THE IRON AGE

138

VOL. LXXXVI.

JULY—DECEMBER, 1910.

728
4/3/30

NEW YORK:
DAVID WILLIAMS COMPANY
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THE IRON AGE

Established 1855 — New York, July 7, 1910 — Vol. 86: No. 1

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office, as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Cutting Down Pig Iron Output

A 15 Per Cent. Curtailment Since February

Production in the Past Year About 29,750,000 Tons—The Iron Trade Quieter

The statistics for June show that the production of coke and anthracite pig iron was 2,265,000 gross tons, or 75,500 tons a day, against 77,100 tons a day in May. On July 1 269 furnaces were in blast, against 280 furnaces one month previous, and the daily capacity active was 73,700 tons, or about 3100 tons a day less than on June 1. The annual rate of production of all kinds of pig iron, estimating charcoal iron at 400,000 tons a year, was about 27,300,000 tons on July 1, against 28,450,000 tons one month previous. A number of furnaces have gone out in the past few days, so that the curtailment may now be reckoned at 15 per cent. from the high point, which was 31,650,000 tons a year in February. The movement will be carried further, as preparations are now being made for the blowing out of other furnaces.

The United States Steel Corporation now has 35 furnaces idle, against 31 on June 1, while at one time last month it had as few as 28 out of blast. The independent steel companies now have five more furnaces out than on June 1. Such statistics of stocks as are available point to a further increase in the Central West and the South, though it is not large.

We estimate the production of pig iron in the first half year, including charcoal iron, at 14,975,000 tons, or about 200,000 tons more than in the second half of 1909. In the past 12 months the country has produced about 29,750,000 tons of pig iron, or nearly 4,000,000 tons more than the highest record for a calendar year —25,795,000 tons in 1909.

The leading interest booked new business at an average rate of 26,000 tons a day in June, practically the same rate as in May, so that the mills are making a strong inroad upon contracts. As to the course of business in the summer months, forecasts are not enthusiastic, since several undetermined factors enter into the reckoning. Better things are generally looked for in the fall, contingent upon an average crop yield.

Among rail contracts of the week are 11,000 tons for the San Antonio & Aransas Pass Railway Company, 5000 tons for an American road of McKenzie & Mann and 2300 tons for the Wheeling & Lake Erie. Car contracts include 3000 for the Baltimore & Ohio, divided among three builders, while 1000 for the same road are about to be let. The Chesapeake & Ohio has bought 1500 cars.

The structural steel industry is still giving a good account of itself. A Chicago office building and a warehouse requiring together 5000 tons are under inquiry; buildings at Niagara Falls, Denver and Edgewater, N. J., calling for 1000 tons each, and the city hall at Oakland, Cal., 1500 tons.

Plate mills are figuring on 12,000 to 15,000 tons for four submarines for the Navy, and at Cleveland the Toledo Shipbuilding Company has placed 2500 tons

The concessions on plates and shapes recently reported continue and on the former have increased in some instances. Those on sheets are more marked on galvanized, which have sold at $4 a ton below the nominal level. Low prices on bar iron still prevail in Eastern and Western markets and these may account for the report of a concession on steel bars which has been received with skepticism in view of the very heavy bookings of most mills for the later months of the year.

At Pittsburgh, Bessemer and open hearth billets are weaker, the latter having sold at $27, the lowest price in many months.

Pig iron markets show considerable maneuvering by buyers, particularly in the Middle West, who seek to contract at present prices for delivery well into next year. Prices are weaker in spots, but producers sell grudgingly on this level for long deliveries. Some sales of Southern low grade irons have been made at fresh concessions. The market on steel making irons is very quiet. For June the Bessemer pig iron average was $15.62 at Valley furnace.

June shipments of Lake Superior ore made a new month's record at 7,316,679 tons. To July 1 the movement was 14,522,058 tons, or 5,819,735 tons more than to July 1, 1909.

The Quantity of Iron Ore Already Mined

From the preachings of those who would have the wheels of our blast furnace blowing engines stopped with a jar a generation or two hence by reason of the sudden exhaustion of all our iron ore reserves to the suggestions of Prof. Henry M. Howe that the earth itself is probably iron and that in time we shall likely be able to regain iron from the rust of that which we have once used is a far cry and practical considerations demand attention to the precise position which we occupy to-day. The facts need no further elaboration than that the value of an iron bearing material depends upon the cost of mining, distance from market and cost of conversion into the iron of commerce, and that all three governing influences vary with the progress of the race, the cost of mining lessening as methods are improved, the cost of transport to market decreasing as transportation methods improve and the market areas spread, and the cost of conversion being reduced as mechanical appliances and metallurgical processes are improved. It requires but the most rudimentary knowledge to observe that no limit can possibly be set to these advances. The known ores which are on the whole the most useful are used first, and improvements either keep pace with, or run in advance of, the requirements as to the use of less useful material.

As to discernible and, indeed, computable value, there is the dead level of the material which it is not necessary to use now and for which need in the near future cannot be foreseen. In general, the value of ore which is used is as much above this zero as the cost of delivering iron made from it is below the lowest cost obtainable with worthless material. This is the theoretical position at any time, and the difference in cost of making and delivering iron, or the value of ores, varies as the conditions from time to time vary.

In the progress from the use of the best ore that has ever been found to the use of the poorest material it may in future become necessary to use, some ground has been covered. Taking the average of all ores mined and used in the United States, the cost of mining has increased, the distance traveled to blast furnace has increased, the iron content has decreased and the amount of impurities has increased. It is not as generally realized as it should be that considerable ground has already been covered in these respects. One factor of several involved is the actual tonnage of ore which has been mined, and such data as are available have been condensed in the table below. Statistics of the iron ore production of the United States have been gathered annually only since 1889, while statistics of the Lake Superior movement have been collected from the beginning. For a report to the National Conservation Commission, C. W. Hayes prepared a statement of the production of iron ore in the United States from 1810 to date, the production prior to 1889 being computed from the pig iron production, and therefore including imports. The inclusion of imports is negligible on account of the smallness of the figures in the early years, and from other considerations. Using Mr. Hayes' figures for the earlier years, and deducting Lake Superior shipments to arrive at an approximation for the remainder of the country, we have constructed the table below:

Approximate Iron Ore Production in the United States.

	Lake Superior. Gross tons.	Remainder. Gross tons.	United States. Gross tons.
1810-1879	13,078,056	80,348,471	93,426,527
1880-1889	33,282,337	57,761,517	91,043,854
1890-1899	105,999,198	57,989,995	163,989,193
1900-1909	297,287,452	87,391,597	384,679,049
1810-1909	449,647,043	283,491,580	733,138,623

Ninety per cent. of the Lake Superior production up to 1879 was in the 14 years after 1865, and it was not until 1890 that the Lake Superior production was clearly in excess of that of the remainder of the country. Of the 449,647,043 tons shipped by the Lake Superior region to the end of last year, 195,703,424 tons has been from the Mesaba range and 253,943,619 tons from the remainder of the region.

The first estimate of the total reserves of the Lake Superior region was half a billion tons for the Mesaba range and a quarter billion for the old ranges. That was made at a time when the Mesaba was very young, while the old ranges had shipped about 100,000,000 tons. Since then, therefore, about 150,000,000 tons has been shipped from them. Had the known ore in the old ranges not increased, there would now be left but 100,000,000 tons, and it is questionable whether the present reserves, of quality at all comparable with that of the ores now being brought down, are greatly in excess of that figure.

As to the Mesaba, the 200,000,000 tons thus far mined has not effected any practical reduction in the reserves, for the reason that the proving up of new ore year by year has kept ahead of the production, so that the known reserves have increased year by year. The additions have been much larger than the subtractions, but on the other hand, the average quality, having regard to the three items—cost of mining, iron content and impurities—of the discoveries has been much below that of the 200,000,000 tons mined.

The reputation which the Mesaba range quickly made as a cheap producer of excellent iron ore has survived to such an extent that full value is frequently not given, in current thought, to the fact that of the

best ores of the region a total of 200,000,000 tons has been taken away, and more than 95 per cent. of this 200,000,000 tons in the past 13 years. This has subtracted a great deal from the quality of Mesaba ores, as originally established, although the visible supply has meanwhile increased.

Our table throws an interesting light upon the mining of ore outside the Lake Superior region. Of course up to 1879 the Lake Superior region was a minor factor. In the eighties it became important, and in the nineties it bore the entire increase in demand, so that the production outside the Lake Superior region was practically identical in the two decades. There was, however, a shifting of the position, for the Lake Superior region reduced production at many points, and this loss chanced to be made up by the rise of the South. In the succeeding decade there was an increase, for the regions which increased in the nineties continued to increase, while the regions which lost in the nineties had little, if anything, more to lose.

The fact that nearly 300,000,000 tons of ore has been mined in the United States outside the Lake Superior region does not mean that much has been done toward the exhaustion of the deposits, for in the main they have suffered less from this than from the competition of the Lake Superior ores. The time will come, although far in the future, when the best of the remaining Lake Superior ores, still a large tonnage, will be able to do no more than compete on even terms with many workings elsewhere which were abandoned in the eighties and nineties.

Preparedness

To urge any one nowadays to "make hay while the sun shines" or to "prepare for war in times of peace" is almost to invite rough treatment. We have all been warned so many times to look ahead a little way and to prepare for the rainy day that it has become a point on which we are apt to be rather irritable. Yet there are few things that do one more good than an occasional "punching up," and if there is anything about which we need to be constantly reminded it is preparedness.

We are always building for the morrow. The row of bricks we cement into position to-day is to bear the burden of those to be built above it; the decisions we make to-day stand or fall to our benefit or sorrow in proportion to the worth of the judgment which makes them. We have had the example only recently of the commendable action of the managers of a great steel corporation, who accumulated a huge surplus for the purpose of fortifying the future of the business, withholding much money which would otherwise have gone to the stockholders as dividends, and perhaps seriously weakened the corporation in the very next period of stress. The wisdom of such a policy is apparent.

In just what way this money shall be spent is, however, a far more difficult problem than it is to decide at the board meeting whether or not to set aside such a sum, and how much it shall be. The belief in the wisdom of the policy is more widespread than is the sagacity necessary to distribute the amount in such a way as to assure maximum returns.

In manufacturing goods having a highly competitive market the getting of orders is often governed by but small differences in quotations, especially in cases where price is considered more important than quality. Although a manufacturer's quotation is but 5 cents per 1000 higher than his competitor's, it gives the latter the business and brings the former one more "lost sales" report from his agent. By and by these reports come in so thick and fast and the factory is running on short time so much that the manufacturer is forced to take notice. He asks himself why it is that the other fellow can underbid him and decides, as he must, that it is simply because the competitor can produce the goods more cheaply than he can. And ten to one the competitor can do so because he has at least kept up to date.

The absolute necessity of a manufacturer's taking immediate advantage of the latest machinery and methods cannot be too strongly urged. This does not mean to purchase new and improved machinery haphazard, nor to fit up at once for any revolutionary process that may offer glittering theoretical possibilities of reducing costs. It does mean, however, that a constant study should be made of the cost of his product and of the demands of the market. It is a very simple matter for him to compute how much he can afford to pay for machinery which will reduce his cost a certain rate per 1000 of product. In some cases a new machine may pay for itself in less than six months, in others it may take longer, but one must look further than this to see all the benefit which the new machine brings. It may be and often is the only way of obtaining and holding the very kind of business for which the factory is, in the main, equipped to produce and upon which the existence of the establishment depends. To succeed and to hold success, there must sooner or later (and preferably sooner) be this constant study of cost reduction, or increase in efficiency, which means the same. Just how near to the ebb the tide of a man's business is at times he can only guess, but it is certain that if he has built up his strength and properly directed his skill he can comfortably ride the waves until the tide flows his way again.

The Striker Apprentice

In works where indentured apprentices are employed a strike brings grievous injustice to the boys whom the union impels by threat or cajolery to go out with the journeymen. It is a poor beginning of a man's career to break his first business contract. The apprentice and his guardians have put their signatures to a formal agreement and have given bond for the completion of the contract, either in cash or in the form of the indorsement of a person presumed to be able to meet the obligation should the necessity arise. A moral as well as a financial responsibility is created, which the union disregards.

Neither the union officers nor the journeymen members stand to forfeit nearly as much as the apprentice. The official is seeking nothing in the way of labor except that which accompanies his position. The journeyman feels that he can get work somewhere, whether or not the strike succeeds. No contract exists between him and his employer which cannot be quickly terminated. In sharp contrast is the position of a striking apprentice. Not only does he forfeit his bond, but he blots his reputation as a workman. He is young, perhaps too young to realize what he is doing, and he is led by his elders to strike for them, not for himself.

They apply a form of intimidation which, judging from recent experience, requires exceptional courage to put aside. Stationed as a picket in front of a machine shop within the past week was a machinist's apprentice whose contract the owner holds, assured by somebody's bond. The union is responsible for the presence of the boy in such an indefensible occupation. It is often difficult for strikers to regain the positions which they have voluntarily abandoned. The case of a striking apprentice is an extreme one, and seldom is he permitted to return to his home shop.

A New Metal Company.—The Kroenert Smelting & Refining Company is now operating its new plant at 6620-6624 Kelly street, East Liberty, Pittsburgh. The company erected a building, 50 x 75 ft., and equipped it with two furnaces for smelting and refining metals, one crucible furnace and babbitt and solder kettles. M. M. Kroenert is president; E. J. Forse, vice-president; G. A. Kroenert, secretary and treasurer, and Joseph J. McDermott, superintendent. Mr. McDermott for years had charge of a Western company's plant, operating in the same line of business. Among the products the company will deal in are terne metal, solder, babbitt, pig lead, type metal, aluminum and aluminum solder, &c.

The Pontiac Foundry Company, Pontiac, Mich., is receiving bids for the construction of a foundry building, 70 x 300 ft.

Pig Iron Production

A Further Decrease in June

Daily Capacity Falls Off 3100 Tons and Is Still Declining

Our pig iron statistics for June show that the production of coke and anthracite pig iron was 2,265,478 gross tons, or 75,516 tons a day, against 77,102 tons a day in May. On July 1, 269 furnaces were in blast, against 280 furnaces one month previous, and the daily capacity active was 73,762 tons, or about 3,100 tons a day less than on June 1, when the figure was 76,846 tons. The annual rate of production of all kinds of pig iron, estimating charcoal iron at 400,000 tons a year, was about 27,300,000 tons on July 1, against 28,450,000 tons one month previous. The reduction in rate of output from the high point, which was 31,650,000 tons a year in February, was nearly 14 per cent. up to July 1. A number of furnaces have gone out in the past few days, so that the curtailment may now be reckoned at 15 per cent. On February 1, 313 coke and anthracite furnaces were in blast. The net reduction to July 1 was, therefore, 44.

We estimate the production of all kinds of pig iron in the first half of 1910 at 14,975,000 gross tons. The comparison with the official figures for the second half of 1909 is as follows:

Second half of 1909	14,773,125
First half of 1910, estimated	14,975,000
Estimated production for 12 months	29,748,125

These figures show that the highest production for



Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to July 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago.

a calendar year, 25,795,471 tons in 1909, has been exceeded in the past 12 months by nearly 4,000,000 tons.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with June, 1909, is as follows:

Daily Rate of Pig Iron Production by Months. Gross Tons.

	Steel Works.	Merchant.	Total.
June, 1909	45,507	19,149	64,656
July	58,679	19,123	67,702
August	51,354	28,192	72,546
September	55,361	24,146	79,507
October	57,067	26,789	83,856
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,870	27,746	85,616
March	56,143	28,316	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,637	23,879	75,516

June Output by Districts

The table below gives the production of all coke and anthracite furnaces in June and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	February. (28 days)	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)
New York	156,470	180,005	166,307	171,461	163,575
New Jersey	26,102	29,557	29,092	22,973	18,443
Lehigh Valley	54,028	52,224	64,910	70,344	66,944
Schuylkill Val.	53,996	62,865	61,084	65,725	60,349
Lower Susquehanna and Lebanon Val.	64,054	70,738	71,694	65,667	60,315
Pittsburgh dis.	541,791	592,494	543,531	510,514	483,909
Shenango Val.	137,095	137,315	124,440	120,301	130,290
West. Penn.	133,266	143,308	141,246	144,578	132,344
Md., Va. and Kentucky	66,454	78,761	77,032	82,071	82,181
Wheeling dis.	120,035	113,753	106,736	94,217	76,166
Mahoning Val.	220,779	241,653	225,588	218,243	208,988
Central and North. Ohio.	201,462	218,660	181,805	144,344	145,393
Hocking Valley, Hanging Rock and S.W.Ohio	42,876	47,935	48,264	43,290	41,521
Mich., Minn., Mo., Wis., Colo.	65,363	77,209	75,802	71,588	68,051
Chicago dis.	322,196	348,972	351,272	358,509	328,953
Alabama	154,337	180,836	173,071	165,937	160,970
Tenn., Georgia and Texas	36,949	41,664	41,889	40,418	37,086
Totals	2,397,254	2,617,949	2,483,763	2,390,180	2,265,478

Capacity in Blast July 1 and June 1

The following table shows the daily capacity of furnaces in blast July 1 and June 1. These figures are based largely on the performance of the furnaces in June and May:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	July 1.—Number in blast.	July 1.—Capacity per day.	June 1.—Number in blast.	June 1.—Capacity per day.
New York:					
Buffalo	16	15	5,085	14	4,956
Other New York	7	3	558	3	574
New Jersey	8	3	615	3	642
Spiegel	2	..	.....	..	....
Pennsylvania:					
Lehigh Valley	23	14	2,064	14	2,095
Spiegel	3	2	155	3	174
Schuylkill Valley	16	8	1,962	9	2,023
Low. Susquehanna	7	5	1,053	5	1,090
Lebanon Valley	10	7	957	7	956
Pittsburgh dist.	50	41	16,130	41	16,015
Spiegel	3	2	281	3	464
Shenango Valley	20	14	3,809	16	4,146
West. Penn.	27	16	4,285	17	4,192
Maryland	4	4	1,102	4	1,105
Wheeling dist.	14	7	2,340	8	3,040
Ohio:					
Mahoning Valley	22	20	7,260	19	6,940
Central and North.	22	14	4,846	14	4,940
Hocking Val., Hanging Rock and S. W. Ohio	15	10	1,238	11	1,345
Illinois and Indiana	31	21	9,135	23	11,174
Spiegel	3	3	330	3	314
Mich., Wis. and Minn.	9	6	1,064	5	894
Colo., Mo. and Wash.	7	5	1,301	5	1,311
The South:					
Virginia	23	11	1,280	12	1,395
Kentucky	5	2	312	2	296
Alabama	46	23	5,565	23	5,784
Tenn. and Georgia	20	13	1,235	13	1,310
Totals	413	269	73,762	280	76,846

Among furnaces blown out in June or on July 1 were one New Jersey zinc in the Lehigh Valley, Leesport in the Schuylkill Valley, one Edgar Thomson in the Pittsburgh district, Ella, one New Castle and Hall in the Shenango Valley, Saxton in Western Pennsylvania, Alleghany and Victoria in Virginia, Riverside in the Wheeling district, Marting in the Hanging Rock district, one Federal, one Joliet, one South Chicago and two Gary in the Chicago district, and Rockdale in Tennessee.

Among furnaces blown in were one Niagara in the Buffalo district, one Duquesne in the Pittsburgh district, one Ohio in the Mahoning Valley, one New Castle in the Shenango Valley, Buena Vista in Virginia, one Mayville in Wisconsin.

The Curves of Pig Iron Production and Prices

The curve of pig iron production from January, 1907, to the present time is shown in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907. Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	36,439	59,232	84,459
April	73,885	38,289	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	56,444	64,656	75,516
July	72,763	59,287	67,793	.....
August	72,594	43,851	72,546	.....
September	72,783	47,500	79,507	.....
October	75,386	50,554	83,856	.....
November	60,937	52,595	84,917	.....
December	39,815	55,158	85,022	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	....	....
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	....	....
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	....	....
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	....	....
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.— 1908.	1909.	1910.	Spiegeleisen and ferromanganese. 1909.	1910.
January	664,415	1,117,823	1,773,201	12,325	19,538
February	745,802	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,553	1,739,212	23,743	25,591
April	725,548	1,093,092	1,669,898	22,478	22,304
May	759,674	1,256,448	1,519,283	20,834	26,529
June	717,689	1,365,527	1,549,112	16,516	27,680
July	758,629	1,508,762	.....	17,613	....
August	897,652	1,559,991	.....	22,313	....
September	933,514	1,660,839	.....	28,148	....
October	996,481	1,769,094	.....	25,384	....
November	981,167	1,689,994	.....	23,376	....
December	1,090,339	1,768,799	.....	20,791	....

The Record of Production

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,939,866	2,265,478
July	2,255,666	1,218,129	2,103,451	.....
August	2,250,410	1,359,831	2,248,930	.....
September	2,183,487	1,418,998	2,385,206	.....
October	2,336,972	1,567,198	2,599,541	.....
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

The Verona Tool Works, Pittsburgh, operated by Metcalf, Paul & Co., has rewarded four employees for long and faithful service by presenting them with gold medals and giving them pensions. One man was employed continuously by the company for 37 years, a second for 36 years, a third for 35 years and a fourth for 29 years.

May Exports and Imports of Iron and Steel

As compared with April, the May exports of iron and steel show an increase and the imports a decrease, according to the report of the Bureau of Statistics of the Department of Commerce and Labor. The value of the exports of iron and steel and manufactures thereof, not including iron ore, was $17,658,042 in May, against $16,529,254 in April, while the value of similar imports was $3,486,336 in May, against $3,710,614 in April.

The exports of commodities for which quantities are given totaled 135,344 gross tons in May, against 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for May and for the 11 months of the fiscal year ending with May are as follows, compared with the corresponding periods of the previous year:

Exports of Iron and Steel.

	May,		11 mos. ending May,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	7,814	5,121	70,917	42,332
Scrap	3,687	3,819	14,508	21,192
Bar iron	2,057	1,297	14,644	10,535
Wire rods	1,834	1,427	22,442	11,196
Steel bars	8,201	4,763	81,062	45,461
Billets, blooms, &c.	180	13,981	49,313	98,757
Hoops, bands, &c.	600	269	4,659	3,213
Steel rails	35,516	30,794	344,186	213,315
Iron sheets and plates	8,834	5,447	87,893	51,027
Steel sheets and plates	13,315	8,478	128,924	70,764
Tin and terne plates	1,161	640	10,917	4,464
Structural iron and steel	15,750	5,643	104,742	92,654
Barb wire	7,349	4,645	67,407	60,162
Wire	8,293	8,717	73,009	63,661
Cut nails	1,031	848	8,449	7,034
Wire nails	4,996	1,580	34,093	24,349
All other nails, including tacks	1,185	592	7,866	6,087
Pipe fittings	13,301	11,788	150,778	118,312
Totals	135,344	109,849	1,275,609	944,315

The imports of commodities for which quantities are given totaled 45,021 gross tons in May, as compared with 51,438 tons in April and 57,150 tons in March. The details of such imports for May and for the 11 months ending with May, as compared with the corresponding periods of the preceding year, are as follows:

Imports of Iron and Steel.

	May,		11 mos. ending May,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	21,405	8,747	223,606	94,032
Scrap	3,253	642	116,370	5,132
Bar iron	4,304	500	29,962	14,050
Rails	540	6	6,844	1,292
Billets, bars and steel in forms n.e.s.	3,885	1,008	34,797	11,524
Sheets and plates	159	159	6,425	2,978
Tin and terne plates	7,086	6,487	63,553	46,724
Wire rods	2,174	692	14,040	10,519
Structural iron and steel	1,915	62	10,157	5,384
Totals	45,021	18,363	505,752	191,635

The imports of iron ore in May were 240,833 gross tons against 206,135 tons in April, 163,633 tons in March and 97,393 tons in the month of May, 1909. The total importations of iron ore for the 11 months ending with May were 2,188,261 gross tons, against 890,933 tons in the corresponding period of the previous year and 914,949 tons in the corresponding period of the fiscal year 1908. Of the May imports of iron ore 135,950 tons came from Cuba, 66,507 tons from Europe and 38,376 tons from British North America.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the 11 months ending with May, was $162,629,982, against $131,171,621 in the corresponding period of the previous year. In the same periods, respectively, the imports reached totals of $35,434,273 and $19,997,877.

The new blast furnace of the Worth Brothers Company, Coatesville, Pa., is now producing at a daily rate averaging between 350 and 400 tons. The stack is not being pushed, but is gradually being worked up to its intended capacity of 500 tons per day. Standard basic pig iron is being produced. The construction of a second furnace by this company is going forward rapidly. Foundation work for the necessary additions for the boiler and engine house has been practically completed, and a good portion of the structural work has been done. The plate work on the four hot blast stoves has been completed and the shell of the furnace stack is now being erected. It is hoped that this second furnace will be ready to blow in before the close of the year. An addition to the main office building of the company, which will double the present building, is now under way.

The Lake Superior Iron & Chemical Company

Rogers, Brown & Co. have been appointed sole selling agents for the charcoal pig iron of the Lake Superior Iron & Chemical Company, which on July 1 transferred its Michigan property to a company of the same name incorporated in New York. The sale included about 300,000 acres of woodland in fee and under contract, the Yale and Tyler's Fork iron mines, six charcoal blast furnaces, of which the Ashland makes the Hinkle brand, Manistique makes Champion, Newberry makes Michigan, Boyne City makes Pine Lake, Elk Rapids makes the same name and Chocolay the same name, also four chemical plants. The officers of the new company are as follows: John Joyce, president, Boston; W. H. Matthews, vice-president, Detroit; L. F. Knowles, secretary, Detroit, and A. Vanoss, treasurer, Toronto. The annual capacity of the six furnaces is about 200,000 tons. They are favorably located to distribute the particular grades and furnish the analyses required by manufacturers of cylinders, automobiles, car wheels, &c.

The Western Steel Corporation Rolling Bars

The Western Steel Corporation, Seattle, Wash., began the operation of its 14-in. and 22-in. rolling mills at Irondale June 21, steel bars being the first products rolled. For a fortnight previous to this time the open hearth furnaces had been pouring steel and ingots had been accumulated awaiting the operation of the rolling mills. From this time on, it is stated, there will be steady operation of both the open hearth furnaces and the rolling mills. The company is now practically in the field for the filling of orders for manufactured steel. A considerable tonnage is already upon its books An average analysis of the steel thus far produced at Irondale is as follows: Carbon, 0.22; manganese, 0.50; phosphorus, 0.01; sulphur, 0.032. The blast furnace at Irondale, it is expected, will be put in blast this week.

The Vulcan Steam Shovel Company will move its plant from Toledo, Ohio, to Evansville, Ind., about January 1. The ownership of this company and of the Bucyrus Steam Shovel Company, South Milwaukee, is practically identical, and the object of changing the location is to have a plant more convenient to the Southern trade. A site and bonus were given by citizens of Evansville to secure the plant. The Toledo plant will be dismantled and the machinery moved to Evansville.

The Columbia Tool Steel Company, Chicago Heights, Ill., is erecting a building with 5000 sq. ft. of floor space to be used for machine shop and storehouse purposes. No additional equipment will be installed, as the extra space will be used to relieve the present crowded condition of the company's shops.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July 6, 1910.	June 29, 1910.	June 1, 1910.	July 7, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.25*	$16.25	$17.00	$16.50
Foundry No. 2, Southern, Cincinnati	14.75	14.75	14.75	15.75
Foundry No. 2, local, Chicago	16.75	16.75	16.75	17.00
Basic, delivered, eastern Pa.	*15.75*	15.75	16.25	15.50
Basic, Valley furnace	*14.50*	14.50	15.00	15.00
Bessemer, Pittsburgh	*16.40*	16.40	16.90	16.15
Gray forge, Pittsburgh	*14.90*	14.90	15.40	14.65
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*25.00*	25.00	25.50	23.00
Forging billets, Pittsburgh	*30.00*	31.00	31.00	27.00
Open hearth billets, Philadelphia	*28.50*	28.50	29.00	25.00
Wire rods, Pittsburgh	*30.00*	31.00	31.00	29.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	*13.50*	13.50	15.00	14.50
Steel rails, melting, Philadelphia	*14.25*	14.25	14.50	16.00
Iron rails, Chicago	17.00	17.00	17.00	17.00
Iron rails, Philadelphia	*19.00*	19.50	20.00	19.50
Car wheels, Chicago	*15.00*	15.50	15.50	16.00
Car wheels, Philadelphia	*14.50*	14.50	15.00	15.25
Heavy steel scrap, Pittsburgh	15.00	15.00	15.00	16.00
Heavy steel scrap, Chicago	*12.75*	12.75	13.50	14.00
Heavy steel scrap, Philadelphia	*14.25*	14.25	14.50	16.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.47½*	1.47½	1.52½	1.45
Common iron bars, Chicago	*1.40*	1.45	1.47½	1.35
Common iron bars, Pittsburgh	*1.50*	1.50	1.55	1.45
Steel bars, tidewater, New York	1.61	1.61	1.61	1.41
Steel bars, Pittsburgh	1.45	1.45	1.45	1.25
Tank plates, tidewater, New York	*1.61*	1.61	1.66	1.46
Tank plates, Pittsburgh	*1.45*	1.45	1.50	1.30
Beams, tidewater, New York	*1.61*	1.61	1.66	1.30
Beams, Pittsburgh	*1.45*	1.45	1.50	1.46
Angles, tidewater, New York	*1.61*	1.61	1.66	1.30
Angles, Pittsburgh	*1.45*	1.45	1.50	1.46
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.40
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.30*	2.40	2.40	2.20
Wire nails, Pittsburgh*	1.80	1.80	1.80	1.70
Cut nails, Pittsburgh	1.75	1.75	1.75	1.70
Barb wire, galv., Pittsburgh*	2.10	2.10	2.10	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.75*	12.75	13.00	13.25
Electrolytic copper, New York	*12.37½*	12.37½	12.75	13.00
Spelter, New York	*5.20*	5.20	5.30	5.35
Spelter, St. Louis	*5.05*	5.05	5.15	5.27½
Lead, New York	**4.40**	4.37½	4.37½	4.35
Lead, St. Louis	**4.25**	4.22½	4.22½	4.30
Tin, New York	*32.80*	33.00	32.90	29.00
Antimony, Hallett, New York	8.12½	8.12½	8.12½	7.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.45c. to 1.50c., net; I-beams over 15 in., 1.60c., net; H-beams over 8 in., 1.70c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.55c., net; angles over 6 in., 1.60c., net; angles, 3 x 3 in., and up, less than ¼ in., 1.70c., base, half extras, steel bar card; tees, 3 in. and up, 1.60c., net; zees, 3 in. and up, 1.55c., net; angles, channels and tees, under 3 in., 1.45c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.80c., net; hand rail tees, 2.80c., net; checkered and corrugated plates, 2.80c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.45c. to 1.50c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼ in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.20c.; No. 28, 3.40c.; No. 29, 3.50c.; No. 30, 3.75c. Painted roofing sheets, No. 28, $1.70 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	52
⅜ in.	71	57	67	53
½ in.	74	62	70	58
⅝ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	62	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1⅜ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $30.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50 cents. Terms are 30 days, net cash, f.o.b. mill. The above prices are absolutely minimum on contracts for large lots, makers charging the usual advances of $2 to $3 a ton to the small trade.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, July 6, 1910. (By Telegraph.)

Pig Iron.—There is little or no new inquiry for pig iron and not enough is being sold to establish a market. The Standard Sanitary Mfg. Company has not yet closed on its inquiry for 8000 tons of Northern No. 2 for its Allegheny and New Brighton works, but may buy before the day is over. It is understood that low prices have been named. Furnaces and dealers are not trying to force sales of pig iron at present, believing it is useless to do so under existing conditions. Stocks of pig iron in June showed an increase over May, and it is believed that further restriction in output will have to be made before the market can improve. We quote standard Bessemer iron at $15.50 to $15.75; malleable Bessemer, $15 to $15.25; basic, $14.50 to $14.75; No. 2 foundry, $14.50 and gray forge, $14, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Steel.—The market is extremely quiet, very few new inquiries being out, and prices on both Bessemer and open hearth steel are weak. We quote Bessemer billets at $25 and sheet bars at $26 to $26.50; 4 x 4 in. open hearth billets, $27 to $27.50; open hearth small billets, $28 to $28.50; open hearth sheet and tin bars, $28 to $28.50; forging billets, $30 to $31, all f.o.b. Pittsburgh, freight to destination added.

Coke.—A local dealer closed a contract this morning for a round tonnage of 72-hour foundry coke for delivery over the year beginning July, on the basis of $2.25 per net ton at oven. The inquiry of the Westinghouse Electric & Mfg. Company for foundry coke is based on a maximum of 12 cars a week for the year beginning July and which will amount to close to 15,000 tons for the year. It is probable, though, that the actual tonnage involved will not amount to over 12,000. Bids have gone in on this inquiry on the basis of $2.25 per net ton, at oven, for standard 72-hour foundry, and the contract may be placed this week.

(By Mail.)

The second half of the year opens up with very quiet conditions. The outlook does not promise much activity through July, while August may also be dull. A good many finishing mills shut down June 30 for inventory and repairs, and of course will not take in any material for the next two or three weeks or until they start up again. The Republic Iron & Steel Company has closed its Bessemer plant and some of its finishing mills in the Youngstown district, and they will probably be shut down about two weeks. The Pittsburgh Steel Company has closed its open steel plant, rod and wire mills at Monessen, Pa., and they will be closed down for the next two weeks or longer. As yet no settlement has been reached between the mills in the Western Bar Iron Association and the Amalgamated Association on the wage scale, but this does not mean that the union bar iron mills will shut down, as there is a provision in the scale by which they can run until an agreement is reached. A leading consumer is still in the market for 7000 to 8000 tons of Northern foundry pig iron for last half of the year delivery, and the inquiry of about three weeks ago of the Colona, Pa., interest for a large tonnage of basic iron has not yet been closed. The steel market is quiet, and prices on both Bessemer and open hearth steel are weak. Standard 4 x 4 in. open hearth billets could readily be had to-day at $27, Pittsburgh, the lowest price that has ruled in this market for some time. Little is doing in scrap or coke, but some inquiries are in the market for foundry coke for last half of the year.

Ferromanganese.—There is little or no new inquiry and prices continue weak. We quote foreign 80 per cent. ferro for delivery over balance of this year at $39 to $39.50, Baltimore, carrying a freight rate of $1.90 a ton for delivery in Pittsburgh district.

Ferrosilicon.—Aside from a sale of 25 tons of 50 per cent. at $57.50, Pittsburgh, for delivery during July, nothing of moment has been done in this material in the past week. The market is weak and we quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh. We quote 10 per cent. at $23; 11 per cent., $24, and 12 per cent., $25, all at Ashland furnace, to which $1.90 a ton should be added for delivery in the Pittsburgh district.

Rods.—The dull condition existing in the wire trade is reflected in rods, the demand for which is light and confined to small lots. We quote Bessemer and chain rods at $30 to $31, and open hearth rods at $31 to $32, Pittsburgh.

Skelp.—The mills rolling wide sizes of sheared iron and steel skelp are pretty well filled up for the next several months on recent contracts placed, and against which specifications are being received freely. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—The past week has been quiet, new orders for light rails amounting to about only 2000 tons and no contracts of importance for standard sections have been placed. The demand for track supplies continues heavy, especially for splice bars, for which the Carnegie Steel Company has recently entered some good orders. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 to 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Structural Material.—A contract for about 1500 tons of steel for a bridge for the Erie Railroad for its Mahoning Division was the only contract of importance placed. Inquiries are active, and the two leading local fabricators are pretty well filled up for the next three months or longer. We quote beams and channels up to 15-in. at 1.45c. to 1.50c., Pittsburgh.

Plates.—Local mills are bidding on 12,000 to 15,000 tons of plates for four submarines to be built for the Navy, and another inquiry is up to the local mills for 2000 to 2500 tons of ship plates. The only car orders of importance in the past week were the Baltimore & Ohio for 1000 all steel coke cars, placed with the Pressed Steel Car Company, 1000 coal and coke cars with the Cambria Steel Company, 1000 steel underframe cars with the Standard Steel Car Company, and the Chesapeake & Ohio for 1500 50-ton cars with the Standard Steel Car Company. The plate mills are pretty well filled up with orders for July and August, but have little on their books for last quarter. We quote ¼-in. and heavier plates in the narrower sizes at 1.40c. to 1.45c., and wide sizes at 1.45c. to 1.50c., Pittsburgh.

Sheets.—Reports were current last week that several of the leading sheet mills had made a reduction of $2 a ton on black and galvanized sheets, but this is officially denied. The report probably arose from the fact that for some time the prices on the lighter gauges of black and galvanized sheets have been shaded $2 to $3 a ton by a few of the mills, and these concessions are now being met by several of the larger interests. The new demand for sheets has fallen off a good deal, and there is no trouble now in getting prompt deliveries in blue annealed and electric sheets. The official price of No. 28 black sheets is 2.40c., but a good many mills are entering orders at 2.30c., and the regular price on galvanized No. 28 is 3.50c., but orders are being taken at 3.40c. or less.

Tin Plate.—This is probably the most active item on the whole list, all the leading tin plate mills being in operation to full capacity, and with about enough business on their books to take their output for the balance of this year. New buying in tin plate is light, as the season is over, but consumers are specifying freely against their contracts, and most of the mills are behind in shipments. Prices are very firm, and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Specifications on steel bars in June were extremely heavy, but will probably show a falling off during this month, as a good many consumers have closed their works for inventory and repairs and will not take in material until these have been completed. There is little new buying in iron bars, and a good many of the railroads have tonnage due them on old contracts, which should have been taken out prior to June 30. We quote steel bars at 1.45c. and common iron bars about 1.50c., Pittsburgh.

Hoops and Bands.—A good many contracts on hoops and bands expired June 30, and while some of these will be carried over, others will be canceled. We quote steel hoops for forward delivery at 1.50c. to 1.55c. and steel bands at 1.45c. to 1.50c., on contracts, the latter carrying half extras as per the steel bar card. We are advised that 1.50c. on steel hoops and 1.45c. on steel bands are absolute minimum of the market, a good many contracts being on the books of the mills at these prices.

Spelter.—The market continues dull and weak, prime grades of Western being offered as low as 4.90c., East St. Louis, equal to 5.02½c., Pittsburgh.

Spikes.—No important orders for railroad spikes are being placed with local makers, the demand being entirely for small lots for repair work. Boat spikes and small rail-

THE IRON AND METAL MARKETS

road spikes are showing a more active demand. We quote standard sizes of railroad spikes, $\frac{1}{2}$ x 9-16 in. and larger, at 1.55c. to 1.60c. for Western shipment and 1.60c. to 1.65c. for local trade. Boat and small railroad spikes are lower in price and we quote these at 1.65c. to 1.70c., base, these prices being for carload and larger lots.

Rivets.—Current orders are mostly in small lots to meet actual needs. Buying has been light for some time. A few of the smaller makers continue to shade regular prices, which are 2.15c. for structural rivets and 2.25c. for boiler rivets, f.o.b. Pittsburgh.

Shafting.—The new demand for shafting is fairly active, but is not so heavy as some time ago. Specifications against contracts are coming in at a fairly satisfactory rate, and makers are now catching up on deliveries on which they have been behind for some time. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of about 55 and 5 off.

Wire Products.—Conditions in the wire trade are far from satisfactory. Orders are light and only to meet current needs. While specifications against contracts were a little heavier in June than in May, it is admitted that the wire trade this year so far has been a disappointment. The American Steel & Wire Company closed down some of its mills on June 30 for inventory and repairs, while the open hearth steel plant, rod and wire mills of the Pittsburgh Steel Company are also closed for inventory and will be idle for two or three weeks. We quote wire nails at $1.80 in carload and larger lots; galvanized barb wire, $2.10; painted, $1.80; annealed fence wire, $1.60; galvanized, $1.90; cut nails, $1.75 to $1.80, all f.o.b. cars, Pittsburgh, with usual terms, and freight to destination added.

Merchant Pipe.—A leading gas interest is reported to be in the market for 100 to 150 miles of 16 to 20 in. pipe. On the lap weld sizes of pipe, used largely for oil and gas lines, the mills are pretty well filled for the remainder of this year, but have few orders on their books for the butt weld sizes, the demand for which has been dull practically all of this year. Discounts on iron and steel pipe are reported as being fairly well maintained.

Boiler Tubes.—Local makers have recently taken several nice contracts for locomotive tubes. The demand for merchant tubes is fair, but is not as large as the mills would like to have it. Regular discounts on locomotive and boiler tubes, printed on a previous page, continue to be more or less shaded.

Coke.—The output in the Upper and Lower Connellsville regions last week showed a falling off of about 11,000 tons as compared with the previous week, and shipments were about 1000 cars less. The market continues quiet, but several large inquiries for foundry coke are out. The Westinghouse Electric & Mfg. Company is reported in the market for upward of 12,000 tons of foundry coke for last half shipment. We quote best grades of furnace coke running under 1 per cent. in sulphur for delivery over last half of the year at $1.80 to $1.85, and best grades of 72-hour foundry coke at $2.15 up to $2.40 per net ton at oven for same delivery. Furnace coke loaded on cars which has to be moved is being offered at $1.65 to $1.70 for best grades.

Iron and Steel Scrap.—Many consumers of scrap closed their plants down June 30 for inventory and repairs, and will not take in any material for some little time. The Pittsburgh Steel Company, Monessen, Pa., which is the largest local consumer of heavy steel scrap, has shut off shipments of scrap until its operations are resumed. Very low prices were bid on the New York Central list, which closed June 28, and also on the list of the Pennsylvania Lines West, which closed June 30, and as a result but little was secured by local dealers. The scrap trade is likely to continue very quiet through July and possibly next month. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$15.00 to $15.25
No. 1 foundry cast	14.25 to 14.50
No. 2 foundry cast	13.25 to 13.50
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.00 to 16.25
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	11.00 to 11.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	25.00 to 25.25
Steel car axles	21.00 to 21.25
Locomotive axles	26.00 to 26.25
No. 1 busheling scrap	13.00 to 13.25
No. 2 busheling scrap	9.00 to 9.25
Old car wheels	14.50 to 14.75
Sheet bar crop ends, shipping point	16.75 to 17.00
Cast iron borings	8.25 to 8.50
Machine shop turnings	9.50 to 9.75

Chicago

FISHER BUILDING, July 6, 1910.—(*By Telegraph.*)

The custom among manufacturing interests to shut down for inventories and repairs makes the first half of July a very dull period in the market for materials, and it may be several weeks before it is possible to get a definite line on fall trade. The steel mills are an exception to this general closing down, as they have enough business booked to carry them through the summer. The rail mills, in fact, are not able to make deliveries as fast as the railroads desire them, and this is also true of track fastenings and track supplies. The demand for soft steel bars has been so heavy for more than a year that the mills are barely able to clean up old specifications in time to begin on new yearly contracts on which specifications are now coming in. The structural and plate mills are not so well booked, but new structural contracts are coming forward steadily and the railroads are expected to place liberal car orders within the next 60 days. A favorable indication of general business conditions is that the demand from store for plain material is almost as good as it was last winter, and keeps up at a surprising rate. The mills are doing so much better now on deliveries that a general dropping off was expected in sales from store. The buying from stock is not from manufacturers in distress, who were looking last winter for all the material they could get, but is of a general and satisfactory character, and shows that small industries and the smaller building projects are going forward at a normal rate of business. The bar iron market feels the lack of railroad buying and the scrap market is very dull. Trading in metals is limited to prompt deliveries.

Pig Iron.—There is more willingness on the part of Southern furnace interests to sell at $11.50, Birmingham, for last half, and a fair amount has been done the past week at this figure by one of the leading interests which has been holding at $12 until a few days ago. Buyers, however, are showing little interest in the market, and there is no general movement to cover beyond the third quarter. The business pending is principally old inquiries. Many buyers are taking inventory, and their foundries will be closed for a week or more during July, making this the dullest point of the year in actual consumption. Another deterring influence is that the corn belt has gone for more than a month without rain, and while crops have not suffered, there is a tendency in many industries to wait for rains and improvements in business before making deferred purchases. While more of the Southern interests are willing to do $11.50 for the last half of the year than there were a week ago, there are not enough inquiries for spot iron to develop any concessions in this market for prompt or third quarter iron. In Northern grades there is practically no change in the situation. A malleable interest has purchased 3000 tons for the last half for delivery at St. Charles, Ill., and it is understood that the price was not materially lower than the furnace basis which is quoted for Chicago delivery. The local interests seem to be holding firm at prices which net about $16.25 to $16.75, at furnace. With Chicago switching charges added, this is equal to the price which has been quoted in this market for some time. There are scattering inquiries for low phosphorus iron, one from a Milwaukee stove foundry being for 600 tons. The Thomas Furnace at Milwaukee will blow out in a few days for repairs and improvements. The following quotations are for July, August and September shipments, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.25 to 17.75
Northern coke foundry, No. 2	16.75 to 17.25
Northern coke foundry, No. 3	16.25 to 16.75
Northern Scotch, No. 1	17.75 to 18.25
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.60 to 16.10
Southern coke, No. 4	15.35 to 15.85
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	15.10 to 15.60
Southern mottled	14.85 to 15.35
Malleable Bessemer	16.75 to 17.25
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—No important inquiries have been reported in this market for some time and Pittsburgh quotations govern.

Rails and Track Supplies.—Chicago mills are well covered with specifications for rails and track supplies and not much interest is expected to develop in this market until the railroads begin contracting for 1911. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.75; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—A fair amount of business was

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let in the West last week and other good jobs are pending. The Y. M. C. A. Building at Gary, Ind., 440 tons, was let to Vierling, McDowell & Co., Chicago. The Adams School, San Francisco, 415 tons, went to the Ralston Iron Works of that city. The Daniels & Fisher Building at Denver, Colo., 1000 tons, was taken by J. L. Patterson of that city. The general contract for the Jefferson Hotel at Peoria, Ill., has been let, but the plans for the steel work will be revised. The original plans called for 1000 tons. The steel work of the Halsted Street State Bank in Chicago, 485 tons, has been let to George W. Jackson, Inc. The American Bridge Company booked 150 tons for the plate and forge shop of the Minnesota Steel Company at Duluth and 500 tons of axles for the Pullman Company, Chicago. Bethlehem shapes have been specified on two jobs which are pending, the Bankers' Insurance Building at Lincoln, Neb., 215 tons, and a warehouse in Chicago for Marshall Field & Co., which will require 2000 to 3000 tons. Plain material from mill is quoted $1 lower in this market following the reduction last week in Pittsburgh. We quote plain material from mill, 1.63c. to 1.68c., Chicago; from store, 1.90c. to 2c., Chicago.

Plates.—The local mill of the leading interest continues to receive good specifications for steel cars, growing out of the car orders that were placed by the railroads during May. New business from other sources, however, is quiet, and competition in the Pittsburgh district has made prices $1 a ton lower. We quote mill prices at 1.63c. to 1.73c., Chicago; store prices, 1.90c. to 2c., Chicago.

Sheets.—The sheet market is moving along slowly, with the usual concessions from the Eastern mills on black and galvanized sheets and on corrugated roofing. A steady trade is expected during the summer and fall, as there has been a general shortage of tinners through the West, so that the people who do roofing and tin shop business have not been able to take care of their trade. The men available, however, will be kept at work steadily, thus insuring a good jobbing trade for the mills. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from store, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 3c. to 3.10c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—The implement manufacturers and other yearly buyers of bars have been giving liberal specifications the past month on their contracts. A year ago many of them had allowed their warehouse stocks to run down, so as to show low inventories July 1, and many of them did not give full specifications until late in the summer and fall. Practically all of them, however, ran short during the winter and spring, with most annoying results. This year it seems to be their policy to accumulate good stocks in their warehouses before beginning their manufacturing season, and in many cases the mills have enough specifications to run them comfortably for six months, leaving very little capacity open to take care of current new business. The bar iron mills, however, have but little business on their books, and outside mills are offering concessions on prompt business, placing iron bars at a considerable discount under soft steel bars. The hard steel bar mills are doing better and have a fair amount of business in sight. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago.

Merchant Steel.—The mills continue backward on deliveries of cold rolled shafting, smooth finished machinery steel and other lines for which there has been an unusual demand this year. The inquiry for tool steel is also active and a good business is being done from store in miscellaneous lots of bars, sheets, structural and other material on which buyers want spot or prompt delivery. Manufacturers are generally showing a tendency to buy for near delivery, except the larger interests, which make yearly contracts direct with the mills.

Rods and Wire.—July is the dullest season of the year in the wire business and the first half of July is generally very quiet, as it coincides with harvest time. The mills, however, are getting a fair run of business and conditions are considered very favorable for fall trade. There are no expectations of bumper crops of wheat or corn, but fair crops usually bring the farmers better returns by realizing higher prices. A great deal of fence building on the farm has been postponed until fall on account of weather conditions which have kept the farmers busy in the field. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c., all Chicago.

Cast Iron Pipe.—Municipal legislative bodies generally adjourn for the summer months throughout the West, and no large lettings are expected in the water pipe trade for some time. The leading pipe interest has booked a letting at West Allis, Wis., for about 300 tons of water pipe, and there is a fair run of small lettings and orders from minor municipalities. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for gas pipe.

Old Material.—Railroad malleable scrap continues the weakest feature of the market, as the large foundries appear to be entirely indifferent to the bargains that are offered them. A Western railroad offered a lot of 1500 tons at private sale last week at $11.50, but was unable to make a sale, although nearly every dealer in town had an opportunity to take the material. Other grades of scrap are holding fairly steady, as prices are so low now that a buyer can generally be found for any material that has to be placed. Cast scrap is a little weaker, in sympathy with pig iron, and, perhaps, due also to the fact that foundries melt less in July and August. The only profit for the scrap dealer is on the short side of the market, a condition that has prevailed for the past nine months. Where the dealer makes a sale to the consumer before he buys the material to cover it he has come out ahead, but if he buys before he has the customer lined up he loses. The railroads have offered an unusual amount of scrap during the past 60 days, as they were tied up by the coal strike until late in the spring and were unable then to move their material. This scrap is beginning to come in now, but it does not exert much pressure on the market, as the dealers have sold practically all of it as they went along on contracts with consumers. Market conditions are such that dealers do not show any confidence in expecting higher values. They are not laying down scrap in their yards at present prices, although values are below the average of last year. Scrap men watch the stock market and financial conditions closely and as a rule they have been trading cautiously and doing a brokerage business for the past six months. If there should be an unusual demand next fall from mill consumers and foundries there will be very little in the way of reserve stock in dealers' yards to meet it. In many cases the prices quoted in this market are nominal, as there are no sales to consumers to fix a definite level. This is true, for example, of old car wheels, on which no sales to foundries have been reported for a long time. The best bid received last week by a railroad, which offered 500 tons, was equal to about $15 for Chicago delivery, but the wheels were not sold. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$17.00 to $17.50
Old steel rails, rerolling	16.00 to 16.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	15.00 to 15.50
Heavy melting steel scrap	12.75 to 13.25
Frogs, switches and guards, cut apart	12.75 to 13.25
Shoveling steel	12.25 to 12.75

The following quotations are per net ton:

Iron angles and splice bars	$15.00 to $15.50
Iron car axles	20.00 to 20.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	12.75 to 13.25
No. 2 railroad wrought	11.75 to 12.25
Springs, knuckles and couplers	12.00 to 12.50
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	11.00 to 11.50
Steel axle turnings	9.00 to 9.50
Machine shop turnings	7.75 to 8.25
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.50 to 12.00
Agricultural malleable	11.00 to 11.50
Pipes and flues	9.50 to 10.00

Philadelphia

PHILADELPHIA, PA., July 5, 1910.

There has been a customary slowing down in business, due to the holiday period, as well as the closing of plants for usual midsummer repairs and stock taking. In some few cases mills will undergo more extensive repairs and the period of idleness slightly prolonged; in others, however, stoppages have been quite brief. Orders and inquiries were lighter during the latter part of last week, but in quite a number of instances mills started out this week with a very satisfactory volume of business. Nothing of any great importance has developed in the pig iron markets, and prices are unchanged at recent quotations. There has been a fair business in steel plates, and a trifle better quantity of work in structural material is being offered. Prices for plates and shapes are, however, not particularly strong. The other lines of finished materials continue dull. Old material remains inactive. The demand for coke has been brisker, quite a few contracts for foundry coke for second half shipment being closed.

Pig Iron.—Some little business in foundry irons continues to be done, although the market exhibits the usual

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characteristics of the season. Sales of No. 2 plain foundry have been more freely made, several 500-ton lots being taken by consumers at prices ranging from $16 to $16.25, delivered. No. 2 X foundry is selling in small lots at $16.25 to $16.75, delivered, the inside price being the minimum open quotation for standard brands, and not all producers will meet that figure, which, it is contended, is under their cost of production. Cast iron pipe foundries have been buying moderate lots of low grade iron for early delivery, purchases during the week aggregating several thousand tons. Several fair sized blocks of foundry iron are still before the trade, while fresh inquiries recently have been mostly for small quantities. Melters continue to feel round pretty thoroughly before placing their orders. The demand for forge iron for mill purposes continues dull, but prices are nominally unchanged. There has been a moderate movement in Virginia foundry irons. The minimum price for No. 2 X is held by the majority of producers at $13.75, furnace, for third quarter shipment, although $14 is obtained for some brands; one unimportant interest is said to be willing to make a slight concession for prompt iron. Recent sales have practically all been for small lots. The demand for steel making grades of iron is less marked; some little business in low phosphorus iron has been done at unchanged prices. Basic iron is quieter. On the recent buying movement from 40,000 to 45,000 tons was taken, and the interests buying are now out of the market. One or more melters in this district are, however, believed likely to come into the market for third quarter iron. The situation generally appears to have a little better tone, although there are still several weak sellers in the market. A number of the producers claim that they cannot meet the present low quotations, and they would rather further curtail production than sell at quoted minimum prices. The following range about represents the market for standard brands delivered in buyers' yards in this vicinity:

Eastern Pennsylvania, No. 2 X foundry	$16.25 to $16.75
Eastern Pennsylvania, No. 2 plain	16.00 to 16.25
Virginia, No. 2 X foundry	16.50 to 17.00
Virginia, No. 2 plain	16.25 to 16.75
Gray forge	15.50 to 15.75
Basic	15.75
Standard low phosphorus	22.75 to 23.00

Ferromanganese.—No inquiry from consumers in this territory is reported, although sellers still note some demand from Western buyers. Quotations are nominal, at $39.50 to $40, Baltimore, for 80 per cent., but on desirable lots could probably be slightly shaded.

Billets.—Very little business is being offered, inquiries being usually for small prompt lots. Mills in this vicinity are shut down for repairs, which in some instances will be quite extensive. Prices are unchanged and a shade stronger, at $28.50 to $29 for ordinary rolling billets, delivered in this vicinity. Forging billets are firm at $31 to $32, Eastern mill, the usual extras applying for high carbon and special sizes.

Plates.—Mills report a very satisfactory run of business since the first of the month. Orders for the most part are small, but there have been a few fair-sized lots placed. The shut down at the mills will not be prolonged. Prices are still inclined toward weakness, as many of the mills are anxious for business. Desirable tonnages can be placed at 1.60c., delivered here, although 1.65c., delivered, about represents the market for orders of an ordinary character.

Structural Material.—A better volume of building work is before the trade. The individual tonnage is in no particular instance very large, but in the aggregate represents a fair total. More railroad bridge work has come out, the Western Maryland Railroad, it is understood, having placed considerable business for a proposed extension of its road. A good volume of miscellaneous business is coming to the mills, which maintain about an average production. Prices show no change, but are weak at 1.60c. to 1.65c. for plain shapes, delivered in this vicinity.

Sheets.—The demand has been fair, although current business has been interrupted by the holiday. Mills are accumulating orders, owing to the usual midsummer suspension of plants. Prices are a shade stronger, the following range representing the market for business of an ordinary character: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

Bars.—Business remains quiet. Some small orders are being placed, but little real interest is shown in the market. Refined iron bars are being pretty firmly held at 1.47½c. to 1.55c., delivered in this territory, with steel bars strong at 1.60c., delivered.

Coke.—Business in foundry coke has been more active, but the demand for furnace coke is quiet. Quite a few contracts for supplies of foundry coke, delivery over the last half of the year, have been made at $2.25 to $2.50, per net ton, at oven. Spot foundry coke has been sold, however, down to $2.10. Furnace coke is weak at $1.65 to $1.85, at oven. The following range of prices, per net ton, about represents the market for last half, delivered in this territory:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—Inactivity is to be noted in practically all grades. Pending awards against railroad lists now before the trade and which represent about the average quantity the trade is marking time. Very few sales are reported, and those made are usually for small lots. There has been no movement in heavy melting steel and prices are unchanged; wrought scrap, however, is, if anything, weaker. The following prices named for delivery in buyers' yards in this vicinity are to a large extent nominal:

No. 1 steel scrap and crops	$14.25 to $14.50
Old steel rails, rerolling	16.00 to 16.50
Low phosphorus	19.50 to 20.00
Old steel axles	20.50 to 21.00
Old iron axles	26.50 to 27.50
Old iron rails	19.00 to 19.50
Old car wheels	14.50 to 15.50
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	14.50 to 15.00
No. 1 forge fire	12.50 to 13.00
No. 2 light iron	8.50 to 9.00
Wrought turnings	9.75 to 10.25
Cast borings	9.50 to 9.75
Machinery cast	15.00 to 15.50
Railroad malleable	14.50 to 15.00
Grate bars	12.50 to 13.00
Stove plate	10.00 to 10.50

Cincinnati

CINCINNATI, OHIO, July 6, 1910.—(*By Telegraph.*)

The price situation remains much the same in both crude and finished material, notwithstanding the efforts of consumers to turn the tide their way. Some large users of pig iron are apparently making their last stand for lower prices this week. The scrap situation shows extreme weakness.

Pig Iron.—A number of tentative inquiries for foundry and special iron which looked promising last week are said to be temporarily abandoned. Southern furnacemen show, if anything, a more aggressive front and consumers seem to be gradually abandoning the hope of $11 iron for this year. The real test of both Southern and Northern markets should develop to-morrow, when representatives of every furnace interest in both sections will compete for the 2400 tons needed by a large central Ohio interest. A local furnace is expected to take the Northern business, for a delivered price of $15.75 would net the furnace $15.50, and about the best that Ironton interests could do would be $16, delivered. Malleable is still held at $15.50, Ironton, and there is a little inquiry for ferrosilicon, which is quotable at $23 for 10 per cent., with a spread of $1 between per cent. units. Low grades of pig iron are reported to be scarce again, with some inquiry from the pipe companies. A manufacturer of agricultural implements in northern Indiana has out an offer for a considerable tonnage of iron at a figure about 50 cents below the market. The south central Ohio manufacturer wanting 1000 tons of Nos. 2 and 4 foundry has withdrawn the inquiry for the present. One large Southern interest which has hitherto been willing to sell to the close of third quarter at $11.50, Birmingham, quotes $12 on 1200 tons up for award to-morrow as its minimum, and another large interest in the same district has made $12 its minimum also for fourth quarter business. For immediate delivery and through the last half, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$15.25 to $15.75
Southern coke, No. 2 foundry	14.75 to 15.25
Southern coke, No. 3 foundry	14.50 to 14.75
Southern coke, No. 4 foundry	14.25 to 14.50
Southern coke, No. 1 soft	15.25 to 15.75
Southern coke, No. 2 soft	14.75 to 15.25
Southern gray forge	14.00 to 14.25
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.70
Lake Superior coke, No. 2	16.20
Lake Superior coke, No. 3	15.70
Standard Southern car wheel	25.25 to 25.75
Lake Southern car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Reports from the larger producing districts indicate that operators are not encouraging long time contracts from furnacemen at present levels. There are some fairly good contracts in negotiation for foundry coke, but as a rule the average jobbing establishment is buying from hand to mouth. Some prompt delivery furnace coke is going as low as $1.65 per net ton, at oven, and from $1.75 to $1.85 rules on contract for the second half. Pocahontas furnace grades are quotable at $1.85 on contract and for spot lots from 5c. to 10c. lower, according to ruling conditions. Connellsville foundry coke on contract is selling at $2.25 to $2.50, Pocahontas foundry about $2.15 to $2.25, Wise County

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foundry about $2.25, with some going as low as $2 for spot and early delivery.

Finished Iron and Steel.—Warehousing and jobbing interests continue to report business excellent, and there was no appreciable let up in buying on account of the national holiday. Structural material, except plates, is on a 1.50c., Pittsburgh, basis, and out of stock, 1.90c.; plates are quotable at 1.45c., Pittsburgh. Steel bars are quotable also at 1.45c., Pittsburgh, and the month of June proved the best of the year on sizes popular with the agricultural implement makers. Iron bars are weak, and 1.50c., Cincinnati mill, is easily done. Anticipating a great volume of concrete construction, business on twisted steel bars is excellent, and promises to be considerably larger. A number of important improvements will be made in the mills of the Newport Rolling Mill Company, which are shut down this month for the annual overhauling. The large improvements in progress at the plant of the American Rolling Mill Company in Middletown, Ohio, are rapidly approaching completion, and beginning with the new year the output of the plant will be materially increased.

Old Material.—There is no change in market conditions on scrap and dealers are all anticipating an extremely dull month. Shipments are delayed on account of the July shutdown, and some interests seem anxious to cancel. Dealers are still buying, but at very low levels, and railroad offerings have been fairly well taken by local establishments. Relayers are still fairly active. For delivery in buyers' yards, Cincinnati and southern Ohio, we quote nominal prices, as follows:

No. 1 railroad wrought, net ton	$11.50 to $12.00
Cast borings, net ton	4.00 to 5.00
Heavy melting steel scrap, gross ton	11.50 to 12.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	16.50 to 17.00
Old iron rails, gross ton	17.00 to 17.50
Old steel rails, short, gross ton	14.50 to 15.50
Old steel rails, long, gross ton	14.50 to 15.50
Relaying rails, 56 lb. and up, gross ton	22.00 to 23.00
Old car wheels, gross ton	12.00 to 13.00
Low phosphorus scrap, gross ton	16.00 to 16.50

Cleveland

CLEVELAND, OHIO, July 5, 1910.

Iron Ore.—That the movement down the lakes during June exceeded 7,000,000 tons is indicated by incomplete reports of shipments received from upper lake docks. This is a considerable gain over May, when the shipments were 6,081,335 tons. Owing to the fact that about 20 per cent. of the independent vessel tonnage has been taken out of commission, and few merchant furnaces want to take their ore, it is expected that the July shipments will show a falling off. No sales are reported. We quote prices as follows, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—While the market in this territory is rather quiet, several sales of foundry iron were made during the week in lots of 500 tons and under. A number of inquiries are also pending for small lots. One local foundry that bad an inquiry out for 1000 tons or more has decided not to buy for the present. Two other local foundries that use considerable tonnage are feeling the market on prices for the first half of next year. An inquiry from western Pennsylvania is for 1000 tons of No. 2 foundry for spot shipment. While less active than two or three weeks ago, considerable tonnage of foundry and malleable iron was sold during the week to Michigan and Indiana consumers. Some contracts for both foundry and malleable iron have been made for the first quarter and first half of next year. Furnaces willing to sell for delivery beyond January 1 are asking about 50 cents a ton above last half prices for that delivery. Some contracts are being made, however, for delivery extending through one or two months of next year at last half prices, buyers attempting to secure as extended deliveries as possible on such terms. For last half delivery No. 2 foundry is generally quoted at $14.50, Valley furnace, for the last half, but one or two interests are understood to be shading this to $14.25. There is an improvement in the demand for Ohio silvery iron. The price of $18 for 8 per cent. is being shaded for third quarter delivery. Southern iron is fairly firm at $11.50, Birmingham, for No. 2 for the third quarter and $12 for the fourth quarter. For prompt shipment and for the last half we quote, delivered Cleveland, as follows:

Bessemer	$16.65
Northern foundry, No. 1	15.75 to 15.90
Northern foundry, No. 2	15.25 to 15.40
Northern foundry, No. 3	14.75 to 14.90
Gray forge	14.75 to 14.90
Southern foundry, No. 2	15.85 to 16.35
Jackson Co. silvery, 8 per cent. silicon	19.50

Coke.—Some additional foundry coke contracts have been placed for the last half and a few running through an entire year at last half prices. Some producers are unwilling to sell beyond January 1. A local interest has contracted for its furnace coke requirements for July. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment and $1.80 to $1.85 for the last half. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 for spot shipment and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—With the exception of a few orders for round lots for specific work, not much new business came out during the week. Many consumers are taking inventories and specifications have been rather light, except for steel bars. Orders for a considerable tonnage of bars were received on contracts that expire July 1. The Carnegie Steel Company has received a contract for 2500 tons of structural shapes and plates from the Toledo Shipbuilding Company for a car ferry, the contract for which has just been placed by the Ann Arbor Railroad. The Wheeling & Lake Erie Railroad has placed contracts for 2300 tons of ferrotitanium rails, the Carnegie Steel Company getting 1150 tons and joints for the entire tonnage and the Lackawanna Steel Company getting 1150 tons. The contract for the new plant to be erected by the National Carbon Company at Niagara Falls has been let to T. H. Brooks & Co., Cleveland. The main building will require 1000 tons, but other buildings proposed will probably increase this to about 1500 tons. Bids will be received this week for the Cleveland Athletic Club Building, requiring 1000 tons, and proposals will be asked for shortly for a new building for the Cleveland Telephone Company that will take 800 tons. Considerable other structural work is in prospect in this city that will require 400 tons and under. We quote plain material at 1.45c., Pittsburgh. The demand for plates is rather light. Mill agencies are getting 1.50c., Pittsburgh, for small lots, but on desirable orders some mills are shading the usual price of 1.45c., Pittsburgh. The demand for sheets continues light and prices are weak and irregular. Many of the smaller mills are eager for tonnage, and black sheets are being shaded $3 a ton and galvanized $4. Steel bars are firm at 1.45c., Pittsburgh. The demand for iron bars continues light and prices are stationary at 1.40c. to 1.45c., at mill. The two local bar iron mills shut down June 30. When they will start up again will depend on the demand. Business with jobbers continues fairly good.

Old Material.—With some mills shut down and others holding back on shipments, there is practically nothing doing in the scrap market. Prices are weak, but owing to an absence of transactions quotations, which have not been changed, are largely nominal. While some demand will follow the resumption by the mills dealers do not look for much activity before fall. The Erie Railroad closed July 5 on its usual tonnage. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.50 to $15.00
Old iron rails	16.50 to 17.00
Steel car axles	21.00 to 21.50
Heavy melting steel	13.25 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.50 to 14.00
Light bundled sheet scrap	9.75 to 10.25

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.50 to $22.00
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	9.50 to 10.00
No. 1 busheling	12.00 to 12.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., July 4, 1910.

Pig Iron.—Much is heard of $11.50 iron for delivery anywhere from prompt through the entire remainder of the year, yet it is an exceedingly hard matter to trace the source of such information and to find the furnace interests willing to admit of having made such quotations and sales. However, while two or three say that they are selling iron on the basis of $11.50, others say that $12 is their best price. The actual tonnage of iron sold the past week was not as large as the week previous. One lot of 3000 tons was sold at $11.50 for third quarter delivery. The Holt furnace of the Central Coal & Iron Company has gone out of commission, which means a further curtailment of production. The output of the Ironaton furnace of the Alabama Consolidated Coal & Iron Company has been sold for the entire year. This means another stack out, so far as its output figuring in stock conditions. Low grade iron is still very much in demand, and the usual premium is de-

THE IRON AND METAL MARKETS

manded. On the whole, Southern producers are gradually adjusting production to what seems to be the demands of the country along the line of consumption. If it is a fact that production is yet too large, considering the fair tonnage in stock, in all probability steps will be taken to have a still further readjustment of matters. At least, this seems to be the sentiment of producers. Buyers are realizing more forcibly the attractiveness of present prices.

Cast Iron Pipe.—Considering the fact that the pig iron market has been more or less unsettled, it is natural to suppose that the manufacture of finished products directly affected by it would be uncertain to a great extent. Local manufacturers report a continuation of the small bookings, which is considered a very satisfactory business. This, of course, is particularly good for them from the fact that they are enabled to quote from time to time in keeping with the changes in the pig iron market. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for gas pipe.

Old Material.—To put it mildly, business in the scrap iron market is practically at a standstill. Owners of mill and factory refuse to sell their accumulations of scrap on account of the exceedingly low prices. Dealers claim they cannot afford to offer anything like attractive prices for same, and users apparently have all they want at present; hence there is a very inactive market. Prices quoted are only nominal and are about as follows, per gross ton, f.o.b. cars here:

Old iron axles	$16.50 to $17.00
Old iron rails	12.50 to 13.00
Old steel axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.00 to 9.50
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, July 4, 1910.

Though speaking in a general way, the demand for pig iron is dull at present, in the case of some houses reference to their books shows that a quiet satisfactory business has been done for the first half of 1910. One leading house states that its sales to July 1 totaled as much as for the entire period of 1909, and another company states that its shipments exceeded the same time last year, though a part were 1909 contracts. Bankers report a shrinkage of nearly $15,000,000 in deposits in the past three months and an increase in loans of $10,000,000, indicating that business enterprises are expanding in this section.

Coke.—The demand for foundry coke keeps up well, though for the most part it is coming from medium to small buyers; consequently the total tonnage is not large. One office, however, last week closed a contract for 1000 tons of Indianapolis by-product coke for shipment over a year and another house reported a sale of 2500 tons of standard Connellsville for the same delivery. Large contracts are based on $2.25 per net ton f.o.b. Connellsville, while smaller transactions are done at $2.50. There is hardly a sufficiently active demand from large buyers to make a strong market, though previous prices are asked.

Pig Iron.—With most offices the past week was the dullest since New Year's, both with respect to inquiries and sales. The larger houses report some good inquiries and a few sales. Among the inquiries are the following: 2000 tons foundry iron, 1000 tons Southern foundry, 1000 tons malleable, 3000 tons Southern foundry (this inquiry specifies shipment over the first quarter 1911). One leading office reports sales aggregating 1800 tons of Southern foundry, mostly for last half delivery; another seller mentions 600 tons of No. 2 Northern and Southern iron, various deliveries, and 300 tons of No. 1 soft for prompt shipment. A merchant seller secured contracts for 500 tons. With respect to prices, a considerable business is being worked on the basis of $11.50, Birmingham, for No. 2 Southern foundry, for shipment over the last half; this may be considered the market, notwithstanding $12 is asked and offers of less are declined by some furnacemen. Southern Ohio is held at $15, f.o.b. furnace.

Old Material.—It is mainly a dealers' market, with some business passing, and shipments being made on previous contracts. Owing to July usually ruling dull on account of repairs, hot weather and the adjustment of the Amalgamated scale of wages, not much improvement is looked for in the near future. A list of 2500 tons offered by the Missouri Pacific was closed out last week. Prices realized were lower than last month. The tone of the market is tolerably strong in anticipation of a better demand early in the fall, and prices are unchanged from last week. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	15.00 to 15.50
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	21.00 to 21.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	6.00 to 6.50
No. 1 busheling	11.00 to 11.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	10.50 to 11.00
Agricultural malleable	10.00 to 10.50
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	9.00 to 9.50
Machine shop turnings	8.50 to 9.00

The Amilie Mfg. Company, East St. Louis, Ill., has been incorporated; capital stock, $100,000; incorporators, Sigvald C. Amilie, Eleanor P. Amilie, W. Sherwood Doyle, to engage in general manufacturing.

The Garver Tracklaying Machine Company, Urbana, Ill., has been incorporated; capital stock, $30,000; incorporators, Taylor M. Garver, Oliver W. Lamb and Harvey M. Grant.

William Yule of the DeCamp-Yule Coal, Coke & Iron Company returned last week from a visit to Texas, where he had been looking after the company's ore and foundry interests.

San Francisco

SAN FRANCISCO, CAL., June 29, 1910.

A general curtailment of business has been apparent for the last month, due largely to the unsettled labor conditions which obtain at most manufacturing centers on the Pacific Coast. In most departments the movement is entirely of a distributive nature, the tonnage booked by mill interests being very light. The demand in southern California has been checked by the strike in the Los Angeles metal trades. In San Francisco and at other points where no strike has been declared purchases are made in a small way for the most pressing requirements, but the uncertain outlook still causes hesitation in regard to placing large orders. Estimates as to the probable requirements of the next year have not been reduced, however, and the present curtailment is considered temporary, as the situation aside from labor conditions is favorable. Structural activity in San Francisco and the interior shows a slight revival, and there is a fair inquiry for bars. A moderate tonnage of rails has been booked and several new inquiries are coming into the market. Old material is quiet, with a tendency to weakness in some lines.

Bars.—The jobbing movement is well maintained, but the large tonnage in store here is sufficient for most current requirements. While there is a steady inquiry for reinforcing material, orders from the manufacturing interests are of moderate volume and mostly for immediate needs. Jobbers continue to order from foreign mills for next year's supply, but the tonnage booked by domestic mills has not been appreciably reduced since last month. Bars from store, San Francisco, are quoted at 2.50c. for steel and 2.30c. for iron.

Plates.—The recent heavy demand for plates has been largely due to the construction of oil storage tanks, riveted pipe, &c., the principal tonnage being handled at Los Angeles. Following the strike in that city there has been a marked reduction in the demand, the curtailment extending to heavy sheets used in pipe work. Deferred delivery has been asked on a number of orders and some cancellations are reported, as much of the construction work for the oil fields is delayed indefinitely. A resumption of activity on the adjustment of present difficulties is assured, as the necessity for completing the work in hand is urgent. The demand in other quarters continues strong, with several new inquiries for gas tank construction in San Francisco and interior towns. The San Francisco Gas & Electric Company has ordered material amounting to over 2600 tons for a new gas holder from a Philadelphia firm. The Oro Water, Light & Power Company, Oroville, Cal., is planning a new gas container. Additional storage projects in the oil fields are taking shape, but the outlook in that quarter is uncertain at the moment.

THE IRON AND METAL MARKETS

Rails.—The jobbing movement of light rails remains fairly active and local merchants are in the market to a moderate extent to replenish their stocks. Recent bookings of standard sections have included a few orders of some importance, a purchase having been closed for the Oakland & Antioch line, about 25 miles. A considerable tonnage is also moving in the north. A new project is being promoted for a road through Coalinga, connecting Fresno and Monterey. Plans are being made for a 30-mile lumber road in Butte and Plumas counties, Cal. An extension project of the Hilo Railway, Hawaiian Islands, has been approved by the stockholders.

Structural Material.—Fabricating work continues quiet, though most of the local shops have a little more work on hand than a month ago and the local outlook is better than for some time past. Most jobs are of the same unimportant character as for some time past, contracts for large buildings coming out very slowly. Dyer Bros. have taken a contract for about 100 tons for the Pacific Coast Steel Company's new shop at South San Francisco and another small contract for the Gutzeit Building on Mission street. Other local jobs to be let shortly are the Whittell and Dimond estate buildings. The contract for the Los Angeles Athletic Club, Los Angeles, has been delayed on account of labor troubles at that place. Awards have also been delayed on the Solano and Kern county court houses. The Western Pacific car shops at Sacramento, Cal., will require a considerable tonnage, the contract for which is expected in the near future. The Baker Iron Works has taken a small contract for the Pacific Light & Power Company's plant at Redondo, Cal. The steel work for the Nicolaus, Gaven & Southworth Building at Sacramento, Cal., will be given out this week, and a fair tonnage will be required for the Clunie Theatre Building at Sacramento. The San Francisco masonic lodges are considering the erection of another large building, to cost about $600,000. The largest job in prospect is the Oakland City Hall, preliminary plans for which have been accepted. The details have not been worked out, but the building is expected to require about 2500 tons of steel and the contract should be let within the next year. A fair volume of work is expected to result from the appropriation for Government buildings in California, including the sub-treasury at San Francisco and large post offices at Berkeley, Chico and Pasadena, Cal. Beams and Channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Merchant Pipe.—The tonnage booked in the last month has been as small as for any similar period in the year. The jobbing trade in small pipe is still of small proportions, and appears likely to continue so for some time. Merchants have been unable to effect any material reduction in their holdings, most of which were acquired over six months ago, and there is practically no inquiry for future delivery of such material from the mills. The 1000 tons in transit by sea has not arrived and some anxiety is felt regarding its safety. The oil pipe business, which was the principal feature at the beginning of the quarter, has fallen flat. A few small orders are being placed, but the large business for fall delivery which was anticipated is almost entirely witheld. No direct inquiry has yet been made for the requirements of projected pipe lines, but a few small orders have been received for gas and water systems. The town of Bishop, Cal., is in the market for 1000 ft. of 4-in. pipe.

Cast Iron Pipe.—The tonnage is fairly well sustained, bookings during June being rather above the average, and with a number of new inquiries continued activity is anticipated. There is a good demand for gas pipe, as additions are to be made to the distributing systems in a number of California towns. Plans have been completed for laying the first section of the San Francisco auxiliary water system. Bids will be received in a few days for an 8-in. line between the Presidio and Fort Mason, San Francisco. The town of Lodi, Cal., will open bids July 5 for over 400 tons of pipe and about 60 tons of specials and hydrants. The United States Pipe Company has taken an order for 2000 ft. of 4-in. pipe for Vallejo, Cal. The Pacific Gas & Electric Company, will shortly install a lot of new pipe at Vallejo. The wooden pipe lines of the San Diego Flume Company, supplying water to a number of towns near San Diego, Cal., are to be replaced with iron.

Pig Iron.—It is still difficult to sell pig iron for future delivery and foundries which are not already supplied are confining their purchases to immediate needs. Requirements are not large, though the volume of machinery work is better than a few months ago. Prices show considerable variation, according to the nature and magnitude of the transaction. The amount of domestic iron used here is negligible, Chinese iron being used quite extensively for general work. Importers of Chinese iron are prepared to meet all competition, the price being held at about $23 on small lots, though larger sales are occasionally reported at lower figures.

Old Material.—Cast iron scrap is neglected by melters at present, immediate requirements being provided for by former purchases. A considerable tonnage is coming into the market, but there is no pressure to sell on the part of dealers and prices are well maintained. Steel melting scrap is also piling up, as none has been shipped East for some time and more is offered than the local demand can take care of. The price is largely nominal and some decline is expected. Rerolling rails find a fair demand. Prices are quoted as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

Buffalo

BUFFALO, N. Y., July 5, 1910.

Pig Iron.—A considerable improvement in the inquiry for small lots in foundry grades and malleable was noted during the latter part of last week, but the sales developing were rather light, the holiday observance interfering with the active routine of business. In basic no sales were reported. Prices are still slack, with no apparent tendency toward an upward turn. Furnacemen as a rule, however, are pursuing a conservative course in the matter of quotations and refusing to meet competition that will bring prices any nearer to the cost line. Reports from melters in territory tributary to this district indicate there will be a steady consumption, at the present heavy rate of shipment from furnaces, right along during the midsummer period. We quote as follows, per gross ton, f.o.b. Buffalo, for prompt shipment and last half:

No. 1 X foundry	$15.50 to $16.00
No. 2 X foundry	15.25 to 15.75
No. 2 plain	15.00 to 15.50
No. 3 foundry	14.75 to 15.25
Gray forge	14.50 to 15.00
Malleable	15.25 to 16.00
Basic	15.25 to 15.75
Charcoal	19.00 to 19.50

Finished Iron and Steel.—The June total of business in finished products for Buffalo territory was very heavy, fully equal to May, and one leading interest reports it the best of any month of the current year in actual tonnage placed on order books. Reports show that most of the contracts expiring July 1 were specified in full, the mills promptly canceling all contracts not completely specified, in accordance with their more recent policy not to extend low-priced contracts. The demand for steel bars continues active, although order placements have been somewhat checked for the week by the holiday suspension of business. The demand for twisted steel bars for concrete work has been large and prices are firm for all bar products. In the Canadian export trade the feeling is optimistic, with large inquiry for shapes and plates. In structural lines the demand is very active, and specifications for a large number of propositions in bridge work, new plant construction and miscellaneous commercial and industrial buildings have come into the market for figuring within the last week. Bids will be closed this week for the addition to the Snow Building, Syracuse, to be used by the Citizens' Club, requiring 150 tons. The Toledo-Massillon Bridge Company, Toledo, was low bidder for the steel for the Niagara Machine & Tool Works' new plant, Buffalo, 700 tons, and the George Kellogg Structural Company received contract for the structural steel, about 300 tons, for the Clinton Street Market Building, Buffalo. The contract for the steel for the plant of the Simonds Mfg. Company, Lockport, N. Y., about 1000 tons, has been awarded to the Kenwood Bridge Company, Chicago. The wage trouble between the Buffalo Union of Structural Iron Workers and the structural steel erectors has been adjusted by the acceptance of the erectors' offer of 55 cents per hour, and the union men have resumed work.

Old Material.—The market is practically at a standstill. The mills are holding back shipments on contracts while taking inventory, and there is very little buying. About the only demand is in wrought scrap and railroad malleable, in which there has been a small amount of business done. The sales in most lines have been insufficient to give an index to prices. The schedule we quote is largely nominal and covers gross ton prices, f.o.b. Buffalo:

Heavy melting steel	$13.25 to $13.50
Low phosphorus steel	18.00 to 18.50
No. 1 railroad wrought	16.00 to 16.25
No. 1 railroad and machinery cast scrap	14.50 to 14.75
Old steel axles	18.00 to 18.50
Old iron axles	22.50 to 23.00
Old car wheels	14.50 to 15.00
Railroad malleable	14.50 to 14.75
Boiler plate	11.75 to 12.25
Locomotive grate bars	11.50 to 12.00
Pipe	11.25 to 11.75
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	12.25 to 12.50

THE IRON AND METAL MARKETS

New York

NEW YORK, July 6, 1910.

Pig Iron.—Inquiries and transactions are of smaller volume and there are indications of midsummer quiet. In a few cases prices have been asked on lots of several hundred tons and two considerable inquiries from foundries are reported for the last half, one of 3000 tons in New York and one of 4000 to 5000 tons in New England. Foundries are fairly well provided for for the third quarter, and it is not expected that more than moderate activity will be seen in the next two months. The buying of lower grades by pipe foundries has continued and prices on Southern pipe iron have gone about 25c. below what has been commonly reported recently. Southern foundry grades have not been active in this district. Buyers of foundry iron continue to make offers below what furnaces are willing to entertain. Producers see in the further reduction of output an adjustment to consumption, which makes them less disposed to consider current prices for deliveries running into 1911. We quote Northern foundry iron at tidewater as follows: No. 1, $16.75 to $17; No. 2 X, $16.50 to $16.75; No. 2 plain, $16 to $16.25. Southern iron is quoted at $16.50 to $16.75 for No. 1 and $16 to $16.25 for No. 2.

Steel Rails.—The Tennessee Coal, Iron & Railroad Company has taken an order for 11,000 tons of rails for the San Antonio & Aransas Pass Railway Company and the Carnegie Steel Company will furnish 700 tons for the Elkins Electric Railway Company. McKenzie & Mann, the Canadian contractors, have bought 5000 tons from the Lackawanna Steel Company. An order for 2300 tons of ferrotitanium Bessemer rails for the Wheeling & Lake Erie is divided between Pittsburgh and Buffalo mills.

Ferroalloys.—Inquiries for ferromanganese are light and prices are not strong; in New York sellers are quoting about $39.50, seaboard. Although the supply of ferrosilicon for immediate delivery is not particularly heavy prices are weak and sellers are quoting around $57.50, Pittsburgh. There have been sales, however, at about $58. A western Pennsylvania steel company purchased 15,000 tons of spiegeleisen during the week in two lots of 7500 tons each. About $25 a ton was paid.

Finished Iron and Steel.—The month as a whole closed an unusually good June, although some falling off in business marked its last days. The remainder of the summer will probably be quiet. The past week has been especially dull, with its holiday and the fact that inventory and repair season is on in many plants. Plates and structural materials are in little demand, and even steel bars have been slow, with the result that deliveries are considerably improved, except for certain sizes. The bulk of business in this line is done in contracts, and the largest of these have been closed for the remainder of the year, at least so that for the next six months the new business will be less conspicuous. A fair trade in bar iron is reported, but plates in this territory are especially quiet. The only structural orders of size noted in this vicinity are the Pullman Building, Forty-fourth street and Madison avenue, 400 tons; the Warner Sugar Refinery, Edgewater, N. J., 1000 tons, both taken by the American Bridge Company, and the McGraw Building Annex, 800 tons, awarded the Hay Foundry & Iron Works. Among the best building contracts from other sections are the following: A hotel, 700 tons, and an office building, 350 tons, in Washington, D. C., taken by Barber & Ross; the tower of the Daniels & Fisher Building, Denver, 1000 tons, taken by M. J. Patterson; a building for the Milwaukee Electric Company, Milwaukee, Wis., 450 tons, taken by the American Bridge Company, and 800 tons of bridge work for the Toledo & Ohio Central, let to the Toledo-Massillon Bridge Company. A contract has also been closed for 400 tons for a mill building for the Canton Sheet Steel Company, Canton, Ohio. Bids have been asked for the Great Lakes Building, Chicago, for 3000 tons, and for a city hall at Oakland, Cal., to require 1500 tons. While some shading in prices has been reported, it does not appear to have been sufficient or of a nature to warrant changing the quotations—plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.61c. and bar iron, 1.50c. to 1.55c., all New York.

Cast Iron Pipe.—New York City will let contracts today for about 3800 tons. Apart from this the market is quiet. Carload lots of 6-in. are quoted at $24.50 to $25 per net ton, tidewater.

Old Material.—The situation is discouraging to holders of old material. The railroad lists out for this month are quite heavy, and an additional supply of scrap is thus coming on a market already overstocked. Consumers are not only buying very sparingly but are using every effort to secure lower prices. About the only articles in the list which maintain any show of strength are relaying rails, old steel car axles, wrought pipe, cast borings and heavy cast. Dealers having steel scrap contracts to fill have been able in the past week to buy small quantities at $13.25, delivered in eastern Pennsylvania. From present indications the market for old material seems destined to pass through an exceedingly quiet summer. Quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.25 to $12.75
Old girder and T rails for melting	11.25 to 11.75
Heavy melting steel scrap	11.25 to 11.75
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.25 to 13.75
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.50 to 6.00
Cast borings	6.50 to 7.00
Wrought turnings	6.75 to 7.25
Wrought pipe	11.75 to 12.25
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	11.50 to 12.00

Metal Market

NEW YORK, July 6, 1909.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
June.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
30	12.75	12.37½	{33.10 / 33.15}	4.37½	4.22½	5.20	5.05
July.							
1	12.75	12.37½	32.90	4.40	4.25	5.20	5.05
2	12.75	12.37½	....	4.40	4.25	5.20	5.05
5	12.75	12.37½	32.90	4.40	4.25	5.20	5.05
6	12.75	12.37½	32.80	4.40	4.25	5.20	5.05

There has been some activity in tin. Copper is quiet and unchanged. Lead is in a little better position and the price is higher. Spelter is quiet.

Copper.—The copper statistics for June show that the exports were not as heavy as in May, and in consequence buyers are not taking much interest in the metal, as they do not seem to fear that there will be any material advance as a result of the forthcoming figures of the Producers' Association. Copper is lower now than it was during the strong buying movement of several weeks ago, and consumers who were making heavy inquiries at that time are filling their wants by taking up small lots at prices decidedly under the quotations then given them. Plenty of electrolytic copper is now offered in New York at 12.37½c., and lake can be had at 12.75c. Figures compiled by the New York Metal Exchange show that the June exports of copper were 22,688 tons, and the total for the six months of this year shows a decrease of 18,998 tons, compared with the same period of last year. L. Vogelstein & Co. give the following figures of German consumption of foreign copper for the month of January-May, 1910: Imports, 69,700 tons; exports, 3312 tons; consumption, 66,388 tons, as compared with consumption during the same period in 1909 of 62,709 tons. Of the above quantity, 61,451 tons was imported from the United States. In London to-day spot copper was sold for £54 7s. 6d. and futures for £55 1s. 2d. The sales amounted to 700 tons of spot and 800 tons of futures. The market was dull. The exports of copper so far this month have been 5330 tons.

Pig Tin.—Although there has been a fair buying movement in pig tin, its present position is something of a disappointment considering the exceptional June statistics. It is thought in the trade that the existing prices are too high to be consistent with the demand. On June 29, as was then stated, it was made known that deliveries into consumption during June amounted to 5000 tons, and the total for the six months showed an increase of 3700 tons, compared with the same time last year. Considering the recent quiet condition in other nonferrous metal markets, this was an exceptionally good showing, and it was thought that the price would advance. On June 29 and 30 there was a fair buying movement and about 500 tons changed hands, but since Monday quotations have steadily receded, and to-day the market here was below the import cost. Yesterday afternoon tin was sold in this market at 32.90c., but the business was largely between dealers. As there were no transactions on Saturday, the business week was a short one and the holiday dullness may account for some of the lack of interest shown by consumers. In London to-day spot tin was sold for £149 15s. 6d. and futures for £150 15s. The sales amounted to 200 tons of spot and 270 tons of futures. The market was dull. The arrivals of tins so far this month were 740 tons and there are 2165 tons of float.

Tin Plates.—Tin plates are selling well in this market and some fair sized quantities are being taken by packers who make their own tin boxes in which to put up their goods. There is also a good sale for foreign tin plates, the price of which remains at 13s. 4½d. at Swansea, Wales. The price in New York for 100-lb. coke plates is $3.84.

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Lead.—More interest is being taken in lead and the price has advanced, as outside sellers are now asking the same price as the American Smelting & Refining Company, which is 4.40c., New York. Last Friday it became known that a number of outside lots which had been offered in the West at 4.37½c., New York, were disposed of, and there was a prompt readjustment of prices on the part of other outside sellers. There is a fairly good call at this time from the lead pipe and sheet lead manufacturers. The demand for the metal from white lead manufacturers has fallen off, however, but it is estimated that the general demand is at least taking care of the production. The price of lead to-day is 4.40c., New York, and 4.25c., St. Louis.

Spelter.—Very little interest is being taken in spelter, but the producers manage to keep the price up. It is apparent that stocks are fairly well concentrated, and those who are aiming to keep the price around 5.20c., New York, notwithstanding the lack of demand, appear to be able to hold their own. The price of the metal at St. Louis is 5.05c. Stocks here are very scarce, but there is enough of the metal concentrated in the West to insure prompt and early shipment, even although a heavy demand should arise.

Antimony.—The antimony market is unchanged and the demand is light. Cookson's is 8.38½c. and Hallett's 8.12½c. These prices are weak.

Old Metals.—The demand is light. Dealers' selling prices, which are nominally unchanged, are as follows:

	Cents.
Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.50 to 8.75
Brass, light	7.00 to 7.25
Heavy machine composition	11.00 to 11.25
Clean brass turnings	7.50 to 8.00
Composition turnings	9.25 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, July 5.—Consumers of metals are generally limiting their purchases to requirements of the immediate future. For longer delivery it is believed that 13c. could be shaded on lake copper in the Chicago market, but buyers do not seem interested in purchases for the future, and for spot shipment 13c. is maintained. The spelter interests are holding for higher prices, but the market is reported dull, possibly due to the fact that the wire and sheet mills are using less spelter at this season. We quote Chicago prices as follows: Casting copper, 12⅝c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 33½c.; small lots, 35c.; lead, desilverized, 4.30c. to 4.35c., for 50-ton lots; corroding, 4.50c. to 4.60c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.20c. to 5.25c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¼c.; copper bottoms, 10½c.; copper clips, 12¼c.; red brass, 11¼c.; yellow brass, 9¼c.; light brass, 6¼c.; lead pipe, 4¼c.; zinc, 4⅜c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, July 4.—Lead is somewhat firmer and held at 4.25c. to 4.30c. Spelter is rather stronger, at 5.05c. to 5.10c., East St. Louis. Zinc ore is quoted at $38 to $39 per ton, Joplin base. We quote tin at 33.30c. per lb.; antimony, 8.60c.; Lake copper, 13.10c.; electrolytic copper, 12.75c., all St. Louis. The demand for finished metals ruled good during the past week.

Iron and Industrial Stocks

NEW YORK, July 6, 1910.

What is claimed to have been the worst break in the stock market since the panic of 1907 occurred last Thursday. The cause assigned for this break was the order of the Interstate Commerce Commission reducing freight rates on railroads reaching jobbing points in the States of Washington, Utah and Nevada. While the railroad stocks bore the brunt of the downward movement, industrial stocks necessarily sympathized. The market since then has been weak, with occasional reactions from lowest prices. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	8⅛- 8½	Railway Spr., com.	30¼- 32¾
Allis-Chalm., pref..	29⅜- 30½	Railway Spr., pref.	95 - 95⅝
Beth. Steel, com...	23 - 25	Republic, com.....	29 - 31½
Can. com.....	6½ - 9	Republic, pref.....	91 - 92½
Car. pref.....	67¼- 69⅝	Sloss, com.....	63¾- 66⅝
Car & Fdry, com..	48⅞ - 53	Sloss, pref.....	114
Car & Fdry, pref...	109 -112	Pipe, com.....	15 - 16
Steel Foundries...	51 - 51½	Pipe, pref.....	54 - 55⅝
Colorado Fuel.....	30 - 33⅜	U. S. Steel, com...	68⅛- 75¼
General Electric...	138¼-142½	U. S. Steel, pref...	113⅜-115
Gr. N. ore cert....	49¼- 56½	Westinghouse Elec.	58⅜- 62
Int. Harv., com...	93 - 97	Am. Ship, com.....	80
Int. Harv., pref...	119 -121	Chi. Pneu. Tool...	37 - 38
Int. Pump, com...	43⅜- 43¾	Cambria Steel.....	41½- 44½
Int. Pump, pref...	80 - 81	Lake Sup. Corp....	15 - 21¼
Locomotive, com...	38½- 41	Pa. Steel, pref.....	105
Locomotive, pref...	107 -107½	Warwick	9¾- 10¼
Nat. En. & St.,com.	17 - 17½	Crucible St., com..	10⅝- 11¾
Pressed St., com..	30¼- 32¾	Crucible St., pref..	76½- 79¾
Pressed St., pref..	95 - 96	Harb.-W. Ref., pref.....	94

The William Cramp & Sons Ship & Engine Building Company, Philadelphia, reports the following results for the year ended April 30:

	1910.	Decrease.
Income	$716,141	$31,808
Fixed charges	289,714	12,082
Surplus	$462,427	$19,726

During the year the company paid off $220,000 20-year 5 per cent. notes and $25,000 first mortgage 5 per cent. bonds and expended $87,953 in the purchase of real estate, tools, machinery, &c.

June Ore Shipments Break the Record

CLEVELAND, OHIO, July 6, 1910.—(*By Telegraph.*) —June ore shipments broke previous records for any one month. The total was 7,316,679 gross tons. This is an increase of 123,480 tons over the previous record, which was made in August, 1909. Shipments up to July 1 were 14,522,058 tons, which is a gain of 5,819,735 tons over the same period last year.

The Connellsville-Buffalo Coke Rate.—The United States Court of Appeals has reversed the decision of the lower court, which granted the steel companies at Buffalo an injunction restraining the railroads from placing in effect their announced increase in the freight rate on coke from the Connellsville district to Buffalo. The reversal order provides, however, that the decision shall not go into effect until July 15, pending an appeal to the Supreme Court. The steel companies of the Buffalo district will at once file an appeal asking for a stay or reinstatement of the order originally granted and will make a strenuous effort to secure it.

The H. F. Brammer Mfg. Company, Davenport, Iowa, manufacturer of washing machines, whose entire plant, including warehouses and raw material, was destroyed by fire June 26, has arranged temporary quarters which will enable it to take care of its customers within three or four weeks. New buildings of fireproof construction, of larger dimensions than those burned, will be erected as quickly as possible. New equipment for all departments will be required upon completion of the new plant, as well as necessary equipment for a steam power plant.

King George V of England, who was elected an honorary member of the Iron and Steel Institute when Prince of Wales in the year 1905, has been pleased to become patron of the Institute. Among other honorary members is the Archduke Friedrich of Austria, who was elected in 1907. The late King of Sweden and the late King of Belgium were honorary members at their decease and had held such membership for many years.

The Taylor Steel Company, Canton, Ohio, manufacturer of crucible steel castings, alloy steel castings for automobile parts and special malleable iron castings for auto parts, has decided to build a plant for the manufacture of crucible steel forgings. The site has not yet been selected, but it will be shortly. The company will be in the market for considerable equipment for the new works.

The American Car & Foundry Company

Eleventh Annual Report—Year Ending April 30, 1910

The income account of the American Car & Foundry Company for the fiscal year ending April 30, 1910, makes the following showing as compared with the previous year:

Net earnings	$5,725,098	Inc. $1,983,123
Renewals, repairs, &c	1,635,620	Inc. 789,476
Surplus available for dividends	$4,089,478	Inc. $1,193,647
Preferred dividend	2,100,000	Unchanged.
Balance	$1,989,478	Inc. $1,193,647
Common dividend	600,000	Unchanged.
Surplus	$1,389,478	Inc. $1,193,647
Previous surplus	22,563,078	Inc. 195,831
Total surplus	$23,952,556	Inc. $1,389,478

The net working capital at the close of the year, excluding reserves, was $17,770,023. The general balance sheet, as of April 30, 1910, is as follows:

Assets.

Property and plant account		$66,182,532.51
Cost to April 30, 1909	$64,044,377.66	
Additions to steel car plants at Berwick, Detroit and Wilmington and new steel passenger car plant at St. Charles	676,134.32	
Reservation for construction of and additions to steel car plants	1,462,020.53	
Current assets		34,685,434.86
Materials on hand, inventoried at cost or less, about 85 per cent. of which will be used on cars we have contracts to build	$18,763,222.80	
Accounts and notes receivable	12,278,781.68	
Stocks and bonds of other companies, at cost, or less	701,868.78	
Cash in banks and on hand	2,941,561.40	
Total		$100,867,967.17

Liabilities.

Preferred stock		$30,000,000.00
Common stock		30,000,000.00
Current liabilities		12,725,223.63
Audited vouchers for material and notes payable, not due; and pay rolls (paid May 10, 1910)	$12,050,223.63	
Dividend No. 45 on preferred stock (payable July 1, 1910)	525,000.00	
Dividend No. 31 on common stock (payable July 1, 1910)	150,000.00	
Reserve accounts		4,190,187.46
For insurance	$1,000,000.00	
For purchase price of Wilmington plant	500,000.00	
For general overhauling, improvements and maintenance	628,166.93	
For construction of and additions to steel car plants	1,462,020.53	
For dividends on common stock, to be paid when and as declared by Board of Directors	600,000.00	
Surplus account		25,952,556.08
Total		$100,867,967.17

From President Frederick H. Eaton's accompanying remarks the following extracts are taken:

The past year has shown a marked increase of activity in all the departments of the company. This increase of activity, however, has not been uniformly distributed over the entire year. The pendency of Federal legislation affecting railroads and the possibility of governmental litigation during the closing part of the year have had the effect of very materially curtailing the railroads' demand for new equipment, so that by far the greater portion of the year's business was entered during the first half of our fiscal year just closed. Notwithstanding these conditions, the net earnings resulting from the company's operations during the past year show an increase of $1,193,647.37 over those for the preceding year; and the management is able to report that the company has on hand at the close of business April 30, 1910, orders for its different products considerably in excess of the orders on hand at the close of the two preceding years.

The report for the year ending April 30, 1909, showed a reserve of $1,138,154.85 for construction of and additions to steel car plants. Of this reserve there has been expended during the past year $676,134.32. By this expenditure we have built at the Peninsular plant, Detroit, an extension, giving us there an additional aisle; at Berwick, an extension to the steel passenger car department and a third aisle in the freight car department; at Wilmington, additions to the steel passenger car department, making now possible there the complete construction of steel passenger cars; and at St. Charles we have completed and equipped the steel passenger car shop we had in course of erection at the close of last year and have partly completed an additional shop. With this additional shop we will have at St. Charles a plant for the construction of all-steel passenger cars complete in all details.

In view of the increased demand for steel construction, particularly for passenger cars, the management considers the maintenance of an ample reserve for construction of and additions to steel car plants as of prime importance. To reimburse this fund for the expenditure made from it during the past year, and to keep the company in position for the carrying out of its fixed policy with regard to steel car construction, there has been added to this reserve $1,000,000, making the total of this fund carried over to the new year $1,462,020, as against $1,138,154 at the close of the fiscal year ending April 30, 1909.

From our reserve for general overhauling, improvements and maintenance, there was expended during the year the sum of $538,414.56—this amount covering various improvements in power houses, the installation of considerable new machinery at a number of plants, the electrification of several of the shops and the completion of the equipment of the new wheel and gray iron foundry at St. Louis. This leaves to the credit of this account $628,166—which, in view of the high condition of efficiency in which the company's plants have been at all times maintained, is deemed sufficient for the coming year without addition to this reserve.

In the president's letter for the preceding year it was said that "we have perfected plans for the prompt and timely construction of another steel car plant." The management did not consider it advisable to begin the construction of this additional steel car plant during the past year, deeming it, in view of existing conditions, more economical and in all ways preferable that the capacity of our existing plants should be increased by the making of the extensive improvements therein already referred to. We remain, however, prepared to construct this additional steel car plant, just as soon as, in the judgment of the management, the interests of the company will be best served by so doing.

In all the work of improvement of the plants, the management has had in mind the growing demand for steel in preference to wooden car construction; and the company is prepared for the time when cars of steel will entirely supersede those of wood.

Due to the conditions existing at the close of the fiscal year ending April 30, 1909, the business done during the past year was of necessity taken on a strongly competitive basis; and as a result the company has had to work on a narrow margin of profit. Considering these conditions as well as others above referred to, the management feels that the result of the year's operations has been, on the whole, satisfactory.

An estimate that the total number of immigrant aliens admitted at all ports of the United States in the fiscal year ending June 30 reached 1,035,545 has been made by Commissioner General Keefe. This is an increase of 283,759 over the number of immigrant aliens admitted last year.

Trade Publications

Steels.—The Royal Metal Steel Company, Broadway and Sixty-fourth street, New York City. Catalogue. Size 6 x 9 in.; 24 pages. Lists a number of foreign high speed, automobile, electrically treated and alloy steels which the company handles as the manufacturers' American representative. Altogether about 30 brands are mentioned, with a brief description of their properties and the purposes for which they are intended to be used. A list of different automobile parts with the brands recommended for making them completes the catalogue.

Steel Ball Burnishing Process.—The Abbott Ball Company, 14 Hicks street, Hartford, Conn. Circular. Relates to the treatment of metal goods by the burnishing and tumbling process, which takes the place of buffing both before and after plating on practically all kinds of small metal goods. This operation is said to be very simple and the advantages claimed for the process are that large quantities of work can be handled at a great saving of time and money.

Polyphase Motors.—Wagner Electric Mfg. Company, St. Louis, Mo. Bulletin No. 82. Covers a line of polyphase motors which are made in standard sizes from 1 to 75 hp. Touches upon the latest developments in the art of building polyphase motors and discusses the relative adaptability of the polyphase and single-phase types. Space is also given to the principles upon which an induction motor is designed and operated and the advantages of the slip ring and squirrel cage models. The principal features of the construction of this line of motors are given and there are several illustrations showing different sizes of motors both singly and operating machinery such as planers, air compressors, conveyors and a turbine pump.

Roofing.—H. W. Johns-Manville Company, 100 William street, New York City. Mailing card. Describes the uses and advantages of the J-M asbestos roofing, which is composed of pliable sheets of asbestos felt saturated with asphalt. Several of these sheets are cemented together with asphalt forming a composite roofing fabric which, it is stated, will not dry out under the combined action of sun and air.

Water Softeners.—Dodge Mfg. Company, Mishawaka, Ind. Two wall hangers. Size 13¼ x 20 in. Treat of the Eureka water softener, an exterior view of which is shown on one of the hangers and a sectional colored view on the other.

Disk Grinders.—Charles H. Besly & Co., Chicago, Ill. Catalogue, 6 x 9 in.; 78 pages. Points out the special features of the Besly spiral disk grinders and band polishing machines. All the different sizes of machines of this extensive line are illustrated and briefly described and space is given to various grinding fixtures, exhausters and accessories such as Helmet spiral circles, cement, glue and oil.

Condensers.—Wheeler Condenser & Engineering Company, Carteret, N. J. Bulletin No. 106. Calls attention to the use of high vacuum surface condensers for steam turbine use, built by this company. The bulletin describes the arrangements of the tube surface, the use of rain plates and other means employed to secure high steam economy without unnecessary consumption of power by auxiliaries or the use of excessive amounts of cooling water, and is illustrated by numerous half-tone and line engravings. An illustrated description of this condenser was printed in *The Iron Age* March 3, 1910.

Machinery.—Reck & Corbitt Iron Company, 1238 N. First street, St. Louis, Mo. Catalogue No. 7. Shows the different lines handled by this company, which include gasoline engines, power hammers, disk sharpeners, emery grinders, buffing and polishing lathes and woodworking machinery. Accessories such as saw mandrels, circular saws, pulleys and shafting and hangers are also illustrated.

Sewer Inlets.—The Burch Plow Works Company, Crestline, Ohio. Pamphlet. Covers a number of different types of sewer inlets and manhole covers. These are made for installation at corners and in curbs and at the roadside for conducting surface water into sewers and underdrains at bridge approaches, road crossings, driveways, underdrains, intersecting country roads, and for suburban work in general. An iron manhole cover for use in the center of the street and expansion cast iron culvert pipe, which is made in two sections that are held in place by lugs, are also shown.

Typesetting Machines.—Lanston Monotype Machine Company, Philadelphia, Pa. Booklet. Size 8½ x 15¼ in.; 36 pages. Contains a brief account of the Monotype machine and its development. This description is supplemented by a number of illustrations showing the various portions of the plant where the machine is built and the different steps in its construction.

Automatic Mine Car Stop.—Automatic Car Stop Company, O'Fallon, Ill. Mailing card. Deals with an automatic car stop designed to be placed at the bottom of the shaft to keep cars from running into the sump. It eliminates the use of boards and other material commonly used for this purpose and in addition is said to give the operator a more uniform hoist.

Screw Machine Tools and Parts.—The National-Acme Mfg. Company, Cleveland, Ohio. Catalogue. Size 7 x 9 in.; 46 pages. Contains an illustrated and tabulated list of tools and parts for the Acme automatic multiple-spindle screw machine, an illustrated description of which was printed in *The Iron Age* June 4, 1908. All of the tools and attachments used on the machine as shipped to-day are shown, numbered to facilitate the ordering of repair parts.

Alabama Blast Furnace Conditions.—BIRMINGHAM, ALA., July 6, 1910.—(*By Telegraph.*)—The Sloss-Sheffield Steel & Iron Company has blown out another furnace in this city. The Southern Iron & Steel Company put out its Alabama City furnace. Only eleven furnaces in this State are in blast on foundry iron, representing about 60,000 tons a month. From 10,000 to 12,000 tons of pig iron was sold here last week.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has been awarded a contract by the McClintic-Marshall Construction Company, Pittsburgh, for material to be used on the Panama Canal, for lock work, for which the latter company has the general contract. The contract includes iron and steel castings, bronze, vanadium and nickel steel, and all machine work in connection with them. Deliveries are to extend over a period of two years. The initial shipment is to be made shortly after the first of the year. It will require less than one-half the capacity of the company's Wheeling plant to fill the contract, and will not interfere in any way with its rolling mill and steel works casting business.

The Follansbee Brothers Company, Pittsburgh, has placed contracts for two new 30-in. sheet mills and other extensive improvements to be made at its Follansbee, W. Va., plant. The new mills will be of heavy construction and modern in every detail. Each will have two stands of rolls, which will give the company a total of 23 stands of rolls, including nine cold rolls. The rolls and equipment complete will be furnished by the National Roll & Foundry Company, Pittsburgh, with works at Avonmore, Pa. The new mills will be electrically driven by power generated by low pressure turbine engines. The plans include a change from steam to motor-drive for the present bar mills.

A number of the men formerly employed in the sheet mills of the Youngstown Sheet & Tube Company, Youngstown, Ohio, that have been on strike since July of last year, have made applications for their old positions. Some have been put to work and others will be as fast as there is an opportunity. The Amalgamated Association has not as yet officially declared off the strike at these sheet mills, but most of the men have decided on their own account to return to work.

The members of the Eastern Pig Iron Association have accepted an invitation from Witherbee, Sherman & Co., Inc., to be the guests of the company at Port Henry, N. Y., Wednesday, July 27, when the midsummer meeting of the association will be held. An inspection trip will be made to the well known iron mines at Mineville. Most of the visiting party will leave New York Tuesday evening, July 26.

Under direction of President Taft the Tariff Board has mapped out a series of investigations in connection with each schedule of the tariff, and leading economists, technologists and statisticians will be employed to secure information. The sole instruction to the board by the President is to "get at the truth, regardless of whom it helps or hurts."

Among sales of locomotives last week by the American Locomotive Company were 10 Mallet articulated compound locomotives, the total weight of which will be 225,000 lb., to the Central African Railways, and four four-wheel saddle-tank locomotives, the total weight of which will be 56,000 lb., to Haney, Quinlan & Robertson, Toronto, Canada.

The Machinery Markets

There is a healthy demand for machinery in most parts of the country, although the expected summer dullness prevails in some lines. The railroads are still practically out of the market, as far as heavy buying is concerned. There are two large lists to be purchased against in the East, and in the West lists amounting to several million dollars are now before the trade. During the last week the Chicago, Rock Island & Pacific Railroad issued a list of from 12 to 18 machine tools in the Chicago market. In Milwaukee unprecedented hot weather has unsettled the market somewhat, but the fact that prices are stiffening on some classes of small equipment indicates that there is a good undercurrent of business in that territory. The automobile and agricultural industries are furnishing a generous support to the market and prospects of good crops contribute to the optimistic feeling. In Detroit there is a noticeable activity in the machinery trade resulting from shop additions, due to the growth of the automobile industries, and in Cincinnati the lathe makers and manufacturers of drills and planers notice an improvement, although stock taking is interfering with business there somewhat. The American Rolling Mill Company, Middletown, Ohio, has purchased about $12,000 worth of tools in the Cleveland market, which brought the June business of some machinery houses in that city up to a good figure. Business is quiet in Pittsburgh, but it has no element of weakness, and inquiries promise a better buying movement shortly. In Baltimore and in the South business is irregular and the principal demand is coming from the iron and steel plants and the textile mills. Labor troubles are causing some difficulty on the north Pacific Coast, and there is some slight delay in filling orders. Buyers are tolerant over the delay, however, and a good future business is promised. There is an unusual demand for engines, electric generating units and transmission equipment in the Southwest, but the demand for other lines of standard equipment is somewhat slow. In the far Central West the machinery demand is expected to continue quiet until after the harvest. Current business is dull in the Northwest, but it is judged from inquiries now before the trade that a buying movement is due there in August.

New York

NEW YORK, July 7, 1910.

The machinery trade in New York is quiet, but the holiday has interfered so much with the week's business, coming as it did on Monday following the Saturday half-holiday, that it is hard to judge just what the actual conditions might be. The railroads continue to delay purchasing against the lists now before the trade and there is a lessened demand from the general manufacturing trade caused in some quarters by the usual shut-down at this time of the year for stock taking purposes. In the shoe manufacturing business and in the jewelry trade, especially, it is customary to close down during the week in which the Fourth of July occurs, and some shops close down for a fortnight for stock taking, unless business is unusually good. There is a good volume of inquiries before the trade and most of them are of a nature that indicates that those inquiring will make purchases in the near future. The demand for second-hand machinery continues good and it is thought this may be due to recent reductions in prices asked for that class of equipment. When makers of most classes of new machinery were so far behind several months ago the price of second-hand machinery for immediate delivery was advanced perhaps beyond its value and in some cases the price put on equipment was prohibitive to many who were in need of used machinery. The manufacturers of dredges, steam shovels, excavating equipment, hoisting engines and other out-of-door machinery are doing an especially good business just now, as the open weather of the last two months has given an impetus to construction work. The contractors on the Catskill aqueduct have been generous buyers of late of this line of equipment.

The engineering firm of Sanderson & Porter, 52 William street, New York, has inquiries out for considerable power equipment for central station work. This company has contracts in hand for extensive improvements to the plants of the Tucson, Ariz., Gas, Light & Power Company; Tucson Rapid Transit Company, the Albuquerque, N. M., Gas, Electric Light & Power Company; the Grays Harbor Railway & Light Company of Aberdeen, Wash., and the Sheridan, Wyo., Electric Light & Power Company.

Among orders recently booked by the Crocker-Wheeler Company, Ampere, N. J., are the following: Two 1000-kw. engine type generators for the Republic Iron & Steel Company's Hazelton, Pa., plant; one 500-kw. engine type generator for the A. M. Byers Company, Pittsburgh, Pa.; one 175-hp. auxiliary pole motor for the Orford Copper Company of New Jersey, and two 500-kw. synchronous motor generator sets for the Gary, Ind., plant of the American Sheet & Tin Plate Company.

The Taylor-May Machine Company has been incorporated at Rochester, N. Y., for the manufacture of tools, machinery and automobile parts and accessories; also dies for use in the manufacture of typewriters. The principal portion of the machinery for the company's plant has already been purchased.

The Sterling Iron & Railway Company, Sterlington, N. Y., will install a crushing plant unit, including a No. 7 gyratory breaker and auxiliary apparatus.

The Syracuse Bridge Company, Syracuse, N. Y., is planning an addition to its works, 50 x 120 ft. The understanding locally is that it will be used mainly for storage of finished material.

It has been definitely decided at Perry, N. Y., to install another pumping unit in the municipal water works station, and funds for the purpose will be provided shortly.

Some additional equipment may be required in the near future by J. F. Friedel & Sons, Syracuse, N. Y., who have arranged for a four-story addition to their factory.

Bids for pumping machinery, including gasoline engine driven and motor operated triplex pumps, will be taken at Livonia, N. Y., by the Water Commissioners, until July 11.

The Saratoga Graphite Company, Saratoga Springs, N. Y., will install a crushing plant, including five heavy gravity pumps, such as are used in mining work for ore reduction.

The Thousand Islands Electric Light & Power Company, Clayton, N. Y., has just completed a new power plant, consisting of a Tait balanced draft gas producer, supplying two three-cylinder engines from the shops of the Foos Gas Engine Company, Springfield, Ohio, direct connected to two electric generators of 150 kw. each, built by the Crocker-Wheeler Company, Ampere, N. J., which are designed to operate in parallel. The plant was furnished and installed by James Beggs & Co., New York City.

Machinery for a thoroughly modern plant, comprising all of the improvements which have recently been brought out in this industry, has been installed by the Dyett Sand Lime Brick Company at Port Jefferson, N. Y. It includes three large steam boilers, Corliss engine, steel pressure cylinder, &c.

Charles L. Lewis, Ilion, N. Y., has been awarded a contract by the city of Spencerport, N. Y., for constructing water works in that city at a cost of $32,348. The firm of Morrison & Farrington, Syracuse, N. Y., are the consulting engineers on the work.

The Hudson Terminal Construction Company, 50 Church street, New York, is building a water works system for the city of Bridgeton, N. J., at a cost of $40,000. The Hudson Terminal Construction Company, of which H. Van Winkle is president, is purchasing all the equipment.

Bids will be opened July 14 at the office of the Department of Parks, Fifth avenue and Sixty-fourth street, New York, for furnishing new boilers for the conservatories in Central Park. The amount of security required is $3000.

THE MACHINERY MARKETS

Chicago

CHICAGO, ILL., July 5, 1910.

The Chicago machinery market is passing into the summer vacation period in fairly good shape. Business is naturally dull in July and no unusual developments are expected for some time. Trade on the whole has been good this year, when one considers the discouraging features of the market that would naturally tend to check the enthusiasm of buyers of machine tools. The long and persistent decline in the stock market, the political unrest, the bear talk in financial circles and other elements of that character, are bound to have a depressing effect on business, and in the face of it all the machine tool market has shown surprising vitality. A great many manufacturers will wait a month or two longer for crop news before making their plans for next year. There is not likely to be serious trouble on this score as the position of the farmer is pretty well assured. There are good crops of oats, hay and wheat, and if the corn crop should fall a little short higher prices will even the matter up for the producer, so that the farmer is on safe ground and there is nothing to discourage the manufacturers who are affected by agricultural conditions. There are pending in the market about a dozen large lists of machine tools from railroads, amounting altogether to several millions of dollars, and something will have to be done on these lists during the next month or two, as the railroads need the tools. When this business comes in it will give the machinery houses a good start of their fall trade.

The Sterling Foundry Company, Sterling, Ill., is erecting a foundry which will double the capacity of its present plant, and a two-story building, 40 x 85 ft., for erecting, finishing and shipping its products. Additional equipment to be installed will include modern exhaust cleaning mills and dust arrester, cinder mill, drawer type core oven, elevator, two motors, band saw, universal saw, grinding machines and sheet metal equipment. It is expected that the buildings will be completed by September 1.

The Fort Wayne Electric Works, Fort Wayne, Ind., has completed plans and specifications for a new factory building, 140 x 220 ft., and an office building, 60 x 140 ft., two stories. The buildings will be of reinforced concrete construction.

The Illinois Traction Company of Champaign, Ill., will complete this summer at Venice, Ill., one of the most modern steam driven plants in the West. The equipment is to include 12 water tube boilers, furnished by the John O'Brien Boiler Works Company, St. Louis, Mo.; a Hamilton-Corliss engine of 1500 hp., from the shops of the Hooven, Owens, Rentschler Company, Hamilton, Ohio; a 1000-kw. General Electric generator; a 3000-kw. vertical steam turbine and generator, built by the General Electric Company, Schenectady, N. Y.; Worthington pumps, Case cranes, &c. The work on the building is being done by the McClintic-Marshall Construction Company, Pittsburgh, Pa.

Cribben & Sexton, Chicago, will build a large foundry, powerhouse and several new shop buildings, in connection with their stove factory. Some of the contracts have already been let.

The Buckeye Foundry & Engine Company, Joliet, Ill., will furnish power equipment and other machinery for a manufacturing plant now being erected at Wichita, Kan., by the Wichita Cement Brick & Supply Company, which is 100 x 150 ft., two stories.

Francis M. Barton, 185 Jackson boulevard, Chicago, has prepared plans for a box factory, 60 x 125 ft., to be erected by H. R. Gibbons. It will be located on Orchard street.

The McKenzie Furnace Company, Chicago, whose offices are at 84 Van Buren street, is completing a foundry and finishing shop, 75 x 300 ft., at Chicago Ridge, Ill. The necessary equipment has been provided, but this is likely to be extended a little later on.

Contracts have been made by the Freeport Casket Company, Freeport, Ill., for a two-story factory building, 48 x 160 ft., with wing, 32 x 48 ft. The equipment has been largely provided for.

Plans are under consideration at Clinton, Ill., for driving the pumps in the municipal water works with electric motors instead of by steam power as at present. No definite decision in the matter, however, has yet been reached.

A three-story addition, 80 x 160 ft., is to be made this summer to the plant of the Link Belt Company at Indianapolis, Ind.

The Hawks Electric Company, Goshen, Ind., is preparing to erect an electric generating station of considerable size, the equipment of which has been partially arranged for.

Philadelphia

PHILADELPHIA, PA., July 5, 1910.

The local machinery market has felt the influence of the national holiday, as well as the customary closing of plants for midsummer repairs and stock taking. Under these circumstances the volume of business closed has been comparatively light. Merchants' sales have been confined to single tools, principally lathes, drill presses and the smaller run of tools. Few inquiries of any importance have developed, although there is considerable business in sight, and the volume continues to increase, but it will be late in the fall before some of these propositions will develop into business. Little has come from the railroads; one inquiry for a few grinders has been put out by the Pennsylvania Railroad, but lists covering any material quantity of equipment are conspicuously absent. Special tools and machinery have been in light demand, although a fair inquiry for power equipment and power transmission machinery is still to be noted.

Appleton & Burrell have a contract for a two-story engine house, 28 x 34 ft., at 1202 and 1204 Brandywine street, from plans by Ballinger & Perrott, to be built for the Bilgram Machine Works.

The Pennsylvania Equipment Company, West End Building, is in the market for a second-hand 18 x 30 in. mine hoisting engine.

The Leo-Niessen Company has acquired property 59 x 100 ft. at Twelfth and Spring streets, and is having plans prepared for a seven-story reinforced concrete commercial building to be erected on the site.

The contract for the tower for the water system of Beach Haven, N. J., has been awarded to the Philadelphia Iron Works of this city.

Arrangements have been completed by which the plants of M. H. Treadwell & Co., Lebanon, Pa., Stoever Foundry & Mfg. Company, Myerstown, Pa., and Lebanon Steel Castings Company, Lebanon, Pa., will erect combined plants on a tract of 28 acres in Easton, Pa., recently acquired. The new plants will have about twice the capacity of the present ones. They will be operated entirely by electric power supplied from local sources. Work at the old plants will continue until the new buildings and equipments are ready so that no time will be lost in manufacturing or in making delivery on orders at any of the three plants.

The Pennsylvania Railroad Company will ask for proposals at an early date for the erection of additions to its shop to be built in Northumberland, Pa.

It is reported that the new saw factory of the Union Saw Company at Frackville, Pa., formerly of Williamsport, Pa., has been practically completed, and will be started in full operation at an early date.

The Department of Public Works, Philadelphia, will receive proposals until July 20 for the construction of a sewage disposal plant from plans and specifications by the Bureau of Surveys. This will be the first of a series of these plants, and will be located in the Holmesburg district. Information and plans may be had from George R. Stearns, director, City Hall. Experiments for this work have been conducted for a long time, and the plant to be erected will demonstrate the practical value of the system used, which, if satisfactory, will be adopted at other plants to be erected.

New England

BOSTON, MASS., July 5, 1910.

The market has suffered from the combination of extreme hot weather with a holiday. Last week business was by no means stagnant, however, the dealers reporting scattering sales totaling very good figures. It is too early to tell what July will bring forth, but naturally there will be a let-down. The vacation period is on, and the men having the controlling influence as to purchases are each year shortening their business hours and lengthening their vacations, which means concentrating attention on the routine of business rather than on plans for enlargement of manufacturing facilities. Nothing more has been heard of the proposed purchases of machinery by the Thomas S. Plant interests for the Wonder Worker Shoe Machinery Company. The award of a contract for one of the new submarines to the Lake Torpedo Boat Company, Bridgeport, Conn., will mean increased activity at the works in that city, and it is hoped that the three other boats of this class carried by the naval appropriation bill will be constructed for the Electric Boat Company, New York, at the yards of the Fore River Shipbuilding Company, Quincy, Mass. The supply business remains good, considering attendant circumstances. Prices are maintained, and deliveries are prompt, with the

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exception of twist drills, concerning which there is some complaint.

The machine tool warehouse of the Chandler & Farquhar Company, Boston, Mass., was wet down for the third time in a few years, Sunday morning, as the result of a fire in the upper stories of the building. One section of the space occupied by machinery escaped the water and prompt action saved the balance of the stock from very serious damage.

The city of Haverhill, Mass., contemplates the establishment of a municipal electric plant, either by the purchase of the existing electric cmopany's property or by the building of a new station.

Additions to general manufacturing facilities in New England include the following: Vanderhoef & Co., Norwalk, Conn., straw goods, two-story addition, 60 x 125 ft.; Brampton Woolen Company, Newport, N. H., one-story weave shed, 90 x 90 ft.; Lawrence Dye Works, Lawrence, Mass., new plant; G. S. Jennings, Bridgeport, Conn., carriage factory, 50 x 113 ft., three stories; Derby Rubber Company, Derby, Conn., reclaimed rubber, additional buildings to double capacity.

The plant of the newly organized Sharp Mills, New Bedford, Mass., will be on a very large scale, with a total floor area of 520,000 sq. ft. The main mill will be 136 x 565 ft., five stories, the engine room 122 x 160 ft., with two beds for cross compound engines, the boiler room 141 x 164 ft., to be equipped with 14 boilers, and a storehouse, 70 x 316 ft., three stories.

M. M. Bartlett, Winsted, Conn., recently superintendent of the Winsted Scythe Company, will establish a business for the manufacture of scythes, lawn mower blades, corn and tobacco knives and leather belting. The new company, which is now organizing with a capital stock of $20,000, will occupy the factory building at Mooreville, formerly the plant of the Standard Mfg. Company. New Equipment will be required, including grinding machines, presses and oil fuel blowers. The factory is a modern building, 25 x 170 ft., and contains machinery that can be adapted to the wants of the new owners. Mr. Bartlett is a veteran scythe manufacturer. Before going to Winsted he was with the North Wayne Tool Company, North Wayne, Maine, and later managed the scythe department of the Hubbard & Blake Company, Oakland, Maine. The leather belting department of the new company will be equipped with a new type of machinery, a recent Scotch invention, designed to reduce cost of manufacturing.

The Winsted Hardware Mfg. Company, Winsted, Conn., is in the market for a varied list of machinery for the manufacture of articles from sheet metal and wire. This is a new corporation, with authorized capital stock of $100,000, chartered under Connecticut laws. Thurlow H. Bronson is the president, Arthur A. Griffin secretary and Stuart B. Camp treasurer. A factory has been secured and the work of equipping it is already under way. The product will be upholstery hardware, bright wire goods, cup and screw hooks, bird cage hooks, drawer pulls, towel bars, sash lifts, molding hooks, picture nails, sash and curtain rods, pole brackets, porcelain picture and shutter knobs, closet screws, nuts and washers.

The North & Judd Mfg. Company, New Britain, Conn., manufacturer of saddlery hardware, will build an addition to its annealing room 70 x 94 ft., and an addition to its brass factory 60 x 105 ft. The foundations are already completed.

The George E. Wood Tool Company, Southington, Conn., manufacturer of screw drivers and hardware specialties, which is controlled by the Stanley Rule & Level Company, New Britain, is planning to build an additional factory in the near future.

The Industrial Improvement Association, Southington, Conn., proposes to erect an industrial building, space in which will be rented to manufacturing concerns. Subscriptions already obtained assure the carrying out of the enterprise.

The Aluminum Castings Company, Cleveland, Ohio, manufacturer of aluminum, brass and bronze castings, is making additions and alterations at its plant at Fairfield, Conn., which will double its capacity.

The Leighton Machine Company, East Manchester, N. H., manufacturer of knitting machinery, will erect a two-story shop building 40 x 240 ft., with wing for office and a power house.

The power plant of the Hartford Electric Light Company, Hartford, Conn., will be equipped with two Curtis steam turbines of about 5000 kw. each, together with the necessary battery of boilers.

Cincinnati

CINCINNATI, OHIO, July 5, 1910.

In the machine tool trade conditions show the customary midsummer dullness, and a number have taken advantage of the opportunity afforded by the coming of the national holiday on Monday, to take stock and look over the shop equipment, shutting down from the evening of June 30 to July 5. Reports from the lathe manufacturers indicate that nearly all have business enough booked to carry them through the July and August period and in one or two instances [illegible] improvement is noted in the demand for radial drills as well as planers, although manufacturers making a specialty of these heavier types report that the first half of the month showed a better record in sales than the last.

Manufacturers of electrical tools, particularly the portable types, report business excellent. The Hisey-Wolf Company, the foundations of whose new factory in Camp Washington are laid and the structure well along, reports June the best month in its history.

The Cincinnati Traction Company has an order under way at the shops of the Cincinnati Car Company for 50 new open summer cars of a new type with flat roof minus raised deck ventilators and with an enlarged rear platform where will be built a smokers' bench. This order with one placed recently for 50 of the pay-as-you-enter type means an outlay of $400,000 already this year for new equipment.

There is a local movement on for an organization of employing foundrymen. Several meetings have been held, at which appreciated assistance was rendered by Secretary Manley of the Cincinnati branch, National Metal Trades Association, and a strong organization of foundry owners in this section, which will have the moral support and sympathy of the members of the Metal Trades Association, is an early possibility. There are conditions in the trade, in addition to the extreme dullness that is just now giving the craft much concern, that require special treatment. It is expected that every shop doing any kind of jobbing will become a member.

The fortieth anniversary of the establishment of the foundry of Richter & Co., at Cincinnati, was celebrated July 1 with a banquet and appropriate exercises. The business was started by Joseph A. Richter as a brass foundry and on a small scale in the rear of a cutler's establishment on Main street near Ninth. Later the business was established at 210-214 East Ninth street, the foundry's present location. The day was also selected for the incorporation of a new company which will conduct the business in the future under the name of The Richter Company, with a capital of $80,000. The incorporators are Edward B., John H., Charles H., Louis A., Amelia, J. H. and Joseph A. Richter.

The Ashland Iron & Metal Company is a new incorporation with a capital of $10,000, at Ashland, Ohio, by A. Talaznek, Sarah Talaznek, J. Milner, J. M. Bernstein and E. E. Gross.

The Watt Mining Car Wheel Company, Barnesville, Ohio, has increased its capital stock from $75,000 to $125,000.

The Elwood Iron Works Company is a new incorporation for Elwood, Ind., to manufacture machinery parts. The capital stock is $50,000 and the directors are Wayne Leeson, Thomas Connor, W. N. Durbin, T. E. Palmer, George Pohl, M. J. Fogarty and C. C. de Hority.

The Incandescent Light & Stove Company has acquired a 3½ acre site in Oakley, Cincinnati suburb, and will erect a plant 60 x 250 ft.

The American Steel Grave Vault Company at Galion, Ohio, has increased its capital stock from $25,000 to $50,000.

The Steel Mfg. Company has been incorporated at Newark, Ohio, by T. J. Costello, L. B. Richards, J. W. Bower, Katherine M. Shaugnessey, J. A. Flory. The capital stock, $10,000.

The Western Ohio Railway Company at Lima, Ohio, has increased its capital stock from $3,400,000 to $4,000,000.

The property of the Huron Steel & Iron Company at Norwalk, Ohio, which has been in the hands of receivers for five months, was sold at auction on June 25 to the Assets Realization Company of Camden, N. J., represented at the sale by S. W. Swabey of Chicago, general counsel of the company. The bid that secured the property was nearly $61,000 more than the appraised value and the new owners have advised that they will take it over as soon as the sale is confirmed. The identity of the purchasing concern is not revealed, but the statement is made that it is one of the largest and most influential in the country and that it will operate the plant on a larger scale than ever before.

Charles Horix, general manager of the Vulcan Steam Shovel Company, Toledo, Ohio, announces that the plant will be removed to Evansville, Ind., about January 1. Evansville capitalists have donated a site and given a substantial bonus. The Bucyrus Steam Shovel Company of Milwaukee, Wis., and the Toledo plant are controlled largely by the same directors, and the Evansville location is in line with their policy to seek a Southern outlet for their commodities.

The plant of the Ohio Shovel & Stamping Works at Canal Dover, Ohio, which was destroyed by fire on June 21, will be rebuilt. The building and contents were insured for $13,500 and the loss was estimated at $15,000. The plant was established three years ago and has grown steadily.

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Cleveland

CLEVELAND, OHIO, July 5, 1910.

While taken altogether the market is not active, a few of the machinery dealers report a fair volume of business during the week and some improvement over the previous week. While June as a whole was not a busy month, the local machine tool houses are fairly well satisfied with the amount of business booked, which in volume about equalled that of May. With vacation time coming on and the usually dull period of the year, dealers will not be surprised if orders are rather light during the next few weeks. Among the larger purchases reported during the week was about $12,000 worth of tools by the American Rolling Mill Company, Middletown, Ohio, whose list was noted several weeks ago, and tools aggregating about the same amount by an Ohio automobile concern. Another automobile manufacturer in this State has an inquiry out for about $35,000 worth of tools. While other automobile makers do not appear to be buying extensively at present there is a fair volume of single tool orders from this source. Among the general inquiries pending there are a number for lots of about half a dozen tools. A very good demand for gear hobbers in all sizes is noted. The demand for milling machines continues active, with considerable uncertainty about deliveries. One maker can make prompt deliveries on some sizes has withdrawn others because of being sold so far ahead, and is not promising shipment on other sizes until as late as next June. There is a good demand for second-hand machinery and dealers say they could sell more if they had the desired tools in stock.

In the foundry trade the demand for light gray iron castings is holding up well and foundries generally have nearly all they can do. Some report that they would be running at their maximum capacity could they secure more molders, of which there seems to be somewhat of a scarcity at present.

The Republic Rubber Company, Youngstown, Ohio, will enlarge its plant by the erection of an addition, 80 x 200 ft., five stories and basement. Plans are being prepared by the Osborn Engineering Company, Cleveland. Later the company expects to build an addition to its power plant.

Plans for various municipal improvements in Hudson, Ohio, have been prepared by D. M. Hosford, engineer, Caxton Building, Cleveland. Contracts will be placed shortly for a lighting plant. The specifications provide for gas engine of about 150 hp., a gas producer and a 100-kw. generator.

Plans for a water distribution plant for the Athens State Hospital at Athens, Ohio, are being prepared by the Osborn Engineering Company, Cleveland. Boilers, pumps and some other equipment will be required.

Plans for a new plant for the Tropical Oil Company, Cleveland, have been prepared by the Moore Engineering Company. A building of steel and reinforced concrete will be erected on West Seventieth street. It will be a three-story structure, 42 x 120 ft. Only special machinery will be required.

The Royal Rubber Company, Akron, Ohio, has purchased the plant of the Empire Mower & Reaper Company in that city, on which it has held an option for some time. The company's output will be increased and new machinery will be installed. The company will make a specialty of non-skid automobile tire. The company is capitalized at $50,000. J. C. Gibson is the general manager.

The Burt Mfg. Company, Akron, Ohio, reports that the demand for ventilators is holding up in a very satisfactory manner. Its business during May broke all previous records, both in the number of ventilators sold and in its aggregate business. Among the orders taken by the Burt company during the past few days is one from the D. M. Ferry Seed Company, Detroit, Mich., for 150 ventilators.

The Moore Heating & Mfg. Company, Akron, Ohio, has leased the space formerly occupied by the Hedgeland Mfg. Company in the power block on South Market street, Canton, Ohio, and expects to have it fitted up in about 30 days for the manufacture of warm air furnaces and stoves. The company will have 30,000 sq. ft. of floor space.

The General Motors Company, which owns the Elmore automobile plant at Clyde, Ohio, has decided to make extensive extensions to that plant. It is announced that a new building, 200 x 250 ft., will be erected for manufacturing purposes.

The Lindsay Fence Company, Cleveland, will erect a new plant on East Fortieth street. The building will be 28 x 106 ft., three stories.

The Federal Foundry Supply Company, Cleveland, has increased its capital stock from $30,000 to $50,000.

The Cleveland Elbow Company, maker of stovepipe elbows, has taken out incorporation papers with a capital stock of $15,000. A. E. Pearce and others are the incorporators.

Pittsburgh

PITTSBURGH, PA., July 5, 1910.

The closing days of June and beginning of July have been attended by a quiet condition of trade without pronounced features of any kind. In this situation, however, no element of weakness appears. On the contrary, there is a strong undertone to the market, with excellent prospects for a heavy buying movement not many weeks hence. Machinery for general industrial service has been more frequently called for of late than shop tools or special equipment of any kind, although the foundry trade shows considerable activity and appliances for boiler shops, tank works, sheet metal plants, &c., see about as well as at any time during the year. Deliveries seem to be rather uncertain. Some manufacturers are prepared to make prompt shipments of standard apparatus, while others do not care to take contracts except for some distance ahead. Dealers have been able thus far to meet the requirements of their regular customers; but this is largely due to the varied sources of supply which many of them have provided, as well as to the liberal stocks carried, in consequence of which there has also been a good deal of scattering trade coming to this district which is ordinarily satisfied much nearer home.

The Erie City Iron Works, Erie, Pa., is reported to have taken the contract for a boiler and 150-hp. engine, the latter to be direct coupled to a 90-kw. alternating current generator in the plant to be built by the Newmanstown Electric Light Company, Newmanstown, Pa.

Dealers here expect to provide some equipment for a plant to be erected at Charlestown, W. Va., by the Baldwin Forging & Tool Company, which now operates prison shops at Columbus, Ohio. The new works will be constructed for larger capacity and furnished with the best modern tools.

The Pittsburgh office of the S. Obermayer Company is calling the attention of owners of brass, bronze and aluminum foundries in this district to the advantages of copper perforated chaplets of that company's manufacture. The use of one of these allows the molten metal to flow through the perforations in such a way that there is not the customary head or rod extending outside the casting.

Two boilers of 350 hp., an engine of 250 hp., electric generator set for lighting service and a line of heavy operating machinery have been installed in the remodeled plant of the Greenbrier Lumber Company, Neola, W. Va., which will be one of the most important buyers of that section in future of mechanical equipment of various kinds.

The Enterprise Electric Company, Warren, Ohio, is offering a new type of transformers for factory lighting service. They are wound for very low voltage, thereby, it is claimed, reducing the consumption of current and prolonging the life of small lamps used over machines.

The York Steam Boiler Works, York, Pa., is reported to have under consideration a two-story addition to its plant with dimensions approximately 50 x 60 ft.

The McCullough-Dalzell Crucible Company, Pittsburgh, has found this one of the best seasons in its 40 years' experience for the sale of equipment to steel and brass foundries.

The Gulf Refining Company, whose general offices are in Pittsburgh, is reported to have decided upon a number of improvements to its various properties, including the erection of additional steel storage tanks at Uvalde, Texas.

The American Conduit Mfg. Company, Pittsburgh, is putting on the market a tubing known as galvanite, which is especially designed to carry electric wiring in power and industrial plants so as to eliminate fire hazard.

The Ridgeway Dynamo & Engine Company, Ridgeway, Pa., is making a very strong guarantee for its direct current generators, namely, that they will be sparkless in service at all points between no-load and 100 per cent. overload, without shifting of the brushes.

The Hollingsworth Wheel Company has been organized at Hagerstown, Md., to establish a manufacturing plant. The equipment will include woodworking machinery and tools for the production of metal parts, including wheel rims.

The A. Garrison Foundry Company, Pittsburgh, in addition to its regular line of standard and special machinery for shop and mill service, is making a specialty of turned, ground and polished chilled iron rolls, for which the demand this year has been uncommonly large, due to the severe service imposed upon the machinery of the plants in which they are used.

The plant and business of the Ohio Wagon Company, Wapakoneta, Ohio, which recently passed under the control of new interests, will be enlarged and improved machinery installed.

The motive power department of the Wheeling & Lake Erie Railroad is preparing a $200,000 list of tools and machinery needed to complete the equipment of its new shops at Brewster, Ohio. The list will be given out as soon as

THE MACHINERY MARKETS

B. A. Worthington, receiver of the road, with headquarters at Cleveland, receives authority from the court to make the expenditure. It is the plan of the company to handle at the Brewster shops all the heavy repair work on the lines between Pittsburgh and Toledo.

Equipment which includes two steam boilers, a 150-hp. engine, air compressor, crushing plant, kilns, &c., has been installed by the Apollo Lime & Ballast Company, Apollo, Pa., as the first of several units of production. Additional machinery will be provided as the needs of the business develop.

The Wheeling Limestone Company, Wheeling, W. Va., has made some purchases of machinery for a large crushing plant to be located in the vicinity of Mt. de Chantal on the Baltimore & Ohio Railway, construction of which will be completed before fall. Other apparatus will be required later.

The Pittsburgh Machinery & Equipment Company, Fulton Building, Pittsburgh, Pa., dealer in railroad and contractors' equipment, has been appointed agent for the Davenport Locomotive Works, Davenport, Iowa, for the sale of railroad, mine and contractors' locomotives in western Pennsylvania, eastern Ohio and West Virginia.

The Aluminum Company of America, Pittsburgh, Pa., is building a large cofferdam of concrete at Messena, N. Y., replacing an old wooden structure, and not making an addition to its plant, as stated in *The Iron Age* of June 23.

Baltimore

BALTIMORE, MD., July 5, 1910.

More or less irregularity during the month of June is reported by machine tool builders and merchants, as well as general industrial concerns. Builders of tools and machinery continue actively engaged on work in hand, sufficient in the majority of instances to keep them well employed during the next three or four months, but have found it difficult to close up pending business, of which there is quite a good volume before the trade. Merchants have found conditions somewhat varied. Some lines have been quite active, others appear almost neglected. There has not been very much business in heavy machine tools, although power transmission equipment has been in good demand. A fair business in supplies is reported. Southern buying has not been particularly active, orders being confined largely to single tools and moderate quantities of supplies, sufficient for near future needs. Railroad purchases have been meager, although the Baltimore & Ohio Railroad has placed further orders for freight cars. Structural steel fabricators are busy, and, while no large contracts have been recently placed, several buildings and additions are being figured on for erection in Baltimore as well as in the South. Considerable municipal work is under consideration, and the demand for general contractors' equipment and supplies is good.

The T. C. Basher Company reports June as a satisfactory month. Several good orders for power equipment, as well as heating and ventilation projects, have been closed and other large contracts are in sight. The boiler plant of this concern is very busy on boiler and tank work, and has considerable business ahead.

The Detrich & Harvey Company has taken a moderate amount of new business, included in which were several open side planers for export. Shipments have been extensive and considerable business is on its books, but, while there has been some good inquiry for new tools, difficulty has in some instances been experienced in closing up pending inquiries.

The Baltimore Retort & Fire Brick Company has sufficient orders on hand to keep it actively engaged for at least three months. Several large contracts for brick for boiler installations as well as for special shapes for furnaces, both heating and melting purposes, have recently been booked.

The Baltimore Bridge Company has completed a moderate job of structural work for the Campbell Company, Camden, N. J., and are progressing rapidly with the work of erection of the addition to the Fidelity Building in this city. Extensive shipments against export orders for Central America recently reported are also being made. This company is quite busy, although recently orders have been of a rather miscellaneous character.

The Aumen Machinery Company has taken a contract to install for the Crown Cork & Seal Company an extensive system of conveying apparatus for transferring shipments from its plant to the freight yards of the Pennsylvania Railroad at the Union Station. The system will extend to all the different departments of the plant. A good general demand for machinery and supplies is reported, that for woodworking machinery being the most active. Individual orders, however, are usually small.

The Hollingsworth Wheel Company, Hagerstown, Md., is reported as being in the market for two new or second-hand return tubular boilers, 60 to 100 hp. each, and two new or second-hand Corliss engines, one of 70 and one of 35 hp.

The Baltimore Antiseptic Laundry Company has purchased additional property on Myrtle avenue, near Chatsworth street, on which it is proposed to erect an addition to the plant.

The Chesapeake Iron Works has booked orders for structural work in connection with the new Theatre Francais, a warehouse for R. Morris & Son in this city, and for the Wadsworth Building, Charlotte, N. C. The work of erection in connection with the Woodward Apartment House, Washington, D. C., has been completed, as has also the foundry building for Levering Bros. in this city. Southern demand for structural work is reported good and the plant continues very actively engaged.

The Ellicott Machine Company has, it is stated, given a contract to the Maryland Steel Company for the hull and boilers of a large suction dredge, for which it will furnish the machinery and general equipment. The hull will be 150 ft. long and 40 ft. in width, with a 16 ft. 6 in. depth of hold.

Consideration is again being given to plans by which the bondholders of the Baltimore Refrigeration & Heating Company would establish a large electric power plant in connection with the present plant. Those interested in the project are endeavoring to obtain a franchise for the city of Baltimore, on the success of which depends the carrying out of the present proposed plans.

Bids will be opened in a few days for an eight-story structural steel addition to the department store of the Hochschield-Kohn Company.

Plans have just come out for an addition to the department store of A. A. Brager, particulars regarding which are not available. C. M. Anderson is the architect.

Ground will shortly be broken by the Southern Can Company for the erection of a large warehouse and lithographing building at Lancaster & Wolf streets, from plans by Wyath & Nolting, architects. The building will be three stories and measure 96 x 118 ft., of brick and concrete and of fireproof construction throughout. The contract for the erection of the building has, we understand, been let to John Cowan, contractor.

On readvertisement but one bid, that of the Bennett Building Company, was received a few days ago by the Board of Awards, Baltimore, Md., for the erection of a new high pressure pumping station. The bid will be reported on by the board at its meeting next week.

The Fairbanks Company reports general sales as showing a betterment during June when compared with those of the previous month. The scale business shows a marked improvement, while that for machine tools and general equipment has been on about an even basis. Little inquiry in the way of extensive equipment is reported, transactions being largely in the smaller class of tools and machinery.

Crook-Kries & Co., successors to the Mechanical Department Crook-Horner Company, will move their office and showroom as well as drafting rooms from 227-231 West Saratoga street to the southwest corner of Park avenue and Saratoga street, where a three-story building, 20 x 110 ft., has been taken. This company has recently booked an order for installing a heating and ventilating system in the Notre Dame College. A 250-hp. boiler and a 75-kw. generator and a 110-hp. Erie ball engine, direct connected, will be installed. A new boiler house, 70 x 70 ft. is being erected to house the power plant, for which Charles L. Reeder is the engineer. Contracts for heating and ventilating the Falconer Building, Gay and Water streets, and some extensive work at Fort Moultrie, S. C., have also been booked, while an extensive conduit system is being put in at Fortress Monroe, Va.

Detroit

DETROIT, MICH., July 5, 1910.

In all of the territory naturally tributary to this market there exists at the present time a degree of activity in building new shops or additions to manufacturing establishments such as has never been known before. Every week plans are published that call for the expenditure of large amounts in structural work and equipment; and one of the most significant features of the situation is the fact that metalworking plants predominate. Much of this is due to the extraordinary development of automobile building and its subsidiary lines; but the metal trades as a whole are expanding at a rate that is absolutely unprecedented. What the effect will be upon the future of the market for machine tools and other equipment can only be conjectured; yet enough business is in sight to practically assure a steady run of buying

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for some months to come. So far as the projects now under way are concerned, the needs of plant owners in the way of equipment were largely anticipated during April, May and June, or even earlier, as most of them are the result of careful planning that began no later than last fall. They will, however, be followed by numerous others, particularly at interior manufacturing centers, announcements of which are likely to be made at frequent intervals all through the summer. Locally, the machinery trade does not present an appearance of any market activity, and during the worst of the heated season visible signs of activity will probably not be very manifest; still, the aggregate volume of inquiries is large, and considerable purchasing is being done in a quiet way.

In the line of foundry work the stimulating effect of the recent convention continues to be felt, and the correspondence of local manufacturers and supply houses is unusually heavy. To what extent this has thus far resulted in increased orders cannot be learned with any degree of certainty, but the trade appears to be in a most flourishing condition considering the season.

L. G. Hupp is arranging for the erection of a forge shop 70 x 100 ft., for the Hupp-Turner Company, Detroit. Nearly all of the apparatus needed is understood to have been purchased. Plans are also in progress for buildings to be occupied by the Hupp-Yeates Electric Car Company, newly organized, which will manufacture a patented type of electric automobile.

The Capitol Brass Works, Detroit, is introducing quite extensively this season the electro-magnetic separators of its manufacture, which have found a very practical application in machine shops, brass foundries, &c., for recovering valued metals from the floor refuse, &c.

The Saginaw Sheet Metal Works, Saginaw, Mich., is about to have work started on a one-story plant 150 x 270 ft.

Plans are being prepared by Smith, Hinchman & Grylls, Detroit, for a new factory building, to be occupied by the Roe-Stephens Mfg. Company. The details, however, have not yet been fully worked out, and provision for equipment is still to be made.

Benj. Middleditch, Detroit, who handles foundry supplies, has had a large trade for some time past in tumbling barrels for brass foundries, which he offers in a very substantial type of construction that will stand long service. In connection with his own plant a new foundry is being erected.

Temporary arrangements will be made at Port Huron, Mich., to strengthen the equipment of the water works station, but a new pumping engine is urgently needed and will probably be purchased in the near future.

The Dominion Stamping Company has just been organized here with the intention, it is stated, of building large works to furnish stampings for the use of automobile factories, but further particulars are lacking.

The Linderman Machine Company, Muskegon, Mich., has under construction a new shop, 66 x 106 ft., which will be used for erection work, the equipment including a 10-ton traveling crane as well as electric and pneumatic apparatus and other tools. The company's power and compressor capacity will also be increased.

Along with the heavy demand this year for the larger size cranes, the Northern Engineering Works, Detroit, has had more calls than in any previous period for jib cranes and small wall hoists, particularly for use in the numerous plants of only moderate capacity, which are under construction in all parts of the country.

The Booth Mfg. Company, Muskegon Heights, Mich., will remove in the near future to Howard City, Mich., where it is preparing to establish a plant in what was formerly the Skinner-Steenman factory. Little, if any, new equipment will be needed at the outset beyond what has previously been in service.

The Hoskins Mfg. Company, Detroit, announces that in the manufacture of its electric furnaces, pyrometers and heating appliances it uses a special nickel-chromium alloy, which is produced in entirety in its own plant from the compounding of the metals through the various processes of rolling, annealing and drawing.

There will be a two-story building, 60 x 130 ft., completed this summer for the Detroit Granite Company. A contract for the structural work has just been awarded the Russel Wheel & Foundry Company, Detroit.

A foundry building, 70 x 300 ft., is to be constructed in Pontiac, Mich., for the Pontiac Foundry Company, which is now taking bids on building and equipment.

Work will be begun some time this summer and machinery provided for an addition to be made to the plant of the Bromwell Brush & Wire Goods Company, at Greensburg, Ind.

The Detroit Auto Specialties Company, which is located at 909 Greenwood avenue, Detroit, will put up a new two-story building, 50 x 75 ft., equipped with light machinery for the manufacture of automobile parts and supplies.

A new building, 60 x 200 ft., one story, is to be erected at Ypsilanti, Mich., for the Michigan Pressed Steel Company. The structural contracts have been let and some equipment provided for.

The Universal Motor Company, Denver, Colo., which has previously been mentioned as looking for a new location, recently purchased ground in the vicinity of New Castle, Ind., and will erect a large new plant.

The Great Lakes Engineering Works, Detroit, whose plans for expansion have already been mentioned, is arranging for the construction of a group of seven buildings to be erected at Ashtabula, Ohio. The details of arrangement and equipment, however, have not yet been fully determined upon.

Contracts are now being awarded and work will proceed at once on one of the new factory buildings provided for in the plans of the Everitt, Metzger, Flanders Company, Detroit, which is to be 70 x 370 ft., four stories. Specifications will also be ready shortly on two buildings of smaller size to be added to the company's Port Huron Works.

Whitehead & Kales of this city have the structural contract for two new shop buildings of large dimensions to be built here for the Glass Enameled Package Company.

A steam turbine set of 1500 kw. will be installed in the power plant of the Reliance Motor Company's new factories at Owosso, Mich., to furnish current for operating a large number of induction motors driving machinery in the shops.

At the recent convention of foundrymen, one of the exhibits which attracted a great deal of attention was the Grimes roll-over molding machine, which is handled by the Detroit Foundry Supply Company of this city. Many of these machines are now in operation in various parts of the country.

The Anderson Forge & Machine Company, which has been erecting a new plant in Detroit, is about to proceed with the construction of a power house to provide current for the electrical operation of its machinery.

A large steel hardening cylinder has recently been added to the equipment of the Grande Brick Company's plant at Grand Rapids, Mich.

It is reported from Sidnaw, Mich., that the factory of William Beitner & Son, which burned there last week, will be rebuilt for larger capacity. The headquarters of the company are at Traverse City, Mich.

The American Sandstone Brick Machinery Company, Saginaw, Mich., has been obliged to crowd its shops to their utmost capacity lately on orders for equipment to be installed in the sand lime brick plants which are now springing up in all parts of the United States and Canada. The requirements of that industry have increased this year at a very rapid rate.

Three tubular boilers of 250 hp. each, a Corliss engine of 500 to 600 hp., generator, electric motors and other power equipment, will be required for the new flooring mill at Gladstone, Mich., work upon which has already been begun by the Northwestern Cooperage & Lumber Company. Much of the machinery needed was recently purchased and more will be added later on as required.

The Advance Pump & Compressor Company, Battle Creek, Mich., is finding an excellent market for centrifugal pumping units in connection with quarries and plants utilizing sand, clay or gravel, owing to the variety of service which they are capable of performing, from the dewatering of pits to the forced circulation of water against high heads, that is frequently found necessary. The pumps are built in vertical or horizontal types, single or multi-stage.

The interests of the Fisher Hydraulic Stone & Machinery Company have been concentrated at Mt. Gilead, Ohio, where shops with modern equipment are being operated.

The additional pumping machinery for water works service at Grand Rapids, Mich., will be purchased in the near future. Specifications can be obtained from the Board of Public Works, which will receive bids until the evening of July 21.

The Means Foundry & Machine Works is completing a new plant in Toronto, Ohio, which will be of considerably larger capacity than the one which has heretofore been operated at Steubenville, Ohio. Some of the machinery used at that place will be utilized in the present location and other modern equipment added.

The Kelsey Wheel Company, Detroit, is erecting additions to its plant to be used for storage room and the manufacture of a line of presses used for the purpose of making balls, cups, brake drums and similar stampings. All necessary machinery has been purchased.

The Hale Motor & Machine Company, Detroit, has been incorporated by S. E. Hale of Cleveland, Ohio, and Chas. Ritter and J. C. Hudson of Detroit. The company has a capital stock of $125,000, and will manufacture motors and auto parts.

The Howse Commercial Car Company, Detroit, has been

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incorporated with a capital of $60,000 to manufacture commercial power trucks. The incorporators are: August J. Stieber, Charles F. Howse and E. P. Newton.

Bradley, Miller & Co., Bay City, Mich., are having plans drawn for a new box factory, which will probably be furnished with electric motor drive throughout.

The Michigan Pressed Steel Company, Detroit, has plans prepared for a one-story factory building, 60 x 200 ft.

The E. J. Kruce Company, Detroit, has awarded a contract for the erection of a two-story machine shop, 50 x 150 ft.

The Cass Motor Truck Company, Port Huron, Mich., recently mentioned, is receiving bids through its architect for the construction of a one-story automobile factory building, 60 x 350 ft.

The Grand Rapids Railway Company, Grand Rapids, Mich., has plans completed and is receiving bids for the construction of new car shops.

The Detroit United Railway Company, Detroit, has in the course of erection an executive building, 62 x 85 ft; new car barns, a washhouse, 52 x 202 ft., and repair shop, 54 x 202 ft. As soon as these buildings are completed there will be erected a number of other buildings, among which will be express and freight offices and sheds and a group of shops for the manufacture, equipment and repair of cars.

The Davidson Mfg. Company, Lenox, Mich., has been incorporated with a capital stock of $35,000. The company will manufacture wood-carved toys and will erect a factory 50 x 100 ft. The officers of the company are George R. Davidson, president; James E. Weter, vice-president; Frank J. Hirt, treasurer, Harles E. Turner, secretary.

Milwaukee

MILWAUKEE, WIS., July 5, 1910.

Continued hot weather, which has been the worst ever known here since Milwaukee became a manufacturing center, demoralized business to such an extent last week that it is impracticable to ascertain just what condition the market for machinery is in at this time. Locally, it is difficult to interest buyers or even to find the people responsible for purchases, as many of them took advantage of the impending holiday to get away to the country for a brief vacation. At the large manufacturing plants, however, orders are reported to be coming in steadily from all parts of the country, and frequent references have been made of late to a brisk foreign trade. In all lines of standard machinery, including shop tools and foundry appliances, conditions seem to be more satisfactory to the makers than to dealers or users. Milling machines, lathes and shapers have been bought so far ahead that, until the large new shops now under construction for leading Milwaukee firms are completed, it will tax their facilities to the utmost to take care of the most desirable class of business. Turret lathes and screw machines can be supplied with reasonable promptness, and there has recently been some good second-hand stock offering. Gear cutters, grinders, polishing machines, pneumatic tools and small apparatus of all kinds can be readily secured, although prices are stiffening. On electric generating sets, motors, controllers, &c., it is becoming increasingly difficult to secure deliveries under 90 days, and for special winding a greater length of time is demanded. Air compressors, except in the larger capacities, are obtainable promptly, and a good many orders for these machines have been placed within the past few weeks. Pumps of every description, hydraulic pressure machinery, accumulators, &c., also fall in the same classification. Heavy traveling cranes, wall cranes, mono-rail conveying systems, hoists, locomotive cranes, derricks, unloading machinery, lifting magnets and all appliances for handling machinery, parts or bulk material, are strongly in demand, and the inquiries received here come from all over the world. Taken as a whole, the situation seems to be full of promise; but the course of the general market is characterized by such irregularity that it will be some time before things are settled down sufficiently to enable any predictions to be made with confidence.

The demand for equipment to be installed by automobile builders and manufacturers of agricultural machinery keeps up to a surprising degree, and there is scarcely a plant here which has not been supplying some of the requirements of these industries. For automobile parts, however, the inquiry seems to be considerably less urgent, and one of the factories here which has been very busy for months past on work of that character is laying off some of its men.

Apparatus used for construction purposes and in allied lines cannot be turned out fast enough to meet the requirements of the various sales agencies in the country, through whom the bulk of the product of plants in this section is placed. Calls for both standard and special machines have been increasing steadily from one month to another, and indications point to a rush of business in the late summer and fall such as the country has never before witnessed.

For saw mill and flour mill outfits, in the manufacture of which many shops in Wisconsin are occupied, there is a marked falling off in the demand, but this condition always occurs during the summer. Planing mills and woodworking plants of all kinds, on the other hand, seem to require more new equipment than ever before, and manufacturers of flour mill machinery are finding a good outlet for their product in cereal factories and other plants in which granular material is pulverized, sifted and bolted.

Among the foundries no lessening in activity is apparent. All continue to be crowded with work and orders seem to be turned down about as frequently as they are accepted. Some of the large manufacturing plants are about to add to their foundry facilities, among them being the Bucyrus Company, South Milwaukee.

The Milwaukee Machine Tool Company is about to conclude the purchase of power equipment for its West Allis plant, including boiler of 80 to 100 hp., engine, dynamo and a number of electric motors.

The Wm. Rahr Sons' Company, Manitowoc, Wis., has secured the site for a new plant, and plans have been ordered drawn.

The Leo Hofmeister Company, Milwaukee, is letting contracts for its new roofing factory in Layton Park, a suburb of this city. The main building will consist of a structure, 118 x 209 ft., with wing, 75 x 118 ft. All of the apparatus required for the present appears to have been provided for.

By an addition now under construction the plant of the R. B. Lange Mfg. Company, Racine, Wis., will be practically doubled in capacity. The new structure is 100 x 250 ft. Machinery has been purchased.

The Wallace Mining Company, Highland, Wis., is adding to its equipment an electric generator and other apparatus of greater capacity than that previously in service.

The principal building of the plant to be erected at Beaver Dam, Wis., for the Beaver Dam Foundry Company, will be 70 x 200 ft., one story, of brick and steel construction. Contracts for the work have just been placed.

Some woodworking and power machinery, including probably electric motors, will be required by the Nelson Lumber Company, Two Rivers, Wis., in consequence of two additions to be erected to their mill. Further particulars are lacking.

The authorities at Brownstown, Wis., have engaged an engineer to prepare plans for an electric power plant. The machinery required will not be of large capacity.

It is reported from Highland, Wis., on the authority of J. H. Lewis of that place, whose information is recognized as possessing uncommon accuracy, that the introduction of electric commercial power in the mining industry of southwestern Wisconsin has already been acknowledged to be of the highest economic value. While the territory now reached from the large generating station of the Interstate Light & Power Company, at Galena, Ill., comprises about 200 square miles, plans have recently been formed for the extension of the service north of Highland, as far as the city of Mineral Point, where current will be supplied to the zinc oxide and acid works, as well as other industries. The Galena station, which now has a capacity of 3000 kw. in General Electric generators driven by engines built in the Allis-Chalmers shops here, will be enlarged at once and the equipment of the various substations strengthened as well as new ones constructed. The reduced cost of operating mining and ore reduction machinery, according to Mr. Lewis, and the cessation of interruptions to service, which were formerly frequent in consequence of power plant breakdowns, are leading nearly all of the companies that have not yet made the change to motor drive to consider doing so. The effect upon the boiler and engine business has already been felt in cancellation of contracts or the breaking off of negotiations that were previously pending. At the same time, the aggregate of machinery purchases is likely to be larger than formerly, due to the ease with which operations can be extended by the use of the more flexible and convenient electric system.

The Wisconsin Bridge & Iron Company, Milwaukee, has taken the contract for structural work on the Wisconsin Motor Mfg. Company's new plant in West Allis, Wis., which will be pushed to completion this summer. The details have been previously reported.

The Pawling & Harnischfeger Company, Milwaukee, is rapidly extending its sales of traveling hoists for the new electric mono-rail system, which was placed on the market some time ago and is now coming into very general favor. In the Northwest it has recently been adopted by some of the largest lumber companies for handling their finished product. By means of the hoist used the operator can from his cage grasp, raise, turn, convey, lower and release a lumber unit without the aid of a ground man. This is due to the fact that the hoist is provided with a turntable having arms or tongs formed into hooks at their lower extremi-

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ties, which take hold of the beams upon which the unit rests. A similar system, but without the turntable and tongs, was installed by this company in the pattern shop and yard of the Allis-Chalmers Works at West Allis, where it has been in service for about eight years. The same application might be made to advantage in any large industrial plant having material which could be handled in this way, including sheet metal.

Construction work has been started on the new mill of C. W. Cheney at Eau Claire, Wis.

A. D. Burnett, Galesville, Wis., has been awarded the contract by the county to construct two steel bridges near Hixton, Wis.

The C. A. Shaler Company, Waupun, is carrying into execution plans made some time ago for the erection of a new two-story factory building, 30 x 130 ft., to be used in the production of the Shaler type of electric vulcanizers, facilities for the manufacture of which have been outgrown. The new structure will be built on the unit system, permitting future expansion without disarrangement of the older parts. A part of the present plant will be used for storage.

It is reported from Eau Claire, Wis., on what appears to be authentic information, that the Northwestern Steel & Iron Works will erect a new foundry building 80 x 200 ft.

A two-story manufacturing building, 70 x 80 ft. or larger, will be completed this summer for the Janesville Batten Mills, Janesville, Wis.

Machinery is being installed in the new shop of the Jefferson Auto Supply Company, Jefferson, Wis., and some work has been started.

The plant formerly operated by the Chicago Excelsior Company at Wausau, Wis., has been sold to Louis Scharbau of that place, who will add to its capacity and install some new machinery.

It is reported from Racine, Wis., that the present wagon factory of the Mitchell-Lewis Motor Company will be leveled, in order to provide for the erection of a modern electrically operated plant in its place. Other contemplated additions and improvements will be carried out in the near future.

The Racine Foundry Company, Racine, Wis., is placing its new plant in operation. A specialty will be made of castings for automobile companies.

The Cleveland Mining Company, Hazel, Green, Wis., is installing a steel head frame at its main shaft and has just placed contracts for pumping machinery, a large two-stage air compressor, drills, &c. The bulk of the equipment is to be furnished by the Galena Iron Works, Galena, Ill.

The Nelson Foundry Company, North Milwaukee, has completed additions to its foundry, doubling the former capacity. A 3-ton hand traveling crane has been added to the foundry equipment and a pattern shop and pattern storage building have also been built.

The Two Rivers Wooden Ware Company, Two Rivers, Wis., is being operated under the direction of a receiver appointed by the court, pending a reconstruction of the company, and is not out of business, as stated in *The Iron Age* of June 23.

The South

CHATTANOOGA, TENN., July 2, 1910.

While some manufacturers and dealers report an excellent demand for nearly all of their products, the average run of trade has fallen off considerably below the standard which was set during the spring months. It is also very irregular. The greater number of orders entered recently developed from inquiries made some time ago, and a considerable percentage comes from districts distant to the principal centers of distribution, where development work is in progress. Railroad buying, which promised for a time to cut quite a figure in the market, has again diminished almost to the vanishing point. The iron and steel companies and allied industries, including mining, yield the most profitable line of orders, and the more important contracts, as well as small single purchases, are pretty well distributed among Southern plants and sales agencies. Phosphate producers, fertilizer works and chemical manufacturers are probably next among the industrial concerns now buying, and their requirements will be an important factor in the situation for at least a number of weeks. Textile mills are also good customers, but their business mostly goes North.

An addition is to be made this summer to the plant of the Chattanooga Plow Company, Chattanooga.

The D. M. Stewart Mfg. Company, Chattanooga, is making a specialty of insulating material for electric power appliances and machinery, which can be furnished in any shape desired.

The purchase of machinery for an electric generating plant and pumping station authorized for construction at Osyka, Miss., is expected to be taken up by the city officials the latter part of this month, following the sale of bonds for the purpose.

A large number of induction motors will be required for driving machinery in the new mill which the Meritas Mills Company is preparing to erect at Columbus, Ga.

A new plant is to be built at Birmingham, Ala., for the Caldwell-Watson Foundry & Machine Company. Provision for electric power will be made throughout.

It is reported from Troy, Ala., that the Standard Chemical & Oil Company will make important improvements in its plant, including the installation of some additional machinery and the partial introduction of motor drive. For the latter purpose an electric generating set will be required.

The Citizens' Light, Heat & Power Company's plant at Montgomery, Ala., has passed under the control of new interests. Additional machinery is to be installed, if the plans of the present owners are carried out, and the service considerably improved. The equipment now includes a battery of Heine water tube boilers and engine driven generating units of about 900 kw. supply current mainly for commercial day load.

Plans have been matured at Louisville, Ky., for a four-story factory building to be erected by the Grisanti Statuary Company. Operating machinery, including electric power equipment and pneumatic appliances, is being provided for.

The machine shop and repair plant of the Alexandria Lumber Company, Ltd., at Pineville, La., recently burned and will need to be replaced. It was equipped for work on locomotives and other rolling stock of a logging railroad as well as for keeping operating machinery in condition.

The Solomon-Norcross Company, Atlanta, Ga., has prepared plans for the improvements of the electric power plant recently purchased by the city of Amory, Miss., which now includes two Triumph generators for direct current driven by engines that were built in the shops of the Hardie-Tynes Mfg. Company, Birmingham, Ala. The present capacity is 150 kw. Pumping machinery for municipal water service will also be installed.

The Berryton Mills, Augusta, Ga., recently incorporated with a capital stock of $150,000, has acquired the property at Racoon, Ga., formerly known as the Racoon Mills. The company has purchased the entire village of Racoon and will change its name to Berryton. About $80,000 worth of new machinery will be required to complete the improvements contemplated.

The Selma Spoke Factory, Selma, Ala., recently incorporated with a capital stock of $10,000, is erecting a plant for the manufacture of spokes for automobile wheels. The company will be under the management of H. E. Masters, its president.

The McNally Pneumatic Gin Corporation, Norfolk, Va., was recently incorporated, with $200,000 capital stock, to manufacture cotton gins. The machines are now being built in Boston and a factory site is being looked for in the South, plans for which have not yet been completed. T. H. Synon is president, J. J. McNally vice-president and M. Denver Synon secretary.

The Northwest

MINNEAPOLIS, MINN., July 2, 1910.

During this month trade is hardly likely to develop any large proportions. Except for municipal buying, which follows in each instance close upon the sales of bonds authorized at recent elections, there is no pronounced support to the market, and current purchases mainly comprise machinery or supplies that are needed for immediate use. Equipment required for the factory buildings or extensions reported during the past few weeks, some of which will not be installed before autumn, has been largely ordered, and what is left includes for the most part standard apparatus that can be taken from stock or supplied on short notice just prior to the time when it will be set up. Much of this class of trade will develop during August and the first part of September.

The property of the Grand Forks Gas & Electric Company, Grand Forks, N. D., which includes a power plant of 1500 kw. capacity, has passed under the control of the H. M. Byllesby Company, Chicago, who are expected to make important improvements.

The plant of the Grangeville Electric Light & Power Company, Grangeville, Idaho, which is equipped with a 300-kw. Bullock generator and a McCormick hydraulic turbine of the S. Morgan Smith Company's manufacture, will be enlarged, having been purchased by a company having other power properties in that section with which it will be jointly managed.

The Gopher Mfg. Company, Minneapolis, which has a good-sized plant here, with sales offices in the Palace Build-

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ing, is being offered inducements to remove to another city, but recently decided to remain at its present location, where additional facilities will probably be provided in the near future. The company manufactures a portable ditching machine.

The equipment of the new municipal power plant at Beach, N. D., recently mentioned, will include a steam boiler of 150 to 200 hp., a cross compound Corliss engine of 150 hp. and an alternating current generator of 100 kw. or larger, together with pumps, heater and other auxiliary apparatus.

The Minneapolis Steel & Machinery Company, Minneapolis, has been awarded the contract for the gas producer plant and engine to be installed in the municipal power station at Tyndall, S. D., and the electrical machinery will be furnished by the Northwestern Electrical Equipment Company, St. Paul.

Charles Leonhardt, who operates a foundry and machine shop in New Ulm, Minn., is considering plans for the erection of a large new building equipped for greater capacity than he now has available.

The most important movement which has thus far been developed to strengthen the position of this city as a manufacturing center appears to have been inaugurated by the Commercial Club of Minneapolis in the appointment of a committee on new industries, which, although but lately formed, has already accomplished results. Not only will new plants be located here, but a systematic effort is to be made to build up and retain the industries already started. Foundries, machine shops, boilermakers and structural iron and steel works will be especially encouraged. The committee is composed of A. E. Zonne, chairman; W. B. Boardman, H. A. Tuttle, E. K. Lower and Wallace G. Nye.

Among local concerns that continue to do a good business, notwithstanding the general midsummer dullness, is the Northern Machinery Company, Minneapolis, which now has a large trade all through this section. Inquiries from the growing cities of the iron ranges in northeastern Minnesota have been particularly numerous.

The Southwest

KANSAS CITY, MO., July 2, 1910.

The feature of the six months ending in June, and one that still characterizes the market more than any other, has been the extraordinary demand for engines, electric generating units, power transmission apparatus and motors for direct machinery drive. For the remainder of the year purchases on this account will probably be even greater, as numerous replacements and extensions of power machinery are contemplated all through the Southwest, in addition to what will be required for new factories and other industrial enterprises that are about to be started.

Other standard lines of equipment are somewhat slow at present, with the possible exception of pumping outfits, crushing plants and mining or ore reduction machinery. For these there is still considerable inquiry, despite the lateness of the season; but shops, foundries, sheet metal works, fabricating plants, &c., have mostly filled their requirements for some time to come, and part of the buying for fall delivery will not be done until later.

The National Lead Company, St. Louis, Mo., whose purchases of power machinery were recently mentioned, has just let the contract for building a one-story factory 100 x 750 ft., which will be among the most modernly equipped of any in the country.

The Fulton Iron Works, St. Louis, recently sold two large, heavy duty engines for shipment to Cuba.

R. K. Papin & Co., Pierce Building, St. Louis, are reported to be in the market for two standard gauge locomotive cranes, one having a 50-ft. boom with fall block and hook, and the other a 40-ft. boom with 1-yard clam shell bucket.

A line of 40 direct current motors will be required by the American Car & Foundry Company for extending electric drive in its plant at St. Charles, Mo. The contract has already been placed.

An automobile plant to supply the company's southwestern trade, which is now very extensive, may be built in San Antonio, Texas, by the Gramm Motor Car Company of Bowling Green and Lima, Ohio. Efforts to secure the industry for San Antonio are now being made by the local Chamber of Commerce.

The authorities at Englewood, Kan., have engaged engineers to prepare plans for a modern system of water works of moderate capacity.

The new plant of the Tucson Iron Works, Tucson, Ariz., is now fully equipped and in operation. One of the specialties of the company will be mining machinery, for which there is an excellent market at present in Arizona and the surrounding districts, including the northern states of Mexico.

The electric generating plant and other property of the Imboden Power & Development Company, Imboden, Ark., has been acquired by interests identified with the local bank and will be enlarged in capacity if present plans are carried out.

A one-story building, 50 x 100 ft., the purpose of which is not stated, will be erected for the W. E. Bohne Machinery Company, Joplin, Mo.

Equipment will be provided shortly for a new stave factory, 60 x 200 ft., to be built at Louisiana, Mo., by the Louisiana Stave & Heading Company.

The generating station of the Roswell Electric Light Company, Roswell, N. M., which has a present capacity of about 500 kw., is reported to have been secured by other interests, with the object of enlarging it and considerably extending the service.

The Arkansas Bridge Company, Fort Smith, Ark., has taken the contract for a large steel bridge connecting that city with Van Buren, Ark.

Machinery for pulverizing will be installed by the Picher Lead Company, Joplin, Mo., in an addition to its plant, 50 x 50 ft., to be completed this summer.

An electric generating set has been installed by the W. B. Baker Company, Heber, Ark., and will be used for lighting service in the plant. Later on additional machinery for motor drive may be needed.

Some pumping machinery of more modern design than that now in service will be required for the municipal plant at Wellington, Kan., where improvements in the water works system have been authorized.

Purchases of machinery for city water works will be made at Miles, Texas, within the next few weeks, following a sale of bonds for the purpose.

The Nevada Water, Light & Traction Company, Nevada, Mo., has acquired the water works, electric light plant, gas works and traction system in that city. The company is planning extensions to its street railway and also for its gas and light service.

The North Pacific Coast

PORTLAND, ORE., July 1, 1910.

Labor troubles are still causing considerable difficulty, with some delay in filling orders taken for machinery or repairs, particularly the latter, although employers are having rather good success in replacing men who have struck. Industrial conditions as a whole, however, are very promising, and the expansion which is visibly taking place along lines of general manufacturing, augurs well for the future of the metal trades, which will be called upon to supply the rapidly growing requirements of the various mills, factories, quarries, crushing plants, logging and mining companies, traction lines, central power stations and the like. From all of these a fair value of business is now being derived. Recently rush repair work has not been easy to place, as some shops feared to take it on because of the likelihood that they would be hindered in its execution, but that condition is now adjusting itself, and the needs of regular customers have not at any time been seriously interfered with. In the line of new building a number of projects recently mentioned are now maturing, and some buying of metal working machinery is being done on this account.

Robbins & Taylor, Portland, Ore., have an interesting exhibit in the photograph of a 96-in. marine engine cylinder from the steamer Charles Spencer. It was broken in two places and put in good condition again by being brazed at the Portland Brazing, Machine & Coppersmith Works, which is now owned and operated by this firm.

A woodworking plant and box factory, the main building of which is 60 x 120 ft., is now being completed by the Nibley-Mimnaugh Company, Wallowa, Ore. A full line of modern machinery has been provided for, but some addional equipment will be required later on.

Plans are reported to have been practically decided upon by the Griffin Wheel Company of Chicago, Ill., for a number of new buildings to be erected on its property at South Tacoma, Wash., and building contracts are being let. Some of the details, however, are still to be worked out. A new foundry is included.

An engine driven generating set of 150 kw., with exciter, switchboard, &c., will be installed in the near future by the Northwestern Woodenware Company, Tacoma, Wash.

The Puget Sound Metal Works, Seattle, Wash., whose plans for rebuilding the plant destroyed by fire were recently referred to, have arranged for its construction and equipment.

The Hofius Steel Company, Seatttle, Wash., will extend its plant this summer and provide for a considerably

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enlarged output, which has been made necessary by the demands upon the business.

The Pacific Electric Engineering Company, Portland, Ore., is making a specialty of electric drive and lighting in industrial plants, for which it furnishes both plans and power equipment, installing the latter complete.

The Whatcom County Railway & Lighting Company, which, in addition to its hydroelectric station near Mount Baker, operates a large steam driven plant in Bellingham, Wash., is replacing the latter with a new power house, which will be equipped for considerably greater capacity.

The Wm. J. Rainey Company, Bellingham, Wash., has just put in service a large new timber cutting plant and planing mill, the machinery for which is all operated by electric motors.

Notwithstanding the fact that some other lines of trade are slack the Hoquiam Machine Works, Hoquiam, Wash., has recently been experiencing a very active demand for the new cast steel block of its manufacture.

The Farther Central West

OMAHA, NEB., July 2, 1910.

From this time until after harvest the machinery trade will be slowing down, as so much attention is being devoted at present to preparations for moving the new crops that all other lines of industry are correspondingly neglected. The hot weather also has a depressing influence upon business in the larger cities, especially in view of the fact that the temperatures have been higher this summer than for many years past. Necessity for enlarged manufacturing facilities at various points is, nevertheless, forcing a certain amount of buying of equipment, and the leading dealers find in each day's mail enough inquiries to keep them reasonably busy. The bulk of the business comes in unsolicited from former customers and there does not appear to be as much shopping around as usual. Negotiations are also apt to be short, direct and more to the point than is ordinarily the case.

The Caldwell-Hallowell Company, Waterloo, Iowa, has let the contract for the erection of a building, 80 x 120 ft., to be used in the manufacture of gasoline engines.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, extension of whose main building has previously been mentioned, is now arranging for two additional structures. The area of the machine shop has been increased to 140 x 300 ft.

The foundry formerly occupied by the Waterloo Gas Engine Company is being enlarged and will be operated in future by the Association Foundry Mfg. Company, Waterloo, Iowa, which represents some of the interests that are making the city an important manufacturing center. Local work will alone be sufficient to keep the plant very busy.

The authorities at Wymore, Neb., have under consideration the installation of two motor driven pumps of the type manufactured by the Goulds Mfg. Company, Seneca Falls, N. Y., from whom the equipment will probably be purchased.

In order to provide for the growth of its business, which has necessitated extension of manufacturing facilities, the Iowa Malleable Iron Company, Fairfield, Iowa, has increased its capital to $200,000.

The Des Moines Electric Company, Des Moines, Iowa, is about to let contracts for the building and equipment of a power transformer substation.

The Ritchie Corrugated Culvert Company, Muscatine, Iowa, will build a plant in South Muscatine.

The Iowa Portland Cement Company, Des Moines, Iowa, which put a new plant in operation some weeks ago, is adding a number of electric motors for machinery drive.

Contracts have been placed for the construction of a new municipal power and lighting plant at Paullina, Iowa, and equipment purchased.

It is reported from Mason City, Iowa, that the Lehigh Portland Cement Company will establish a plant there with capacity of 2500 barrels daily, to be electrically operated. The headquarters of the company mentioned are at Allentown, Pa.

Negotiations are to be opened by the city of Fairbury, Neb., for the purchase of the 300 kw. electric power plant of the Fairbury Light & Water Company, failing which the construction of a municipal station will be entered upon.

The Oskaloosa Traction & Light Company, Oskaloosa, Iowa, which operates a battery of Stirling boilers of 1000 hp., furnished by the Babcock & Wilcox Company, will soon arrange for adding another unit of 250 hp. and some auxiliary apparatus. An extension of the power house is to be built in order to provide for the increased capacity needed.

The installation of one or more motor driven centrifugal pumps has been practicaly decided upon for the municipal water works to be constructed at Murray, Utah, and the authorities are considering plans for a hydro-electric plant to provide the necessary power for operating the station.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, has been awarded the contract for an elevated steel tank and tower, to be erected in connection with the new municipal water system at El Centro, Cal. An interesting feature of the complete installation is the fact that the pumps will be driven by distillate engines built in one of the shops on the Coast.

Government Purchases

WASHINGTON, D. C., July 5, 1910.

R. C. Holliday, chief of Bureau of Yards and Docks, Navy Department, Washington, D. C., will open bids July 16 for two 100-kw. synchronous motor generator sets, one 2½-kw. booster set and switchboard controlling equipment.

The Isthmian Canal Commission, under circular 593, will open bids July 19 for steam traps, engine indicators and a general lot of shop supplies.

The Lighthouse Board, Washington D. C., opened bids June 27 for two Scotch boilers complete with uptakes, smokestacks and boiler mountings, to be delivered at the Lighthouse Depot, Lazaretto Point, Md., as follows: William Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., $12,435; John Mohr & Sons, Chicago, Ill., $11,640; Newport News Shipbuilding Company, Newport News, Va., $11,985; Springfield Boiler Works, New York, $10,873.

The Isthmian Canal Commission, Washington, D. C., opened bids under circular 589, June 28, for the following:

Class 12.—One universal milling machine—Bidder 79, Herron, Ricard & McCone, San Francisco, Cal., $2880; 140, Pacific Tool & Supply Company, San Francisco, Cal., $2863.12.

Class 13.—One vertical milling machine—Bidder 79, Herron, Ricard & McCone, San Francisco, Cal., $2530.

Class 31.—Two motor driven centrifugal drainage pumps—Bidder 27, Buffalo Steam Pump Works, Buffalo, N. Y., $366.50; 80, Hallidie Machinery Company, Seattle, Wash., $349; 114, Manning, Maxwell & Moore, New York, $342; 142, Perine Machinery Company, Seattle, Wash., $286; 195, Watson-Stillman Company, New York, $395; 201, H. R. Worthington, New York, $473 and $425.

Class 81.—One standard gauge compressed air locomotive, one accumulator and supplying, installing and testing outside pipe line and charging stations—Bidder 117, McCay Engineering Company, Baltimore, Md., $22,700; 137, H. K. Porter Company, Pittsburgh, Pa., $15,080.

Class 101.—One universal turret lathe—Bidder 73, Gisholt Machine Company, Madison, Wis., $2620, $2675 and $2890; 196, Warner & Swazey Company, Cleveland, Ohio, $2125.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids July 19, under schedule 2675, for five generators, and 2672, for a miscellaneous lot of air driven drilling machines and hammers. On July 26 bids will be opened, under 2693, for two transmitters and indicators for the Brooklyn Navy Yard, and on August 16, schedule 2695, one steam hammer; 2696, one water tube boiler, for the Mare Island, Cal., station.

A New Dodge Warehouse.—It will not be long until the Dodge Mfg. Company will be storing pulleys, hangers, clutches, bearings and other stock goods in its new warehouse at Mishawaka, Ind. Work is progressing with speed. Already the first floor has been passed and material is being laid for the second. The completed structure will be one of the most modern in the country. Reinforced concrete is being used entirely, with Fenestra steel windows, thus insuring against fire. The plans call for four stories and a basement, the length being 256 ft. and the width 112 ft. Besides its use as a place for storage, excellent facilities will be provided for the rapid crating of goods. Along one side and one end a loading platform has been built where cars can be filled without delay and hurried to the Lake Shore & Michigan Southern Railroad by ample trackage for immediate delivery to customers.

Lake Superior Mining Institute.—For its 1910 meeting the Lake Superior Mining Institute will make its headquarters at Ironwood, Mich. The meeting begins Wednesday, August 24, and there will be alternations of excursions to Gogebic Range mines and sessions for reading papers, the meeting closing on Friday. An invitation has been accepted to visit the Gary Ind., plant of the Indiana Steel Company after adjournment at Ironwood.

A Standard Gauge for Sheets and Plates

Congressman W. P. Borland, who represents the Kansas City district in the House of Representatives, on June 23 introduced a bill embodying the views of Western jobbers relative to a uniform gauge for iron and steel sheets and plates. The text of the bill (H. R. 27,140), which was referred to the Committee on Interstate and Foreign Commerce, is as follows:

A Bill Establishing a Standard Gauge for Sheet and Plate Iron and Steel

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of securing uniformity the following is hereby established as the only standard gauge for sheet and plate iron and steel in the District of Columbia and in all the Territories and possessions of the United States; and for all sales and shipments into any State, Territory, District, or possession of the United States from any other State, Territory, District, or possession of the United States, or to any foreign country, and for all sales to the United States or for its use, namely:

Number of gauge.	Approximate thickness in fractions of an inch.	Approximate thickness in decimal parts of an inch.	Approximate thickness in millimeters.	Weight per square foot in ounces avoirdupois.	Weight per square foot in pounds avoirdupois.	Weight per square foot in kilograms.	Weight per square meter in kilograms.	Weight per square meter in pounds avoirdupois.
0000000	1-2	0.5	12.7	320	20.00	9.072	97.65	215.28
000000	15-32	0.46875	11.90625	300	18.75	8.505	91.55	201.82
00000	7-16	0.4375	11.1125	280	17.50	7.983	85.44	188.37
0000	13-32	0.40625	10.31875	260	16.25	7.371	79.33	174.91
000	3-8	0.375	9.525	240	15	6.804	73.24	161.46
00	11-32	0.34375	8.73125	220	13.75	6.237	67.13	148.00
0	5-16	0.3125	7.9375	200	12.50	5.67	61.03	134.55
1	9-32	0.28125	7.14375	180	11.25	5.103	54.93	121.09
2	17-64	0.265625	6.746875	170	10.625	4.819	51.88	114.37
3	1-4	0.25	6.35	160	10	4.536	48.82	107.64
4	15-64	0.234375	5.953125	150	9.375	4.252	45.77	100.91
5	7-32	0.21875	5.55625	140	8.75	3.969	42.72	94.18
6	13-64	0.203125	5.159375	130	8.125	3.685	39.67	87.45
7	3-16	0.1875	4.7625	120	7.5	3.402	36.62	80.72
8	11-64	0.171875	4.365625	110	6.875	3.118	33.57	74.00
9	5-32	0.15625	3.96875	100	6.25	2.835	30.52	67.27
10	9-64	0.140625	3.571875	90	5.625	2.552	27.46	60.55
11	1-8	0.125	3.175	80	5	2.268	24.41	53.82
12	7-64	0.109375	2.778125	70	4.375	1.984	21.36	47.09
13	3-32	0.09375	2.38125	60	3.75	1.701	18.31	40.36
14	5-64	0.078125	1.984375	50	3.125	1.417	15.26	33.64
15	9-128	0.0703125	1.7859375	45	2.8125	1.276	13.73	30.27
16	1-16	0.0625	1.5875	40	2.5	1.134	12.21	26.91
17	9-160	0.05625	1.42875	36	2.25	1.021	10.99	24.22
18	1-20	0.05	1.27	32	2	0.9072	9.765	21.53
19	7-160	0.04375	1.11125	28	1.75	0.7938	8.544	18.84
20	3-80	0.0375	0.9525	24	1.50	0.6804	7.324	16.15
21	11-320	0.034375	0.873125	22	1.375	0.6237	6.713	14.80
22	1-32	0.03125	0.793750	20	1.25	0.567	6.103	13.46
23	9-320	0.028125	0.714375	18	1.125	0.5103	5.493	12.11
24	1-40	0.025	0.635	16	1	0.4536	4.882	10.76
25	7-320	0.021875	0.555625	14	0.875	0.3969	4.272	9.42
26	3-160	0.01875	0.47625	12	0.75	0.3402	3.662	8.07
27	11-640	0.0171875	0.4365625	11	0.6875	0.3119	3.357	7.40
28	1-64	0.015625	0.396875	10	0.625	0.2835	3.052	6.73
29	9-640	0.0140625	0.3571875	9	0.5625	0.2551	2.746	6.05
30	1-80	0.0125	0.3175	8	0.5	0.2268	2.441	5.38
31	7-640	0.0109375	0.2778125	7	0.4375	0.1984	2.136	4.71
32	13-1280	0.01015625	0.25796875	6½	0.40625	0.1843	1.983	4.37
33	3-320	0.009375	0.238125	6	0.375	0.1701	1.831	4.04
34	11-1280	0.00859375	0.21828125	5½	0.34375	0.1559	1.678	3.70
35	5-640	0.0078125	0.1984375	5	0.3125	0.1417	1.526	3.36
36	9-1280	0.00703125	0.17859375	4½	0.28125	0.1276	1.373	3.03
37	17-2560	0.006640625	0.168671875	4¼	0.265625	0.1205	1.297	2.87
38	1-160	0.00625	0.15875	4	0.25	0.1134	1.221	2.69

Sec. 2. That it shall be unlawful for any person in the District of Columbia or in any Territory or possession of the United States to sell or offer to sell, deliver or offer to deliver, in fulfillment of any contract of sale, any sheet or plate iron or steel of any other gauge than that hereby established.

Sec. 3. That it shall be unlawful for any person to sell or offer to sell, deliver or offer to deliver, in fulfillment of any contract of sale, any sheet or plate iron or steel to the United States or to any person for its use by any other gauge than that hereby established.

Sec. 4. That it shall be unlawful for any person by any communication sent by mail, telegraph or otherwise, from one State, Territory, District or possession of the United States to any other State, Territory, District or possession of the United States, or to any foreign country, to sell or offer to sell any sheet or plate iron or steel by any other gauge than that hereby established.

Sec. 5. That it shall be unlawful for any person to transport or deliver for transportation, or offer to transport or deliver for transportation from one State, Territory, District or possession of the United States to any other State, Territory, District or possession of the United States, or to any foreign country, any sheet or plate iron or steel which shall be sold, measured, gauged or designated by any other gauge than that hereby established.

Sec. 6. That in the practical use and application of the standard gauge hereby established a variation of two and one-half per centum either way may be allowed.

Sec. 7. That any person who shall violate any of the provisions of any of the foregoing sections shall be guilty of a misdemeanor, for each offense shall, upon conviction thereof, be fined not to exceed five hundred dollars, or shall be sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court. And for each subsequent offense and conviction thereof shall be fined not less than one thousand dollars, or sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court.

Sec. 8. That in construing and enforcing the provisions of this act, the act or omission or failure of any officer, agent, or other person acting for, or employed by, any corporation, company, society or association, within the scope of his employment or office, shall in every case also be deemed to be the act, omission or failure of such corporation, company, society or association, as well as that of the person.

The Twichell Iron Company, Kansas City, Mo., states that the object of this bill is to prevent misrepresentation and to check the substitution of other gauges for those which have been agreed to be delivered. Copies of the bill are to be presented to the different hardware and sheet metal associations for their endorsement. The prospects of getting the bill passed depend on how widespread the interest in it may prove to be. The Twichell Iron Company expresses strong belief in the necessity of this legislation.

A New Factory for San Antonio.—The Commercial Motor Car Company, San Antonio, Texas, organized with a capital stock of $150,000, began operations June 15. It has purchased a desirable site for a factory in that city and will erect a reinforced concrete building which is to be equipped with the most approved machinery for manufacturing and assembling commercial auto trucks. This is claimed to be the first institution of its kind in the South. The company expects that the business will be highly profitable, as the demand for the class of vehicle to be made assures the plant a satisfactory trade in motor trucks for both light and heavy hauling, which are to be the company's specialties. Z. Z. Brandon is president and L. J. Brandon is secretary and treasurer. The office will be located in the Book Building until the factory is ready for occupancy.

The International Congress of Mining, Metallurgy and Practical Geology

The Great Meeting at Duesseldorf, Germany, June 20 to 23

BY CHARLES KIRCHHOFF.

It was an extraordinary gathering of eminent European mining engineers, metallurgists and geologists which assembled at Duesseldorf on the Rhine to participate in the proceedings of the fifth "International Congress for Mining, Metallurgy, Applied Mechanics and Practical Geology," to give it its full title. The invitation to meet at Duesseldorf was issued by a group of five associations, both local and national in their range of interests, being the Verein fuer die bergbaulichen Interessen in Oberbergamtsbezirk Dortmund, the Mining Association of the Dortmund district, the Verein deutscher Eisenhuettenleute, the national society of German iron metallurgists, the Verein deutscher Eisen und Stahlindustriellen, the national society of German iron masters, the Verein deutscher Maschinenbau-Anstalten, the national society of builders' machinery, and the Stahlverband, the German steel syndicate. Rather to the surprise of the hosts, the invitation was accepted by no less than 1762 members of the societies and representatives of foreign governments, 634 foreigners being included in the list. The participation on the part of the United States was unfortunately very small. E. W. Parker of the United States Geological Survey, being prevented from sailing at the last moment, while Prof. J. W. Richards of South Bethlehem, Pa., and C. W. Baker, editor of *Engineering News*, were delayed by the extraordinary fog in the channel.

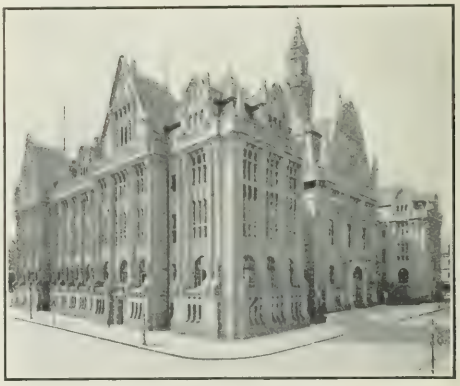
The very large attendance taxed the facilities of Duesseldorf, in spite of its usually ample and satisfactory accommodations, to the point of leading to the temporary assignment of bathrooms, in individual cases, as lodging rooms.

Admirable Arrangements Made

In spite of the rush, so admirable were the arrangements, so thorough the preparations, and so clever the management that the crowded programme was carried through without a hitch. The writer happens to know that this was not accomplished without extraordinary and sustained efforts, a corps of 30 men being engaged all night on the eve of the Congress in perfecting the final details.

The credit for the success is due primarily to Dr. E. Schroedter, the genial and tactful secretary of the German society of iron and steel metallurgists, and the editor in chief of *Stahl und Eisen* and his associates. The temporary organization, which was subsequently elected by the Congress as the permanent organization, consisted of Edward Kleine of Dortmund, prominently identified with the great coal mining industry of the district, and F. Springorum, the general manager of the Hoesch Steel Works at Dortmund, one of the leaders of the steel industry. The secretaries were H. von und zer Loewenstein of Essen, the secretary of the local coal interests, and Dr. Schroedter. The treasurer was Dr. Schaltenbrand, the general manager of the German Steel Syndicate, whose unusual linguistic abilities were freely drawn upon to summarize offhand in English or French for the benefit of foreigners the speeches and addresses made in German. The three languages were the ones accepted as official, and it was surprising how freely they were used and generally understood.

By far the greater number of the papers were available in full, with their accompanying illustrations, in the language of the author, in itself a feat in management which those familiar with even small conventions will appreciate. The climax, however, was capped by the fact that there were placed in the hands of the delegates in advance well prepared abstracts of practically all of the papers in the three languages printed in parallel columns. Besides there was a wealth of literature available in the form of guide books, maps, &c., to which was added a neat daily Congress journal, in three languages. Your correspondent is inclined to dwell upon these features because they show what efforts are put forward to anticipate the desires of delegates at such conventions which seem



The Steel Syndicate's Building at Duesseldorf, Germany.

to him to be approaching the point where even with the best of effort they threaten to become unmanageable.

The City of Duesseldorf

A few words may be said of Duesseldorf itself. It combines to an extraordinary degree the features to make it an ideal convention city, and be it added leaves no stone unturned, as one feature of far reaching municipal enterprise to secure representative gatherings. No American boom town could outdo it in aggressive enterprise and none could match it in long headed, liberal, many-sided development. A little fishing settlement in the twelfth century, it became the headquarters of different feudal lords, but it was not until the second half of the eighteenth century that it became important, one interesting event being the establishment of the Painters' Academy in 1767. Later under the administration of Peter Cornelius, Schador and the Achenbachs it became one of the great art centers of Germany, and while it has in recent decades divided the honors with other cities, there still remains a devotion to and appreciatiou of art which greatly adds to its charm to the traveler.

Duesseldorf boasts above all of being a "garden city," some of its old moats and feudal gardens having been converted into a series of connected public parks, with splendid trees and lawns, statuary and fountains.

Upon its past of a court residence and an art center, whose population in 1880 did not reach 100,000, there has been built up without sacrificing its early charms and even much enhancing them, a great industrial and commercial center, whose population has risen to 350,000. Much of this of course is due to the tremendous development during the past 30 years of the coal mining, iron and steel and allied industries, but it has not been accomplished without a good deal of hustling and even more of farsighted investment of heavy sums of money.

Some of the many feats accomplished by the management of the city may be cited as an example. A private company undertook to develop a tract of land on the opposite bank of the Rhine and an old ferry was supplanted by an exceedingly handsome bridge. Later on the town acquired the property, used the material for preparing the ground on which the great exhibition of 1902 was located, and which, by the way, besides being a gem in its way, proved a commercial success. The principal building, an imposing structure, was built to stay, and is now used for frequent exhibitions of fine arts. The city, by donating the ground, induced the state to build near by, also facing the Rhine, a very large and handsome courthouse, and the offices of the Royal Government.

The Steel Syndicate's Building

When the question came up of establishing a home for the Steel Syndicate, the city, realizing the importance of securing the establishment of the offices of this great organization and thus confirming the position of Duesseldorf as the commercial and industrial center of the steel industry, offered the site, and made an arrangement under which the city, under certain conditions, takes over the building, in the case that the syndicate is not renewed at the expiration of its present term. The building is an ornate structure, with a very attractive tower; is very large, accommodating fully the 400 employees who, under the leadership of Dr. Schaltenbrand, handle the entire selling and management of the products of the Steel Syndicate. There are very fine assembly and committee rooms, elegant but dignified in their appointments, and the offices of the officers and their staffs. The stairway and the assembly room will be adorned by a series of six huge paintings, executed by H. E. Pohle, representing the different stages in the manufacture of steel rails. It is characteristic of German methods that the artist and representatives of the Steel Syndicate spent weeks traveling among the mines, coke ovens, furnaces and mills, taking photographs and making observations, so that the pictures should be truthful in all their technical details, as well as representing, from an artistic point of view, the glories of the industry. The writer commented on the fact that, contrary to the usual conception of the artist portraying industrial work, the pictures were not crowded with men in attitudes approaching muscular agony, and was told that it was the distinct purpose to convey to the layman the fact that the brawny Vulcan has given way to the worker, usually in an attitude of rest, watching the operations of the machinery and guiding it in doing its well defined duty.

The fact may be added, as another instance of canny advertising, that four of these pictures form the "close" of the exhibition of the syndicate at Buenos Aires, where they attract and give interest to what would otherwise be the usual pile of heavy steel products, which means so little to the casual visitor to exhibitions, and seems to render, usually, such exhibitions a pure waste of money to the steel producer.

Duesseldorf has prospered greatly, which is shown by the fact that the total state income tax levied, which in 1892 amounted to 1,500,000 marks, rose to 5,900,000 marks in 1909. The local taxes in German cities are based on the state income tax, and these in Duesseldorf are much lower than they are in other industrial cities in the district. They are 145 per cent. for the city, while they are 200 or double for Essen and Duisburg, 210 for Dortmund, 230 for Barmen, 155 for Cologne and 177 for Aix-la-Chapelle. The city harbors 16,000 firms, who employ 120,000 persons, the chief industry being that of iron and steel, and the building of machinery.

(To Be Continued.)

The Superior Steel Company's Improvements

The Superior Steel Company, whose plant is at Carnegie, Pa., near Pittsburgh, recently placed in operation its new 12-in. double cold mill, which is giving entire satisfaction. The mill was built by the A. Garrison Foundry Company, Pittsburgh, and includes gearing and countershaft; it has three stands of 12 x 18-in. cold rolls on either side of the gearing. An Erie City high-speed improved Lentz valve engine drives the mill. This engine and some other equipment necessitated the installation of 800-hp. water tube boilers in the old power house.

The company has also contracted with the A. Garrison Foundry Company for a hot mill that will consist of a 20-in. roughing train, three 14-in. intermediate and part continuous trains, and one 14-in. finishing train; all are to be driven by rope sheaves with the exception of the finishing train, which will be driven through direct connection by Porter-Allen high speed mill engines, built by the Southwark Foundry & Machine Company, Philadelphia. This mill will be installed in a new building, 80 x 350 ft., the steel for which is being furnished and erected by the McClintic-Marshall Construction Company, Pittsburgh. A new continuous heating furnace of the Alex Laughlin type, 1600-hp. Erie City water tube boilers and a new Pawling & Harnischfeger electric traveling crane are to be added. It is expected this mill will be installed and ready for operation about September 1.

The Superior Steel Company now has the largest cold-rolled strip steel plant in the country. It recently installed a complete narrow gauge industrial system of the Orenstein-Arther Koppel Company type, which includes two electric locomotives and 36 steel cars. Some time ago a crane runway 75 ft. wide and several hundred feet long was erected in the billet yard. This is also served by a Pawling & Harnischfeger electric crane. The Dravo Contracting Company, Pittsburgh, is extending the company's water works system. A concrete pumping station 16 x 33 ft. is being built, in which two De Laval electric centrifugal pumps are to be installed, while provision has been made for a third. The pumps are designed to operate at 1150 rev. per min. against a head of 70 ft., having a rated capacity of 5250 gal. per min. Water will be taken from Chartiers Creek and pumped into a Scaife water softening plant. The pump station will likely be completed by August 1. These improvements recently made and others undergoing construction cost about $300,000, and bring the Superior Steel Company's plant up to the highest state of efficiency. About a year ago it installed a 20-in. continuous mill for rolling large sizes of bars. This was also built by the A. Garrison Foundry Company and it is driven by a Reese piston valve engine. A number of shears and some special machinery for handling cold rolled material have also been installed for the company by the A. Garrison Foundry Company.

The Boston Gear Works, Frank Burgess, Norfolk Downs, Mass., whose factory was completely burned last November, has built a new plant which is now running night and day.

The Centennial of the First Rolling of Boiler Plate in the United States

Many representatives of the iron and steel trades participated in a double centennial celebration at Coatesville, Pa., on Saturday, July 2—that commemorating the occupation of the present site of the Lukens Iron & Steel Company's works on the Brandywine Creek by Isaac Pennock, the founder of the Lukens plant, on July 2, 1810, and that celebrating the making of the first boiler plate in America, in the old Brandywine Mill, under the direction of the forefathers of the present operators of the Lukens works. The occasion was also made noteworthy by the marking of the site of what has been known as the "Old Mill" with a bronze tablet, placed by the Chester County Historical Society.

The out of town guests were met by automobiles on the arrival of the various trains and taken to the offices of the Lukens Iron & Steel Company, where they were informally welcomed. Later luncheon was served on the lawn of "Gray Stone," the residence of President A. F. Lukens. At 2 o'clock a parade of the employees of the Lukens works was formed, which passed in review before the officers of the company and assembled guests, thence passing through the principal streets of the town and marching to a meadow on the banks of the Brandywine, near the Lukens works. Here the exercises of the afternoon were held, under the direction of George Morris Philips, president of the Historical Society. After Charles Lukens Huston had invoked divine blessing an address of welcome was made by Dr. Philips. He referred to the way in which the Chester County Historical Society, which had prepared the tablet for the site of the old Lukens mill, as shown in *The Iron Age* of June 30, was performing similar service at other historic spots in Chester County.

At Coventryville, in the northern part of the county, it is marking the site of Coventry Forge, started in 1717, the first forge in Chester County, and the second in Pennsylvania, at which Mordecai Lincoln, the great-great-grandfather of Abraham Lincoln, worked as a blacksmith, and in which he was a partner. A few miles further west, in Warwick township, the society is marking Warwick Furnace, built in 1737, where the Franklin stoves were first made, and where cannons and cannon balls were made for the use of the Americans in the Revolutionary War. At Phœnixville, Coatesville's only rival in the county as an iron town, the society dedicates this week a bronze tablet on the site of the rolling mill where in 1783 the first iron was rolled in Phœnixville.

An Address by John Fritz

Dr. Philips introduced John Fritz, the grand old man of the steel industry, who responded with reminiscences of the iron industry. Mr. Fritz said in part:

The reputation of the Lukens firm was thoroughly established many, many years before my connection with the iron business; but there is one unparalleled and pleasant feature in this record—the length of time the works have remained in one family.

EARLY EXPERIENCES WITH PUDDLE MILLS.

The first puddling furnace in this country was built at Plumsock, near Brownsville, Fayette County, Pa., in 1817. On Redstone Creek, in 1817, a flood caused its partial destruction and the machinery was subsequently removed to Brownsville. In 1819 a rolling mill was built at Pittsburgh containing four puddling furnaces. This was accidentally blown up and the machinery was taken to Covington, Ky. Both enterprises thus seem to have ended in disastrous failures. From 1817 to 1836 but little progress was made in the way of marked improvement. In the years 1844-1845 the manufacture of rails commenced. This at once gave puddling the leading position in the manufacture of iron, which it maintained until the introduction of the Bessemer process.

At this time the manufacturers' troubles began. The demand for puddlers soon exceeded the supply and they thought it might be well for them to have things their own way. Hence the troubles commenced, and bitter they were. At that time the Welsh hammer was the only way in use to put the puddled ball in shape for the rolls. Then the crocodile squeezer came into use, next the Winslow squeezer. All of them were incapable of doing the work properly and in quantity. Next and last came the Burden squeezer, the introduction of which caused the bitterest strike I ever witnessed. As I at this time recollect there was but one Burden squeezer put in that did not cause a strike. This was at Cambria, and there was a little strategy practiced which at that time was highly essential.

After a time the puddlers became reconciled to the use of the squeezer and it came into general use, and is to this day as nearly perfect a machine for the purpose intended as has been devised. It is simple in its construction, does its work in a perfect manner and establishes justice between the ironmaster and the workman from which there is no appeal, and, in the end, it became the puddler's friend.

About the year 1848 boiling came into general use. This was a great improvement, and puddling soon became the all important branch of the great iron industry of the country and continued in the lead until it was overtaken by the almost magical invention of Sir Henry Bessemer.

EARLY BLAST FURNACE PRACTICE.

Until about the year 1840, practically speaking, all the iron product of the United States was made with charcoal. My first connection with the blast furnace was in 1839. It was set against the hills so that the ore, charcoal and limestone could be delivered on a level with the tunnel head to save hoisting. The blast was made by water power, the blowing cylinder was made of wood, and was driven by a wooden beam, which was connected to the crank on the end of the water wheel shaft by a connecting rod. I was sent to this furnace as a cub to put up what was called a belly pipe, which was made at the shop. I was learning my trade. When it was put in place it did not reach the tuyere by some 6 or 7 in., and I suppose some mistake had been made in the length. The man in charge, founder as he was called, opened his hand and placed his thumb at the end of the pipe and opened his finger at the opening for the tuyere and said it was just right. The pipe was connected to the main pipe by a short leather connection so it could be swung out of the way to get the cinder out. The general condition of the furnaces was very crude until 1840, when David Thomas, since affectionately called "Father Thomas," made the first anthracite iron in a commercial way that was made in this country.

THE EVOLUTION OF THE ROLLING MILL.

In 1824 the rolling mills were in a very crude condition and there was no marked improvement in them until the manufacture of rails commenced. But even at this time the plan of the mills and the manner of building them practically remained the same. The mills were geared. The general impression of the rolling mill proprietors seemed to be the more wheels they could get in the better the mill. Up to this time the carpenter or millwright had largely to say; consequently wood was much used, the shafts were generally made square and the flywheel and the gear wheels were secured on them by wooden wedges into which thin wedges of iron were driven. After the manufacture of rails commenced a more rigid and better workmanship was required. The millwright and carpenter were superseded by the machinist; the shafts were now turned up and the wheels bored out and the mill all fitted in a more workmanlike manner.

From 1845 to 1856 there were but few improvements made either in machinery or in the manner of rolling except in the introduction of the rail straightening machine, which took the place of the 60-lb. sledge and a special man to handle it. When he wanted to rest the works came to a standstill until such time as he was completely rested, sobered up or restored to health, as the case might be.

INTRODUCTION OF THE THREE-HIGH MILL.

The year 1857 is a memorable period in the history of the manufacture of iron. Up to this time all the rails were rolled on a two-high mill, a most crude and unscientific manner of rolling iron, especially rails, they being passed back over the rolls, the metal cooling, and as the rail was formed the flange became thinner and cooled more rapidly, and consequently it was much more liable to crack and tear up. In the three-high mill the tendency to crack or tear the flanges is greatly reduced from the fact that in passing through the rolls in the opposite direction, any

crack or tear that may occur is rolled down instead of being increased as in the two-high mill, in which it frequently happened that the flange tore off the whole length of the rail, winding around the roll and forming what was called a collar, and at times breaking the roll. Besides the greatly increased quantity that could be made in a given time, the quality was greatly improved and the criminal practice of patching rails, which were liable to break in the track, killing people, destroying property and delaying traffic, was completely abandoned. This alone in the days of iron rails made the improvement invaluable. But the traveling people at large knew nothing of the danger they were constantly exposed to when on a train.

[Mr. Fritz then gave at some length the now familiar story of his introduction of the three-high mill at Johnstown, Pa.]

THE NATION'S GREAT DEBT TO BESSEMER STEEL.

The Hon. Abram S. Hewitt, in replying to the presentation to him in 1890 of the Bessemer medal by the Iron and Steel Institute of Great Britain, speaking of the Bessemer process, stated that a striking effect of this invention was that it furnished us the means of paying off our national debt. He showed that the cheapening in the cost of transportation enabled us to increase enormously the sales of food products in foreign markets, and our imports of foreign merchandise were correspondingly increased. From these imports a revenue was derived enabling the country to reduce the national debt in 25 years from about four thousand millions of dollars to less than nine hundred millions of dollars in 1890.

When I was a boy of ten years old, I read a speech made by Thomas F. Benton of Missouri, in which he said that if he had his way he would build a great national highway from the Atlantic to the Pacific oceans, and on the highest peak of the Rocky Mountains he would erect a colossal statue of Christopher Columbus, with the right hand extended as if saying, "There is the way to India." As I grew up and railroads came into general use, I believed it would be practicable to build one across the mountains, but I did not expect to make the rails for it, which I did, and it was the introduction of steel rails that made it possible. Now I have lived to see five or six transcontinental lines built and we are trying to get more. Were they to undertake to build a railroad from the Atlantic to the Pacific and start at the Atlantic end, using iron rails such as used to be made, and using 150-ton locomotives and cars carrying 50 tons of freight, the rails on the Atlantic end of the line would be worn out before the Pacific would be reached.

It is to the invention, introduction and perfection of the modern system of steelmaking in this country that we are indebted for the education of our people in the scientific, mechanical and metallurgical arts, enabling them to erect such manufacturing plants as were necessary to supply our Government with the sinews of war, and thus making it possible to achieve those glorious victories which at once placed us in the front rank among the nations of the earth.

History of the Company and of Iron Making in Chester County

A. F. Huston, president of the Lukens Iron & Steel Company, followed with an address, reviewing the history of the company from the time its founder, Isaac Pennock, established the Federal Slitting Mill at Rokeby, on Buck River, Chester County, in 1780, to the erection of what was known as "the Old Mill" on the Brandywine Creek, the site of the present Lukens plant, in 1810, and the development of the same in later years. This history in detail was given with illustrations in *The Iron Age* June 30, 1910, pages 1562 to 1567.

Ex-Governor Samuel W. Pennypacker, president of the Historical Society of the State of Pennsylvania, made an interesting address on "The Early Iron Industry in Chester County." He said that early iron making in Pennsylvania began along the Schuylkill River. The first authentic manufacture was in 1717, when Rutter & Potts began the manufacture at Colebrookdale. In 1718 Samuel Matt established the Coventry Forge in Chester County, so that the county ranks second in the manufacture of iron in eastern Pennsylvania. In 1736 iron making was engaged in at Pottstown at Warwick furnace, where many of the early stoves were made. Here also were cast cannon and balls for use in the Revolutionary War. About 1740 an iron plant was located at Valley Forge, on the Schuylkill River, operated originally under the name Mount Joy Forge, but later changed to the Valley Forge, from which that historic locality takes its name.

The speaker referred particularly to the elaborate ornamentation on iron implements and castings in the early days. While the castings and tools were crude in manufacture the ornamentation was quite artistic. Steel making was engaged in at Coventry at a much earlier date than that claimed for its manufacture in Connecticut.

Congressman Thomas S. Butler followed with a brief address congratulating the Lukens management on its long and successful career, and wished it continued success.

At the close of Congressman Butler's address the assembled guests proceeded to the Chemical Laboratory of the Lukens Works, which stands on the site of the old mill. On a granite column against this building the bronze tablet commemorating the making of boiler plate was placed. After brief remarks by Dr. Philips the unveiling of the tablet was performed by Charles Lukens Huston, Jr., son of C. L. Huston, vice-president of the company. With this came to a conclusion the exercises of the day. Visitors were then given an opportunity to visit and inspect the various departments of the plant.

Those in Attendance

Among the guests of the company were the following:

John Fritz, Bethlehem, Pa.
Hon. Samuel W. Pennypacker, Pennypacker's Mills, Pa.
Craig Ridgway, Craig Ridgway & Son Company, Coatesville, Pa.
Jonathan R. Jones, Howard Wood and W. W. Lukens, Alan Wood Iron & Steel Company, Philadelphia.
Edgar S. Cook, Warwick Iron & Steel Company, Pottstown, Pa.
Leonard Peckitt and S. Carlton Peckitt, Empire Steel & Iron Company, Catasauqua, Pa.
W. W. Hearne, Matthew Addy & Co., Philadelphia.
Charles Hart, Delaware River Steel & Iron Company, Chester, Pa.
Charles Edgerton, Coatesville Boiler Works, Coatesville, Pa.
F. V. Smith, Vulcan Iron Works, Wilkes-Barre, Pa.
Wm. D. Craven, Iroquois Iron Works, Buffalo, N. Y.
Thomas Q. Wood, Alan Wood Iron & Steel Company, Philadelphia.
Henry Goldner, Philadelphia.
Ledyard Heckscher and H. W. Gwyn, Richard Heckscher & Sons Company, Philadelphia.
George B. Johnson, West Chester, Pa.
H. B. Workmore, American Dredging Company, Philadelphia.
Charles K. Barnes, C. K. Barnes & Co., Philadelphia.
Prof. Moses Ehlich, Springfield, Ohio.
P. A. E. Guerber, Guerber Engineering Company, Bethlehem, Pa.
G. A. Chandler, Lehigh University, Bethlehem, Pa.
W. H. Ridgway, Craig Ridgway & Sons Company, Coatesville, Pa.
Millard F. Carr, J. W. Paxson Company, Philadelphia.
Percy A. Marvel, Federal Refractories Company, Cleveland, Ohio.
J. F. Corlett and J. F. Cockburn, J. F. Corlett & Co., Cleveland, Ohio.
Wm. Nees, Baldwin Locomotive Works, Philadelphia.
Hon. Thomas S. Butler, West Chester, Pa.
W. P. North, North Bros. Company, Coatesville, Pa.
E. T. Moore and Fredk. E. Moore, Coatesville Boiler Works, Coatesville, Pa.
Joseph S. Hitner and Jos. Faltenmeyer, Henry Hitner's Sons Company, Philadelphia.
W. Vernon Phillips, F. R. Phillips & Sons Company, Philadelphia.
Emanuel Dreifus, E. Dreifus & Co., Philadelphia.
John H. McDermott and Thos. J. McDermott, McDermott Bros., Allentown, Pa.
Wm. Perry and W. H. Perry, Jr., Perry & Co., Providence, R. I.
Richard D. Gibney, Coatesville, Pa.
Penrose M. Davis, Coatesville, Pa.
Henry Howson, Howson & Howson, Philadelphia.
G. K. Mohr, J. J. Mohr & Co., Philadelphia.
Irvin Vannan, Danville Foundry & Machine Company, Danville, Pa.
Leon E. Thomas and A. S. Blanchard, Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa.
Robt. Brooke and Dr. O. Brooke, E. & G. Brooke Iron Company, Birdsboro, Pa.
J. J. Caine, Jno. J. Caine & Co., Philadelphia.
G. H. Shern, Alliance Machine Company, Alliance, Ohio.
W. B. Simpson, A. M. Castle, Chicago.
George O. Gunderson, Acme Steel Company, Chicago.
H. E. Levick, Crew, Levick & Co., Philadelphia.
A. P. Haines, Link-Belt Company, Philadelphia.
H. A. Beale, Jr., and Geo. Thomas 3d, Parkesburg Iron Company, Parkesburg, Pa.
W. H. S. Bateman, Parkesburg Iron Company, Philadelphia, Pa.
L. K. Stubbs, Coatesville, Pa.

C. R. Hoopes, Hoopes Bros. & Darlington, Inc., West Chester, Pa.
James A. Coe, James Coe & Co., Newark, N. J.
H. T. Potts and Walter W. Cook, Potts & Co., Philadelphia.
W. B. Robinson and G. J. Starke, *Iron Trade Review.*
Elmer E. Rambo and W. S. Harlan, Coatesville, Pa.
J. E. Baker, Baker & Co., New York.
W. W. Fairer, Fairer & Son, Columbia, Pa.
S. B. Minnich, Minnich Machine Works, Landisville, Pa.
E. A. Corbin, Hartford Steam Boiler Insurance Company, Hartford, Conn.
Abner C. Baldwin, East Downingtown, Pa.
George M. Philips, West Chester, Pa.
Joseph Thompson, Philadelphia.
Edgar C. Ancott, Connery & Co., Philadelphia.
Howard M. Bate and Richard H. Bate, W. T. Bate & Son, Conshohocken, Pa.
Arnold Gersten, Percy Heilner & Son, Philadelphia.
H. Graham Rambo, Coatesville, Pa.
Jackson Taylor, M.D., Coatesville, Pa.
Gilbert Cope, West Chester, Pa.
A. H. Swing, Jesse Kenworthy and Jesse Kirk, Coatesville, Pa.
Jacob Edge, Edge Mills, Pa.
R. J. Clark, Philadelphia.
W. L. Tod, Wilmington, Del.
N. B. Wittman, Potts & Wittman.
August A. Miller, *The Iron Age,* Philadelphia.
Wm. Huston, Dumont, N. Y.
Charles Ducas, New York.
Charles P. L. Huston, New York.
John L. Lincoln, Lansdowne, Pa.
John L. Smith, Coatesville, Pa.

Also the following officers and representatives of the Lukens Iron & Steel Company: A. F. Huston, president; C. L. Huston, vice-president; Joseph Humpton, secretary and treasurer; Horace B. Spackman, purchasing agent; J. R. Van Ormer, general sales agent; Charles Humpton, assistant purchasing agent; F. H. Gordon, assistant sales agent; H. L. Binser, auditor; G. F. Schnatz, sales manager at Philadelphia; Warren H. Crampton, sales manager at Baltimore; Robt. Gardner, Harry Loeb, Charles L. Hunter, Alfred Goodfellow, O. F. Spackman, J. L. Christie, H. Taggart, F. H. Woodhull, P. Ralph Baker, C. F. Miller and Paul Haldeman.

Also the following officers of the Chester County Historical Society: George Morris Philips, president; Joseph Thompson and Samuel Marshall, vice-presidents; Gilbert Cope, recording secretary; J. Carroll Hayes, corresponding secretary; Lewis K. Stubbs, treasurer.

Obituary

J. HARRY DILLON, manager for 16 years of the New York branch of the L. & I. J. White Company, Buffalo, N. Y., died suddenly June 20 at his home in Brooklyn, N. Y., from acute indigestion, aged 40 years. He was born in Brooklyn and took the position above referred to in 1894, at the death of the then manager, Samuel White. He had previously been employed by the house of Gilbert & Sheridan. He was a man of exceptional qualifications and made himself of such value to his company by his indefatigability in the pursuit of business that the place he has vacated will be difficult to fill. He leaves a widow.

JULIUS BEILER, Pittsburgh, died June 30, aged 60 years. He was born in Germany and had been a resident of Pittsburgh for about 45 years. For many years he was treasurer of the Crescent Steel Works of Miller, Metcalf & Parkin, and after that concern was taken over by the Crucible Steel Company of America he served as treasurer of the new company for several years. At the time of his death he was president and director of the Third National Bank of Pittsburgh. He leaves a widow and one son.

J. Ross NICOLS, St. Paul, Minn., died June 23, aged 60 years. He was born in Pittsburgh. His father, John Nicols, in 1855, established the wholesale iron, steel and heavy hardware house in St. Paul which was conducted for many years under the name of Nicols & Dean and more recently Nicols, Dean & Gregg. J. Ross Nicols became connected with the business in 1869 and at the time of his death was a director in the firm.

The Electrical Alloy Company, Morristown, N. J., has issued price lists of fine copper, brass and German silver ribbon ⅛ to 1 in. wide, and of 18 per cent. German silver resistance ribbon ¼ to 1 in. wide. The company makes a specialty of resistance materials.

Personal

Humphrey Bond of the metal house of Vivian Bond & Co., 68 Beaver street, New York, is in Europe on business, to be absent four weeks.

J. W. Hemmerle, formerly with E. M. Moore & Co., Pittsburgh, is now in charge of the contractors' machinery department of the Standard Supply & Equipment Company, 1151 Liberty avenue, Pittsburgh.

Edmund W. Mudge of E. W. Mudge & Co., iron and steel factors, Pittsburgh, has been elected a director of the Columbia National Bank of that city. Mr. Mudge is also chairman of the Board of Directors of the Phillips Sheet & Tin Plate Company, with plants at Weirton and Clarksburg, W. Va., and has large interests in the La Belle Iron Works, Steubenville, Ohio.

B. G. Follansbee, president of the Follansbee Brothers Company, Pittsburgh, manufacturer of tin plate and sheets, has sailed for Europe.

Charles A. Dennen has been appointed superintendent of the McKeesport Works of the American Sheet & Tin Plate Company at McKeesport, succeeding Dewees Harris, resigned.

H. H. Westinghouse of the Westinghouse interests at Pittsburgh, and George Mesta, president of the Mesta Machine Company, Pittsburgh, will sail for Europe July 16 to attend the international meeting of the Mechanical Engineers.

E. E. Wood will be the factory manager of the Grant & Wood Mfg. Company, Chelsea, Mich., which will manufacture automatic machinery. He was formerly general superintendent of the works of the Jones & Lamson Machine Company, Springfield, Vt., and later was with the Pratt & Whitney Company, Hartford, Conn. For the past four years he has been associated with the Walcott & Wood Machine Tool Company and its predecessor, the George D. Walcott & Son Company, Jackson, Mich., as president and general manager.

Henry D. Sharpe, head of the Brown & Sharpe Mfg. Company, Providence, R. I., has returned from a European trip.

Robert D. Meacham, son of D. B. Meacham, resident partner of Rogers, Brown & Co., Cincinnati, has been appointed a salesman, traveling in Ohio territory. He has been attached to the Buffalo office for about a year and was formerly connected with the Cincinnati office.

William S. Twining, for a number of years chief engineer of the Philadelphia Rapid Transit Company, Philadelphia, whose resignation was tendered several months ago, severed his relations with that corporation July 1. He will enter the service of Ford, Bacon & Davis, New York, electrical engineers.

C. A. Tupper, who has been in charge of the publicity work of the Allis-Chalmers Company for the past few years, was tendered a farewell dinner at the Gargoyle, Milwaukee, Wis., on the evening of June 30, by a number of his friends. Mr. Tupper recently resigned his position with the company to take the active management of the Reliance Engineering & Equipment Company, which he organized.

H. H. Hirschfield, sales manager of the American Saw Mill Machinery Company, 50 Church street, New York, will sail July 16 for an extended business trip through Cuba and Mexico. He will make a stop of several days in Merida, Yucatan.

Howard C. Rose, formerly with the Ingersoll Milling Machine Company, Rockford, Ill., and later with the Ford Motor Company, Detroit, has established a machine tool agency at 827 Ford Building, Detroit, where he represents the Ingersoll Milling Machine Company and Barber & Colman, both of Rockford, the latter being manufacturers of milling machine cutters, &c.

The American Society for Testing Materials

Papers and Discussions on Iron and Steel, Alloy Steels, Hardness Testing and Protection Against Corrosion, at the Thirteenth Annual Convention—A Memorial to Charles B. Dudley

The convention of the American Society for Testing Materials at Atlantic City, N. J., last week, lasting from Tuesday to Saturday, had the largest attendance in the society's history. There were eight sessions for the reading of papers and their discussion, besides an evening session for tributes to the man to whom more than to any other the present prosperity and influence of the society are due—the late Charles B. Dudley. Sixty-four papers, reports and orders of business were scheduled for the meeting. In a few cases the expected paper was not presented, but there were also cases in which an unscheduled paper became available for presentation, so that the volume of the society's *Proceedings*, which has averaged over 800 pages in the past two years, will again be very large. The membership of the society was reported to be 1280. The enrollment at the session ran up to 325, including 54 ladies, whereas the total of members and guests had not before been over 300. The absence of some familiar faces, particularly among the society's older members, was noticed; also the presence of a larger percentage than ever of young men, many of them on the early side of 30.

This year's meeting emphasized what was apparent last year—that the society is in a more settled period of well organized work. A good many specifications have now been formulated; the battles over steel rails have been fought. But there remain large programmes of work to be completed, while specifications are to be revised and new lines of investigation entered upon. In a few instances some friction has developed within committee bounds, but it has not been such as to create disaffection.

Many of the papers read at last week's meeting are not of direct interest to readers of *The Iron Age*. And of those which are, the volume is such that not all can be covered in the report below; a few papers, therefore, go over to a later issue. The question of hardness tests probably called out as much comment as any matter pertaining to iron and steel; there was also interest in the discussion on copper in steel, and the protection of iron and steel surfaces against corrosion is still proved to be important among the live subjects handled by the society.

The sessions devoted to cement and concrete, to bitumens and petroleum products and to testing machines and apparatus attracted a strong contingent and were well conducted.

THE MEMORIAL TO DR. CHARLES B. DUDLEY

The Wednesday evening session was devoted to addresses on the life and life work of Charles B. Dudley, for so many years the society's president. Probably there is no parallel to this gathering and to the tributes that made it memorable, in the annals of American engineering societies. So much is it the custom in such commemorations to dwell on achievements that this occasion was made remarkable for the equal prominence given to personality and character. Prof. Henry M. Howe presided.

The opening address was made by Robert W. Lesley, vice-president of the society, who spoke in behalf of the Executive Committee. The other speakers and the particular phases of Dr. Dudley's life work on which they touched were the following: "As a Railroad Man," by Theodore N. Ely, chief of motive power, Pennsylvania Railroad; "As a Chemist," by Edgar F. Smith, vice-provost of the University of Pennsylvania and past president of the American Chemical Society; "As a Metallurgist," by Henry M. Howe; "As a Mentor," by Col. B. W. Dunn, in charge of the Bureau for the Safe Transportation of Explosives; "As a Citizen," by W. H. Schwartz, editor of the Altoona *Tribune;* "A Personal Tribute," by Capt. R. W. Hunt.

It was not so much the eloquence and devotion of these tributes that made them impressive as the fact that the speakers showed such fidelity and adequacy in dealing with their subjects, saying not simply things that might be said but the things that their hearers felt must be said of the rare man who had been friend as well as leader. The session closed with the adoption by a rising vote of the following minute as prepared by Professor Howe:

> Let us record at once our deep grief and our deeper gratitude; our grief indeed at the loss of a great leader and dear friend, but above all, our gratitude that we have had the privilege of being led.
>
> Such measure of usefulness as our society has had it owes in very large part to that leadership. Here was a most rare combination of qualities, the sterling, the intellectual, the human, the judicial, each on a high level, all combining to form a character, a personality, whose like we shall not look upon again.
>
> With a clear head to see the world's needs, to part the essential from the accidental and the merely concomitant, went the skillful and persuasive tongue to make clear to the rest of us what he had first made so clear to himself. With these went the perfect fearlessness, apparently even the unconsciousness of either danger or fear, which made him lead on where others would have flinched. With these again went his calm, clear, good judgment, which seemed to tell him spontaneously which among the good things that needed doing were the most worthy of being done, and what were the best and surest ways of doing them.
>
> With all these admirable qualities went that which was necessary to the accomplishment of his high purposes, his kindness of heart, his sympathy and his tact, which made us all his allies in what he undertook. Had he a proposal? Our affection and veneration for him made us almost its advocates before it was unfolded. Its intrinsic wisdom, and the clearness with which he expressed it, found an audience ready, almost anxious, and certainly expecting, to be convinced.
>
> Great as were his tangible works, his greatest was the imponderable. Standing on a high platform, his call raised us toward his level, all the more effectively because of his complete unconsciousness of his own hight. We who have known and loved him are for that knowledge and that love the better and the higher—how much, ah, who shall say?

METALLURGY OF IRON AND STEEL

Closing of Blowholes in Rolling Steel

Prof. H. M. Howe, on taking the chair at the meeting of Tuesday evening, was presented to the society by Mr. Lesley as its president-elect and was warmly greeted. Professor Howe, after acknowledging the honor, gave some further notes on the "Closing of Blowholes in Steel Ingots." What he described was in continuance of the inquiry of which he had given some details at the meeting of 1909. Pieces extending from front to back were cut out of the side of a steel ingot intended for boiler plate, one at the top, one at the middle and one near the bottom. The ingot was rolled down into a plate, which thus had three gaps extending in from one edge. Opposite these gaps pieces were cut out and their specific gravity compared with that of the ingot steel previously cut out, the latter proving to be considerably less. The closing up of blowholes in rolling was thus indicated. The next inquiry was as to the condition of the steel in view of the possible elongation of the blowhole into a seam. From the pieces of the plate cut out opposite the gaps thin slices were cut and these latter were bent nearly

double. If the blowholes had simply been elongated it would be expected that seams as much as 3 in. long would be found. Instead, the longest seam thus disclosed was 0.06 in. in length, while a number were but 0.02 in. in length.

Copper Clad Steel

In a paper on "Copper Clad Steel: Its Metallurgy, Properties and Uses," Wirt Tassin gave an account of the methods followed in the manufacture of this product at the works of the Duplex Metals Company, Chester, Pa. The weld between the two metals secured by the process employed is such that the copper can be separated from the steel only by melting it off. It will resist several temperature changes as well as great stress or shock. The clad metal can be rolled, swaged or drawn, hot worked or cold worked, and the proportion of copper and steel in the original billet will remain nearly a constant, no matter what the reduction, as from a 6-in. billet to a No. 12 wire.

The process as described by the author is in brief as follows: Steel billets are rolled to a 5 1-16-in. round, and cut into 26-in. lengths. It then passes to a machine in which both ends are drilled and tapped. After a special pickling and washing the piece goes to a preheater, from which it is drawn up into a heated tube by means of a rod and a bushing screwed into the billet. The rod slides up and down in the center hole of a three-jaw chuck, which holds the tube and centers the billet in it. A steel flange is then screwed on the bottom of the billet, forming with the tube a mold in which the billet is the core. The billet and its flange are now lowered out of the tube into specially prepared copper and held long enough for the copper to coat the surface of the steel and form with it an alloy. At a certain point in the reaction the billet is drawn up into the tube and the whole carried to a second furnace of the pit type, the pots of which contain the purest commercial copper. The tube and billet are lowered into a crucible; the molten copper rushes in through two openings in the top of the tube, unites with the alloyed area and fills the mold. The tube is then withdrawn from the crucible and when the copper has set the chuck, rod and flange are unscrewed, the copper clad billet pushed out of the mold and after heating it is rolled to the desired size and shape. The rolling is in general similar to that of steel.

With 40 per cent. of the sectional area is copper and the 60 per cent. steel containing not over 0.15 per cent. carbon, 0.40 per cent. manganese and 0.04 per cent. sulphur and phosphorus, the tensile strength, after the proper treatment, is close to and the yield point greater than that of an all steel rod of equal section and similar composition and treatment. The yield point of copper-clad steel will average 84 per cent. of its ultimate strength when dead soft. The high values noted were attributed in the paper to the influence of the first dip or alloy coat of copper and its effect on the structure of the steel. Views were thrown on the screen showing a much finer grain in the copper coated than in the uncoated steel. In the weld area certain compounds are present which, together with the copper, have a far reaching effect.

Tests on copper-clad rods show that when corrosion sets up it begins at the center of the steel instead of at the point of contact of the two metals, while with a copper tube shrunk on a steel rod exactly the reverse is true. The explanation is that in copper clad there is a definite union of the copper and steel and that certain products of this union have properties which retard ionization and do not accelerate corrosion.

The most obvious use of copper-clad steel is as wire for electrical and mechanical purposes. Copper clad steel electrical wire has an average conductivity of 40 per cent. of the same size copper wire. In telephone work the life of the wire depends on its breaking weight and elastic limit. These are for a No. 10 copper wire, respectively, 530 and 293 lb., while that of a No. 14 copper clad is 760 and 320 lb. The one weighs 166 lb. per mile and the other 61 lb. Having the strength of steel and the durability of copper, the copper clad wire is especially of value where high tensile strength and resistance to corrosion are essential and good conductivity is desirable. Since steel of any desired physical qualities may be used as a core, copper clad is adapted to bridge work, derrick guys, rigging, springs, rounds of all sizes suitable for anchor bolts, pump rods, &c. For large structural shapes it is questioned if copper clad will have a commercial use, though it has value for light shapes for skylights and similar work.

DISCUSSION.

The high elastic limit of the copper clad steel was commented on as surprising. In response to a question Mr. Tassin said that the steel adjacent to the weld showed a lowering of carbon. The important point was the profound change which took place in the structure of the steel as a whole—the much greater fineness of the grain and the fibrous character of the structure.

Dr. Waldo referred to the hardening of steel by chilling, while copper softens by chilling. He pointed out the difficulty of speaking positively about moduli of elasticity of such compound metals. In this connection he suggested the appointment of a committee of three to report at the next annual meeting on the proper use of the terms "modulus of elasticity" (Young's modulus) in engineering specifications and descriptions, including its use in describing non-ferrous metallic materials and combinations. This suggestion was later put in the form of a resolution and adopted.

Professor Howe suggested that the high elastic limit reported for copper clad steel might be due to the mode of application of the stress. In the weld area are iron-copper alloys of unknown elastic limit, and the stress is transmitted from a metal of low to one of high elastic limit.

Cupro-Nickel Steel

G. H. Clamer, Philadelphia, read a paper on "Cupro-Nickel Steel," which represented considerable new work in this class of alloys.

At the outset he reviewed the results of investigations of the iron-nickel and iron-copper series. He showed that iron-copper alloys can be produced carrying 5 to 20 per cent. copper, which without nickel would be extremely hard, brittle and red short, but by adding nickel in the proportion of 20 to 50 per cent. these become highly ductile, easily forgeable and easily machineable. Tests of two typical alloys within the above range showed the following:

	No. 1.	No. 2.
Copper	9.00	19.50
Nickel	22.00	45.00
Carbon	0.22	0.2
Ultimate strength, pounds	101,000	98,230
Elastic limit, pounds	57,300	54,150
Elongation, per cent	42.5	35
Reduction of area, per cent	61.5	47.9

Such alloys, it was suggested, might be used in place of the present 25 to 35 per cent. nickel-steels because the steel can be produced at a much lower cost, not only because of the substitution of copper for nickel, but because the alloy can be made from monel metal, which sells at about the price of copper. It is also possible to make the steel directly from Sudbury nickel ores by smelting and Bessemerizing to eliminate the iron to the extent desired, roasting the matte produced, and finally producing the combined oxides resulting from roasting the matte. It is believed that either by the use of monel metal for making the steel alloy or by its direct production from the ore the cost might be sufficiently reduced to make it attractive for roofing, gutters, spouts, ventilators and other uses. Such sheets can be sold at much less than copper—probably at two to four times the cost of coated steel sheets, but the alloy is twice as strong as steel and three times as strong as copper sheets and thinner gauges can be used. At the higher end of the series these alloys are nonrusting.

The author also experimented with the lower copper-nickel alloys to note the effect of replacing part of the nickel in nickel-steel within the pearlitic range by copper. He made such sheets with 1 to 8 per cent. monel metal, in which the proportion of nickel to copper is roughly 2½ per cent. nickel to 1 per cent copper. Here again the copper really acts like so much nickel, at least when present in

these relative proportions, and it is possible, therefore, to produce a steel of practically the same physical proportions as nickel-steel at very much reduced cost. In these steels the nickel, iron and copper are in the same relative proportions in which they exist in some of the prominent mines at Sudbury, Ont., averaging analysis of these ores being as follows:

Copper	8 to 2.00
Nickel	2 to 5.00
Iron	35 to 52.00
Sulphur	Balance.
Gangue	

By the operation of reducing this ore to matte, calcining the metal to remove the sulphur and reducing the calcined product this steel can be produced almost to the most desired formula. The valuable properties of nickel-steel carrying below 6 per cent. nickel have long been recognized, and recently the value of copper as a valuable constituent of steel, instead of a metal to be looked upon as detrimental has also become recognized. It is probably not quite so surprising, therefore, that the joint addition of copper and nickel within this range of proportions is productive of valuable results. The addition of these two metals in combination seem to have the same effect upon the steel as if they were individually added, the copper in its effect really being about the same as so much added nickel. It is possible, therefore, to replace part of the nickel in nickel-steel by copper without materially altering the physical properties. The following table gives the physical properties of some of these alloys:

	Monel metal.	Carbon.	Ultimate strength.	Elastic limit.	Elongation.	Red. area.
No. 1	4	0.11	83,600	66,300	26.5	65.4
No. 2	5	0.10	75,300	64,000	27.5	71.4
No. 3	2	0.15	75,500	63,700	28.0	65.4
No. 4	4	0.61	151,000	120,000	8.0	15.8

Copper in Steel Not Injurious

John A. Matthews, general manager of the Halcomb Steel Company, Syracuse, N. Y., described as follows some of his experiences with steels containing nickel and copper.

In looking up this subject I was surprised to find how little attention has been given in papers and discussions that have been presented to the American Society for Testing Materials during the past five or six years to the general subject of copper in steel. So far as I recall none of the society's specifications mention copper at all; however, I find that there is still in the minds of many users of steel a prejudice against copper. A year or two ago we sent a large quantity of spring steel to the Panama Canal. Upon its receipt we were advised that the copper content exceeded the specification, and it was reported as being from 0.07 to 0.12, whereas the specification had stated that the steel was subject to rejection if the copper exceeded 0.05. Our own analyses confirmed the fact that the copper was higher in the steel than we had expected, but the writer looked up the authorities on the subject and presented such an eloquent and convincing brief that not only was the steel accepted, but specifications since that time have omitted any reference to the copper content.

In connection with nickel-steel a firm of automobile manufacturers formerly specified that the copper in their nickel-steel should not exceed 0.025. The writer was instrumental in getting this specification changed so that the user shifted the decimal point for copper one point to the right, making the permissible amount 0.25, and still later omitted all mention of copper in his specification.

It is hardly necessary here to review the large number of recent investigations that have been made in connection with this subject; for example, the articles that have appeared in the journals of the Iron and Steel Institute of late years by Stead, Wigham, Colby, Breuil and others; also articles by Dillner, Müller and Bischoff in *Stahl und Eisen*, together with the statements by Harbord, Campbell and Howe in their general treatises on steel. It is, perhaps, a surprise to many to know how generally present copper is in all kinds of steel, even in the best grades of Swedish materials. Bischoff published the analyses of some 40 or 50 samples of German and Swedish steels, and every one of them contained copper, the amounts varying from mere traces up to 0.274. It is sufficient to say, however, that the general trend of scientific work in connection with the influence of copper and steel has been to show that in any ordinary quantities in which it is likely to be found its effect is not marked one way or the other, or may even be benficial.

ELECTRIC CUPRO NICKEL-STEEL.

The particular experiment in reference to cupro nickel-steel to which I should like to refer is of perhaps more than ordinary interest, owing to the fact that the heat of nickel-steel containing copper was melted in our Héroult electric furnace [Halcomb Steel Company], and that the pig iron used in this heat was produced in Canada in the Héroult smelting furnaces which were installed there some years ago—that is, the entire heating from the ore to the finished product was by means of electricity, and this is probably the first heat of steel so made in the United States. The pig iron, as produced from certain of the Canadian ores, carries a considerable amount of nickel and copper, and it was with a view to seeing what results could be obtained from this pig iron that we made a cold heat, charging in cold pig and ore into our furnace. The result of this heat gave steel of the following analysis:

Carbon	0.14	Sulphur	0.013
Silicon	0.034	Nickel	3.62
Manganese	0.50	Copper	0.48
Phosphorus	0.013		

It must be remembered that all the nickel and copper present were contained in the original pig iron used. We had no definite analysis in mind when we started this heat, but were more interested in finding what grade of steel would result from the grade of pig used. The ingots were clean and worked very satisfactorily under the hammer, and the ½ per cent. of copper present seems to have exerted no deleterious influence as regards the heating or working. For the sake of comparing this steel with another steel of approximately the same analysis but free from copper we selected an open hearth nickel-steel whose heat analysis was as follows:

Carbon	0.46	Phosphorus	0.021
Silicon	0.056	Sulphur	0.034
Manganese	0.70	Nickel	3.36

An examination of this heat showed that it also contained about 1-10 of 1 per cent. of copper. The physical tests to be mentioned later were made from ⅞-in. diameter round bars, and the greatest care was used in their heat treatment. Tests were made in duplicate and the bars from the two heats were annealed at the same time so as to avoid any possible difference in the annealing temperature. It was noted that the open hearth steel machined a little more freely than the electric furnace nickel-steel containing 0.5 per cent. of copper, but here the superiority ended. The tensile tests of the material as rolled gave us the following figures:

	O. H. nickel.	Cupro-nickel.
Elastic limit, pounds	74,626	72,400
Ultimate strength, pounds	122,000	115,000
Elongation in 2 in., per cent	16	22
Reduction in area, per cent	34	51

In the annealed condition the physical tests were as follows:

	O. H. nickel.	Cupro-nickel.
Elastic limit, pounds	64,750	63,750
Tensile strength, pounds	119,000	107,300
Elongation in 2 in., per cent	17	25
Reduction in area, per cent	37.5	48

Samples of both steels were heated to 1500 degrees F., quenched in oil and drawn back to a temperature of 800 degrees F. and maintained at that temperature for 20 minutes. In this condition the results of physical tests are as follows:

	O. H. nickel.	Cupro-nickel.
Elastic limit, pounds	154,500	154,000
Tensile strength, pounds	175,000	172,500
Elongation in 2 in., per cent	9.75	13.25
Reduction in area, per cent	30.8	49.1

SUPERIORITY OF CUPRO NICKEL-STEEL.

In all the tests above the elastic limits and tensile strengths are not very different for the two steels, but the very great superiority of the cupro nickel-steel in the elongation and reduction of area is most noticeable. The presence of the copper certainly has not in any way decreased the toughness of the steel, as manifested in its elongation and reduction of area, but the most remarkable difference in the two steels was noticed in samples which had been quenched as before at 1500 degrees F. and drawn back to only 600 degrees F. In this condition both steels showed an elastic limit of about 185,000 lb., with the tensile strength slightly above 200,000 lb., but, whereas the open hearth steel was decidedly brittle by this treatment, only giving 2 per cent. elongation and 4 per cent. reduction in area, the electric furnace product gave 12 per cent. elongation and 46 per cent. reduction in area.

So far as this single test is concerned, therefore, there is absolutely no evidence to show that the copper has exerted a harmful influence upon the nickel-steel, and we must either ascribe its superiority to the presence of copper, or to the superiority of the electric method of melting, or to both acting jointly.

From an extended experience with electric furnace product, as compared with the open hearth nickel-steels in carbons varying from 0.10 up to 0.50, there no longer remains any doubt in my mind as to the superiority of the electric product over open hearth nickel-steel.

The Héroult furnace, with which I have had experience, was the first commercial electric furnace installed in the United States, and the result of this experiment, where both the pig iron and the steel were of electric furnace origin, seemed to me of sufficient interest to present to the society.

DISCUSSION.

Captain R. W Hunt believed the more recent disposition to ignore copper in steel specifications was

due to experience with metal from Cornwall ores, all of which contain some copper. He had made rails with 0.5 per cent. copper and they were good rails, though of smaller section and intended for lighter traffic. They were low in phosphorus, high in copper and incidentally high in sulphur. It must be largely on the lines of alloys, he thought, that further advancement is to be made in steel. The ores recently found in northern Cuba contain rare elements naturally combined and results with these would be noted with interest.

J. V. W. Reynders, vice-president and general manager of the Pennsylvania Steel Company, was asked to comment on this company's Cuban ores, said that these ores in the Mayari district contain nickel and chromium, and in time data would be available as to the results of mixing these ores with Cornwall ores containing copper. In more recent years, he said, the copper has been eliminated from Cornwall ores, but for the sake of the profit from copper.

Henry Souther referred to copper as detrimental to welding quality in steel, particularly in tubes. The copper seems to have a more unfavorable effect on welding than sulphur. Steels of high phosphorus and high sulphur weld better than those having low phosphorus and low sulphur with some copper. The latter are red short and will not weld.

It was stated that the Lackawanna Railroad has on its line a good many rails containing copper, rolled at the old Scranton mill of the Lackawanna Iron & Steel Company. Recently an 80-lb. rail was taken up which showed 0.40 per cent. carbon and 0.6 per cent. copper.

The Effect of Titanium on Segregation

Dr. Geo. B. Waterhouse, metallurgist of the Lackawanna Steel Company, presented a paper on "The Influence of Titanium on Segregation in Bessemer Rail Steel." It is printed on another page.

DISCUSSION.

Professor Howe spoke of quiescence as one of the things that strongly oppose segregation in steel. Quiet steel encourages the formation of pine tree crystals at the side and the molten metal is landlocked. The action of titanium he considered to be similar to that of aluminum, on which Mr. Talbot has written.

A. A. Stevenson, Standard Steel Works, thought that the addition of aluminum or even of silicon to the steel would give the same result as was secured with titanium in the cases cited.

Henry Souther raised the query whether temperature was not as important an element as titanium in the tests described, seeing that the steel to which titanium was added was held 3 min. before pouring.

The question was raised by F. N. Speller as to the effect of titanium on open hearth steel. While no tests on such steel were cited in reply, it was conceded that Bessemer steel, being quieter than open hearth, the results from titanium with the former would naturally be more favorable. In reference to the possibility of getting too cold a steel from holding it in the way described in the paper, Professor Howe remarked that with the larger charges of to-day there is not the danger that was once feared from a lowering of the temperature.

TESTS OF IRON AND STEEL

Strength of Steel from I-Beams

E. L. Hancock, professor of applied mathematics in Worcester Polytechnic Institute, gave the results of tests made on pieces cut from standard I-beams varying in size from 6 in. 13.5 lb. to 20 in. 65 lb., and on pieces cut from three Bethlehem beams. The specimens were cut from the middle of the web, the root of the web and the flange near the root, and were designated in the tabulation of results as, respectively, W, R and F. The broken test pieces showed some differences of structure. W showed a fine surface in the region of the fracture, while R and F were much coarser. The small beams had a fine structure generally and all the Bethlehem beams tested showed a very fine structure with silky fracture. There were variations in strength, which the author considered due to the varying amounts of work on different parts of the beam in rolling.

The value of the data given in the paper was lessened by the absence of chemical analyses, though later, it was stated, funds may be available for complete analyses. Samples from one set of three pieces were examined for carbon, W showing 0.22 per cent., F 0.27 per cent. and R 0.25 per cent. This suggested that differences in chemical composition might have to do with the variations in strength. Illustrating these variations, three pieces were tested from the flange of one beam. The one cut near the root of the web had an elastic limit of 24,000 lb.; the one from the extreme edge of the flange had 36,000 lb., and the one from an intermediate location had 34,000 lb. The author's tables of elastic limit contained a good many low values. A piece from the root of the web of a 20-in. 65-lb. beam had an elastic limit of 13,500 lb., and there were several instances of less than 20,000 lb. The yield point was not given in the tables accompanying the paper, but the author said that it was found to differ much more in the Bethlehem beams than in the standard beams. His general statement was that the differences between elastic limit and yield point in the various specimens ranged from 3000 to 8000 lb. The average elastic limit of the 33 pieces tested from standard beams was about 26,000 lb. and the ultimate strength 60,000 lb. Of the nine specimens from Bethlehem beams the average elastic limit was 26,300 lb. and the average ultimate strength 65,500 lb. A summary of the results was made as follows:

1. The elastic limit varies considerably for material cut from different portions of the beam, both standard and Bethlehem being lowest in root of web, higher in flange near root and highest in web. This confirms the work of Professor Marburg.

2. The indications are that there is considerable difference chemically in the material in different parts of the beam. It is desirable that these chemical tests be made and recorded as a part of this investigation.

3. The appearance of the fractured pieces indicates a considerable variation in the density of the material throughout the beam, due probably to the work of rolling The thin beams show material superior to that of the thick beams.

DISCUSSION.

Secretary Marburg said that one of the most important questions relating to the strength of I-beams is the amount of load that will cause the beginning of a continuous increase of deflection; in other words, to determine that load which will cause a progressive failure of the beam. What is wanted is tests that will subject a beam to such static loads as are borne by the beam in actual service.

The further point was made in the discussion that since tests of beams have not been made in which loads and stresses were like those to which the material is subjected in service it is well to have an ample factor of safety and to make sure that the elastic limit of the steel is not approached too closely.

Professor Howe noted the fact that out of 11 standard beams from which pieces were taken for Mr. Hancock's tests there were eight in which the web had a higher elastic limit than the flange, while in no case did the web have a much higher elastic limit than the flange. The explanation might be that the web was finished colder than the flange.

"Tests of Steel and Wrought Iron Beams"

Under the above title, H. F. Moore gave details of tests carried on in the past year in the laboratory of

applied mechanics of the University of Illinois. The material tested was principally small I-beams and the principal object of the tests was to investigate twisting action and sidewise buckling and to determine the magnitude of the direct bending stresses developed in the beams at failure. Only preliminary results were given. The author suggested that the limit of proportionality of stress to deformation would have been found at stresses lower than those he gave for elastic limit, had more delicate instruments been used. Many structural members, he added, are stressed locally, in the process of manufacture, beyond the limit of proportionality, as, for example, I-beams are often cold straightened to bring them into proper alignment. Many such members are standing severe service, though the stress due to load has been added to local stress in manufacture. It is not certain, therefore, that the limit of proportionality is a satisfactory criterion of load-carrying capacity. Another deduction made was that one effect of sidewise restraint is to raise the modulus of rupture nearly to or slightly above the yield point of the material in tension and to cause failure to take place slowly.

Test of a Structural Steel Plate Partly Fused by Electric Current

A. W. Carpenter, New York, reported the results of tests on a steel plate which had been partly fused by a short circuited electric current. The electrification of the New York Central road out of the Grand Central Station involved carrying electric third rail and electric power cables over the Park avenue viaduct, about 1¼ miles long. The cables were placed in steel tube conduits just over the tops of the girders on which the conduits were supported on wooden blocking. A short circuit fused the conduit pipe and burned the underlying cover plate, the burn extending clear through the plate at one point. The conduit metal and cable copper were fused into the plate. The injured portion was cut off and replaced with a new plate. Tests were made to determine how the strength of the plate had been affected. These were described at some length. The conclusion drawn was that the injury did not extend far beyond the limits of the visible burning. This change was enough to reduce the static strength of the plate tested some 40 per cent. and to destroy its ductility. It was concluded that a plate with a similar injury would be unreliable for service, but that if the local injury were cut away the balance of the section would have practically the same unit strength as before.

Tests of Rail Steel

M. H. Wickhorst, who is now engaged in making investigations of rail steel for the American Railway Association, reported on open hearth rail which failed by splitting through the head in various directions, through the web vertically or diagonally, vertically from the head to the base and in other ways. Sections were examined under the microscope after polishing highly and etching. Most of the split rails showed light streaks or patches indicating streaks of metal low in carbon. It was at first thought that slag in the metal caused the white streaks, possibly by oxidizing the carbon. The author then says:

> This may perhaps be true of small streaks, but it was later learned that it was the practice at the mill that made these rails to put small soft Bessemer steel plates on the stools of the molds to reduce the cutting out of the stools by the hot metal. These plates, it seems, get churned up with the rest of the metal, melt partly or wholly, but before becoming thoroughly mixed with the main body of steel, the metal sets, leaving streaks as shown in the figures. It had been thought that the first metal poured would set and hold the plate at the bottom of the ingot, where it would be sheared off, but as soon as it appeared that the plates caused streaks, as shown, the practice was promptly stopped. A few similar failures have been noted in rails from other mills, but whether due to a similar cause has not been determined.

P. H. Dudley, New York Central Lines, had prepared a paper of some length on "Elongation and Ductility Tests in Rail Sections Under the Manufacturers' Standard Drop Testing Machine." In the author's absence it was read by title.

Apparatus for Testing

J. Madison Porter gave an interesting account of "Some Testing Accessories" as employed in the laboratory of Lafayette University, exhibiting various pieces of apparatus specially devised by the speaker and his associates.

A paper by Albert Sauveur, Cambridge, Mass., described "Apparatus for the Microscopical Investigation of Metals," including some attachments devised by the author.

COMMITTEE REPORTS ON IRON AND STEEL

Progress Toward International Specifications

The report of Committee A1 on Standard Specifications for Steel, the chairman of which, William R. Webster, Philadelphia, is now in Europe, was presented as a printed pamphlet of 16 pages. It dealt almost entirely with the Copenhagen Congress of the International Association for Testing Materials and the conferences of members of international Sub-Committee 1A on Specifications for Iron and Steel. One of these was held in London July 1, 1909, and a more informal one at Copenhagen in September. The results have already been given in *The Iron Age*. In brief, the representatives of England, Germany and the United States have recommended that the specifications of the British Engineering Standards Committee, the Deutscher Verband für die Material Prüfungen der Technik, and American Society for Testing Materials be used in the respective countries for materials manufactured on export orders. It was also recommended that when one of these associations revises its specifications hereafter it endeavor to bring them in line with those of the other two countries; also that manufacturers be induced if possible to roll trial orders for material under the conditions of the specifications of other countries, to find out how far these conditions can be introduced for export orders. The sub-committee also decided to consider specifications from other countries than the three named provided differences were harmonized within those countries and one representative standard specification be submitted for each class of material.

The report indicates a departure in the procedure as to international specifications on steel from that followed on cast iron. Chairman Webster held that there should be a harmonizing of differences in each country for itself, and that the international Sub-Committee on Iron and Steel should not attempt to do this. On the other hand (as indicated in the report of the Committee on Cast Iron, referred to in last week's issue of *The Iron Age*), when it came to cast iron, those who attended the informal conference at Copenhagen decided not to proceed under the so-called London resolutions, the recommendations of which are summarized above (and which provide for discussing specifications at future annual meetings), but to undertake at once an international unification of the cast iron specifications.

The report of Committee A1 has this to say as to the prosecution of the work to be done previous to the next meeting of the International Congress, to be held in the United States in 1912:

> Instead of submitting proposals for international specifications to the Congress in 1912, the work should be completed by that time and international specifications submitted for approval. This can be done if the work is started at once in a systematic manner, and funds provided for carrying it on here and abroad. Summaries of the specifications from each country should be tabulated, published in French, German and English, and promptly delivered to all the members, then the work will go on continuously and the general interest maintained. The specifications for ship material, boiler material, steel wire, &c., should be taken up in addition to those already considered.
>
> The co-operation and support of the national engineer-

ing societies and the various departments of the governments are needed in this most important work, both by their taking part in the work of committees on specifications and by giving their financial support. In addition to this a general subscription from the steel manufacturers and others interested will have to be solicited.

A great deal has been said about increasing the export trade of this country, but how can this be done so long as the contracts embody features in favor of English and Continental manufacturers, which are purposely inserted to send the orders to their countries? Reference is here made to specifications for steel rails, locomotives, bridges, &c., which form part of every contract for export orders. This matter is not generally understood, and too much light cannot be thrown on it at this time, now that the general movement for international standard specifications has been started and our Government officials are doing all they can to extend the export trade of their country.

On motion of Walter Wood the report of the committee was "received and filed."

Specifications for Cold Drawn Steel

A progress report was presented by C. E. Skinner, chairman of Committee A8 on Standard Specifications for Cold Drawn Steel. Twenty tons of standard automatic screw stock has been made up by producers in accordance with the requirements decided on by the committee. The work undertaken includes chemical tests, physical tests and tests for machining quality under various conditions of machining speed, with a complete record of tools used, pieces made and other details.

For Committee B1 on Standard Specifications for Hard Drawn Copper Wire, it was reported that the specification is being revised and will be submitted later.

DISCUSSION.

Professor Lanza suggested that the question of maintaining the straightness of cold drawn material, also the matter of hidden flaws, be considered in connection with the specifications. The chairman of the committee said it was believed a specification could be prepared covering all grades of cold drawn material, though the committee was chiefly concerned with the requirements for steel for use in automatic machines running at high speed. Mr. Souther said he had been interested in investigations of the machinery qualities of cold drawn steel. He had used both the Brinell and the Shore tests for hardness and believed both these methods to be of material assistance. He was not prepared to say that the hardness test is a correct measure of machinery quality, but results seem to point that way.

Specifications for Staybolt Iron

The Committee on Standard Specifications for Staybolt Iron submitted a revised specification, which under the rules goes over for one year. The changes consist of the following: The addition to the first sentence of the words "the basis of which must be pig metal and entirely free from any admixture of steel." The omission of the following matter: "The pile must be made up of a central core composed of bars from ½ in. to 1 in. square and be covered on all four sides with an envelope ⅝ in. thick, as per sketch. This pile must be rolled to a billet, allowed to cool, again heated, and then rolled into bars of the required dimensions." The substitution of a nick and break test for the threading test. The revised specification is as follows:

PROPOSED STANDARD SPECIFICATIONS FOR STAYBOLT IRON.

Process of Manufacture.

All staybolt iron must be hammered or rolled from a bloom or a box-pile having a cross-sectional area of at least 45 sq. in., and not less than 18 in. long, the basis of which must be pig metal and entirely free from any admixture of steel.

Physical Tests.

(*a*) Tensile Strength.—Not less than 48,000 lb. per square inch.

(*b*) Elongation.—Not less than 28 per cent. in 8 in.

(*c*) Reduction of Area.—Not less than 45 per cent.

(*d*) Double Bending Test.—Close in both directions without flaws.

(*e*) Nick and Break Test.—A bar, nicked all around to a depth not less than 8 per cent. and not more than 16 per cent. of the diameter of the bar, and broken, shall show a clean fiber entirely free from crystallization.

(*f*) Vibration Test.—The test bar shall stand a minimum of 6000 revolutions when subjected to the following vibratory test:

A threaded specimen, fixed at one end, has the other end moved in a circular path while stressed with a tensile load of 4000 lb. The circle described shall have a radius of 3-32 in. at a point 8 in. from the fixed end of the specimen.

Inspection.

(*a*) The Iron must be smoothly rolled and free from slivers, depressions, seams, crop ends and evidences of being burnt.

(*b*) It must be truly round within 0.01 in. and must not be more than 0.005 in. above or more than 0.01 in. below specified sizes.

Selection of Samples for Test.

The bars will be sorted into lots of 100 bars each and two bars will be selected at random from each pile. Failure of either of these bars to meet any of the above specifications will be cause for rejection of the lot which the tests represent.

TESTING METALS FOR HARDNESS

The Shore Scleroscope and Other Devices

A paper which brought out considerable discussion was that of A. F. Shore on "The Scleroscope." This instrument was described in *The Iron Age* of August 27, 1908, p. 555. Not only Mr. Shore's paper dealing with his ingenious and already widely used device, but the comments made later by many who have used it illustrated that testing engineers are far from agreement in their attempts to define hardness and in their ideas of the best means of measuring it. Mr. Shore's paper traversed the subject at great length, tending to clear up some points that have been matters of dispute, while as to others it must be said that the author's statements lack something of perfect clearness. Mr. Shore laid stress on one proposition, namely, that there is but one kind of hardness in the eye of the practical constructing engineer. He could not accept the distinction sometimes made between "static" and "dynamic" hardness. Discussing "cutting hardness," as referred to by Professor Turner, the author explained why in a certain cited case a brass which showed 12 hard by the scleroscope cut copper showing 20 hard, saying among other things:

If a chip is cut off any metal, particularly when the tool is blunt, a certain amount of pressure is required. This pressure must always exceed the ultimate strength and, therefore, the chip is superhardened. Suppose now we were to select a piece of cold rolled or hammered copper which in the casting measured 6 hard, but as the result of pressure superhardened to 20, and, on the other hand, we took a piece of brass 12 hard in the annealed condition or as a casting, and we then scraped the edge of one over the other to see which one would be cut. If we remember that there is a great deal of superhardening due to the brass casting as soon as it is exposed to compression—twice as much, perhaps, as the limit of the copper—is it not clear that the piece of brass must easily cut the copper which was already compressed and could be superhardened no further, at least under the pressure required to do the said cutting?

The author distinguished between what he called "basic hardness," the amount of superhardening due to cutting pressures, and toughness, the last named being greater as the difference between basic hardness and the superhardness due to cold compression increased. Further on, the different fields of the various instruments designed to show hardness and machining quality are referred to as follows:

We will assign to the sclerometer the property of measuring the abrasive increment, which should be particularly valuable in connection with cutting operations because of its cutting action. The ball test measures resistance to penetration under a constant pressure, the scleroscope measures precisely the same thing, with the only difference that it measures the resistance to penetration under shock. Then we may also consider the drill test for hardness, for there is a machine built which does this scientifically. I regret very much that I am not more familiar with the sclerometer, but I can readily see that, for instance, on 7 per cent. nickel-steel this instrument would read high, while the scleroscope and the ball test show it is low. On cold rolled metals it would probably measure the basic hardness only, giving no account of the additional hardness which the rolling mill man put into it. Probably the drill test and the sclerometer, which are both cutting devices, agree very closely on this point, that when a metal is cold rolled it is not much more difficult to cut than if it were left hot rolled, in spite of the rapid increase of the hardness as agreed on by the scleroscope and the ball test.

Now if these two cutting devices kept on agreeing all through the severe trial there is no doubt that they would be valuable, and would enable us to solve metallurgical problems of great importance. A little practice will show,

however, that the drill test will not agree with the sclerometer, and it may show anything but the physical hardness, although it is probably a fact that it will show us something about the abrasive element in metals in a soft state, for it will indicate the amount of tool wear under perfect conditions (because the drill is a cutting tool) which would be caused by the presence of abrasives. To thus prove that the drill is useless as a means for testing hardness we do not have to go very far. Thus manganese steel only 30 hard cannot be drilled as much as high speed steel annealed, showing more than double this hardness, while yet a cold chisel will very easily cut large, smooth chips off the manganese steel such as it should on material showing a hardness of 30. Why is this? Because the drill cuts with a scraping action, thus giving the abrasive element in manganese steel a chance to wear away its edge at once, while the cold chisel, acting in a different way so as to escape the abrading effect for the most part, will be enabled to cut manganese steel. Likewise the drill will report a false hardness on carbon steel when compared with tungsten steel, as well as cast iron having a high silicon or manganese content, and which are abrasives, and so on. In this connection there is a great deal of research work to be done, and it would be particularly interesting to have more data regarding the complete performance of the sclerometer when compared with the readings of the scleroscope and the ball test.

DISCUSSION.

Professor Howe called attention to the fact that a number of qualities are commonly grouped under the term "hardness." There is a difference in hardness as determined by different methods. For example, for crushing certain kinds of rock a stamp shoe of cast iron is best, giving better service than would hardened steel. Under other conditions manganese steel does very well, the selection of the stamp shoe depending on the character of the rock. A manganese steel rail has great resistance to abrasion. It was also thought, until it was tried, that manganese steel would be an ideal material for car wheels; put to the test it was entirely disappointing. Why a manganese steel car wheel running on a rail wears away while a rail of the same unit stress resists so well is not clear. Cohesion manifests itself differently under differing conditions of stress; if there were no differences in cohesion the problem would be simple.

J. H. Parker, Reading, Pa., had found in tests made with the scleroscope some variables that need to be accounted for. To get accurate results the glass tube must be plumb and the surface of the material tested must be normal to the line of impact. In the case of hot worked material there is a surface decarbonization, and in such cases low values are obtained, whereas a few thousandths of an inch below the true values would be found. The surface must be properly prepared.

Attention was called in further discussion to the fact that the scleroscope gives good results with thin material, provided it is properly supported. It was stated that the effect of case hardening is accurately measured if the case is not too thin.

D. E. Douty, Washington, D. C., referred to the tests for hardness made by the Bureau of Standards, five methods being used. The results will be published in due time. The speaker put on the blackboard the following statement of results with the Brinell and scleroscope methods:

	Scleroscope.		Brinell hardness numeral.
Tool steel	86.1	(107)	641
Silicon steel	33.6	(43.7)	262
Manganese steel	29.5	(30)	179
Cast iron No. 1	33.3	(25)	149
Cast iron No. 2	32.9	(28.7)	172
Bessemer steel	26.6	(31)	185
High carbon steel	37.8	(48)	289
Cu(70) Sn(30) alloy	42.4	(18.3)	110
Cu(80) Sn(20) alloy	25.5	(16.7)	100.5
Cu(90) Sn(10) alloy	22.1	(15.8)	94.7
Copper	15	(14.7)	88.5

[Between the two columns of figures we have set down in parenthesis the quotients arising from dividing the Brinell figures by 6, this being the ratio used in making comparisons, published abroad, of Brinell ball and Turner sclerometer tests. It will be seen that some of the figures agree closely with the corresponding ones in the first column; others are further off, while others differ widely.—EDITOR.]

Bradley Stoughton spoke of the rapidly increasing employment of the hardness test in metal working establishments. In time, in the interchange of material between works, some form of hardness test will need to be agreed upon to become the basis of acceptance of steel and other metals. Already the International Society for Testing Materials has published the results of large numbers of static and dynamic tests and the relations of the Brinell numerals to ultimate strength, elastic limit and in a general way to ductility have been worked out. The Shore device is easiest to operate and is the quickest to give results. It is particularly applicable to cold rolled material and to determining the proper shape of new material. It may be used, for example, to determine how to temper a tool and how to shape the nose of it to get the best results. It would seem to be useful for indicating segregation; also for testing tempered steel where other methods would spoil the material.

There are some cases, the speaker said, to which the scleroscope is probably not so well adapted as some other devices; for example, in the testing of case-hardened bevel gears, as for automobiles. Many of these have a case as thin as 1-64 in. The Shore instrument gives the skin hardness of gears, but that is not sufficient, as in time the skin wears off. In the case of dies for drop forgings the scleroscope test may show good hardness on the surface, but it is important to know how the hardness varies through every 1-100 in. beneath the surface. The same might be said of projectiles. As to rails, some tests have been made in Germany by the Brinell method, but they have not been extensive enough for deductions. It has been variously stated that elasticity and resilience, and, again, brittleness, are the qualities tested by the scleroscope. Dr. Dudley had said that springs would need to be tested for resilience by a method that would not destroy the springs themselves; and if the Brinell or the Shore method could give an idea of resilience as affected by heat treatment a very useful purpose would be served. Speaking of the cutting quality of metal as indicated by the Keep machine, Dr. Stoughton said that those who sell it say that the dullness of the drills makes no difference. He had not found it so. The drill can be used but once or twice without resharpening. As to the divergence of results on alloys as tested by the scleroscope, he suggested that the instrument might be fitted with a microscope so as to test in turn the hard constituent and the soft matrix of certain alloys. While the International Association for Testing Materials had done considerable work in laboratory testing, its tests were not so voluminous in the practical operations of industrial works. Therefore the American Society for Testing Materials might well have a committee to carry on work in these practical applications of hardness testing.

CORROSION AND PRESERVATIVE COATINGS

The present convention yielded less striking contributions than some of its predecessors to the literature of preservative coatings and the corrosion of iron and steel. The relative corrosion of wrought iron and of steel, for example, is a quiescent subject. As to preservative coatings for structural materials developments are not likely to be important pending the service tests now under way at Atlantic City and Pittsburgh.

Report on Preservative Coatings

S. S. Voorhees, chairman of Committee D1, on Preservative Coatings for Structural Materials, reported in general as to the work of the committee, and the chairmen of various sub-committees reported progress. The inspection of the Havre de Grace Bridge, on which are panels representing 19 paints, showed that after four years the protection afforded is still satisfactory in a great majority of cases. Important changes are on the eve of occurring in some

of the panels, the committee thinks, but the time has not yet arrived for photographing or for removing the films. There has been an inspection of the wooden panels at Atlantic City, but more time will be required for definite conclusions. From the sub-committee on Linseed Oil it was reported that the manufacturers of such oil think more work should be done on different crops of seed before deciding on specifications. Some difference of opinion was said to exist as to the amount of rosin permissible in boiled linseed oil. For the sub-committee on the Influence of Paints on Corrosion it was reported that samples of 10 commercial pigments will be selected and sent to the members of the sub-committee for investigation.

Concerning the Havre de Grace Bridge tests, Chairman Voorhees said that the paints on the specially prepared plates were not in as good condition as those covering the members of the bridge. The statement that these plates were pickled brought out the remark from one member that the Pennsylvania Railroad no longer pickled metallic surfaces preparatory to painting. The effect on the surface of a steel plate due to the liberation of hydrogen in pickling was referred to in this connection. The point was also made that, while black scale tightly adhering to a plate constitutes a protection, it is well to remove loose scale before painting.

G. W. Thompson read a brief paper on "Another Solubility Test on Protective Coatings," adding to the information he presented on this subject last year. He described tests with two paints to determine their solubility. The surface covered by one showed, under the spraying with water to which both were subjected, the formation of a scum or organic compound. This compound, it would appear, may account for the washing and streaking of some paints. The experiments are being continued on wood, steel and galvanized iron to determine whether the formation of such soluble compounds, affecting very considerably the durability of the coating, depends in any way on the surface painted.

The Corrosion of Iron and Steel

Dr. Allerton S. Cushman presented the report of Committee A5 on the Corrosion of Iron and Steel, saying that its work in the past year had consisted in the care and supervision of the wire fence panels at Pittsburgh, and the official inspection of the steel panels at Atlantic City. There has not been time enough to justify a report on the former; therefore the committee's report, of which a synopsis is given below, deals with the steel panels put up at Atlantic City in the fall of 1908.

The first official inspection of these panels was on April 15, 1910, and was conducted by a committee of seven. Each plate was given two separate marks, graded upon a scale of 10—one mark to signify the condition of the plate as far as corrosion effects were discernible, and the other to grade as nearly as possible the condition of the protective coating. Account was taken of chalking, checking, cracking, scaling and color. The object of the Atlantic City panel tests was to determine whether the results under service conditions bear any relation to the respective inhibition and stimulative effects of certain pigments as shown in the laboratory water tests previously conducted. These latter tests consisted in immersing samples of steel in water suspensions of the various pigments and blowing air through the containers for definite periods of time, the corrosion being measured by the loss in weight sustained by the test pieces.

The committee is of the opinion that the steel panel tests have not gone far enough to warrant definite conclusions. It considers it probable that in time many plates that are at present in good condition will begin to fail and fall below others which now show slight deterioration. One thing is already apparent, however, and that is that "those pigments whose protective value depends upon the principle of chromate inhibition, as well as those which produce basic reactions in water suspensions, have given a good account of themselves on the steel panels." The committee reported the 18 pigments (out of 50 used on the panels) employed in both the water and panel tests, which received an average mark of 8 or over in the panel inspection of April 15. It says that of the 18 only 5 are exceptions to the above statement concerning the good results with chromates and pigments giving basic reactions in water suspensions. There were six duplicate panels for each of the single pigments. The committee, therefore, decided that the inspection would be more thorough if half the paint film on each plate of one set were removed, so that the condition of the surface underneath the paint could be examined. These panels were brought into the convention hall and were generally inspected. The 18 pigments common to both tests, which received an average mark of 8 or over, are the following:

	Average.
American vermilion (chrome scarlet)	9.8
Chrome green (blue tone)	9.8
Zinc barium chromate	9.7
Sublimed blue lead	9.6
Sublimed white lead	9.5
Zinc lead chromate	9.5
Zinc chromate	9.4
Bright red oxide	9.3
Prussian blue (water stimulative)	9.2
Natural graphite	9.1
Orange mineral (American)	9.0
Medium chrome yellow	9.0
White lead (quick process)	8.9
Willow charcoal	8.8
Prussian blue (water inhibitive)	8.8
White lead (Dutch process)	8.7
Red lead	8.7
Zinc lead, white	8.0

The Painting of Cement and Concrete Structures

The paper of Charles McNichol, Washington, D. C., on the above subject was given an appreciative hearing, since as a master painter he put at the disposal of the society and his craft a method of preparing the surfaces of cement and concrete structures for painting. It consists in treating the cement surface with a solution of zinc sulphate and water, mixed equal parts by weight and applied with a bristle brush after the cement is dry. If 48 to 72 hours is allowed as a drying period this treatment will make a cement wall as safe to paint as an ordinary plaster wall. Incorporated in the paper was a letter from Dr. Allerton S. Cushman, in which it was pointed out that when zinc sulphate is brought into contact with hydrated lime a chemical reaction results in the formation of gypsum and hydrated oxide of zinc. After the surface has become thoroughly dry again it will contain within its pores a mixture of gypsum and zinc oxide, which have no bad influence on linseed oil, and, in fact, are frequently used as paint pigments. The filling of the pores of the concrete has the effect of preventing suction, thus keeping the oil paints from penetrating too deeply into the cement.

Exposure Tests of Paint on Steel

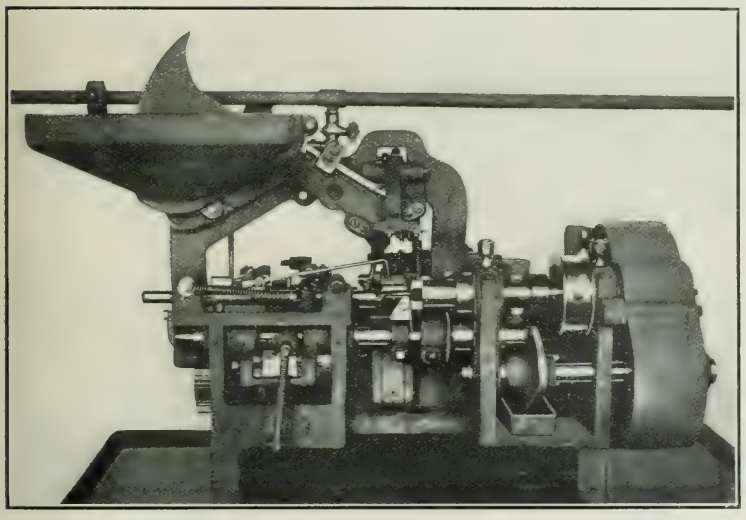
A paper by Cloyd M. Chapman of Westinghouse, Church, Kerr & Co. on "Some Exposure Tests of Structural Steel Coatings" dealt with tests made by the exposure of 1600 steel plates painted with 530 different coatings submitted by 271 manufacturers and dealers. The paper will be given in a later issue. It showed marked differences in the comparative ratings of various pigments after one and two years' exposure. Some which were rated high on the shorter exposure went far down in the scale on longer exposure. The red leads, red lead primers and zinc oxides were rated highest, in the order named, after two years' exposure.

The Alabama Fuel & Iron Company, Birmingham, Ala., has purchased the Russellville Iron Ore & Metal Company.

A New High Speed Wood Screw Threader

A Part of the E. J. Manville Improved Line of Screw Making Machinery

The latest perfected type of wood screw threader built by the E. J. Manville Machine Company, Waterbury, Conn., is one of a complete line of machines for the manufacture of wood and machine screws from blanks made by the cold heading process on the builders' cold headers or rivet machines. The other machines in this line include shavers and slotters, machine screw and bolt, die threaders and pointers. Special study has been given to securing high speed of production, continuous operation and ease of adjustment and durability by the designer, H. P. Townsend, who has had considerable experience in designing this class of machines. This new threader has been developed, therefore, to meet the demand that exists for a faster and more convenient and durable machine than has ever before been produced.



The New High Speed Wood Screw Threading Machine Built by the E. J. Manville Machine Company, Waterbury, Conn.

A few of the most important special features are here described in comparison with the machines in common use. The frail, springy rotary fan hopper, with its irregular and uncertain moving pickup arm has been replaced by a new type of grooved blade fan hopper, which is rigidly mounted and braced, in which the movements are positive and steady, overcoming the snapping of the pickup arm and scattering screws on the floor or in the gears of adjacent machines. The track from the hopper to the cutoff fingers is adjustable for different diameters of screws and the cutoff lever is rigidly mounted directly in line with the end of the track instead of reaching around from the back of the track, like the old type of springy cutoff.

The hopper blade is operated by a friction device which can slip in case anything gets caught, and is provided with a comb or scavenger, which throws all over size or misplaced screws back into the hopper. This complete feed mechanism, as shown in the illustration, is mounted on a single rigid bracket, so that a few extra feed mechanisms may be carried in stock for different sized screws, and when it is desired to change the machine from one size to another, the entire feed can be removed and a new one set in its place by loosening two screws which fasten the bracket to the frame. The cutoff fingers and pickup fingers are made of sheet steel and will be carried in stock.

The back rest, which has always been a source of trouble by the screws and chips collecting behind it, is fully protected, so that this is impossible and will therefore save many breakdowns. The spindle will hold large or small screw heads with an even grip, thereby preventing broken tools and crushed heads. The gripping dies are round and counterbored from the back, so that they may be replaced or changed without removing the spindle from the machine and will run true. They present their gripping surface to the underside of the head, the top of the head being backed up by a plunger which is adjustable from the rear end of the spindle by a set screw and lock nut. This enables the operator to keep the jaws at their most powerful gripping position.

The tool post is short and rigid and is carried on a hollow tool bar, inside of which is mounted the returning spring which, owing to its direct action and its use for this single purpose alone, is many times lighter than the old heavy springs, pulling at an angle at the front of the machine. This, together with the stop collar on the tool bar to receive the bump of the return overcomes broken cams and gears, which in the old machines are of frequent occurrence. The rock lever for rocking the tool in and out of the work is evenly balanced, so that a very light spring is used for rocking and holding the follower stud against the forming shoe, overcoming the severe wear which has always been a source of much inconvenience.

The forming shoe, as shown, is located where it is easily accessible, and may be quickly removed or adjusted, the adjustments being horizontal, vertical and also inclinable for giving the tool proper guidance for cutting a perfect thread, whether the back rest be perfect or worn. The back rest itself may be rocked sideways to take up wear caused by the point of the screw wearing in more than the shank. The pointing tool is carried on a long, stiff, well supported bar and is easily adjustable for giving a perfect point. The pointing is done against the back rest and not with a box tool or hollow mill, thus enabling the threading tool to start threading before the pointing tool is through its operation.

In general, yielding movements are provided wherever necessary to insure against breakage. All wearing surfaces subject to severe use are hardened and easily replaced. The gearing is cut and protected by a casing. All the bearings have bushings to facilitate repairs, and the rigidity, convenience and careful timing of cams, &c., give the machine its rapid production. The first cost of the individual machine is slightly higher than the old style, but the smaller number required and the less operatives necessary bring the first cost and the subsequent operation of a 1000-gross plant far below that of machinery at present in general use.

The Pridmore Core Molding Machine

A New Time Saver for the Foundry

For molding odd shaped cores such as cannot be produced on the usual core forming machines because of their non-uniformity of section, Henry E. Pridmore of Chicago, manufacturer of the Pridmore molding machines, has developed a core molding machine. It is a second horizontal shaft mounted near the base of the machine and normally held in their upper position by the action of a tension spring. When it is desired to depress the arms the operator steps on the U-shaped rod extending from the crank arm, depressing it against the resistance of the spring. As soon as the foot pressure is released the arms are returned to their upper position. The core box is attached to the frame directly with screws through the holes in the rocking frame, as shown in the illustrations, or where the boxes

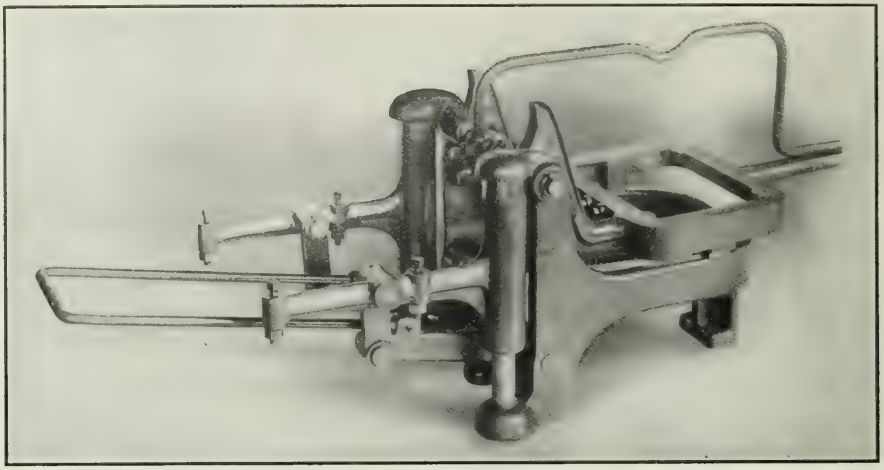


Fig. 1.—The New Rock-over Core-molding Machine Built by Henry E. Pridmore, Chicago, Ill.

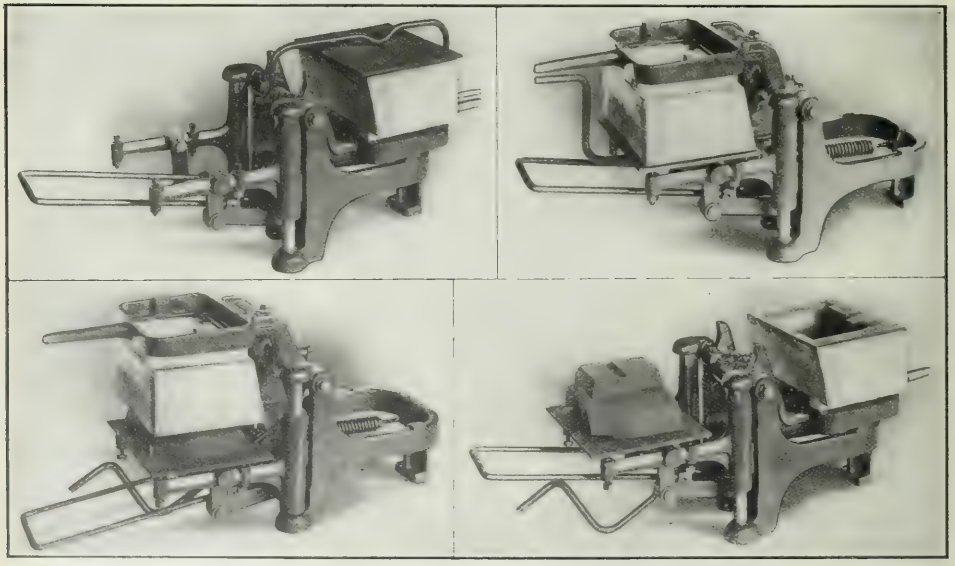


Fig. 2.—The Core Box Filled and Rammed.
Fig. 4.—The Core Drawn Down Out of the Box.

Fig. 3.—The Box Rocked Over to the Drawing Position.
Fig. 5.—The Box Returned Ready for the Next Core.

STAGES IN THE OPERATION OF THE PRIDMORE CORE MOLDING MACHINE.

constructed and operated on the same principle as the Pridmore rock over drop machine.

Fig. 1 shows the machine alone, before applying the core box. It will be seen to consist of a heavy rigid stand supporting on a horizontal shaft the frame which carries the core box and two vertical parallel steel uprights upon which the combination draw arms and receiving tables are mounted. These arms are raised and lowered through connecting rods from cranks on must be frequently changed a special arrangement is provided of a slotted plate attached to the under side of the box through which a turn bottom attached to a centrally located cross bar in the frame can be passed and turned to lock the parts together. With this arrangement it requires but a few moments to attach the box to the machine.

In making a core the box is turned to the position shown in Fig. 2, filled with sand and rammed by jolting

it on the frame two or three times. The frame is purposely made heavy for this reason. The top board is then put on the box and the clamping rod adjusted on it, so that while the handle of this rod and that of the rocking frame are held together by the operator, the box may be rocked over into the position shown in Fig. 3 without danger of having sand jar out or the cover displaced. The next operation is to lower the drawing lever by stepping on it as before explained, which causes the core to drop away from the box as shown in Fig. 4. The frame is then rocked back to the original position ready for the next core to be made as shown in Fig. 5. The receiving table returns to its upper position when foot pressure on the drawing lever is released and the core is then ready to be lifted off. The action of the vibrator is also automatic. Revolving the frame shaft while the frame is being rocked over causes the air valve to open and vibration continues until the rocking over motion ceases and the core is released from the box.

The rapidity with which the sand can be jolt rammed, the facility with which the core box board is clamped to the box and the box rocked over, and the accuracy with which the finished core is released from the box are among the principal advantages claimed for the machine.

The Baird No. 1 Tool and Die Grinder

The bearings, which are perhaps the most vital part of such a tool, are the special feature of the new No. 1 tool and die grinder made by the Baird Machine Company, Oakville, Conn. Fig. 1 shows the general appearance of the grinder and its countershaft, and Fig. 2 is a detailed sectional view through the spindle, which shows the bearing construction.

The bearing boxes are made of bronze of the composition specified by the Government for bearings and are ring oiling and dust proof. Simple adjustments are provided for taking up wear, the boxes being in one piece and fitted to tapered journals on the spindle, so that an endwise adjustment will compensate for wear. At the same time a more uniform wear is insured and less tendency to wear out of round, or for the spindle to become loose in its bearings. The

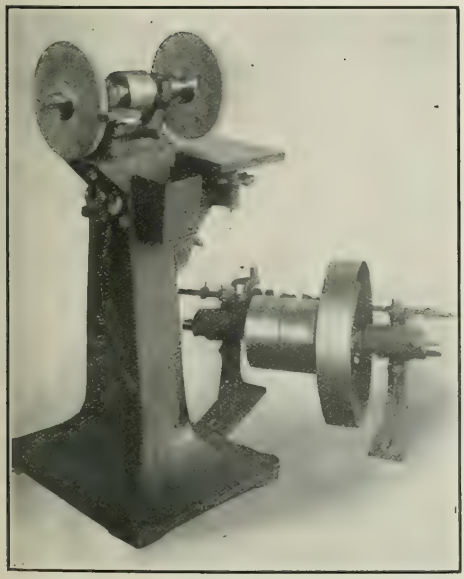


Fig. 1.—The No. 1 Tool and Die Grinder Built by the Baird Machine Company, Oakville, Conn.

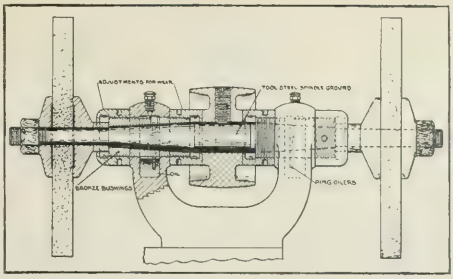


Fig. 2.—Axial Section Showing the Spindle Bearing Construction.

bearings can be easily and quickly replaced with new ones when worn out. The spindle is of tool steel, with taper ground journals, as before mentioned.

Another feature is the very fine adjustment of the table, such as is required for grinding punches, dies, press and automatic machine tools, &c. It is obtained by manipulating the small hand wheel shown in Fig. 1, and the bracket supporting the table can be easily and quickly adjusted vertically, and is released or clamped rigidly in position by an upward pull or downward thrust of the clamping lever on the side. A counterweight for the bracket is contained in the pedestal, which keeps it from falling when the clamp is released, and facilitates the raising or lowering. An adjustable tool post is provided for one wheel, to support tools to be ground, such as lathe and planer tools, chisels, &c.

With the grinder are furnished two emery wheels, a set of wrenches, water tank and countershaft. The latter is provided with a slotted lever shipper and is actuated by the twisting of a rod. The dead center positions of the connecting links lock it in either running or idle position.

Following are the more important dimensions and specifications of the grinder:

Hight from floor to center of spindle, inches	40
Distance between wheels, inches	15¼
Diameter and face of emery wheels, inches	12 x 1
Diameter of spindle, inches	1½
Diameter of spindle at wheel, inches	⅞
Speed of grinder spindle, revolutions per minute	2,000
Length of tapered bearings, inches	4
Size of table, inches	10 x 18
Vertical adjustment of table for fine adjustments, inches	1
Vertical adjustment of table for bracket, inches	12¾
Top of table to center of spindle (table and bracket down), inches	15¾
Diameter and face of pulley, inches	5 x 3¼
Length of countershaft, inches	30
Speed of countershaft, revolutions per minute	550
Diameter and face driving pulley on countershaft, inches	18 x 3¼
Diameter and face tight and loose pulleys on countershaft, inches	8 x 3¾
Floor space, inches	25½ x 24
Weight, grinder only, pounds	435
Weight, complete with countershaft, pounds	585

The grinder is especially recommended for toolroom use or for general purposes, such as the grinding of punches, dies, automatic machine tools, lathes and planer tools, chisels, &c.

The United Metal Trades Association of the Pacific Coast, in its *Bulletin*, dated June 25, notes slight changes in the machinists' strike. In Seattle several new men have been put to work and some of the old ones have returned to their jobs. In Tacoma conditions are slightly more in favor of the employers. In Portland no more men have struck and a few new ones have been secured, so that a little gain is shown there. The reports from all localities affected by the strike indicate that the members of the association are more determined than ever to maintain the open shop and the nine-hour day. The statement is made that open shop pattern shops are now in operation on the Pacific Coast, one being in Portland and one in Seattle.

Titanium and Segregation*

The Influence of Titanium on Segregation in Bessemer Rail Steel

BY G. B. WATERHOUSE.

Segregation is one of the important questions before the steelmaker. It is, therefore, natural that for many years it should have engaged the attention of iron and steel metallurgists in different countries and have given rise to an important literature. The author greatly regrets that, owing to lack of time, he is unable to review this literature and bring together the more important findings. Herewith are presented the results recently obtained by him on segregation in acid Bessemer rail steel. They point in the same direction as those published in 1905 by Talbot, which showed the important influence of aluminum in greatly retarding segregation in certain cases.

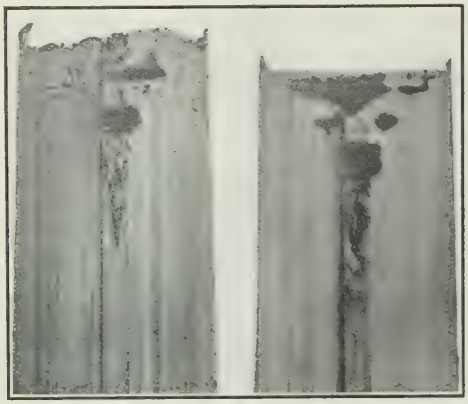


Fig. 1.—Ordinary Steel Ingot. Fig. 2.—Titanium Steel Ingot.

In the present instance titanium, when rightly applied in the proper amount, is also found to retard segregation of sulphur, phosphorus and carbon, in what is normally quiet, quick-setting steel. In all commercial steels the bulk of the ingot must be used, and it is believed that the results given below are of importance, showing as they do one way in which segregation may be considerably controlled.

Results with Ingots

The ingots used were from an ordinary rail steel heat, and from a heat to which had been added 64 lb. of ferrotitanium, which amounted to only 0.25 per cent. of the weight of the heat. The ordinary steel was made in the usual way. After the heat was turned down, the proper amount of molten spiegel was poured into the vessel. The heat was held there a short time, poured into the ladle, and then through a 1½-in. nozzle into the ingot molds.

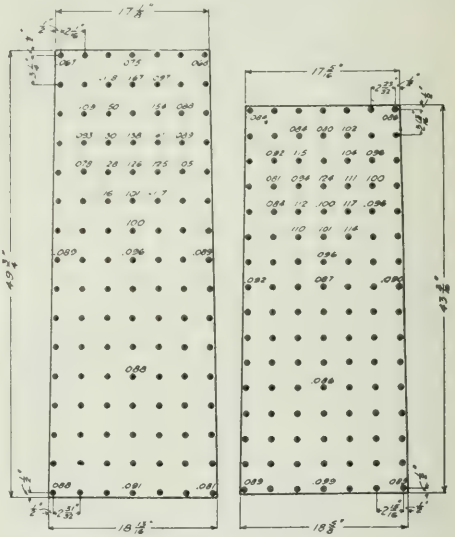


Fig. 5.—Normal Ingot, Half Section. Phosphorus in Ordinary Steel.

Fig. 6.—Titanium Ingot, Half Section. — Phosphorus in Titanium Steel.

There were six molds. After three ingots had been poured, a ladle test was taken. The third ingot of the six was allowed to cool while still standing on its stool and was then cut through longitudinally.

The heat in which ferrotitanium was used was made in exactly the same way. As the steel was poured into the ladle, the alloy was shoveled in; the heat was then held in the ladle for 3 min. before pouring the ingots. In this case also, the third ingot of the heat was cooled in an upright position and cut through longitudinally. An analysis of the ferrotitanium gave:

	Per cent.		Per cent.
Carbon	10.50	Silicon	1.60
Titanium	11.60	Manganese	0.30
Iron	74.12	Calcium	Trace

The photographs of the ordinary and titanium in-

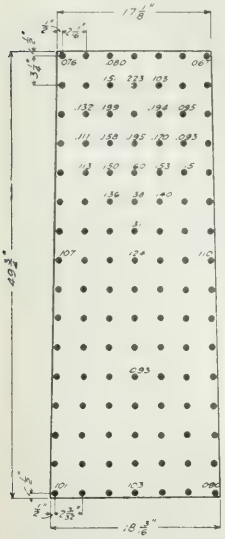


Fig. 3. — Normal Ingot, Half Section.—Sulphur in Ordinary Steel.

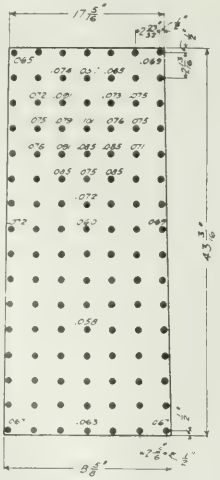


Fig. 4.—Titanium Ingot, Half Section.—Sulphur in Titanium Steel.

* Read before the American Society for Testing Materials, Atlantic City, N. J., June, 1910.

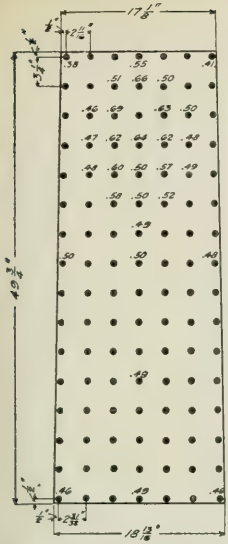


Fig. 7.—Normal Ingot, Half Section.—Carbon in Ordinary Steel.

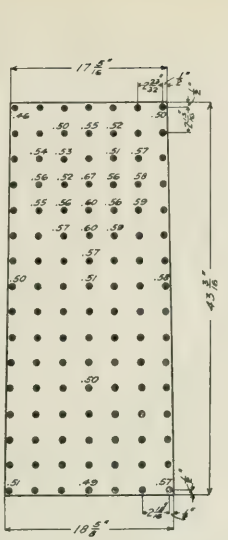


Fig. 8.—Titanium Ingot, Half Section. — Carbon in Titanium Steel.

gots are shown in Figs. 1 and 2. The noticeable feature is the increased soundness of the titanium steel due to the concentration of the blowholes in the pipe cavity.

The analyses of the ladle tests from the two heats were as follows:

	Carbon. Per cent.	Sulphur. Per cent.	Phos. Per cent.	Manganese. Per cent.	Silicon. Per cent.
Ordinary steel....	0.44	0.098	0.088	0.91	0.117
Titanium steel....	0.47	0.068	0.093	0.95	0.118

No trace of titanium could be found in the latter steel, so that it is not, strictly speaking, a titanium steel, but will be called so for the purpose of distinction.

In the accompanying diagrams, Figs 3 to 8, inclusive, are shown the results obtained from determinations for sulphur, phosphorus and carbon. A 13-16-in. drill was used, and drillings were taken to a depth of 5/8 in. The diagrams are drawn to scale, so that the location of the drillings can be readily seen. The methods used were the same for all the samples and all the determinations were made by one man. The results are briefly considered in order.

Sulphur.—This element segregates the most. In the ordinary steel it has risen from 0.098 per cent. in the ladle test to a maximum of 0.223,and there is a considerable area with more than 0.147, which is 50 per cent. more than the ladle test. In the case of the titanium ingot, the contrast is very remarkable. The greatest result is 0.101, which is not quite 50 per cent. more than the ladle test, 0.068, and the segregated area is very much smaller than in the case of the ordinary ingot. It is true that there are two factors which may partly account for this difference in results; the titanium ingot is somewhat smaller, and there is less sulphur in the steel as a whole. The fact remains, however, that there is much less segregation of sulphur in the titanium than in the ordinary steel.

Phosphorus.—In the ordinary steel the phosphorus has risen from 0.088 per cent. in the ladle test to a maximum of 0.167, and here also the segregated area is seen to be considerable. In the titanium steel the maximum is 0.124, starting with a ladle test of 0.093, and the segregated area is more restricted than in the case of the ordinary steel. The ordinary steel is in a better condition to start with than the titanium steel, as it has slightly less in amount (0.088 as compared with 0.093), so that the behavior of the phosphorus is a good test of the preventive power of the titanium.

Distance from Top of "A" Rail	Carbon, per cent		Sulphur, per cent.		Phosphorus, per cent.		Silicon, per cent		Manganese, per cent.	
	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.
0/2"	0.52	0.49	0.042	0.041	0.094	0.090	0.154	0.158	0.92	0.93
1/2"	53	47	042	038	092	091				
2/2"	53	49	042	039	093	093				
3/2"	53	49	044	041	092	092				
4/2"	52	49	043	039	094	089				
5/2"	53	48	044	041	094	091				
6/2"	53	47	042	040	096	093				
7/2"	54	47	043	042	096	092				
8/2"	54	48	042	041	099	095				
9/2"	54	48	042	041	095	091				
10/2"	54	50	043	050	099	088	161	177	93	97
11/2"	55	52	043	048	100	088				
12/2"	54	51	045	046	101	094				
13/2"	54	50	045	054	102	104				
14/2"	54	50	044	051	100	094				
15/2"	54	51	043	054	102	102				
16/2"	54	47	045	051	100	114				
17/2"	54	48	045	053	103	100				
18/2"	55	49	044	046	096	114				
19/2"	55	47	043	048	093	104				
20/2"	55	46	044	046	101	101	160	167	95	99
21/2"	54	47	043	048	095	107				
22/2"	54	46	043	049	098	105				
23/2"	54	54	044	054	101	108				
24/2"	54	55	044	050	100	098				
25/2"	54	54	044	051	102	097				
26/2"	54	56	045	051	100	100				
27/2"	54	53	043	051	101	102				
28/2"	56	52	045	050	104	107				
29/2"	54	52	045	051	100	100				
30/2"	54	53	046	051	098	104	160	172	95	97
31/2"	55	52	046	048	103	102				
32/2"	56	52	049	051	101	104				

Table I.—Analyses of A Rails.

Distance from Top of "A" Rail	Carbon, per cent		Sulphur, per cent.		Phosphorus, per cent.		Silicon, per cent		Manganese, per cent.	
	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.
33/8"	0.54	0.52	0.047	0.050	0.098	0.098				
35/2"	56	51	046	049	096	112				
36/8"	55	52	045	050	096	110				
38/2"	55	51	045	043	101	096				
39/8"	54	52	046	050	100	102				
41/2"	54	51	045	051	099	106				
42/8"	54	52	045	046	103	110				
44/2"	55	52	045	051	106	104	0.170	0.158	0.96	0.95
45/8"	56	53	045	048	105	100				
47/2"	54	53	043	048	103	105				
48/8"	55	....	045	....	098	....				
50/2"	55	53	045	048	103	100				
51/8"	54	53	043	048	095	101				
53/2"	55	53	042	047	100	102				
54/8"	54	52	041	047	094	096				
56/2"	54	53	044	047	100	100				
57/8"	52	53	044	047	098	101				
59/2"	50	53	040	047	098	101	157	166	97	94
60/8"	52	52	041	047	098	100				
62/2"	50	51	043	047	096	102				
63/8"	52	52	042	040	096	100				
65/2"	53	53	043	052	097	099				

Table II. Analyses of B Rails.

The results given in the diagrams (Figs. 5 and 6) show it to have been effective.

Carbon.—Here again the titanium steel shows less segregation than the ordinary steel, and it must be remembered that it starts with 0.47, as compared with 0.44 per cent. The highest results found are 0.67 in the one case and 0.69 in the other, and the diagrams show that the ordinary steel again has the larger segregated area.

The results of the silicon and manganese determinations are not given; they are somewhat erratic in each case, but do not exhibit segregation.

Results with Rails

It was felt desirable to make careful experiments with the entire length of rails from two ingots, one of ordinary steel and one of titanium steel. Among other reasons, the results given above do not represent those of regular practice, in which the ingots are placed in the soaking pits while the interior is still molten, and are rolled when solid throughout. It was thought that in the latter case, where the same opportunity was not given, there would not be found the same amount of segregation. Accordingly, two heats of steel were made as nearly as possible under the same conditions, except that in one case 75 lb. or 0.3 per cent. of ferrotitanium was used, and the steel held for 3 min. in the

ladle before pouring. In each case the third ingot of the heat was taken. The ingots were three-rail length, and the section rolled was the Dudley 100-lb. rail. The rails were marked A, B and C, being respectively the top, middle and bottom rails from the ingots.

The drillings for analysis were obtained in the side

Distance from end of rail.	Carbon, per cent.		Sulphur, per cent.		Phosphorus, per cent.		Silicon, per cent.		Manganese, per cent.	
	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.	Titanium.	Ordinary.
66'8"	0.51	0.53	0.041	0.050	0.097	0.100				
68'2"	54	53	042	051	099	098				
69'8"	51	52	042	040	099	099				
71'2"	52	52	041	052	092	092				
72'8"	50	52	042	057	092	096				
74'2"	50	52	041	053	093	098	0.172	0.172	0.92	0.93
75'8"	51	52	041	053	093	090				
77'2"	51	52	040	050	095	088				
78'8"	53	51	041	049	101	086				
80'2"	52	52	041	047	100	084				
81'8"	52	53	040	046	098	092				
83'2"	52	53	040	048	104	087				
83'8"	52	53	041	050	098	098				
86'2"	53	53	040	053	000	093				
87'8"	53	54	040	052	102	095				
89'2"	53	53	039	048	104	096	147	141	90	99
90'8"	51	53	039	052	092	098				
92'2"	51	53	040	052	095	094				
93'8"	51	52	040	050	099	095				
95'2"	50	53	040	053	102	090				
96'8"	51	51	039	042	092	084				
98'2"	51	52	040	044	091	086				

Table III.—Analyses of C Rails.

of the head with a 13-16-in. drill, going well past the center in each case, and to a uniform depth each time. Beginning 2 in. from the top of the A rails, drillings were taken every 12 in., and in the B and C rails, every 18 in.

The analyses of the ladle tests of these two heats were as follows:

	Carbon. Per cent.	Sulphur. Per cent.	Phos. Per cent.	Manganese. Per cent.	Silicon. Per cent.
Ordinary steel....	0.49	0.041	0.102	0.92	0.162
Titanium steel....	0.51	0.041	0.102	0.92	0.172

The results obtained on the drillings are given in Tables I, II and III. In the case of each rail, the distance given is from the top of the A rail.

In this case also it is seen that the use of ferrotitanium has lessened the segregation. The sulphur in the ordinary steel varies from 0.038 to 0.054 per cent., and in the titanium steel from 0.039 to 0.049. The phosphorus in the ordinary steel varies from 0.084 to 0.114 per cent. and in the titanium steel from 0.090 to 0.105. Lastly, the carbon in the ordinary steel varies from 0.46 to 0.56 per cent., but in the titanium steel only from 0.50 to 0.56.

The use of the alloy, therefore, has brought about much more uniformity in the steel, and, as remarked before, has lessened the segregation.

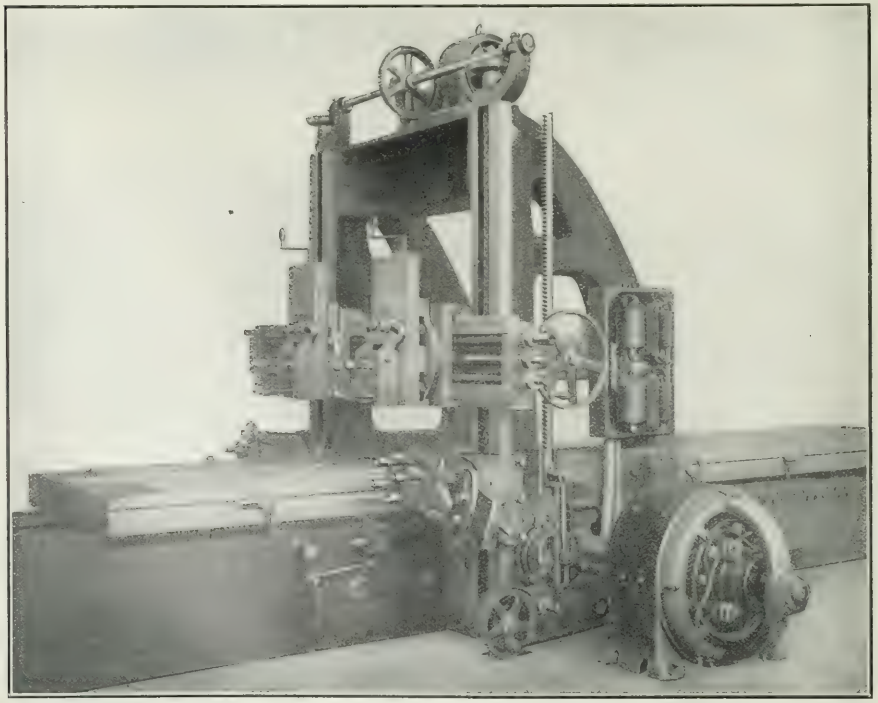
Improved Drive for Large Pond Planers

Power Supplied by a Reversible Variable-Speed Electric Motor

The larger a planer the more difficult does it become to drive and return its table without excessive waste of power or the use of somewhat complicated mechanism. In a new type of drive developed by the Pond Works of the Niles-Bement-Pond Company, New York, the common practice of accomplishing the reversing between the platen and the source of power has been departed from, and the reversing is done in the driving motor itself. The control, both for variation of cutting speed and reversing for the return speed is entirely through electrical means. Cutting speeds of between 25 and 40 ft. per minute are provided and return speeds of about 60 to 100 ft. per minute for moderately large planers and of between 55 and 90 ft. for the largest sizes. The minimum length of stroke that the platen can make is 2 in., and the platen can be stopped within a limit of ⅛ in.

The Platen Action and Control

The reversible electric motor, having a speed range of 4 to 1, or from about 200 to 1000 rev. per min., is



A 48 x 48 In. by 18 Ft. Planer with Reversing Motor Drive Built by the Pond Works of the Niles-Bement-Pond Company.

directly coupled to the shaft carrying the platen driving pinion. The motor switch panel is mounted on one of the housings, as shown in the engraving, and is connected with a pilot switch mounted on the bed of the machine. Through the combination the speed and direction of the table travel are controlled. On the controlling panel are four solenoid switches, the contact members of which are made of sheet copper or bar stock that is easily obtainable and bent to shape, so that renewals need entail no serious loss of time. Also on the panel board are two indexed gauges each having 12 different positions corresponding to as many speeds for the cutting stroke and the return stroke. By sliding the gauge knobs to the required positions, given cutting and return speeds are obtained. These gauges through resistance regulate the armature and field strength.

The pilot switch is entirely enclosed, is only 6 in. in diameter and is located on the planer bed, where the hand lever control common to belt driven machines is usually placed. It is tripped in the usual way by adjustable dogs on the edge of the platen, and by its movement electrically operates the controller on the housing. The pilot switch can be operated by hand instead of by the reversing dogs, giving the operator immediate control of the cutting speed from the minimum up to that for which the controller gauges are set. Similarly the return speed may be governed. This ability to vary speeds in the middle of a stroke is especially of advantage when planing castings with hard spots, thin walls, &c., or a line of castings which may vary in hardness of metal. In such cases the cutting speed is set to that most suitable for the average or soft castings, and as the tool is about to encounter the harder metal or thin walls, the pilot switch is shifted by hand and the minimum cutting speed is immediately obtained and is maintained until the pilot is returned to its former position.

To stop the platen at any particular point, the operator throws the pilot switch to the middle or off position, and the platen comes to rest within a limit of ⅛ in. The speed with which the control lever is shifted does not affect the proper control of the motor. On account of the controller's automatic action it is impossible to reverse the direction of the motor's rotation until its speed is diminished to a safe amount. It is claimed that this not only effects a power saving of nearly 100 per cent. at the instant of reversal, but saves the current supply line from any voltage surge or pumping action.

Advantages Over Belt or Clutch Driven Planers

The builder gives the following arguments to support the contention of the superiority of this type of drive over others: In the belt-driven planers a continual variation of stroke or cutting speed and of useful power is taking place as a result of variation in belt tension and belt surfaces in contact. Where a planer is driven by a motor through friction clutches, the efficiency of the friction surfaces is affected by oil, moisture and heat, so that planers with this type drive are subject to the same variations in cutting speed and useful power as belt-driven planers. In either of the foregoing types there is the attendant element of slip at the time of reversal. Slip in the transmission of power is a direct loss, not only of the power, but in expense occasioned by the necessary replacement of belt or frictional surfaces through wear. In the new Pond drive the direction of the platen stroke is changed, not through shifting belts or clutches, but by reversing the direction of rotation of the motor. The absence of friction surfaces eliminates all the disadvantages inherent to belt or friction clutch drives. Maximum efficiency is secured by the instant availability of the speed best suited to the work, and overhead crane service is facilitated by the absence of vertical belts and countershafts.

The Williams Ratchetless-Ratchet-Rench

To explain the apparently contradictory name of the new drop-forged wrench recently patented by J. H. Williams & Co., Brooklyn, N. Y., it acts like a ratchet wrench, but contains no ratchet mechanism. The idea will be quickly understood from the illustrations, Fig. 1 showing the general appearance of a double-ended wrench of the type and Fig. 2 a diagram of its action in use.

When pressure is exerted on the handle of a wrench there are only two points of contact between the nut



Fig. 1.—A Solid Wrench of a Form That May Be Used Like a Ratchet Wrench, Made by J. H. Williams & Co., Brooklyn, N. Y.

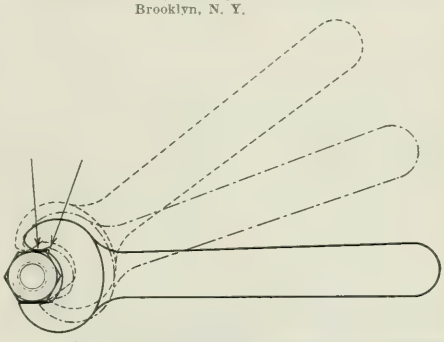


Fig. 2.—Diagram of the Action of the Williams Ratchetless-Ratchet-Rench.

and the jaws; these are at the outer end or point of the advancing jaw and the heel of the following jaw. Obviously the point of the latter can be cut away without destroying the effectiveness of the wrench. It still can be used in either direction, but must be turned over for opposite rotation. The advantage of the modification comes in when the wrench is on its idle stroke, for, instead of retracting it from the flats of the nut after the manner of an ordinary solid wrench, the handle is simply swung back as with a ratchet wrench, and the short jaw rolls on the flat with which it is in contact, releasing the other jaw from the opposite flat. Further movement of the handle attended with slight pressure toward the nut allows the sh t jaw to slide as soon as the nick at its base is free. When the long jaw comes in contact with the next flat of the nut the short jaw hooks the corner diametrically opposite the one in contact with the point of the long jaw and a reverse rotation of the handle causes the nut to turn.

The new wrench is claimed to work with imperceptible wear on the nut or tool; there is nothing to get out of order and its action is materially more rapid than that of a solid wrench. The wrench is made in a variety of sizes. Sizes now in stock are adapted to engage at their smaller ends a tire lug, a 9-16-in. set screw and ⅜-in. cap screw, and at their larger ends a spark plug, a ½-in. United States standard bolt and a ⅝-in. cap screw. Sizes for ¼ to ¾-in. bolts and ¼ to 1-in. cap screws are now in preparation, and other sizes will be made to order in reasonable quantities.

The American Shipbuilding Company is building a forge shop at its Lorain, Ohio, plant. The shop will be 60 x 200 ft., of concrete and steel. A 4500-lb. hammer will be installed for heavy forging work.

De Laval High Efficiency Centrifugal Pumps

The Principles of Design and Their Selection for Various Services

The requisites of a centrifugal pump are that it shall give the required capacity at the required head and with the specified speed, and do the work efficiently. In the development of the designs of the De Laval Steam Turbine Company, Trenton, N. J., much has depended on analysis of tests made upon pumps previously built. This enables predicting accurately the performance of a new pump, even where the service is quite out of the ordinary.

The efficiency obtainable is influenced by the speed at which the pump is to be run, the capacity, the head and the characteristics desired. In calculating efficiencies the total head generated is taken as the suction head measured at the entrance to the pump, plus the pressure head measured at the discharge, plus the difference in level of the two gauges, plus the gain in velocity head between the two points where the gauges are connected.

Characteristics of Centrifugal Pumps

The accompanying diagrams, Figs. 1 to 8, show characteristic curves of De Laval centrifugal pumps of several sizes, designed for different classes of service. Each diagram contains three curves, which indicate the head developed, the power required and the mechanical efficiency developed throughout the range of output or capacity of the pump. These three curves show accurately what the pump will do under any given conditions.

The characteristics of a pump of improper design are shown in Fig. 9. While the efficiency of this pump is fairly good for the capacity, its other features render it unsatisfactory. The pump generates at no delivery a head of about 215 ft., but when delivery begins, the head rises until, at a delivery of 300 gal. per min., it is over 260 ft., after which it falls. The greatest efficiency is obtained at an output of about 450 gal. per min., which is therefore the delivery at which the pump should be rated. The head generated at this output at the speed corresponding to the chart is about 235 ft., which should therefore be the working head. However, if the head at no delivery is only 215 ft., the pump would not, when working against a static pressure, such as that in a standpipe, begin to deliver until the speed had been considerably increased or a by-pass opened. After getting the delivery up to the desired amount, the speed could then be reduced or the by-pass closed, but the pump would be left in a state of unstable equilibrium, and if it should lose the flow, would not be able to regain it.

More serious still are the defects of the horsepower curve. The power consumed by the pump increases steadily from no delivery up to the maximum tested. This means that if the head on the discharge of the pump be relieved, as when beginning to pump into an empty standpipe, or when there is an exceptional demand for water, the amount of power consumed will be excessive, perhaps sufficient to overload and burn out an electric motor, or to require the use of an unnecessarily large and expensive motor, and in this type of unit the motor is the more costly part.

In each of the diagrams relating to De Laval pumps it will be seen that the horsepower required reaches a maximum at about the delivery corresponding to the maximum efficiency, which delivery is that for which the pump was designed. After this, the power taken by the pump becomes less as the flow increases, so that should the head on the pump be diminished, as through breakage of a pipe line, or other cause, the brake horsepower consumed will actually decrease, rendering overloading of the motor impossible. This automatic protection to the motor is secured, not by the addition of governing apparatus or other contrivances, but by the shaping of the pump passages. This makes possible the use of smaller and less expensive motors and permits selecting a motor having maximum efficiency at the output coinciding with the demands of the pump under normal operating conditions.

Construction of De Laval Pumps

A De Laval single-stage pump consists of the casing, which is divided into top and bottom parts, *a* and *b*, Fig. 10; the impeller *c*, running in the casing; the shaft *d*, supporting the impeller; the packings *e* and *f* around the shaft, preventing the entrance of air into the casing; and the bearings *g* and pedestals *h*, by which the shaft is supported. The water passage from the suction opening to the inlet of the impeller is formed in the lower half of the casing, branching in single-stage pumps, so that water is admitted to both sides of the impeller. The discharge passage is likewise formed in the lower part of the casing and is a continuation of the volute or chamber surrounding the impeller. Water entering the suction opening flows to the inlet opening of the impeller, and in passing through the latter is thrown outward, gaining both velocity and pressure through the action of centrifugal force, and the acceleration experienced in the impeller. In the volute chamber surrounding the impeller, the velocity is gradually reduced to that of the flow in the discharge pipe, and thereby energy of motion generates an additional pressure.

The casings of horizontal pumps, both single-stage and multi-stage, are formed of two parts only; that is, they are split horizontally on the center line of the shaft and both the suction and discharge openings are in the lower half. The top half can be lifted off, as shown in Fig. 11, after which the impeller and all passages are accessible, and the shaft and attached parts can be removed without disturbing the piping or connections or any other part of the machine. There is but one joint in the casing, a plain, flat surface, scraped to a fit and maintained tight by an oiled paper gasket. The construction of the water passages and the volute is such that they serve as heavy stiffening rings to withstand the bursting effect due to the water pressure. Cast iron is used for the casings of all pumps handling noncorrosive liquids or fresh water. If corrosive or abrasive liquids are to be handled, other metals are used, such as acid-resisting bronze, nickel alloys or steel.

The Impeller

As the water passes through the impeller at a relatively great velocity, any irregularities will be highly wasteful of energy. The losses occur within the impeller, depending on the manner in which the stream of water through the passages is handled, and without the impeller, due to friction against the water in which it revolves. The impeller should receive the water without shock, and the water should flow through it without shock or undue skin friction. Shock is due to improper shape of passages, which may also give rise to cavitation and subsequent corrosion. Skin friction is determined principally by the roughness and extent of the passages. It is, therefore, important to have the impeller interior finished, and to make it of a material that will retain its original finish and shape, and, aside from other considerations, the length of the passages through the impeller should be reduced as much as possible.

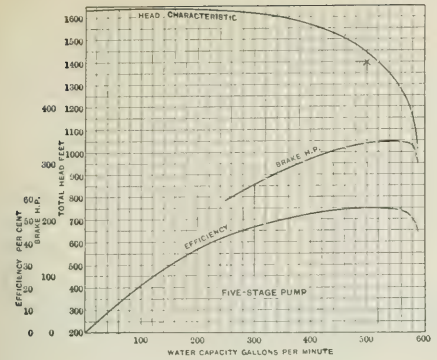


Fig. 1.—Hydraulic Pressure Pump for Steel Mill Service.

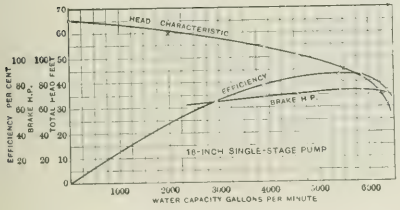


Fig. 3.—Circulating Pump for Barometric Condenser Service.

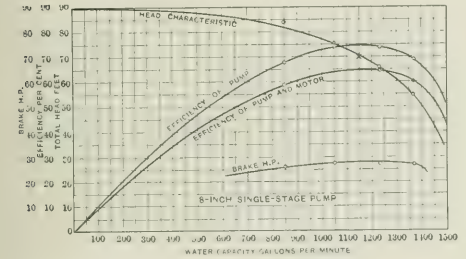


Fig. 5.—Small Motor-Driven Service Pump for Moderate Head.

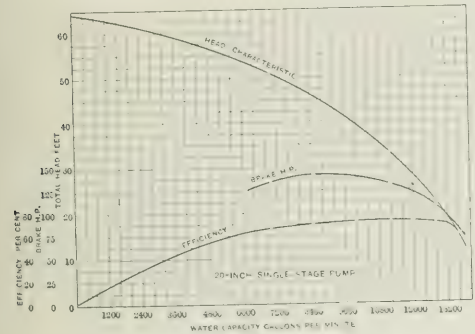


Fig. 7.—Large Motor-Driven Pump for Low Head Service.

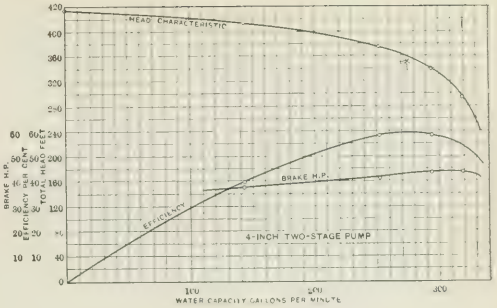


Fig. 2.—Turbine-Driven Boiler Feed Pump.

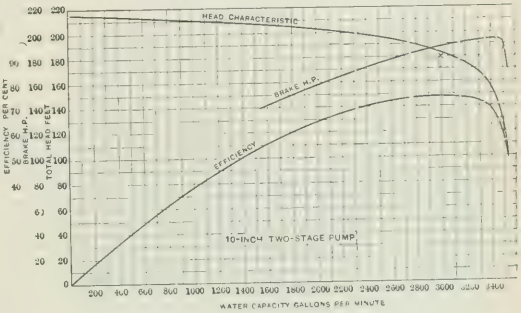


Fig. 4.—Water Works Pump for Moderate Head.

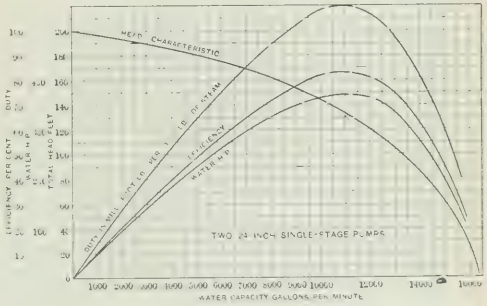


Fig. 6.—Large Turbine-Driven General Service Pump.

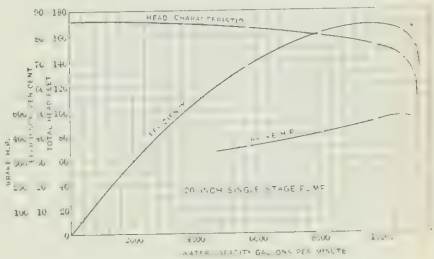


Fig. 8.—Motor-Driven General Service Pumps.

TEST CHARACTERISTICS OF DIFFERENT TYPES OF DE LAVAL CENTRIFUGAL PUMPS.—X INDICATES HEAD AND DELIVERY SPECIFIED.

The energy losses on the outside of the impeller are traceable both to viscosity and to eddies, and their amount, besides depending upon the nature of the surface, increases about as the square of the velocity at which the surface travels through the water. To generate a given head, the periphery of the impeller of a centrifugal pump must run at a definite velocity. Then a square inch of outside surface on the impeller will

meet a certain resistance as it revolves, which, multiplied by its velocity, will represent the rate at which it is wasting energy. Therefore, of two pumps generating a given head, the larger diameter impeller will have a greater number of square inches of surface moving at any given velocity, and will, therefore, waste a correspondingly greater amount of energy. In addition the width of surface between two given velocity limits will be greater as the diameter of the impeller is greater, so that the extent of surface running through the water at a given velocity will increase as the square of the diameter. In other words, the external impeller

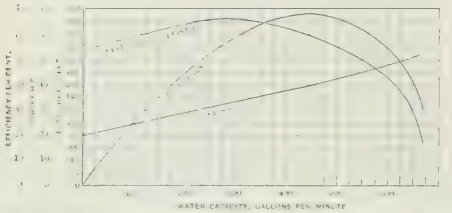


Fig. 9.—Characteristics of a Turbine Pump of Improper Design.

friction for a given head varies as the square of the diameter, so that the small diameter impeller is better.

The open impeller without side plates, that is, the paddle-wheel type, not only gives rise to excessive friction, due to the contact of the rapidly moving water in the impeller with the stationary pump casing, but eddy currents between the edges of the impeller and the case are also set up. The inclosed impeller is not subject to these losses, as the retaining shrouds revolve with the blades and with the contained water. The blades of open impellers must run close to the pump casing to prevent leakage. This trouble is not present with the inclosed impeller, which can be run with any desired clearance. As the velocity gradient between the impeller and the casing can be then distributed over a greater distance, the difference of velocity between adjacent layers of water is less, and, as hydraulic losses increase about as the square of the velocity, the waste of energy is also less.

The impellers of De Laval pumps are bronze, the metal best adapted to withstand the action of water and retain its original shape and smoothness. It also takes a high polish and allows of more accurate castings than can be obtained with iron. The impellers are finished on all surfaces, and the vanes are filed and polished by hand to templets, to obtain the exact theoretical curvature. They are then mounted and balanced for static and running balance at high speed. The double-suction inclosed impeller is used for all De Laval single-stage pumps. It eliminates end thrust and much of the wear and friction on bearings, besides permitting of handling a larger volume with a given diameter of impeller.

The Absence of Diffusion Vanes

De Laval pumps give high efficiencies without dependence upon diffusion vanes to form gradually enlarging passages from the periphery of the impeller to the volute or discharge chamber, the purpose of these passages being to receive the water without shock as it leaves the impeller and to allow it to slow down gradually as it approaches the volute chamber, converting the velocity head into pressure head. When first introduced diffusion vanes happened to increase somewhat the efficiency of the centrifugal pumps then in vogue, but in a properly designed pump they are more harmful than otherwise, since they can be designed to suit only one condition of discharge from the impeller into the diffusion passages. The water leaving the vanes of a centrifugal pump impeller should be directed by the appropriate shape of the casing. Diffusion vanes are correct only when the pump is operated at exactly its rated head and speed; any change in either capacity, head or speed renders them inefficient, for they then obstruct the passage of water, introduce additional skin friction loss and offer chance for solid matter to jam between them and the impeller blades.

The Running Parts and Packing

The shafts are special hammer forged, open hearth steel, turned and ground. All bearings are of the vertically split, babbitt-lined, ring-oiled type, not integral with the pump frame or shaft pedestals, but formed in separate shells resting in the brackets or pedestals. The latter are separate from the pump casing and

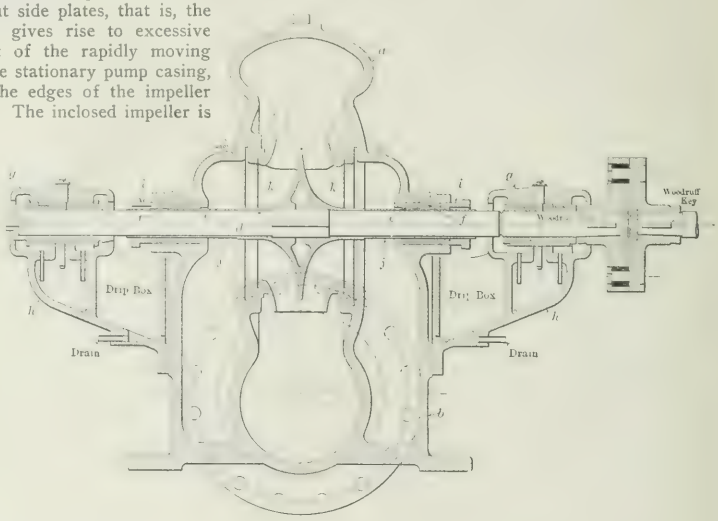


Fig. 10.—Longitudinal Sectional Elevation of a De Laval Single-Stage Double Suction Centrifugal Pump.

stuffing boxes, and no water can leak past the stuffing boxes and find its way into the bearings and oil reservoirs. The separate pedestal also permits removing the bearings for inspection without disturbing the stuffing boxes, pump case cover or other parts of the pump. To prevent the creeping of oil from the bearings along the shaft, the latter is provided with grooves, commonly known as "oil slingers."

Leakage of water out of the pump or of air into the pump along the shaft is prevented by packed glands, *i*, Fig. 10. These contain soft packing under pressure, with a hollow skeleton ring in the middle of the packing, to which water under pressure is admitted, forming an air tight seal and preventing the entrance of air into the suction chamber of the pump and consequent loss of suction. The glands are bronze, split horizontally to allow removing without disturbing other parts of the machine. The shaft at this point is protected from corrosion by a special bronze sleeve, *j*, which extends inward to the impeller and forms a bearing surface for the packing. Any scoring is re-

ceived by the sleeve, which can be easily and cheaply replaced.

Leakage from the discharge chamber back past the impeller to the suction chamber is prevented by the combination of a removable wearing ring *k*, attached to the pump casing and of another removable ring *l*. attached to the revolving impeller. The intermeshing grooves form a labyrinth joint, as is more plainly shown in Fig. 12, and make it possible to maintain high efficiency while developing high pressure per stage. This type of packing permits larger

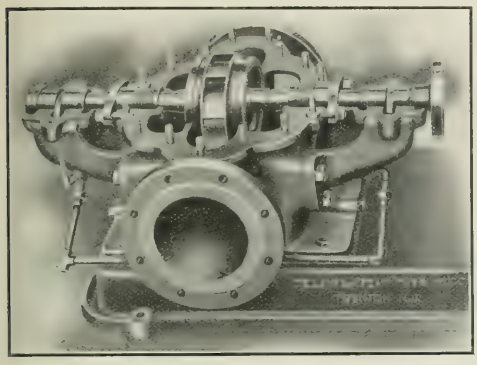


Fig. 11.—A Small De Laval Single-Stage Pump with Cover Removed Showing Accessibility of Internal Parts.

clearance, both axially and radially, without excessive leakage. The path of the water through the rings is tortuous, and the loss of head at each turn prevents rapid flow, besides which the water in the labyrinth is set in rotation, creating a counter centrifugal force opposing the leakage. The rings are made of bronze.

It is practically impossible to maintain three or more bearings in alignment, especially with a rapidly turning shaft. For this reason, all De Laval pumps are provided with a flexible coupling between the pump and the driving motor. The shaft of each is supported by two separate bearings and either mechanism can be removed without dismantling the other.

Vertical Shaft Centrifugal Pumps

The general design and details of construction of the vertical pumps are similar to those of the horizontal type. In some cases the vertical type of machine is furnished with a single suction impeller where the conditions are more suitable for this kind. A lower guide bearing is used to avoid the use of an overhung impeller, which is apt to vibrate and destroy the upper bearing. Both bearings are so arranged that they can be inspected while the pump is in operation, and can be removed without disturbing any part of the pump other than the bearing cap. The sub-base is cut away, so that the lower bearing bracket is fully accessible. In connection with the upper bearing there is a thrust bearing to carry the weight of the running parts of the pump. Hydraulic balance is secured by the design of the pump. All bearings are furnished with special oiling devices and sealed oil drain reservoirs. In case the pump is operated submerged, all waste oil can be piped to an elevation above water level and reclaimed.

Multi-Stage Pumps

A multi-stage pump, such as is shown in Fig. 13, is several single-stage pumps in series, with their impellers in the same casing. Thus, the pressures developed in the several stages are added together and the total head is equal to the sum of the heads generated by the individual stages. The casing is, like those of the single-stage pumps, of two castings only, the passages from the delivery chamber of one impeller to the suction of the next being formed permanently in the solid casting itself.

The impellers of multi-stage pumps are of the inclosed type, and may be regarded as halves of double suction impellers. Water enters the double suction impeller axially from the two sides and the two currents of water join after having been turned into a radial direction; two single suction impellers, as shown in Fig. 12, put together back to back and the dividing wall between the impellers thinned out to nothing toward the periphery, would become a double suction impeller as used in single-stage pumps. The use of the double suction in the single-stage pump renders the impeller self-balancing. To use a double suction impeller in multi-stage pumps would involve complicated passages.

It is possible, however, to balance a single suction impeller by duplicating the conditions of pressure on both sides of the web of the impeller, by providing a balancing chamber on the back of the impeller, as shown in Fig. 12, having the same cross sectional area as the suction chamber, being inclosed by labyrinth rings of the same diameter as those encircling the suction opening. The web of the impeller is pierced

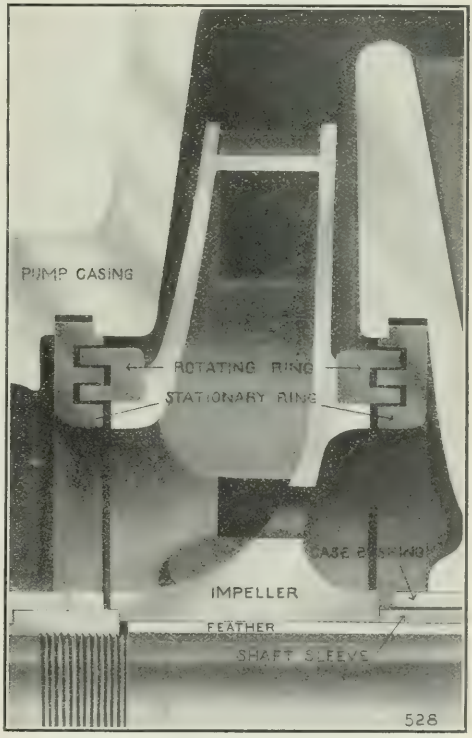


Fig. 12.—Longitudinal Sectional Detail of Impeller and Casing of a Multi-Stage Pump Showing Labyrinth Packing Rings, Shaft Protecting Sleeve and Case Bushing.

by holes connecting the balancing chamber with the suction chamber, so that the static pressure in the suction chamber shall be transmitted to the balancing chamber, also that an extra pressure shall be generated in the balancing chamber approximately equal to the thrust due to the reaction of the axial column of water entering the suction of the impeller. To provide for possible unbalanced end trust, babbitt lined, ring oiled thrust bearings of the marine type, form the supporting bearing.

The multi-stage pump contains an additional water joint, as compared with the single-stage pump, located

where the rotating shaft passes through the diaphragms separating the several stages. This joint, *m*, Fig. 14, is formed between a protecting bronze sleeve keyed to the revolving shaft and a similar sleeve held by the diaphragm. It is long, with small clearance, but there is no rubbing contact and wear does not occur.

Pumps for Special Services and Methods of Driving

The centrifugal pump is used efficiently for handling water under practically all conditions. It is readily adapted to all customary speeds, and can be driven by electric motor, gas or steam engine, steam turbine or belt. Turbine driven pumps may be driven through gears or directly from the turbine shaft. By gears, it is possible to operate the pump at any desired speed, and inasmuch as two gears can be driven from a single spindle, two pumps are easily arranged for parallel or series operation, or both, as desired, a valuable feature where pumps must work against different heads at different times. If pumps are to be directly connected to electric motors, it is important that the speed of the pump should be adapted to the speed of the motor. In general high speed motors weigh less and cost less than low speed motors, and the pump can be designed to meet any speed conditions imposed by motors. Belt driven pumps are similar, except that they are provided with an outboard bearing attached to the bed plate for supporting the shaft beyond the pulley. In large sizes, four bearings are provided and a flexible coupling is placed between the shaft carrying pulley and the pump shaft. This allows the pump to be dismantled without disturbing belt or pulley and protects the pump shaft from distortion due to the pull of the belt.

For mine pumping the De Laval pump possesses the advantages that it occupies little space, does not endanger the motor in case of accidental release of pressure, is easily adapted to work efficiently at different heads, and can be kept in continuous operation for long periods of time without requiring attention to packing glands, &c. For water works pumping service, the pump is entirely suitable, especially where a moderate first cost is important.* The simplicity and durability of the pump enables it to be run by comparatively unskilled labor. It contains practically no packings and can be run continuously 24 hours a day. It also has a large overload capacity and can be speeded up, or changed from parallel to series, to give high pressure for use in fires or for other purposes. Where electric power is available it is frequently more economical to install a motor driven pumping unit than to install a steam plant. By means of electric-driven centrifugal booster pumps, it is possible to supply elevated districts much more economically than by raising the pressure over the entire territory supplied.

For condenser circulating service, absolute reliability is required. Where centrifugal circulating pumps are used to supply barometric condensers, the sloping characteristic curve peculiar to the De Laval pump is valuable, since the pump must start from no flow against a comparatively high head without the assistance of vacuum to lift the water and, after the condenser is in operation, handle the much larger volume of water demanded by the condenser against a lesser head. For hot well service, the pump has the advantages of requiring little space and attention and of being flexible and easily controlled, especially when steam turbine driven. It responds automatically to wide variations in load and greatly simplifies the operation of a condensing plant.

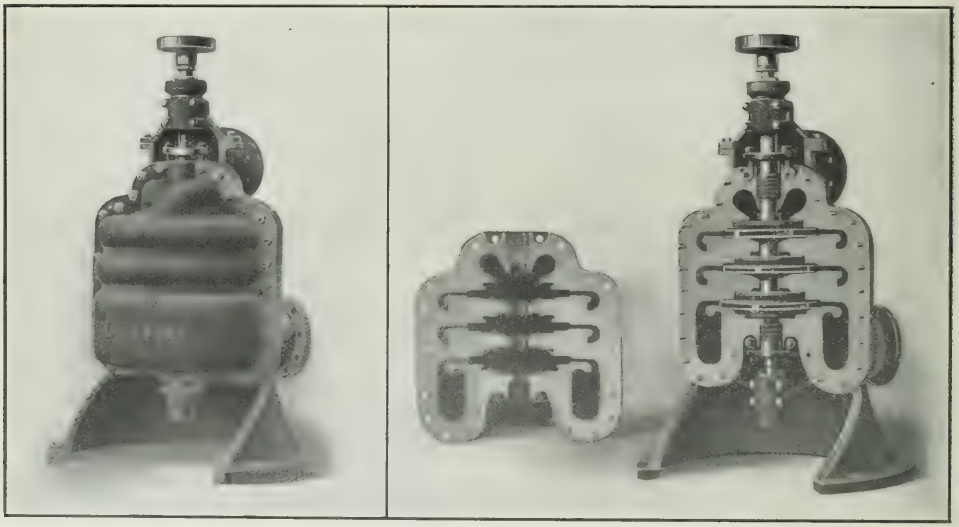


Fig. 13.—Assembled and Opened Views of a Vertical De Laval Three Stage Pump.

Centrifugal boiler feed pumps* are usually of small capacity and deliver against a comparatively high head. They have pre-eminent advantages for this work, as they do not endanger the pipe line by vibration and shock, and the entrance of water to the boiler can be regulated without reference to the pump. There are no valves or large packings to be kept tight, nor is there danger of breakage of the pump through loss of suction by reason of hot water. The steam turbine driven boiler feed pump can be operated in connection with any standard pump governor to maintain either a fixed pressure or a fixed excess pressure in the feed line. In this case the turbine governor operates only as a maximum speed limit.

Where the highest steam economy is not required, as in the case of steam plant auxiliaries, the exhaust of which can be used in feed water heaters, the gearless turbine driven centrifugal pumps are recommended by their compactness and simplicity. In such units, the pump impeller and the steam turbine motor shafts are connected directly together by a flexible coupling. If

* *The Iron Age* contained an illustrated description of a set for this class of service.

A set of this type was described in *The Iron Age*.

the exhaust of the turbine can be used for heating the feed water, the power required to drive the pump costs practically nothing, since all the energy in the steam is returned to the boiler. On the other hand, where economizers are installed and where there would otherwise be an excess of auxiliary exhaust, the feed pumps can be fitted with a low pressure turbine and run with the exhaust steam of other auxiliaries or from the intermediate receivers of the main engines or turbines. The turbine driving the pump can also be arranged to exhaust into the intermediate stage of the main turbine.

For circulating hot water in heating systems, the gearless turbine driven pump offers advantages in the way of simplicity, reliability and absence of shock. There is practically no expense, as the exhaust can be utilized in the water heater. The same considerations apply to brine pumps. By arranging these to be driven by mixed flow turbines, they may be operated on live steam or exhaust steam, or both, as required to round out the efficiency of the plant or to provide more exhaust for ice making.

De Laval pumps are widely used in steel works for hydraulic pressure service. There are no valves, an important matter where high pressure must be generated, and the small shaft areas are easily kept tight against leakage. There is no danger of excessive pressure, and the high pressures required can be generated with comparatively few stages. Usually plenty of exhaust steam is available in a steel plant to supply a low pressure turbine driving a pump, and such pumps show marked economy.

Pumps for irrigation, drainage or handling sewage are often driven by electric motors, using purchased current from transmission lines. Special materials are used where the water is corrosive or contains abrasive material.

The standard De Laval multi-stage pump has been approved by the Associated Factory Mutual Fire Insurance Companies for use as a centrifugal fire pump. The characteristics of these pumps prevent overloading of the driving motor under the various head and capacity conditions, as when a large number of hydrants are opened or many hose lines connected; and on the other hand the pressure will not rise excessively when the pump is delivering only a small output. Also, by reason of the sloping characteristic, there is no difficulty in starting a second pump in on a piping system on which one pump is already working. Fire pumps are supplied in four sizes: 500, 750, 1000 and 1500 gal. per min. Each will generate a standard pressure of 100 lb. per square inch, but the same type of machine can be furnished for special conditions requiring greater water capacity or greater head.

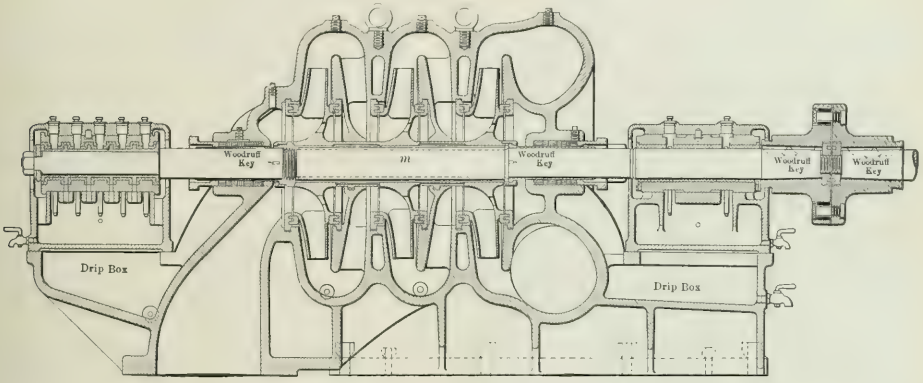


Fig. 14.—Longitudinal Sectional Elevation of a De Laval Three-Stage Centrifugal Pump.

The Dominion Iron & Steel Company's Report

The total net profits of the Dominion Iron & Steel Company for the fiscal year ended May 31, 1910, amounting to $2,237,489, showed an improvement of $11,655 over 1909, but were $362,511 less than in 1908. The lack of a greater gain over last year was due to the deficiency in the fuel supply from the Dominion Coal Company, which made it necessary to obtain coal from outside sources, and increased the cost of production to the extent of $160,000. The charge for depreciation also was greater by $89,809 than that of 1909. For the past four fiscal years the earnings have compared as follows:

	1910.	1909.	1908.	1907.
Totals	$2,237,489	$2,225,834	$2,600,000	$2,247,536
Interest	629,528	654,422	605,000	684,384
Surplus	*1,607,960	1,571,412	1,995,000	1,563,152

* Total surplus, May 31, 1910, was $2,058,225.

The production for 1910 of iron and steel of all kinds totaled 785,827 gross tons, as against 1,029,617 tons in 1909 and 1,029,155 in 1908, the loss being the result chiefly of the irregular coal supply.

In view of the fact that the company has now completed its merger with the Dominion Coal Company, and thus insured itself against further fuel trouble, the production for the current fiscal year should experience a considerable increase, and as orders are plentiful and the plants are running at capacity, earnings should show corresponding gains. The government bounties on pig iron will cease next December and those on wire rods in June, 1911, but it is thought that their absence will not be felt, owing to the fact that the cost of production is steadily being lowered.

Texas Iron Ore of High Quality

E. J. Lavino & Co., Bullitt Building, Philadelphia, Pa., furnish the following information in regard to the Texas iron ore which they recently received at that port on the steamship F. J. Luckenbach: "This ore was sampled while being discharged at Philadelphia by Andrew S. McCreath & Son, Harrisburg, Pa., and their test is as follows:

	Per cent.		Per cent.
Moisture	3.438	Manganese	0.314
Metallic iron	57.450	Sulphur	0.116
Silica	4.800	Phosphorus	0.118
Alumina	0.942		

"This sample cargo was made up of ore dug from the ground and shipped run of the mine; it had not been treated or washed in any way and shows how much better this particular Texas ore is than the ore found in other sections of Texas or in the other Southern States."

Some Recent Tests of Cast Iron *

The Sensitiveness of Cast Iron to Cooling Influences

BY ALEXANDER E. OUTERBRIDGE, JR.

In the *Proceedings* of the American Society for Testing Materials, 1903, Vol. III, p. 216, will be found a paper by the writer in which attention was called to the extraordinary variation in the physical properties, such as strength, hardness, softness, ductility, density, size of grain or "fracture," &c., of test bars or other castings of different thicknesses, poured from one ladle of molten iron, due to differences in the rate of cooling of the metal. No comparable variations, caused in this way, exist with other metals, such as the nonferrous alloys, or even with steel (except in a minor degree); and it is no exaggeration to say that the rate of cooling of gray cast iron exerts as important an influence in determining its physical properties as does variation of its chemical constituents, within, of course, certain wide limits.

In the paper referred to, four hypothetical cases were cited in illustration of this dictum and several actual tests were recorded. Some of these records were of experiments made by the writer over 20 years ago, while others were of more modern date. Some of them showed the difference in fracture, strength, density, &c., between sections cut from the center and those cut from near the surface of comparatively large masses of metal. Others showed remarkable differences in tensile strength between round bars of different diameters in the rough, cast from one ladle, and turned to different dimensions. The following conclusions were drawn from these tests:

Importance of Knowing the Dimensions of Test Bars

The rate of cooling of cast iron from the fluid to the solid state is such an important factor in determining the physical properties of the metal, that it is just as necessary to know the dimensions of the test bars as it is to know the chemical composition. For the same reason, it is equally desirable that standard sizes of test bars should be adopted which would be suitable for different grades of iron.

Since that time some progress has been made in this country toward the standardization of cast iron test bars, largely through the efforts of Dr. Moldenke and a committee of the American Society for Testing Materials, but there is still a lack of uniformity in the practice prevailing in this country and in Europe, which it is hoped may eventually be rectified.

Very recently the writer has had occasion to again observe the operation of the law of rate of cooling of cast iron in test bars varying but slightly in dimensions. In these later experiments the bars were accurately turned to uniform size and pulled on the 100,000-lb. hydraulic testing machine of William Sellers & Co., Inc. It happened that a number of experimental castings were required which would show very much higher tensile and transverse strength (the former to range from about 27,000 to 40,000 lb. per sq. in.) than if cast from ordinary foundry iron, and at the same time should be absolutely free from brittleness or hard spots in any part of the castings, which were only about ⅜ in. thick in the thinnest portions.

Test No.	Dimensions of Bars as Cast, ins.	Dimensions of Bars as Machined: Length, ins.	Diam., ins.	Area, sq. ins.	Ultimate Strength of Bars: Total lbs.	Lbs. per sq. in.	Average, lbs. per sq. in.	Remarks.
2270	1 × 1 × 15	2	0.505	0.2	5,400	27,000	27,000	Poured from one ladle; cast March 29, 1910
2270	1 × 1 × 15	2	0.505	0.2	5,400	27,000		
2271	¾ × ¾ × 15	2	0.505	0.2	5,900	29,500	29,250	
2272	¾ × ¾ × 15	2	0.505	0.2	5,800	29,000		
2273	1 × 1 × 15	¾	0.505	0.2	7,000	35,000	36,050	" " " " " April 1, 1910
2274	1 × 1 × 15	¾	0.504	0.1995	7,400	37,100		
2275	¾ × ¾ × 15	¾	0.505	0.2	8,500	42,500	41,750	
2276	¾ × ¾ × 15	¾	0.505	0.2	8,200	41,000		
2299	1 × 1 × 15	¾	0.505	0.2	5,200	26,000	25,000	" " " " " April 5, 1910
2300	1 × 1 × 15	¾	0.505	0.2	4,800	24,000		
2301	¾ × ¾ × 15	¾	0.505	0.2	5,300	26,500	27,500	
2302	¾ × ¾ × 15	¾	0.505	0.2	5,700	28,500		
2284	1 × 1 × 15	¾	0.505	0.2	5,800	29,000	30,500	" " " " " April 9, 1910
2285	1 × 1 × 15	¾	0.505	0.2	6,400	32,000		
2286	¾ × ¾ × 15	¾	0.505	0.2	7,400	37,000	34,750	
2287	¾ × ¾ × 15	¾	0.505	0.2	6,500	32,500		
2288	1 × 1 × 15	¾	0.505	0.2	5,400	27,000	27,000	" " " " " April 12, 1910
2289	1 × 1 × 15	¾	0.505	0.2	5,400	27,000		
2290	¾ × ¾ × 15	¾	0.505	0.2	6,500	32,500	32,250	
2291	¾ × ¾ × 15	¾	0.505	0.2	6,400	32,000		
2303	1 × 1 × 15	¾	0.505	0.2	6,900	34,500	35,000	" " " " " April 21, 1910
2304	1 × 1 × 15	¾	0.505	0.2	7,100	35,500		
2305	¾ × ¾ × 15	¾	0.505	0.2	8,500	42,500	42,500	
2306	¾ × ¾ × 15	¾	0.505	0.2	8,500	42,500		

Tensile Tests of Cast Iron.

Results Shown by Recent Experiments

Two test bars, 1 x 1 x 15 in. and ¾ x ¾ x 15 in., were poured from the same ladle as each casting. The object of making two sizes of test bars varying only ¼ in. in lateral dimensions, was to approximate as closely as possible the cooling conditions existing in the castings, which varied in thickness. The larger bars were broken transversely in a testing machine, using a span of 12 in. Then one of the broken pieces from each transverse test and each of the smaller bars were turned to a diameter of 0.505 in. between threaded ends and pulled in the 100,000-lb. testing machine. The smaller bars were not subjected to the transverse test. Only tensile tests are recorded herein, and all represent tests of different bars, not duplicate tests of any single bar.

The ratio between the transverse strength of a bar 1 in. square, not machined, tested on a 12-in. span, and the tensile strength of the same bar machined, is about 1 to 10 with ordinary foundry iron, about 1 to 11 with stronger iron, and about 1 to 12 with very strong iron.

The following interesting points may be noted:

* Read before the American Society for Testing Materials, Atlantic City, N. J., June, 1910.

1. The uniformity of tensile strength of different bars of the same dimensions cast from one ladle of iron.

2. Invariably the smaller test bars (¾ in. square) of any series, if free from flaws, show higher tensile strength than the larger bars (1 in. square) cast from the same ladles, thus fully corroborating the observations previously recorded in 1903.

3. In machining the test bars, it was observed that the chips from the bars of the stronger metals (both from those 1 in. square and those ¾ in. square), instead of breaking off short, like ordinary cast iron, were quite curly like soft steel or wrought iron turnings.

4. In all cases save one, the metal of the castings in the thinnest section (⅜ in.) was entirely free from chill, or mottled iron, and was readily machinable. In the exceptional instance the metal was perfectly gray in the test bars and in the castings themselves, except in the thinnest portions where it was almost white, due to the more rapid cooling of these very thin walls.

A study of the accompanying table of tests will show that the minimum increase in the average tensile strength of the two test bars ¾ in. square, over the average tensile strength of the two bars 1 in. square, cast from the same ladle and turned to the same diameter, is 2250 lb. per sq. in. The maximum increase under like conditions is 7500 lbs. per sq. in.

It is certainly remarkable that differences so large should occur between bars differing so little in dimensions, cast from one ladle and presumably of uniform mixture of iron. It shows how very sensitive the metal is to cooling influences, and again reveals the importance of adopting standard sizes of bars for tests of cast iron.

An Automobile Steel Body Factory

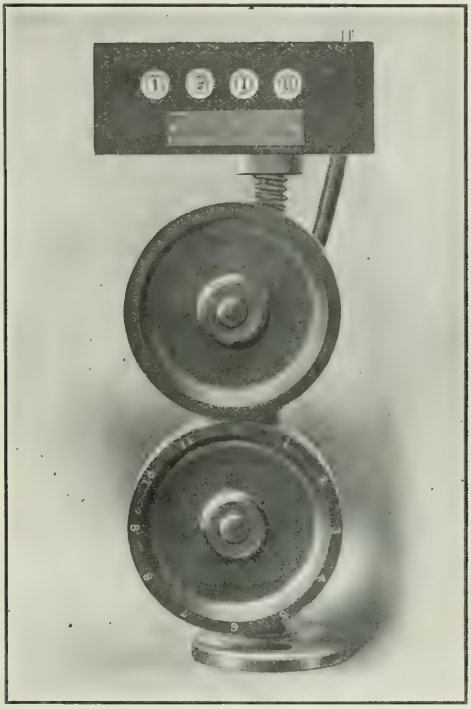
The Bauer Steel Body Company, incorporated under the laws of Michigan, will be located in its new factory, Warren and Fifteenth streets, Detroit, Mich., after July 15. The company will manufacture steel bodies, automobile hoods, fenders, tanks and other special sheet metal products. The company's automobile body is of its own design, and is fully protected by patents. These bodies are constructed on a frame work of angle iron and special steel. The inside is lined with a fibrous material, which serves as a non-conductor of heat or cold. This material is treated in a manner which hardens it, makes it an integral part of the steel and further serves to keep it from rattling.

The company has located in Detroit because of the numerous automobile factories located there or in that vicinity, but expects in time to establish factories at various other points. At present most of the machinery has been purchased for the new plant, but from time to time special machinery and equipment will be required, such as is used in sheet metal works. The president of the company is Charles W. Rosenberg; vice-president and superintendent, M. C. Bauer; secretary and treasurer, Milton C. Hirschfield; superintendent of sheet metal department, John T. Lawson; superintendent of painting department, Joseph Schumacher.

Beall Brothers, Alton, Ill., have completed the rebuilding of their shovel factory which was destroyed by fire some five or six months ago. They have added to this new factory all modern improvements. All the machines are run by individual motors of the best pattern. They also generate their own electricity. All the wires are underneath the ground. The factory is about three times as large as the old one and is capable of turning out 350 to 450 dozen shovels, spades and scoops per day. It is absolutely fireproof, there being not a piece of wood as large as a toothpick in the forging department. They are now prepared to fill orders promptly.

The Roco Wire Measuring Device

The C. J. Root Company, Bristol, Conn., has recently placed on the market the Roco wire measuring device for measuring bare or insulated wire, rope, &c. The material passes over the wheel of the device and is measured in units of 1 ft. or any other units, according to the circumference of the measuring wheel used. In the illustration the machine is shown with a 12-in. measuring wheel. The circumference of this wheel is either smooth or corrugated, and the friction roll running in conjunction with the measuring wheel can be grooved for various sizes of wire or the edge may be perfectly smooth. The friction between the two members is regulated by a spring. The counting mechanism,



The Roco Counter for Measuring Wire Made by the C. J. Root Company, Bristol, Conn.

which is contained in the small rectangular box at the top of the machine, is operated by a flexible shaft connected with the measuring wheel, and the numbers showing through the holes indicate the number of units equal to the circumference of the measuring wheel that have been measured. This mechanism can be set to zero at any time by opening the case and turning the dials back, or it can be supplied with a closed case to prevent tampering with it. When so furnished the record is a continuous one and the difference in the readings at the start and finish gives the length of the material measured.

This device can be attached to the floor, bench or side walls permanently or can be moved from one part of a factory or store to another, wherever measuring has to be done. In a hardware store it can be used for measuring wire, rope, wire netting, light chain and flat or round leather belting. Another application is its use in the field by electric light, telegraph and telephone companies for measuring the amount of wire employed in the construction of new lines or service connections, where it is essential that an accurate record of the amount of material used be obtained to charge the consumer accordingly.

Dodge Drive in a Combined Steam and Water Power Plant

An Interesting Installation at One of the Kimberly-Clark Company's Paper Mills

Appleton, Wis., has long been important in the paper making industry. The Fox River provides abundant water power and formerly there were a number of small or moderate sized plants which in recent years have been consolidated or transformed into a fewer number of larger units. Two very small and old paper mills were acquired some time ago by the Kimberly-Clark Company, but have been abandoned recently as too small for economical operation. These mills stood close together, so that their power facilities could readily be combined. On the site of one of the mills, formerly known as the Vulcan mill, a steam and water power electric generating plant has been erected from which current is transmitted to the company's mills at Kimberly, four miles away. The new plant is known as the Vulcan power house.

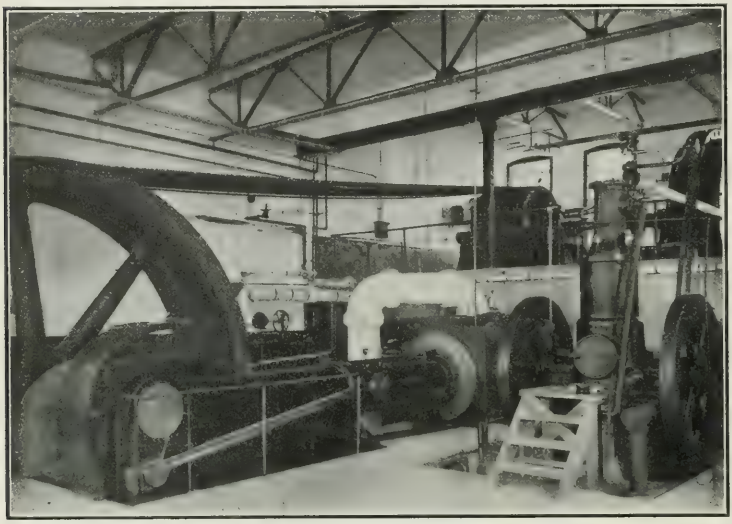


Fig. 1.—The Dodge Rope Drive in the Combined Steam and Water Power Plant of the Kimberly-Clark Company's Kimberly, Wis., Paper Mills.

Still standing in its old position is a 24 x 48 x 42 in. cross compound Corliss engine shown in Fig. 1. Above and on the level of what was formerly the wet machine floor of the old Vulcan mill is a 750-kw. alternating-current generator. The shaft of the latter has couplings at both ends, one side connected to a water wheel line shaft and the other to a shaft carrying a driven sheave for a Dodge rope drive from the flywheel of the old steam engine. The driven sheave is shown in the foreground of Fig. 2. The flange coupling on each side of the generator has a separator plate between its faces, so that the entire load may be carried by the water wheel alone or by the steam engine alone, and the idle prime mover can be completely isolated by removing the bolts and plate from the corresponding coupling. When the water is insufficient to carry the load the engine may be used to assist, and if the water fails entirely the engine may carry the entire load and the water wheels be cut out of operation.

Originally the engine delivered its power by a rope drive so that the flywheel was already grooved, but it so happened that a larger diameter and wider face wheel was desired, and a Dodge hardwood lagging was applied to the flywheel to form a new grooved surface. The wood lagging increased the pitch diameter by 18 in.; the iron wheel had a pitch diameter of 16 ft. with grooves for 23 wraps of 1¼-in. rope. The wood lagging gives a pitch diameter of 17½ ft. and is grooved for 29 wraps of 1¼-in. rope.

Figs. 1 and 2 show the two ends of the rope drive. A single tension carriage which travels a horizontal track under the floor below the driven sheave keeps the rope at proper tension. The lagging on the flywheel is made in two split sections, that is, in four semi-circular pieces, and is applied to the wheel so that the

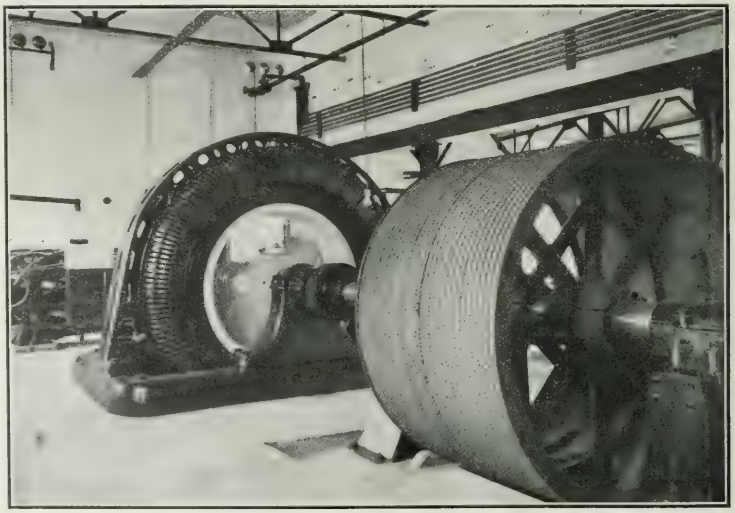


Fig. 2.—The Driven Sheave and the Alternating Current Generator.

parting lines break joints in the lagging itself and with the parting lines of the iron pulley. The wood lagging thus becomes an important reinforcement of the strength of the entire wheel.

The water wheels were furnished by James Leffel & Co., Springfield, Ohio, and the transmission equipment by the Dodge Mfg. Company, Mishawaka, Ind. There are four Sampson turbine water wheels all running right hand. The turbine shafts are in two sections below and above the couplings. Above these couplings the entire equipment was furnished by the Dodge Company. The vertical shafts are carried in special bearings attached to heavy cast iron bridge trees supported by longitudinal steel side beams. The large bevel gears at the top of the vertical shaft mesh with four bevel pinions on the line shaft whose extension is coupled to the generator. The water wheels run at 96 rev. per min. and the line shaft at 214 rev. per min., which is the generator speed.

Fig. 3 shows the arrangement and construction of the transmission, with its heavy cast iron yokes and bridge trees for supporting not only the vertical shafts and bevel gears, but also the horizontal line shaft and bevel pinions. Openings in the top of the main yoke castings are filled with distance pieces, whose removal permit lifting out any section of the horizontal shaft without disturbing any equipment whose removal is not desired. Distance pieces are inserted between the faces of all couplings on the line shaft, not only to facilitate removing the shaft sections, but also to permit cutting out the fourth wheel when only three are needed, or the fourth and third wheels when only two are required. As will be seen in this illustration, the main yokes not only carry a pillow block bearing for the horizontal shaft, but also are extended downward into the large bevel gears to carry a bearing for the top end of the vertical shaft. A bridge tree below the main yoke carries a second vertical bearing immediately beneath the bevel gear. Thus the shafts are afforded ample and sure support, so essential for proper operation of gearing in such important service.

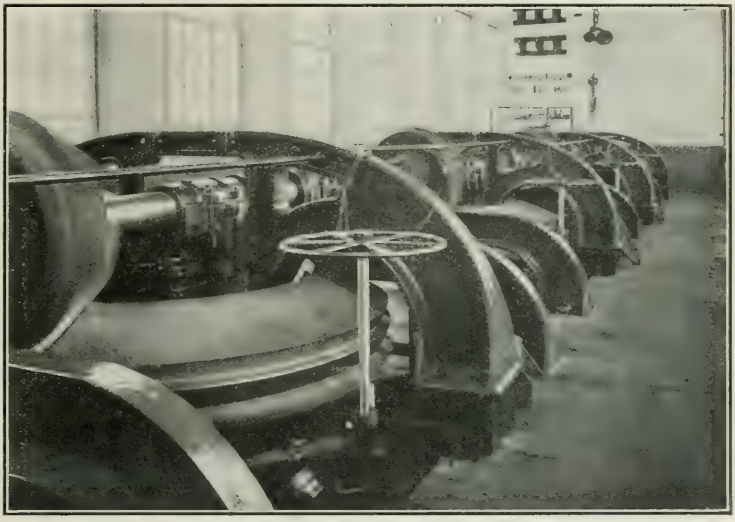


Fig. 3.—The Dodge Equipment in the Transmission from the Leffel Water Wheels.

The installation of this equipment was effected in remarkably short time. The water wheel transmission equipment was erected in four working days.

The Crown Cork & Seal Company's New Brass Foundry.—The Crown Cork & Seal Company, Baltimore, Md., will begin operations in its new brass and aluminum foundry this week. The foundry building is 40 x 70 ft., has an extremely high ceiling and is well ventilated and lighted. Two Ideal tilting coke furnaces of 600 lb. capacity have been installed, also three crucible fires of the usual type, Millet core ovens and sand blast apparatus for cleaning castings. Convenient arrangements have been made for sand, coke and metal storage. The new foundry will accommodate 14 molders, the class of work being almost entirely bench work. Most improved sanitary arrangements for the use of employees have been provided. Electricity will be exclusively used for power purposes. At a later date the company will install a case hardening department in one portion of the foundry building.

New Publications

Downing's United States Customs Tariff. Size, 4½ x 6¾ in.; pages, 630. Cloth bound. Publishers, R. F. Downing & Co., 24 State street, New York. Price, $2.

This work gives the full text of the tariff act of August 5, 1909, with a supplementary aphabetical schedule of duties, so that rates of duty can be readily found on any article imported. The work contains over 20,000 such items, each of which shows the paragraph in the law pertaining to it, and further refers to all decisions that may govern. The book has been revised to March 1, 1910. In addition to the alphabetical schedule, it furnishes much valuable information in relation to customs matters. The firm has published United States tariff books for about 30 years, and has grown to be recognized as a standard authority. The statement is made that the United States Treasury Department has purchased 1000 copies of this edition for use in the various departments of the customs service throughout the country.

Wiring a House. By Herbert Pratt. Bound in paper. Size, 5⅝ x 8 in.; pages, 21; illustrations, 6. Price, 25 cents. Published by the Norman W. Henley Publishing Company, New York City.

This is the sixth of a series of practical papers, and shows every step in the wiring of a modern house or shop. All the different steps are thoroughly explained, so that the task is made comparatively easy. Having determined the number and location of the lights to give the best lighting effects, the placing of the meter is next taken up. The main cut-out cabinet location is then considered, and the running of the necessary wiring from the service pole outside to the different lamps shown on the floor plans follows. The process of determining the sizes of wire to be used is next explained. The work of installation is taken up and instructions are given for putting in the system in molding or open or concealed knob work. A table of safe carrying capacity of wire, as determined by the National Board of Fire Underwriters, is appended.

The Electro-Magnetic Percussion Drill

For cutting holes in concrete pneumatic drills are commonly used, but it is appreciated by contractors that an electric drill would have many advantages. Electricity is available almost everywhere now and an electric drill could be easily carried to the work and put into operation in a few minutes, while a pneumatic tool must be accompanied by an air compressor. Further, an electric tool could be more easily moved about on the work with a flexible cable supplying the power rather than the heavier and stiffer air hose. The low first cost of an electric drill compared with a pneumatic outfit also should be an important consideration. The illustrations show an electric type that promises commercial success—the Model five-percussion drill manufactured by the Electro-Magnetic Tool Company, Chicago, Ill. Although this tool is heavier than the ordinary pneumatic drill, it weighs only 34 lb., and its excess of weight is objectionable only in overhead work,



Fig. 1.—Drilling Horizontally.

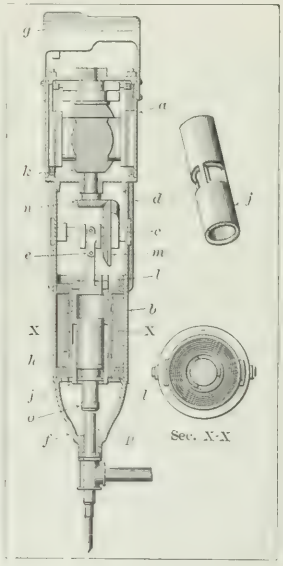


Fig. 2.—Section of the Drill.

The Percussion Drill Made by the Electro-Magnetic Tool Company, Chicago, Ill.

and then a supporting standard may be used. When the tool is used horizontally or for drilling downward, the extra weight is no drawback. As shown in Fig. 1, the tool is quite easily handled.

Referring to Fig. 2, which is a section illustrating the parts of the electric drill, the frame consists of two pieces of steel tubing, *a* and *b*, separated by a brass gear case *c*, and fastened together by the two tie rods *d*. The nose piece *f* and the handle *g* are cast aluminum. In the lower section of the drill frame *b* is a solenoid *h*, designed to exert a pull of 100 lb. A steel sleeve *j* within the solenoid is operated by a small series motor *k* installed in the upper portion of the drill frame, through the gears *m* and *n* and the connecting rod *e*. The hammer element *o*, weighing 2½ lb., is located inside the sleeve and is not connected either mechanically or electrically with any other portion of the drill. The tool is totally inclosed to protect the working parts from dust or dirt and all interior nuts and bolts are securely fastened. The gears and rubbing surfaces are case hardened steel and the bronze bearings are of ample size and are provided with adequate means for lubrication. All electrical connections are thoroughly bushed and insulated.

Current passing through the solenoid sets up a powerful magnetic field, the effective direction of which on the hammer is determined by the position of the sleeve. The latter, being reciprocated rapidly by the motor, produces a shifting of the magnetic field and causes the pull to be exerted first at one end and then at the other of the hammer element. This part endeavors, therefore, to follow the movement of the sleeve. On the forward movement it impinges on the drill shank delivering a hammer blow and on the return is automatically brought to rest by the action of the magnetic field. As the hammer element is not mechanically connected with any other part of the drill, no sudden strains are put upon the gears or crankshaft by the blow. The magnetic connection acts with a perfect cushioning effect which is one of the marked points of superiority in this tool, and vibration is declared to be much reduced. The motor which imparts the reciprocating motion to the sleeve is of the series type and as the load is constant it cannot run away. As the motor and solenoid are connected in parallel, the breaking of the external circuit, in stopping the drill, leaves the solenoid circuit closed through the motor, thus preventing any inductive kick from the coil. The drill is started or stopped by a switch in the handle readily controlled by the hand which supports the tool. The operator's other hand grasps the drill holder, and moving this back and forth imparts a rotary motion to the drill itself.

The amount of power required is the same as that consumed by seven 16-cp. lamps, and the tool may be directly connected to a direct current lighting outlet. The drill delivers 1450 blows per minute, and the speed is said to be equal to or greater than that of an air hammer used on similar classes of work. It is recommended for drilling holes from ¼ to 1¼ in. in diameter, and may be used in any position with equally good results. The tool drills ⅞-in. holes 4 in. deep in concrete in from 45 to 75 sec., and 9-16-in. holes 2 in. deep at the average rate of 1000 per day.

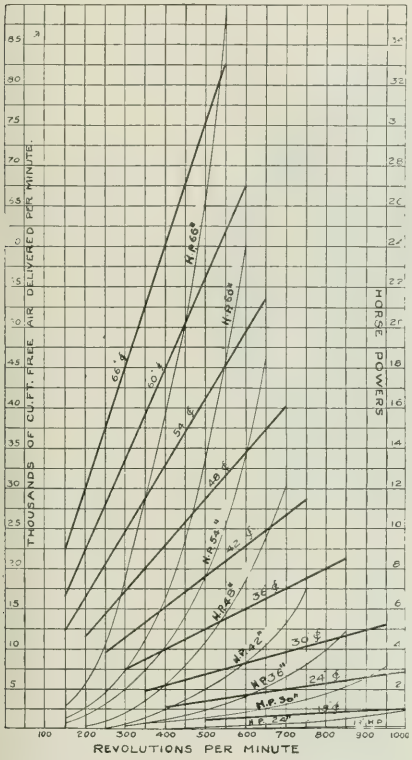
The development of the business of the West Penn Steel Company at Brackenridge, Pa., manufacturer of open hearth steel sheets for all purposes, and also open hearth steel sheet bars, has been quite rapid, and the company is able to keep its mills in full operation in the manufacture of sheet bars and steel sheets. Its two 80-ton open hearth steel furnaces were built by the S. R. Smythe Company, House Building, Pittsburgh. Its sheet mills are rolling from No. 10 to 30 gauge. The company contemplates making additions to its finishing capacity in the shape of pickling machines, annealing furnaces and cold rolls, which will permit the entire output of the mills to be put into sheets of fine finish and for special purposes.

The Bridgeport Forge Company's Improvements.—The McClintic-Marshall Construction Company, Pittsburgh, has received an order for the steel work for a shop 57 x 160 ft., two stories, for the Bridgeport Forge Company, Bridgeport, Conn. Another building of the same dimensions, brick and steel construction, will also be erected. The construction company has about 75 days in which to erect these two buildings and expects to complete the work in that time. They will cost nearly $100,000, and will be equipped with traveling cranes and labor saving devices electrically driven. Charles F. Bliss is president of the Bridgeport Forge Company and Thomas Dunlap, for a number of years sales manager, has been made general manager.

Power and Capacity of Davidson Ventilating Fans

Machines for producing air movement naturally divide themselves into several groups, each proving most efficient within certain limits of air pressure produced. When velocities and resistances are low the screw or propeller type best serves the purpose. Here the air is both received and discharged in an axial direction. For pressures ranging from somewhat less than 1 ounce per square inch up to a possible 12 to 16 ounces, the peripheral type occupies the field. In this the air is received axially, but delivered radially around the periphery usually into a spirally expanding case with a suitable outlet.

Beginning within the range of 10 to 12 ounces, the rotary blower, moving forward, uniformly measured



Power and Capacity Curves for a Davidson Ventilating Fan Made by the Massachusetts Fan Company, Watertown, Mass.

volumes of air, possesses the ability to create pressures ranging up to several pounds per square inch. The turbine blower, now in process of development, covers much the same field. For the production of still higher pressures the piston blowing engine and the air compressor successfully meet the requirements.

The determination of volumetric capacity and the corresponding power expenditure presents more or less difficulty in the case of air movement. This becomes increasingly so as the velocity and pressure are reduced, principally because ordinary resistances and atmospheric disturbances have a proportionally greater influence as the produced velocity and pressure are reduced. For this reason the range of capacity and power in the case of screw or propeller fans is subject to wide fluctuations according to the resistance presented by extended piping systems or wind velocity. The maximum delivery and the minimum power per cubic foot for a given number of revolutions is secured only when the fan delivers freely in still air and there is no opportunity for interference of air currents. It is under these conditions that the properties of Davidson ventilating fans as presented in the accompanying curves have been determined by the Massachusetts Fan Company, Watertown, Mass.

The effect of increased resistance through the extension of piping or the counter blowing of the wind is to throttle the discharge, thereby decreasing it, but at the same time increasing the power required to drive the fan. This is exactly opposite to the effect of resistance in the case of the peripheral discharge; here increase in resistance, which is equivalent to reduction in free delivery area, decreases the work to be done and hence the power required. But even when the outlet is entirely closed considerable power—roughly, one-third of that with a full outlet—will be required to drive the fan within the case. With the propeller fan, on the other hand, the decrease of resistance to free discharge increases the power required until the maximum must be expended when no air whatsoever is discharged. In other words, in a peripheral fan, the power is automatically adjusted, although only approximately, to the work actually accomplished in moving air, while the propeller fan becomes increasingly inefficient as the delivered volume diminishes. Hence it is far more vital in the case of the latter type that resistances should be reduced to a minimum.

New Steel Tie Factory at Newark, Ohio

The Steel Tie & Mfg. Company, Newark, Ohio, incorporated under the laws of that State, has been organized with the following officers: President and general manager, T. J. Costello, formerly general manager of the Buckeye Rolling Mill; vice-president, J. W. Blower of Columbus, general manager of the Hislyvania Coal Company; secretary and treasurer, L. B. Richards of Newark, Ohio, president of the Standard Rail Company. The company started last week to operate its new plant, equipped up to date by the Osborn & Sexton Company, Columbus, Ohio, and will turn out 500 ties per day, which will be increased as soon as new equipment can be put in operation.

The steel ties are manufactured under Blower's patent. They have been thoroughly tried out in several of the largest coal mines in the State, and have proved to be more satisfactory than was expected by the patentee. For the time being, the factory will be kept busy exclusively on ties for mines and industrial plants, as enough orders have been received to keep running on the light ties for several months.

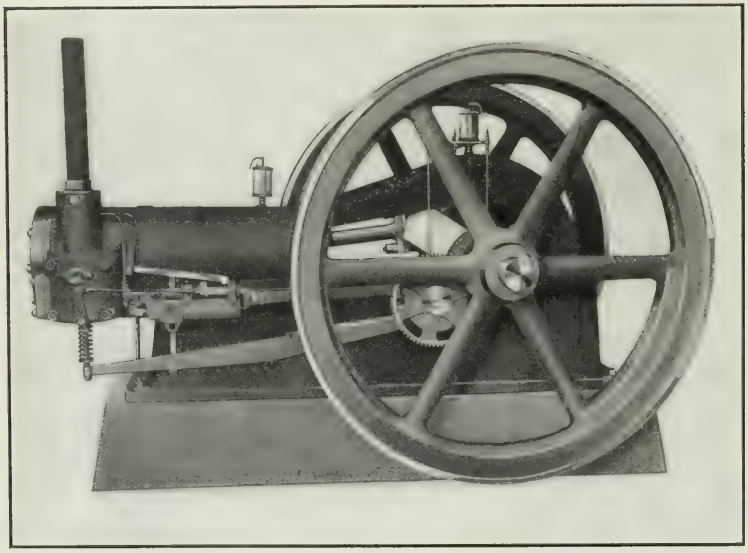
The St. Louis Steel Foundry Increases Its Capacity.—As a result of the success that has been met with in the manufacture of manganese steel crossings, frogs, switches, &c., for steam and electric railroads, also miscellaneous manganese steel, the St. Louis Steel Foundry, owned and operated by the Curtis & Co. Mfg. Company of St. Louis, Mo., has been compelled to make extensive enlargements of its plant, which have just been completed. Additional crane and grinding equipment have been installed. The enlargements have added about 100 per cent. to the floor space and places the company in much better position to take care of and make early deliveries on excess tonnage.

The Newport Sand Bank Company, miner and shipper of molding sand, Newport, Ky., held its annual meeting June 27. Cleveland H. Dye was elected a director to fill the vacancy caused by the death of J. Frank Dye. The directors elected George W. Dye president and treasurer and Cleveland H. Dye secretary.

Large Charter Gasoline Engines

Sizes of 60 to 100 Hp. Now Being Built

The company claiming to be the first to build and market commercially internal combustion engines using a liquid fuel instead of gas, the Charter Gas Engine Company, Sterling, Ill., has recently added to its line larger power gasoline engines, developing from 60 to 100 hp. This was in response to a demand for heavier and more powerful engines of the horizontal single-cylinder type, capable of running economically, continuously and smoothly, and still not require a more skilled engineer to operate them than is usually found caring for smaller engines. While the main working parts do not differ except in size from those of a 20-hp. or 30-hp. engine, there have been added a number of refinements of the larger producer gas engines that contribute to convenient and economical operation. The illustration shows an 80-hp. engine, and following is a brief description of the features of this type:



An 80-Hp. Gasoline Engine Built by the Charter Gas Engine Company, Sterling, Ill.

The bed is made extra heavy and is strengthened by ribs at points of greatest stress. It has a wide oil trough extending around the base, which adds stiffness as well as gathering waste oil, carrying it to a convenient drain pipe. At the crank end the housing carrying the main bearings is stiffened by bringing the end of the bed and the apron up to a line even with the center of the crankshaft; by this means springing of the main bearings is prevented, with a minimum weight. The main bearings are half-cylindrical machined shells, divided at 45 degrees with the line of explosion pressure. Oil grooves on the outer ends prevent oil working out on to the fly wheels. The lower half bearing can be removed by jacking up the end of the crankshaft slightly and revolving the shell out of its place. The connecting rod brasses are easily taken up in the event of wear; the crank end by means of liners, and the piston end by a wedge and bolt adjustment. A substantial crank shield carrying a sight oil reservoir of ample capacity covers the crankshaft, connecting rod and open end of the cylinder. Oil tubes with sight-feed adjustment lead to the main bearings, crank pin and gear pin bearings. To allow the use of two grades of lubricating oil, a separate sight feed cylinder oiler is usually provided.

The inlet and exhaust valves, of the vertical poppet type, are both mechanically operated. The positive operation of the inlet or suction valve is important in securing the maximum power, economy and smoothness of operation, being much superior to automatically opened valves. The exhaust valve is operated by a cam on the gear shaft, which carries also an eccentric for operating the inlet valve, igniter, fuel and water pumps. Vertical valves are used in both the circulating water and fuel pumps; these can be inspected, cleaned or renewed by removing a cover on the side of the respective valve chambers. The circulating water is forced by the pump into the exhaust case, where the coolest water is needed for properly cooling the exhaust valve and stem. From the exhaust case the water goes through the cylinder water jacket and out.

The igniter is of the make-and-break type, has adjustment to take up wear on the points, and is removable by loosening two nuts. Either electrode is removable with a small wrench, as there are no taper pins, but simply a clamp adjustment on the movable electrode. The hit-and-miss governor of the centrifugal type is carried on the hub of the fly-wheel, and operates on the exhaust valve, cutting out the fuel and air charges except when needed.

The liquid fuel injector is placed vertically over the inlet valve, so that the fuel spray drops down to the combustion chamber. There is, therefore, positively a charge of fuel taken whenever it is injected into the inlet valve by whatever means, for the mechanical lifting of this valve allows it to drop in of itself. This is of considerable help in starting. A feature of this device is that the liquid is throttled or regulated, not by a needle valve a short distance back of the point of spray, but at the very point of its spraying into the downward rushing column of air. A water injector for introducing with the fuel a fine jet of water, which has the effect of moderating the explosion of the gas so that more of the expansive effect is realized, is another important feature, allowing of higher compression with its attendant economy and surety of operation.

Special attention has been paid to making these engines easy starters. An easily manipulated lever for throwing into action a compression relief cam, and another for retarding the spark, greatly relieve the drudgery of starting. While all Charter engines are regularly equipped with a self-starting pump and match striker, with which one man can easily start the largest engine, it is possible for one man alone, taking advantage of the compression relief and late spark, to start by pulling on the wheels. All the working mechanism is on one side in easy reach of the operator. There are no rods or pipes inside the bed of the engine. The engine is guaranteed to develop its rated

power with a fuel consumption of 0.1 gal. per horsepower-hour.

Charter engines have been in use for 20 odd years for nearly all kinds of power purposes, ranging from cow milkers and other light demands to electric light plants, large pumping plants for cities and irrigation, &c. The type herewith illustrated has been put on rice plantations where no skilled labor is available and where the demand for constant supply of water is imperative, and it is claimed its simplicity and reliability have fully met the needs and its economy has been remarkable. In exacting work, with low grade and low cost fuel oil, it is declared to be equally successful. When equipped with a throttling governor it is capable of extremely steady operation for work requiring closely uniform speeds.

Penberthy Injector Output

As something of an index of steam power development in the last quarter century it is interesting to know that on March 29, 1910, the Penberthy Injector Company, Detroit, Mich., made its 600,000th injector. The manufacture of these injectors was begun in 1887. If all of these injectors were still in operation and had an average capacity equivalent to the GG 2½-in. Penberthy injector they would represent a combined capacity sufficient to feed boilers of nearly five times the boiler horsepower capacity necessary to supply the estimated total horsepower in steam engines now in use—150,000,000 hp. Put another way, these injectors would deliver into boilers against 90 to 100 lb. pressure over one-third the amount of water that is constantly going over Niagara Falls, which is approximately 125,000,000 to 150,000,000 gal. per min. With a capacity of 4200 gal. per hour each these injectors would have a combined capacity of 2,520,000,000 gal. per hour, or 21,022,459,848 lb. per hour, or 336,898,395 cu. ft. per hour, or 5,614,973.3 cu. ft. per minute. Allowing 30 lb. of water to a boiler per horsepower hour, the 600,000 injectors would have capacity sufficient to supply 700,748,661 boiler horsepower.

The Society of Automobile Engineers will hold its summer meeting in Detroit July 28 to 30. As a result of the very active campaign that is being made this society is occupying its rightful position in the automobile industry. The July meeting will be the largest and most interesting in its history owing to the feeling throughout the membership that under the energetic administration much of the work which should be undertaken by the society will be carried to a successful conclusion. A programme has been arranged which provides for the reading of papers, discussions and visits to manufacturing plants.

The Improved Cincinnati Planer Elevating Device

The Cincinnati Planer Company, Cincinnati, Ohio, has brought out an improved power elevating device for planer cross rails. Fig. 1 is a front view, showing the arrangement of gears; the direct drive is used for lowering the rail and the compound gears, giving a reverse motion for raising the rail at about half the lowering speed. The stand is bored out and fitted with bushings so that the top shaft which carries the pulley can be withdrawn with the bushings intact and inserted from the other side. Thus when making various styles of drives, which are sometimes complicated by odd dimensions of motors, the pulley can be used on either side. As the power elevating device is used relatively little it has been designed so that only the pulley and top shaft run when it is not in use. This device is powerful and sensitive, and is operated by two small clutches on the top shaft. The two oilers in the top shaft and one at the end provide the lubrication. By having a bearing on each side of the main driving gears all danger of springing the shaft is eliminated. The rear view, Fig. 2, shows the simplicity of the operating device. On the extreme right is the handle for manipulating the clutches, and the small handle for locking it in a central position preventing accidental engagement.

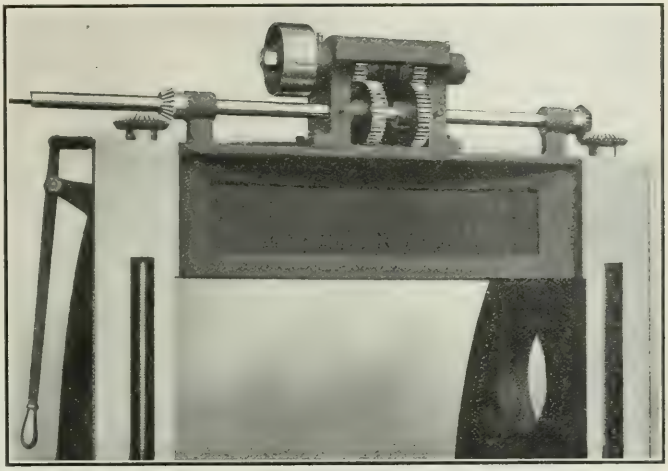


Fig. 1.—The Improved Power Elevating Device for Planer Cross Rails Made by the Cincinnati Planer Company, Cincinnati, Ohio.

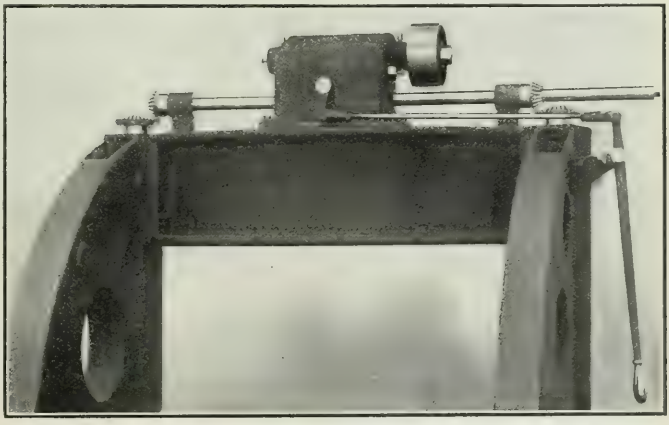


Fig. 2.—A Rear View of the New Cincinnati Planer Elevating Device.

The Akerlund Bituminous Gas Producer

A Suction, Down Draft, Grateless Generator and Novel Cleaning Apparatus

The Akerlund bituminous gas producer, built by the Gibbs Gas Engine Company, Atlanta, Ga., is of the suction, downdraft type. The system comprises a generator, in which air saturated with water vapor it drawn downward through the incandescent fuel, thereby effecting the necessary combination of gases; a cooler in which gaseous tar, lampblack and other impurities are precipitated and washed out; a coke scrubber of the usual form in which the process of cleansing is carried still further; a purifier, containing sawdust arranged on a series of perforated trays, in which the gas is further cooled and freed from all moisture and impurities which may have passed through the rest of the system. Suction is maintained by a slow speed positive exhauster of the Garden City type. The exhauster is connected through a small pressure equalizing tank and automatic pressure regulating valve to a by-pass, which relieves the fire from unnecessary draft when the load varies. There is provision, also, for using the exhauster to blow the fire when starting from dormant conditions and for reversing the draft to deliver gas to the engine by manipulating valves and without changing the direction of rotation or drive of the exhauster.

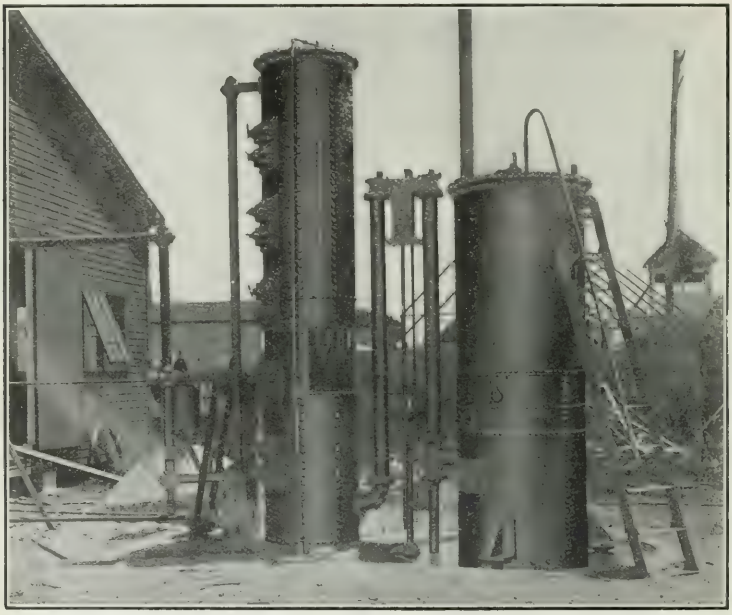


Fig. 1.—The No. 2 Type B Akerlund Gas Producer Built by the Gibbs Gas Engine Company, Atlanta, Ga.

The Generator

The generator is a steel shell, including an annular vaporizer somewhat below the fire line. The shell is supported on piers in a water pit. In the center of the pit, extending upward inside the space inclosed by the shell and to a point somewhat below the vaporizer, is a conical ash pier to prevent irregular accumulation of clinkers. The outer wall of the vaporizer and the inside wall of shell in connection with a baffle plate form a gas accumulation chamber, which insures uniform distribution of draft over the entire fuel bed by taking gas from the center in an annular current which circulates in a horizontal plane outward from the center to both inlets of the accumulation chamber. Air is introduced above the surface of water in the vaporizer downward through induction pipes. The moist vapor then goes upward through similar pipes and is released immediately above the fuel bed in the combustion chamber. These pipes are surrounded by the brick lining, thereby getting all possible benefit of preheating and superheating.

The vaporizer acts as a support for a simple cylindrical lining of standard firebrick. The fire is supported on the ashes which build up from the bottom of the pit, there being in the generator no grates or slopes or projections which could form a lodging place for clinkers and thereby cause irregularities in the fire which would lead to a variation in the quality of the gas as well as in the quantity of gas delivered. The walls of the vaporizer are exposed only to ashes and hot gas, the fire being well above.

The top of the generator is provided with charging doors arranged conveniently for charging fuel, poking and inspecting the fire. Opening the doors for reasonable periods does not affect the quality of the gas, so charging hoppers are unnecessary. Poke holes at the fire line on the side of the shell admit poking all the way through horizontally, and since the fire can be poked from above all the way through the ashes and also observed at will through side holes in the top doors, it is practical for the operator to judge conditions without any uncertainty. Since the draft is downward, all but the volatile tar is consumed in the fire. Ashes are removed through the water seal bottom.

The Cooler

The cooler consists of two legs which are iron pipe mounted vertically and containing sprays, connected by a water seal trap, and each leg has a direct water-sealed drain into the water pit. Gas from the accumulation chamber passes upward through the first leg, thence through the connecting water seal and downward through the second leg to the coke scrubber. In the cooler the gas is thoroughly sprayed with cool water; gaseous tar is precipitated and washed out, along with dust, lamp black and other impurities, through large direct water-sealed drains into the water pit. The seal trap is dry during operation, being filled with water only to cut off the generator from the rest of the system.

Combined Scrubber and Purifier

The combined scrubber and purifier is embodied in a cylindrical steel shell divided into two compartments

by a diaphragm which extends from top to bottom. Near the bottom of the first compartment is a cast iron grate which supports loose coke. Gas enters from the cooler below the grate and in its upward passage meets finely divided water from the sprays above. A downtake riveted to the diaphragm leads the gas downward again and introduces it through an opening in the diaphragm to the lowest compartment of the purifier. The gas then rises through several layers of sawdust supported on perforated trays and radiates its excess heat through the diaphragm to the cooling water in the scrubber, so that when it reaches the outlet, which is connected through the exhauster and pipe line to the engine, it is cool and clean.

The scrubber drains directly into the water pit. As in the cooler, the sprays are designed for ready removal and inspection. The scrubber grate is hinged, swinging downward upon removal of a support, thus facilitating removal of coke through the doors below. The purifier is provided with several changing and filling doors opposite each tray, so that trays and contents can be inspected and renewed when necessary.

Exhauster and Auxiliaries

The function of the exhauster is to create the draft through the system. The Akerlund producer runs with a comparatively low suction, which renders unnecessary a high power expansion exhauster. The exhauster delivers gas into a small expansion tank (about 20 cu. ft. per 100 hp.), the outlet of which leads to the engine. A by-pass from this outlet back to the suction side of the exhauster is regulated by a poppet valve which can be set accurately from the outside and adjusted to deliver gas at any desired pressure. Some Akerlund installations employ a gasometer with a butterfly regulating valve in a by-pass, but the adjustable poppet valve gives best results.

The standard Akerlund installation provides a power pump for circulating water so that most of it can be used repeatedly, reducing the necessary supply to about 5 gal. per hp. hour. The pump is driven from the same countershaft which drives the exhauster and the air compressor included in the engine starting outfit. The countershaft is started by an electric motor or small gasoline engine, and is thrown on the main engine as soon as that has been started. The total power required for all auxiliaries does not exceed 2 per cent. of the capacity of the plant.

Advantages and Results

With reference to the most important points to be considered in connection with soft coal gas producers the following advantages are claimed for the Akerlund design: A constant supply of uniform gas from commercial bituminous coal; gas of proper density and free from impurities which will impede the action of the engine; easy circulation and low suction through the entire system which insures a quick response from the fire to every demand from the engine, thus obviating the necessity of a large storage tank in addition to the gas regulator, and a strictly mechanical design throughout, with simplicity which makes possible easy operation with minimum attention.

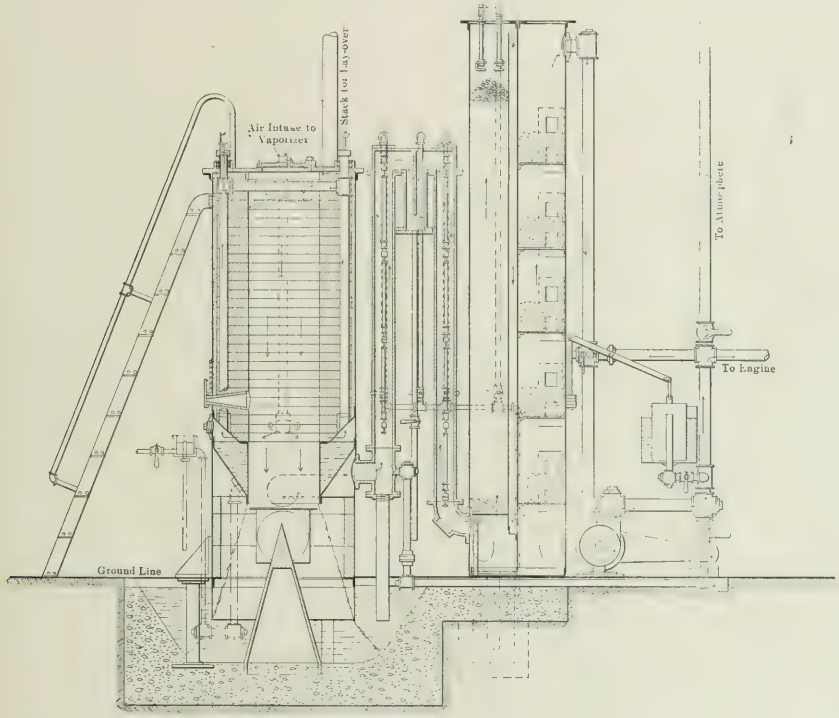


Fig. 2.—Sectional Elevation of the Akerlund Bituminous Gas Producer.

In practice the Akerlund producer seems to fulfill the claims of the manufacturer. Plants in operation with hitherto inexperienced attendants are running continuously and satisfactorily. The coal consuimption is about 1 lb. per brake horsepower hour, including lay-over periods. These results have been obtained with Tennessee, Alabama and Virginia soft coals, including several grades of nut and run of mine. The gas maintains an average minimum of 125 B.t.u. per cubic foot.

In one instance the exhauster was speeded up and surplus gas blown to the atmosphere as a test for the cooling and scrubbing apparatus. The producer (a 250-hp. unit) developed 75 per cent. overload for several days continuously, maintaining an even quality of gas, without delivering any impurities to the engine.

The Akerlund producer is built in single units up to 500 hp. Beyond this capacity the units are combined into batteries.

Foreign Trade Methods

BY WILLIAM J. A. BAILEY, NEW YORK.

Having traveled in most of the countries of the world, both north and south of the equator, selling to all classes of trades, placing agencies, opening up new fields and studying local conditions and trade requirements from many points of view, I have had opportunity to observe the workings of the various methods employed by manufacturers to secure trade abroad.

Too many manufacturers choose to regard foreign trade as something mystical and of doubtful importance; but it is just as easy to do business in China or Peru as it is here in the United States. The large dealer abroad is just as intelligent and progressive as the large dealer in America; and the broad-minded manufacturer will not confine his ambitions to the arbitrary boundaries of the United States, but will regard the whole world as his natural market. He knows that there is no more reason for limiting his sales to the United States than there is to limit them to the State or county or city where the factory stands. To be sure conditions vary in the different countries and the many languages and the systems of weights and measures as well as of currency alter matters somewhat; yet after all these are only details.

Mistakes of Exporters

The most signal errors in the campaign for export trade seem to be a failure to study the individual requirements of each market and an improper selection of the method to secure the business. In the United States there is one language, with a general unity of ideas and a certain sameness from coast to coast; but abroad one finds several languages in a day's journey, as many different ideas as there are languages, and a marked individuality in each country. Monetary systems vary greatly. I might enumerate many more conditions which make it essential for a concern desiring successful foreign trade to study the individual requirements of each country and often of sections of a country. Yet some of our leading manufacturers are conducting expensive campaigns from the factory in their endeavor to sell articles not exactly suited for the foreign markets. The foreign dealers may suggest what is wanted in their respective countries; but the man at the factory is obdurate. "They will take the regular goods, as we are not going to make up anything special," is the ultimatum of many in their foreign campaigns. Such concerns are only wasting their money in these misdirected efforts and would do well to remain out of the foreign field altogether. I regard American machinery manufacturers as perhaps the most progressive, as they are usually willing to make an effort to adapt their products to conform to the standards of any country.

It is in the selection of the method of handling foreign trade that many make their most serious errors, and very often the genius that makes for success at home seems entirely lacking in foreign endeavors. The Standard Oil Company, Singer Sewing Machine Company and a very few other large concerns handle the foreign markets practically, as they operate their business in the United States, but the great bulk of manufacturers employ one or more of the methods enumerated below.

Drawbacks of Traveling Salesmen

Many makers secure good results by sending a specially equipped salesman into the various markets to call on the buyers and take orders by personal solicitation; and frequently several manufacturers combine to send a salesman out, each contributing a portion of his expenses. While this method may seem very practicable it has several disadvantages. If the salesman is handling special machinery, it is usually necessary for him to cable specifications to the factory where details may be misunderstood, causing serious confusion in making a firm offer. Then, again, if a concern, municipality or government, call for bids on anything the chances are small of the traveler being in the particular city at the right moment; and should he happen so to be he would, perhaps, have to wait there months for the opening of the bids, handling the details of the order and financing it. Furthermore, if a man is in one country he cannot also cater to demand made at the same time in half a dozen other places thousands of miles away.

Another weakness in a traveler's work is that he cannot place proper agents for his factory in the short time he generally spends in a city. The salesman is unacquainted, as a rule, and naturally seeks the more prominent dealers with whom to place the agency. But the large dealers have too many irons in the fire to be able to give satisfactory attention to any one particular article. Of course, if some sort of supervision could be maintained over the large concerns to assure their constant activity with a given line then excellent results could be produced. In my personal travels I always sought out an individual or a small concern composed of active men who had to work hard and produce results to build themselves up, and I have had the pleasure of placing some profitable agencies in this way.

A further serious drawback to the average salesman is that he is limited to one or two languages, and must very often do his business through an interpreter, which is always unsatisfactory. Sometimes a salesman with an excellent record in America proves mediocre when sent to foreign countries, because it requires a peculiar temperament to adapt one's self to the conditions and characteristics of the various places, and then also the obstacles mentioned above militate against the success of a man sent from the factory.

Export Commission Houses

The export commission houses handle a considerable portion of our export business in manufactured articles. If our manufacturers would deal direct with foreign concerns our export trade would be much larger. The commission houses are primarily buying agents for foreign concerns, though they have been the means of establishing many manufacturers in foreign markets. However, the manufacturer who places the sale of his product in the hands of a commission house must remember that this house is a buying and not a selling organization, and, while it may have done fairly good work for other manufacturers in the past in placing lines, its field has always been limited to its own particularly clients, for whom it makes purchases in America. In most cases this means a very small percentage of the entire field that it is possible to operate in.

Furthermore, manufacturers of other countries have their own salesmen located permanently in the chief commercial centers and the entire work of these representatives is to sell the goods, so that the commission houses, acting in the capacity of buying agents for the dealers, have small chance to sell goods from their New York office in competition with direct factory representatives on the ground. The commission house

is exceedingly well equipped to handle foreign shipments and to finance them, but the manufacturer should himself attend to the exploiting if he wants to get the best results.

The export or manufacturer's agent is an individual with an office in New York, who tries to induce the commission houses to find a market for the goods he represents, which is like one salesman asking a competing salesman to sell his goods for him. If the commission house were a good selling medium for any particular line the manufacturer should get in touch with it himself and by thus eliminating the export agent the expense of marketing the products abroad would be reduced by the compensation paid the agent.

Advertising Methods

Some manufacturers undertake to market their products through the medium of catalogues sent to lists of buyers. As an economical method of selling goods, this system has many advantages providing the lists are reliable and the catalogues printed in the languages of the various countries with the weights and measures in the metric system and the prices in the principal currencies. Then the maker must be prepared to correspond in several languages and conduct his sales in a long range impersonal manner which seldom brings big returns.

The export journal figures prominently in the campaign for foreign trade, but advertising in journals to discover a market is unscientific, and such publicity should be used only as an adjunct to build up a trade after the proper foundation for the business has been laid. Then I recommend using journals that circulate all over. It is to be regretted that most of them are printed in English only, which renders the paper valueless for a large portion of the world. However, magazine advertising can never do any harm and may do some good, but if a manufacturer wishes to secure returns at all commensurate with the cost of the publicity he must select his magazine very carefully. A journal that contains advertising of patent medicines and steam engines, and anything or anybody who will pay the price finds its way more often into the waste paper basket than into the hands of the man who decides on purchases. One should purchase representation only in papers that deal exclusively with one's particular trade, as this is the age of specialization the world over.

Worthless Schemes

Some manufacturers use other methods in marketing their products. Some may be good, but as foreign trade offers such varied possibilities the number of schemers in this business is legion. Perhaps their schemes cannot be characterized as fraudulent, for many of them undoubtedly mean well, but few of them accomplish any good worth mentioning. Manufacturers waste thousands of dollars yearly by being inveigled into contributing to the support of impossible schemes. I cannot begin to enumerate them, but various guides, catalogues in several languages sent to consuls, &c., are types of propositions offered to makers which, in my opinion, from personal observation, border on the gold brick order of things. Before a manufacturer pays a dollar for any such inviting plans to extend his trade he should consult reliable authorities to ascertain their true value. Even though well-known men lend their names to the furtherance of these propositions, no maker should be misled into contributing a penny unless he assures himself through the proper channels that the work itself is of sterling worth.

Missionary Work Needed

To give any set rules for the establishment of an export trade is impossible, for different products need different methods, differently applied in the various countries. The main thing is to get established on a firm footing in each place. This embraces considerable missionary work in studying the markets carefully, ascertaining what competition there is to meet, in what manner the particular markets may want an article, the prospective demand in each place, terms current, methods of doing business, &c. Before a manufacturer enters a new market and begins to solicit orders he should spend a year studying that market, so that he knows best how to handle it.

One way which has been found quite successful is for a manufacturer to ally himself with a concern having established sales offices in all the principal cities. Such a concern could take over the entire export sales end of the business, and each of its salesmen would represent the factory exactly as the manufacturer would expect his own salesmen to represent him should he station one at each commercial center throughout the world. These salesmen would do even better than the manufacturer's own men, because each one is usually a resident for many years in the particular country where he operates and thus understands local conditions thoroughly, knows the buyers, speaks their language, and is always on the ground ready to take immediate advantage of every sales opportunity and following up every bit of business.

The Vanadium-Alloys Steel Company

The Vanadium-Alloys Steel Company is located in the eastern section of Latrobe, Pa., where it has over 25 acres of land with a switch to the Pennsylvania Railroad. On July 5 the company melted its first steel in its crucible department, and the result was very satisfactory, as indicated by tests made both in the laboratory and on a machine tool. The company at the outset has 48 crucible melting furnaces in which it will manufacture Red Cut high speed steel and Special crucible steel. Its first order calls for vanadium steel, which is now being filled. The present capacity of the plant is about 2800 tons of tool steel per annum.

The buildings of the plant cover about two acres. The equipment, besides the furnaces above mentioned, includes the following: One 12-in. rolling mill driven by a large Westinghouse alternating current motor, a complete hammer shop, boiler house with 200-hp. boilers, one box annealing furnace of the Wm. Swindell & Brothers type, laboratory, stock department, office building, &c.

E. T. Edwards, formerly with the Firth-Stirling Steel Company, Demmler, Pa., in charge of its melting department, is president and general manager of the Vanadium-Alloys Steel Company, while D. T. Sipe, for 15 years in charge of the furnaces in the melting department of the Firth-Stirling Steel Company, where that company's line of Blue Chip steel is made, is superintendent. The laboratory is also in charge of a former Firth-Stirling employee. Each of these well qualified men will use his experience to get out a high quality product. The company has already established a sales agency in Cleveland and for New England, and is open to engagements with reputable representatives in other sections who can take the agency on an exclusive basis. Later on the new company will establish a line of stock warehouses in certain parts of this country, and it will also seek export trade. All communications should be addressed to Latrobe, Pa.

According to the regular monthly report of the Relief Department of the Pennsylvania Railroad, the sum of $177,386.24 was paid to members during the month of May, 1910. Of this amount, $120,513.10 represents the payments made on the lines east of Pittsburgh and Erie, and $56,873.14 on the lines west. Since the establishment of the funds a total of $28,469,890.15 has been paid out.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1 3-4 in. round and square	1.90c
1 1/2 to 4 in. x 1/4 to 1 in.	1.90c
1 1/2 to 4 in. x 1/8 to 3/16 in.	2.10c
Rods—5/8 and 11-16 round and square	2.10c

Angles:

3 in. x 1/4 in. and larger	2.00c
3 in. x 5/16 in. and 3 in.	2.00c
1 1/2 to 2 1/2 in. x 1/4 in.	2.00c
1 1/2 to 2 1/2 in. x 3-16 in. and 1 in. x 1/8 in.	2.10c
1 to 1 1/4 in. x 3-16 in.	2.20c
1 to 1 1/4 in. x 1/8 in.	2.20c
7/8 x 1/4 in.	2.40c
7/8 x 1/8 in.	2.50c
5/8 x 1/8 in.	3.00c
1/2 x 1/32 in.	4.00c

Tees:

1 in.	2.05c
1 1/4 in.	2.05c
1 1/2 to 2 1/2 x 1/4 in.	2.15c
1 1/2 to 2 1/2 x 3/16 in.	2.25c
3 in. and larger	2.15c

Beams | 2.10c

Channels, 3 in. and larger | 2.05c

Angles—1 to 6 x 5/16 to No. 8 | 2.20c

"Burden's Best" Iron, base price | 3.15c

Burden's "H. B. & S." Iron, base price | 2.95c

Norway Bars | 3.50c

Merchant Steel from Store—

	per lb.
Bessemer Machinery	1.90c
Toe Calk, Tire and Sleigh Shoe	2.40c
Best Cast Steel, base price in small lots	9c

Sheets from Store—

Black.

	One Pass. or Box Annealed	Box Annealed Cleaned.
No. 16	2.90	3.00c
Nos. 18 to 21	2.95	3.10c
Nos. 22 and 24	3.05	3.20c
No. 26	3.15	3.30c
No. 28	3.25	3.50c

Russia, Planished, &c.

Genuine Russia, according to assortment | 12 @14½

Imitation Planished, W. Dean & Sons, A. Ragg, B. & S. net

Galvanized.

Nos. 11 to 16	3.20c
Nos. 22 to 24	3.55c
No. 26	3.75c
No. 28	4.10c

No. 20 and lighter 36 inches wide, 25c higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	5.75c
No. 26	6.25c
Nos. 28	7.25c

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	per 100 sq. ft. $3.85	4.80
No. 26	per 100 sq. ft. 2.95	4.00
No. 28	per 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A. A." Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 24 x 28 with an 8 lb. coat	$8.50
IX, 24 x 28 with an 8 lb. coat	10.50

Seamless Brass Tubes—

Last November 13, 1908. Base price 18c

Brass Tubes, Iron Pipe Sizes—

Last November 13, 1908. Base price 18c

Copper Tubes—

Last November 13, 1908. Base price 22c

Brazed Brass Tubes—

Last August 1, 1908. 19½c

High Brass Rods—

Last August 1, 1908. 14½c

Roll and Sheet Brass—

Last August 1, 1908. 14½c

Brass Wire—

List August 1, 1908. 14½c

Copper Wire—

Base Price. Carload lots mill 14c

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity, 18c; 8 oz. 19c

Sheet Copper Cold Rolled, 16 oz. 2c advance over Hot Rolling

Sheet Copper Polished 2 in. wide and under, 2c per square foot

Sheet Copper Polished over 24 in. wide, 2c per square foot

Polished Copper, 1c per square foot more than Polished

METALS—

Tin—

Straits Pig | 34½@35c

Copper—

Lake Ingot	14¾@15c
Electrolytic	14¾@15c
Castings	14¼@14½c

Spelter—

Western | 6¼@6½c

Zinc.

No. 9, base, casks | 8c | Open | 8¼c

Lead.

American Pig	5 @5¼c
Bar	6¾@6¾c

Solder.

½ & ½, guaranteed | 22 @22½c

No. 1	19 @19½c
Refined	17½@17½c

Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson	@10c
Halletts	@10c
Other Brands	@9½c

Bismuth—

Per lb. $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting | 24c

Rods & Wire | Base Price 31c

Sheets | Base Price 33c

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	10.25@10.50
Copper, Heavy and Wire	10.00@10.25
Copper, Light and Bottoms	9.00@9.25
Brass, Heavy	6.75@7.00
Brass, Light	5.50@5.75
Heavy Machine Composition	9.25@9.50
Clean Brass Turnings	6.75@7.00
Composition Turnings	8.00@8.25
Lead, Heavy	@3.50
Lead, Tea	@3.25
Zinc Scrap	@3.75

Nicholson Files

Sales of good files should remind you
You can all avoid a "rut" —
Just by stocking up and selling
Files like these that *always cut.*

Some Hardware merchants get in the "rut" of stocking any kind of files just because they are *cheap.* But such files don't *sell* and are "dead stock" on their shelves.



TRADE NICHOLSON MARK
U.S.A.



Nicholson File Company, Providence, R. I.

THE IRON AGE

Established 1855 | New York, July 14, 1910 | Vol. 86: No. 2

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

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A Drifting Iron Market

Buyers Await Developments from Without

Pig Iron Lower, While Prices in Various Finished Products Are Gradually Yielding

For the first half of July the iron trade has been drifting and buyers are waiting for outside developments to determine their next move. Crop reports have been a foremost factor in the past week, but the estimates, while less favorable than could be wished, are far from indicating disaster, the shortage in spring wheat being compensated for in large part by promised increases in winter wheat, corn, hay and cotton. There is a disposition on the part of some leaders in the industry to base their forecasts on broader tendencies that may be of slow operation, since they involve a process of readjustment.

Reports have been scattered widely in the week of reductions in prices of steel products, some of them referring in terms to agreements among the producers to make radical cuts. The fact is that the situation as to prices has not changed from what has been noticed for weeks. There has been a gradual yielding as the volume of orders ahead of the mills has decreased. On plates and structural shapes 1.40 cents, Pittsburgh, is now more common. There are also further concessions on sheets and wire products.

Exact measurement of the shrinkage in iron and steel consumption is difficult. Some gauge may be taken from the operations of the United States Steel Corporation, which has been keeping its pig iron production closely in line with the demand upon its steel works. Its subsidiaries now have 36 blast furnaces idle, against 35 one week ago, and 74 per cent. of capacity is active.

The structural trade, while not as active as in June, is still promising. In New York City the south section of the New York Central Terminal, 10,000 tons, is about to be let. In addition to the 12,500 tons for the Western Maryland, taken by the McClintic-Marshall Construction Company, 3000 tons for the Utah Copper Company and 2500 tons for an office building are the largest contracts of the week.

Plate mills are operating at from two-thirds to three-fourths of their capacity. In the East the four steamers to be built at Newport News, two for the West Indian and two for Chesapeake Bay trade, represent about 8000 tons of plates.

Pipe line work is the salvation of the wrought pipe industry in the dullness of merchant pipe. The Texas Company has bought 100 miles of 8-in. pipe from the leading interest and 100 miles of 6-in. pipe from Steubenville, and the former has also taken 90 miles of 12-in. pipe for a natural gas line in Canada. One company has closed contracts for 30,000 tons of products for oil country use.

The railroads are not expected to make any considerable demand upon the rail mills in the balance of

the year and some intimations have been given of the postponement of deliveries, but the amounts involved are not significant thus far.

Steel bar and tin plate mills continue to lead in the extent of their activity. Iron bars are apparently a diminishing factor in the market. The labor scale settlement was never of less moment than it is this year. A further conference will be held next week.

The increased producing capacity in wire products is making a further impression upon prices. In the Pittsburgh district one interest whose mills have been shut down has started up all departments. Wire rods are weaker at Pittsburgh and have sold under $29.

Inquiries for 20,000 tons of billets have come up at Chicago, but mills in that district cannot accept the business.

Pig iron has developed further weakness, in spite of repeated announcements of the bottom. Virginia No. 2 foundry iron has been cut to $13.50 and Southern and New York State iron have made new low marks for the year. In the Cincinnati district an inquiry has come up from a steel works for 5000 tons of basic and 3000 to 4000 tons of Bessemer iron for delivery in the last half of the year. Foundries are doing little new buying, except that low priced iron is being taken in small lots to average higher priced contract iron.

Our Excessive Pig Iron Production

Over and over the reviews of the pig iron market in the past few months have called attention to the excessive production. The makers of merchant pig iron have been prompt to diagnose the situation, and there has been a general agreement among them in the statement going out from time to time that the market price was uncomfortably close to the cost of production. It has been agreed, also, that, as this condition cannot soon be cured through an increase in demand, since shrinkage and not expansion has been the rule for some months, the only alternative is such a cutting down of pig iron output as will require some inroad upon furnace stocks to take care of the current rate of consumption. In this connection it is to be noted that while stocks of iron in consumers' hands increased in the latter part of 1909 and the early weeks of 1910, somewhat to the confusing of furnacemen who had been led to think that shipments represented consumption, the furnace interests are now chiefly the carriers of stocks. This condition at least permits of closer checking up than that which preceded.

In view of all that has been written about industrial reaction and particularly the receding demand for iron and steel, the readjustment in the blast furnace industry has been moderate and comparatively slow paced. The United States Steel Corporation, with its great diversity of products, has means of knowing promptly the condition of the steel industry as a whole, and also is able to make prompt adjustments. Its pig iron output, therefore, is capable of rapid regulation, and thus may become a fairly close index to the drift of things. In the past two months the corporation has seemingly made a larger proportionate curtailment than the independent steel companies. The latter, however, have been coming more closely in line within the past two weeks, several of their furnaces having blown out in that time.

As stated in these columns one week ago, the reduction from the high level of pig iron production reached in February—85,616 tons a day for coke and anthracite pig iron—has now amounted to about 15 per cent., making allowance for several furnaces that have stopped since July 1. It is evident from the condition of the market—and every consumer who goes out to buy a round lot discovers it—that the weight of accumulated stocks is being increasingly felt. One producer, who may be easily financing his accumulated iron, refuses to consider a low offer, but the buyer finds another who is willing to accept it on a single contract which will keep his furnace stocks from becoming unmanageable.

The question which the merchant furnace interest has now to answer is whether the situation is to be allowed to drag on as in recent weeks, with the possibility of further weakness as the necessities of sellers may become a larger factor, or whether by a more heroic process the supply of iron shall be cut down to the smaller needs of the country. Sentiment in favor of a very general banking of merchant furnaces for two, three or four weeks has been finding more frequent expression of late, but for well-known reasons no movement will be undertaken to make such sentiment effective. It is now about 20 years since a movement for a 30-day banking of furnaces was started at Louisville, Ky., but it failed of general co-operation. In the Mahoning and Shenango valleys such methods have been employed at intervals in the past 15 years, with temporary good effect. In the spring of 1898 the National Association of Non-Bessemer Pig Iron Manufacturers was all but organized and the assent of 80 per cent. of the capacity was secured to a plan of regulating output. But good times came on while the other 20 per cent. was being labored with and the crisis which the merchant pig iron industry seemed to be facing was avoided. To-day such an association would promptly invite attention from the national Department of Justice.

Naturally those furnaces which have their own ore and coke would be expected to run longer on such a market as to-day's than purely merchant furnaces. Recent competition would indicate, moreover, that some of the former have been willing to surrender a fraction of their theoretical profit on ore. Yet it would seem that such differences of status in the trade are having less to do with the policy of producers than considerations that are affecting all industries, for ore-buying makers of pig iron are selling ahead with the same apparent freedom as are ore miners. In fact, the persistence of so many blast furnaces might be taken as evidence of stronger faith in improvement later in the year than current developments are calculated to inspire.

Ambiguities of the New French Tariff

Manufacturers of machinery are concerned over certain ambiguities of the new French tariff. Several of its provisions give promise of serious complication as well as of expense to American exporters. Speaking broadly, without going into the details of the schedules, sharp discrimination is made against a precision tool, as compared with less delicate mechanisms, and against the accessory of a machine as compared

with those parts which are considered indispensable to its operation. An exact definition of the terms in their application to machine tools and machinery will probably be impossible. According to the correspondents of American manufacturers, French commissions are now engaged in this complicated, but essential, task. A micrometer caliper is a precision tool, but it is asked, Is a 25-cent spirit level to be placed in the same category? Probably a similar distinction would be made between milling machines of the several grades. Certainly the difference exists among the grinding machines. It is further asked, To how many change gears is a machine entitled? Where does the excess begin and the classification change to that of accessory? Endless disputes will arise between importers into France and the customs officials, with frequent recourse to the courts. Perhaps precedents will finally accumulate to establish a standard practice controlling the great majority of questions. The criticism of the Americans is not of the tariff rates, but of the vague wording of a statute affecting not only the French people, but also those countries whose exports of machinery and tools are absorbed by the republic.

Living Up to Agreed Deliveries

Machinery buyers are renewing their complaints that some of the machine tool builders and dealers are not living up to their promises of deliveries—a criticism which always accompanies a return of large demand. A natural impulse of a salesman, either in or out of the home office, is to permit his zeal in landing an order to render him ultra-sanguine in his promises as to shipments. Very often a few weeks' difference in quoted delivery determines the placing of business. Not a few sales have been made of late where the deciding factor was the promise of early shipment, even in the face of lower figures offered by competing houses.

The temptation is great to sell on a theoretical rate of production of machinery. The chances are usually against the maintenance of such a rate, and salesmen should not permit themselves to trust to luck to help them out. In the long run such a policy does not pay, and each year more of the machinery people are realizing the fact and are adhering to the rule that so far as it lies within their power they will deal fairly with their customers in this respect.

A reputation for fulfilled promises counts for a great deal. The buyer will probably associate the characteristic with reliability of statements as to the machinery itself. Strive as a machine builder may, he cannot always do as he agrees, but his plans should be laid with sufficient skill, founded on the records of a good shop system, so that the danger of being compelled to transgress against the delivery clause of the contract would be very small. Occasionally a manufacturer may be able to better the date of a shipment, which then emphasizes the intention to live up to his word.

One of the arguments advanced in the trade against the feasibility of enforcing a non-cancellation clause in machinery contracts is that in a large percentage of cases the contracts are broken by the manufacturers themselves through failure to make the specified deliveries. Probably this is an overstatement, but there is certainly too much laxity in living up to the letter of a contract with regard to deliveries. Punctuality should be cultivated until it becomes a habit.

Steel Quality an Issue in Germany

Considerable space is given in this issue of *The Iron Age* to special correspondence from the International Congress of Mining and Metallurgy at Duesseldorf and to abstracts of the important papers read at the section of Practical Metallurgy. These emphasize again the extent of our debt to German engineers for literature of the advance made in iron and steel and related industries in the past 15 years. The Duesseldorf Congress is monumental in the number and character of the papers it has contributed on subjects of first importance to iron and steel works engineers and to all who would know the conditions of the international competition in steel works products as affected by German development.

Probably the most interesting matter brought before the section of Practical Metallurgy was the paper which is reviewed at length on other pages, dealing with the status of the basic Bessemer steel process in Germany. American steel manufacturers are not alone in their struggle with the problem of higher quality rail steel which the railroads have been crowding upon them with growing insistence. Those who in the midst of the agitation of three years ago were urging our railroads to place their rail orders abroad may be surprised to know how the basic Bessemer process, the pillar of the German steel industry, has been put on the defensive in a similar campaign for high rail quality that has been waged in Germany. It will be seen, moreover, that oxygen, far more than phosphorus, is the German steel maker's enemy. Not only has the question of the quality of the steel produced in such quantities by the basic Bessemer converters of Germany become an issue in international markets, but it is raised by the increasingly rigid specifications of the German state railroads. It will be no small factor also in the work of the committees representing the United States, Germany and Great Britain, that have undertaken to harmonize the steel specifications of the three countries.

In this international contest, involving the claims of the converter and the open hearth processes, in which German producers, with their large dependence on Minette ores, are chief sponsors for the converter, we can see how the electric furnace is to loom up more and more, in conjunction with the pneumatic process, as a guarantor of rail quality.

Useless Machinery Requirements

Some buyers of machinery make it a practice to impose unusual specifications in contracting for new equipment. With this class of customers no standard machine seems to meet the wants of their shops. They would have it a little different. Manufacturers, and more particularly dealers, are obliged for this reason to endure many annoyances in overcoming what they believe to be mistaken theories. The trouble usually lies with one man in the buyer's works who believes he can improve upon the accepted practice. He likes to change the range of speeds or feeds or make some other correction in design which creates additional costs for the builder and, presumably, for the customer.

More times than not the change is useless or actually undesirable from the standpoint of results. Occasions arise when departures from the standard type are necessary, and the builders are then glad to co-operate with and give the benefit of their expert knowledge to their customers.

Users of machinery, however, should realize that, as they know more of their own products than do the machine tool builders, so do the latter know more of their machines than can possibly be learned from the user's individual experience. It is each to his trade and each reaping the advantage of the special skill acquired by the other. A chuck maker knows more about chucks than the lathe builder, and the lathe builder knows more about lathes than the chuck manufacturer. Yet each uses the other's product continuously. Usually, the man who would needlessly alter the specifications of a standard machine has as his own product something foreign to the machine tool business. Men should learn to depend upon the knowledge of proved specialists rather than to rely upon their own observations, which must of necessity be crude by comparison.

June Copper Production and Stocks

The June statistics, issued by the Copper Producers' Association, contain the following statement of production and stocks:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, June 1	160,425,973
Production of marketable copper in the United States from all domestic and foreign sources during June.	127,219,188
Deliveries of marketable copper during June:	
For domestic consumption	53,363,196
For export	65,895,948
Total	119,259,144
Stock of marketable copper of all kinds on hand at all points in the United States, July 1	168,386,017

The report shows an increase of surplus stocks during the month of 7,960,044 lb.

The Sturtevant Salesmen's Convention.—The salesmen of the B. F. Sturtevant Company, Hyde Park, Mass., are known personally to so many engineers that it is a matter of interest to note their convention which was held June 15 to 18. The branch office managers and salesmen from all over the country assembled at the works and general offices at Hyde Park and spent four very busy days in going over general business matters. The evenings were enlivened by banquets and other social features. The last day of the convention closed by a sail down Boston harbor, with an afternoon and evening spent as guests at the Cohassett home of E. N. Foss, treasurer of the company. The convention was marked by great enthusiasm as the company was just finishing, July 1, the largest business year in its history. A fine photograph was taken of the participants. It showed a number of the men holding small multivane wheels, such as are used in the Sturtevant Ready-to-Run electric ventilating sets. In the background were huge multivane wheels used for tunnel ventilation.

The Bunting Brass & Bronze Company, Alliance, Ohio, has its plans practically complete for the erection of a foundry, 54 x 250 ft.; machine shop, 54 x 100 ft., and several buildings of less size for warehouses, pattern vault, &c. The construction will be steel, concrete and brick, absolutely fireproof, designed for both light and heavy casting and for the finishing of small, duplicate brass parts. It has not been definitely decided as to where the company will locate, but the probabilities are that it will be further west than Alliance.

Early Iron Making in Eastern Pennsylvania

Historical Places Being Marked by Tablets

The Chester County Historical Society of Pennsylvania, which has been active in the marking by tablets the sites of various early iron manufacturing plants in that county, unveiled a tablet on the wall of the Phoenix Iron Company's pattern storage house, Phoenixville, Pa., marking the site where iron was first rolled at that place in 1783. The inscription on the tablet reads: "Near this point is the site of the rolling mill, where in 1783 was rolled the first iron in Phoenixville, marked by the Chester County Historical Society, 1910." The history of the iron industry in Phoenixville dates from May, 1783, when there was there established a small rolling mill and nail factory.

A similar tablet will be placed by the society at Coventryville, marking the site of the Coventry Forge, which will bear the inscription, "The second iron works in the Province, and the first in Chester County, was here built by Samuel Nutt in 1717. Mordicai Lincoln, ancestor of Abraham Lincoln, was part owner and blacksmith in 1725. Last heat in 1870. Marked, 1910, by the Chester County Historical Society."

At Warwick Furnace the society will place a tablet bearing the inscription, "Warwick Furnace, built here 1737 by Mrs. Samuel Nutt, was the third blast furnace in Chester County. The first Franklin stove was cast here and also cannon and cannon balls for the Revolutionary Army. Last iron was made in 1867. Marked, 1910, by the Chester County Historical Society."

The society on July 2 unveiled a tablet at the Lukens Iron & Steel Works, Coatesville, Pa., marking the site where the first boiler plate was rolled by Dr. Charles Lukens, about 1820, a full account of which was printed in *The Iron Age* of July 7.

In connection with the unveiling of the Phoenixville tablet, addresses were made by George B. Johnson of the Chester County Historical Society, and Chester M. Spare, who accepted the tablet. Mr. Spare also spoke briefly of the early history of the Phoenix Iron Company. The date of the incorporation of the present company was in 1855. This was the result of development of a plant established many years previously, in which David Reeves, formerly president of that company, acquired a partnership as early as 1827, from which date the Reeves family have been the leading factors in the history of the iron manufacture in Phoenixville. In 1846 a rail mill was built at this plant, and the manufacture of rails extensively engaged in. It was in 1855 that the company began the manufacture of structural shapes. On the mill erected at that time were rolled the first beams and shapes made in America, the largest size being a 9-in. beam. In 1861 beams 15-in. in depth were rolled; bridge building was later engaged in, and from time to time greater facilities were added, bringing the plant up to its present high state of efficiency and wide range of product. In the early days the product was of iron, the manufacture of steel being taken up more recently.

The Canadian Northern Railway Company has been called upon by the Premier of Alberta to fence in lines and right of way in that province, and the work, which was ordered at the instance of farmers living along the lines, is to be begun at once. As the mileage of unfenced lines is great, a heavy tonnage of wire will be required.

The American Boiler Manufacturers' Association of the United States and Canada will hold its next annual convention in Chicago, October 10 to 13. The headquarters will be in the Auditorium Hotel.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July 13, 1910.	July 6, 1910.	June 8, 1910.	July 14, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.25*	$16.25	$16.75	$16.50
Foundry No. 2, Southern, Cincinnati	*14.75*	14.75	15.00	15.75
Foundry No. 2, local, Chicago	*16.50*	16.75	16.75	17.00
Basic, delivered, eastern Pa.	*15.75*	15.75	16.25	15.50
Basic, Valley furnace	*14.50*	14.50	14.75	15.00
Bessemer, Pittsburgh	*16.40*	16.40	16.65	16.40
Gray forge, Pittsburgh	*14.40*	14.90	15.40	14.90
Lake Superior charcoal, Chicago	18 50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*25.00*	25.00	25.50	23.00
Forging billets, Pittsburgh	*30.00*	30.00	31.00	27.00
Open hearth billets, Philadelphia	*28.50*	28.50	29.00	25.00
Wire rods, Pittsburgh	*29.00*	30.00	31.00	29.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	*13.00*	13.50	15.00	14.50
Steel rails, melting, Philadelphia	*14.25*	14.25	14.50	16.00
Iron rails, Chicago	*16.75*	17.00	17.00	17.00
Iron rails, Philadelphia	*19.00*	19.00	20.00	19.50
Car wheels, Chicago	*14.75*	15.00	15.50	16.00
Car wheels, Philadelphia	*14.50*	14.50	15.00	14.75
Heavy steel scrap, Pittsburgh	*14.50*	15.00	15.25	15.75
Heavy steel scrap, Chicago	*12.25*	12.75	13.50	14.00
Heavy steel scrap, Philadelphia	*14.25*	14.25	14.50	16.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.47½*	1.47½	1.50	1.45
Common iron bars, Chicago	*1.40*	1.40	1.47½	1.35
Common iron bars, Pittsburgh	*1.50*	1.50	1.55	1.45
Steel bars, tidewater, New York	1.61	1.61	1.61	1.41
Steel bars, Pittsburgh	1.45	1.45	1.45	1.25
Tank plates, tidewater, New York	*1.56*	1.61	1.66	1.51
Tank plates, Pittsburgh	*1.40*	1.45	1.50	1.35
Beams, tidewater, New York	*1.56*	1.61	1.66	1.51
Beams, Pittsburgh	*1.40*	1.45	1.50	1.35
Angles, tidewater, New York	*1.56*	1.61	1.66	1.51
Angles, Pittsburgh	*1.40*	1.45	1.50	1.35
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.30
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.40
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.30*	2.30	2.40	2.20
Wire nails, Pittsburgh*	1.80	1.80	1.80	1.70
Cut nails, Pittsburgh	*1.70*	1.75	1.75	1.70
Barb wire, galv., Pittsburgh*	2.10	2.10	2.10	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.62½*	12.75	13.00	13.12½
Electrolytic copper, New York	*12.37½*	12.37½	12.75	13.00
Spelter, New York	**5.20**	5.20	5.15	5.35
Spelter, St. Louis	**5.05**	5.05	5.00	5.27½
Lead, New York	**4.40**	4.40	4.37½	4.35
Lead, St. Louis	**4.25**	4.25	4.22½	4.25
Tin, New York	*32.65*	32.80	32.85	28.90
Antimony, Hallett, New York	8.12½	8.12½	8.12½	7.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.55c., net; H-beams over 8 in., 1.65c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.50c., net; angles, over 6 in., 1.55c., net; angles, 3 x 3 in., and up, less than ¼ in., 1.65c., base, half extras, steel bar card; tees, 3 in. and up, 1.55c., net; zees, 3 in. and up, 1.50c., net; angles, channels and tees, under 3 in., 1.40c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.75c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ½-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 2 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.20c.; No. 28, 3.40c.; No. 29, 3.50c.; No. 30, 3.75c. Painted roofing sheets, No. 28, $1.70 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2¼ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $29 to $30.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash. f.o.b. mill. The above prices are those quoted on contracts for large lots, makers charging the usual advances of $2 to $3 a ton to the small trade.

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Pittsburgh

PARK BUILDING, July 13, 1910.—(*By Telegraph.*)

Pig Iron.—The largest inquiry for pig iron in the market at present is that of a Kentucky steel company, which is inquiring for 5000 tons of basic and 3000 to 4000 tons of Bessemer for last half delivery. The general inquiry is perhaps a little better, but it is altogether for small lots, consumers not being assured that bottom has been reached and are not willing to take on iron for a long delivery ahead, even at present low prices, which to some furnaces are certainly below the actual cost of making it. We quote standard Bessemer iron at $15.50; basic, $14.50; malleable Bessemer $14.75; No. 2 foundry, $14.25, and gray forge, $13.50, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90 cents a ton.

Steel.—New inquiries for billets and sheet and tin bars are very light and prices on both Bessemer and open hearth steel are weak. A local tin plate mill has sold its entire output of tin scrap to a steel interest and has contracted for its tin bars with the same concern for the last half of the year. We quote Bessemer billets, 4 x 4 in., $25; Bessemer sheet bars in random lengths, $26; 4 x 4 in. open hearth billets, $26.50 to $27; open hearth small billets, $27.50 to $28; open hearth sheet and tin bars, $27.50 to $28, and forging billets, $30 to $31, all f.o.b. Pittsburgh, Wheeling or Youngstown district, with freight to point of delivery added.

Steel Rails.—The Carnegie Steel Company will put its rail mill at the Ohio Works, Youngstown, Ohio, on open hearth steel rails in a few days to roll an order, in preference to shipping the cold open hearth blooms to its Edgar Thomson mills. The Ohio Works rail mill will likely run on open hearth rails for three or four weeks, or until this order is filled, which is said to be for export trade.

Pipe.—It is stated that the National Supply Company, Pittsburgh, has secured an order for about 30,000 tons of oil country goods, consisting of casing, tubing and drive pipe, for shipment to one of the large oil interests in California.

Wire Products.—Reports are current of an official reduction of about $2 a ton to be made in rods, wire and wire nails within a day or two, but confirmation of the reports has not been obtained.

(*By Mail.*)

The first half of July shows a little better feeling in the iron trade. Reports are received from several of the leading steel concerns that specifications against contracts so far this month have shown a slight increase over the last half of June. It is believed that while July and August will be comparatively dull months in the iron trade, with the opening of September a revival in the general demand will start. The railroads have bought very little material since the first half of 1907, and it is positively known from reports received by leading steel companies from their selling agents throughout the country, that practically all the leading railroads are badly in need of rails, engines, cars and other material. The local pig iron trade continues quiet, with some doubt as to whether prices have touched bottom, in spite of the fact that to some furnaces they are now below the actual cost of making iron and have been for some time. While Bessemer iron is held nominally at $15.50 and basic $14.50, Valley furnace, it is possible that these prices might be shaded on firm offers and on iron for third quarter. The market on both open hearth and Bessemer steel is showing some signs of distress and prices are lower than they have been in some months. It is believed that 4 x 4 in. open hearth billets could be bought very close to $26, Pittsburgh.

Ferromanganese.—No new inquiry of moment has been in this market in the past week, and the situation is very quiet with prices weak. We quote 80 per cent. foreign at $39 to $39.50, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.90 a ton.

Ferrosilicon.—The market is very dull, new inquiry being light and only for small lots. Most consumers are pretty well covered on their requirements for the balance of this year. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh. We quote 10 per cent. at $23; 11 per cent., $24, and 12 per cent., $25, all at Ashland furnace, to which $1.90 a ton should be added for delivery in the Pittsburgh district.

Rods.—New inquiry for rods is light, and no sales of moment have been made in this market for some time. Prices are weak and Bessemer rods may be fairly quoted at $29 to $30 and open hearth and chain rods at $30 to $31, Pittsburgh.

Skelp.—There is a pronounced scarcity of both grooved and sheared iron plates, due to the shut down of several plants in the Pittsburgh and Youngstown districts, that have not arranged the puddling scale with their men. Prices are firm, and higher prices are being asked on iron plates. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—In the past week the Carnegie Steel Company entered new orders for 2400 tons of light rails and received specifications against contracts for about 1000 tons. A good part of the output of the Edgar Thomson rail mills is open hearth rails, the blooms being brought from the Homestead Steel Works and reheated. At their present rate the Edgar Thomson rail mills are pretty well filled up with specifications for light rails and also for standard sections into September. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 to 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Structural Material.—The McClintic-Marshall Construction Company has taken in the past week upward of 12,000 tons of bridge work for the Western Maryland Railroad. The American Bridge Company has taken several contracts, one of 3000 tons of Western bridge work and another of about 2500 tons for an office building. Prices are only fairly strong, and for delivery in the Pittsburgh district are 1.45c., but in competitive business, for delivery outside of the Pittsburgh district, beams and channels up to 15-in. are quoted at 1.40c., Pittsburgh.

Plates.—It is stated that the Atlantic & Porto Rican Steamship Company has placed orders for two passenger boats with the Newport News Shipbuilding Company, which will require 2500 to 3000 tons of plates and shapes, and which will be furnished by the Carnegie Steel Company. The Baltimore & Ohio Railroad opened bids Tuesday for 1000 hopper bottom cars, and has just placed a contract with the Baldwin Locomotive Works for 50 locomotives. It is probable that the shapes, axles and wheels for these locomotives will be furnished by the Carnegie Steel Company, while the plates will go to an Eastern mill. It is also stated that the Toledo Shipbuilding Company has recently taken a contract for a lake boat, which will require 3000 to 4000 tons of plates. We quote ¼-in. and heavier plates for delivery in the Pittsburgh district at 1.45c., and for delivery outside the Pittsburgh district at 1.40c., Pittsburgh.

Sheets.—The leading sheet mills deny that any official reduction in prices has been discussed. The reports of such a reduction probably arose from the fact that for several months prices on the lighter gauges of black sheets have been shaded by some mills from $2 to $3 a ton, and on galvanized from $3 to $4 a ton. These concessions in prices are being made now by sheet mills that some time ago refused to enter contracts at less than the official prices. The present demand for black and galvanized sheets is fair, while on blue annealed and electrical sheets the mills are pretty comfortably filled for the next several months. The American Sheet & Tin Plate Company is operating to about 80 per cent. of its sheet capacity, its only idle plant being the Aetna-Standard Works at Bridgeport, Ohio, containing 23 hot mills, which has not turned a wheel for more than a year. Other sheet mills report they are operating to about full capacity and have a fair amount of work ahead. Official prices on sheets, which, however, do not now represent the actual market, are based on 2.40c. for No. 28 black and 3.50c. for No. 30.

Tin Plate.—This product continues to be the most active on the whole list of finished iron and steel, and while new buying at present is not heavy, all the leading tin plate mills are pretty well filled up for the balance of this year if consumers take out all the tin plate for which they have made contracts. The tomato and corn crops this year promise to be very heavy, and this will mean a tremendous consumption of tin plate by the canneries later in the season. The American Sheet & Tin Plate Company is operating practically to full capacity all its plants except the Laughlin and La Belle Works in the Wheeling district, and no efforts have been made to start these plants. The Jones & Laughlin Steel Company is now making deliveries of tin plate from its first unit of 12 mills, which was started up some time ago, and expects to put on additional tin mills within the next two months. Prices on tin plate are firm, and we quote on the basis of $3.60 for 100-lb. cokes per base box, f.o.b. Pittsburgh.

Bars.—Specifications will soon commence to come in on the heavy contracts for steel bars placed in May and June by the implement and car builders, some of these contracts running from July to December and others from July over the next year. The railroads have not been specifying very liberally against their contracts for steel and iron bars, and a good deal of tonnage on these contracts, which should have been taken out in the second quarter, has been carried over into third quarter. The local steel bar mills are busy on

THE IRON AND METAL MARKETS

specifications which are coming in freely, and shipments this month will no doubt be very close to June, which was a heavy month. The Republic Iron & Steel Company has started up its works in Youngstown, Ohio district, which were closed down June 30 for inventory and repairs. No settlement has yet been reached between the Western Bar Iron Association and the Amalgamated Association on the puddling scales, but another meeting will likely be held about July 20. The puddling department of the Youngstown Sheet & Tube Company is shut down, this concern not having reached an agreement with the Sons of Vulcan on the puddling scale. Most of the other bar iron mills in the Central West are running under the terms of the clause in the scale which allows them to run, pending settlement of the puddling and finishing scale. New demand for iron bars is light, and several of the mills are in need of specifications. We continue to quote steel bars at 1.45c. and iron bars at about 1.50c., f.o.b. Pittsburgh.

Spelter.—A little more activity in demand is reported, and prices are possibly a shade firmer. We quote prime grades of Western at 4.95c. to 5c., East St. Louis, carrying a freight rate of 12½c. per 100 lb., for delivery in the Pittsburgh district.

Hoops and Bands.—New demand for hoops and bands is reported as fairly active, and a number of consumers whose contracts expired on June 30, but on which all the material was not taken out, have had these extended into third quarter, while in some cases new contracts have been made. We quote steel hoops for forward delivery at 1.50c. to 1.55c. and steel bands at 1.45c. to 1.50c., f.o.b. Pittsburgh, extras as per the steel bar card applying on the latter.

Spikes.—No large contracts for railroad spikes have been placed with the local mills for some time, new demand being largely confined to small lots for repair work. For small railroad and boat spikes the demand is more active than for standard sizes, and the makers are entering a fair amount of new business. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at 1.55c. to 1.60c. for Western shipment and 1.60c. to 1.65c. for local trade. Boat and small railroad spikes are lower in price and we quote these at 1.65c. to 1.70c., base, these prices being for carload and larger lots.

Rivets.—New demand is fairly active, and so far this month orders placed are better than in the last half of June. Official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but for desirable orders these prices are being shaded.

Shafting.—Automobile builders continue to specify liberally on contracts for shafting. The general trade is placing fair orders, but the makers are not quite as busy as they were some time ago and have been able to catch up to some extent on back orders. Prices are fairly strong, but in exceptional cases for desirable orders are shaded. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of about 55 and 5 off.

Wire Products.—There has been no improvement in conditions in the wire trade other than noted in this report for some weeks. The new demand for wire nails and wire products generally is light and is confined to small lots to cover actual needs. The Southern wire trade usually opens up in the early part of August, and it is believed that within the next month orders for wire products will show an increase. The Pittsburgh Steel Company has started up its open hearth steel plant, rod and wire mills at Monessen, Pa., and the American Steel & Wire Company has also started several of its works which closed down about June 30 for inventory and repairs. Reports are current of $1.75 being quoted on wire nails, but while this is being done it is only in exceptional cases and by one or two of the smaller outside mills that are anxious for orders. The two leading companies in the wire trade, the Pittsburgh Steel Company and American Steel & Wire Company, are still quoting on the basis of $1.80 for carload and larger lots of wire nails. We quote galvanized barb wire, $2.10; painted, $1.80; annealed fence wire, $1.60; galvanized, $1.90; cut nails, $1.70 to $1.75, all f.o.b. cars, Pittsburgh, with usual terms, and freight to destination added.

Merchant Pipe.—There has been considerable activity in the large pipe trade in the past week. The National Tube Company has taken a contract for 100 miles of 8-in., to be furnished to the Texas Company, and the same interest has taken 90 miles of 12-in. for a gas line to convey natural gas into London, Ontario, Canada. The La Belle Iron Works, Steubenville, Ohio, has also taken a contract for 100 miles of 6-in. for the Texas Company. Reports are current of some very large contracts for line pipe being placed in California to convey crude oil for fuel purposes from the California oil fields into Arizona and New Mexico, but official confirmation of the placing of these contracts is lacking. The general demand for merchant pipe is only fair, but on the larger sizes the leading mills are pretty well filled up for the balance of this year. It is stated that official discounts on steel and iron pipe, in the main, are being observed.

Boiler Tubes.—Additional contracts for locomotive tubes have recently been placed with local mills. The new demand for boiler tubes is fairly heavy, and the mills are pretty well filled up for the next several months. Official discounts on locomotive and boiler tubes, printed on another page, are still being more or less shaded.

Coke.—There has been some pretty heavy buying of foundry coke for delivery over the last half of the year, and several inquiries are in the market for furnace coke for the same delivery. One local interest has recently taken three or four nice contracts for foundry coke on the basis of $2.40 to $2.50 per net ton at oven, for delivery over balance of this year. The coke made by this concern has a high reputation in the trade and always demands the highest prices. The inquiry for the Westinghouse Electric & Mfg. Company for about 12,000 tons of foundry coke for last half of the year has not yet been closed. We quote best grades of furnace coke running under 1 per cent. in sulphur for delivery over last half of the year at $1.80 to $1.85, and best grades of 72-hour foundry coke at $2.15 up to $2.40 per net ton at oven for same delivery. Furnace coke loaded on cars which has to be moved is being offered at $1.65 to $1.70 for best grades.

Iron and Steel Scrap.—The market has been exceedingly quiet in the past week, and not much betterment is expected until next month, as by that time the plants that are now closed for inventory and repairs will probably have started up again. The Pittsburgh Steel Company, the leading consumer of heavy steel scrap in this district, started up its open hearth steel plant at Monessen, Pa., last week and is again taking in old material. Dealers believe that prices of scrap have about touched bottom, and there is not as much pressure to sell as there was two or three weeks ago. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.50 to $14.75
No. 1 foundry cast	14.25 to 14.50
No. 2 foundry cast	13.25 to 13.50
Bundled sheet scrap, at point of shipment	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.00 to 16.25
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	11.00 to 11.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	25.00 to 25.25
Steel car axles	21.00 to 21.25
Locomotive axles	26.00 to 26.25
No. 1 busheling scrap	13.00 to 13.25
No. 2 busheling scrap	9.00 to 9.25
Old car wheels	14.50 to 14.75
Sheet bar crop ends, shipping point	16.75 to 17.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	9.50 to 9.75

Chicago

FISHER BUILDING, July 13, 1910.—(*By Telegraph.*)

Nothing has developed in the past week to materially change the complexion of the market. Pig iron is holding its own at the levels previously reported, and there is no more willingness to sell than is manifested to buy, as it is not believed that there will be any appreciable change in the situation for the next few weeks. Melters as well as furnace interests are inclined to let the market drag, content to watch and wait for the development that will indicate that bottom has been reached. Agricultural consumption of rolled products is pre-eminently the bright feature of the market, and there seems no cessation in the movement of material to these channels. The frequent showers in the Northwest this week further tend to brighten this situation. July has not started well for fabricated material, but June was a good month, the contracts closed in that period aggregating 187,000 tons. Prices, however, remain low. In the failure of the Amalgamated Association to reach an agreement with the Western Bar Iron Association at the recent scale conference, bar iron has strengthened sentimentally. Plate, structural and rail mills are running comfortably, but in no instance are they crowded with specifications. The axle mill and 12-in. bar mill at Gary are reported near completion, and both will be started up within the next 30 to 60 days. Scrap is without any life and values have receded this week under the pressure of heavy railroad offerings. The Wisconsin Steel Company has blown out its No. 2 furnace.

Pig Iron.—Possibly the most important development of the week is the reduction in the price of a Virginia brand of iron. This product had been held on the basis of $14.25,

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Roanoke, for No. 2, which is equivalent to $13.10, Birmingham, or $17.35, Chicago. Under the conditions that have been prevailing in the iron market the company has been unsuccessful in marketing its product at this level, and has announced a cut of 75c. a ton, or to the basis of $12.35, Birmingham, for No. 2 for third quarter delivery. Very little interest is manifested in the market, however. Reports here mention that Birmingham irons have been sold as low as $11.25 for prompt shipment, but they cannot be verified. The lowest price offered in this market is $11.50 for No. 2. The loading interests aver they are holding out for $12, but are doing no business at this figure. Inquiry for iron is light, and there is such a contest to secure the business offered that frequently the buyer becomes wary and withdraws for a better price. There was a sale last week of 1500 tons of malleable Bessemer and 500 tons of foundry for last half delivery at the "going market price," to quote the seller. This may mean anything from $16.50, at furnace, down. Another malleable interest has also come into the market for last half requirements, about 1800 tons, and there are scattering inquiries for 6000 tons of foundry irons. There is no fixed price for Northern brands. It ranges from $16.25 to $16.50 for No. 2 at the furnace, and each transaction is a law unto itself. Charcoal irons are firm, and the quotations below represent the minimum spread. The following quotations are for July, August and September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.60 to 16.10
Southern coke, No. 4	15.35 to 15.85
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	15.10 to 15.60
Southern mottled	14.85 to 15.35
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—Inquiries for 20,000 tons of Bessemer billets were made this week, one consumer wanting 10,000 tons but it was impossible to place the business in this market. No sales of open hearth or forging billets are reported, although specifications against existing contracts are to full contract quotas. In the absence of any transactions, Pittsburgh quotations continue to govern.

Rails and Track Supplies.—There were no sales of standard sections this week, and only a few scattering inquiries for light rails. The South Chicago and Gary mills are comfortably fixed as to specifications, but neither plant is running to its full capacity. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.50; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—The low price at which fabricated material is being offered is bringing out a considerable volume of business. Quotations to-day range from $44 to $46 a ton. Last January the price was around $50 a ton. Only a small proportion of the business figured upon is placed, however, as the competition and disparity in prices create the belief that [illegible] waiting. The contracts taken by the American Bridge Company during June aggregated 75,000 tons and those placed with its competitors 112,000 tons, a total of 187,000 tons for the month—a very healthy evidence that building operations are not hampered by any lack of capital or fear of the future. Contracts let in the West last week include 160 tons for a power house for the South Side Light & Power Company of San Francisco, which went to the Pacific Rolling Mill Company of that city; 820 tons of bridge material awarded to the American Bridge Company by the East St. Louis, Columbia & Waterloo Railroad; 708 tons for the Memphis union station, let to the Richards-Noelke Iron Works, Indianapolis, Ind. The only new large job that has come up for figures this week is the building for the Dime Savings Bank of Detroit, 4000 tons, bids for which are being taken by D. H. Burnham & Co. of this city. We quote plain material from mill, 1.63c. to 1.68c., Chicago; from store, 1.90c. to 2c., Chicago.

Plates.—The most noteworthy feature this week was the receipt of specifications for 7000 to 8000 tons of material for steel car construction. New tonnage is light and specifications from the general trade are only fairly good. The South Chicago mills are operating between 75 and 80 per cent. of their capacity. We quote mill prices at 1.63c. to 1.68c., Chicago; store prices, 1.90c. to 2c., Chicago.

Sheets.—The Western market continues quite erratic. Competition is keen for the business offered and prices easily respond to pressure. The increasing cost and slow delivery of sheet bars are gradually eliminating the low sellers in this market, and there is a belief that by the first or middle of August conditions will be more normal. Trade is opening up well in the Southwest, from which point there is an especially good demand for galvanized and corrugated sheets. Specifications from the electrical and agricultural trades are also reported good. Inquiries from jobbers throughout the various sections of the West indicate that these interests are beginning to feel the need of replenishing their warehouse stocks. The Inland Steel Company started up its plant at Indiana Harbor last Monday after a week's shutdown over the holiday for repairs. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.58c.; No. 28 galvanized, 3.68c. Prices from stock, Chicago, are: No. 10 blue annealed, 2.25c. to 2.35c.; No. 28 black, 3c. to 3.10c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—Specifications for soft steel bars are extraordinarily heavy. The best delivery that can be made is six weeks to two months, despite the fact that all the mills are running to their fullest capacity. Some relief from this congestion is expected when the new 12-in. mill at Gary is started up, which is now expected to be September 1. Bar iron is in fair demand, though prices continue somewhat erratic. Railroad and car business is slow, but the specifications from jobbers, which are very liberal, more than make up for this discrepancy. The Interstate mill at East Chicago resumed operations last Monday after a week's idleness, but the three Western mills of the Republic are still down. No agreement was reached at the Detroit conference between the representatives of the Amalgamated Association and the Western Bar Iron Association a couple of weeks ago, and another conference will likely be held the third or fourth week of this month. Pending the settlement of the disputed questions, the Western mills will continue in operation through July on the old scale, except those of the Republic Iron & Steel Company, and these mills will not start up until the new schedule has been settled and signed. There is a good business in hard steel bars, due to active building operations, and prices are very firm. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago.

Rods and Wire.—The most optimistic feature of the present situation in the minds of producers is the low stocks of all forms of wire products reported from all sections of the country. Despite the fact that July is ordinarily a dull month, many jobbers have found it necessary to send in requisitions for immediate shipment. This is considered the hopeful feature of the situation, and with the early return to traveling men to their territory a sharp improvement in buying is looked for. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.78c.; wire nails, 1.98c.; painted barb wire, 1.98c.; galvanized, 2.28c., all Chicago.

Merchant Steel.—In anticipation of an active season, the implement manufacturers are placing specifications for fall shipments quite freely. There has also been a good run of new business in the week under review as a result of shortages disclosed in the process of taking inventory. Mills are slowly overtaking their delinquent deliveries, but are advising their customers to specify freely and early to assure the delivery of the material at the proper time.

Cast Iron Pipe.—There were several municipal lettings last week ranging from carload lots to 400 tons, the latter being placed by the city of Essexville, Mich., and awarded to the leading interest. Several desirable specifications were received from gas interests, aggregating 1000 tons. Cheyenne, Wyo., is in the market for 3000 tons, which will be closed within a week or 10 days. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for gas pipe.

Old Material.—The Western market might be summed up briefly in the statement that apathy prevails. It is even hard to dispose of bargain lots and many of these have gone begging this week. The mid-summer shut down was more extensive among bar mills in this section this year and the period of idleness was longer than usual, resulting in an accumulation of scrap which has practically put these interests out of the market for the immediate future. Furthermore, there are very extensive offerings by railroads, four new lists having come out this week, of an aggregate of 13,000 tons divided as follows: Illinois Central, 6000 tons, St. Paul, 3000 tons, Santa Fe, 2000 tons and the Soo Line 2000 tons. The Baltimore & Ohio and the Burlington both disposed of large lists last week, further glutting the market. These large offerings, combined with the large stocks in the hands of consumers and country merchants have created a feeling of fullness and apprehension hard to overcome. The big dealers are not inclined to speculate on the

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situation and contrary to their usual custom at this time of the year are not buying for storage. With the exception of stove plate and heavy cast the entire scrap list is weak. A local implement manufacturer paid $11 last week for 200 tons of stove plate, and heavy cast is easy to dispose of at $13. Both these materials are scarce. There is no market here either for borings or turnings and it is also well nigh impossible to dispose of either railroad or agricultural malleable at prevailing prices. The Illinois Central and Santa Fe lists will be sold this week and it is believed that some new low prices will be established at that time. The Illinois Central list includes 1000 tons of railroad wrought and 1000 tons of car wheels and the prices offered thus far for these materials are below the quotations that have been current. Market conditions are such that dealers do not show any confidence in the future and the belief of the majority is that prices will be lower before there is any recovery either sentimentally or otherwise. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.75 to $17.25
Old steel rails, rerolling	16.00 to 16.50
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.75 to 15.25
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.50 to $15.00
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.50 to 12.00
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	11.00 to 11.50
Steel axle turnings	9.00 to 9.50
Machine shop turnings	7.50 to 8.00
Cast and mixed borings	4.50 to 5.00
No. 1 busheling	10.50 to 11.00
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.25 to 11.50
Agricultural malleable	10.75 to 11.00
Pipes and flues	9.50 to 10.00

Philadelphia

PHILADELPHIA, PA., July 12, 1910.

The usual midsummer characteristics are to be noted in both the crude and finished material markets. Buying continues irregular and there is an absence of snap in the demand. Sellers make no effort to force business, while buyers are holding back with an expectancy that they will in the near future be able to purchase at a trifle lower prices. Weak sellers continue to take business at inside figures, although there are still a number of producers who will not meet the low figures named. The heated term has also had a retarding effect on business, as well as the production at the mills, which have in a number of cases resumed operations after the usual midyear suspensions. The demand for heavy plates has been a trifle better, but prices are not strong; less business has been going in structural material, while the other lines of finished material show but little movement. A shade more business is reported in old material, but sales are principally in small lots and between dealers. Coke is quieter, with prices a little firmer.

Pig Iron.—The market has a tendency to drag. While occasional inquiries come out for foundry grades, business is not placed freely, and when any material quantity is involved there is usually pretty sharp competition for the business, as some makers in this, as well as adjoining districts, are quite anxious to get orders on their books. There has, however, been very little large lot buying for general foundry use in this territory, although one inquiry for 4000 tons, covering various higher grades of foundry iron for last quarter and first half delivery, is before the trade. The major portion of the recent transactions has been of a small lot character at prices ranging from $16.25 to $16.50, delivered, for standard brands of No. 2 X foundry, with an occasional small or special sale at the $16.75, delivered, price. The differential between No. 2 X and No. 2 plain grades is not over 25c. a ton, and some makers have entirely eliminated it, quoting the same price for either No. 2 X or No. 2 plain iron. Prices, however, do not show as wide a range as they recently have, inasmuch as those who have been holding at a high level are in some instances receding from their position and meeting the market more generally. The cast iron pipe foundries have been somewhat more active buyers, one Delaware River foundry having purchased several thousand tons of low grade iron, while another is in the market for 5000 to 6000 tons, for which they expect to close in a few days. Southern makers are figuring quite extensively on this business, although Northern off-grade iron is also being offered. The movement in Virginia foundry irons has not been particularly active, and, while some makers still name $14, furnace, for small lots of No. 2 X, this grade can be readily had at $13.75, furnace, although the majority of producers will not sell for delivery extending over the full second half. The range of prices for delivery in this territory now more closely approximates $16.50 to $16.75, although occasional sales at $17, delivered, are reported, with some makers quoting the same price for either No. 2 X and No. 2 plain grades. The demand for forge iron for rolling mill purposes is light; a few sales have been reported at $15.50, delivered, in this territory. Basic iron has been quiet, and several sellers have canvassed the trade thoroughly recently without finding a buyer. Moderate sales of standard low phosphorus iron are reported for delivery over the last half of the year; prices are a trifle easier, $22.50 to $23 representing the market for standard brands. The presence of weak sellers gives the market an uncertain tone, as sales at low prices are usually kept pretty well covered. The following range, however, represents open quotations for standard brands delivered in buyers' yards in this vicinity:

Eastern Pennsylvania, No. 2 X foundry	$16.25 to $16.50
Eastern Pennsylvania, No. 2 plain	16.00 to 16.25
Virginia, No. 2 X foundry	16.50 to 16.75
Virginia, No. 2 plain	16.25 to 16.50
Gray forge	15.50
Basic	15.75
Standard low phosphorus	22.50 to 23.00

Ferromanganese.—No demand is reported from consumers in this territory and prices are nominal, at $39.50 to $40, Baltimore, for last half delivery.

Billets.—There is a noticeable absence of demand for open hearth rolling billets, although some contracts for forging billets for second half delivery have been made on a $31 to $32, Eastern mill, basis. Small sales of rolling billets from stock are reported at $28.50 to $29, delivered in this territory, although odd lots can frequently be had at a concession from those prices.

Plates.—While Eastern mills receive a very fair volume of general business, that from customers in this territory has not been very heavy. Some more extensive business, however, is being figured on, one inquiry for some 6000 tons of tank and gas holder plates, and another of 1000 tons for bridge work, being among them. Current business is, however, rather of a miscellaneous character, on which open quotations of 1.60c. to 1.65c., delivered in this territory, are named, although there are rumors of concessions, particularly on the part of Western mills.

Structural Material.—Business is reported as being somewhat lighter. A number of fair propositions are being figured on, few, however, being in this immediate vicinity. Some of the mills are showing more anxiety to book orders, but the weak tendency of prices has a tendency to hold back orders. For ordinary plain shapes, delivered in buyers' yards in this vicinity, 1.60c. can be freely done.

Sheets.—Mills have to a large extent resumed work after the usual midyear shut down, and have as a rule a larger volume of business on their books, a good share of which accumulated while mills were idle. The market in this district has a somewhat stronger appearance, with prices comparatively firm at the following range: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

Bars.—Very little business is being offered and trade drags perceptibly. A number of the mills are still idle, and some may not resume operations until they have a fair tonnage of orders on the books. Prices are unchanged, refined iron bars being quoted at 1.47½c. to 1.55c., delivered, in this territory. Steel bars are firm at 1.60c., delivered.

Coke.—With the closing of a number of contracts for second half foundry coke, activity in the market became somewhat quieter. Prices also showed a stiffening tendency, particularly on the part of makers in the Connellsville field. Very little business is offered in furnace coke. Prices generally show no change, but have a stronger tone, the following range being named, per net ton, for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.50 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—Outside of some fair sales of low phosphorus scrap, aggregating about 3000 tons, transactions in old material have been small and confined principally to transactions between dealers. The associated steel and rolling mills are taking on very little material, pending the awards against the various railroad lists. A sale of several hundred tons of car wheels is reported, but the market on the whole continues quiet, and prices, owing to insufficient sales in many grades to establish a market, are largely

THE IRON AND METAL MARKETS

nominal, ranging however, about as follows for delivery in buyers' yards in this territory:

No. 1 steel scrap and crops	$14.25 to $14.50
Old steel rails, rerolling	16.00 to 16.50
Low phosphorus	19.25 to 19.75
Old steel axles	20.50 to 21.00
Old iron axles	26.50 to 27.50
Old iron rails	19.00 to 19.50
Old car wheels	14.50 to 15.50
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	14.00 to 14.50
No. 1 forge fire	12.50 to 13.00
No. 2 light iron	7.50 to 8.50
Wrought turnings	9.75 to 10.25
Cast borings	9.50 to 9.75
Machinery cast	15.00 to 15.50
Railroad malleable	14.00 to 14.50
Grate bars	12.25 to 12.75
Stove plate	10.00 to 10.50

Cincinnati

CINCINNATI, OHIO, July 13, 1910. (*By Telegraph.*)

Pig Iron.—An inquiry has just come out from a local consumer for 8000 to 8500 tons of steel making iron, basic and Bessemer. While this has excited some interest locally, no price cutting contest is anticipated, as figures seem to have gone about as low as the furnaces can stand. The central Ohio interest, mentioned last week, is understood to have placed an order for 1200 tons of Southern iron, and the balance of its requirements will be filled with Northern iron, not yet contracted for. A local firm has received a report from the Birmingham district showing that out of 40 active furnaces only 20 are now in blast. This has not stiffened prices as anticipated, and $11.50, Birmingham, for No. 2 seems the prevailing figure. Northern irons are listless, and we quote $15 to $15.50, furnace. Malleable is firm at $15.50. The smaller interests are buying sparingly. For immediate delivery and through the last half, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$15.25 to $15.75
Southern coke, No. 2 foundry	14.75 to 15.25
Southern coke, No. 3 foundry	14.25 to 14.50
Southern coke, No. 4 foundry	14.00 to 14.25
Southern coke, No. 1 soft	15.25 to 15.75
Southern coke, No. 2 soft	14.75 to 15.25
Southern gray forge	14.00 to 14.25
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.70
Lake Superior coke, No. 2	16.20
Lake Superior coke, No. 3	15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Foundry coke has a better tone this week, and prices are firmer. This is brought about for the reason that July is the contracting month for the foundry interests, and a number of contracts have been made during the past few days, some for a six months' supply, but the majority for the entire 12 months. Furnace coke is quoted around $1.70 to $1.75 per net ton, at oven, for prompt delivery, with a 5c. advance for second half shipment. The contract price for Pocahontas furnace grades hangs around $1.85, with slight concessions for prompt delivery. Connellsville foundry coke is firm, at $2.25 to $2.50, on contract, and Pocahontas foundry at $2.20 to $2.25. A fair quotation for Wise County foundry coke would be from $2.10 to $2.25.

Finished Iron and Steel.—Business continues good, with no sign of a let-up in the near future. The large amount of building going on makes an excellent market for reinforcing concrete bars. Structural material of all kinds is in fair demand. Beams and channels, out of stock, can be bought around 1.90c. The demand for iron bars is not strong and they are quoted around 1.50c., Cincinnati, mill delivery. Hoops and bands are holding their own.

Old Material.—The market is dull and very little material of any kind is moving. Railroad offerings for the past few days have been light. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$11.50 to $12.00
Cast borings, net ton	4.00 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	16.50 to 17.00
Old iron rails, gross ton	17.00 to 17.50
Old steel rails, short, gross tons	14.50 to 15.50
Old steel rails, long, gross ton	14.50 to 15.50
Relaying rails, 56 lb. and up, gross ton	22.50 to 23.00
Old car wheels, gross ton	12.00 to 13.00
Low phosphorus scrap, gross ton	16.00 to 16.50
Heavy melting steel scrap, gross ton	11.50 to 12.00

Cleveland

CLEVELAND, OHIO, July 12, 1910.

Iron Ore.—Shipments appear to have slowed down slightly since the first of the month. A considerable falling off is expected later in the season. Some of the merchant furnace companies that were unwilling to take their ore earlier in the season are now accepting shipments. No sales have been made for some time. In spite of the fact that 20 per cent. of the independent vessel capacity has been taken out of commission, there are not enough cargoes to supply all the boats now in operation. We quote prices as follows, per gross ton: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market is quieter than for several weeks. Inquiries of any size are lacking and the only sales reported are a few small lots. A number of northern Ohio foundries that have had inquiries out during the past few weeks have decided not to buy for the present. Some of these are buying spot iron as they need it. Quotations remain about stationary, but not enough business is coming out to test the market. Owing to the light demand some stock piles are growing more rapidly than they did in June. Some of the producers are not trying to meet present prices. No. 2 foundry is quoted at $14.25 to $14.50, Valley furnace. There is some inquiry for small lots of high silicon iron. Ohio silvery, 8 per cent. silicon, is held at $18 for the fourth quarter, but this price is being shaded 25c. to 30c. for the third quarter delivery, and $18.50 is being asked for the first half of next year. There is little inquiry for Southern iron. The only sale reported is 500 tons of No. 2 to a central Ohio stove maker at $11.50, Birmingham, which appears to be the present market basis. For prompt shipment and last half we quote, delivered, Cleveland, as follows:

Bessemer	$16.40 to $16.65
Northern foundry, No. 1	15.65 to 15.90
Northern foundry, No. 2	15.15 to 15.40
Northern foundry, No. 3	14.65 to 14.90
Gray forge	14.65 to 14.90
Southern foundry, No. 2	15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—Some foundry coke contracts are being placed at $2.25 for the last half, the same price being quoted for the same grades for delivery through an entire year. No transactions are reported in furnace coke. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment and $1.80 to $1.85 for the last half. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 for spot shipment and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—The market is generally quiet, although some of the mills report a fair demand for small lots of material. Rumors that the price of steel bars is being shaded have gained considerable circulation and have caused some uneasiness among the sellers. It appears that one interest has quoted a price of 1.40c., Pittsburgh, to two or three agricultural implement makers in this territory, but so far other mills are holding firmly to the 1.45c. price, and the opinion prevails that the latter price will be generally maintained. The demand for structural material is only moderate. Fabricating shops are not well filled and are quoting low prices. Contracts have not yet been placed for the plain material for considerable tonnage required for construction work recently let in this city. Buyers seem to be holding off for price concessions. Small lots are still being sold at 1.45c. to 1.50c., Pittsburgh. The contract for an addition to the plant of the Lima Locomotive & Machine Company, Lima, Ohio, has been let to the Massillon Bridge & Structural Company. It will require about 600 tons. There is a fair demand for small lots of plates. Prices are not firm, the 1.40c., Pittsburgh, quotation having become more general. Some mills are still holding to 1.45c., and are getting 1.50c. for small lots. The demand for sheets continues light, with concessions as high as $3 a ton on black and $4 on galvanized. Prices on blue annealed sheets remain firm. The demand for shafting continues good and prices are being maintained. The demand for iron bars is light. Price quotations remain stationary at 1.40c. to 1.45c., at mill. It is expected that the two local bar iron mills will be kept shut down until August 1. The demand for rivets has fallen off somewhat, orders being for smaller tonnages. Regular quotations on rivets are being shaded from $1 to $3 a ton. While the demand on warehouses is less active than a few weeks ago, jobbers report a fair volume of stock orders.

Old Material.—The market continues very dull. Very few orders are being taken and mills generally are holding back shipments on contracts. Some mills that have taken no scrap for the past two weeks because of being shut down will accept shipments again after July 15. Prices are weak and largely nominal. A further reduction of 50c. a ton is made in several grades. Railroad offerings this week

THE IRON AND METAL MARKETS

include lists from the Pennsylvania Lines East and the Norfolk & Western. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.50 to $15.00
Old iron rails	16.50 to 17.00
Steel car axles	20.50 to 21.00
Heavy melting steel	13.00 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.50 to $22.00
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	9.00 to 9.50
No. 1 busheling	12.00 to 12.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 cast	12.50 to 13.00
Stove plate	11.00 to 11.50
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., July 11, 1910.

Pig Iron.—There has been a further curtailment in production the past week by the blowing out of two stacks. The putting out of another is receiving serious consideration, and in all probability it will be done this week. Several small inquiries that have been pending were closed last week, aggregating 3000 or 4000 tons. There is still a feeling of unrest all round, but sellers refuse to be hammered lower than $11.50, at the furnace. This is the lowest price that has been heard of. There is no doubt that pig iron has been sold rather freely during the past three weeks at $11.50; in fact, two or three of our largest producers, it is understood, have put about as much tonnage on their books at these low figures as they care for. It is also a fact that some companies are still quoting $12 for third and fourth quarter delivery. One or two large inquiries that were heard of last week and the week before seem to have dropped out of the market for some cause. In all probability they were submissions and the prices named did not favorably impress sellers, so no trade was closed. As yet none of the Southern producing interests has been willing to open its books for delivery beyond December 31, 1910. It is understood that very few requests have been made for such deliveries thus far. It is thought that with the material curtailment in production since the early part of the year—and especially recently—it will not take long for the furnace companies to work off what surplus iron they have on hand; it may take two or three months to draw in the slack and be ready for a new start.

Cast Iron Pipe.—No important lettings are recorded, about the best feature of the market being the satisfactory small business being booked. These transactions are in keeping with pig iron conditions. There has been a somewhat better demand for gas pipe on account of recent activities along that line in the Middle and Far West. Prices are holding about the same. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 per ton extra for gas pipe.

Old Material.—Several plants of the largest users of scrap are closed down at this time on account of inventory and the usual midsummer wage adjustments, and for this reason the scrap market is even duller than it has been. There is not much hope for any material change until pig iron becomes more active. Little interest is manifested either by buyers or sellers, and prices quoted remain only nominal, as follows, per gross ton, f.o.b. cars here:

Old iron axles	$16.50 to $17.00
Old iron rails	12.50 to 13.00
Old steel axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.00 to 9.50
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, MO., July 11, 1910.

While the leading sellers of pig iron report business very quiet, even more so than usual in the midsummer season, all the large mills, foundries and fabricators in this city and vicinity are busy. A fairly good demand for coke aids in confirming this statement. Building is active and the banks report a satisfactory condition financially. Though the heated term is on, thus far there has not been more than normal temperature and but little curtailment of manufacturing has been caused by the weather. Such suspension as has taken place is due merely to the customary accounting and repair work of the season. Dealers in old material anticipate a good demand to set in early in the fall.

Coke.—While the market is not very active, there is a quite steady demand for coke, with occasionally the closing of good sized tonnage. The large inquiry reported last week is still pending, the parties not being in urgent need and their ideas regarding price are below the market. Among the inquiries noted is one for 50 cars of Connellsville foundry, shipment over a year. The sale of 3000 tons of Connellsville foundry for shipment over a year was reported by one of the leading sales agencies. The market for Connellsville 72-hour foundry for contract is $2.25 per net ton, f.o.b. oven, for round lots. Smaller business for special brands is done at $2.50 for prompt delivery or short time contracts.

Pig Iron.—The early part of the past week found many parties away or just returning from holiday trips, consequently business was restricted to the closing days of the week and trade partook of a holiday character. In fact, with most offices it was very quiet, none of them reporting sales exceeding 500 tons with very little inquiry except for small lots. An inquiry for 2000 tons of Northern iron is still pending. Such business as is passing is mostly for Southern foundry, for shipment over the last half. While some agencies are holding No. 2 Southern foundry at $12 Birmingham, for either prompt or extended delivery, others are offering it at $11.50. Merchant sellers are bearish, looking for lower prices on account of heavy stocks and the capital required in carrying them. We quote No. 2 Southern foundry at $11.50 Birmingham, for any delivery prior to January, 1911, and Southern Ohio at $15, f.o.b. furnace.

Finished Iron and Steel.—The leading interest reports a rather light demand for standard rails; for light rails there is more inquiry than of late. Structural material is only in fairly good demand for miscellaneous stock. Local shops are busy, but not being large companies, the aggregate sales total but a moderate tonnage. There is some outside call however. Bars are in pretty good demand, the better inquiry being for steel. Prices for iron are weaker. Spikes and bolts continue active and for miscellaneous track material there is a steady demand.

Old Material.—The leading dealers report a very quiet market ruling throughout the past week, transactions being almost wholly confined to the regular trade. The St. Louis & San Francisco Railroad closed out 2500 tons of miscellaneous scrap, and the Wabash 800 tons. The tone of the market, in consequence of lack of demand from consumers, is weak, though no material decline in prices is looked for. We quote dealer's prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	15.00 to 15.50
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	21.00 to 21.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	6.00 to 6.50
No. 1 busheling	11.00 to 11.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	10.50 to 11.00
Agricultural malleable	10.00 to 10.50
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	9.00 to 9.50
Machine shop turnings	8.50 to 9.00

Articles of incorporation for the Banner Automobile Company, organized by Russell E. Gardner, president of the Banner Buggy Company and one of the leading business men of the city, have been filed. The contemplated output of the manufacturing plant to be erected is 20,000 cars annually.

The American Welding & Automobile Repair Company, St. Louis, has been incorporated; capital stock $5000; incorporators, August W. Mewes, H. G. Donigan and Fred Essen.

The St. Louis Fire Door & Sheet Metal Works, St. Louis, has been incorporated; capital stock, $7500; incorporators, H. Wertheimer, Albert Nathan and Maurice Weil.

The St. Louis contractors have compromised with the sheet metal workers after more than a month's controversy on the wage question, fixing the rate at $4.80 per day.

THE IRON AND METAL MARKETS

Buffalo

BUFFALO, N. Y., July 12, 1910.

Pig Iron.—The market is quiet, exhibiting signs of the usual mid-summer dullness, and the volume of business coming in during the week was comparatively small. A number of orders which, from the tenor of the previous week's inquiry were expected to develop promptly, have not yet materialized. One interest received orders for malleable aggregating 3000 tons, from New England points, stated to have been placed at the maximum price in the appended schedule. The majority of such orders as were placed, however, were at low figures, especially for foundry irons. Prices obtainable are not attractive to furnacemen as furnaces cannot profitably continue operation indefinitely at current prices in the face of the high cost of production now prevailing. One or two interests, however, are reported to have made reductions equivalent to 50 cents per ton from last week's schedule for No. 1 X and No. 2 X foundry and 25 cents per ton for No. 2 plain. No. 3 foundry and gray forge. A reflection of these reductions seems warranted in the current week's schedule. We quote accordingly, per gross ton, f.o.b. Buffalo, for last half delivery:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.75 to 15.25
No. 2 plain	14.75 to 15.00
No. 3 foundry	14.50 to 14.75
Gray forge	14.25 to 14.50
Malleable	15.00 to 15.75
Basic	15.25 to 15.75
Charcoal	19.00 to 19.50

Finished Iron and Steel.—Most of the leading interests report new business for finished products coming in in good volume, although one or two agencies state some slackening is apparent, attributable to the midsummer vacation season. Steel bar prices remain unchanged, at 1.45c., Pittsburgh. Specifications on steel bar contracts and for hoop material have been heavy. Inquiry has been good for black and galvanized sheets; also for plain shapes and plates. The Canadian export demand for bar and hoop material and plates is well sustained, and some large contracts for structural shapes are pending. In fabricated structural material the demand continues fairly active. Specifications are being prepared for a number of local structures on which bids will soon be called for. These include the Connesius College buildings, requiring a large tonnage; a new theatre building on William street, and a store and loft building on Main street for Allen E. Klopp. Contract for steel for the medical laboratory for the University of Buffalo was awarded to the H. C. Harrower Iron & Steel Company.

Old Material.—The market continues inactive, with no change in conditions as regards the demand from consumers, the mills still holding back on shipping orders. No improvement is in sight and dealers do not anticipate much change in the situation before the end of the summer. Prices are unchanged and largely nominal as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.25 to $13.50
Low phosphorus steel	18.00 to 18.50
No. 1 railroad wrought	16.00 to 16.25
No. 1 railroad [illegible] heavy cast scrap	14.50 to 14.75
Old steel axles	18.00 to 18.50
Old iron axles	22.50 to 23.00
Old car wheels	14.50 to 15.00
Railroad malleable	14.50 to 14.75
Boiler plate	11.75 to 12.25
Locomotive grate bars	11.50 to 12.00
Pipe	11.25 to 11.75
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	12.25 to 12.50

The German Iron Market

BERLIN, July 1, 1910.

In the absence of any new or striking changes in the iron market situation, the chief interest of trade circles attaches to the pending negotiations looking toward the reorganization of the pig iron trade and to other questions of organization. The outlook for the creation of a big combination controlling pig iron production and prices, to which reference has previously been made, has greatly improved within a week. The Niederrheinische Hütte has at last come to terms with the movers for the reorganization of the trade, but only after they conceded to it a yearly allotment of 160,000 tons. This concern, after the extensive reconstruction and enlargement of its furnaces during the past few years, stood out stiffly for a big allotment and got it. The syndicate promoters will now proceed, it is understood, to reach an understanding with the big furnace company at Lübeck, which went into operation some two or three years ago, and with the East German Syndicate, including since several months ago the Krafft furnaces near Stettin. It is surmised, however, that they will encounter at Lübeck the same difficulty as with the Niederrheinische concern, since it also is projecting a considerable addition to its plant, including a third furnace for making special qualities of pig.

SOME SYNDICATES ENCOUNTER TROUBLES.

On the other hand, the efforts to organize the scrap and old iron trade, described in previous letters, appear not to be making satisfactory progress; the negotiations, it is said, have come to a standstill. That all is not easy sailing with the trade organizations in the iron industry is also evident from the fact that not less than three of them went to the wall yesterday. The combination controlling steel castings was not renewed because of the difficulties made by numerous outsiders. The boiler tube syndicate was declared dead yesterday, owing chiefly to the refusal of the Mannesmann Company at Duesseldorf to continue in it, and the gas pipe men also dissolved their combination. From today on there will be open competition in all these products. In this connection it may be mentioned, however, that three of the greatest iron companies of the Silesian District—the Oberschlesische Eisenbahnbedarf Company, the Huldschinsky Works and the Bismarck Hütte—have just entered into a contract arrangement for 10 years for the manufacture of seamless steel tubing upon the community-of-interest principle. Each mill will turn out certain sizes exclusively, and the whole business will be pooled among them.

Reports from the market agree in representing conditions as very quiet. There has been little or no change in the situation for some time, but the uncertainty regarding the American situation is making itself more distinctly felt in Germany than hitherto. Prices are apparently being adhered to pretty firmly, but there is a feeling among consumers, and particularly among dealers, that easier prices will have to be conceded by manufacturers later on. Hence buying is mostly confined to immediate requirements. Dealers in particular are said to be holding back with orders for the purpose of compelling the mills to give easier terms. This has gone on so long now that their stocks are believed to have run pretty low and that they will soon have to come forward with new orders.

New York

NEW YORK, July 13, 1910.

Pig Iron.—There is very little new business. Buyers are of two classes—those who want quick shipment and those who would buy for the last quarter or for delivery extending into 1911. The quick shipment iron is presumably to average with higher priced iron coming in on contracts, a procedure of which there is always a certain amount in a declining market, and at the expense of regular shipments on old contracts. Some iron, chiefly for the high silicon portion of the buyer's mixture, has been sold in this district for air brake work, probably 1500 to 2000 tons, and there has been some buying for Connecticut delivery. While all furnaces are not quoting lower prices, some have gone to new low figures the past week on early delivery iron. Virginia No. 2 has touched $13.50, at furnace, though $13.75 is the more common quotation. In eastern Pennsylvania the furnace companies are unwilling to make the usual differential between No. 2 X and No. 2 plain. Buffalo furnaces have been meeting competition from other districts in New England and have named $14.75 and somewhat lower at furnace. Pipe foundries are buying when attractive offers are made or when their low bids are accepted, some of this business in Southern iron being at $10.75 and $10.50, respectively, at Alabama furnace, for Nos. 3 and 4. We quote Northern foundry iron at tidewater as follows: No. 1, $16.50 to $17; No. 2 X, $16.25 to $16.50; No. 2 plain, $15.75 to $16.25. Southern iron is quoted at $16.25 to $16.75 for No. 1 and $15.75 to $16.25 for No. 2.

Cast Iron Pipe.—As the pipe required for the water extensions of the city of New York will be purchased by contractors under awards made July 6, the price has not been made public. No further lettings of importance are in sight in this immediate vicinity. Purchases for general requirements are light and not numerous. Trade is, therefore, exceptionally dull for this season. Carload lots of 6-in. are quoted at $24.50 to $25 per net ton, tidewater. These quotations would be shaded on large lots or on municipal lettings.

Finished Iron and Steel.—All lines continue rather quiet in this territory. The structural material demand is a shade better. The largest item in prospect in New York is the south section of the new main station of the Grand Central Terminal, for which bids have been asked on 10,000

THE IRON AND METAL MARKETS

tons. The McClintic-Marshall Construction Company has obtained the contract for 1300 tons for the New York Polyclinic Hospital. This company has also taken 12,500 tons for bridges and viaducts on the extension of the Western Maryland Railroad. Other important structural material contracts outside of New York are the Hamilton Bank Building, Chattanooga, Tenn., 1300 tons, awarded the Brown-Ketcham Iron Works; the Virginia Trust Company Building, Richmond, 700 tons, awarded the Virginia Bridge & Iron Company; 2900 tons for the Utah Copper Company, taken by the Minneapolis Steel & Machinery Company; the highway bridge at Oil City, Pa., over the Allegheny River, 1600 tons, to be fabricated by Rogers Bros.; 700 tons for the Memphis, Tenn., union station, given to the Noelke-Richards Iron Works; 600 tons for the Lima Locomotive & Machine Company, Lima, Ohio, awarded the Massillon Bridge & Structural Company; 500 tons for the Sloan Laboratory at Yale University, awarded the Eastern Steel Company, and a bridge at Cleveland for the Erie Railroad, 1000 tons, taken by the Pennsylvania Steel Company. The bids are in, but no decision has been reached on the 3600 tons for the Dime Savings Bank Building at Detroit, Mich. The steel bar mills are receiving good specifications on contracts, but are closing less new business with the result that deliveries are steadily improving, but the price remains firm. The prices of bolts are weaker, but the bar iron business generally is very good for the season. Plates are weak and on good contracts the price is being shaded, but generally for local business, which is mainly in small lots, nothing is being taken at less than the market quotations. In consideration of the weakness in plates the quotation is revised to 1.56c. as a minimum; otherwise prices are unchanged—plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.61c., and bar iron 1.50c. to 1.55c., all New York.

Steel Rails.—The Baltimore & Ohio has just added 1000 tons to its original rail order, this amount being divided between the Pittsburgh and Chicago district mills. An order for 950 tons has been placed by the Elizabethtown Terminal Railway Company with the Carnegie Steel Company.

Old Material.—The demand is light, consumers appearing almost uninterested in the old material market. The supply is large and buyers have acquired the habit of looking for bargains. Quotations per gross ton, New York and vicinity, are nominally as follows:

Rerolling rails	$12.25 to $12.75
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	20.00 to 21.00
Standard hammered axle car axles	21.50 to 22.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.25 to 13.75
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.50 to 6.00
Cast borings	6.50 to 7.00
Wrought turnings	6.75 to 7.25
Wrought pipe	11.75 to 12.25
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, July 13, 1910.

THE WEEK'S PRICES

Cents Per Pound

	Copper.			Lead.		Spelter.	
July.	Lake.	Electrolytic.	Tin.	New York	St. Louis.	New York.	St. Louis.
7	12.75	12.37½	32.75	4.40	4.25	5.20	5.05
8	12.62½	12.37½	32.60	4.40	4.25	5.20	5.05
9	12.62½	12.37½		4.40	4.25	5.20	5.05
11	12.62½	12.37½	32.55 to 32.40	4.40	4.25	5.20	5.05
12	12.62½	12.37½	32.45	4.40	4.25	5.20	5.05
13	12.62½	12.37½	32.65	4.40	4.25	5.20	5.05

The copper market is weak. Tin is selling below the cost of import. More interest is being taken in lead and some outside sellers are quoting advanced prices. The spelter market is quiet and uncertain.

Copper.—Notwithstanding the fact that the report of the Copper Producers' Association shows heavy exports, the figures on the whole were regarded as unsatisfactory by the trade. Notwithstanding the pessimistic sentiment, it is generally conceded that a great deal of copper is going into consumption, and under ordinary circumstances the extent of that movement would be considered good. As the matter stands, however, too much copper is being produced. The United Metals Selling Company has been trying to sell electrolytic copper this week at 12.37½c. A number of consumers were informed by the company Friday and Saturday that they could obtain copper at that price, but they did not seem particularly anxious to take it. Although consumers are carrying little stock, their attitude seems to be that the producers might just as well handle the surplus. It would be hard to say how low some holders of copper would sell electrolytic at this time, but they do not think it advisable to run the market down by reducing their quotations, especially when there seems to be no disposition to buy. Lake copper has weakened in price and there are offerings of round lots at 12.62½c. Casting copper is more plentiful and it can be had at 12.25c. [illegible] was firm. Spot copper sold for 53 [illegible] futures for 25[illegible]. The sales amounted to 700 tons of spot and 2500 tons of futures.

Waterbury Average.—The Waterbury average for June was 12.75c.

Pig Tin.—The pig tin market is dull and the metal is being sold at below the cost of import. There was a good buying movement on Monday, when about 200 tons was sold to consumers. The prices realized were 10 to 15 points below the import cost and the sales were made chiefly by people with London connections who, as a rule, do not care to do business below the London market price. In these cases, however, they were able to buy September tin as low as 32.25c., while they were selling export tin at from 32.35c. to 32.40c. Their purchases of September tin were made from people with speculative tendencies who seem to think the market will go down. It can be seen that the people who sold the spot tin, however, made from 10 to 15 points by their transactions. The arrivals of tin so far this month have been 1743 tons and there are 1949 tons afloat. Pig tin was sold in New York this afternoon for 32.65c. In London to-day spot tin sold for £148 12s. 6d. and futures for £149 15s. The sales were 90 tons of spot and 190 tons of futures. The market was firm.

Tin Plates.—The tin plate market continues firm and good business is being done. In some cases it is easier for buyers to obtain deliveries, especially from independent mills. The price in New York for 100-lb. coke plates is $3.84. There is a good sale for foreign tin plates, which are quoted at 13s. 4½d., at Swansea, Wales.

Lead.—There are indications that lead will advance shortly, and some outside sellers are even now asking 2½ points more than the price made by the American Smelting & Refining Company. That company is selling some good-sized quantities of the metal at 4.40c., New York, and some sales have been made at that price for shipment from Perth Amboy. Special brands of lead are being held at 4.42½c., while holders of the average brands are in some cases demanding that price. It can still be bought, however, at 4.25c., St. Louis, and 4.40c., New York, although it is hard to tell whether the market will remain long at those figures.

Spelter.—Consumers are taking little or no interest in spelter and prices are largely nominal. Considering the fact that consumers are not even feeling the market it is difficult to judge the exact conditions. Stocks are still very scarce in New York, and this city has ceased for the time to be a shipping point. Sellers are quoting the metal at 5.05c., St. Louis, which makes the price 5.20c., New York.

Antimony.—There are some good sized offerings of cheaper grades of antimony at all sorts of low prices, and the market is ragged. Cookson's is held at 8.38½c. and Hallett's at 8.12½c., but these prices are being cut in some cases.

Metals, Chicago, July 11.—The hot weather and the fact that many foundries have shut down in the last two weeks for inventory and other purposes have curtailed the sale of metals in this market. Copper is sluggish and prices are susceptible to pressure. A sharp break occurred in spelter. This product has been maintained on an artificial basis for some time, dealers holding out for higher prices. So little business was offered, however, that a reduction of $1 a ton was made last week. On the other hand, lead advanced $1 a ton, the interests which have been cutting this product having been eliminated, according to report. Old metals are quiet and melters are buying only such odd lots that appear in the light of bargains. We quote Chicago prices as follows: Casting copper, 12⅝c.; lake, 12⅞c. to 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 33½c.; small lots, 35c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12c.; copper bottoms, 10½c.; copper clips, 12¼c.; red brass, 11¼c.; yellow brass, 9¼c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, July 11.—Lead is firm at 4.25c. to 4.30c., East St. Louis. Spelter is weak at 5c., East St.

Louis. Zinc ore is held at $40 per ton, Joplin base. Tin is quoted at 33.05c. per lb.; antimony 8.60c.; Lake copper 13.05c.; electrolytic copper 12.75c., all St. Louis. The demand for finished metals was only fair and ruling as usual in midsummer.

Old Metals.—The market is weak, with a declining tendency. Dealers' selling prices, which are nominally unchanged, are as follows:

	Cents.
Copper, heavy cut and crucible	11.75 to 12.00
Copper, heavy and wire	11.25 to 11.75
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.25 to 8.50
Brass, light	6.75 to 7.00
Heavy machine composition	11.00 to 11.25
Clean brass turnings	7.50 to 8.00
Composition turnings	9.25 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Iron and Industrial Stocks

NEW YORK, July 11, 1910.

The stock market has shown alternations of strength and weakness since our last report. This indicates that a feeling of uncertainty prevails with regard to the immediate future. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chalm., pref.	30	Pressed St., com.	31 - 32
Beth. Steel, com.	23 - 24¼	Pressed St., pref.	96 - 96½
Beth. Steel, pref.	53	Railway Spr., com.	30¼ - 32½
Can. com.	75 - 83	Railway Spr., pref.	100½
Can. pref.	66 - 69	Republic, com.	28½ - 30⅝
Car & Fdry, com.	47 - 50¾	Republic, pref.	91 - 91⅞
Car & Fdry, pref.	110 -114¼	Sloss, com.	63 - 65½
Steel Foundries	50½ - 53	Sloss, pref.	116
Colorado Fuel	30½ - 33	U. S. Steel, com.	67½ - 71¾
General Electric	139 - 143¾	U. S. Steel, pref.	113½-116¼
Gr. N. ore cert.	45 - 53½	Westinghouse El.	59¼ - 61¼
Int. Harv., com.	92½ - 94½	Am. Ship, com.	83 - 84
Int. Harv., pref.	121	Chi. Pneu. Tool	36 - 37
Int. Pump, com.	43½ - 44⅞	Cambria Steel	42⅞ - 44¼
Locomotive, com.	38½ - 40⅝	Lake Sup. Corp.	16⅞ - 19½
Locomotive, pref.	107	Pa. Steel, pref.	105½-105½
Nat. En. & St., com.	16	Warwick	90 - 94
Nat. En. & St., pref.	86½	Crucible St., com.	11⅝ - 11¾
		Crucible St., pref.	77¾ - 78¼

Canadian Shipbuilding Matters

TORONTO, July 9, 1910.—The encouragement the Dominion Government is holding out to shipbuilders is being responded to. At a luncheon given by the Montreal Harbor Board to Albert Vickers, chairman of Vickers Sons & Maxim, Mr. Vickers said that his firm hoped in the very near future to establish Canadian works in Montreal well worthy in every respect to duplicate the high reputation its works in Great Britain had earned. The opening in Canada for British firms such as he represents was brought to his notice, he said, at the time of the Imperial Conference, held in London in 1907. Upon the request of Sir Wilfrid Laurier and L. P. Brodeur, Canadian delegates to that conference, his firm sent a commission to Canada to investigate the possibilities for shipbuilding. The commission was greatly impressed by the prospects. It made an exhaustive report on the principal St. Lawrence ports, and as a result his firm is now interesting itself in the proposals for dry dock construction and shipbuilding in Canada. He added that he hoped the Vickers firm would soon become a factor in the marine and industrial development of the country.

It is announced from Ottawa that an agreement has been concluded under which the government will pay an annual subsidy of 3½ per cent. on the capital outlay, estimated at $2,500,000, of the Vancouver Dry Dock & Shipbuilding Company upon works at Vancouver. Shipbuilding works are to be established in connection with the dry dock.

Bounties and the Tariff

Besides paying 3½ per cent. annually for 25 years on the capital invested in dry docks of adequate capacity and equipment, the government will give contracts to Canadian shipbuilders for the construction of the vessels called for by the naval programme approved at the last session of Parliament, that is, if the cost is not more than 25 per cent. in excess of what the work would be done for in Great Britain.

It is freely predicted that the government will go farther next session and will give a tonnage bounty for the building of merchant vessels. This, it is said, will be accompanied by tariff changes in the interest of steel manufacturers. If builders of dry docks are to have the interest on their capital paid by the government, if Canadian builders of government warships are to have a premium of 25 per cent., and if the builders of merchant vessels are to have a bounty of $6 a ton, they ought, it is argued, to be able to stand a duty on the steel used in the shipbuilding and ship repairing industry. At present steel masts, beams, angles, sheets, plates and knees, when imported for use in the manufacture of ships, are free of duty. It is believed that the government would be prepared to put a 20 per cent. duty on these articles if it were to adopt a ship subsidy scheme. The arrangement would be welcome to the steel manufacturers as a compensation for the loss of the bounties on pig iron, steel and wire rods.

C. A. C. J.

The Acheson Graphite Companies and Products

The International Acheson Graphite Company, Niagara Falls, N. Y., has arranged to erect a very substantial and large addition to its works on the lands of the Niagara Falls Power Company in that city. The addition will be in the nature of a furnace room, which will afford capacity for 10 or 12 new furnaces. The buildings will be of brick and steel construction and erected to the west of the present works, where there is ample room for still further enlargement. The additional furnaces will make possible a very large increase in the output of graphite, thus being indicative of the constantly increasing recognition of the value of the products of the company. These products are electrodes for electrochemical, metallurgical and electrical purposes and powdered graphite for dry cell filler, paint pigment, powder glazing, lead pencils, firearms lubrication, general lubrication, electrotypers' molding and polishing leads, &c. It will thus be seen that electric furnace graphite has acquired prominence in all fields where natural graphite has been used, but it may be added that the electric furnace Acheson-Graphite is recognized generally as being far superior to the natural product mined from the earth.

The Acheson Oildag Company, Niagara Falls, N. Y., has purchased a factory site of 30 acres at Port Huron, Mich. Fort Huron was selected as the site because of its comparatively pure water and excellent shipping facilities. Oildag has made phenomenal progress in the matter of establishing itself as a lubricant and conserver of petroleum lubricating oils, but, owing to the past limited manufacturing capacity of the company, the price was of necessity high and retarded its rapid introduction into general lubrication.

On July 1 the Acheson Oildag Company reduced the selling price of Oildag to approximately 60 per cent. of that previously quoted, thereby bringing it down to a price, when bought in quantity, of considerably less per gallon than that of the oil with which it is mixed. The presence of the deflocculated graphite in the oil makes each gallon equal to two to four gallons of plain oil. This policy of reduction in selling price, in order that the manufacturing interests may quickly obtain the benefits to be derived, is closely following that formerly adopted by Dr. Acheson, when he was president of the Carborundum Company, when he made the rather spectacular drop in the selling price of carborundum from $800 per pound to 10 cents per pound, thereby causing it to become a staple commodity.

The Machinery Markets

The dullness to be expected at this season exists in the machinery trade, and in most quarters only very necessary buying is being done. This is the inventory and stock taking season in most lines and the vacation let-up is noticed everywhere. In some machinery sections, however, there are manufacturers who are running ahead of the average business. New York machinery houses are doing a good business, and the New York Central Railroad has placed orders for more than $50,000 worth of equipment against a list issued some time ago. In Chicago the prospects for the fall business are especially good, as there are indications that some heavy railroad buying will be done in that market. Some machinery houses there have more unfilled orders on their books than at any time since the fall of 1907. In Milwaukee inquiries are especially good and railroad business is picking up. There are also good prospects on the north Pacific coast, as labor difficulties which have been about overcome have been holding up some good business there. In the South favorable climatic conditions have been responsible for some good sales and the machine shops and foundries are fairly busy in that section. In the Southwest business is quiet. There are reports to the effect that in the Northwest the outlook for the future is especially good, according to inquiries now before the trade, and there is an especially good call for contracting equipment in that market. Business is holding its own in Detroit, and in St. Louis sellers of metal working machinery are in some cases doing a business that is more than satisfactory. The market in Pittsburgh is irregular; machine shop and mill equipment is not selling very well, but there is a better demand for power equipment. A similar condition exists in Philadelphia. A Cleveland machinery house has booked an order for $12,000 worth of equipment to be shipped to an automobile manufacturer in Ohio. The attention of New England machinery dealers has been attracted by the announcement that several companies are organizing in that territory for the manufacture of aeroplanes and accessories. It is stated that the business should have a relatively important future in New England.

New York

NEW YORK, July 13, 1910.

The New York Central Railroad has placed orders in the New York market for more than $50,000 worth of machinery, to be delivered at West Albany and other points. These orders are against a list which has been before the trade for some weeks, and they cover a general line of machine tool and foundry equipment. This is about the only railroad business of any consequence that has been done in this territory within the last two months, and the only other large list before the trade is that of the Delaware, Lackawanna & Western Railroad, against which, from all accounts, nothing has been bought. There is a good volume of inquiries before the New York trade at present and business is better than it usually is at this time of the year. Many manufacturers are making their annual inventories and some of them are making inquiries, which indicate that they will make purchases for replacements. There is a healthy demand for second-hand machinery, for which fair prices are being obtained. Manufacturers of milling machines, planers and shapers are still behind in their orders and some types of these machines cannot be had under three months' delivery.

The Simms Magneto Company, 1780 Broadway, New York, will shortly buy machinery equipment, particularly in the line of machine tools, as the company has been making inquiries in the trade which indicate it expects to make extensive purchases. It is apparent that these purchases are intended for equipping a complete plant, but as yet it has not been made known as to where the proposed plant will be located.

The Griscom-Spencer Company, which recently took over the plant of the Goubert Mfg. Company at Bergen Point, N. J., will, from all accounts, make purchases of machine tool equipment. It is understood that in addition to turning out the line of specialties recently made by the Goubert Mfg. Company, the Griscom-Spencer Company will add to its line. The plant at Bergen Point was taken over equipped for manufacturing purposes, but it is understood that it will be brought up to date and important machinery additions will be made.

Machinery men who make and sell electrical power equipment and transmission apparatus are watching the Pennsylvania Railroad's suburban developments in New Jersey. The company is planning to electrify its lines toward and beyond Newark, and it is expected that its electrification zone will be extended to Elizabeth and perhaps as far as New Brunswick. For some time the company's engineers have been making plans looking toward the installation of a high speed service in that direction, and it is known that the railroad has been quietly acquiring more land along its lines and improving its road bed, which are the first steps toward the proposed improvements.

The New York, Westchester & Boston Railway, J. L. Cryder, chief engineer, 63 Beaver street, New York, has awarded all its contracts for the construction of its trolley lines through Westchester County, and it is expected that the system will be completed in from 12 to 15 months. Proposals for eight stations, to be built of reinforced concrete at White Plains road, Morris Park, Baychester avenue, Dyre avenue, Kingsbridge road and East Sixth street, Mount Vernon and Webster avenue, New Rochelle, and Pelham parkway, are now being received, and the company has closed an order for 150,000 railroad ties. As yet nothing has been done toward erecting or equipping the repair and machine shop, included in the company's original plans.

The United States Lighting & Heating Company, 30 Church street, New York, expects to have the large plant it is now constructing at Niagara Falls, N. Y., completed by fall. A main building, 200 x 400 ft., is about finished, and other structures are being erected. The company has 38 acres of land at Niagara Falls, and the plant will be devoted to the manufacture of electrical appliances, chiefly lighting systems for railroad trains and storage batteries for automobiles and commercial trucks. No car equipment will be needed, as contracts for furnishing Niagara power have been entered into with the Hydraulic Power & Mfg. Company, but it is expected that heavy purchases of general machinery will be made.

The Gunn Motor Company, Utica, N. Y., which was recently organized, has been incorporated with an authorized capital of $300,000 to manufacture and sell eight-cylinder motors for automobiles and commercial trucks. The officers of the company are: President, John K. Gunn; vice-president, William T. Baker; treasurer, Charles W. Wicks; secretary, John J. Town; assistant secretary, Guy H. Little. The company has been making some inquiries in the trade which indicate that it will do some good buying for its proposed plant.

The Newark Last Works has been incorporated with a capital stock of $100,000 and will manufacture shoe lasts and shoe trees at 29 Congress street, Newark, N. J., where a plant is being fitted with the necessary machinery, which includes woodworking equipment. John W. McGrain, who was recently connected with the New Jersey Shoe Tree & Last Company, is president of the new company.

The Heller Brothers Company, 897 Mount Prospect avenue, Newark, N. J., is erecting an addition to its plant, 75 x 200 ft. in size, to increase its rolling mill capacity. The company will install a train of 10 and 16 in. rolls.

The Garretson Engineering Company has been incorporated at Buffalo, N. Y., by Albert D. and Harry D. Garretson and Wm. M. Hoffman with a capital stock of $100,000. The company will engage in the manufacture of engines, electrical generators, aeroplanes and other air craft. Offices 786 Ellicott Square Building.

The F. N. Burt Company, Buffalo, N. Y., manufacturer

THE MACHINERY MARKETS

of paper boxes, is taking bids for a six-story addition to its factory at Niagara street, Potomac avenue and the New York Central Belt Line, 57 x 140 ft., to be of reinforced concrete construction.

The Jewell Steel & Malleable Company, recently incorporated at Buffalo, N. Y., with W. E. Jewell as president and A. W. Valentine as secretary-treasurer, has had plans prepared and is receiving bids for a plant to be erected at North Buffalo on a site of four acres, with New York Central Railroad connections. The main building will be 130 x 140 ft. Most of the equipment, including melting furnaces and annealing ovens, has been purchased. Mr. Jewell has for several years been general superintendent of the plant of the Acme Steel & Malleable Iron Works, Buffalo, and Mr. Valentine has been at the head of the sales department of the same concern.

Cornell University, Ithaca, N. Y., has completed plans for the erection and equipment of a chemical laboratory, 40 x 80 ft., three stories, to cost about $50,000.

The Victoria Paper Company, Fulton, N. Y., contemplates building an addition to its paper mill on First street; also to installation of gas producer for power, with a capacity of 1500 hp.

The Federal Creosoting Company of Chicago, Ill., has commenced work on its Tie creosoting plant at West Rome, N. Y., which will include two retorts, power house and office building.

The Buffalo Dry Dock Company is adding a one-story brick and steel engine and boiler house to its ship building plant on the Buffalo River at Ganson street, Buffalo.

The Rice & Adams Company, Buffalo, N. Y., manufacturer of dairy machinery, is adding a small foundry building to its plant at Chandler street and the New York Central Belt Line.

The New York Central Railroad Company has commenced construction of a 30-stall roundhouse at East Rochester, one-story, 90 ft. deep, of reinforced concrete.

The Mine & Smelter Supply Company, with executive offices at 42 Broadway, New York, has taken over the agency for the Western territory of the United States of the pumps made by the Epping-Carpenter Company, Pittsburgh, and the compressors made by the Bury Compressor Company, Erie, Pa.

Catalogues Wanted

The Engineering Supervision Company, 43-45 West 134th street, New York, is arranging an up-to-date catalogue department and desires printed matter relating to metal working machinery, supplies, material, &c.

Chicago

CHICAGO, July 12, 1910.

While the Chicago machinery market is very dull just now during the inventory and repair season in the manufacturing world, there has been a general improvement the past month in the feeling in the machinery trade. Some of the houses ran ahead of their average sales during June, and prospects are generally considered good for fall trade. The Chicago & Northwestern has closed on practically all of the list of tools on which it invited bids recently, a leading manufacturer of heavy tools having taken more than half the business, while the remainder is scattered. It is expected that the Chicago, Burlington & Quincy will begin purchases some time during the next month on its list for the Havelock, Neb., shops. More activity is expected from now on in purchases by railroads, and as the lists that have been pending amount to several millions of dollars, this business will form an important feature of fall trade. The general dealers do not profit much by this railroad business, as they only get scattering orders, but indirectly they profit by it as this business fills up weak spots in the market among manufacturers whose bookings have been light the past six months.

Chicago machinery houses began the second half of the year with more unfilled orders on their books than they have had at any time since the fall of 1907. In fact, complaints are beginning to appear among dealers because the factories in some lines are so far behind, a condition which makes trouble for the dealer in taking new business. The sold-up condition of the factories on milling machines is promoting interest among buyers in universal and face grinders. In many lines remarkable results have been shown in the use of improved grinders for work that was formerly done on milling machines, as well as on planers and shapers. There has been an unusual demand recently for second-hand tools, and in some lines the market is practically bare and dealers are out looking for used tools which are sought by prospective buyers. Altogether the turn of the half year finds a generally hopeful feeling in the trade. As one Chicago dealer expresses it, business would be fine if those Wall Street fellows would only get off the earth.

The Carmody Foundry & Machine Company, recently incorporated with a capital stock of $100,000, has purchased the plant formerly owned and operated by the late J. T. Carmody in Cedar Rapids, Iowa. It consists of a two-story foundry building, 80 x 120 ft.; boiler shop, 80 x 100 ft.; blacksmith shop, machine shop, &c., 80 x 120 ft. The company is prepared to make all kinds of gray iron castings, boiler, stack and sheet iron and general machine shop work.

The Imperial Brass Mfg. Company, Chicago, is having plans prepared for a factory building, 100 x 125 ft., to be erected at Center avenue and Harrison street, at a cost of about $85,000.

Utt Brothers, 108 La Salle street, Chicago, will construct a dam and erect a power plant across the Iowa River at Wapello, Ia.

The Rose Hill Tile Company, Rose Hill, Ia., has been incorporated with an authorized capital stock of $10,000 to manufacture drain tile, brick, building blocks and posts. T. W. Denny is president; H. D. Jarvis, secretary; J. R. Busby, treasurer.

At a meeting of the stockholders of the Belvidere Screw & Machine Company, Belvidere, Ill., the following officers were elected and a site selected for the location of its plant: Frank S. Whitman, president and treasurer; George M. Marshall, vice-president; Willis S. Brown, general manager and secretary. The site is on Madison street, adjacent to the Chicago & Northwestern Railroad. Work on the new factory will be commenced at once.

The Collinsville Electric Company, Collinsville, Ill., incorporated with a capital stock of $100,000, is erecting a plant which will be equipped with two 500-kw. turbines, boiler with stoker, pumps, condenser and auxiliary equipment. The company has also taken up an existing plant which is now in operation.

The Eclipse Engine & Machine Company, Springfield, Ill., has taken over the plant of the Lorrimore Novelty Works of that city and will install one double acting drawing press, one reducing press for use in the manufacture of patented force feed lubrication oil cans, one boring mill, one radial drill and other machines for its engine department.

The American Lawn Mower Company, Muncie, Ind., is erecting a three-story brick factory building and enlarging its present building by the addition of a third floor, which, when completed, will double its manufacturing facilities. All machinery to be installed will be of special make and is now ready for installation.

The Commonwealth-Edison Company, Chicago, has plans completed for a power generating plant to be erected on the north branch of the Chicago River at California avenue and Roscoe street. It will comprise five buildings of various dimensions and is estimated to cost $1,500,000.

The electric generating and distributing properties of the Interstate Light & Power Company, with headquarters at Galena, Ill., have been purchased by H. M. Byllesby & Co., Chicago, who propose to make additions and improvements.

The Heat, Light & Power Company of Muncie, Ind., has increased its capital stock from $30,000 to $500,000. H. B. Hurd is president.

The Elwood Iron Works, Elwood, Ind., has been incorporated, with $50,000 capital stock, to manufacture machinery and iron and metal products. The directors are W. T. Durbin, C. C. De Hority, Thomas E. Palmer, George Pohl and M. J. Fogarty, Wayne Leeson and Thomas Connor.

The American Rolling Mill Corporation's plant at Muncie, Ind., sold at a receiver's sale several months ago, is being dismantled and the machinery and material removed to other cities.

The Dominion Motors Company has been established at Walkerville, Ont., after the failure of Columbus, Ind., to secure the industry. Earl Winans of Columbus is at the head of the company.

James F. Lynch, manager of the Danville Light, Heat & Power Company, Danville, Ind., has been granted a franchise for a similar plant at Shoals, Ind.

The L. C. S. Motor Company, Ft. Wayne, Ind., has been incorporated, with $100,000 capital stock, to manufacture automobile parts. The directors are Charles LaRue, Jeremiah Carmer and C. O. Snyder.

The Whitely Steel Company, Muncie, Ind., has increased its capital stock from $10,000 to $40,000. E. J. Whitely is secretary of the company.

The Star Milling & Electric Company has been incorporated at Lima, Ind., with $10,000 capital stock, to manufacture and transmit electricity. The directors are Oliver P. McKee, Harriet McKee and Emanuel Ritzer.

Iseman & Richer's sawmill and planing mill at Denver, Ind., was destroyed by fire July 5.

The Garver Track Laying Company has been incorpo-

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rated at Urbana, Ill., with $30,000 capital stock, to do general contracting for steam and electric railroads. Taylor Garver, head of the company, is the inventor of a track laying machine operated with compressed air, capable of laying 4 miles of track a day, it is claimed. Oliver W. Lamb of Urbana and Harry M. Grant of Casey, Ill., are other stockholders.

The E. E. Pitman Handle Company's factory at Logansport, Ind., was destroyed by fire July 8, with $10,000 loss. The plant will be rebuilt.

The Caswell-Runyon Novelty Works, Huntington, Ind., will build a $15,000 addition in order to increase the manufacturing facilities.

The Rockford Milling Machine Company, Rockford, Ill., has been incorporated with a capital stock of $25,000 to manufacture and deal in machine tools, &c. The incorporators are Edwin Cedarleaf, Levin Faust and Swan F. Anderson.

Pittsburgh

PITTSBURGH, PA., July 12, 1910.

The market here recently has been very irregular. In the aggregate orders continue large; but practically all buying is done in spots and very little reliability can be placed upon the demand from any particular source. Some contracts of considerable size, now being booked, originate in quarters from which nothing was expected at the present time, while estimates that have been out for some weeks have, in many instances, failed to develop any actual business. Machineshop, foundry and mill equipment is moving slowly. Power units and electrical apparatus of various kinds sell to better advantage than anything else, and the local shops are crowded with such work, with excellent prospects for the fall and winter months. Hydroelectric projects, if all carried to completion, would alone be sufficient to keep a large number of men steadily employed in the manufacturing plants of the district that make a specialty of machinery for water power development.

The Connellsville Machine & Car Supply Company, Connellsville, Pa., has been awarded the contract for new equipment, including a steel frame tipple, to be installed by the Monongah Fuel Company, Monongah, W. Va. The Ross Engineering Company, Fairmount, W. Va., is planning and supervising the improvements. There will be a great deal of activity of a similar character, during the remainder of the present season, in strengthening the facilities of other mining properties and coal handling plants of the district.

Dealers here will furnish considerable material in connection with the work on the new line of the Western Maryland Railroad from Cumberland, Md., to Connellsville, Pa., which will be divided among a large number of contractors, including the Connestoga Construction Company and Foley Bros., Pittsburgh; American Engineering Company and John B. Carter Company, Indianapolis; F. W. Stanley Construction Company, Conneaut, Ohio; Handon & McCourt Company, Akron, Ohio; R. Galiardi, Connellsville, Pa.; Head & Right, Chicago; Robert Will Construction Company, New York City; Ryan & Mannington, Springfield, Mass.; W. M. Bates, Memphis, Tenn., and Fisher & Carroza, Baltimore, Md. Others will be selected during the present month. The general contract, which is stated to approximate $12,000,000, has been let to the Carter Construction Company, Pittsburgh.

The Keystone Furnace Construction Company, whose offices are in the Fulton Building, Pittsburgh, is making a feature of water cooling devices for use with open hearth furnace work, which have been demonstrated to considerably increase the operating economy of a plant. The installations made by the company are covered by exclusive patents.

The Scottdale Foundry & Machine Company, Scottdale, Pa., announces that it will make a specialty in future of vertical gas engines in capacities from 125 to 200 hp., especially designed for driving electric generators. The design of these machines is one that has shown excellent results under tests.

It is reported from Cadiz, Ohio, that a large electric generating station will be erected there by the Wheeling, Cadiz & Tuscarawas Traction Company. Further particulars, including the company's present headquarters, are lacking; but its officials can probably be reached at that place.

The Aspinwall filtration plant of the city of Pittsburgh will be considerably extended and new equipment provided. Mayor Magee has just approved an ordinance for securing additional ground to be used in making the contemplated improvements. Further capacity in pumping engines for water distribution service will also be needed shortly.

The Stoughton Engineering Company, through its Pittsburgh sales office, is extensively introducing its steel converters among the jobbing foundries of this district and the West. For the process used there are a number of interesting claims made which appear to be well substantiated in practice.

The Springfield Coal Mining Company is installing at its shaft in Edensburg, Pa., a winding engine for heavy duty, which was furnished by Wickes Bros., Saginaw, Mich., through their Pittsburgh office. Other improvements are also being effected which will give the company a large season's output.

Some electrical and other equipment will be furnished by manufacturers here for new gas engine building shops which the Rockwell Mfg. Company is reported to be erecting at West Chester, Pa.

Plans are being considered by the motive power officials of the Buffalo, Rochester & Pittsburgh Railway Company for installing additional tools for repair work, either at Du Bois, Pa., or another point, but nothing definite has as yet been decided upon, so far as can be learned.

The improvements to be made this summer in the plant of the Pittsburgh Steel Foundry at Glassport, Pa., including new yard handling equipment, will afford additional facilities that are urgently needed, in view of the present demand upon the company for heavy castings. Orders have been plentiful all through the present season, with excellent prospects for the future.

Centrifugal pumping machinery is being specified to such an extent this year that the Erie Pump & Engine Works, Erie, Pa., has had all it could do lately to keep up with the requirements of the trade. This company manufactures a very compact, easily operated type of pump which is adapted to a wide range of service and has found particular favor among mill owners, contractors, &c.

Builders of pumping machinery in this district are figuring on new equipment to be installed during the coming fall in the water works at Atlanta, Ga.

In connection with the improvements recently determined upon, the Cambria Steel Company, Johnstown, Pa., will install a battery of Taylor stokers manufactured by the American Ship Windlass Company, Providence, R. I.

The purchase of electric generating machinery additional to that included in the original plans, for supplying current to the Southern Cambria Railway, Johnstown, Pa., which was expected to be made in the near future, will probably be postponed, owing to the decision of the road's officials not to undertake certain construction work north of Mineral Point, where the power plant and repair shops have been located.

The Standard Whiffletree & Forging Company, Pittsburgh, which recently succeeded the Pittsburgh Tubular Steel Wriffletree Company, are continuing the business with a somewhat extended line of product and improved equipment. John A. Buchanan, who held a similar position with the old company, has been retained as manager.

The Fairbanks Company, Pittsburgh, has sold to the Pressed Radiator Company, West Pittsburgh, Pa., a 200-pound automatic drop hammer, built by the Standard Machinery Company, Providence, R. I.; Union Switch & Signal Company, Swissvale, Pa., a three-ft. radial drill, the latest type manufactured by the Prentice Company and to the Pennsylvania Company, equipment for installation in the car shops at Pittsburgh, Fort Wayne and the new shops at Conway.

R. W. Oswald, Pittsburgh representative of the Pennsylvania Boiler Works, Erie, Pa., has sold two 150-hp. horizontal return tubular boilers for 125 pounds pressure, to the Union Clay Mfg. Company, Empire, Ohio; Connellsville Mfg. & Mine Supply Company, Connellsville, Pa., 125-hp. return tubular portable boiler.

The Pennsylvania Rubber Company of Jeannette, Pa., has increased its capital stock from $1,500,000 to $2,000,000 to finance the construction of several new buildings. The corporation controls the Pennsylvania Rubber Company of New York, the Pennsylvania Rubber Company of California and the Westmoreland Rubber Mfg. Company, and manufactures rubber tires, air brake hose and other rubber goods.

The Westinghouse Air Spring Company, Wilmerding, Pa., one of the George Westinghouse interests, has increased its capital stock from $5000 to $300,000.

The Gaeth Automobile Company of Pittsburgh has been incorporated with a capital of $500,000, only partly paid in, and it is stated will build a plant in the vicinity of East Pittsburgh, for the manufacture of automobiles. The incorporators are George S. Patterson, W. J. Harvey and George J. Protzman. A small plant at Cleveland, in which the Gaeth automobile is now being made will be dismantled and the equipment moved to the proposed new plant.

T. H. McGraw, Jr., Park Building, Pittsburgh, representative in that district of the Erie City Boiler Works, Erie, Pa., has recently made sales as follows: Board of Control, Martins Ferry, Ohio, 600-hp. boiler for installation

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in municipal electric light plant; F. M. Graff for installation at the Roaring Run and the Kiskiminetas coal works, one 200-kw. engine generator set, two 150-kw. engine generator sets, four 150-hp. boilers and a four-valve Erie city engine; D. B. Zimmerman, Somerset, Pa., for Quemahoning Coal Company, two 150-hp. boilers for the operation of air compressors.

The Bessemer Gas Engine Company, Grove City, Pa., has received an order from the National Aluminum Company of the United States, Clarksburg, W. Va., for a 300-hp. Bessemer gas engine to drive generators, which in turn will operate individual motors.

The Riverside Metal Refining Company, Connellsville, Pa., has made large sales this season to iron and steel mills, as well as other industrial plants where heavy machinery is operated under similar conditions, of its U. S. Standard babbitt for use in bearings. The mixture employed for the purpose is stated to be the result of operating experience and tests extending over a large number of years. The company is now making some improvements in its equipment.

The Harshey Machine & Foundry Company, Manheim, Pa., manufacturer of the Baum type of separators, is represented in Pittsburgh by Edgar M. Moore & Co., with whom selling arrangements were recently made. A good trade in this line had already been established.

The Pittsburgh Gage & Supply Company, Pittsburgh, has recently received numerous contracts for high pressure piping, among which are the following: Monongahela River Consolidated Coal & Coke Company, power plant at Boston, Pa.; New River & Pocohontas Consolidated Coal & Coke Company (two jobs) Berwind, W. Va.; Red Jacket Jr. Coal Company, Red Jacket, W. Va.; Thacker Fuel Company, Thacker, W. Va.; Andrews & Hitchcock Iron Company, Hubbard, Ohio; American Sintering Company, power plant, Hubbard, Ohio; Pittsburgh-Belmont Coal Company, Neffs, Ohio; Pittsburgh Steel Company, Monessen, Pa. It has also received orders for White Star continuous oiling systems as follows: Evans & Almirall Company, Ellis Island, N. Y.; Hewes & Phillips, Philadelphia, Pa.

The Pittsburgh office of the Allis-Chalmers Company has received a contract from the Republic Iron & Steel Company for four blowing engines to be installed at its No. 4 blast furnace now being erected at Haselton, Ohio. The contract includes two high pressure engines with steam cylinders 44 x 60 in. and two low pressure engines with steam cylinders 60 x 84 in., each engine being equipped with 60 x 84 in. air tubes. The delivery of the engines is expected to be made in the latter part of October.

In an item printed on page 16 in *The Iron Age* of July 7, relating to the Taylor Steel Company, the address was given as Canton, Ohio, while it should have been Columbus, Ohio. The company has not yet selected a site for its new plant to make crucible steel forgings, but will do so in a short time, and will then be in the market for considerable new equipment.

Philadelphia

PHILADELPHIA, PA., July 12, 1910.

Although the demand for machinery and tools still shows irregularity, there has been a pronounced betterment reported in that for some classes of equipment, principally of a special character. This is particularly the case in the foreign demand, a marked improvement during the past few weeks being noted, shipyards particularly making quite a little inquiry. There has also been some demand for special tools for field work in connection with recent contracts given out for work on the Panama Canal. The volume of business transacted by merchants and manufacturers has not been very large, the market generally exhibiting the usual characteristics of the midsummer season. The trade, however, while not anticipating any very heavy business during the summer months, looks forward to considerable activity in the early fall. Tentative inquiries made recently give promise of developing into business, and, with order books in pretty fair shape, manufacturers are showing no anxiety as to future business. Owing to the heated spell activity at the various manufacturing plants has been less pronounced. The midsummer shutdown of industrial establishments also has a retarding effect on business, which usually requires several weeks to work off.

Quite a fair volume of business continues to be transacted in power equipment lines. A fair inquiry for boilers and engines of moderate horsepower is before the trade and a good volume of business is being placed from week to week, although individual orders are, as a rule, not large.

Both iron and steel castings are in better supply, although production is somewhat restricted owing to the heated term. Some steel casting plants can now make much better deliveries and, while order books are still in a fairly satisfactory condition, there is more disposition to get business, particularly for near future delivery. In some instances prices are reported as less firm.

The Salem Electric Company has, it is stated, purchased a large tract of land on the water front at Salem, N. J., on which it is proposed to erect a plant three times the capacity of the present one.

The Keystone Steel Casting Company, Chester, Pa., has practically completed the additions to its plant, referred to previously in this column. The increased facilities of its crucible steel melting department will enable the company to triple its former output of crucible steel castings.

The Richlé Bros. Testing Machine Company is quite busy in all departments. An 800,000-lb. testing machine has just been furnished the Lehigh University. A number of smaller machines have been furnished various customers, and orders are in hand for shipment to China, Japan and other foreign countries, as well as from domestic customers.

Sibson & Stern, Inc., lace manufacturer, is erecting a two-story addition, 50 x 77 ft., to its plant, Stenton avenue and Wyoming street. The addition will be used for manufacturing purposes and purchases of additional knitting machinery for its equipment will be made.

C. G. Seidel has awarded a contract to H. L. Lovett for the erection of a large garage, to be known as the Logan Garage, on North Broad street, near Logan Station. The building measures 50 x 80 ft. on the ground plan, and will be equipped with the usual facilities for garage requirements.

The Stromeyer Brake Shoe Company, with a capital of $100,000, has been incorporated under the laws of the State of New Jersey. Julius Stromeyer, C. A. Harris, J. H. G. Peddle and William M. Martin are the incorporators. The company was formed to look after the foreign business of the Philadelphia Brake Shoe Company and does not involve the construction or operation of any plant.

Estimates were taken last week by John T. Windrim for the estate of Stephen Girard in connection with the erection and equipment of a power house to be erected at Twentieth and Oregon streets. The building is to be of reinforced concrete, and will be used as a heating and lighting station for dwellings under erection in that vicinity by the Girard Estate. Contracts have not yet been awarded.

The Baldwin Locomotive Works has booked an order for 50 heavy freight engines of the "Mikado" type from the Baltimore & Ohio Railroad. From orders now on hand continued activity of the company's plants for many months is assured. Some 15,000 workmen are employed at its various plants. Little new business is anticipated during the summer months by the officials of the company; a better movement in the fall is, however, expected.

Arthur A. Klonower and Lawrence C. Jost have formed a co-partnership under the name of Klonower & Jost, with offices at 1538 Cherry street, where they will engage in business as engineers and contractors in heating, ventilation and electrical work. Mr. Klonower was for a number of years connected with Francis Bros. & Jellett, engineers. Mr. Jost was for some time with the same concern, but more recently associated with John Borden Bros. as engineer.

J. Morton Poole Company, Wilmington, Del., has begun shipments on the delivery of 12 10-cwt. Umpherston engines for the West Virginia Pulp & Paper Company, part for delivery at its Tyrone, Pa., and part for its Piedmont, W. Va., plant. This concern also has a number of orders in hand for boring mills and has shipped one of the heavy 8-ft. type to the Baker Iron Works, Los Angeles, Cal. A very satisfactory sale of Fitchburg lathes, manufactured by this concern and sold through Fairbanks & Co., is reported, particularly for those having long beds. The plant is actively engaged and has a very good volume of business in its books.

The Hilles & Jones Company, Wilmington, Del., reports inquiries during the past week or two to have been larger than ever before in its history. There has been considerable inquiry for export and two very fair orders for tools for shipment abroad have been booked. Orders in good number have been taken, covering a very general class of equipment, from some of the railroads, shipyards and industrial plants. Shipments are now being made against one of the largest single contracts ever taken by this concern, which included some 25 to 30 large, heavy tools for the American Bridge Company's plant at Gary, Ind. The Hilles & Jones Company has now in course of erection a new three-story modern office building, measuring 36 x 75 ft. on the ground plan. On completion the space occupied by its present office will be added to its machine shop.

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Cleveland

CLEVELAND, OHIO, July 12, 1910.

The usual midsummer dullness is being experienced in the local machinery market. Business, however, is no worse than it usually is at this time of the year. Some of the dealers are getting a fair volume of small orders, mostly for small single tools. These orders are coming almost wholly from small machine shops and from makers of automobile parts and accessories. The only good sized order reported by a local machinery house during the week was for $12,000 worth of machine tools for an automobile manufacturing company in Ohio that is enlarging its plant. In the opinion of machinery men the demand for additional equipment from the automobile trade will not be nearly as heavy during the latter part of 1910 as during the corresponding months of last year, when a very large amount of new machinery was purchased by the northern Ohio and southern Michigan automobile plants. In carrying out their plans for new plants or extensions started last year and not yet fully completed, some of the larger automobile concerns will probably come into the market during the fall for considerable machinery, but it is believed that some of the smaller makers will go very slow in adding to their capacity, so that the demand from this source will not be so general as a year ago. Local railroad lists have not yet come out and there is practically no buying on the part of the railroads.

Among the local machine tool builders orders have fallen off considerably, but some plants have a good volume of business on their books. There is not much demand for heavy conveying machinery, but local manufacturers of that class of equipment report that small orders are quite plentiful, and with heavier work taken earlier in the season their plants are well filled up for the balance of the year.

The Cleveland Motor Truck Company, Cleveland, recently incorporated with a capital stock of $20,000, which will soon be largely increased, will equip a plant for the manufacture of motor trucks, both gasoline and electric, ranging in capacity from ½ to 6 hp. The company expects to lease a building which will be fitted up for manufacturing purposes within the next few weeks. It is announced that considerable machine tool equipment will be required, but the list has not yet been prepared. The company has established offices at 602 New England Building. H. W. Woodward is president and W. M. Hager, secretary.

The Foote-Burt Company, Cleveland, is enlarging its plant by the building of an erecting shop, 50 x 125 ft. The portion of its plant now used for erecting purposes will be used for enlarging the capacity of the machine shop. The plant of this company has been taxed to its fullest capacity during the past year, a large volume of its orders for drilling machinery coming from the automobile trade. The company reports that it now has enough orders on its books to keep it busy until November.

The Wright Wrench & Forging Company, Canton, Ohio, the name of which was recently changed from the Wright Wrench Company, will engage in the manufacture of machine forgings in addition to wrenches. The company has moved its office to its new plant in South Canton. The plant is near completion and will be used for manufacturing purposes in a few days. The company expects shortly to get out a new pipe wrench and probably some other products in the wrench line.

The Economy Stove Company has entered into a contract with the Sandusky Business Men's Association to move its plant from Cleveland to Sandusky, Ohio. The company will be given a site and a bonus of $30,000, which will be put into buildings, in return for which it agrees to furnish employment for not less than 150 men. The business of the Economy Stove Company has outgrown its present quarters on Scranton road. It will build at Sandusky a complete plant for the manufacture of gas heating and cooking stoves, including a foundry for making its own castings. At present the company does not have a foundry.

The Brown Hoisting Machinery Company, Cleveland, reports that orders for small handling machinery are holding up well, and there is some demand for large equipment. The company has a large amount of work on hand, its plant being well filled up for the balance of the year.

In addition to the erection of a large plant at Niagara Falls, the National Carbon Company, Cleveland, will build an addition to its plant at Fremont, Ohio. The contract for the structural steel has been let to the Riverside Bridge Company, Martins Ferry, Ohio.

The Superior Rubber & Mfg. Company, Akron, Ohio, has increased its capital stock from $10,000 to $250,000 and announces that it will soon perfect plans for equipping a plant for the manufacture of tires and other rubber goods. Officers have been elected as follows: T. E. Moore, president; G. A. Shaw, vice-president; F. B. Adams, secretary, and A. L. Wright, treasurer.

The Baxter Stove Company, Newark, Ohio, will enlarge its plant by the erection of two new buildings of mill construction, two stories. One will be 54 x 260 ft. and the other 50 x 180 ft. Gas engines will be installed.

The Cuyahoga Nut & Bolt Works, Cleveland, has been incorporated, with a capital stock of $10,000, by F. McHale, F. DeEds, A. D. Spurney and W. T. Black.

The Wau-To Pipe Threading Machine Company, Toledo, Ohio, recently incorporated to manufacture and sell pipe threading machines and appliances and heating apparatus and appliances, has arranged to have its equipment manufactured under contract. The company's main offices will be at 605-607 Nasby Building, Toledo, and its directors are Charles E. Bennett, J. A. Miller, both of Wauseon, Ohio, and F. V. Meagley, E. L. Troup and C. J. Reuscher, all of Toledo.

The Elyria Iron & Steel Company, Elyria, Ohio, is manufacturing for the Hart Steel Company reinforced tie plates of a special pattern, which have been in heavy demand ever since the present rush of construction and maintenance work started.

The Heath Foundry & Mfg. Company, Plymouth, Ohio, has decided to equip its plant with automatic sprinklers and desires to hear from manufacturers of sprinkler systems.

The Bruce-Macbeth Engine Company, Cleveland, Ohio, has recently taken orders for 14 gas engines ranging in size from 75 hp. to 200 hp., in addition to a number of smaller gas power units.

Cincinnati

CINCINNATI, OHIO, July 11, 1910.

Machine tool builders are passing through a period of seasonable quietness. Some sporadic orders are being booked, but they rarely call for more than one tool. Inquiries are being received, and if a fair percentage of them result in business the fall trade will be generally satisfactory. The automobile manufacturers appear to have satisfied their wants, at least temporarily, and this breathing spell is enabling the tool builders to catch up on orders booked some time ago, but on some tools this result will not be attained before October; this applies especially to milling machines. With the exception of an order for a few tools from the New York Central, which was obtained last week by a local company, no buying has been done by the railroads. The export business is good.

Skilled labor is still in healthy demand, although a return movement of workmen, who left some time ago to follow the automobile trade, seems to have commenced.

Second-hand dealers are doing a fair business, and those who handle power equipment have recently received some nice orders from the South.

A large amount of construction work is going on in this section, and this naturally helps out the local situation. Quite a number of building plans are under way, which will not be given out until fall.

Among recent sales of the Cincinnati Iron & Steel Company are hand power cranes to the National Automatic Tool Company, New Richmond, Ind.; Columbiana Boiler Works, Columbiana, Ohio, and the Memphis Consolidated Gas & Electric Company, Memphis, Tenn.; nine electric traveling cranes to the Cincinnati-Bickford Tool Company, Cincinnati, and several shapers, radial drills and splitting shears which were shipped to the Southwest. The company reports its business for the past six months as being very good, and the demand for its Cisco lathes as being exceedingly brisk.

The main building of the plant the Victor Safe & Lock Company, Cincinnati, is constructing in Norwood will be 102 x 560 ft.; the machine shop will be 120 x 180 ft. There will be six other buildings, all one story and of brick, concrete and steel construction. Practically all of the necessary equipment has been contracted for. The company expects to be operating its new factory January 1.

The Hess Spring & Axle Company, Cincinnati, in order to take care of its rapidly increasing business, is planning an addition to its factory on Cook avenue. Building details are not yet available.

The Ritter Folding Door Company, Cincinnati, whose factory was recently moved from Newport, Ky., to a new building in the Elmwood district, has just booked an order for 96 of its patent warehouse doors to be installed in a large freight house now being constructed at Dayton, Ohio, by the Cincinnati, Hamilton & Dayton Railroad.

Work is progressing rapidly on the new automobile factory of the Schacht Mfg. Company, Winton place, Cincinnati.

Much interest is manifested in the coming annual outing

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of the Cincinnati Metal Trades Association, scheduled to be held at Chester Park July 30. It is expected that this will be the largest picnic ever given by the association and Secretary Manley is making arrangements to entertain 30,000 visitors. Among the metal workers are many of the best known athletes of Ohio and the athletic games will attract much attention. A new and novel feature this year will be a singing contest between quartettes from the many factories affiliated with the association.

A three-day outing, commencing Friday next, has been arranged by Secretary Manley of the National Metal Trades Association, which will be participated in by about 100 members and their friends. The party will motor out to Laughery Island Club, 30 miles from Cincinnati, returning Monday morning. Several interesting athletic games are on the programme.

Building progress on the new plant of the Cincinnati Machine Tool Company at Oakley has advanced to the stage where the company can definitely announce that it will be in its new home November 1. It reports domestic business as holding its own, while its export trade, especially from Europe, is steadily on the increase.

The Associated Foundries of Cincinnati were organized last week with the following officers: Henry Ritter of the Lunkenheimer Company, president; Wm. Gilbert of the Buckeye Foundry Company, vice-president; S. M. Blackburn of the John B. Morse Foundry Company, treasurer, and Walter Guyer of the Modern Foundry Company, secretary. It is the purpose of the organization to co-operate on questions of mutual interest and create closer social and business relations between its members. Headquarters will be in the office of the Cincinnati branch, National Metal Trades Association, and Secretary Manley of that association will supervise its business affairs.

The Sellers Kitchen Cabinet Company, Elwood, Ind., is finishing additions to its factory which will greatly increase its capacity. It is stated that most of the machinery, consisting of special woodworking machinery, has been purchased, but further equipment will be required later.

The Richter Company, successor to Richter & Co., will increase the capacity of its plumbing supply plant at 210-214 East Ninth street, Cincinnati, by erecting an additional story, giving it 4000 sq. ft. more floor space. Some air compressors, molding machines and other special machinery will be purchased.

The Indianapolis Traction & Terminal Company, Indianapolis, Ind., has awarded the general contract for the construction of its power house, which covers everything but the smokestack and the mechanical equipment. Work has been started on the foundation of the building and it is expected to be ready for occupancy by the first of next January.

The Niles Forge & Mfg. Company, Niles, Ohio, has increased its capital stock from $20,000 to $30,000.

The Auto-Electro-Lite Company, Indianapolis, Ind., has been incorporated with $15,000 capital stock to manufacture electric light generating machines. The directors are G. L. Fish, Ora May Fish and W. Fred McCloud.

The American Electric Headlight Company, Indianapolis, Ind., has been incorporated with $50,000 to manufacture electric headlights. The directors are Chas. S. Stone, Chas. N. Elliott and Harry B. Gates.

The William H. Clore Mfg. Company has been incorporated at Washington, Ind., with $38,000 capital stock, to manufacture silos and farm implements. The directors are William H. Clore, Edward D. Clore, P. J. Cavanaugh, M. N. Palmer and L. H. O'Donnell. The plant of the Clore Plow Company will be moved from Rising Sun to Washington.

The plant of the Border Lock, Nut & Bolt Company, Richmond, Ind., was sold at receiver's sale to William M. Kelley for $11,000. The probabilities are that the plant will be continued in operation.

Among the improvements to be made to the power house of the Terre Haute, Indianapolis & Eastern Traction Company, at Richmond, Ind., are two turbines, each of 450 kw. capacity, and four boilers.

The Chapman Steel Company has been incorporated at Indianapolis, Ind., with $50,000 capital stock, to manufacture iron and steel products. The directors are Niles Chapman, George C. Haerle and H. H. Hornbrook.

The Peerless Tank & Seat Works, Evansville, Ind., has increased its capital stock from $150,000 to $200,000.

The Piqua Blower Company, Piqua, Ohio, has found this a very favorable season for the sale of blowers to be used in foundry service. Inquiries from mines and smelters in the West are also strong, and there are good opportunities at present for placing apparatus of this kind in the countries of Latin America. With the widening circle of demand, the company's trade has increased to a point where a material enlargement of its shop facilities is looked for locally, although no official announcement of such plans has been made.

It is reported from Ironton, Ohio, that the Ohio River Lumber Company of that place will increase its working capital, with a view to extending its operations, including the construction of a large new timber cutting plant in one of the West Virginia districts.

The Buckeye Stamping Co., Columbus, Ohio, is providing for a large future output. It has just made arrangements for the construction of a new one-story building, 80 x 270 ft., of thoroughly modern construction and equipment.

Detroit

DETROIT, MICH., July 12, 1910.

So far as its effects are observable here, the buying movement for new plants and improvements throughout the Central West seems to be very well sustained. Manufacturers in Michigan, northern Ohio and Indiana are, apparently without exception, experiencing one of the most profitable seasons in their history, and dealers in practically all lines have been doing a very satisfactory business, taking each month as a whole. July will undoubtedly fall considerably below the level of May or June; but the closing weeks of August are almost certain to be active, and there is every indication that fall trade will open very strong. This applies particularly to equipment for metal working plants, purchases for which have been somewhat delayed in comparison with those made in behalf of general industrial establishments.

Benj. Bosse, president of the Globe Furniture Company, Evansville, Ind., is reported to be interested in plans for a new factory to be erected by the Big Six Chair Company, recently organized at that place, the equipment of which will include power and woodworking machinery. Electric motor drive is to be used, in accordance with the latest practice.

The Detroit Screw Works, Detroit, Mich., has derived a considerable percentage of its trade this season from automobile manufacturers, and more is offering at present than can be taken care of without prejudice to other branches of the company's business, which have also shown extraordinary activity. By another season its facilities for production of all kinds will be considerably greater.

Preparations are now being made at Grand Rapids, Mich., for rebuilding the box factory of the Brantley-Miller Company. It will be electrically operated.

The Grant & Wood Mfg. Company, Detroit, is getting its plant at Chelsea, Mich., which is being furnished with improved and extended equipment, in shape for a large annual production of automatic screw machines of the multiple spindle type, which will be made a specialty. High grade ball bearings will also be manufactured.

The Morehead Mfg. Company, Detroit, is putting on the market a type of steam trap which has been found very efficient for service in the power houses of industrial plants. Owing to the improvements that are now being very generally made throughout the country in the power equipment of such concerns, inquiries for steam appliances of this kind have recently been very liberal.

The Central Heating Company, Detroit, is about to proceed with the erection of an addition to its plant.

An interesting feature of the equipment of machinery-building plants, shops and foundries, is the rapidly developing use of steel bins and shelving for the stock and tool rooms, vaults, &c., a feature of which is made by Terrell's Equipment Company, Grand Rapids, Mich. This concern is manufacturing steel sections that can be used either for bins or shelving and are readily interchangeable, making the system a very flexible one.

A new power house 30 x 80 ft., with 90-ft. stack, has been built by the Indiana Lumber & Mfg. Company, South Bend, Ind. The equipment, which is now being installed, includes two boilers of 250 hp., with heaters, pumps and other auxiliary apparatus.

Work is being started on a three-story factory building, 80 x 120 ft., for the Holland Gelatine Works, Holland, Mich.

The Industrial Works, manufacturers of locomotive cranes, Bay City, Mich., is making some additions and improvements, including a large new office building. One of the units in the power house will also be replaced by another better adapted to the service. Contracts have all been let.

The Corliss engine for the power house of the Northwestern Cooperage & Lumber Company, Gladstone, Mich., will be built by the Filer & Stowell Company, Milwaukee; the generators and motors by the Allis-Chalmers Company,

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and wood-working machinery, &c., by the American Wood-working Machinery Company, New York.

The American Brass & Iron Company, Detroit, has thus far found this a very favorable season, so far as the demand for its products is concerned, and present indications point to a material increase in its manufacturing facilities before another year.

Some additional equipment for the pumping plant and waterworks system will be required in the near future at Wyandotte, Mich., where extensive improvements have been authorized. The installation of a pump of 3,000,000 gal. daily capacity is being discussed by the authorities, but one of 5,000,000 gal. delivery has been recommended and is more likely to be adopted. Representatives of the leading builders of pumping machinery are keeping in touch with the situation.

The Morton Mfg. Company, Muskegon Heights, Mich., which has made a large number of successful installations of its tools in leading railroad shops of the country, is having a good many inquiries from such sources, in addition to current business, which are likely to develop into orders by or before fall, as at many points equipment is urgently needed. Considerable interest is also manifested in its large portable draw shapers, such as those that have been in service at the West Allis, Wis., works of Allis-Chalmers Company for some time past.

A new building or shop addition, 35 x 50 ft., is to be erected shortly at the plant of the Central Boiler Works, Detroit.

Wickes Bros., Saginaw, Mich., have been experiencing an unusually heavy demand all through the first half of the year for machinery and appliances of various kinds used in boiler shops, tank works, &c., indicating great activity in those lines. Inquiries and sales are quite evenly distributed over the country as far as the Pacific Coast.

Parke, Davis & Co., Detroit, have let the contract for an addition to their power plant. Equipment has been purchased, so far as the main details are concerned, but some auxiliary apparatus may be needed later.

M. D. Bauer, 762 St. Antoine street, Detroit, is arranging for the construction of a manufacturing plant to be occupied by the Bauer Steel Body Company, which was recently organized here. In addition to metal bodies and hoods, gasoline tanks will be produced.

The Detroit Hoist & Machine Company, Detroit, Mich., in addition to its pneumatic hoists, is finding an excellent market this season for its various other products, including small engines for use with winches, derricks and other handling machinery. The compressed air appliances of its manufacture are finding a constantly widening market in foundries for construction work, &c., the demand from these sources having been particularly heavy all through the spring and early summer.

The Lobdell & Churchill Company, Onaway, Mich., which some time ago added automobile steering wheels to its products, is having all it can do to keep up with orders, and has recently been reported to be planning an extension to its plant.

John Brennan & Co., Detroit, have developed a large trade in boilers, tanks and steel plate work of all kinds for use in mining operations, as well as in penstocks, riveted pipe, &c., for the water power plants and supply lines by which they are nowadays so frequently accompanied. The present demand comes not only from northern Wisconsin and Michigan, but also from the West.

Frederick E. Wadsworth and H. Scherer, 1256 Jefferson avenue, Detroit, are erecting an automobile factory 65 x 631 ft., three stories, of cement construction, the foundations of which are practically in. The plant will be operated throughout with electric motors and will be equipped with a sprinkler system. The building is expected to be finished in 90 days.

Sealed proposals in duplicate will be received by the Board of Public Works, Grand Rapids, Mich., until July 21 for furnishing and installing pumping machinery.

The Pressed Steel Company, Detroit, Mich., is erecting an addition to its plant which will be used for assembling purposes only.

The Ideal Furnace Company, Milan, Mich., has increased its capital stock from $60,000 to $100,000 to take care of its rapidly increasing business. The company has lately commenced the manufacture of the Radiant hot water and steam boilers.

St. Louis

ST. LOUIS, MO., July 11, 1910.

Merchant sellers of metal working machinery report business in satisfactory shape and the outlook for fall trade good. Delay is still being experienced in getting orders filled, especially by the large and well known Eastern companies. In some instances parties have elected to take less standard machinery and appliances to meet urgent requirements. Inquiry for second-hand machinery is not as large as it is some seasons.

The Banner Iron Works has its new steel foundry addition well under way, which will have a first-class equipment of cranes and other modern foundry appliances.

The American Brake Company has begun wrecking some adjoining buildings on its property to make room for extensions to its plant. The company is having a good demand for its patent locomotive brake and will add new equipment.

The Brecht Butchers' Supply Company is preparing to move its ice plant here from Denver, Colo. This company, besides making additions to its St. Louis factory, has just installed a new direct connected Corliss unit in its new power house.

The American Car & Foundry Company's new plant at St. Charles, Mo., is nearing completion. Upwards of $1,000,000 has been expended.

The More-Jones Brass & Metal Company is erecting an addition to its plant which will be equipped with the latest machinery.

The Fernholtz Brick Machinery Company is erecting an addition to its plant which will be installed with new machinery.

The Fairbanks Company is erecting a large straw board plant at Federal, Ill., which is to be equipped with the requisite machinery.

The new addition to the Bemis Bros. Bag Company's plant is nearing completion and will largely increase the company's manufacturing capacity.

The Granite City Rolling Mills has recently made some extensive changes in its plant, and among other appliances has installed several electric cranes, including one Gantry.

The Mt. Vernon Car Mfg. Company, Mt. Vernon, Ill., has its new steel plant well under way and the machinery is beginning to arrive, among which will be a heavy American motor driven planer equipped with some of the new variable speed features. This plant will represent an investment approaching $1,000,000.

The large smelting companies with headquarters at St. Louis have been making some changes in their plants in Kansas, and orders for new equipment have been placed.

The tool business in St. Louis territory has brought out some pretty fair orders lately, including one for eight milling machines, some automatic screw machines, &c., for extensions in the plant of one of the machinery manufacturers, a large boring mill for Texas and some tools for Oklahoma.

The L. M. Rumsey Mfg. Company has just received a carload of gas engines, the demand for which is on the increase.

The city of St. Louis recently placed an order for $50,000 worth of machinery and tools to equip the forge shops in three high schools.

The Fulton Iron Works is very busy executing contracts for sugar mill machinery and Corliss engines.

The city of Independence, Mo., has purchased a 500-kw. General Electric turbo unit complete from the John A. Stewart Electrical Company, Cincinnati, Ohio.

The Conrad-Bering Lumber Company, Houston, Texas, whose plant at Pawnee, La., was recently destroyed by fire, has not decided as yet whether it will rebuild. The company states that if it can make a quick sale of the property at Pawnee the plant will be located elsewhere, but in the event of not being able to do this a 42 x 184 ft. building of mill construction will be erected, and sawmill, machine shop and power equipment will be installed.

New England

BOSTON, MASS., July 12, 1910.

The market has been depressed for the past week, though yesterday and to-day indicate that there is no stagnation in the machine tool trade, some fairly good orders having been placed. The announcement of large purchases of machine tools for the great enlargement planned for the Providence Engineering Works, Providence, R. I., by the new owner, the United States Motor Company, will have a cheering sound to the local machinery people. The Boston machinists' strike is petering out. The Massachusetts Railroad Commission has given permission to the Grand Trunk Railroad to build the necessary connections to assure the extending of the system to Providence, R. I., from the Central Vermont, at Palmer, Mass.

The business of the Providence Engineering Works, Providence, R. I., has been acquired by the United States Motor Company, which is consolidating important auto-

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mobile interests. The transaction carries with it large additions which will double the Providence plant. Plans are virtually completed for a manufacturing building adjacent to the present works, 40 x 220 ft., and five stories, for which large purchases of machine tools will be necessary. The structure will be of steel and concrete. The Providence Engineering Works have been making a specialty of automobile engines and transmissions for some time and this department of the business will be developed on a large scale, such being the purpose of the new building. The manufacture of the Rice & Sargent steam engine will be continued, but it is probable that the company's other steam types and its gas producer engine will be abandoned. The United States Motor Company has large properties in New England, comprising the Maxwell-Brisco Company, Auburn, R. I.; Columbia Motor Car Company, Hartford, Conn., and the Alden Sampson Company, Pittsfield, Mass., and all of the plants are either in process of enlargement or will be enlarged within the year. The Providence Engineering Works grew out of the consolidation of the Rice & Sargent Engine Company and the Providence Steam Engine Company in 1889.

The Wattles Stoking Register Company has been organized in Providence, R. I., to manufacture an apparatus known as the Wattles stoking register. It is designed to register automatically the degree of density or the entire absence of smoke passing through a chimney. The corporation is in the preliminary stage of organization, which will be perfected within a short time. The incorporators are Cyra B. Wattles and Dexter B. Potter, Providence, and Herbert R. Dean, Cranston, R. I. The authorized capital stock is $50,000. The company has an experimental plant in the Butler Exchange, Providence, and has already manufactured a number of the registers which have been installed in the chimneys of industrial power plants. A photographic process is employed. In an opening on one side of the chimney is placed an electric lamp, while on the opposite side a dial of sensitized paper receives the light rays through a slot as it revolves by clock work. In this way the density of the smoke passing through the chimney is registered photographically at each minute of the 24 hours. The periods of extreme density show white on the dial, while the most perfect combustion shows black. Between these extremes the record is shaded to give a very exact reading of the condition of the fire, both during working hours and those of idleness. The purpose is twofold, to effect an economy of fuel through skillful stoking and to abate the smoke nuisance through the same medium.

The Winsted Hardware Mfg. Company, Winsted, Conn., manufacturer of upholstery hardware and specialties, is in the market for second-hand machinery of modern type, as follows: Universal milling machine, medium size; universal grinding machine, medium size; two No. 51 or No. 52 National Acme screw machines, a small pressure blower, an exhaust blower for 10-in. pipe, and an edging or trimming lathe. The business is a new one, with T. H. Bronson as the president.

The Henry G. Thompson & Son Company, New Haven, Conn., manufacturer of hack saw machines and blades, will build a four-story addition to its factory on Elm street.

The G. E. Wood Tool Company, Plantsville, Conn., has completed a two-story brick addition to its factory, which will be devoted to the manufacture of chisels.

The Sterling Blower & Pipe Mfg. Company, Hartford, Conn., has changed its name to the Sterling Blower Company.

The new building of the Southington Industrial Company, Southington, Conn., which will be rented for general manufacturing purposes, will be 35 x 96 ft., three stories.

The Sandy River & Rangeley Lakes Railroad will build an extension of its line in Madrid, near West Phillips, Maine, which will open a large tract of timber lands which have hitherto been inaccessible because of the absence of transportation facilities.

Frederick B. Farnsworth, New Haven, Conn., has been appointed receiver of the Yale Safe & Iron Company, West Haven, on the petition of stockholders. The business is in a prosperous condition, so far as orders are concerned, it is stated in the press dispatches, the need of increased capital being the chief cause of the receivership. It is expected that this difficulty will be overcome by the addition of new money.

The contract has been awarded for the new foundry of the Deane Steam Pump Company division of the International Steam Pump Company, Holyoke, Mass. The building will be of steel and brick, 150 x 290 ft., one and two stories.

Plans have been prepared for a machine and carpenter shop and laundry to be built for the Boston State Hospital at Mattapan, Mass., to cost $40,000.

Additions to general manufacturing plants of New England include the following: Maine Wood Reduction Company, Mexico, Maine, large works for the production of alcohol, acetate of lime and tar and charcoal, with the ultimate intention of manufacturing a wide variety of other by-products; Windham Silk Company, Willimantic, Conn., large addition to its silk mills.

The Connecticut Peat Fuel Company, Hartford, Conn., has been organized with a Connecticut charter to manufacture peat into carbonized peat or charcoal or coke. The incorporators are Charles E. Whitmore, New Britain; H. J. Wickham, Manchester, Conn., and Edward A. Beals, Hartford, the last named being the treasurer. The company will begin business with $25,000.

The Union Machine Company, Fitchburg, Mass., manufacturer of paper machinery, has leased the large brick building formerly occupied by the Fitchburg Steam Engine Company, located between the present shop and the Boston & Maine roundhouse, and a building formerly occupied by W. A. Hardy & Sons and the Union Coal Company. Large increase in manufacturing space is acquired. The Steam Engine Company's building is 39 x 120 ft., four stories, and the Hardy Building 20 x 75 ft., two stories. In addition there is an office building, engine house and sheds for storage. The company is adding modern machinery.

The Exeter Machine Works, Exeter, N. H., has decided to establish a department for the manufacture of commercial and semi-commercial motor cars. The machines are of new design. The business recently changed ownership and management, Joseph H. Symonds now being the controlling head. The standard lines are steam and hot water heating apparatus, blowers and exhausters.

The Gurney Heater Mfg. Company, Boston, Mass., manufacturer of heating boilers and other heating equipment, will not begin work on its new plant at South Framingham, Mass., until late in the year. Preliminary work on the site is now under way, including the foundations and a railroad siding. The plans for the buildings are not complete, but the works will be very much larger than those now operated at East Boston, which have a capacity of about 30 tons a day.

The Blanchard Machine Company, Cambridge, Mass., manufacturer of pulverizing and other machinery and general machine shop contract work, has taken the entire upper story of its building, the lease of a tenant having expired. This will give a very greatly increased manufacturing capacity. The building is 60 x 110 ft., with an ell about 60 x 60 ft., and two stories and basement. The equipping of the new space is now in progress. The company is rushed with business, particularly with contract work.

Milwaukee

MILWAUKEE, WIS., July 11, 1910.

Manufacturers, agencies and supply houses now have in hand a large number of inquiries, and bookings during the past week aggregate, in point of value, a very considerable amount.

One of the most significant features of the present state of trade lies in the fact that a greater percentage of orders than usual has been coming in recently, without previous negotiation other than requests for quotations, indicating that users are in urgent need of the machinery and have neither time nor inclination for bargaining or shopping around.

The character of business offering is also excellent. Much of it originates with industrial companies or public service corporations that have been long established and already have heavy investments made in properties scattered throughout the country. Some of these, that were compelled by the revival of business to make certain extensions or improvements, still delayed putting into effect various plans of a more comprehensive nature, which they had been considering, until financial conditions were unquestionably upon a sound basis. Now that the time for hesitation appears to be rapidly passing preparations are quietly in progress to proceed with the developments contemplated, and there is good authority for believing that this will have a very appreciable effect on the machinery market within the next few months. The feeling of unrest due to political causes seems to have almost entirely disappeared.

Railroad buying is cutting more of a figure in the market than has been commonly supposed. Machine tool manufacturers and dealers continue to be disappointed in the failure of certain expected purchases to materialize; but a great deal of equipment of a miscellaneous character, as well as castings, parts, fittings, track, switch and signal material, &c., is going out on single orders or season contracts placed by the different roads. Salesmen who have stuck pretty closely to this line of trade, undismayed by the pessimistic reports in general circulation, have, in spite of many failures, managed to turn in a very satisfying total

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of orders for each quarter. On the other hand, those who are easily discouraged or lack persistence have found consolation in other sources of business. More than one concern has secured good contracts from industrial railways, logging or mining roads, &c., whose trade it had not heretofore been accustomed to go after very strongly.

One line of railroad buying which is increasing in prominence concerns the installation of steel pressure cylinders, tanks, pumps, compressors, power units and other apparatus for tie and timber preserving plants. Even during the panic period such roads as the Pennsylvania and Santa Fe were busy with the construction of such plants, and numerous other lines are now preparing to follow the lead of the more progressive companies. Quite a number of private concerns for supplying treated ties, piling, poles, &c., have also been formed, and those previously established are strengthening their equipment. Two of the largest manufacturers here were pioneers in supplying this class of trade, and the majority of contracts thus far let has been placed in Milwaukee.

The International Steam Pump Company has been negotiating for the purchase of another plant here, and it is expected locally that the deal will be consummated, as it will give that company a line of product, long and favorably known throughout the world, which can be made to supplement very closely what it now has. The evident intention seems to be also to make Milwaukee one of the principal manufacturing centers for the company, which controls the Power & Mining Machinery Company, whose plant is in the suburb of Cudahy. The management of the latter, under Arthur Niedermeyer, gave it a degree of prestige in the mining, rock crushing and other fields which has borne fruit in the large amount of profitable business being done to-day, and the extensions to the Cudahy shops that are now in progress will afford facilities that are urgently required to take care of what is offering.

The Filer & Stowell Company, Milwaukee, is filling an order for machinery to be installed in the enlarged plant of the Crowell & Spencer Lumber Company, at Long Leaf, La., for which it has the complete contract.

The Downey & Kruse Company, Milwaukee, will install the steam heating plant in the new city hall at Kenosha, which is one of the most important contracts let in this vicinity for some time past.

A boiler plant, engine and dry-kiln will be installed by the Cream City Casket Company, Milwaukee, in connection with a two-story addition, 60 x 120 ft., now being made to its plant.

Plans are under consideration by the Brodesser Motor Truck Company, Milwaukee, for the erection of a plant at Juneau, Wis., to be used in the manufacture of commercial vehicles. The main building proposed will be 60 x 200 ft., of brick construction. Equipment can be largely furnished from the factory now operated in Milwaukee. A gas producer, gas engine, dynamo and electric motors will probably be installed.

L. M. Romer, formerly of Detroit, Mich., and Minneapolis, Minn., is establishing a machine shop for auto repairs and general service at Glenwood, Wis.

The plant of the Edgerton Wagon Company, Edgerton, Wis., is in readiness for the installation of machinery, purchase of which was deferred until the operating plans could be fully worked out. An engineer was recently engaged to plan the arrangement of the shops along the most modern lines, and the plant will be put in operation this summer.

The Globe Wire & Iron Works, Milwaukee, has recently taken a number of good contracts for structural material, including the iron work to be used in the new Farmers' & Merchants' State Bank Building.

Considerable mechanical equipment, including two water tube boilers of 250 hp. will be needed in consequence of additions to be made to the St. Agnes Convent and Hospital, Fond du Lac, Wis.

The Business Men's Association, Sheboygan, Wis., is trying to secure for that city the plant of the A. H. Andrews Company, manufacturer of furniture, whose present address is given as Chicago, Ill., where it is said to have experienced difficulty in obtaining room for necessary expansion. If this change takes place, it will mean the purchase of some new machinery, including probably a power set and electric motors.

A new steel frame factory addition, four stories, 100 x 115 ft., will be built in Racine, Wis., by the Horlick's Malted Milk Company. Plans have been completed and bids are now being taken.

The commercial interests of Merrill, Wis., represented by A. J. Stange, are endeavoring to secure the location there of a large stave factory now in operation at a point in Ohio.

A factory addition is being completed at Sheboygan, Wis., for the Columbia Shoe Company, and the heating plant is about to be installed.

Two boilers with a total capacity of 300 hp. will be furnished for operating machinery and power equipment for the new power plant of the Gem Hammock & Fly Net Company, Milwaukee.

The American Zinc Ore Separating Company, Platteville, Wis., is operating its plant to the full capacity, 24 hours of each day, and will make a heavy record for the season. Some enlargement of the works will probably be the result.

Reconstruction work to be done at the factory of the American Bedding Company, Superior, Wis., which recently suffered from fire, will necessitate the installation of some new mechanical equipment.

By the middle or latter part of August the Racine Iron & Wire Works will be able to place their large new plant, at Racine, Wis., in operation.

The National Brake & Electric Company, Milwaukee, has let the contract for structural work on its new machine shop and warehouse to the American Bridge Company.

The Northern Specialties Company, Phillips, Wis., has been incorporated for $200,000 and will establish a manufacturing plant.

Four steam boilers of 100 to 150 hp. each and feed water pumps will be purchased the latter part of this month by the Board of Water Commissioners at Wausau, Wis. Particulars can be obtained on application.

The Racine Gas Engine Company, Racine, Wis., has changed its name to the Racine Tool & Machinery Company, which more correctly designates the lines of manufacturing in which it is at present engaged. The plant additions recently mentioned will be begun in the near future. The growth of this company has been very rapid and of a most substantial character.

Plans are reported to be under consideration at Neillsville, Wis., for erecting a new manufacturing plant on the site of the buildings of the Reliable Furniture Mfg. Company, which were recently visited by fire. No definite announcement has, however, been made.

A new factory is about to be built at New Glarus, Wis., by the Helvetia Condensing Company, whose present headquarters are stated to be Highland, Ill.

It is announced by the Milwaukee Western Electric Railway Company, Milwaukee, that its line of 70 miles in length, from Milwaukee to Beaver Dam, will be built this year, and the erection begun in the near future of a power plant of 20,000 hp. at Hustisford, Wis.

The Frederick A. Little Engineering Company, Fond du Lac, Wis., which prepared the plans of the new plant for the Gardner Machine Company, Beloit, Wis., 100 x 200 ft., has also been given the general building contract.

The factory of the Christensen Mfg. Company, Reedsville, Wis., which was recently destroyed by fire, will be rebuilt. A temporary structure is being provided, which will enable the company to care for current business.

The municipal power and lighting plant at Waupun, Wis., which is equipped with Westinghouse generators. Ideal engines, a De Laval steam turbine unit and boilers of 300 hp., built in the shops of the S. Freeman & Sons Mfg. Company, Racine, Wis., will be remodeled and extended. Bids for the structural work made necessary by the proposed improvements are now being taken. Machinery requirements will be provided for a little later on.

The Worden-Allen Company, Milwaukee, has the contract for the structural work on an extension of the flooring factory of the John Schroeder Lumber Company.

The Heil Company, Milwaukee, will furnish the steel work for the new plant of the Kempsmith Mfg. Company.

A six-story addition, 80 x 120 ft., with new power plant, will be made to the factory of the Phœnix Knitting Works, Milwaukee. Machinery and other equipment, which includes a sprinkler system, will be purchased in the near future. The plans of the building and its arrangement are not yet complete.

The Sterling Engineering & Construction Company, Milwaukee, is completing a large new warehouse building here for its own use.

The Wisconsin Bridge & Iron Company, has been given the contract for the steel work of two new bridges to be erected for the Great Northern Railway in Minneapolis, Minn.

It is again reported from Beloit, Wis., that Fairbanks, Morse & Co. are planning the erection of a new brass foundry, but the firm advises that construction may not be undertaken before next year. No bids on structural work or equipment are being called for.

The Mineral Point Zinc Company, Mineral Point, Wis., has placed a contract with the Galena Iron Works Company, Galena, Ill., for extensive additions to be made to its present plant.

The Northern Boiler & Structural Iron Works, Appleton, Wis., has taken enough contracts during the present season to keep their plant very busy. The orders come not only from industrial establishments, but are also being executed for municipalities and counties in various parts of the State.

The plans of the Wisconsin Motor Mfg. Company, North

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Milwaukee, for its new plant in West Allis, Wis., include a main building 112 x 288 ft., with office 40 x 50 ft., and a separate power house 50 x 50 ft. Each structure will be of steel frame brick construction, with concrete foundation. A saw tooth roof will be put on the machine shop.

The Schwahn-Seyberth Company, Eau Claire, Wis., is completing plans for a new factory to be erected adjacent to the warehouse of the International Harvester Company. It will be used in the manufacture of saddlery.

A large plant will be built at Manawa, Wis., by the Evaporated Milk Company of New London, Wis.

New pumping machinery is to be installed by the city of Grand Rapids, Mich., and manufacturers here are figuring on the equipment, bids for which will be taken until June 21.

The business of the Northwestern Steel & Iron Works, Eau Claire, Wis., has been developing to such an extent this season that the enlarged facilities provided by new buildings some time ago are insufficient to meet the present requirements of trade. It is reported, on what appears to be reliable information, that an addition to the company's foundry, 80 x 200 ft., will be made this fall.

The O. O. Storle Valve Company, Kewaunee, Wis., is being dismantled and removed to Green Bay, Wis., where it is expected to be in active operation by August 1. The plant will consist of a machine shop, brass foundry and storage warehouse. W. J. Hess, who formerly owned a boiler works at Manitowoc, will be at the head of the company.

The C. A. Shaler Company, Waupun, Wis., manufacturer of electrical appliances, is about to erect a concrete factory building, the equipment of which will be operated by electric power with individual motors. The company is undecided at the present time, however, whether it will install a power plant or purchase its power from the city.

The Obenberger Drop Forge Company, Milwaukee, is contemplating the installation of steam hammers and other equipment, with the object of increasing its output.

Charles J. Anderson, proprietor of the Menominee Iron Works, Menominee, Wis., which was destroyed by fire June 17, advises that he is undecided whether he will rebuild his plant at Menominee or seek a new location. Any proposition extended to Mr. Anderson for the removal of his plant to a different location will be considered.

Plans are being drawn by Vaughan & Meyer, who recently opened an office as consulting engineers in the Majestic Building, Milwaukee, for an electric power station to be established at Rochester, Wis., by H. A. Russell. The latter has the contract for city lighting. The equipment will include a generator and water turbine.

A gasoline engine of 20 hp. and dynamo of 12½ kw., to be connected by belting, will be required for municipal service at Browntown, Wis. Bids are to be taken by the authorities until July 31.

The South

ATLANTA, GA., July 11, 1910.

Owing to the fact that climatic conditions here are so much more favorable at this time of the year than in most other cities of the South, local dealers have received a good many calls in person lately from people in need of machinery or supplies, and, in addition to single sales, some good season contracts have been closed. As a whole, however, trade in the majority of districts continues quiet, with more purchasing at the North than usual, owing to the number of manufacturers who are now at the various seaside resorts there within easy reach of Boston, New York and Philadelphia. This is particularly true of the textile interests and other enterprises that are financed largely with Northern capital.

Among the machine shops and foundries there is a great deal of activity manifested, and considerable repair work is offering. Some of the old, established plants, whose owners are widely acquainted, could, in fact, keep reasonably busy on this alone.

A new development company known as the Kentucky River Consolidated Coal Company, which was recently organized at Ashland, Ky., is expected to be in the market by or before fall for mining, coal handling, timber cutting, and planing mill machinery, as well as power and electrical equipment. Among the incorporators is J. W. M. Stewart of Ashland, Ky.

The authorities at Lafayette, Ga., recently engaged J. B. McCrary & Co., Atlanta, to prepare plans for a municipal electric power and lighting station, the machinery for which will be purchased as soon as specifications are ready.

Construction is now in progress of a new building, including machine shop for repair work, to be erected by the Athens Electric Railway Company, Athens, Ga.

The American Casting Company, Birmingham, Ala., has been making heavy shipments this season of cast iron culvert pipe, which it manufactures with a special lock joint, in light, short lengths, that are easy to handle and give a maximum of resistance to pressure.

Some additional equipment will be needed for the municipal power plant at Dalton, Ga., which now has an electrical output of 100 kw. The extent and character of the improvements to be made will be determined after the consideration of a report to be made by engineers which the city has engaged for this purpose.

The Casey-Hedges Company, Chattanooga, Tenn., will supply four 72 in. by 18 ft. high pressure boilers for the new plant of the Crowell & Spencer Company, at Long Leaf, La.

Some new machinery will be installed this year by the Smith-McGowen Company in its plant at Magazine, Ala., and other improvements effected.

Electric power will be provided, either through the erection of its own generating station or otherwise, for the Holston Valley Railway, Bristol, Tenn., which is to be converted into a traction line.

Boilers are being installed in the new plant of the Osceola Lumber Company, at Kissimmee, Fla., where the operating machinery has already been placed, and it will be put in service shortly. Later on some additional equipment will be needed.

Some contracts have been made and others will be awarded during the summer for the construction of the hydroelectric plant which is to serve the city of Bedford, Va. Equipment for the generating station has not yet been purchased.

The Ross-Meehan Foundry Company, Chattanooga, Tenn., is making a feature of railroad castings, the demand for which this season has been fairly good. It is prepared to turn out on short notice any work molded from the standard patterns prescribed by the Master Car Builders' Association.

A new manufacturing plant with the most modern machinery is being completed at Victory, Ga., by the Ficklin Spoke & Handle Company, which will be a good future buyer of mechanical equipment of various kinds.

A new foundry and machine shops are under construction for C. B. Rice, Garyville, La., who expects to have them in operation early in September.

The municipal authorities of Bedford City, Va., have arranged for the construction of a hydroelectric plant on the James River, near Big Island, in addition to a transmission line of about 25 miles, to convey power to Bedford City. A $100,000 bond issue has been voted to cover the necessary expenses. Francis R. Weller, Hibbs Building, Washington, D. C., is the engineer in charge.

The Altavista Cotton Mill, incorporated with a capital of $300,000, will build a two-story plant, 125 x 300 ft., at Altavista, Va. The mill will contain 13,000 spindles and 300 looms, and it will be equipped with modern machinery. In addition to erecting a plant, the company will build 50 cottages to accommodate its employees. A. T. Hutcheson, Charlotte, N. C., is the president and treasurer of the company.

Starke's Dixie Plow Works, Richmond, Va., which has been manufacturing plows and castings for more than 60 years under the ownership and control of one family, has recently been incorporated, but the ownership and management will remain as before. The incorporation was found necessary because of business growth, and the company may in the future extend its line of manufacture.

The Alexandria Lumber Company, Ltd., Alexandria, La., will shortly purchase machine tool parts and repairs.

The American Portable Band Saw Mill Company, Winston-Salem, N. C., which owns patents covering a new style of band saw, is negotiating with manufacturers with a view to having its product made under contract. The company has been formed as a selling organization and will concentrate on marketing its product.

The Southwest

KANSAS CITY, MO., July 11, 1910.

Thus far this month only the most necessary buying has been done, and dealers are getting the bulk of the trade. Representatives of manufacturers are either taking vacations or sticking pretty closely to inside work. At any rate, they are not much in evidence on the outside. Conditions for traveling have been well-nigh intolerable, owing to the heat and drought, and on the part of prospect customers there is very little disposition to go into the details of future requirements. Hence a mail order business covering only standard apparatus or supplies is the result.

For the further Southwest the extreme heat of the summer has had rather a stimulating effect on some branches of trade, for the reason that many owners and superintendents of mines, smelters, irrigation projects, electric plants, &c., have gone East, accompanied by salesmen in the employ

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of machinery builders, to inspect equipment at the shops and close contracts which have been pending. The amount of business transacted in this way is already considerable and will very materially strengthen the record of the month.

Preparations are being made by F. Wolffe, 507 East Eighteenth street, Kansas City, to erect a two-story woodworking plant, 25 x 80 ft.

New roundhouses, furnished with tools for emergency repair work, will be built in the near future by the Atchison, Topeka & Santa Fe Railway at three points in New Mexico along its lines.

Equipment which includes a gasoline-engine-driven hoist and drilling machinery will be required for the property of the Sunset Mining & Smelting Company, Albuquerque, N. M.

The Braeckel Concentrator Company, Joplin, Mo., in consequence of the demand for its apparatus, will be obliged to provide for enlarged manufacturing facilities.

Advices from Corpus Christi, Texas, are to the effect that an engine-driven or steam turbine power plant of 300 kw. will be built there in the near future by the Corpus Christi & Interurban Railway of that place, which now buys current under a yearly contract from the Corpus Christi Ice & Electric Company.

The Missouri Valley Bridge & Iron Company, Leavenworth, Kan., in addition to its standard line of fabricating work and bridge construction, is making a specialty of steel tanks for railroad service, water works and industrial plants.

The new generating station of the Galveston & Houston Interurban Railway Company, Houston, Texas, which will be located at Webster, Texas, will have for its initial equipment three horizontal return tubular boilers of 1800 hp. and two steam turbine units, with condensers, heaters, pumps, switchboards and other auxiliary apparatus, some of which has already been contracted for. There will also be three substations equipped with power transformers and motor generator sets.

The Woodruff-Kroy Company, which has been operating a large barrel factory at Davenport, Iowa, will build a plant at Marked Tree, Ark., and remove the necessary machinery to that point, according to a report from the latter place which appears to be authentic.

The El Paso, Texas, office of the Ingersoll-Rand Company is having a very busy time this summer estimating on air compressor outfits, drills, cutters, &c., for use in the mining districts of Arizona, New Mexico and the States across the border. The activity all through that part of the United States and Mexico is very pronounced.

The Dilley Foundry Company, Pine Bluff, Ark., has had an excellent run of business during the spring and early summer in sawmill and power machinery, general castings, &c., and of late there has been much repair work to be done on logging locomotives.

The construction of a pumping plant for city water service is under consideration at Blytheville, Ark.

The Empire District Electric Company, Joplin, Mo., is preparing to build a power transformer station at Carthage, Mo., and supply electric current from its 2000 kw. hydroelectric plant at Lowell, Kan., to operate motors used in industrial enterprises, including the quarries.

The installation of an electric power and pumping plant will be undertaken in the near future at Wetumka, Okla. Machinery is reported to have been purchased.

Griffin & Co., Walker, Ariz., are reported to have decided upon the purchase of an electric hoist and crushing plant equipped with gravity stamps.

The E. C. Wehrfritz Machinery Company, Little Rock, Ark., has recently had a rush of orders for repair parts, indicating that many plants of that vicinity are being put in condition for expected heavy runs.

A three-story plant for the manufacture of wagons and carriages will be built this summer at Houston, Texas, by Frank Eller.

It is expected that machinery will be purchased in the late summer or early fall for water works at Conway, Ark.

A power and pumping station for public service is to be erected at Foraker, Okla., as soon as the necessary arrangements can be made by the town authorities.

From Mission, Texas, it is reported that the Minneapolis Steel & Machinery Company, of Minneapolis, Minn., is figuring with the city on the installation of a combined electric power and refrigeration plant.

J. F. McIntyre & Sons are installing in their new plant at Pine Bluff, Ark., a battery of boilers and a Corliss engine to develop 200 hp. or more, together with operating machinery.

An electric generator of 150 kw., driven by a gas engine of corresponding capacity, will be placed in service within the coming month at the power plant of the Kansas City, Lawrence & Topeka Electric Railway in Endora, Kan. Other units will be added later on.

At Mulvane, Kan., a bond issue is proposed for the construction of a pumping station.

The F. E. Newberry Electric Company, St. Louis, Mo., has been awarded the contract for the complete electric power and lighting station to be installed at the army post, Fort Crockett, Tex.

A proposition has been submitted to the Commercial Club of Corpus Christi, Texas, by C. J. Stanzell and associates of Schulenberg, Texas, with a view to locating a foundry and machine shop at that place, which will probably be accepted within a week or ten days.

The city of Canton, Kan., has voted bonds in the sum of $30,000 for the construction of an electric light plant and water works system.

Peet Brothers Mfg. Company, Kansas City, Kan., has commenced work on its new plant, which will consist of a manufacturing building 150 x 265 ft., refinery and power building, 75 x 250 ft., steam plant 50 x 100 ft. and an office building 40 x 100 ft. The buildings, together with machinery and equipment to be installed will cost about $300,000. It is expected the plant will be ready for operation by October 1.

The Northwest

ST. PAUL, MINN., July 11, 1910

Manufacturers and dealers who have been interviewed lately are almost unanimous in stating that they are satisfied with present conditions, and look for further development of trade as the summer lengthens, particularly with the near approach of autumn. If this proves true the prediction made some time ago that the present year will be the best from the industrial standpoint that the Northwest has ever had will be abundantly justified. An excellent index of the situation is the growing demand for contractors' equipment, more of which has been ordered within the past few weeks, to judge from reports made by representative houses, than during any similar period of the preceding three or four years taken together. Repairs and spare parts are also much wanted. Considering the fact that heavy purchases were made early in the spring and all existing equipment put in first-class operating condition, the present urgent demand is an evidence of building and development work which is putting severe wear upon machinery in service, as well as taxing its capacity.

The new warehouse to be erected in Minneapolis, Minn., by the Great Northern Implement Company will be 120 x 155 ft., of structural iron and brick construction with composition roofing.

Equipment for a water works system may be required this fall at Kendrick, Idaho, where plans are under consideration. If pumps are installed the contract will probably be placed here.

The Youngstown Iron & Steel Roofing Company, which is represented in Minneapolis by H. V. Fleck & Co., is finding an excellent market in the Northwest for its various products, including both black and galvanized iron and steel sheets, roofing, siding, flooring, metal lath, &c. The extent of building operations has given an impetus to this class of trade which will carry it well along into the fall, even if new business should become scarce, which is not at present the case.

The Minneapolis Steel & Machinery Company, Minneapolis, has been awarded the contract for erecting the new factory of the Linderman Box & Veneer Company, Eau Claire, Wis., which will be 90 x 240 ft.

The Dakota Power Company, Rapid City, S. D., whose purchase of electric generating units has previously been reported, recently placed a contract with the Northwestern representatives of Allis-Chalmers Company, Milwaukee, for the remainder of its power plant and substation machinery, including large transformers.

The steam and hydroelectric plants acquired in Grand Forks, N. D., and vicinity by H. M. Byllesby & Co., Chicago, Ill., as recently mentioned, have been consolidated under the name of the Red River Power Company, Grand Forks, which will proceed at once to make important improvements, including the installation of some new machinery and the rearrangement of existing equipment.

The Mineral Hill Mining Company will shortly install at its property near Lead, S. D., a battery of steam boilers, hoisting engine and other machinery for development work. All of the equipment required at present has been contracted for, but more will be needed later.

The St. Paul Foundry Company, St. Paul, will furnish the structural iron and steel for a building, to be erected at Brainerd, Minn., by the Brainerd Improvement Company.

Electric generating machinery and other equipment will be purchased shortly for the new municipal electric power station at Aurora, Minn.

The Twin City Bridge Company, Minneapolis, has been awarded the contract for a new bridge, to be erected for the town of Daniels, Burnett Company, Wis.

A triple expansion pumping engine or motor driven

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centrifugal pumps of 20,000,000 to 30,000,000 gal. daily capacity will probably be purchased by the city of Minneapolis in the near future to reinforce its water supply system. Plans for needed improvements are now under consideration by the authorities.

A concentrating plant is to be built in the near future and considerable ore reduction machinery installed by the Marsh Mining Company, operating near Burke, Idaho, of which C. L. Colwell, Missoula, Mont., is president. Electric power is now used, and a motor driven hoist, as well as compressor, drills, &c., was recently installed.

A large sum has been appropriated at Cloquet, Minn., for the improvement of the local water works system, a portion of which will be devoted to the purchase of new pumping machinery. An elevated steel storage tank may also be required.

The National Briquetting Company is reliably reported to have decided definitely upon plans for the erection of a plant at Kenmare, N. D., but no construction work will be undertaken before early fall.

The Eagle Iron Works Company, Minneapolis, whose incorporation was recently noted, will enter upon the fall trade with considerably enlarged facilities.

The Kooskia Land & Power Company, Kooskia, Idaho, having received permission from the Interior Department to erect a power dam on the Clearwater River in what is now a national forest, will proceed to build a hydroelectric plant of 4500 to 5000 kw., upon the completion of which a number of industrial enterprises will be established.

M. A. Snyder, Cul de Sac, Idaho, will install machinery in a large new saw mill, which he is planning to build in the vicinity of Chesley, Idaho.

The Security Bridge Company, Minneapolis, has been awarded the contract by the authorities at Lewiston, Mont., for constructing a steel bridge over one of the rivers in that vicinity.

The municipal electric power plant at Granite Falls, Minn., which is equipped with hydroelectric machinery and a small reserve steam unit, will probably be added to this summer. Vote on a bond issue for the purpose is about to be taken.

A. Y. Bayne & Co., Minneapolis, have been awarded the contract for the new steel arch bridge to be erected across the St. Croix River, at Taylor's Falls, Minn., the plans for which were drawn by L. P. Wolff, Minneapolis, whose office is in the Essex Building.

Machinery for an ore reduction plant will be required this season by the Ivanhoe Mines Company, McAllister, Mont.

It is reported from Bismarck, N. D., that the Hughes Electric Company, which operates the central power station there, is now arranging to place boilers, with mechanical stoker furnaces, a cross compound engine of 800 hp. and an electric generator of corresponding capacity in a new plant which it has under erection.

New machinery has been ordered by the Deadwood Gas Company to replace equipment which was recently destroyed by fire.

Fairbanks, Morse & Co., through the representatives connected with the Minneapolis office, have handled a large share of the machinery included in their several lines which has been required for service in Minnesota, North and South Dakota and Montana. One feature in relation to which the writer has heard considerable appreciation expressed by users is the pains taken by this concern to insure satisfactory operation of the machinery after it has been installed, the result being a good many repeat orders.

A 25-ft. addition, to be used as a machine shop for repair work, will be made to the building occupied by the Russell Motor Company, Duluth, Minn.

The Russell Grader Mfg. Company, Minneapolis, Minn., manufacturer of road building machinery, has purchased a site and is having plans prepared for a brick factory building, 80 x 200 ft., two stories and basement, work upon which will be pushed as fast as possible.

The Crittenden Roofing & Mfg. Company, Minneapolis, Minn., is erecting a two-story and basement store and manufacturing building, and will purchase heating plant, power presses and shears and power brakes for metal window work.

The Farther Central West

OMAHA, NEB., June 11, 1910.

For the past week there has not been much life to the market. The travelling salesmen for Eastern houses, who make this city their headquarters, have been able to do very little business and they do not appear to be making much of an effort. From Denver and Salt Lake City a greater degree of activity is reported, as the mines, concentrating plants and smelters are installing or planning the addition of considerable new machinery, and in the vicinity of Lead, S. D., a similar condition exists. At Pueblo there is talk of improvements to be made in various properties of the Colorado Iron & Fuel Company, among them being the placing of a large Corliss engine and other power equipment at Berwind; and some large projects are also about to be undertaken by public service corporations in southern and western Colorado. Among the shops, foundries and general manufacturing establishments of Iowa and Nebraska there is temporary quiet. They are all busy, but not much is heard from them.

The Chicago & Northwestern Railway Company, through its industrial department at Chicago, Ill., is endeavoring to interest manufacturers and investors of other sections in the opportunities for the profitable location of machine shops, foundries, factories and mills at various points in the territory west of the Mississippi River traversed by its lines. There has been considerable development in that direction recently, and for repair work, especially, users of machinery do not need to send East nearly as often as formerly.

The Waterloo Malleable Iron Works, Waterloo, Iowa, which has made a specialty of fireproof pattern vaults, are gradually extending their trade in this line, the importance of which is coming to be recognized more and more among Western manufacturers and owners of jobbing foundries, particularly where there are intricate or otherwise valuable patterns to be handled.

The Frontenac Mining Company, Ltd., Central City, Colo., will install machinery this year for a 200-ton concentrating plant and make other improvements.

An air compressor and drills are being added to the equipment of the Wanakah Mining Company, Ouray, Colo., which will be in the market for machinery and supplies at intervals as the work on its property progresses.

The city officials at Carbondale, Colo., will proceed at once to carry into execution plans for a municipal water works system, the construction of which has been authorized.

The city of Indianola, Iowa, is about to purchase a Corliss engine of 200 hp., to be direct coupled to a continuous current electric generator of 150 kw. for the municipal lighting plant. This is at present furnished with four Fort Wayne generators, having a combined rating of 300 kw., driven by engines built in the shops of the Murray Iron Works Company, Burlington, Iowa.

The Pandora Mining & Milling Company, Pitkin, Colo., is arranging for the installation of an air compressor and other equipment.

The J. Geo. Leyner Engineering Works Company, Littleton, Colo., is putting out a complete line of hammer drills, sharpeners, compressors and other apparatus for mining work, the demand for which is improving steadily in this section of the country. The management has in its possession some very interesting figures, obtained from users of its drills, showing expenses in detail for operation and repairs during specified periods.

From Janesville, Iowa, it is reported that the Royer-Myers Manufacturing Company has been organized there with a working capital of $25,000, to engage in the manufacture of gasoline engines, concrete mixers and tile machines. Preliminary plans have been made for a factory building 40 x 100 ft., so constructed as to be capable of extension as the business develops. Electric power will probably be used.

A decision will probably be reached this summer at Carson, Iowa, to build a city pumping plant and install water works.

A power plant will be built and electric generating machinery installed in the near future by the Granite Tunnel Company, Granite, Colo.

The Wm. Graver Tank Works, which has offices in the Newhouse Building at Salt Lake City, have taken some excellent contracts this year at various points in the intermountain territory for tanks, penstocks and steel plate work, the need for which has been heavier, of late, than for some time past. The company's shops are in East Chicago, Ind.

The Carribeau Mining Company, Ophir, Colo., has provided for the installation of an air compressor.

A new electrically operated plant, 80 x 185 ft., three and four stories, will be built at Dubuque, Iowa, by the Dubuque Packing Company.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, has been awarded the complete contract for improvements in the water works system at Dows, Iowa.

Suction gas producers and tandem gas engines are now being handled by the Intermountain Machinery Company, Salt Lake City, Utah, which finds that the demand for this type of power plant equipment is rapidly growing all through the mining districts, as well as for industrial service and central stations.

The operations of the Dragon Iron Mining Company, Silver City, Utah, which now has an output of 200 tons daily, will be considerably extended during the latter part of the year, necessitating the purchase, in due course, of additional equipment. The main shaft will be sunk to a depth of 1000 ft. or more, being now down over half that distance.

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The North Pacific Coast

SEATTLE, WASH., June 9, 1910.

It is becoming more apparent, from one week to another, that there will be a great deal of buying in the near future for the account of large public service and industrial corporations that have been deferring new projects and improvements for the past three years until business conditions should become settled upon a substantial basis. But for threatening labor difficulties the renewed buying movement that is now expected would have developed sooner. Municipal power and pumping plants, incinerators, crushing plants, &c., will also call for considerable machinery, and the almost universal disposition seems to be to award contracts to local manufacturers just as far as possible, thereby helping to build up the industrics of the Coast. In other lines a fairly steady trade is being maintained, with the volume as heavy as could be expected under existing circumstances.

The Nordeen Iron Works, Everett, Wash., has arranged to manufacture and sell sufficient of the products of the Hanchett Hot Blast Grate Company, Big Rapids, Mich., to supply the trade on the Pacific Coast.

The construction of an incinerator plant is proposed at Tacoma, Wash., and the matter of a bond issue to provide funds for the purpose will be decided in the near future.

Machinery will be required shortly by the Newell Mill Company, Seattle, for a new planing mill 50 x 100 ft. to be added to its plant.

At Wardner, Idaho, The Sampson Mining & Development Company is reported to be provided for the installation of an engine hoist and air compressor.

The Nelson Iron Works, Nelson, B. C., has secured the business of the Rossland Engineering Works, Rossland, B. C., and will continue to carry on the trade which has been developed by that company.

An ore reduction plant is to be installed at Sumpter, Ore., by the Columbia Gold Mining Company, of that place.

Additions have been made to the machinery of the Glendale Lumber Company, Glendale, Ore., which materially increase its capacity, and some further equipment will be needed later on.

A gasoline engine-driven air compressor has just been installed by the Pacific Copper Mining Company, Chewelah, Wash., which will require some additional machinery when the development work now in progress is farther along.

A new Corliss engine of 450 to 500 hp. will be put in service this month by the Nelson-Johanson Company, Tacoma, Wash., together with auxiliary machinery.

Arrangements have been made by the Big Baldy Mining & Milling Company, Concord, Idaho, to install a hoist and air compressor. Some additional equipment will be needed later.

Reservoirs will be built and steam-driven pumps provided for water supply service at Fort Ward, Wash. The complete contract was recently let.

A new high pressure boiler 72 in. x 18 ft. is being added to the power equipment of the Hazel Mill Company, Blanchard, Wash.

The Phœnix Iron Works, Portland, Ore., has been awarded by the city the contract for supply steel gates and valves for the Mount Tabor reservoir system of the West Side water works.

The Vancouver Power Company, now under the control of the British Columbia Electric Railway Company, Vancouver, B. C., which operates a hydroelectric plant of 25,000 kw., driven from wheels built by the Pelton Water Wheel Company and the Abner Doble Company of San Francisco, Cal., is about to proceed with plans which contemplate the development of sufficient electric energy to quadruple that capacity.

Plans were recently made by the Eureka Development Company, Ltd., Hailey, Idaho, for an electric power plant to supply current for motors used in driving mining machinery.

The Coast Iron & Machine Works, Tacoma, Wash., now have their plant well equipped and will henceforth be an important factor in the metal working industry of this section.

Government Purchases

WASHINGTON, D. C., July 12, 1910.

The Bureau of Supplies and Accounts, Navy Department, will open bids July 26, under schedule 2709, for 24 differential blocks and a miscellaneous lot of machine screws, and on August 16, under schedule 2702, for one hobbing auto gear machine.

The Isthmian Canal Commission will open bids August 5, under circular 595, for pumps and fittings and for locomotive and truck springs.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids July 5 for the following:

Class 111.—Eight 12-hp. automatic starting oil engines—Bidder 79, August Mietz, New York, $1875.

Class 121.—Two complete sets of propelling machinery—Bidder 39, Ferro Machinery & Foundry Company, Cleveland, Ohio, $385; 44, Fulton Mfg. Company, Erie, Pa., $428.61; 52, Gas Engine & Power Company and Charles Seabury & Co., Morris Heights, N. Y., $650; 96, Progressive Mfg. Company, Torrington, Conn., $550.

Class 145.—Five sets of standard drill sets and 27 dozen twist drills—Bidder 22, Coggins & Owens, Baltimore, Md., $400.47; 67, J. B. Kendall Company, Washington, D. C., $191.51; 78, Montgomery & Co., New York, $163.95; 83, Manhattan Supply Company, New York, $186.61; 106, Rawles-Cobb Company, Boston, Mass., $120; 120, R. B. Sherman, New York, $178.70.

The Mechanical Engineers' English Meeting

Features of the Meeting and Those Who Will Attend

The joint summer meeting of the Institution of Mechanical Engineers and the American Society of Mechanical Engineers will be held in Birmingham and London, England, July 25 to 30. The members of the American Society and the ladies accompanying them will be the guests of the Birmingham Reception Committee at the excursions and entertainments in the Midlands and of the Institution at the London gatherings. The following papers will be presented at the Birmingham sessions:

"English Running-Shed Practice," by Cecil W. Paget, Derby, member I. Mech. E.

"Roundhouse Practice, or the Handling of Locomotives at Terminals to Secure Continuous Operation," by Frank H. Clark, Chicago.

"Handling of Locomotives at Terminals," by Frederick M. Whyte, New York, vice-president A. S. M. E.

"Handling Locomotives," by Henry H. Vaughan, Montreal, member I. Mech. E. and A. S. M. E.

"American Locomotive Terminals," by William Forsyth, Chicago, member A. S. M. E.

"High-Speed Tools and Machines to Fit Them," by H. I. Brackenbury, Newcastle-upon-Tyne, member I. Mech. E.

Report of the Committee of the A. S. M. E. on Standard for Involute Gears.

At the London meetings the following papers will be presented:

"Electrification of Suburban Railways," by F. W. Carter, Rugby.

"Cost of Electrically Propelled Suburban Trains," by H. M. Hobart, London.

"Economics of Railway Electrification," by William B. Potter, Schenectady, N. Y., member A. S. M. E.

"Electrification of Trunk Lines," by L. R. Pomeroy, New York, member A. S. M. E.

"Electrification of Railways," by George Westinghouse, Pittsburgh, president A. S. M. E.

Very many attractive excursions and entertainments have been provided for in both of the English cities, including visits to various works and to places of historic or general interest. The evening affairs will include a garden fete in the Botanical Gardens, Edgbaston, by invitation of the Birmingham Reception Committee, July 26; reception in the Council House, by invitation of the Right Hon. The Lord Mayor of Birmingham, Alderman W. H. Bowater and The Lady Mayoress, July 27; a conversazione in the Institution House, Storey's Gate, St. James's Park, London, by invitation of the President and Council of the Institution, July 28, and the Institution dinner in the Connaught Rooms, Freemason's Hall, London, July 29.

For the American Society the General Committee of Arrangements consists of Ambrose Swasey, chairman; Charles Whiting Baker, vice-chairman; George M. Brill, Prof. W. F. M. Goss and John R. Freeman; ex-officio, George Westinghouse, president; William H. Wiley, treasurer; Prof. F. R. Hutton, honorary secretary; Willis H. Hall, chairman Meetings Committee,

and Calvin W. Rice, secretary. The subcommittees are as follows: Entertainment—George M. Brill, chairman; John W. Upp, George A. Orrok, Mrs. George M. Brill, Mrs. F. R. Hutton and Mrs. Jesse M. Smith; Printing and Publication—Prof. F. R. Hutton and F. R. Low; Reception—Prof. W. F. M. Goss, chairman; L. D. Burlingham, H. R. Cobleigh, William C. Dart, James M. Dodge, H. L. Gantt, A. M. Greene, Jr., Prof. F. R. Hutton, C. T. Plunkett, F. H. Stillman and Worcester R. Warner; Transportation—Charles Whiting Baker and Calvin W. Rice; and Finance—William H. Wiley.

Altogether there are expected to be 241 members and guests of the American Society in attendance. Of this number 89 gentlemen and 53 ladies will sail on the official steamship, the Celtic, July 16. Those going by other routes or now in Europe include 71 gentlemen and 28 ladies. Following are lists of the gentlemen who will be present at the meeting. The names prefixed with an asterisk (*) indicate those who will be accompanied by ladies.

Sailing on the Celtic, July 16, 1910

Aldrich, John G., Providence, R. I.
*Alford, L. P., New York.
Baldwin, Abram T., Detroit, Mich.
Barnes, Howel H., Jr., New York.
*Bovin, Sydney Walden, New York.
Boyd, H. C., New York.
*Brill, George M., Chicago, Ill.
Brill, Elliot M., Chicago, Ill.
Brill, G. Meredith, Chicago, Ill.
Brooks, J. Ansel, Providence, R. I.
Bump, Burton N., Syracuse, N. Y.
*Burlingame, L. D., Providence, R. I.
*Bursley, Jos. A., Ann Arbor, Mich.
*Calder, John, Ilion, N. Y.
Camp, Geo. E., Utica, N. Y.
Chester, John N., Pittsburgh, Pa.
Clarke, S. W. E., New York.
Cobleigh, H. R., New York.
Colwell, Augustus W., Columbus, Ohio.
*Corbett, Charles H., Brooklyn, N. Y.
Dart, Wm. C., Providence, R. I.
*Davis, Chas. Ethan, Muncie, Ind.
Dean, F. W., Boston, Mass.
*Dodge, James M., past president, Philadelphia, Pa.
Dodge, Karl, Philadelphia, Pa.
*Durfree, Walter C., South Boston, Mass.
*Freeman, John R., past president, Providence, R. I.
Gallonpe, Francis E., Boston, Mass.
Galloupe, Chauncy Adams, Boston, Mass.
*Gantt, H. L., manager, New York.
*Goss, W. F. M., vice-president, Urbana, Ill.
*Greene, Arthur M., Jr., Troy, N. Y.
*Hartness, James, manager, Springfield, Vt.
Hallenbeck, Geo. E., Toledo, Ohio.
Hamilton, Chester B., Jr., Toronto, Can.
*Higgins, C. P., Roselle, N. J.
Honsberg, August A., Cleveland, Ohio.
*Hutton, F. R., past president, honorary secretary, New York.
*Johnson, A. L., Muncie, Ind.
*Keep, W. J., Detroit, Mich.
*Klepinger, J. H., Great Falls, Mont.
Klock, Frank B., Syracuse, N. Y.
Latham, H. M., Worcester, Mass.
*Leland, Henry M., Detroit, Mich.
Lewis, Wilfred, Philadelphia, Pa.
*Lodge, William, Cincinnati, Ohio.
*Low, F. R., New York.
McCreery, J. H., New York.
*Main, Charles T., Boston, Mass.
Main, Theodore, Boston, Mass.
Marburg, L. C., New York.
Miller, Spencer, Jr., New York.
Miller, Spencer, New York.
*Moore, S. L., Elizabeth, N. J.
*Morrin, Thos., San Francisco, Cal.
Nelson, James W., New York.
*O'Neil, J. G., Chicago, Ill.
Orrok, Geo. A., New York.
*Parson, Charles H., New York.
Plunkett, Charles T., Adams, Mass.
Plunkett, Chas. T., Jr., Adams, Mass.
*Reed, E. Howard, Worcester, Mass.
Reid, Joseph, Oil City, Pa.
Remick, H. E., Boston, Mass.
Rice, Calvin W., secretary, New York.
Richmond, Knight C., Providence, R. I.
Roe, J. W., New Haven, Conn.
*Sague, J. E., Albany, N. Y.
Sanford, Geo. R., Syracuse, N. Y.
*Smith, A. Parker, New York.
*Smith, Augustus, New York.
*Smith, Jesse M., past president, New York.
*Smith, Oberlin, past president, Bridgeton, N. J.
*Stillman, F. H., New York.
*Struckman, N. H., St. Louis, Mo.
*Swasey, Ambrose, past president, Cleveland, Ohio.
Thompson, B. L., Syracuse, N. Y.
*Thurston, Edw. D., Jr., New York.
Turner, Charles P., New York.
*Upp, John W., Schenectady, N. Y.
Upp, John W., Jr., Schenectady, N. Y.
Waldo, Leonard, New York.
*Warner, Worcester R., past president, Cleveland, Ohio
Watson, William, Boston, Mass.
*Wells, F. C., Greenfield, Mass.
*Wheeler, Seth, Albany, N. Y.
*Wiley, Wm. H., treasurer, New York.
York, L. D., Portsmouth, Ohio.
York, Robert, Memphis, Tenn.

Going by Other Routes or Now in Europe

Adams, E. T., Milwaukee, Wis.
Adamson, Daniel, Clyde, Cheshire, England.
*Baker, Chas. Whiting, vice-president, New York.
Baker, J. Wheeler, New York.
*Baldwin, Wm. J., New York.
Bates, Edward P., Syracuse, N. Y.
*Bauer, Charles L., Springfield, Ohio.
Bell, James R., Kent, England.
Benet, Laurence V., Paris, France.
Bonner, Wm. T., New Britain, Conn.
Christie, A. G., Madison, Wis.
*Clark, Frank Henry, Chicago, Ill.
*Cooke, Thomas F., Buffalo, N. Y.
*Crawford, D. F., Pittsburgh, Pa.
Cromwell, J. C., Cleveland, Ohio.
Cullingworth, George R., New York.
Dietz, Carl F., Boston, Mass.
Dixon, W. F., Moscow, Russia.
Eynon, Thomas M., Philadelphia, Pa.
Ferris, Chas. E., Knoxville, Tenn.
Foster, E. H., New York.
Francis, Harry C., Philadelphia, Pa.
Fry, Lawford H., Paris, France.
*Garratt, E. A., London, England.
*Hall, Willis E., chairman Meetings Committee, New York.
*Hanson, George, Sterling, Ill.
Hart, Howard S., New Britain, Conn.
Heap, Douglas T., Kent, England.
Hering, Rudolph, New York.
*Hess, Henry, Philadelphia, Pa.
Hess, H. Lawrence, Philadelphia, Pa.
Hillyer, George, Jr., Atlanta, Ga.
Holloway, Thurman Welford, London, England.
Katzenstein, Martin L., New York.
Kirchhoff, Charles, New York.
Kothny, G. L., Manchester, England.
Kroto, G., London, England.
Lee, F. V. T., San Francisco, Cal.
Lewis, W. Yorath, London, England.
Longstreth, Charles, Philadelphia, Pa.
McCreery, J. Harold, New York.
*Marks, L. S., Cambridge, Mass.
*Marshall, Wm. C., New Haven, Conn.
Mathot, R. E., Brussels, Belgium.
Mesta, George, Pittsburgh, Pa.
*Meier, E. D., vice-president, New York.
Mix, E. W., Paris, France.
Moeton, George W., Wilmington, Del.
*Morgan, L. H., Cheshire, England.
Otto, Henry S., Paris, France.
Park, F. A., Clydebank, Scotland.
Parish, W. F., Hamburg, Germany.
*Pulman, Thos. C., London, England.
Reid, John S., Chicago, Ill.
Richards, Chas. R., New York.
Ripsch, G. W., Dayton, Ohio.
Rogers, W. S., Bantam, Conn.
*Sancton, E. K., Kent, England.
*Scott, Arthur C., London, England.
*Sinclair, Angus, New York.
Smith, Alton L., Worcester, Mass.
*Taylor, Frank H., London, England.
*Taylor, Fredk. W., past president, Philadelphia, Pa.
Thuman, F., London, England.
Thurston, Geo. H., Johannesburg, So. Africa.
Trube, G. A., Manchester, England.
*Vander Willigen, T. A., Brussels, Belgium.
Vernon, P. V., Coventry, England.
Westinghouse, H. H., New York.
Willhofft, F. O., Kingston, Canada.

The first partial account of C. C. Murray, receiver of the Shenango Iron & Steel Company, Wheatland, Pa., presented to the federal district court at Pittsburgh, shows assets, exclusive of real estate, aggregating $35,261.

Personal

W. E. Corey returned from Europe this week.

Alba Johnson, vice-president of the Baldwin Locomotive Works, Philadelphia, sailed June 26 for a two months' vacation abroad.

J. M. Lewis, formerly assistant purchasing agent of the Link-Belt Company, has been appointed purchasing agent of the Philadelphia Textile Machinery Company, Philadelphia.

Frank W. Highberger, formerly of Frank W. Highberger & Co., is now connected with Edmund W. Mudge & Co., Frick Building, Pittsburgh, in the coke and pig iron sales department.

John C. Greenway has resigned as superintendent of the Coleraine district, Mesaba range mines, of the Oliver Iron Mining Company to become manager of the Superia & Pittsburgh and Calumet & Arizona copper mines in the Bisbee, Ariz., district. The employees at the Coleraine properties presented him with a silver service.

H. S. White has been appointed sales manager of the Detroit Seamless Tubes Company, Detroit, Mich.

Jos. W. Heffer, who has been connected with the Republic Iron Works, Pittsburgh, for 20 years, goes South July 20 to take charge of the office of the Shelby Iron Company, Shelby, Ala.

David Van Alstyne, the newly elected vice-president of the Allis-Chalmers Company, Milwaukee, who will be in charge of the company's manufacturing system, assumed his duties the latter part of last week. He will make his headquarters at the West Allis works of the company, where the general offices are located.

W. M. S. Miller, who has been in charge of the price department of the Allis-Chalmers Company for the past six years, was recently appointed manager of the publicity department in place of C. A. Tupper, who resigned to become manager of the Reliance Engineering & Equipment Company, Milwaukee. Mr. Miller, who has an exceptionally close acquaintance with the company's products, and is particularly well qualified for his present position, will combine the work of the two departments mentioned. Prior to his connection with the Allis-Chalmers Company he had been in the employ of the Westinghouse Electric & Mfg. Company at Pittsburgh, Pa.

John Pender of John Pender & Co., Brunswick, Victoria, Australia, is making a tour of the United States, visiting rolling mills and other industries in which he is interested. Mr. Pender's firm operates a rolling mill and he contemplates purchasing additional equipment as well as a number of machine tools while in this country.

At a recent meeting of the Driggs-Seabury Ordnance Corporation at Sharon, Pa., St. Elmo Gross, until recently of South Bend, Ind., was elected treasurer. T. A. Harris, formerly secretary and treasurer, continues as secretary.

Prof. John Jermain Porter, metallurgical engineer, University of Cincinnati, Cincinnati, Ohio, announces that he will undertake investigations in cast iron and in efficiency of raw materials, plants and operation, particularly in foundry and blast furnace plants.

D. B. Meacham, resident partner at Cincinnati of Rogers, Brown & Co., sails for Europe Saturday, July 16. J. K. Pollock, also a Cincinnati member of the firm, returns from Europe this week.

A. A. Fowler, resident partner in New York of Rogers, Brown & Co., returns this week from a stay of several months in Africa.

L. R. Pomeroy has been appointed chief engineer of the railroad and industrial division of J. G. White & Co., Inc., with headquarters in New York City. Mr. Pomeroy has for a long time been considered an authority on railroad shop equipment, operation and construction, and is peculiarly adapted both by nature and training for his new work.

Ludwig Hammer of Aachen, Germany, is in this country making arrangements with American textile machinery manufacturers for representing their lines. His headquarters are at the Hotel Astor, New York, and he will be in this country about four weeks.

B. H. Reddy, formerly blast furnace engineer for the Tennessee Coal, Iron & Railroad Company, Ensley, Ala., and more recently rolling mill engineer for the Morgan Engineering Company, Alliance, Ohio, is making a tour of the West, including the Pacific Coast.

William Lodge, president of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, will sail from New York July 16. He will attend the meeting of the Mechanical Engineers and will afterward make a general tour of the Continent.

Charles F. Colbert, Jr., has succeeded T. M. Hyndman, resigned, in the sales department of the Washington Coal & Coke Company, Conestoga Building, Pittsburgh, Pa. An annoying error was made in *The Iron Age* of June 30 in printing Mr. Colbert's name as "Charles J. Colvert, Jr."

George G. McMurtry sailed for Europe Wednesday on the Mauretania.

The Morris & Bailey Steel Company's Improvements.

Contracts have been placed with the Allegheny County Light Company by the Morris & Bailey Steel Company, Pittsburgh, for electric current to illuminate the company's cold rolling mill at Wilson Station, on the Pittsburgh, Virginia & Charleston Railroad, and to operate motors with a total capacity of 460 hp. The Morris & Bailey Company is installing a new 21-in. diameter, 36-in. face, cold rolling mill to roll material 30 in. wide, and to operate this the company is installing a 350-hp. motor to be connected to the Allegheny County Light Company's lines. Steam for power has been abandoned in the operation of four old German cold rolling mills, and these will hereafter be operated by two 40-hp. and two 15-hp. motors, on current taken from the same source as noted above.

The change from steam engine drive to electric drive on the smaller mills was made to save space in the plant, increase the production and secure economy in operation. Electric motor drive for the large mill was decided upon because power purchased was demonstrated to be more economical and satisfactory in every way than either steam engine drive or motor drive from the company's own power plant.

The C. W. Hunt Company, New York, has arranged to have its coal handling, conveying and hoisting machinery business on the Pacific Coast handled by the San Francisco Bridge Company, with offices at 865 Monadnock Building, San Francisco. The company has just completed a naval coaling station in San Francisco Bay for the Government.

The United States Horse Shoe Company, Erie, Pa., has made arrangements with C. K. Turner & Son, 116 Broad street, New York, to handle its export trade in horse and mule shoes in the following countries: Asia, South and Central America, Mexico, Cuba, Philippine Islands, Porto Rico, Australia, New Zealand and Spain.

Announcement is made that the American Society for Testing Materials now has 1341 members, 61 applications having been favorably acted upon since the recent Atlantic City meeting. The gain in the past year is thus 179. A membership of 2000 is aimed at by the time of the International Congress, which will be held in the United States in 1912.

Obituary

MYRON C. WICK

Myron C. Wick, long prominent in iron and steel manufacture in the Mahoning Valley, died at Youngstown, Ohio, July 11, aged 62 years. He was for a number of years president of Cartwright, McCurdy & Co., whose Enterprise Iron Works at Youngstown was built in 1863 and added to in 1874. He became president of the Union Iron & Steel Company, formed in the early nineties, by the combination of Cartwright, McCurdy & Co. and the Youngstown Iron & Steel Company, and operating at one time five mills: the Girard, Ohio, mill, formerly owned by the Trumbull Iron Company; the Warren Rolling Mill at Warren, Ohio; the Upper Mill (Youngstown Rolling Mill Company) and Lower Mill (Cartwright, McCurdy & Co.) at Youngstown, and the Pomeroy Mill at Pomeroy, Meigs County, Ohio, operated for a time by the Pomeroy Iron & Steel Company and later acquired by Cartwright, McCurdy & Co. Mr. Wick was one of the organizers of the Ohio Steel Company in 1893 and was treasurer of that company for a time. When the Union Iron & Steel Company was acquired in 1899 by the Republic Iron & Steel Company (except as to its hoop mills, which were taken over by the American Steel Hoop Company), Mr. Wick became a director and a member of the executive committee of the consolidation, but retired from official connection with it in the following year. He had been for some years a director of the Ohio Iron & Steel Company, operating Mary furnace at Lowellville, Ohio. He was also actively interested in many other industrial enterprises, as well as financial institutions. He leaves a widow, two daughters and three sons.

EDWARD B. DOLLIVER, Worcester, Mass., treasurer of the Standard Screw Company, and manager of the Worcester Machine Screw Company, died July 6 after a brief illness, aged 61 years. He was born in Grafton, Mass. After leaving the common schools he engaged in the shoe making industry with his father, and later was in the hotel business. In 1876 he entered the employ of the Worcester Machine Screw Company, under A. W. Gifford, and served three years in the shop. In 1879 Mr. Gifford acquired full control of the business and Mr. Dolliver was placed in charge of the office, which position he held until 1900, when Mr. Gifford sold the business to the Standard Machine Screw Company. Mr. Dolliver become manager of this branch of the industry and was made a director and treasurer of the company, offices which he held until his death. He was one of the best-known men in the machine screw trade of the country. He had a large interest in the Arcade Malleable Iron Company, Worcester, and was president of the corporation. He leaves a widow and one daughter.

HENRY C. CLARK, Lee, Mass., of the firm of H. C. Clark & Son of that town, manufacturers of paper machinery, died July 3, aged 72 years. A native of Housatonic, Mass., he passed 30 years of his life in Pittsfield, during much of the time being the senior partner of the firm of Clark & Jones, manufacturers of machinery. In 1891 he went to Lee, forming a partnership with John S. Spencer, as Clark & Spencer, and upon the dissolution of the firm in 1900 H. Archer Clark was taken into the partnership. Mr. Clark leaves a widow, one son and two daughters.

EDWIN T. MARBLE, Worcester, Mass., head of the Curtis & Marble Machine Company, builder of cotton and woolen machinery, died July 3, aged 82 years. He was a native of Sutton, Mass. After completing his education at the Worcester County Manual Training School at Worcester he located in that city in 1841. Having served his apprenticeship as a machinist in the shop of Albert Curtis, he was employed as a machinist, foreman and superintendent in various local machine shops. The business of Curtis & Marble was established in 1863, with Albert Curtis as the other partner. In 1895 Mr. Marble bought Mr. Curtis' interest and the business was incorporated as the Curtis & Marble Mfg. Company. Mr. Marble was the president and treasurer, offices which he retained until his death. He held many public offices in the city and State government, and was a director of the Worcester Trust Company and a vice-president of the People Savings Bank. He leaves four sons, all of whom hold offices of responsibility in the large manufacturing plant.

W. A. STADELMAN, president and general manager of the Darley Engineering Company, New York, Chicago and Boston, died July 6 at his home at Rye, N. Y., in his 45th year. Mr. Stadelman, who was especially well known in the machinery trade, received his higher education in the University of Pennsylvania, and after taking a course in mechanical engineering there he became connected with the Sprague Motor Company, which was at that time building the first electric railroad in this country. Later Mr. Stadelman was employed with the Niles Tool Works at Hamilton, Ohio, and in 1896 he became connected with the Brown Hoisting Machinery Company, Cleveland, Ohio. He remained with that firm until 1905, when he became manager of the Eastern office of the Wellman-Seaver-Morgan Company, Cleveland. Mr. Stadelman came to be regarded as an authority on conveying equipment. A few years ago he and others organized the Darley Engineering Company, which manufactures suction and air pressure conveyors for handling and separating material. A widow and two children survive him.

I. C. NORTON, superintendent of the billet and rod mills of the Illinois Steel Company at Joliet, Ill., died in that city June 26, aged 60 years. He had suffered from an intestinal trouble, for which an operation had been performed. He was born at Lockport, near Joliet, in 1850, and received his education there and in Chicago. In 1878 he entered the service of the Joliet mills of the Illinois Steel Company as a timekeeper and advanced steadily. He was active in the public life of the community and was an exemplary citizen.

JACOB WERTHEIMER, St. Louis, died July 7, aged 70 years. He was a native of Hesse-Darmstadt, Germany, and came to America at the age of 21, settling in New York City. He subsequently removed to St. Louis and engaged in the iron business, from which he retired several years ago.

Concerning the recently published statement that balata belting (made of gutta percha, balata rubber and specially woven duck) is about to be manufactured in the United States for the first time, the Boston Belting Company, Boston, Mass., says that it is at present the only domestic manufacturer of this product; that three other interests are preparing to manufacture it in this country, one having already erected a plant, while two others have completed plans for building.

The National Railways of Mexico has placed an order with the American Car & Foundry Company for 2500 cars, to include 1600 box cars, 500 gondola cars, 100 tank cars, 150 flat cars and 150 stock cars. The Baltimore & Ohio Railroad has also been active in placing car orders, as previously mentioned, and has also purchased 50 locomotives of the Mikado type and 30 Mallets. The locomotive orders went to the Baldwin Locomotive Works.

The Warwick Iron & Steel Company, Pottstown, Pa., contemplates blowing in its No. 1 blast furnace, which has for some months been undergoing repairs, about June 20. This action will, it is said, be necessary owing to increased sales of pig iron recently made. The stack will be operated on foundry iron.

The International Congress of Mining, Metallurgy and Applied Geology

Important Papers at Duesseldorf on Recent Practice in Iron and Steel and Related Industries

BY CHARLES KIRCHHOFF.

DUESSELDORF, GERMANY, June 24, 1910.—In a previous letter were given some general facts concerning the preparations for the fifth "International Congress for Mining, Metallurgy, Applied Mechanics and Practical Geology"; also something about Duesseldorf and the great building of the German Steel Syndicate. Preliminary to the congress a gathering was held on Sunday evening in the Zoological Garden, brilliantly illuminated for the occasion. A large military band played while the members were grouped around tables on the piazza of the restaurant, in the open air, enjoying German hospitality.

FIRST SESSION

The meetings began on Monday morning at the Municipal Music Hall, a city building in which frequent concerts are held indoors or in the adjoining garden, according to the season. There are two large halls and a series of smaller ones, which furnished ample accommodations for the functions held. The proceedings opened with an address of welcome by President Kleine, who alluded to the history of the movement. Started originally at the suggestion of the Société de l'Industrie Minérale of St. Etienne in France at the time of the Paris Exhibition of 1878, on a very modest scale, there were larger gatherings in connection with the expositions in Paris in 1889 and in 1900. The meeting at Liége in Belgium followed in 1905, again on the occasion of an exhibition; so that it is for the first time in the history of the movement that Duesseldorf has ventured the invitation without the inducement of an international show. During the course of the congress it developed that the Iron and Steel Institute has put forward the claims of Great Britain and has issued a call to London for 1915.

After Dr. Schaltenbrand, the general manager of the German Steel Syndicate, had translated the speech into both French and English, the Prussian Minister of Commerce, Sydow, welcomed the congress in behalf of the German Chancellor and in the name of the Prussian Government, being followed again by Dr. Schaltenbrand as interpreter. At the motion of Louis Dejardin, Director General of Mining of Belgium, seconded by C. Kirchhoff and T. Martin, British Inspector of Mines, it was decided by acclamation to place the conduct of the congress in the hands of the preliminary organization which had worked out the details of the meeting. The formal proceedings were thus disposed of very promptly, and the congress settled down at once to the huge amount of business before it, in the reading of papers and their discussion.

A Remarkable Array of Papers

The congress was divided into five sections, which held their meetings simultaneously, so that each kept within manageable proportions. These were Mining, Practical Metallurgy, Theoretical Metallurgy, Applied Mechanics and Applied Geology. Not less than 120 papers were ready for presentation, to be dealt with in four sessions. Your correspondent naturally selected the section of Practical Metallurgy as the one most likely to interest the readers of *The Iron Age*. So far as he was able to ascertain, there was little more of animated discussion in the other sections than in that of Practical Metallurgy, so that a report could be little more than an enumeration of the papers presented. Let it be stated that these were throughout exceedingly high in character, the majority of them being by German authors. It seems probable that in many cases the subjects were assigned by the management to well-known experts, whose object it was to present the progress in each particular field in the Fatherland and submit the latest results. Taking it altogether, they constitute a brilliant summary of the latest achievements and trend of thought; and it may be added there is throughout not the trace of an effort to utilize the opportunity to push commercially any particular apparatus or process.

The first paper presented was on

"The Development of Coke Plants Due to Improvements in Type of Oven"

BY PROFESSOR HERBST, AACHEN.

The author limits his review to the consideration of the mechanical arrangements of the coke ovens proper, and leaves out the question of recovery of by-products. The newest development in the construction of ovens lies almost exclusively in an improvement in the horizontal oven with vertical heating flues. The following firms have contributed to this:

1. C. Otto & Co., Dahlhausen (Ruhr), who have developed both their ordinary oven with gas outflow and their regenerative type, both underfired.

2. H. Koppers, Essen (Ruhr), whose furnace has inclined chambers and who have introduced a new type of regenerative furnace, this being designed both for air and gas regeneration; in the present case, as in that of ovens with inclined chambers generally, the oven yields lighting gas, and owing to the outflow of all available gases leads to the necessity of heating with producer gas a regeneration of which is desirable, large quantities of gas being dealt with; further data on this oven are given in a separate chapter dealing with the production of lighting, heating and power gases in coke oven plants.

3. The firm of Franz Brunck, Dortmund, which has maintained its recuperative furnace with double wall heating conduits, but has increased the flame and modified the system of recuperation.

4. F. J. Collin, Dortmund, has a regenerative oven, in which a heating through of the walls as regularly as possible is aimed at, regardless of a regular reversing of the draught, the oven being heated alternately top and bottom, instead of alternately right and left.

5. The Rheinische Chamotte und Dinas-Werke, Cologne, has introduced a regenerative coke oven in which irregular heating due to reversing is also prevented to the greatest possible extent, this being arrived at by a suitable device for delivering air and fresh gas, and for connecting the heating walls with the heating and cooling supplies.

6. Salau & Birkholz, Essen, have a particular type of oven, on the Kros design, the feature of which is that reversing does not take place in the heating flues, its action being limited to the space beneath the oven.

7. E. Coppée, Brussels, builds a regenerative oven in which the bottom flues in the oven chambers are alternately connected with the regenerators situated underneath the oven, in such a way that in one heating period the ovens having even numbers, and in the following those having uneven numbers are connected alternately to the fresh delivery of air and to heating supply.

Recent improvements apply mainly to the development of the regenerative oven. This has increased in importance owing to development in the use of coke oven gas engines and especially to the recent application of coke oven gas for lighting, heating and power purposes in towns. The improvements in question deal with a greater regularity in the heating, with the attainment of the largest possible in vol-

ume of gas by a careful utilization of the calorific value of heating gases and with a reduction in the coking period.

GAS FROM COKE OVENS.

A separate chapter deals with the coke oven gas supply for cities. This met with success in North America, thanks to the energetic action taken in this respect by F. Schniewind as early as in the nineties. In Europe resistance had at first to be overcome on the part of gas engineers. Now, however, the supply of this gas to cities is getting into full swing. Koppers, among the above mentioned firms, has met with special success in this problem by building and working special coke ovens. The Rheinische Chamotte und Dinas-Werke is also dealing with the problem. The Stettiner Chamottefabriken has built, among other ovens, those for the Munich Gas Works.

Since the working of coke ovens, owing to the large quantities of coal dealt with and gasified, and also to the comparative cheapness of the process, is less dependent upon the richness in gas of the coke, the quality of the gas produced is less rich both at the beginning and toward the end of the process. Generally, therefore, the gas obtained during the favorable period is supplied as rich gas, the poor gas being utilized for heating the ovens. In large batteries of coke ovens, a natural equalization of the gases may take place and the whole of the gas produced may be supplied to outside customers, in which case the ovens must be heated by separate producers.

The ovens having inclined coal chambers are referred to in the first place as having met the case and having been found suitable for town gas supply; they are now, however, being superseded in many large installations by horizontal ovens. Examples of the former, built by Koppers and by the Stettiner Chamotte-Fabriken, are given, together with particulars upon the horizontal ovens for gas production.

OPERATING THE OVENS.

Under this head, the charging apparatus is first referred to, and various examples are given for the rapid charging on the top by trucks in the direction of the width of the oven and through several openings. In regard to charging from the side by means of pushers, after previous stamping of the coal into an iron mold, various designs are referred to, among others, those of Méguin & Co., Dillingen (Saar), who have specially dealt with the development in the coal stamping process, being led thereto by the character of the coal mined in their district. The arrangement of the leveling and charging devices and of those for supplying them with coal is clearly shown. Attention is called to a series of precautions to be taken with regard to objectionable gases developed during the charging of the oven; the matter has already been dealt with in detail in the technical press, and is briefly alluded to under Koppers, Collin and other firms.

Activity has also been displayed in regard to the mechanical leveling of the coal inside the coke oven, this having been developed by a large number of engineering firms, among which may be mentioned the Bochumer Eisenhütte, Bochum; Hartung, Kuhn & Co., Duesseldorf; Gewerkschaft Schalker Eisenhütte, Gelsenkirchen-Schalke; the Sächsische Machinenfabrik vorm. Rich. Hartmann, Chemnitz; H. Koppers; Méguin & Co.; Baroper Maschinenbaugesellschaft; Maschinenbauanstalt Altenessen; and Franz Brunck. Three types of machines are resorted to, the leveling being effected either by rack gear, by chain or rope transmission, or by crank with an oscillating lever.

In the matter of coke pushers, no special novelty requires mentioning. Care has been taken to build these machines on powerful and safe working as possible.

Manufacturers have also given their attention to the designing of the oven doors. The supply of gas to towns has made it incumbent upon the producers to provide tighter doors than is possible by the usual coating of loam. Types of doors are referred to which render the loam coating unnecessary. The "tight doors" may be mentioned at this point. These facilitate a better heating of the top of the cake of coke. They press against inclined packing surfaces provided on the oven. New protective devices provided for preventing the burning of the doors are alluded to. For leveling, a number of small openings are available. The more recent chain lifting and other devices for working the doors are briefly described.

Special features now surround the quenching of the coke with the object of both saving labor and securing very rapid quenching so as to prevent the coke from absorbing too great a proportion of water. Portable quenching apparatus is mentioned. Attempts to turn to account the waste heat in the quenching process have hitherto not given practical results.

Mechanical conveying devices for loading are being used to an increasing extent, especially in countries where manual labor is high. Band conveyors are specially used, partly also for serving the coke-breaking and screening plant. Several examples are given. The conveyors are charged from an inclined plane suitably arranged. Bucket conveyors and grabs for loading the coke are also noticed.

Another important phase of the same subject was dealt with in the paper by Prof. O. Rau of Aix-le-Chapelle on

Progress in the Recovery of By-Products in Coke Making

The statistics of the world, although defective, indicate the rapid development. They are best expressed in the returns of the output of sulphate of ammonia, which rose from 484,000 tons in all countries in 1900 to 952,000 tons in 1909. To this Great Britain contributed 348,000 tons, Germany 323,000 tons, the United States 90,000 tons, France 54,000 tons and the other countries 137,000 tons. In Great Britain the quantity was made up of 171,000 tons from gas works, 75,000 tons from coke oven plants, 19,000 tons from blast furnaces, 26,000 tons from producers and 57,000 tons from shale works. In Germany, on the other hand, gas works contributed only 40,000 tons, coke plants 278,000 tons, and sugar refineries 5000 tons. Professor Rau's paper is an exhaustive summary of the literature of the subject, dealing with the investigations made concerning the gasification of coal, its influence upon the output of tar, the considerations affecting the coking quality of coal, the chemistry of nitrogen, the separation of the by-products, the direct sulphate process and other methods and the utilization of the tar, benzole, ammonia, gas and other by-products.

G. Francke, professor at the School of Mines at Berlin, reported on the

Present Position of Iron Ore Briquetting and Agglomerating in Germany

The author reports that there are now in Germany nine plants briquetting daily about 2200 tons of ore, fluedust, blue billy, &c., and one iron and manganese ore agglomerating plant with a daily product of 130 tons. Of the whole the quantity of fluedust handled amounts to about 510,000 tons, or about one-third of the quantity produced at German blast furnaces. This, however, will be materially increased since there are five or six fluedust briquetting plants in course of construction or approaching completion. At the present time fluedust is being worked on a commercial scale by the chloride of magnesium process of Dr. Schumacher at the Dortmund Union, Dudelingen and Haspe works, by the lime process of the Maschinenbau A. G. Tigler of Duisburg-Meiderich, at the Deutscher Kaiser works, the pitch process of Dr. Trainer also at Deutscher Kaiser and the process of the Scoria Gesellschaft of Dortmund at the Krupp works at Rheinhausen. New plants are being built at Rombach, Schalke, Hoesch, Gutehoffnungshuette and Rheinische Stahlwerke, which are adopting either the chloride of magnesium process, the Tigler lime process or the Ronay hydraulic pressure method, controlled by the Allgemeine Briquettierungs-Gesellschaft of Berlin.

The chloride of magnesium process calls for only low cost of plant, 50,000 to 60,000 marks for a capacity of 60 tons in 10 hours, low wages, power and material. At Dudelingen the addition of ½ per cent. of chloride of magnesium in the form of 1½ per cent. of a 33 per cent. solution suffices. The cost of briquetting the fluedust, inclusive of interest and sinking fund, is 1.60 marks per ton of briquettes, while at the Dortmund Union the cost is 1.70 marks on account of somewhat larger requirements of chloride of calcium.

The lime process calls for the addition of 6 to 8 per cent. of slaked lime ground with 1 per cent. of blast furnace slag. The briquetting pressure is 200 to 400 atmospheres, which yields fair briquettes, but the cost is high. The pitch process has produced good briquettes, but the cost of the pitch is high, 40 marks per ton, and the pressure required, 600 atmospheres, is also high.

No data relative to the Scoria process used at Krupp's could be obtained.

The Ronay high pressure process is being introduced at several places. No binder is required, but the pressure ranges between 900 and several thousand atmospheres.

The iron ore briquetting plants produce about 150,000 tons annually. They include the plant of the Ilsede Huette near Peine, Hanover, where clayey brown iron ore and calcareous concentrates are briquetted by a special process with roll cinder, basic Bessemer slag, purple ore, &c., mixed hot. At the Georgsmarienhuette at Osmabrueck, the lime process is used for purple ore and fluedust. The Schumacher process is also employed at the Koenigshuette in Upper Silesia either for purple ore alone or mixed with heavy fluedust and Gellivara magnetic concentrates.

At the Friedenshuette in Upper Silesia the Ronay process is in use on a mixture of purple ore and either converter or fluedust or 3 per cent. of slaked lime.

The Ilsede plant has the reputation of working most cheaply, at a shade under 1 mark. The results at the furnaces show that the use of briquettes increases the output considerably, decreases the consumption of coke very materially, and lowers the output of fluedust. Similar experiences have been made at Koenigshuette and at Georgsmarienhuette.

The sintering process has been in use at only one point in Germany, at the Giessener Braunsteinwerke at Giessen. The cylinders were built by Fellner & Ziegler of Frankfurt a M-Bockenheim and yielded a product suitable for shipping to distant points at a satisfactory cost.

BRIQUETTING BORINGS AND TURNINGS.

Professor Francke at the end of his paper alludes to the briquetting of wrought iron, cast iron and steel turnings and borings by the Ronay process, by progressive hydraulic pressure ranging from 1200 to 2000 atmospheres and upward. Working results have shown that briquettes made of turnings show a loss of only 4 to a maximum of 10 per cent. in melting and yield much better castings, particularly as to density, toughness and strength, so that they make it possible to dispense with the usual additions of expensive special grades of pig iron. Different plants are operating under this method very satisfactorily, among them the Saechsische Metallbrikettwerke at Chemnitz, A. Borsig of Berlin-Tegel and Berliner Eisenbrikettwerke. Further central briquetting plants for turnings are being built for Gebr. Sulzer of Winterthur, for the Imperial Navy Yard at Kiel and at Vienna, Buda Pesth and Leeds.

DISCUSSION.

In the discussion a rather vigorous protest was entered by Dr. Weiskopf of Hanover, a member of the commission appointed by the German Society of Iron Masters to look into briquetting, against some of the low costs given in the paper. He stated that the investigations of the committee had gone far enough to justify the statement that 3 marks per ton was as low as had yet been attained in briquetting anywhere in Germany.

Prof. Henry Louis of Newcastle-on-Tyne referred to the very great development in England, the United States and Sweden of the nodulizing process, which apparently was not appreciated in Germany. He noted the considerable reduction in the consumption of fuel in the blast furnace and instanced a case in Sweden of a blast furnace whose consumption of charcoal when using nodulized Swedish magnetites had declined to 850 kg., as compared with 1200 kg. required when untreated ore was charged.

Dr. Blasberg of Dahlhausen followed with a paper on

The Change in the Composition of Firebrick

The paper deals with the changes which occur in the composition of firebrick, the analyses being given in some cases; the changes observed are those due to heat, slags, &c. Special attention has been given, in the researches carried out, to the working of coke ovens and the manufacture of open hearth steel. In the case of the behavior of bricks in coke ovens, the action of common salt which happens to be in solution in the water used for washing the coal comes specially into play. Attention is also called to the damage which may also be caused by the deposit of solid coal particles in the joints of the brick. In the case of open hearth furnaces, the destruction of the silica bricks, of which the roof of the furnace is built, is reviewed, the action both of basic oxides and of deposits of carbon being considered.

A very interesting, fully illustrated paper was that of Curt Grosse of Metz on

The Present State of Cleaning Blast Furnace Gases in Germany

In the German customs union there are produced at the present time, corresponding to an annual production of 13,600,000 tons of pig iron, about 7,650,000 c. m. of waste blast furnace gases per hour reduced to a temperature of zero C and a pressure of 760 mm. At present 4,840,000 c. m. of this quantity are cleaned. This sum also includes the plants in construction. As a rule the gas first passes dust catchers and is then thoroughly refrigerated and washed several times. The large dust catchers have a capacity of about 0.8 to 1.5 per cent. of the gas quantity to be cleaned per hour. The ratio of the diameter to the hight of the dust catchers varies between 1:2 and 1:3 according to the ore worked. The rising and falling pipes of 2 to 3 m. diameter and to 25 m. hight which are still in use have not the effect ascribed to them. Large dust catchers are much better. The coolers are mostly constructed as fixed apparatus, as they need a large space when intense cooling is required. (Capacity about 0.6 to 1 per cent. of the quantity of gas to be cooled per hour.) The cooling must be done thoroughly in order to condense the steam contained in the gases as completely as possible, because in this way the useful calorific power as well as the pyrometric effect is considerably increased.

In coolers of right dimensions the temperature of the gases can be decreased down to 3 or 5 degrees C over the entrance temperature of the cooling water. At the same time 30 to 60 per cent. of the dust are extracted. Mechanical rough and fine cleaning of the blast furnace gases are done by different systems. The author refers to the principal systems—the Zschocke, Theisen, Bian and Schwarz—and treats their effect, requirements of power, water, &c., by showing drawings of whole plants and details.

Of new constructions (being at the beginning of their development) are mentioned those of Hartmann and Bayer working after the desintegrator system and the Flössel system. Both give good results.

In order to decrease the costs for service and installation it is recommended that the large establishments do the cleaning in a centralized cleaning plant, as in this way the great fluctuations of the single furnaces compensate each other, the plants being easily managed, with complete and cheap reserve apparatus. The conditions required to-day of a good cleaning plant for blast furnace gases are:

1. The cooling of the gases must be done as thoroughly as possible in order to extract the steam as completely as possible;

2. The gases for heating purposes may only contain 0.1 to 0.5 grammes of dust per cubic meter, whereas for gas engines are admissible only 0.01 to 0.03 grammes at a temperature of about 25 degrees C.

3. All apparatus must be as simple and safe as possible.

4. The plant must allow good inspection and easy regulation within wide limits.

RESULTS AT VARIOUS BLAST FURNACE PLANTS.

Data collected by the author from different blast furnace plants show that the reduction in the consumption of coke brought about by the installation of gas cleaning fluctuators is between 20 and 55 kg. per ton of iron. One furnace company, however, does not record any lowering in coke consumption. After the introduction of gas cleaning plants the increase in the temperature of the blast amounted to 60 to 100 degrees Celsius at the different works. The time during which the hot blast stoves were on gas was lessened from 8 to 5 hours and from 6 to 3 hours, being therefore nearly cut in two. The time during which the stoves could be kept in blast rose from 1 hour to 1½ hours and from 1½ to 2 hours, or an average of ½ hour. Two plants, it is true, report that after introducing gas cleaning they could neither keep the stoves longer on blast, nor shorter on gas. The stoves when burning cleaned gas require about 42 to 44 per cent. of the entire output of gas. Adding 16 to 18 per cent. for the requirements of the furnaces themselves, there remained available from 37 to 42 per cent. of the entire gas produced for the steel works and rolling mills or for other purposes, while formerly, with uncleaned gas, nearly all of it was consumed for their own hot blast stoves and boilers. The introduction of gas cleaning, therefore, leads to a very considerable saving of money. Figures up to 40 per cent. have been given to the author. Two plants do not record any saving of money. The production of steam showed an average increase after the introduction of cleaned gas of 10 per cent. or 2 to 22 kg. per square meter of heating surface per hour.

The life of the hot blast stoves increased on an average from two to three months to 12 to 14 months and that of the boiler flues from one to three to four months. The returns and opinions as to the life of the hot blast stove brick when heated with cleaned gas vary a good deal. One manager reports that the stove brick would wear more rapidly than with uncleaned gas, but the other works state that the life of the brick is longer. It seems to depend upon whether the brick, at the time of the introduction of gas cleaning, had been working for a considerable time with uncleaned gas. In that case there were probably accretions of slag which were melted by the higher temperature due to heating with cleaned gas, thus destroying the brick more rapidly. With fresh brick at the introduction of cleaned gas, accretions of slag are avoided at the outstart and the life of the brick is longer. At some of the works the temperature of the escaping gases in the flue is still very high (up to 560 degrees Celsius). This proves that the heating has not been properly installed. Under normal conditions the temperature should not go above 300 degrees Celsius, but then the design of the hot blast stove should be adapted to the use of cleaned gas. The cooled and cleaned gas has a materially higher calorific value and demands a longer path in the stove in order to surrender its heat fully. Recently, therefore, the stoves have been built to a hight of 40 m. The consumption of gas for heating becomes very advantageous since the diameter is reduced. Probably a diameter of 6 to 7 m. would be the most effective for such stoves and would yield the maximum efficiency.

This shows clearly the great advantage secured by gas cleaning plants. They make it possible to utilize waste furnace gas effectively. Realizing this, various works have developed their cleaning plant very well and have even provided for reserve producer plant in order to be supplied with gas, in case of stoppages, so that the cheaply operated gas engines may be always kept running full. These producers

are, of course, so arranged that their gas first passes through the cleaning plant before going to the gas engines. The blast furnaces possess the source of great earning capacity in their waste gases, provided they are cleaned. The excess of gas is so large that blast furnaces are able to supply electric current to neighboring factories at a low price. They may heat the drying ovens of large foundries and it is probable that in the near future other methods of utilizing the furnace gases may be found.

Dr. H. Passow of Blankensee, who is one of the greatest cement experts of Germany, submitted a paper on

The Value of Microscopical Research for the Grading of Blast Furnace Slags

The value of the microscope for judging the hydraulic value of basic blast furnace slags was recognized for the first time about 10 years ago, when even a limited enlargement showed that by granulation and crushing there were produced both vitreous and nonvitreous slag particles. These two forms cannot be differentiated one from the other by analysis. In the manufacture of slag Portland cement, therefore, as in that of the other kinds of cement using basic blast furnace slags—which have no relationship with puzzolana cement, but are equal in value to Portland cement—the microscope must constantly be resorted to, since it shows very rapidly whether granulation or crushing has yielded vitreous or nonvitreous slag particles.

It is only the vitreous slags which have a market value for the manufacture of slag Portland cement and other slag cements. When the microscope reveals that granulation or crushing has yielded too large a proportion of nonvitreous particles, or that the subsequent drying has had for effect to largely increase the latter, then suitable means must be taken to prevent the detrimental action. The author states instances and gives a large number of data and micrographs to illustrate the subject.

The microscope plays an equally important part in the case of a new plant. Every blast furnace yields a slag which is either subject to reaction or is not, and also a slag having properties between the two. The slags which are subject to reaction give the best cements, but it is more difficult to convert them into vitreous form than those in which reaction is slow. The grades that are between the two extremes are the most suitable for cement manufacture. The microscope settles these and all similar points; it cannot be dispensed with and it should find a place in all works' laboratories and experimental stations.

SECOND SESSION

The Monday afternoon session was opened by W. Esser of Differdingen, Luxemburg, on

The Present Status of the Basic Bessemer Process in Germany

The author reviews the enormous development of the industry, the output rising from 328,909 tons in 1883 to 7,668,599 tons in 1909. He showed the progressive change in the layout of the plants from the early two converters grouped about a circular pit, followed by a group of three vessels supplied by a mixer, a similar group of three served by a straight pit, a set of four 25-ton converters in line, with two 500-ton mixers and a straight casting pit, as at the Rheinhausen works of Krupp and other modern works. A review was given in detail of the steps taken to increase capacity, lengthen the life of plant, reduce waste and lower labor cost, together with some interesting figures showing the mass of materials which must be handled by a modern German basic Bessemer plant. The maximum output yet attained has been 560,000 tons in one plant in one year. This calls, per day of 24 hours, for the supply of 2100 tons of pig iron, to be transported from the blast furnaces to the mixers in 110 ladle changes. This quantity is blown in 129 heats, which require 260 tons of burnt lime and call for about 23 tons of sintered dolomite and tar. The slag produced foots up to about 400 tons and the steel scrap amounts to 50 tons. The blowing engines must handle 950,000 c. m. of blast and deliver at a pressure of 2 atmospheres. The three casting ladle cars must each carry 633 tons of molten steel in 43 trips from the converters to the cast house, and with 3-ton ingots there are cast 645 ingots, which must be transported from the cast house to the soaking pits. If this work is done by two electric cranes, each crane must make 322 trips in 24 hours. Such an output has been possible only by improving the lining until a well-handle steel plant makes an average of 280 blows without repairs. The normal life of needle bottoms is 60 to 65 blows, while it may be put at 95 blows for tuyere bottoms.

Esser's review of the conditions underlying and affecting the future of the basic Bessemer process is so complete and so clearly put from both the technical and commercial point of view that it deserves practically full reproduction. It shows the strength and the weakness of different districts, and throws light upon the struggle which is now being waged among those who are after all the most formidable competitors of our own makers. The basic Bessemer is the backbone of the German competition, in Germany and in the world's markets. The works outside of the Minette district are looking for relief to the open hearth pig and ore process, in which is involved the question of quality of the basic Bessemer product. With the steady advance in the requirements for rail quality the basic Bessemer companies are getting uneasy, and, in fact, are having more and more trouble with the state railroads, and, of course, are seriously open to attack in the international markets.

A very full synopsis of this important paper—important both technically and commercially—is given in a separate article.

R. Genziner, manager of the Julienhuette, in Upper Silesia, read a paper on

The Ore Processes in Germany

The Siemens-Martin process, in the first years of its application, mainly served to melt the scrap obtained in the works in which it was used, or scrap purchased from outside, together with the smallest possible amount of pig iron. The open hearth process, on the other hand, brought about a great change in the last years, when the use of pig iron in its molten state was introduced. The Austrian Donawitz works commenced with this process on a large scale in 1893. At the present time a large number of German plants work with molten pig iron, and it may be considered certain that the ore-process will shortly lead to a further great development. The following processes are in use at the present time in Germany:

1. Ore-process with a molten charge of pig iron having a low or an average percentage of phosphorus, and taken
   (a) Direct from the blast-furnace, or
   (b) After passing through the usual type of heated mixer, or again
   (c) Using a mixer for partly refining.
2. The Bertrand-Thiel process or Hoesch process, using a molten pig iron charge having a high percentage of phosphorus (basic iron).

The author, as a typical instance, gives under 1a, a description of the process followed at the Hubertushuette, where the open hearth furnaces are almost exclusively worked with coke oven gas. Analyses and combustion curves are added, together with data on the technical efficiency of the furnace, its output and consumption.

Under 1b, he gives details on the working with a heated mixer at Julienhuette. The great advantage resulting from the use of such a mixer in the open hearth process is shown by the analyses of blast furnace pig iron and of the iron from the mixer. A description of the installation at the same steel works follows, together with one illustrating the metallurgical transformations of typical charges, and analyses of slag taken both during the process and on completion of same. Data are added concerning the arrangement of the Niederrheinische Huette, Hochfeld, in which the working up of molten pig iron charges is shortly to be adopted.

The author further describes under 1c the ore-process using a mixer in which refining begins to take place and he instances the Georgsmarienhuette, the Huestener and the Bethlen-Falva works, special attention being called to the interesting conditions ruling in the first of these three establishments, in which the mixer is operated with cleaned blast furnace gas.

In chapter 2 is given the exact description of the Hoesch process, complete data being added on the metallurgical progress of the method, which is gradually gaining more and more importance. The method followed at the Phoenix Steel Works, Hoerde, is also described. In this, cold basic iron is occasionally used on a method similar to that followed at Hoesch. The author adds a few data showing the manner in which many steel works have advantageously developed the scrap process. He concludes with statistics giving an idea of the extent to which the

open hearth furnace is gradually superseding the converter in Germany and in other countries in regard to the quantity of output.

H. Terpitz of the Hubertushuette dealt with

The Use of Different Gases for Operating Open Hearth Furnaces and Their Influence on the Quality of the Products

Special interest attaches at the present time to the utilization for operating open hearth furnaces of the waste gases from coke ovens and of the surplus gases from blast furnaces, larger quantities of which become available as the result of the development of gas engines. For instance 7 to 8 c. m. of furnace gas is required per horsepower hour for a steam engine, as compared with 3 to 3½ c. m. of furnace gas for a gas engine. At some works, as the Hoerde, furnace gas has been conducted in a 3 km. pipe line to a distant rolling mill for firing boilers, but other works have no such outlet and must use considerable quantities of gas. At a number of places the effort has been made to take the waste blast furnace gas to open hearth furnaces, but the results have been disappointing on account of the low calorific value as compared with good producer gas. The most extensive experiments of the character have been carried out at the new steel works of the Georgs-Marienhuette at Osnabrueck, where furnace gas alone is used for the tilting primary open hearth furnaces. Terpitz gives it as his personal opinion that in a few years open hearth furnaces will be operated successfully, using blast furnace gas wholly or partly. He supports the proposals of Jos. von Ehrenwerth and Schmidhammer to regenerate blast furnace gas by passing it through coke breeze or fine coal heated with oxygen manufactured by the Linde process.

As for the utilization of waste coke oven gas for working open hearth furnaces, the Hubertushuette started to do this in May, 1907. During the first calendar year the normal coal consumption was brought down by only 2.13 per cent. In 1908, however, 41.19 per cent. and in 1909 43 per cent. of the total coal consumption was supplanted by coke oven gas. The best results were attained in September, 1909, in which, on a production of 6200 tons of ingots, the coal consumption amounted to only 14.9 per cent., so that 53.15 per cent. of the total requirements of coal were supplanted by coke gas. In these comparisons the basis was the average annual coal consumption of 1906, when it amounted to 318 kg. per ton of ingots.

The new coke plant consists of two groups of 45 Otto-Hoffmann ovens each, in which 320 tons are put through in 24 hours. The excess of gas per day is 60,000 to 70,000 c. m., which is not alone used for the open hearth furnaces but also for heating the drying ovens of the foundry and for other purposes. It carries 6.5 per cent. carbonic acid, 2 per cent. of heavy hydrocarbons, 1 per cent. of oxygen, 16.4 per cent. of methane, 38.7 per cent. of hydrogen, 24.8 per cent. of nitrogen and 10.6 per cent. of carbonic oxide. The lower calorific value is about 3300 heat units without elimination of benzole.

Terpitz ascribes the adverse effect upon the quality of the steel, which is usually attributed to the presence of hydrogen in the heating gases, entirely to mistakes in the temperature of the open hearth heats, which may easily be made worse by mistakes in casting. He takes similar ground as to nitrogen. As for sulphur in the heating gas, he cites some experiences and urges that the prejudices against the effect of heating gases upon the metal in the basic open hearth process be dropped, and that attention be directed wholly to the gases which are generated in the bath itself in the oxidizing and reducing reactions. He admits a lowering in the life of furnace ports and roofs by 8 to 10 per cent., which he attributes to the increased difficulties which the employment of a higher grade gas involves.

Since it has been shown that open hearth furnaces may be operated with full success with waste coke oven gas, a wide range is opened for the by products of coke oven plants. Since it is easier to utilize low grade dust coal under boilers than in the producers of open hearth furnaces, it may prove expedient in some localities to deliver the coke oven gases rather to the open hearth furnaces than to the boilers, and the question may arise, where gas engines are in use, whether the excess of waste coke oven gas be more effectively used for generating power or for heating open hearth furnaces. If there be an excess of both waste blast furnace gas and of coke oven gas, it will be best to utilize the coke gas for the open hearth furnaces and the blast furnace gas for the engines, because the higher calorific value of the furnace is useful for the working of the furnaces but is rather disadvantageous for driving gas engines because of the greater strains put upon the working cylinders and valve heads of the gas engines as the result of the higher temperatures. An intimate and regular mixture of gas and air is more easily attained in using blast furnace gas for the engines, because the volumes are more nearly alike than they are with coke oven gas with its three and one-half times higher calorific value.

The paper of O. Friedrich of Julienhuette, Upper Silesia, on "Recent Improvements in the Construction of Open Hearth Furnaces" contains a number of drawings of the latest designs tested in Germany, and the text cannot well be understood without the illustrations.

Dr. B. Neumann of Darmstadt reported on

The Present Status of the Electro Steel Processes

He goes over the well trodden ground of describing the Heroult, Stassano, Girod, Keller, Kjellin and Roechling-Rodenhauser furnaces, without adding much that is new. He submits interesting data, however, on the Nathusius furnace, which possesses some apparently valuable features, and which has been in operation for a year at the Friedenshuette, Upper Silesia, apparently refining liquid basic Bessemer metal. Dr. Neumann appears to have succeeded in at last eliciting some information from Krupp on the Frick furnace and its operations, concerning which so little has reached the public so far. He furnishes some data, too, with regard to the Hiorth induction furnace, which is in operation at Helleven, on the Jossingfjord, and to the operations of the plant of Le Gallais Metz & Cie at Dommeldingen, who have been endeavoring to convert Luxemburg pig with 0.6 silicon, 1.2 manganese, 0.12 sulphur and 1.8 phosphorus into steel castings.

A second paper on electro steel was that of G. Arnon of Paris, which dealt almost entirely with tests of steel made at the Forges d'Allevard in the Chaplet furnace and at the P. Girod steel works at Ugine. They simply confirm the mass of evidence already available as to the very high quality of the metal made in the electric furnace. The discussion brought out by these two papers was not as animated as expected, and elicited little of interest, the lateness of the hour possibly being responsible for this.

THIRD SESSION

Tuesday morning was given over to work, all the sections holding very well attended sessions. That of Practical Metallurgy was opened with a paper, transferred from the previous day, by P. Breuil of Conillett, Belgium, on "Rail Steel." It is a very conscientious summary of the mass of data collected in Europe and America on the relations between the chemical composition and the wearing qualities of rails, which is now beginning to agitate somewhat seriously the rail industry of the continent and particularly of Germany.

C. Irresberger of Muelheim a. d. Ruhr presented an illustrated paper on

The Present Status of the Foundry Industry in Germany

Neglected until very recent years, this industry has built a number of broadly planned foundries for machine castings, jobbing and for special work which are worthy of comparison, technically, with the finest plants in other branches of the iron industry. They command an excellent staff of foundry engineers, educated at technical universities, and of foremen who have added to their training at trade schools long experience in foundry practice and particularly in molding. Much has been done for the workmen; the foundries are heated and well ventilated, and are provided with spacious well kept refreshment rooms and bathrooms. Formerly the main feature of a foundry was the skill of the molders; now it lies chiefly in varied costly mechanical equipment. Everywhere molding machines have been introduced; handling is done mechanically, and even the cupolas are in many cases supplied with charging apparatus. Great care is given to the analysis of raw materials, and to-day there are very few foundries which do not steadily or temporarily utilize the aid of a laboratory. Sand dressing machinery and appliances for the cleaning of castings are highly developed. The former are frequently entirely automatic, costing as much as did decades ago an entire foundry of fair capacity. The art of cleaning castings has attained its climax with the cleaning plants in which the workman does the cleaning with a sand blast while protected by an air veil.

In the development of the foundry trade two tendencies are apparent. The blast furnaces endeavor to capture one special branch after the other, in order to reduce administration and other general costs, while the foundries proper

try to devote their entire energies to few castings in order to simplify plant and reach maximum capacity. The furnace foundries possess an advantage over the remelting foundries since they get their iron without cost of handling and marketing, and they will gain further since the introduction of iron mixers, which render remelting in the cupola unnecessary even for more delicate castings. At the present time there are employed in Germany 120,000 men in 1560 foundries, which annually produce 2,750,000 tons of castings, valued at almost $125,000,000.

A splendid review is that of H. Ortmann of Voelklingen on the

Improvements Made During the Last Ten Years in Rolling Mill Construction

The author deals with the subject under four headings, as follows:

1. The rolling mill proper—*i. e.*, the housing, its fittings and the rolls.

2. The gearing—*i. e.*, the mechanical parts which transfer the motion and power from the engine to the rolls, and are located between the latter and the engine; wobbler shafts, couplings and cogwheels.

3. The engine—steam engine, gas engine or electric motor.

4. All devices used for feeding the rolls and carrying the material in course of rolling until the material is rolled complete; sets of rollers, conveyors, traversing heads, bloom and other shears, straightening machines, &c.

Not many new features are pointed out in part 1. Attention is called, however, to the fact that by reason of a better design for the base of the housing frames and the use of an improved cross connection at the top part of the housing standards the frame is now more rigidly built. This, among other advantages, has made it possible to strongly fit the mechanical devices for shifting the rolls upon the housing standards. The schöpf and Tobler oval guides are improvements referred to; they make it possible to do mechanically work which with ordinary wire rod mills could hitherto only be carried out by manual labor. They enable the ordinary German rod mills to be transformed for working automatically in a way similar to that of the American continuous mills.

The author remarks that until 10 years ago the gearing connected with the rolling mills had not received much attention and had remained in a comparative backward state. It had not been subjected in any way to the improvements which had been made in "gearing" for other purposes. The introduction of closed in cogwheel housings having large sized cogwheels running in oil, provided with a good system of bearings lined with white metal, and the greatly improved installation of these housings by connecting them in different ways to the engine frame, have largely contributed to render the rolling mills more safe working. Comparisons are made between older and newer types of mills, in order to show that rolling mill driving has attained to its present satisfactory development owing in a very great measure to the great improvement in the cogwheel housings referred to and the use of better couplings.

In the matter of the engines for driving the mills, it is pointed out that there is exceedingly good evidence in favor of electric driving, an effect of which has been to stimulate builders of engines for steam driving, particularly in the case of reversing engines; steam reversing engines for driving mills have been greatly improved of late and show most favorable figures for steam consumption. The electric driving of small mills has been specially improved, three-phase motors being now used, provided with devices which allow of variations in the speed of the mills, instead of using the one speed which formerly was alone possible with the three-phase motors. The paper shows three such arrangements, with illustrations.

The fourth part of the paper, dealing with the accessory machinery for feeding the rolls and conveying the rolled product until the final section be reached, goes into the subject in detail. The improvements in regard to live rollers, raising platforms, bloom shears, hot beds, sleeper presses, straightening machines, particularly in the matter of beams and railroad material manufacture, are reviewed.

The finishing of small sections after leaving the rolls is specially dealt with, the paper describing the improved devices which have become necessary to cope with the increased output due to the increase in efficiency of the plant and to the use of larger ingots. The improvements have been such that the rolled product on leaving the rolls is automatically cut, straightened, cooled and further conveyed for cutting up into the required lengths, all these operations being effected by one man acting upon one single lever. The author shows in this review the extraordinary progress made in rolling mill construction within the last 10 years, and the way in which German engineers, by adequate installations, have been able to meet the constantly increasing demands made upon the efficiency of the mills.

Dr. J. Puppe followed with a paper on "The Latest Results of the Study of Rolling Mills in Germany." It is supplementary to the brilliant investigations which Dr. Puppe has carried out for some years under the auspices of the German Society of Iron Makers and which were published last year in the form of a volume which this year has been translated into English. Extended abstracts from the work were printed in *The Iron Age*.* Dr. Puppe's investigations constitute really the first serious study of the power requirements for shaping metal in the rolling mill, a field practically untouched by scientific investigation before.

Otto Mauritz of Nuremberg brought forward a contribution on

The Cost of Various Methods of Driving Steel Works Blowing Engines

Until now the piston steam engine has been generally used for driving steel works blowing engines. For new works there should be taken into consideration the use of a steam turbo blower, while at old works even in the purchase of a blowing engine a turbo blower would not be entertained, because it cannot compete in cost with the piston engine, usually only low superheat being available. The peculiarities of steel works practice, frequently interrupted working and wide fluctuations in volume and pressure of blast when compared with blast furnace blowing engines seem apparently to tell against the employment of gas engines. This accounts for the fact that so few German works have selected gas engines for driving steel works blowing engines, although the advantage in low cost of operation is very great. A gas blowing engine is naturally operated in a different manner from a steam blowing engine. The former is not stopped during the pauses in blowing, but it is allowed to run at reduced speed, which involves some consumption of fuel—a loss, however, which is not larger than the loss by condensation in the pipe line of steam blowing engines during these pauses. Mr. Mauritz takes as the basis of his comparisons a steel plant with an annual production of 400,000 tons of ingots. The annual cost of running a 4000-hp. blowing engine is:

1. Sinking fund and interest:
   Engine and foundations.....12 per cent.
   Building ..... 6 per cent.
2. Water consumption per ton of steel ingots:
   Steam blowing engine.....7.3 cu. m. = 258 cu. ft.
   Gas driven engine.....2.4 cu. m. = 85 cu. ft.
   Electrically driven engine.....0.125 cu. m. = 4 cu. ft.
   1 cu. m. is reckoned to cost 1 pf. (3d. per 1000 cu. ft.)
3. Wages, lubricant, material for cleaning and maintenance, repairs, per ton of steel ingots:
   Steam blowing engine, coal-fired boilers..0.139 m. = 1.4 d.
   Steam blowing engine gas-fired boilers....0.088 m. = 0.9 d.
   Gas driven blast engine.....0.88 m. = 0.9 d.
   Electrically driven boilers.....0.015 m. = 0.1 d.†
4. Cost of fuel or of electric current.

With a view to comparison on a common basis, the fuel costs are reckoned within the following limits:

1 ton of coal (7.5 evaporative power) 10 to 20 marks (10 to 20 shillings) 1000 c. m. (35,320 cu. ft.) blast furnace gas 900 w.e. (101 B.t.u.) 0.90 to 1.80 marks (9 d. to 1 s. 8 d.).

In valuing the blast furnace gas, the volume of this gas taken was that equal to the weight of coal required to generate the same volume of steam. An efficiency of 75 per cent. was reckoned upon in the case of the coal-fired boilers, and an efficiency of 53 per cent. in that of the gas-fired boilers. The cost of the steam remains therefore the same in both cases, whether using coal of 7.5 evaporative power at 10 marks per ton, or blast furnace gas of 900 w. e. at 0.90 mark per 1000 c. m.

The cost for electric power is more difficult to state than that for coal or blast furnace gas; in the case of current it would be necessary to consider both whether it be produced by a steam turbine plant (boilers either coal or gas-fired) or in a gas-driven generating station. With a view to deal fairly also with this point, the diagrams apply to a current cost varying from 1.5 pf. to 3 pf. (0.15 to 0.3 d.) per kilowatt hour. This is not to be taken to imply that where coal costs 10 marks per ton, the kilowatt hour should be valued at 1.5 pf.

The higher and the lower limit of running cost is as follows:

Type of blowing engines.	Cost: 1 ton coal = 10 m., or 1000 cu. m. gas = 0.9 m., or 1 kw.-h. = 1.5 pf. Marks.	£	Cost: 1 ton coal = 20 m., or 1000 cu. m. gas = 1.8 m., or 1 kw.-h. = 3 pf. Marks.	£
Steam, coal-fired boilers	268,800	= 13,440	401,000	= 20,050
Steam, gas-fired boilers	255,800	= 12,790	388,000	= 19,400
Gas driven blowing engines	156,500	= 7,825	206,900	= 10.345
Electrically driven reciprocating blowing engines	194,500	= 9,725	344,500	= 17,225

The above comparison which applies to a new plant (case 1) shows the great superiority of gas engine driving.

* *The Iron Age*, March 11, 1909, page 810.

† This figure does not take into account the electric generating set; the cost for this is included in that for the current.

The paper also considers whether a gas-driven blowing engine would be economical in the two following cases.

Case 2. That of a metallurgical works owning a steam-driven blowing engine the cost of which has been written off.

Case 3. That of a similar works whose steam-driven blowing engine is not yet written off. The annual provisions for sinking fund and for interest have therefore to be added to the annual cost of working the gas-driven engine.

The paper shows that here also the gas-driven blowing engine is the most advantageous, since the annual saving in running cost which it yields, as against a steam-driven blowing engine using gas-fired boilers, is as follows:

In case 1a.. 99,300 m. = £4,965	
In case 1b..181,900 m. = £9,095	In case a, cheapest fuel cost
In case 2a.. 39,300 m. = £1,965	10 marks per ton.
In case 2b..121,900 m. = £6,095	In case b, highest fuel cost
In case 3a.. 39,300 m. = £1,965	20 marks per ton.
In case 3b..121,900 m. = £6,095	

The saving in case 2 and 3 is equal, the absolute cost figures vary.

Simplicity, accessibility and uniformity of the plant, i. e. complete electrification, might finally lead to the putting down of an electrically driven blowing engine (turbo compressors), if purely economical conditions be aimed at. The conditions, however, require careful consideration for arriving at a correct solution. And when this is reached there is still to settle the point as to whether the current generating dynamos are to be driven by gas engines or steam turbines. Under this head the author concludes that a gas-driven power station is by far the more advantageous of the two.

A. Greiner, general manager of the Cockerill Works of Belgium, stated that of the 27 gas engines now being built at his works, four are for steel works blowing engines. Regenbogen insisted that in a comparison of costs the furnace gas must be put in at its local market value and not on the basis of its calorific value, and the point was also brought out that gas engines are usually underloaded.

A very elaborate paper followed by Prof. E. Heyn of the Royal Testing Bureau of Gross Lichterfelde, on

The Corrosion of Iron and Steel

It deals with the tests carried out in conjunction with Professor Bauer, the following conclusions being drawn: While the kinds of material used—steel, wrought iron and cast iron—do not show notable differences in the attack of rust in still water, such differences do appear in flowing water. The cast iron used is then generally attacked more vigorously than the wrought iron and steel used. The apparent advantage of cast iron over steel is partly offset by the fact that in flowing water steel is attacked in a very irregular manner so that spots attacked but little vary with spots much corroded, on the same sample. With the cast iron used the attack is considerably more uniform.

The measure of the attack by rust of steel and cast iron is dependent upon the speed of the flow of the water. With increasing speed the attack increases at first in order to decline again when a maximum has been passed.

In a strongly agitated solution of salt, the differences in the degree of attack of steel, wrought iron and cast iron decrease.

The color of the rust on cast iron and on steel becomes darker as the speed of the water increases.

The last paper was that of Dr. B. Schweck of Berlin, on a

"New Method for the Production of Hydrogen and Its Application to Metallurgy,"

invented by Dr. A. Frank and Dr. N. Caro, who worked it out in collaboration with Prof. C. von Linde.

The inventors started with water gas, which, after separating the carbonic acid and after compression, they cooled with liquid air, then separating quantitatively, in a liquid state, the main portions of carbon monoxide and nitrogen as well as the sulphur and phosphorus combinations. There remains technically a hydrogen gas containing over 95 per cent. hydrogen, 3 to 4 per cent. carbon monoxide and 1 to 2 per cent. nitrogen, and also a carbon monoxide gas of 85 per cent. in round figures, which used in a gas motor supplies the power required by the plant. The liquid air for cooling yields after rectification a pure oxygen in any required quantity. This simultaneous yield of hydrogen and oxygen in one apparatus renders the process eminently suitable for application to autogenous welding and to metallurgical purposes for smelting at high temperatures, since the gases can be obtained at a very much lower cost than was heretofore possible, the gases being moreover free from noxious substances.

The session closed with formal thanks by delegates representing the French and English members to the presiding officer. During the course of the sessions representatives of different countries had alternately conducted the proceedings as honorary presidents.

PAPERS ON THEORETICAL METALLURGY

Your correspondent was not able to attend the sessions of the other sections. The range covered by the section of Theoretical Metallurgy may be appreciated from the following list of papers:

DR. C. BENEDICKS, Upsala, Sweden, "The Production of Artificial Meteoric Iron."
PROFESSOR DR. BORCHERS, Aix-la-Chapelle, "The Reactions During Copper Refining and Matte Smelting, Their Acceleration and Simplification by Electric Smelting."
DR. BORNEMANN and PAUL MUELLER, Aix-la-Chapelle, "The Electric Conductivity of Liquid Alloys."
DR. H. BRAUNE and EDW. HUBENDICK, Stockholm, Sweden, "Production of Tar Free Producer Gases from Uncoked Fuel, from the Standpoint of Organic Chemistry."
C. BRISER, Leoben, Austria, "On the Theoretical and Practical Value of the Electric Blast Furnace."
G. CHARPY, Montlucon, France, "On the Importance of Carbon and Carbon Monoxide in Metallurgical Processes."
DR. WALTER CONRAD, Vienna, "On Current and Tension in the Electric Furnace."
W. G. GILHAUSEN, Aix-la-Chapelle, "Researches on the Heat and Substance Balances of the Blast Furnace."
DR. P. GOERENS, Aix-la-Chapelle, "On Gas Inclusions in Various Steels."
DR. H. GROSSMAN, Berlin, "On the Quantitative Determination of Nickel and Cobalt."
LEON GUILLET, Paris, France, "The Thermic Treatment of Special Steels."
LEON GUILLET, Paris, France, "Cementation Considered from the Practical and Theoretical Standpoints."
A. JORSTEN, Aix-la-Chapelle, "Influence of Heat Treatment Upon the Size of Grains of Iron."
PROF. JOS. W. RICHARDS, South Bethlehem, Pa., "Gruner's Ideal Working of the blast Furnace."
PROF. JOS. W. RICHARDS, South Bethlehem, Pa., "The Rationale of Dried Blast."
E. RICHARME, Zarizinsky-Sawod, "On Dephosphorization of Steel in the Presence of Carbon."
DR. RUER, Aix-la-Chapelle, "The Iron-Nickel System."
O. THALLNER, Remscheid, "Relations Between the Thermic Effect, Metallurgical Phenomena and Crystallization in the Basic and Acid Electric Smelting Processes."
F. WEYL, Aix-la-Chapelle, "Cementation in a Vacuum."
DR. WINTER, Bochum, "On the Influence of Galvanizing on the Strength of wire."
DR. WUEST and DR. PELSER, Aix-la-Chapelle, "The Influence of Liquation on the Strength of Ingot Iron."
DR. WUEST, Aix-la-Chapelle, "On Saving Fuel and Increasing the Production of Blast Furnaces by Hot and Dry Blast."

PAPERS ON APPLIED MECHANICS

Although relatively the smallest in the matter of attendance, the section of Applied Mechanics, too, took up an important series of papers, the titles of which were:

M. ANDROUIN and CH. M. STEIN, Paris, "Influence of the Improvement of Methods of Heating on the Development of Mechanical Forging."
TH. V. BAVIER, Düsseldorf, "The Development of Ventilators and Compressors in German Mining."
PETER BERNSTEIN, Cologne, "Hydraulic Compressors."
PAUL BODENSTEIN, Cologne, "The Present Status of Ore Concentration."
W. ELLINGEN, Cologne, "Aerial Ropeways of Great Capacities."
CILLER, Mülheim (Ruhr), "Haulage by Compressed Air Locomotives in Mining."
G. V. HANEFSTENGEL, Leipzig, "The Cheapening of Haulage by Wire Rope and Electric Suspended Railways."
M. HEYM, Wetter, Ruhr, "The Influence of Electricity on the Development and Efficiency of Lifting Appliances in Mining and Steel Works."
DR. HUGO HOFFMANN, Bochum, "The Managing of Power Engines, and in Particular of Winding and Rolling Mill Engines and Dynamos."
PROF. PAUL LANGER, Aix-la-Chapelle, "Recent Experience in Large Gas Engine Installations."
K. MALEYKA, Berlin, "Electricity in Metallurgical Work."
C. MATSCHOX, Berlin, "The Part Played by Mining and Metallurgy in the History of Engineering."
W. PHILIPPI, Berlin, "Electricity in Mining."
DR. RATEAU, Paris, France, "The Turbo Compressors."
STACH, Bochum, "The Development of Separate and Central Condensation."
STACH, Bochum, "Heat-Storage Tanks for the Utilization of Exhaust Steam."
FR. TILLMANN, Saarbrücken, "Underground Haulage."

WORKS EXCURSIONS AND SOCIAL FEATURES

Tuesday afternoon was given to the first of a series of well managed visits to a large number of iron and steel plants, collieries, machine shops, harbor and other municipal works, &c., and to geological excursions, to which the whole of Wednesday and Thursday were also devoted. The iron works thrown open to the congress were Deutscher Kaiser, of Thyssen & Co. at Bruckhausen, Rheinische Stahlwerke at Meiderich, Phoenix at Ruhrort, Friedrich-Alfred Huette of Krupp at Rheinhausen, the Lindenberg Electric Steel Works at Remscheid, the Electric Steel Works of Moenkemoeller at Bonn, Rothe Erde at Aix-la-Chapelle, Hoesch, Hoerde, Union at Dortmund and Gutehoffnungshuette at Oberhausen and the

Becker Electric Steel plant at Willich. Among the shops inspected were those of Haniel & Lueg, Ernst Schiess, Sack and J. P. Piedboeuf & Co. of Duesseldorf; Bechem & Keetmann of Duisburg, and Gasmotoremfabrik, Dentz, and Humboldt of Cologne. A well bound little volume, with map, gave a brief account of all the plants visited.

Visit to an Electric Steel Plant

On Wednesday, June 22, a special trip was made into the Berg district as one of the many excursions. It included a visit to the electric steel plant at Remscheid of the Richard Lindenberg Company. This company was the host at a lunch at the famous Remscheid dam, of both the men who had inspected the plant and of the ladies who had gone over the suspended railroad over the Wapper River, between Barmen and Elberfeld, and had been shown the fine Kaiser Bridge at Muengsten.

The Lindenberg Steel Works is the first plant which developed the manufacture of electric steel on a commercial basis, and it has been manufacturing regularly special high grade steels for a series of years, including chrome, nickel and tungsten and carbon steels for a variety of purposes. The steel plant consists of a 6-ton Wellman tilting open hearth furnace, basic lined, and one 3-ton basic and one 1¾-ton acid Heroult two-phase electric furnace. While formerly the practice was to treat the crude steel from the open hearth furnace in one Heroult basic lined furnace, there has been recently added the second acid lined furnace, the Lindenberg brothers having developed and patented a process for the production of an electric steel low in silicon in the acid furnace. They now have the alternative of refining the open hearth metal in the acid or in the basic electric furnace, or of treating it first in the basic and finishing in the acid furnace—an opportunity of which they avail themselves to produce special steels to best advantage. Thus tungsten steels are best made in the acid furnace, although it does involve some loss of metal, while chrome steels are produced invariably in the basic furnace. The requirements are exacting and varied, yet the managers have adopted a series of preliminary forging and tempering tests which enable them to ascertain whether the desired quality has been attained. The precision with which prescribed chemical composition can be attained is the one extraordinary and valuable feature of the electric furnace, so that it may really be called a laboratory on a large scale in its accuracy. A number of heats were made in both furnaces, the steel being cast into bottom poured round ingots, which looked clean and sound, in spite of very short sinkbeads. The plant is equipped with a series of hammers and with a mill for rolling bars, strips and sheets. The firm is soon to establish an agency for the sale of its steels in New York.

Brilliant Entertainments

The municipality of Duesseldorf was the host Monday evening at a reception in the Tonhalle, which was really an elaborate dinner and a concert by two military bands.

On Tuesday evening a brilliant company assembled to participate in the banquet, over 1000 ladies and gentlemen being seated in the two great adjoining halls of the Tonhalle. The one crowning success of the occasion was the performance of the festal play, which followed immediately upon the conclusion of the dinner. The stage of the larger hall had been converted into a striking reproduction of a steel plant, with hammer, open hearth furnace, cast house and ladle crane, the decorations having been painted by George Hacker, a Duesseldorf artist, from designs of the Duisburg Maschinenbau A. G. Vorm. Bechem & Keetmann of Duisburg. The performance began with the playing of the forging song from Richard Wagner's Siegfried with anvil accompaniment, the curtain rising upon an animated scene. The forge master, a very vigorous person, announces that the Entertainment Committee of the Congress has imposed upon the works the task of furnishing a steel band 25,000 miles in length, the specifications calling for infinite tensile strength and tenacity, it being a matter of indifference whether it be open hearth or Bessemer, acid or basic. He is interrupted by the doubts and exclamations of English, French, Italian, Russian and Swedish workmen, very cleverly imitated as to their characteristics, and then invokes the aid of Vulcan. Accompanied by the forging song of the Georgs Marienhuette, timed with anvil blows, the charge of steel is tapped, the ladle crane brings on the ladle and the cast is made. Then the stripper is brought forward, but instead of the expected big ingot there appears, in the glare of light, the Genius of Technology in the form of a white robed woman, who, stepping forward, delivers a poem glorifying the achievements of the modern mechanical arts, which represent the steel band embracing the whole world. The men of different nationalities are commanded to clasp hands and warned never to forget, even in the midst of struggle, that it is man's work which carries all upward. With words of greeting the closing invocation is that work and play may unite to strengthen the band of steel. The actress who had very cleverly delivered the lines was showered with the roses which decorated the tables, and the applause was prolonged and exceedingly hearty. The play, which was entitled "The Masterpiece of the International Steel Works, Ltd., Société Anonyme," was composed by Dr. P. Gabein and Dr. M. Philips from the suggestion of Dr. Schroedter, who was forced to appear before the audience to receive its greetings. A series of toasts followed. Great enthusiasm was evoked by the announcement during the banquet that Count Zeppelin had started for Duesseldorf with his airship and would join the party the next evening on the excursion on the Rhine. Then the company adjourned to the adjoining gardens.

Enthusiasm Over Count Zeppelin and the Airship

Although the weather had become very unfavorable and rain was falling heavily, it was a very large party which gathered Wednesday evening on the special steamer for a trip on the Rhine, the great attraction being that Count Zeppelin, who had in the meantime made his remarkable flight from Friedrichshafen to Duesseldorf, would be present. It may seem extraordinary what unbounded enthusiasm the German people, high and low, have shown for this venerable aeronaut. National pride can account for only a part of it. It is really principally the personality of the man, who, although well into the seventies, possesses unusual pluck, vigor and earnestness, coupled with a charming, almost modest, demeanor. In the pouring rain large crowds stood for hours in front of the hotel after his arrival hoping to catch a glimpse of their hero, and cheering frantically at the appearance of any person they were led to hope was Zeppelin. Decorated in youth during the Franco-Prussian war with the highest distinction a German soldier can attain, the Iron Cross of the First Class, for a daring riding feat, Count Zeppelin did not take up aeronautics until he had been retired, a general, for age. He staked his entire personal fortune and all the money he could raise from his friends. The head of the greatest steel selling organization told your correspondent that his earnestness and good faith were so convincing that he was furnished the steel for a great garage building with the understanding that he could only pay for it if his efforts ended in success—a proposition to which at the outstart there was little disposition to accede.

On the next day the airship, which had been taken over according to contract by the "Delag," a company organized to operate it, as the result of successful trips,

began its public flights with 20 passengers. One of the participants who had succeeded in securing a ticket was Harold Jeans, the editor of the *Iron and Coal Trades Review* of London, whose interesting account of the trip induced your correspondent to book for the next ascension. Persistently adverse weather for four days, during which he waited, made any trips of the airship impossible, and he was forced to forego the experience.

A peculiar condition affects the ability of the airship to start on its journeys. It is not so much a question of the force but of the direction of the wind with reference to the longitudinal axis of the great garage in which it is housed. When the wind is at right angles to the shed it is too risky to draw the huge airship out of it. A few figures are given, in an official communication to the press, to make this clear. When the wind strikes the airship on end it slips off readily from the pointed end and from the sides of the long body, exerting a pressure which even during a storm does not exceed 800 kg. When the wind blows in the direction of the axis of the shed, the airship can easily be brought out by few men. But when the wind is at right angles to the axis of the shed, the pressure rises quickly to 8000 or 10,000 kg. and upwards. When under such conditions the airship is slowly drawn out of its shed, the pressure grows as the long body begins to protrude, and when about three-quarters of the length has been hauled out becomes so great that the crew cannot control it. It is pushed aside and the part remaining in the shed is buckled. The Duesseldorf shed, which was built by the municipality, is stationary. It has been proposed to build round sheds, so that the airship can be brought out whatever the direction of the wind, but as yet the question of the best design for a shed which will meet all conditions of weather has not been solved in a satisfactory manner.

The Last Function

On Thursday afternoon the proceedings of the Congress were brought to a brilliant close by a garden party in the Town Hall at Essen, after an inspection of the Krupp colonies and other institutions. It was on this occasion that the invitation was issued and accepted to hold the next International Congress in England in 1915.

On the invitation of the directors of the International Exhibition of Brussels and the commissioner of the German Empire, about 400 of the delegates took part in an excursion to Brussels, there being a formal reception in the German section on Friday evening, a dinner at the "Chien Vert" concluding with fireworks on Saturday evening and a reception in the Town Hall by the city of Brussels on Sunday evening.

The Oliver Chilled Plow Works, South Bend, Ind., has plans under way for additional buildings which will give it an increase of about 100 per cent. in the capacity of its plant. The building work which is under way is largely the reconstruction of old buildings, but new additions and entirely new structures are being erected. Equipment required has been contracted for and includes board and rope drop hammers, bulldozers, punches, shears, grinders, lathes, planers, drill presses, milling machines and woodworking tools. A steam turbine, boiler, air compressor, additional pumps, together with the usual complement of shafting, hangers, trolley lines, &c., have been installed in the power plant.

The Higbee Iron Company has been incorporated to develop a tract of 160 acres of iron land on the Mesaba range, near Hibbing, Minn. The company is capitalized at $100,000. R. B. Higbee of St. Paul is president and George Salzer, a lumberman of Minneapolis, is vice-president.

Customs Decisions

Old Steel Rails Not Dutiable as Scrap

Old steel rails are still "rails," according to a recent decision made by the Board of United States General Appraisers adverse to a contention of the Benjamin Iron & Steel Company. The Government officers assessed duty under the provisions of paragraph 126 of the tariff of 1909, which specifies duty at the rate of 7-40 cent per pound. The importers contended that the rails should be regarded as "old scrap," fit only for remanufacture by melting, and therefore dutiable at the rate of $1 per ton under paragraph 118. They claimed, first, that the steel rails are old scrap; second, that this class of old scrap is to be remelted, and, third, that the shipments comprise only such old rails as are unsuitable for rerolling. General Appraiser Fischer says that all of the points made by the importers may be true, but for reasons stated in a former decision, arising under the Dingley tariff, the merchandise would be excluded from scrap steel, as provided by the express terms of paragraph 118. He adds: "The testimony shows that some of the steel has been actually sold to parties who utilize it for purposes of remanufacture by melting. The proof offered, however, does not satisfy us that steel of this character is not suitable to be commercially remanufactured by process other than by melting. The phrase, 'fit only to be remanufactured by melting,' means unfit for any other remanufacturing purpose, and for the reasons stated in G. A. 7003 we overrule the protests without an affirmance of the decisions of the collector."

Spiegel Mixed with Ferro Is Not "Destroyed"

In overruling a protest filed by the Joseph R. Foard Company, the Board of United States General Appraisers holds that a simple mechanical mixture of two imported metals, due probably to carelsssness in the stowing of the vessel or in the handling of the goods, is not such a damage or destruction of the goods as will excuse the importers from paying duty. Some spiegeleisen was imported at Baltimore. A portion of it was stored in such a way as to become mixed with some ferromanganese. In discharging the vessel the mixed portion of the cargo was divided so as to give the importers of the spiegeleisen their full weight. The Foard Company, however, alleged that 7150 lb. in weight which they received was so mingled with ferromanganese and other fine material as to be worthless. Judge Waite in his decision for the board finds that the tariff act of 1909 does not provide for an allowance under the provision for damage or destruction, and that in the case in question there is no injury which prevents the return of the commodity to its original condition.

Rivets for Nonskidding Automobile Tires

The Michelin Tire Company has won a victory before the Board of United States General Appraisers, the assessment of duty imposed by Collector Loeb on rivets or studs for anti-skid tires being set aside and lower duty granted. The rivets are about ½ in. in length, with a flat head. Duty was assessed at 45 per cent. under the provisions of paragraph 167 of the new tariff act, as "rivets for nonskidding automobile tires." The importers claimed that the articles are dutiable properly at 1¼ cents per pound as "rivets of iron or steel not specially provided for." The testimony showed that the rivet after importation is machined and later heated and case hardened. General Appraiser Fischer in his decision sustaining the protest, says: "As imported the rivets are not used for anti-skid tires; they are in the finished form of an ordinary steel rivet, and do not afford sufficient evidence as to their special adaptation for use for nonskidding tires as would warrant their classification under that clause."

The Present Status of the Basic Bessemer Process in Germany

[*Review and synopsis of a paper by W. Esser, Differdingen, Luxemburg, read at the International Congress of Mining and Metallurgy at Duesseldorf, Germany, June* 20, 1910.]

The distribution geographically in Germany of the basic Bessemer steel industry is controlled by two considerations. In the Rhenish-Westphalian district, as well as on the Saar and in Upper Silesia, coal is the basis of the heavy iron industry, while on the north flank of the Hartz Mountains, in Upper Franconia and in Luxemburg-Lorraine, it is built up on the ore. Originally, in the first named three districts local ore deposits led to the establishment of the iron industry. But as the fact soon developed that these deposits in the Rhenish district and Westphalia were not adequate, the necessity arose of supplying iron ore or pig iron on a large scale, first from the Lahn and Dill districts, later from England and Spain, and ultimately from Sweden and Luxemburg-Lorraine.

At first the pig iron was remelted at all of the basic Bessemer works in cupolas and the selection of the mixtures was one of the most important problems of the engineer. After the knowledge had been acquired which pig iron best met the requirements of the basic process, direct metal was introduced, and soon after the steel plant was made more independent of the blast furnace by interposing the mixer.

The Industry Moving Toward the Ore

In the Rhenish province and Westphalia this soon led to the disappearance of the pure steel works with rolling mill, and the mixed plant became the rule, in which the heat of the liquid pig iron was utilized down to the rolling of rails, billets and the larger sizes of bars. The great progress made in the utilization of blast furnace gas for direct driving of machinery has pushed the heavy steel industry more and more into the ore districts, the result being that even now the participation of the steel works of Luxemburg and Lorraine in the total steel production of the works united in the Steel Syndicate amounts to about 19 per cent. The cost of transportation for both raw material and finished products is the main factor, and it is evident, since there is needed for the manufacture of a ton of pig iron from 30 per cent. ore about three times as much ore as coke, that this alone suffices to drive the industry from the coal to the ore.

Handicaps of Upper Silesia and the Saar

In Upper Silesia conditions are least favorable for the basic Bessemer process because the district must draw on South Russia and Sweden for its phosphoric ores. The prediction may be made that the time is in sight when there the basic Bessemer will make room for the pig and ore process. The latter offers the advantage that the phosphorus in the pig iron may be kept lower than is permissible with the basic Bessemer, without sacrificing the advantage due to the production of a basic slag. When it is considered, furthermore, that there the basic Bessemer process suffers from the high silicon and manganese content of the pig iron, it is clear that the cost of production cannot be kept below the figure which is attainable with the pig and ore process.

The basic Bessemer plants of the Saar district all have this point in common that they only work ore from their own properties in the Minette district and that all of them besides converting direct metal, remelt in cupolas pig iron produced in their own furnaces located in Lorraine and in Luxemburg. Since this ore and pig iron is subject to a haul of 90 to 100 kilometers, it is the building of a canal along the Moselle and Saar Rivers which must decide whether these basic Bessemer plants are to remain in the Saar district, or whether they too must be transferred to the ore district.

The basic Bessemer industry at Peine, near the Hartz, is based upon the ores at Ilsede and Salzgitter, which resembles the Minette, but has the advantage over it that the furnaces need not charge manganese ore.

The ore of the Franconian Jura, of Upper Franconia and the Upper Palatinate, is used for the basic Bessemer, and is mined and smelted on a large scale by the Maximilianshuette at Rosenberg, near Amberg. In recent years very extensive prospecting has been carried on and eminent geologists claim that there are enormous deposits of ore. The hope is held out that this may lead to a very great extension of the basic Bessemer process.

Minette Ores the Chief Foundation

The greatest share of the supply of phosphoric ores for the German works is contributed by the Minette of German and French Lorraine and Luxemburg. This ore is found in extensive deposits in the Jura formation and may well be pronounced one of the most important occurrences of the whole world. It crops out along the flanks of the left bank of the Moselle, dipping flat to the southwest into France. The deposit extends in a strip 18 to 20 km. wide from the Belgian frontier on the north, near Longwy, to beyond Nancy on the south, and the beds of partly calcareous and partly siliceous ores undergo only one short interruption. The calcareous ores range from 28 to 37 per cent. of iron, 12 to 20 per cent. of lime and 6 to 9 per cent. of silica. They cover mainly the middle part of the district, while the siliceous ores, with 32 to 40 per cent. of iron, 7 to 9 per cent. of lime and 12 to 22 per cent. of silica, occur in the northern and southern sections of the district, and amount to about one-third. Accurate delimitations and figures cannot be given, because there occurs a siliceous bed below the calcareous deposits. The manganese in the ores amounts to about 0.3 per cent., so that without additions of manganese, there can be obtained only the so-called O. M. pig iron, with 0.5 to 0.6 manganese. Therefore, in order to obtain basic Bessemer pig, it is necessary to add manganese ores. The phosphorus in the ores is uniform, amounting on an average to 0.6 to 0.7 per cent.

Germany's Share in the Minette Deposits

Dr. Kohlmann estimates the extent of the deposit at 70,000 hectares, of which France possesses 40,000 hectares, German Lorraine 27,000 and Luxemburg 2500 hectares. It is stated that France has 2,500,000,000 tons, German Lorraine 1,800,000,000 tons and Luxemburg 700,000,000 tons.

Thus far German steel works have secured about 6000 hectares in France. The ores of the Joeuf, Briey and Landre basin are exceptionally favorable for the basic Bessemer because the calcareous ores of the district carry 3 to 4 per cent. and upward more of iron than the ores of Aumetz Plateau. As the use of cleaned gas in hot blast stoves increases, the furnace slag may be made more basic, and therefore the rich calcareous ores naturally become more valuable. The German share of siliceous Minette is small, and for the time being only the lower beds of Aumetz and Deutsch-Oth are worth mining. All the other siliceous beds

and notably those in the southern part of German Lorraine, are relatively poor. In the territory belonging to Luxemburg the Esch and Differdingen basins contain rich siliceous Minette, so that a very good mixture is obtained with these ores and the calcareous ores of French origin.

The furnace mixture is made directly from the pockets, and it is made according to grade. Usually it consists of two-thirds calcareous and one-third siliceous ores.

Complaints Against Basic Bessemer Steel

In recent years the basic Bessemer process has been attacked, both on the ground of quality of product and cost of production. It is usually claimed that it is not possible to produce steel sufficiently low in phosphorus in the basic Bessemer converter, and that this constitutes a serious objection to the further employment or even an extension of the process. Against this the point may be made that soft steel carrying 0.06 and 0.07 phosphorus does not through this percentage alone suffer an impairment of quality, provided conductivity or other electrical qualities do not prescribe a special degree of purity. The reason why it is not desirable to blow metal below 0.06 phosphorus in the converter is not that such a quality would make its manufacture too expensive because of increased waste; but the rejection of such a specification is due to the fact that a further lowering of the phosphorus would lead to an unduly large quantity of oxygen being carried into the steel.

Oxygen the Real Source of Trouble

For by far the majority of uses it is not the decisive point whether the steel contains 0.06, 0.04 or less of phosphorus; but the most important matter is that in its manufacture it has been kept as free as possible from oxygen. The manufacture must be judged by the fact whether there is safety against unnecessarily large absorption of oxygen and at the same time whether there is a possibility of subsequently eliminating such oxygen as may have been absorbed. If there were only a method of rapidly determining by analysis the oxygen in steel, the basic steel works would be the first to prescribe the determination of this element for every single blow.

Uniformity of Blast Furnace and Converter Metal

Esser goes into a study of the practice at the large works to determine to what extent the process meets these requirements, with special reference to the conditions in the Minette district. At these works 7 to 8, and in one case 11, blast furnaces of 160 to 220 tons daily capacity deliver their entire product to the same mixer, and all the furnaces smelt the same ore year in, year out, so that the burden varies within very narrow limits. It is evident, therefore, that wide variations in the quality of the pig iron occur very rarely. One of the largest works in the district has submitted series of analyses for consecutive weeks and months, showing fluctuations in the silicon between 0.28 and 0.45 per cent., the upper limit having been reached only a few times. Under such conditions the metal taken from the mixer shows a degree of uniformity in all its elements which can hardly be excelled in practice. Considering the long training of the crews and the aid given by the analysis of every charge, it will be realized with what certainty the length of the after-blow and the required quantities of additions may be measured. Besides, a sample is taken shortly before the beginning of the after-blow to ascertain the degree of oxidation, so as to keep the supply of oxygen down to the necessary minimum. In that way the waste is kept down and the manganese in the finished product called for by the uses to which the steel is to be put is attained with certainty.

It is evident that a maker will not produce in the basic converter steel required to meet a specification of less than 0.04 phosphorus for rails. It may be possible to make an occasional blow to meet such a specification, but the danger of overblowing undoubtedly prevents a large output. Esser holds it to be out of the question that rails meeting such a specification are really better in quality than a good properly blown basic Bessemer rail, which has a tensile strength of 70 kg. per square millimeter and shows a clean structure, free from blowholes.

Deoxydizing More Thorough Than Has Been Credited

The assertion is usually made that open hearth steel possesses an advantage over basic Bessemer metal because there is sufficient time after the end of the oxidation in the open hearth furnace to treat the steel, which is not the case in the basic converter, because with the latter the deoxydizing is done in the converter. This reproach has been met by practice long ago. To-day no basic Bessemer plant works by this method; in fact, steel makers justly hold that the necessity for it is the weakest point of the Talbot process. The obstinancy with which this view is maintained can only be explained by the fact that those who hold it have not for years witnessed well conducted basic practice. In this process the maximum development of heat extends over the last stages, so that the rise in temperature offers an exceedingly favorable opportunity to give the blown steel time for a number of minutes to finish the reactions.

To begin with, the moment selected for the addition of ferromanganese is when the pouring off of the slag has been completed, because a number of oxygen compounds separate from the shallow bath during the time which this operation calls for. Time may, therefore, be given for a reaction, for which otherwise costly ferromanganese would be needed. The important point is that as much time as possible is allowed to the charge in the converter, after the addition of the ferromanganese, for the reactions as is permitted by the circumstances, it being seven to eight minutes for a well conducted blow. During this time gases, segregations and oxygen compounds have an exceedingly favorable opportunity to separate from the metal, since the bath is distributed over a wide area in the converter while in a horizontal position and the depth of the bath is exceedingly small.

It is a special advantage of the basic process that the bath of steel may be left to itself without heating during this period when it is covered with a thin layer of slag. The latter, besides, chills on the surface, and therefore does not further act as a conveyor of oxygen. In the open hearth furnace the heating must continue and account must be taken of the circumstances that through the liquid slag fresh oxygen is carried into the steel, and that a part of the additions are burned.

So far as the elimination of the sulphur is concerned, the gathering of the pig iron from so many blast furnaces into one mixer is of course very favorable. The progress made through the steadily increased requirements for the quality of steel cannot be better illustrated than by the fact that the Luxemburg Lorraine steel works export annually far more than 100,000 tons of tin plate bars, for which reclamations would be immediately made as soon as the sulphur materially exceeded 0.05 or 0.06 per cent., or as soon as the steel showed the slightest tendency to blow holes.

Costs of Basic Bessemer and Pig and Ore Processes

So far as the costs of production of the basic Bessemer and the pig and ore processes are concerned, Esser makes the following comparison, on the basis of costs in the Minette district, which hardly seems fair to the latter. He excludes such costs in his tabulation as are identical in both, such as cost of casting

ingots, deoxydation and handling of materials. This tabulation is as follows:

	Basic Bessemer. Tons. Marks. Marks.	Basic open hearth. Tons. Marks. Marks.
Pig iron	1,000 at 40 = 40,000	1,000 at 38.5 = 38,500
Lime	140 at 9.7 = 1,358	... ...
Limestone	... .	223.6 at 5 = 1,118
Ore	... .	283.7 at 25 = 7,092
Manganese ore	... .	10 at 50 = 500
Blast furnace gas	890 at 2 = 1,780	....
Producer gas	... .	1,103 at 4 = 4,412
Wages	890 at 1.3 = 1,157	1,103 at 3 = 3,309
Furnace repairs	... .	1,103 at 2 = 1,206
Totals	49,295	57,137
Steel produced	890 tons.	1,103 tons.
Items of cost per ton of steel	49.76 marks.	51.80 marks.

Since the same amount of phosphorus is available in the 1000 tons of pig iron, the allowance for sale of phosphate slag is the same in both cases. Esser concludes by quoting Mark Twain's statement: "The news of my death is grossly exaggerated." C. K.

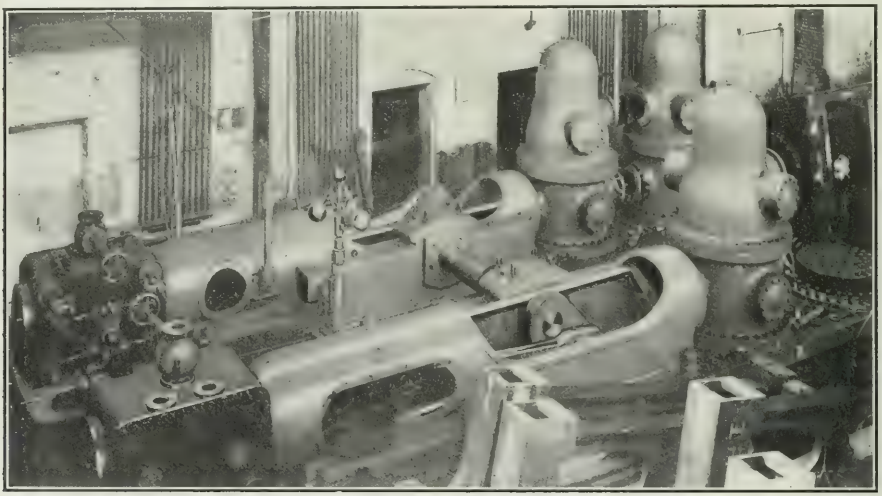
Cooper Engine Contracts.—The C. & G. Cooper Company, Mount Vernon, Ohio, has been awarded contract by the Republic Iron & Steel Company for two 1500-hp. cross compound condensing Corliss engines, to be installed at the Haselton blast furnaces at Haselton, Ohio. These engines will drive two 1000-kw. Crocker-Wheeler direct current generators, and will furnish power for the new pipe mills of the Republic Company at Lansingville. They will complete a series of six compound Cooper engines for electrical purposes installed for the Republic Company in the Youngstown district. The Cooper Company has also received a contract from the Follansbee Brothers Company, Pittsburgh, for power transmission machinery to drive a new train of hot mills at Follansbee, W. Va.; this equipment includes rope wheels, shafts, pillow blocks, &c. It also has a contract from the Gleason Works, Rochester, N. Y., machine tool builders, for a simple heavy duty Corliss engine to drive a 250-kw. direct connected generator, which will furnish power for the works, including extensive additions now being erected.

The St. Louis Foundry Foremen's Association held its monthly meeting July 9 at the Missouri Athletic Club. The topic of the evening was "Cupola Practice." J. P. Pero is president of the association, and the secretary is C. Roy Rook, 1445 Syndicate Trust Building.

Allis-Chalmers Fire Pumps for Baltimore

The Allis-Chalmers Company, Milwaukee, Wis., has recently built three new high pressure fire service pumping engines to supply the high pressure fire protection lines of the city of Baltimore, Md. The three pumps, one of which is shown in the accompanying illustration, are complete in the shops of the maker awaiting the construction of the new pumping station being built by the city. These pumps will take their supply from the regular city water mains, but provisions have been made for an additional supply from the harbor.

The type of machinery selected by the Baltimore authorities is interesting, as it differs from that used by other large cities for fire protection. The pumping engines are of the company's horizontal, twin duplex, crank and flywheel type, with steam cylinders 22 and 22 x 36 in., and pump plungers 13¼ in. in diameter. Each pump has been designed to deliver 3000 gal. of water per minute against a total head of 150 lb., but they are also capable of pumping against a maximum pressure of 300 lb. per square inch.



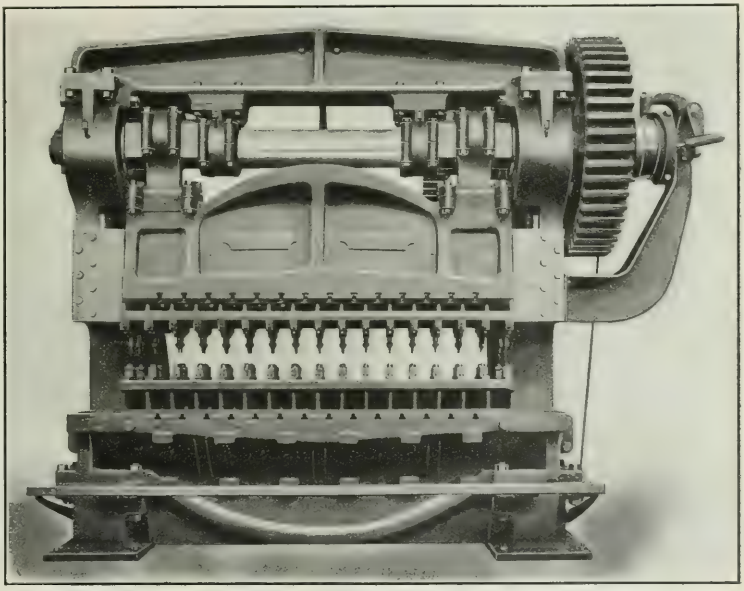
One of the Pumping Engines for the Baltimore Fire Service, Partly Erected in the Shops of the Allis-Chalmers Company.

New York City has pumping stations equipped with Allis-Chalmers motor driven centrifugal pumps. Philadelphia, where the first high pressure system was installed, employs geared triplex pumps, built by the Deane Steam Pump Company, driven by Westinghouse three cylinder vertical gas engines, as there are enough independent sources of gas supply to make the system absolutely reliable. Both these systems have been very satisfactory in their operation. The Philadelphia system was described in *The Iron Age*, January 21, 1904 and an illustrated description of the New York installation with a report of the tests made was printed in the issue of October 21, 1909. The next large municipality to install high pressure fire protection apparatus was San Francisco, where the work was begun immediately after the earthquake and fire which destroyed the entire business section of the city. Centrifugal pumps driven by steam turbines were selected for both the land station and the fireboat equipment, using oil for fuel under steam boilers. Baltimore selected steam engine driven reciprocating pumps. When this system is completed and placed in service the insurance rates will be much less and a great conflagration such as that experienced in 1904, in which property valued at over $1,000,000 was destroyed, will be rendered practically impossible.

A Large Cleveland Multiple Punch

A new type of multiple punch that is of interest not only because of its size, but because its two rows of punches are adjustable, has recently been built by the Cleveland Punch & Shear Works Company, Cleveland, Ohio, for the Pressed Steel Car Company, Pittsburgh, Pa. Having the rows of punches adjustable permits the punching of tapering lines of holes, which is often desired in punching the holes in the stakes for pressed steel freight cars. It is claimed that with all other machines of the character only parallel rows of holes can be punched. This machine is designed particularly for punching holes in pressed steel stakes, and all of the holes are made with one operation of the machine.

The punch, which is known as the No. 6 multiple stake punch and, as shown in the accompanying illustration, is equipped with 34 punches, although a similar machine having 40 punches in one row was recently made by the Cleveland Punch & Shear Works Company for the Pressed Steel Car Company, that being the largest punch ever made. The machine illustrated is capable of punching 40 $\frac{15}{16}$-in. holes through a $\frac{5}{8}$-in. plate. This machine is 13 ft. 11½ in. high, 17 ft. 4⅞ in. long and 11 ft. 2 in. wide. The width of the plunger is 20 in. and the width of the girder 27¾ in., giving that amount of surface for the tool holders. The distance between housings is 10 ft. 2 in. and the gap is 14 in. The total weight is 168,000 lb.



A Large Multiple Punch Built by the Cleveland Punch & Shear Works Company for the Pressed Steel Car Company.

This machine is a standard Cleveland multiple punch with steel automatic clutch and steel main gear. There are four main shaft bearings. The housing bearings are 17 in. long and 12¼ in. in diameter. The length of the bearings inside the pitman is 12 in. and the diameter 12¼ in. The machine has a 6-in. stroke. The housings are semi-steel castings and the shaft is hammered steel. The bolster blocks are cast steel. All bearings are bushed. Through bolts with castled nuts are used wherever possible. The sliding crosshead is counterbalanced with weights hung on levers.

There are two rows of punches parallel to the shaft, there being 17 gagged punches in each row, mounted on bolster blocks. The minimum adjustment of the punches between centers is 2¼ in. and the maximum adjustment 10 ft. The minimum adjustment of the rows of punches is 3 in. and the maximum 7 in. The bolster blocks are so arranged that when parallel rows of holes are not desired the rows can be diverted from 3-in. minimum to 5½-in. maximum. This is done by the use of specially arranged T slots.

The machine is motor driven, being equipped with a 30-hp. Westinghouse motor directly connected to the flywheel shaft through cut gears, the power being transmitted through an intermediate shaft, steel gears and steel pinion meshing the main shaft gear or clutch gear.

Dodge Brothers' New Plant at Detroit

The plant of Dodge Brothers, Detroit, Mich., manufacturers of special machinery, tools, gears and automobile parts, now under course of construction, consists of two main buildings, 65 x 400 ft., four stories, connected at one end by a building, 65 x 105 ft., four stories, and by steel bridges at the other end. These buildings are of reinforced concrete, fireproof construction, with metal windows, with floors to carry 100 lb. per square foot, having no beams or girders exposed on the ceilings, and are to be heated and ventilated with a hot air blowing system. There will be installed upon completion of the buildings two freight elevators, 12 x 20 ft., each having a capacity of one-half ton, and another, 12 x 24 ft., of one-ton capacity.

The company also has under course of construction a power plant, 100 x 120 ft., to be equipped with eight 200-hp. return tubular boilers, fitted with Detroit stokers; two Allis-Chalmers cross compound engines, direct connected to 500-kw., 480-volt Bullock alternators; one Ball-Corliss type simple engine, direct connected to 100-kw., 125-volt generator, and one 85-kw. motor generator exciter, set together with a 24-panel switchboard controlling the entire plant. The engine room will be served by an electric traveling crane of 15 tons capacity.

Other structures comprise a drop forging building, 70 x 400 ft., equipped throughout with steam drop hammers and electrically-driven presses, and served by a 10-ton crane, and an office building, 50 x 120 ft., two stories, connected to the factory with a bridge at the second story. All railroad sidings for the entire plant have been depressed, bringing the car floors to the same level as the floors of the factory. Contracts for the entire equipment have been let.

The new 12,000-ton ore boat, the W. J. Olcott, which is being built for the Pittsburgh Steamship Company, was launched at the yards of the Great Lakes Engineering Works, Detroit, July 9. The boat is named in honor of the president of the Oliver Iron Mining Company.

Exposure Tests of Structural Steel Coatings*

Ratings of 530 Different Paints After One-Year and Two-Year Terms of Service

BY J. V. M. CHAPMAN.

About three and a half years ago Westinghouse, Church, Kerr & Co. exposed to the weather on the roof of the building occupied by them at the southern extremity of Manhattan 24 small steel plates, each coated with a so-called steel preservative paint. The great difference soon noted in the protective value of these paints led to the testing of other paints and coatings, until some 1600 plates have now been exposed, painted with 530 different coatings submitted by 271 manufacturers and dealers. The results obtained to date are more or less interesting, according to the conclusions which may be drawn from them. Hereafter we will state only the facts; the conclusions may be drawn by each reader for himself.



Fig. 1. Illustrating Exposure Tests for Steel Coatings.

The method employed in most of these tests was as follows: Small samples of the ready mixed paints were submitted by the manufacturer or dealer, together with a statement of the principal ingredients entering into their manufacture. Each paint was applied to two mild steel plates of about No. 16 gauge, 2 in. wide and 6 in. long, which had first been well cleaned of oil and foreign matter by rubbing with a cloth saturated with benzine. Each plate had its number plainly stamped in one corner. One plate was given one coat and the other two coats. Care was taken to give a uniform full coat to both sides and all edges of the plates. All painting was done indoors by the same person. About five days were allowed between coats for drying. After the second coat had dried the plates were fastened to boards with galvanized iron tacks and exposed on the roof at an angle of 45 degrees, facing south. Fig. 1 shows some of these plates on the boards as they are now exposed on the roof.

Scratch Marks to Induce Rusting

On the day the plates were exposed scratch marks were made with a sharp instrument across two opposite corners of each plate. These scratch marks cut through the paint film, leaving bright metal exposed, so that rust could and did start immediately along these lines. At regular intervals after exposure each plate was examined and a record made of its condition. The one quality which was being sought, and the prime factor which entered into the rating of the paints, was protection against rust.

An arbitrary scale of ratings was adopted, based on the amount of rust apparent on the plate. Until some small spot of rust appeared the plate was rated at 100 per cent., except in cases of fading, alligatoring, bad chalking, &c., without any rust apparent, which were rated at 97 per cent. When one small spot of rust the size of a pinhead appeared the plate was rated at 90 per cent. When several such spots or one larger spot of rust appeared the plate was rated at 85 per cent. When the sum of the areas of the rust spots totaled an area of about ¼ in. square the plate was rated at 80 per cent.; when ½ in. square, at 75 per cent. When the combined area of rust spots totaled about 1 sq. in. the plate was rated at 70 per cent., and so on down the scale until zero rating indicates the plate entirely rusted on the exposed side. Fig. 2 shows a series of plates in various stages of the progress of the rust from 100 per cent. to zero. Examinations were made and results recorded at the end of two weeks, four weeks, six weeks, 12 weeks and every three months thereafter.

Various Forms of Failure

The scratch marks across the corners of the plates developed some interesting results by showing the

* A paper read at the Atlantic City meeting June 1910 of the American Society for Testing Materials.

relative resistance offered by the various coatings to the spread of the rust which got its start where the bright metal was exposed. Fig. 3 shows clearly two rather extreme cases. In one case the coating has failed at many points and the plate has rusted at each of these weak spots, but the coating has not allowed the rust to progress under it, and therefore the rust spots are small and the rust at the scratch mark is still confined within narrow limits. Should this paint be called a good inhibiter and a poor excluder? The other case is that of a paint which has allowed the rust to spread rapidly where it once got a start at the scratch marks, but has not allowed a single spot of rust to start on any other portion of the plate. Is not this evidence of a poor inhibiter, but a good excluder? Both of these plates have been exposed the same length of time.

Another interesting and somewhat curious fact has been noted in these tests. It is that the various classes of pigments fail in characteristic manners. A plate coated with a graphite paint does not rust in the same manner as one coated with red lead or an iron oxide. This difference is illustrated in Fig. 4, which shows the characteristic failures of four classes of paints: carbon, graphite, iron oxide and red lead.

As the test plates were exposed from time to time throughout the year in lots of about 200, it would not be fair to compare the three or six months' rating of a paint exposed in June with the corresponding rating of one exposed in November, after the one had been subjected to warm, dry weather and the other to an equal period of cold, rain and snow. For this reason the one year and two year ratings are compared in all cases, so that all have been exposed to the four seasons in succession one or more times.

The Coatings Classified

As noted above, each manufacturer was asked to state the principal ingredients in his paint, and on the basis of these statements the samples were classified into groups depending upon its chief pigment, or, in the absence of pigments, upon its vehicle. In this way the paints were divided into a number of classes as follows:

Carbons.—In this class are grouped the natural and artificial carbons, except graphite.

Graphites.—This class contains both the natural and artificial graphites.

Iron Oxides.—These also include both the natural and artificial pigments, some of which were received in paste or dry form, to which pure linseed oil was added in our laboratory.

Red Leads.—This class includes both the straight red lead and oil mixed in the laboratory shortly before applying, and the ready mixed red lead paints which contain considerable percentages of other pigments to keep the lead in suspension. These red leads had no other coating over them.

Red Lead Primers.—These consist of tests in which the first coat was a red lead paint, either "ready mixed" or straight red lead and oil, while the second coat was of some other class. Of course, no one-coat tests could be made in this way. The second coats in this class were of widely different varieties.

White Leads.—This class is rather surprisingly small, and is made up largely of paints mixed from the paste in our own laboratory.

Zinc Oxides.—Few makers put out a zinc oxide paint for structural steel.

Mineral Hydrocarbons Without Pigments.—This class is composed of paints made of the various kinds of tars and tarry refuse and the various minerals of an asphaltic nature, gilsonite, elaterite, &c., but without any pigments added to them. They form one of the more numerous groups, and as a rule are much lower priced than the oil paints. They also form the class for which the greatest merit is usually claimed by the makers and agents.

Mineral Hydrocarbons With Pigments.—This class is made up of the same character of materials as the last, but with various pigments added. For instance,

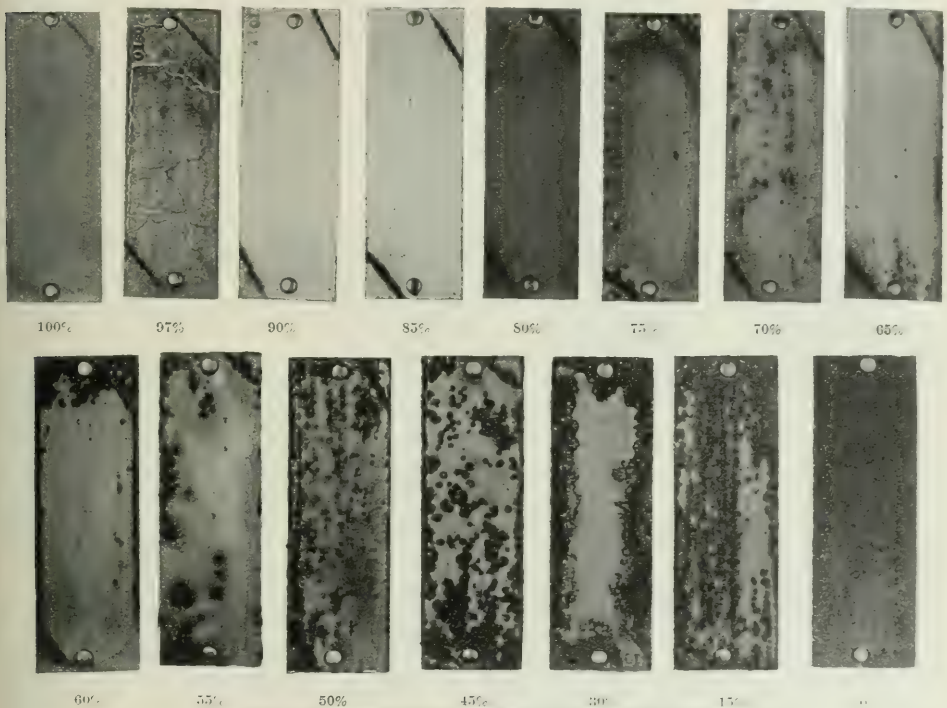


Fig. 2.—Progressive Stages of Corrosion and Corresponding Ratings.

a paint made of gas tar and iron oxide would fall in this class rather than in the iron oxide class.

Vegetable Hydrocarbons With and Without Pigments.—This class includes distillates and residual pitches of vegetable oils, &c. They are not numerous enough to divide into two groups, hence those with and those without pigments are placed in the one class.

Cements.—Several manufacturers have acted upon the oft published statement of the fact that Portland cement offers a protection to steel against rust, and have put out a paint said to be made up largely of cement. These paints are here grouped in a class by themselves. As they have appeared in the market mostly within the past two years only one of them has had a full two years' exposure.

Chromates.—Another result of recent paint literature has been the appearance of a number of paints said to contain chromates or chromic acid in some

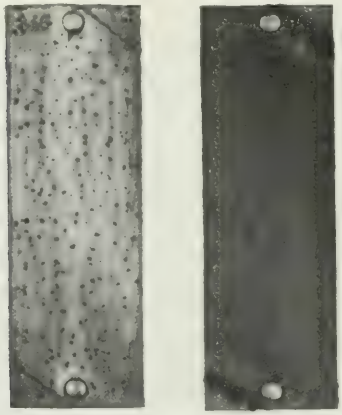
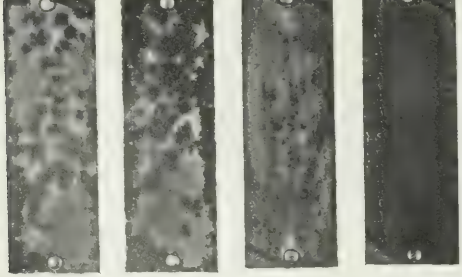


Fig. 3.—Different Ways in Which Corrosion Resulted from Scratch Marks.

form. Some of these have appeared within the past year and no tests of those can be included in this paper.

Vehicles.—This class contains the oils, varnishes and transparent coatings containing little or no pigment, but which are more or less used for the protection of steel.

Miscellaneous.—Into this class are grouped all the coatings which do not fall into one of the above groups or concerning which the maker refused proper information to enable the paint to be classified. Other sub-



Carbon. Graphite. Red Lead. Iron Oxide.

Fig. 4.—Different Types of Corrosion with Different Classes of Paints.

divisions were made in our laboratory records, but they each contained so few representatives that they were all thrown into this miscellaneous class for purposes of comparison in this paper.

The Results Summarized

In the following table is given a summary of the results obtained with each class of paints for one and two year exposures of one and two coat specimens. This table also gives in each case the number of tests which entered into each result:

Table of Results of Exposure Tests of Structural Steel Paints.

	One year exposure.				Two years' exposure.			
	One coat.		Two coats.		One coat.		Two coats.	
Class.	No. of tests.	Aver. rating. Per ct.	No. of tests.	Aver. rating. Per ct.	No. of tests.	Aver. rating. Per ct.	No. of tests.	Aver. rating. Per ct.
Carbons	65	21	54	70	34	2	36	46
Graphites	67	18	56	66	42	3	43	45
Iron oxides	74	35	71	69	52	10	52	46
Red leads	50	58	39	77	19	16	20	61
Red lead primers	0	..	43	75	0	..	14	56
White leads	23	51	11	82	3	0	3	25
Zinc oxides	5	25	5	69	5	3	5	50
Mineral hydrocarbons without pigments	66	20	73	46	36	0	37	18
Mineral hydrocarbons with pigments	10	16	11	53	7	0	7	20
Vegetable hydrocarbons with and without pigments	13	19	13	57	3	0	3	5
Cements	7	36	7	46	1	0	1	0
Chromates	14	32	24	70	9	0	9	39
Vehicles	22	8	7	11	3	0	3	0
Miscellaneous	94	28	103	67	70	7	85	39

The United Iron Works.—At the annual meeting of the stockholders of the United Iron Works, Springfield, Mo., held July 1, the following officers were elected: C. H. Cole, president; H. T. Hornsby, vice-president and general manager; A. C. Daily, treasurer and purchasing agent; R. P. Bowyer, secretary. The directorate was named, as follows: R. P. Bowyer, A. C. Daily, J. T. Woodruff, J. R. Woodfill, Jr., and B. F. Hobart. The reports of the officers for the past year showed a prosperous condition of affairs. The company has plants at Iola, Pittsburg and Independence, Kan.; Joplin, Aurora and Springfield, Mo., and a distributing house at Kansas City. At the close of the meeting about 40 stockholders and officers of the company were banqueted at the Springfield Country Club. C. H. Cole, president of the company, was the toastmaster.

A Large Riehle Testing Machine.—The Riehlé Brothers Testing Machine Company, Philadelphia, Pa., has just shipped the largest screw power testing machine it has ever built to the Lehigh University, South Bethlehem, Pa., for its new engineering laboratory. The machine complete weighed 150,000 lb., will take in specimens 28 ft. long, and has a capacity, on two screws, of 800,000 lb. On June 20 an elaborate test of the machine was made at the company's works, among those in attendance being John Fritz, President Drinker, Prof. F. C. McKiblen and G. A. Chandler of Lehigh University, W. A. Lathrop, president of the Lehigh Coal & Navigation Company; Professor Kavanaugh of the University of Minnesota, and a number of other prominent engineers. The machine was tested to its fullest capacity, and met most satisfactorily all requirements.

Some changes have recently been made among officers of the Petroleum Iron Works, Sharon, Pa., builder of heavy iron and steel plate work. A. W. Krause, secretary and treasurer, Charles A. Lytle, E. G. Wright and H. L. Stafford of Pittsburgh, have sold out their holdings to Joseph T. Sweeney of Sistersville, W. Va., representing the majority stockholders. Mr. Krause has resigned as secretary and treasurer and Mr. Sweeney will fill the two positions.

Ajax Electric Riveters

A new riveter, which will punch the hole and drive and head a rivet with one pressure of the pedal, has been placed on the market by the Electrical Machinery Sales Company, Milwaukee, Wis. These tools combine the functions of a riveter and holder-on and a portable riveter, chipping and calking tool. Three styles of tool are built; the bench type, shown in Fig. 1; the pedestal type, shown in Fig. 2, and a portable model. Three sizes of each type are built, and while those illustrated have a self-contained electric motor for operating them, a belt driven model is also made. The average time required to turn a smooth polished head on each end of a stud or wire rod is 1 sec. for any shape of head, and the capacity depends entirely upon the quickness and ability of the operator to place rivets in position. It is stated that from 4000 to 20,000 pieces per day can be handled by inexpensive labor, as a boy or girl can learn to operate the machines in a few moments and turn out good work as rapidly as an experienced or expensive man.

The mechanism is durable and simple and consists of a slidable solid steel revolving disk block, with three special design striking shoes on its lower surface. These shoes strike a resilient plunger, which in its turn delivers the blow directly upon the work to be done. The riveting operation is controlled by the treadle, the force of the blow being proportional to the amount of pressure applied. Releasing this pressure stops the blow instantaneously. This ability to vary the force of the blow is one of the special features of the Ajax machine, as it will strike the lightest continuous tap, medium or heavy blow, as desired, and the change from one to the other can be made instantly. The hammer runs continuously, so that there is no delay in starting or stopping.

Some of the work done by this machine is the driving of rivets hard down, swelling and fitting the countersink, heading over lightly, thus permitting the parts joined to swivel, and doing internal riveting, such as lamp and hollow ware work, by the use of horns. Although these are the operations for which the tools are primarily designed, they can be used for hammering spun metal pieces before annealing, driving pins, or any other work where a blow is required.

The No. 1 riveter is a small, compact tool for jewelers, clock manufacturers, toys, light metal work and other riveting where 1-32 to ⅛ in. rivets are used. No. 2 is used by tin, brass and sheet metal workers, building hardware manufacturers and makers of automobile lamps and bicycle chains, where the maximum rivet handled is ¼-in. Size No. 3 is used for link chains of all kinds, metal wheel spokes, riveting tanks, and by manufacturers of hardware, agricultural machines and electrical supplies, handling as a maximum ½-in. rivets. The principal dimensions and specifications of these tools are given in the following table:

	No. 1.	No. 2.	No. 3.
Floor space, inches	6 x 10	8 x 18	10 x 20
Depth of throat, inches	5	7	8
Table adjustment, inches	5	8	9
Weight, bench model, pounds	75	325	335
Weight, pedestal model, pounds	125	350	360

In addition to these three types the company builds a portable tool for heading rivets up to ¼-in., which is suspended from the ceiling or a joist by a small steel cable and is fitted with a special type of floor crane, which permits it to be wheeled easily from place to place wherever work is to be done, and a line of special riveters for structural and railroad shop work, where the rivets used range from ⅜ to 1¼ in. The motor driven tools are provided with attachment plugs and wire for attachment to the nearest lighting outlet.

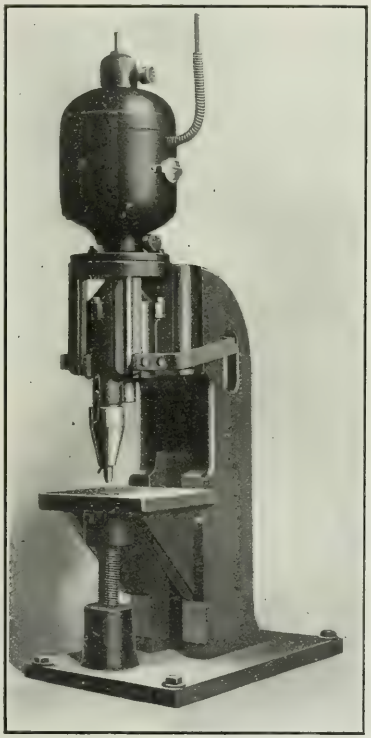


Fig. 1.—Bench Type.

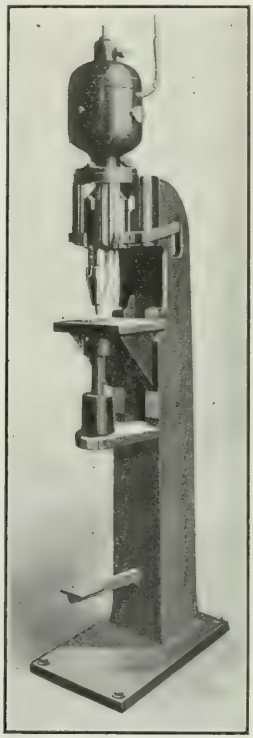


Fig. 2.—Pedestal Type.

Ajax Electric Riveters Sold by the Electrical Machinery Sales Company, Milwaukee, Wis.

A Large Bavarian Iron Ore Deposit

Considerable attention has been attracted during the past five years by reports of iron ore discoveries in northern Bavaria, in the region lying between Nuremburg and Bayreuth. While the deposit has not yet been fully explored, it is known to be of extensive dimensions. About 450 claims have already been filed, covering an area of about 225,000 acres. The ore averages about 40 per cent. iron. Experts have estimated that the deposit contains a total of 1,700,000,000 tons of brown ore, making it a very important addition to Germany's already large ore reserves. It is probable that most of these ores will be shipped to furnaces in other parts of the country, as there is no nearby supply of coal. The district is not far removed from the head of navigation on the Main River, through which and the Rhine the ores can be shipped to the furnaces on the lower Rhine at no great expense.

The Dayton Pipe Coupling Company, Dayton, Ohio, manufacturer of couplings, clamps and fittings, has received an order for about 45 miles of pipe couplings for a gas line to be laid in Kansas.

The Newton 26-In. Cold Saw Cutting-Off Machine

A High Speed Machine with a New Feed-Changing Mechanism

A cold saw cutting-off machine arranged for motor drive and a positive feed of four different rates has been brought out by the Newton Machine Tool Works, Inc., Philadelphia, Pa. The general appearance of the tool is shown in Figs. 1 and 2, which are views of opposite sides of the machine. As will be noticed from these engravings the work table and bed of the machine, including the saddle slides, are one solid casting and the construction throughout is heavy.

This design of machine is said to embody all the known features for increasing the output by the elimination of idle time of machines. All the operations are controlled by three levers, one in the front (Fig. 1) for changing the rate of feed, the other at the left end (Fig. 2) for engaging the feed clutch and fast traverse, while the hand wheel is used only for very slight adjustments and is fitted to the end of the squared feed screw to be removed if operations on broad or angular work interfere. The work clamps and V-blocks are also removable. When operating on I-beams, which are recommended to be cut in a vertical position at all times to make the cuts in the shortest possible time, due to the short length of travel, the V-block is removed. For cutting rounds the block is placed on the table and the work placed in the small V. For cutting square stock a slight vertical projection is provided to facilitate the squaring of the work.

The machines are fitted with No. 2½ Brown & Sharpe geared pumps. The reservoir for the lubricant is in the rear end of the base casting. This lubricating system delivers the heat absorbing and lubricating fluids at the point of cutting, as practice has demonstrated that the former method of rotating the blade through a pan of lubricant was not satisfactory for a number of reasons, chief of which was the inability of the blade to hold a sufficient quantity of fluid and the tank required continual attention in removing chips which could not be prevented from falling into the oil pan.

These machines are fitted with roller thrust bearings in place of disk hardened steel and copper washers, and all bearings are bushed where necessary. All of these features add materially to the cost of the machine, especially the roller thrust bearings, which increase the cost of that particular item about 15 to 16

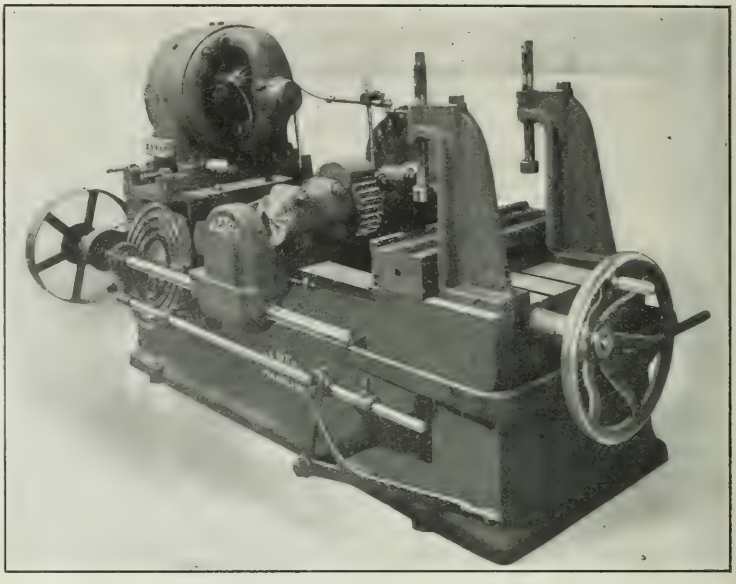


Fig. 1.—The New High Speed 26-In. Cold Saw Cutting-off Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

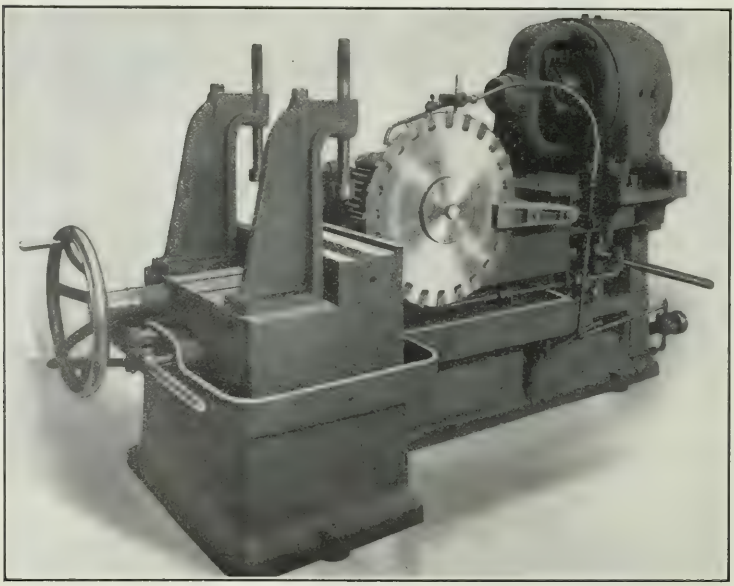


Fig. 2.—Another View of the Newton 26-In. Cold Saw Cutting-off Machine.

times, but it is considered that they are warranted because they very much reduce the operating and maintenance cost.

The spindle of the machine, which is 26 in. in diameter, revolves in brass bushed capped bearings, equal in total length to the diameter of the saw blade, and is driven by coarse pitch tooth, broad face hammered steel gearing mounted between the two spindle bearings. The drive is further through an intermediate spur gear, which is cut from the solid shaft, and is of the same diameter as the worm wheel shaft. The driving worm wheel is of solid bronze and the driving worm is of hardened steel, fitted with roller thrust bearings. Motion to the horizontal shaft on which

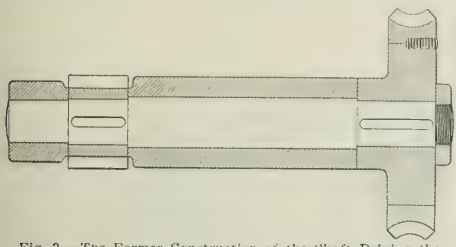


Fig. 3.—The Former Construction of the Shaft Driving the Spindle.

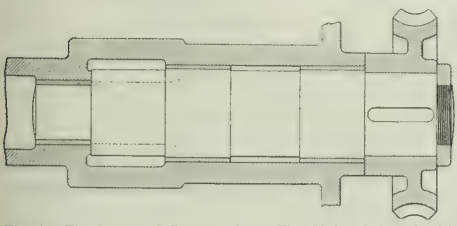


Fig. 4.—The Improved Construction.—The Pinion Integral with the Shaft and the Worm Gear Solid Bronze.

the driving worm is mounted is transmitted by a 4-in. belt to the countershaft or to the armature shaft of the motor when machines are motor driven. The saddle of the machine has square lock gibbed bearing on the bed on the operating side and adjustments are made by taper shoes.

Four changes of positive feed, ranging from 0.547 to 1.109 in. per min. with a 26-in. saw running at a peripheral speed of 45 ft. per min. are provided. This speed is lower than that ordinarily used when machines are fitted with solid tooth saw blades, which is from 60 to 65 ft. The manner of obtaining these feed changes is apparent from an inspection of Fig. 1. Another departure from former practice is the substitution of a solid steel worm wheel for one having a cast iron center, a change made necessary by the increased stresses incident to the use of inserted tooth saw blades to their full capacity. The difference between the former plan of furnishing the worm wheel shaft with the intermediate spur gear keyed on and the present scheme of cutting the teeth from the solid shaft is shown in Figs. 3 and 4.

Power quick return to the spindle saddle is also provided, which is available in both directions on a motor-driven machine if a double-throw switch and reversing motor are employed.

The capacity of the machine is round stock 7½ in. in diameter, square pieces 7 in. on a side, and for I-beams on a square or miter cut in a vertical position 15 in. The net weight of the machine is 5800 lb. and the floor space is 8 x 3 ft.

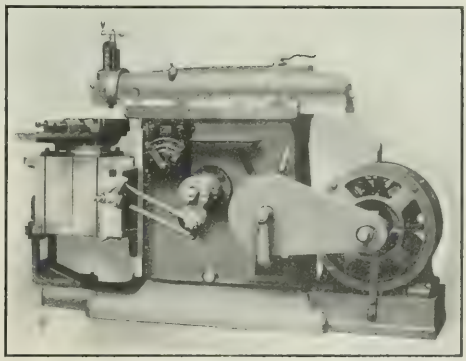
The equipment regularly furnished includes the pump, piping and attachments for cutter lubrication and the necessary wrenches for either the belt-driven or motor-driven models, and with the former a countershaft is included.

A Motor-Driven Queen City Shaper

The adjustable speed motor offers decided advantages in the way of rapid and economical production for some classes of machine tools. With the mechanical methods of speed reduction, by cone pulleys or nests of gears, only coarse increments in speed are obtainable which means that tools cannot always be worked up to the limit of their productive capacity. The new high-speed steels require a greater pulling power in the belts and an increased strength in the gears and reasonably fine increments in speed by mechanical means alone are almost impossible, owing either to the increased length of the cone pulley or to the large number of gears, some of which are of abnormal size. For these reasons the adjustable speed motor may in some cases actually decrease the cost of the machine tool by eliminating bulky and expensive mechanical speed-changing devices.

In the accompanying engraving, a type SA 5½-hp. motor, made by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., is shown connected to a 24-in. back-geared crank shaper built by the Queen City Machine Tool Company, Cincinnati, Ohio, which was illustrated and described in *The Iron Age*, April 7, 1910. The motor is provided with auxiliary commutating poles and has a speed range of from 450 to 1350 rev. per min.

The faceplate controller, located on the side of the shaper, enables the workman to regulate the speed to suit the requirements of his work and a large number of operating speeds, limited only by the number of field resistance steps on the controller, are available. Thus the correct speed for most efficient operation on each piece of work is easily and quickly obtained. On each position of the controller, the speed of the motor is



A 24-In. Queen City Shaper Driven by a 5½-Hp. Westinghouse Adjustable Speed Motor.

practically constant for all rated loads, which is of great importance in machine tool service, as it reduces tool breakage to a minimum. The controller handle is within easy reach of the operator, who can make any speed adjustment or stop the shaper instantly while standing at the rail.

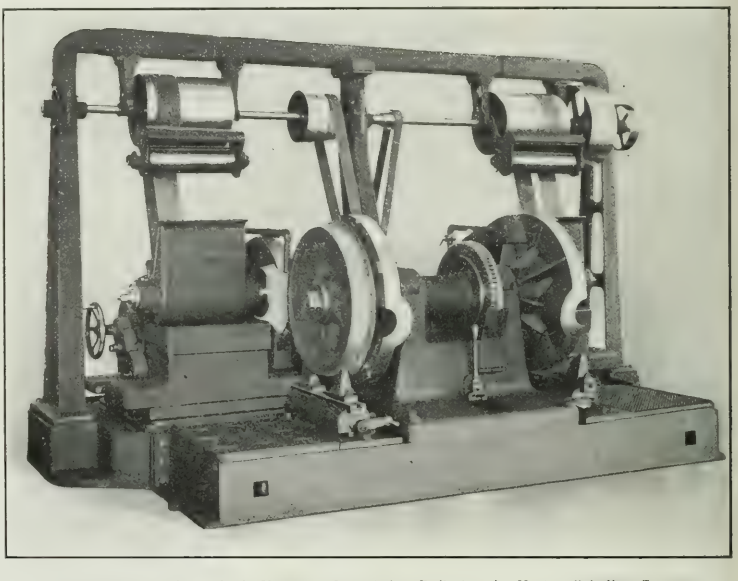
The use of a silent chain to connect the motor to the shaper eliminates belt slippage and provides a positive driving power. The chain runs very smoothly and without perceptible vibration. The motor is supported on a sub-base cast integral with the base of the shaper. The equipment is compact and takes up little floor space.

The Fort Pitt Spring & Mfg. Company has moved its general offices from the Farmers' Bank Building, Pittsburgh, to its plant at McKees Rocks, Pittsburgh, bringing its executive and manufacturing departments together to better handle its growing business.

A New Norton Car Wheel Grinder

The car wheel grinder shown in the illustration is the latest type brought out by its builder, the Norton Grinding Company, Worcester, Mass. While it follows in general design the machine described in detail in *The Iron Age* September 27, 1906, it is arranged to grind wheels unmounted on axles, being intended for the use of manufacturers of car wheels rather than the railroads. The intention is first to grind the wheel true and round and to chuck the hole afterward. In fact, buyers of car wheels use different sized holes, according to where the wheels are to be used, and it is therefore necessary for them to chuck the holes to suit themselves, true with the grinding. The wheel shown in place is of manganese steel, with hard rim and soft center.

The machine is fitted with extraordinarily heavy face plates, to which the loose wheels are bolted through the cored hole in the center, resting against three points. Location in the center of the axis is effected by means of the V support which has previously been adjusted for the purpose. The small crank shown at the front of the V mechanism is turned over, dropping the V's sufficiently so that no high spots of the wheel will touch them while it is revolving. In each plate are three half-round openings, the purpose of which is to admit the hook used for lifting the wheel into place and holding it during the bolting. The operator, of course, stops the revolution when one of the openings is at the top. The two face plates and the spindle form one solid casting, to which the worm wheel is bolted, which secures the great rigidity that prevents the vibration of the work while grinding. The machine weighs 16 tons.



A New Grinder for Car Wheels Unmounted on Axles, Built by the Norton Grinding Company, Worcester, Mass.

Sharon Steel Hoop Company Extensions.—The erection of a wide band mill which has been discussed for some time by the management of the Sharon Steel Hoop Company, Sharon, Pa., has now been determined upon, and work upon it will be started as promptly as possible. The mill will be ready for operation about January 1 next. It will require an addition of about 1000 hp. to the present power plant. None of the contracts has yet been let. On the completion of the new mill the Sharon Steel Hoop Company will be in position to produce hoops, cotton ties and bands from ⅜ to 12 in. wide and employment will be given to 100 or more additional men. It is the policy of the company to carry all its steel production forward to finished material ready for the market.

The Union Drawn Steel Company, Beaver Falls, Pa., part of whose plant was recently destroyed by fire, has placed a contract with the Masters-Mullin Construction Company, Cleveland, Ohio, for the first story of its new factory building up to the first floor level, to be built of reinforced concrete. The steel work for this building, amounting to about 1000 tons, has been placed with the Berger Iron Company, Akron, Ohio. The building will be 140 x 375 ft., two stories with basement, fireproof throughout. Considerable new equipment will be needed which has not yet been placed.

The Continental Can Gompany is now operating its new plant at Canonsburg, Pa., which is devoted exclusively to the manufacture of open cut cans, not soldered inside. The present production is 200,000 cans per day, but as soon as all machinery is installed the daily capacity will be 500,000. The company has found its stock facilities inadequate and is now building an addition to its stockroom, a brick building, 100 x 150 ft., which will be completed about August 15. The Canonsburg plant is the largest, being operated by the Continental Can Company, and is one of the most modern in the country. A number of new ideas have been worked out in the manufacturing departments.

The Loop Nut Company, Madison, Wis., has been incorporated to manufacture a patented nut invented by W. C. Schoelkopf, the general manager of the company. The company at present will confine its operations to the manufacture of brass nuts from ⅛ to ¼ in. for electric connections, storage batteries, coils, carburetors, &c. It contemplates later extending its operations to include nuts of larger sizes in iron. The company has purchased most of its equipment, but is now in the market for automatic drilling and tapping machines to tap nuts of the above mentioned sizes. It desires catalogues from manufacturers of tools of this description.

The A. E. Shorthill Company, Marshalltown, Iowa, manufacturer of structural iron and steel, has submitted to the Commercial Club of Omaha, Neb., a proposition for the removal of its plant to that city, where it will be reorganized under the name of the Omaha-Shorthill Company and capitalized at $500,000. Part of the present plant of the company at Marshalltown will remain in operation, however, to take care of the Iowa trade in bridge and structural steel business. Work of removal will begin as soon as a site has been determined upon.

Lake Superior Mining Developments

The Cleveland-Cliffs Company's Operations—Mine Valuations in Ishpeming—The Republic Iron & Steel Company May Buy a Mesaba Village Site—Abandoned Mines Reopened

MARQUETTE, MICH., July 9, 1910.—The electrification of the Marquette range mines of the Cleveland-Cliffs Iron Company is proceeding with satisfactory headway. There are two generating plants, one at Negaunee and one at Princeton. The former station is now furnishing power to the Maas, Negaunee, Cleveland Lake, Cleveland Hard Ore, North Lake and Barnes mines; the latter is serving the Princeton No. 1 and No. 2 and the Stephenson. While both of the plants are now running smoothly, they will be operated to even better advantage when a heavier load is carried. At present the Negaunee station is generating about 300 kw., and the capacity of the turbine is 1500. The capacity of the turbine at Princeton is also 1500 kw. It will, perhaps, be several years before either plant will be operated to its full capacity. The only important work still to be done in connection with the transmission system is the installing of motors and other equipment at various mines and shops. The plants are constructed so that they can be operated separately or jointly. With the stations in full commission an important saving will be effected in labor and fuel costs.

The Cleveland-Cliffs Company's Progressiveness

The company's North Lake mine will be a shipper this season, the shafts now being rapidly opened to the ore through the connecting drifts and cross cuts. The property is only one of half a dozen or more that the company is engaged in developing, and there are other deposits still to be opened. In the case of this corporation hundreds of thousands of dollars are expended annually in the search for and the development of mines. With all its activity the company has maintained the finest mining locations, making them attractive to employees, and has sought in every possible way to better the condition of its men, being farsighted enough to realize that such things tend to raise the standard of labor. It has been a mutual work, appreciated by the many concerned.

The Cleveland-Cliffs Company has been progressive in other lines than mining. For one thing, it is providing homes for many tillers of the soil, vast tracts of hardwood lands becoming available for that purpose with the timber removed. It has also engaged in forestry to a considerable extent, returning to many lands young trees to replace the timber it is taking. It has been prominent in all matters pertaining to the advancement of the country in which it operates so extensively, and it is an organization recognized as well deserving any good fortune it may meet in its development of the mineral resources of the region.

Mine Valuations in Ishpeming

The valuation of the realty of the mining companies operating within the city limits of Ishpeming, Marquette range, has been fixed by the Board of Review at $3,411,000. This is a reduction of $50,000 from the figures of the preceding year. The assessed valuation of the United States Steel Corporation's hard ore and hematite properties has been fixed at $835,000. This is less by $100,000 than the valuation made in 1909, but as the Section 16 mine has been placed on the roll at $600,000, while last year it was down for $500.000, the corporation's total of $1,435,000 remains the same. No changes were made in the valuation of any of the Cleveland-Cliffs Iron Company's properties, compared with last year, and the total assessed valuation in this case is $1,526,000. The valuation of the Jones & Laughlin Steel Company's Lake Angeline mine has been reduced from $500,000 to $450,000. The personal valuation of the several mining companies has been cut by something like $200,000, this action being taken on account of the smaller stocks of ore now on hand.

The Bates Iron Company has been organized for the purpose of developing and operating a mine in the so-called Hall-Yackel lands at the western end of the Menominee range. The property is located in section 19, 43-34, Iron County, Michigan, and is controlled by Ladenberg, Thalman & Co. of New York, operators of the Florence mine in the Wisconsin portion of the Menominee district. Much exploratory work has been done at the new property the past two years. This work has recently been suspended and a shaft will be sunk. This will be a difficult problem, as the overburden is deep and contains a great deal of quicksand. Lowe Whiting, who has been mining engineer for the Youngs Mining Company at Iron River for several years, has been appointed superintendent of the Bates Company's operations.

The Republic Iron & Steel Company's Mesaba Operations

It is reported from the Mesaba range that the Republic Iron & Steel Company contemplates buying the entire village site of McKinley. It is the understanding that the ore deposit has been found of much greater value than expected, and, besides, litigation has broken out in connection with the mining operations, which are being conducted in the very heart of the town. The officials do not confirm the rumors regarding the contemplated purchase of the village. The company has been drifting for some time under buildings in the town, and the people owning the houses having become alarmed, are demanding the right to inspect the mine to determine if it is safe for them to live above the workings. The management has denied them this right, and court action has followed in the form of an injunction. The hearing on the injunction is still pending.

The Liley mine, formerly known as the Alberta, at Virginia, Mesaba range, was abandoned in 1908, the lessees at that time being of the opinion that the property was practically of no value. The Liley Iron Mining Company was organized last year and took over the lease, beginning operations May 1 last. Since the resumption of work 10,000 tons of ore has been shipped and some 30,000 tons more will go out this season. It is claimed that the deposit is large enough to permit of production for a number of years. This season's output has been sold to M. A. Hanna & Co. The property is an underground proposition. The present company holds a 10-year lease.

Activity on the Vermilion Range

The value of the tract having been determined after months of exploratory work, the Section Thirty Mining Company is proceeding with the development of its property on the Vermilion range on an ambitious scale. The deposit apparently is extensive, footing up some millions of tons, and the ore is of the finest quality. Mining thus far is almost entirely incidental to development work, but fully 50,000 tons will be shipped the present season. Very naturally the developments at Section Thirty have greatly stimulated exploratory operations on the Vermilion. Various properties are being drilled or test pitted, and in some cases shafts are being sunk. It is the claim that new ore bodies are being found. The conditions at the North American, Vermilion Steel & Iron and Vermilion Steel Extension, all of which are controlled by T. J. Walsh and associates, are reported entirely satisfactory. The Vermilion Iron Development Company is sinking a shaft on Pine Island. The formation here has been traced for a distance of a mile. It is some 200 ft. in width and on the surface contains a fair grade of ore mixed with jasper. It is hoped to encounter clean ore at depth. The shaft will be sunk

500 ft. The Roy Development Company has mixed ore at a depth of 120 ft., and it, too, is hopeful of better things. The Duluth-Vermilion Company, which is exploring in the Robinson Lake basin, has started the work of sinking a shaft. So, also, has the Section Thirty Development Company. The property of this latter concern adjoins that of the Section Thirty Mining Company and is believed to carry the extension of the Section Thirty deposit. Ore has, in fact, been encountered.

G. E. Drum Type Controllers for Machine Tools

For the control of machine tools driven by electric motors where the starting service is frequent or of a severe nature, drum type controllers generally are to be preferred to other types. The General Electric Company, Schenectady, N. Y., builds machine tool controllers designed with many special features to meet the conditions of modern shop practice. Among these features may be mentioned substantial removable barriers between the fingers wherever required; magnetic blowouts for all equipments for 500-volt service or for large currents at lower voltages; special screws to hold the segments, with heads slightly countersunk below the surface so as to prevent their wearing with the segments, and tapered at such an angle as to prevent their loosening; sheet iron covers lined with asbestos to protect live parts from dust and mechanical injury, and eliminate danger of shock from accidental contact; terminals and other parts readily accessible, and field control with adjustable fingers similar in design to the fingers for the armature circuit. The accompanying illustrations show three types of G. E. drum controllers.

When it is desired to obtain overload and no-voltage protection in connection with drum controllers, a CR-251 panel should be used. This panel consists of a double pole circuit breaker, a single pole contactor and two fuses, all mounted on a slate base, the latter being provided with feet to make a neat installation. The circuit breaker and fuses afford the overload, and the contactor the no-voltage protection. The operation of these panels depends essentially upon an electrical interlock between the no-voltage release and the drum controller. When the controller handle is moved to the first point the coil of the contactor is energized, closing the contactor and completing the armature circuit. As greater force is required to close the contactor than to hold it closed, when the controller handle is moved beyond the first point, a high resistance is inserted in series with the contactor coil to prevent the contactor from closing in case of a restoration of voltage after failure, until the controller is turned back to the first point.

This device is designed for both shunt and compound wound motors.

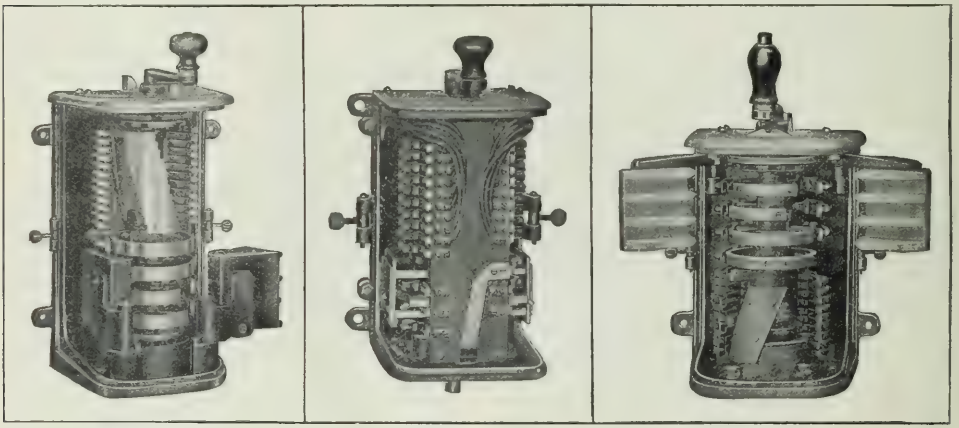
The Worcester Half Time School

The terms of the co-operative apprenticeship which is a feature of the new half time school at Worcester, Mass., contain interesting information as to the nature of the course. They are, in part, as follows:

The term of apprenticeship shall be four shop years, to be divided into eight periods of six shop months. Lost time shall be made up at the expiration of each period, at the rate of wages paid during said period, and no period of service shall begin until all lost time of the preceding period shall have been made up.

Applicant or guardian shall deposit with the company, as surety for the performance of his duties under this agreement, the sum of $50.

Applicant shall be given a preliminary trial of 350 hours. At any time during this trial period the company reserves the right to return the guaranty fund and to terminate this agreement, if the applicant does not show promise of ability to learn the machinist's trade.



Type R-99-A. Type R-116-A. Type R-118-A.

Drum Type Controllers for Machine Tool Motors, Made by the General Electric Company.

If for any cause orders shall fall off, making it necessary to shorten the hours of labor, or to close the works or any department thereof, the company may for such time suspend this agreement wholly or in part, paying only for the time actually worked. Time so lost shall be made up as hereinafter provided.

The apprentice shall attend the high school in ————, and successfully complete the four-year course provided for alternate-week scholars. He shall work one week in the shop and attend school the alternate week, and during the school vacation shall work one week and have the alternate week to himself.

The apprentice shall conform to all the rules of the shop, shall perform his duties with punctuality, diligence and fidelity, rendering any reasonable service in the line of the trade which may be required.

The apprentice shall not belong to any military company or fire company during the term of apprenticeship except as required by law.

The company will faithfully instruct the apprentice in the machinist's trade in their shop, on the alternate school and shop plan, advancing him successively through the various departments as his capabilities are developed. If the apprentice shows special aptitude in any particular branch of the trade and desires to make that branch a specialty, the company will give the apprentice the opportunity whenever it can be accomplished consistently with the interests of both parties.

The company reserves the right in its discretion to terminate this agreement or to discharge the apprentice from its employment for any of the following reasons:

a—Refusal to obey rules and regulations.
b—Lack of industry or capacity.
c—Indifference to his duties or laziness.

d—Improper conduct within or without the shop.
e—Failure in the school course.
f—Leaving school or expulsion from school.

The company will hold the guaranty fund of $50 until the expiration of this agreement. If the apprentice completes the full term of four shop years, learns his trade and demeans and acquits himself throughout in a creditable manner, the company will repay to the apprentice the full sum deposited, together with 4 per cent. interest thereon, and will also give him a diploma certifying him to have served his time as an apprentice and to be competent in the branches he has followed.

If the apprentice leave the service of the company before the completion of his apprenticeship, or is discharged by the company for any of the reasons specified, the guaranty fund, together with all accrued interest, shall be forfeited to the company, and the company shall not be liable to the apprentice or any other person for the whole or any part thereof.

The apprentice shall be paid wages on the regular pay days of the company, according to the following scale, for the time of actual service in the shop:

Period.	Cents per hour.	Period.	Cents per hour.
First	10	Fifth	12
Second	10½	Sixth	13
Third	11	Seventh	14
Fourth	11½	Eighth	15

Lackawanna Steel Company Earnings

For the Lackawanna Steel Company and subsidiary companies the following statement of earnings is made for the quarter and the half year ending June 30, 1910, and a comparison is given with the corresponding periods of 1909:

April 1 to June 30.

	1910.	1909.	Changes. Increase.
Income, less expenses, repairs, &c.†	$1,662,002	$586,863	$1,075,138
From investments	349,000	80,460	268,539
Totals	2,011,002	667,323	1,343,678
Deduct interest	437,500	406,875	30,625
Sinking funds	101,402	90,816	10,585
Depreciation and renewals	364,063	282,537	81,526
Total deduction	902,965	780,229	122,736
Surplus	1,108,036	*112,905	1,220,941

January 1 to June 30.

Income, less expenses, repairs, &c.†	$2,770,343	$765,533	$2,004,809
From investments	678,000	160,920	517,079
Totals	3,448,343	926,454	2,521,889
Deduct interest	854,583	792,500	62,083
Sinking funds	191,614	141,223	50,391
Depreciation and renewals	708,165	483,359	224,806
Total deduction	1,754,363	1,417,082	337,280
Surplus	1,693,979	*490,628	2,184,608

* Deficit. † After deducting all expenses incident thereto, including ordinary repairs and maintenance of plants and interest on bonds and fixed charges of subsidiary companies.

Unfilled orders on June 30, 1910, are reported at 379,836 gross tons, against 384,984 tons one year previous.

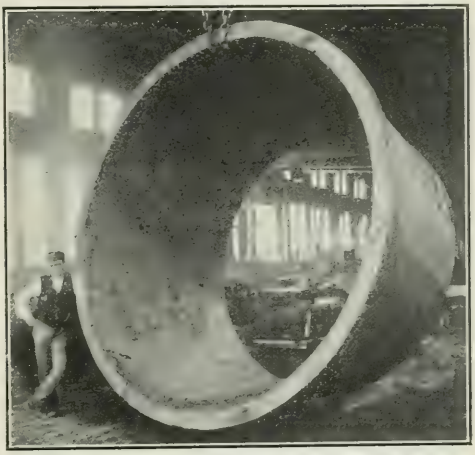
The Eureka Steel Novelty Company, Buffalo, N. Y., has absorbed the G. H. Davis Mfg. Company and the Silver Wire Company of Buffalo and the Twin City Mfg. Company of Tonawanda, N. Y., having increased its capitalization for this purpose, and will remove its manufacturing plant to North Tonawanda. The reorganized company is enlarging and re-equipping the plant occupied by the Twin City Mfg. Company on Schenck street, North Tonawanda, and will take possession shortly. Most of the new machinery and equipment required has been provided for, but some additional stamping presses and other equipment will be purchased later. The company's specialty is garment hangers, of which it makes over 50 different styles in wire, metal and wood. Various novelties of wire and steel will also be made and contract work will be done. William M. Farnham is president.

Isabella Furnace No. 2 of the Carnegie Steel Company, which was recently blown out, will be torn down and replaced by a modern stack.

A Large Casting Made by the Prime Steel Company

The steel casting shown in the accompanying illustration was cast in the Dutcher plant of the Prime Steel Company, Milwaukee, Wis. It is unique because of its size, being 12 ft. 6 in. in diameter, 9 ft. 6 in. deep, 1½ in. thick below the flange, and weighs 8 tons. No pattern was used, as it was made in a sweep mold. It has been the practice heretofore to make castings of these dimensions in sections and it is considered something of an accomplishment to have successfully made a casting of this character under these conditions. The casting is a hopper for one of the blast furnaces of the Northwestern Iron Company at Mayville, Wis.

The Dutcher plant was acquired by the Prime Steel



A Blast Furnace Hopper Ring Cast in One Piece by the Prime Steel Company, Milwaukee, Wis.

Company last fall, since which time approximately $100,000 has been spent in improvements and additions. The foundry now has a capacity of 120 tons daily. There are two open hearth furnaces, each of 15 tons capacity. The main casting floor has been increased by an addition 80 x 130 ft., making the length of this building 400 ft. A further extension is contemplated in the near future. This building is served by two electric traveling cranes, one of 20 tons capacity, and one of 25 tons capacity, each equipped with a 10-ton auxiliary hoist. A Brown hoist yard crane with magnet attachment handles the material in and out of the yard. A pattern shop and pattern storage building have been added, together with a large and complete core room. It is also proposed to extend the chipping room in the near future.

The Michigan Stove Company, Detroit, Mich., states that the report recently published that its capital stock had been increased to $3,000,000 is not correct. The capital stock of the company has been $3,000,000 for nearly 10 years, being divided into $1,500,000 preferred and $1,500,000 common. Some weeks ago an increase was made in the preferred stock to $1,600,000. The increased amount was issued from the company's surplus, and is in the hands of the treasurer, and the main object in issuing it was to give some of the company's reliable men in the office and responsible departments an interest in the business. Some of the stock will be issued to them. The present capital stock of the company is, therefore, $3,100,000, of which $1,600,000 is preferred and $1,500,000 common.

Trade Publications

Oil Burning Equipment.—Tate, Jones & Co., Inc., Empire Building, Pittsburgh, Pa. Circular No. 1029. Calls attention to the latest development which has taken place in the manufacture of oil burning equipments for open hearth furnaces. The line manufactured and illustrated includes a water-cooled and a swinging burner for open hearth furnaces and a ladle drying and heating burner. The swinging type is the one ordinarily employed, but where the space between the furnaces is so limited as to prevent its use the water-cooled one is used instead.

Automobiles.—The Stevens-Duryea Company, Chicopee Falls, Mass. Catalogue. Illustrates the complete line of motor cars for 1910 built by this company. The special features of these cars—the unit power plant, three-point suspension and the patent multiple disk clutch—are all described at some length. Practically all the parts entering into the construction of these cars are illustrated and there are a number of illustrations of the different models. Space is also given to a brief illustrated description of the testing department where the engines are tested. This was described in *The Iron Age* September 23, 1909.

Reinforced Concrete Construction.—Turner Construction Company, 11 Broadway, New York. Pamphlet. Contains a classified list of the contracts for reinforced concrete structures which have been recently completed by this company. They include general manufacturing buildings, warehouses, mills, offices, lofts, stores, cold storage plants, stables and garages, power houses, stairs, reservoirs and tanks, foundations and retaining walls, and a number of miscellaneous structures. Among the last are included bank vaults, chemical laboratories, a coal hoist tower, machine shop, a pipe tunnel, a school, a tenement house, and a small bridge between two existing buildings.

Hose.—New York Belting & Packing Company, Ltd., 91 Chambers street, New York. Catalogue M H. Devoted to Magic hose. This hose was originally designed for garden use but it is now made in a number of different sizes for water, air drill and pneumatic tool use. The tube of this hose is seamless rubber reinforced with one or more layers of tightly braided yarn with a layer of rubber between each braiding and covered by a seamless cover reinforced in some cases with wire or a woven metallic jacket.

Throttle Valves.—The Watson-Stillman Company, 190 Fulton street, New York. Catalogue No. 80. Refers to the Chambers locomotive throttle valve, which was designed by a superintendent of motive power to overcome the objections encountered in the older designs. These valves are made in two standard types, which differ only in the connection to the dry pipe, one being intended for use where the throttle stem enters above the center line of the dry pipe and the other where it enters below. The special features of these valves are described and this description is supplemented by illustrations of the various parts. Some of the advantages claimed for this valve are that inspections can be made without removing parts or breaking steam joints, no lost motion in the operating mechanism, ease of operation, a greatly reduced number of parts and a greater number of parts standardized for all types and sizes of locomotives.

Steel Castings.—The Penn Steel Casting & Machine Company, Chester, Pa. Catalogue. Size 7 x 10 in.; pages 84. Contains a number of illustrations descriptive of the general line of work done, which includes gun mounts and gun carriage parts, propeller wheels, rudders, stern posts, frames and miscellaneous castings entering into marine construction, stockless and old style anchors, high pressure pipe and fittings, valves and cylinders, gearing, rolls and general machinery castings, locomotive and general railroad castings, and electrical and miscellaneous castings. A brief description of the different castings appears under each illustration and in addition there are a number of views showing the plant where this work is done.

Counting Instruments.—The Shaeffer & Budenberg Mfg. Company, 963 Kent avenue, Brooklyn, N. Y. Bulletin. Covers the counters, engine registers and speed indicators made by this company. The instruments illustrated include counters in square and round cases for registering the motion of engines or other moving parts where the counter is directly attached, electric counters intended to be mounted at a distance from the machinery, counters for cars, hoists and ropeways, can and loom counters, and a device for measuring the output of paper machines. Space is also given to speed indicators and pocket revolution counters.

Bar Iron and Sheets.—The Zug Iron & Steel Company, Pittsburgh, Pa. Catalogue. Size 4 x 6½ in.; pages 54. Contains trade names and definitions of the various brands of high grade iron manufactured by this company under the trade name of Sable, notes on iron and steel and black sheets, and tests. A classification of the extras on iron and steel and tables of the weights and areas of different sizes of bar iron are included.

Metallic Filament Lamps and Meter Testing Rheostats.—The General Electric Company, Schenectady, N. Y. Two bulletins. No. 4739 describes the G. E. Mazda incandescent lamp, which has an improved tungsten filament and gives a high efficiency. The bulletin describes the lamp in detail and illustrates the various sizes of this type of lamp for use on multiple circuits. Tables showing the cost of operation and life, effect of voltage variation on candle power and the relative costs of lighting with various lamps to secure equal illumination are included. Space is also given to the reflectors necessary to give the best results. No. 4744 is concerned with a meter testing rheostat designed to supply an artificial load for making the periodical calibration of service wattmeters. Switches are provided whereby the load can be varied from ½ ampere to the full load rating of the rheostat in ½-ampere steps. Two sizes of rheostat are made, the capacities being 15 and 30 amperes respectively.

Smoke Preventer.—G. H. Scharf Company, Ypsilanti, Mich. Catalogue. Illustrations and descriptive matter explain the operation of the Scharf automatic smoke preventer and fuel economizer, which is said to be automatic in action, easy to operate, economical in the use of fuel, and reliable. This device is operated by the opening of the fire door for firing and gives a strong draft for the new fire. The smoke preventer is shown alone and in combination with a boiler, and there are a number of views of plants where it has been installed.

Die Grinder.—The Geometric Tool Company, New Haven, Conn. Pamphlet. Deals with the Geometric chaser or die grinder, said to be adapted for grinding any make of thread chaser or tap-formed die. The vise in which the work to be ground is held is mounted universally, and the adjustments provided are such that the die or chaser may be ground square or to any radius according to its shape and whether it is right or left hand. A second grinding wheel is provided for tool grinding.

Pulverizing and Crushing Machinery.—The Jeffrey Mfg. Company, Columbus, Ohio. Catalogue No. 31C. Shows the Jeffrey pulverizers, alfalfa mills, shredders and roll crushers. Specifications and descriptions of these machines are included, and these are illustrated by photographic views and drawings. The latest models of the Jeffrey swing hammer pulverizer for crushing limestone, gypsum, shale, slate, phosphate rock, fireclay, kaolin and run of mine coal are also illustrated and described. In a number of cases the various parts entering into the construction of the machines are shown as well as the complete machines themselves. A partial list of users of these machines is given, together with the number used and the character of the material they handle.

Second-Hand Electrical and Steam Machinery.—John A. Stewart Electric Company, First National Bank Building, Cincinnati, Ohio. Special list of new and second-hand electrical and steam machinery, which is offered for immediate delivery. The lines listed include alternating and direct-current generators, in direct-connected, belted or coupled models, rotary converters, alternating and direct-current motors, steam turbines, Corliss and automatic engines, boilers, condensers, transformers and circuit breakers.

Analytical Instruments for Gases.—The Carb-Ox Company, Rogers Park, Chicago, Ill. Pamphlet. Describes and illustrates a line of gas analysis instruments and gas sampling apparatus designed for use in connection with the analysis instruments. An automatic recorder for recording and indicating the draft, the presence of carbon dioxide and automatically analyzing flue gases and recording the percentage of dioxide present is also described. Other specialties to which space is given include an automatic gas calorimeter designed for indicating or recording or both, an automatic damper regulator, a differential draft gauge, and an apparatus for testing lubricating oils.

Forges, Blowers and Drills.—The Canedy-Otto Mfg. Company, Chicago Heights, Ill. Price-list No. 9. Illustrates a line of steel forges for all classes of work handled by blacksmiths, wagon, plow, railroad, boiler, tin and small repair shops, and forge blowers designed to be mounted either on a column or bench and operated by either a crank or lever. The line of drills includes a large number of different sizes and styles, from single-geared hand-feed drill handling ½-in. bits to a large 20-in. power operated upright drill. The illustrations are supplemented by brief descriptions and a list of repair parts is included.

Blowers.—The Piqua Blower Company, Piqua, Ohio. Catalogue. Deals with a line of positive blowers built with two impellers which are exact duplicates and perform the same amount of work. Two styles of blower are built, one which is designed for blast pressures of 32 oz. per square inch and continuous duty and the other for service requiring a blast pressure of 16 oz. or less and intermittent duty. These two types are illustrated and described and tables giving the principal dimensions are appended. A number of other blowers which are modifications of these two general designs are also shown.

Contractors' Supplies.—Al. H. Hoffman, 327 Hutton Building, Spokane, Wash. Monthly bulletin and circulars. These relate to contractors', railroad, mine and building supplies and equipment, such as steam shovels, locomotives, buckets, concrete mixers and a preparation for removing carbon from the cylinders, valves and pistons of gas engines without any injurious effect.

Molding Machines.—Henry E. Pridmore, Nineteenth and Rockwell streets, Chicago, Ill. Catalogue No. 7. Size 7¼ x 7¾

in.; pages 54. Calls attention to the adaptability of the Pridmore molding machines for the production of automobile castings. The molds used in the production of the different castings are illustrated as well as the machines making them. A partial list of manufacturers of automobiles operating their own foundries and jobbing founders making a specialty of this class of work who use these machines is appended.

Air Compressors. — Ingersoll-Rand Company, 11 Broadway, New York City. Forms Nos. 3006 and 3023. The former gives general description and specifications for the class O duplex steam-driven air compressor, whose distinctive features are massiveness, powerful construction and simplicity of design. The other pamphlet is devoted to a special type of the class O compressor which is known as the OC class and is driven by a Corliss engine. The illustrations include the compressors themselves and the different parts entering into their construction.

Vacuum Cleaners.—The Connersville Blower Company, Connersville, Ind. Bulletin A-V. Describes a new automatic valveless residential unit for vacuum cleaning in which a novel arrangement has been devised for disposing of the dust after it has been collected. This is so arranged that all the air drawn into the pipes is filtered through water, thus separating the dust from the entrained air and leaving it in solution until it is flushed into the sewer. This filtering water is automatically replaced every time the mechanism is started and is flushed out each time it is stopped. This device can be installed anywhere in the building, the preferred one being the basement of a residence or small building, while in larger buildings it is possible to intall units having a capacity of one or two sweepers on different floors. The connection to the sewer for disposing of the dust is the same as that used for any ordinary plumbing fixture.

Foundry Heating Systems.—The Green Fuel Economizer Company, Matteawan, N. Y. Pamphlet. Contains detailed descriptions of two installations recently made by this company at the foundry of the Waterbury Castings Company, Waterbury, Conn., and the plant of the Abendroth & Root Mfg. Company, Newburgh, N. Y. In the former the space to be heated was approximately 515,000 cu. ft., and the side walls were almost entirely glass. The arrangement of the ducts which supplied the heat just where it was needed by the workman while at the same time furnishing them with fresh air and forcing the smoke and gases out of the building through the skylight, is also described. *The Iron Age*, January 27, 1910, and October 22, 1908, contained illustrated descriptions of these two installations.

Sand Rammers.—Ingersoll-Rand Company, 11 Broadway, New York. Bulletin No. 8108. Concerned with the Crown bench and floor sand rammers for foundry and concrete work, which are operated by compressed air. Special advantages claimed are economy, low cost of production, large output and high quality of the work. The construction of the rammer is described and illustrated by sectional views. A table showing the saving produced by the sand rammer over hand ramming for a number of different sizes of copes is appended.

Vacuum Cleaners and Air Compressors.—The Blaisdell Machinery Company, Bradford, Pa. Six bulletins. Refers to the rotary one and two sweeper outfits, which are designed for location in the basement or the cellar of a house and are connected with the upper floors by a standpipe or riser, outlets being provided on each floor for the connection of the hose and cleaning tools, a high vacuum portable cleaner of one-sweeper capacity and a portable vacuum cleaning plant mounted on a wagon. Practically all the different types of a large and varied line of air compressors are illustrated and tables of dimensions are appended. *The Iron Age*, February 15, 1906, contained an illustrated description of the Blaisdell self-oiling air compressor.

Boilers.—Parker Boiler Company, Pennsylvania Building, Philadelphia, Pa. Booklet. Points out the advantages of the Parker down-flow boiler, in which the water and the steam move downward or in a direction opposite to that of the flame and hot gases of the furnace, so that the hottest particles of each are in communication and the minimum difference of temperature exists between the adjacent particles of the two. Illustrations of a number of plants where these boilers have been installed are given, as well as the various parts of the boiler itself, and a number of test reports are appended.

Machinery and Supplies.—Contractors' Supply & Equipment Company, 1645 Wazee street, Denver, Colo. Catalogue. Deals with a wide line of contractors' machinery, tools and supplies. It is very complete and covers practically everything required from the smallest machine part to equipment for a complete plant. One of the special machines handled is the Callahan-Walton drag line excavator, for doing all sorts of excavation. This machine is built entirely of steel and has an average capacity of 1200 cu. yd per working day of 10 hours.

Air Compressors.—The American Well Works, Aurora, Ill. Bulletin No. 115. Illustrations and descriptive matter explain the operation of the American air compressors, which are built in a number of different sizes and styles in both horizontal and vertical models. In the horizontal models the compressor is driven by a steam engine mounted on the same base with it, while the vertical models are arranged for belt, gear or steam engine drive. One of the latter is a mountain-transport air compressor constructed in sections and specially designed for mule-back transportation, the heaviest piece weighing less than 200 lb. In addition, this company makes a portable steam-driven air compressor which is mounted on a wagon frame together with the engine and boiler. Space is given to a special application of the air compressor, the air-lift system for raising water or oil from wells by compressed air, and to accessories, such as an air receiver and an unloader for maintaining a constant receiver pressure.

Shaft Hangers and Belting.—Corbett Supply Company, 143 North Warren street, Trenton, N. J. Folder and circular. The former deals with the Cortay adjustable ball and socket hanger for shafting, ball and socket pillow block and adjustable post hanger. These three types are illustrated and tables are given of the different sizes carried in stock for various diameters of shaft. The other treats of Dick's Balata belting, for which this company is a selling agent.

Milling Machines for Automobile and Motor Manufacturers.—The Ingersoll Milling Machine Company, Rockford, Ill. Two bulletins. No. 18-C illustrates and describes the design of a line of fixed rail automobile multiple-spindle milling machines built especially for manufacturers of automobiles and their parts. The machines shown include a 24-in. three-head model, a 30-in. four-head model and a 24-in. duplex three-spindle machine used for milling the ends of four-cylinder *en bloc* castings as a duplex machine and as a three-head machine for completing all the remaining operations. No. 19-C shows the machines described in the other bulletin in actual use and the illustrations are of actual operations.

Turbine Pumps. — The Watson-Stillman Company, 190 Fulton street, New York City. Mailing card. Devoted to the Watson-Stillman twin volute turbine pump for house tank service and sump drainage. These pumps are designed for supplying water to elevated tanks in private houses, apartments, country residences and factory buildings, where a demand exists for a pump that is simple, needs no skilled labor for operating, is not likely to get out of order, will not consume an abnormal amount of power, and will operate silently. A turbine pump is said to fulfill all these requirements. The illustrations include two horizontal models having capacities of 25 and 150 gal. per minute, a 1-in. single-stage vertical submerged sump pump, and an automatic switch for maintaining the level in the supply tank between fixed limits.

Engraving.—A. Mugford, Inc., 30 Union place, Hartford, Conn. Booklet, 3¾ x 9 in., entitled "A Buyer's Catachism." With questions and answers and typical illustrations it covers the subject of engravings of various kinds, such as wood, wax, line (zinc and copper) and half-tones, explaining the special suitability of each and the kind of copy necessary for their making. In conclusion there is a brief statement concerning the firm, its organization and facilities and the fact that it makes a specialty of manufacturers' catalogues and booklets, particularly in the mechanical line. The concern now maintains sales offices and art departments in New York and Syracuse, N. Y., a complete art and engraving department at Worcester, Mass., and a complete plant at Hartford, Conn., for making engravings and for printing.

The Kempsmith Mfg. Company's New Plant

All of the contracts have now been awarded for the construction of the new plant of the Kempsmith Mfg. Company at Forty-fifth avenue and Rogers street, West Allis, Wis. A spur track from the Chicago & Northwestern Railroad has been completed to the site of the buildings. Ground was broken last week, and the company now expects to have these works in operation by November 1.

There will be four buildings. The initial dimensions of the main structure will be 200 x 250 ft., with a wing 100 x 100 ft., and later it will be extended to 500 ft. in length. It will be of saw tooth construction, concrete foundation and floor, and brick walls. The pattern shop is a separate building, 50 x 90 ft., absolutely fireproof. The power plant, 50 x 100 ft., also fireproof, will contain two 100-hp. boilers and a 200-hp. Corliss engine, direct connected to a 150-kw. generator. The office building will be 40 x 60 ft., two stories and basement, brick and faced stone. All new equipment needed in this plant has been contracted for.

The Wickwire Steel Company, Buffalo, N. Y., is building a 400-ft. extension to the concrete ore dock at its plant on the Niagara River, to provide ore unloading facilities for the new furnace B, which is rapidly nearing completion. With the new addition the company's ore dock will be 1000 ft. in length.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—
Bar Iron from store—

Refined Iron:
1 to 1⅝ in. round and square ..... ₰ lb 1.90¢
1½ to 4 in. x ⅜ to 1 in ..... "
1½ to 4 in. x ½ to 5-16 ..... 2.10¢
Rods—⅝ and 11-16 round and square ..... ₰ lb 2.10¢

Angles:
3 in. x 1¼ in. and larger ..... 1.90¢
3 in. x 3-16 in. and ⅛ in. ..... 1.95¢
1½ to 2½ in. x ⅛ in. ..... 1.95¢
1½ to 2½ in. x 3-16 in. and thicker ..... 1.90¢
1 to 1¼ in. x 3-16 in. ..... 2.00¢
1 to 1¼ x ¼ in. ..... 2.00¢
⅞ x ¼ in. ..... 2.00¢
⅝ x ¼ in. ..... 2.00¢
⅝ x ⅛ in. ..... 2.05¢
½ x 3-32 in. ..... 1.95¢

Tees:
1 in. ..... 2.05¢
1¼ in. ..... 1.95¢
1½ to 2 x ¼ in. ..... 1.95¢
1½ to 2½ x 3-16 in. ..... 2.05¢
3 in. and larger ..... 1.95¢

Beams ..... 2.10¢
Channels, 3 in. and larger ..... 2.10¢
Bands—1½ to 6 x 5-16 to No. 8 ..... 2.10¢
"Burden's Best" Iron, base price ..... 1.95¢
Burden's "H. B. & S." Iron, base price ..... 2.95¢
Norway Bars ..... 3.60¢

Merchant Steel from Store—

Per lb.
Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.20¢@2.50¢
Best Cast Steel, base price in small lots ..... 7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₰ lb 2.90¢	3.00¢
Nos. 18 to 21	₰ lb 2.95¢	3.05¢
Nos. 22 and 24	₰ lb 3.05¢	3.15¢
No. 26	₰ lb 3.10¢	3.30¢
No. 28	₰ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₰ lb 12 @14½
Patent Planished, W. Dewees Wood ..... ₰ lb A, 10¢; B, 9½ net

Galvanized.

Nos. 14 to 16 ..... ₰ lb 3.20¢
Nos. 22 to 24 ..... ₰ lb 3.35¢
No. 26 ..... ₰ lb 3.45¢
No. 28 ..... ₰ lb 3.60¢
No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—
Galvanized.

Nos. 22 and 24 ..... ₰ lb 5.45¢
No. 26 ..... ₰ lb 6.25¢
Nos. 28 ..... ₰ lb 7.50¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₰ 100 sq. ft. $3.85	4.80
No. 26	₰ 100 sq. ft. 3.30	4.00
No. 28	₰ 100 sq. ft. 2.90	3.75

Tin Plates—
American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 ..... $5.35
IX, 14 x 20 ..... 7.00
A. 1 Charcoal:
IC, 14 x 20 ..... $5.40
IX, 14 x 20 ..... 6.50
American Coke Plates—Bessemer—
IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40
American Terne Plates—
IC, 20 x 28 with an 8 lb. coating $8.50
IX, 20 x 28 with an 8 lb. coating 10.50

Seamless Brass Tubes—
List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—
List November 13, 1908. Base price 18¢

Copper Tubes—
List November 13, 1908. Base price 32¢

Brazed Brass Tubes—
List August 1, 1908. 19½¢ ₰ lb

High Brass Rods—
List August 1, 1908. 14½¢ ₰ lb

Roll and Sheet Brass—
List August 1, 1908. 14½¢ ₰ lb

Brass Wire—
List August 1, 1908. 14½¢ ₰ lb

Copper Wire—
Base Price, Carload lots mill 14 ¢

Copper Sheets—
Sheet Copper Hot Rolled, 16 oz. (quantity lots) ₰ lb 18 ¢
Sheet Copper Cold Rolled, 1¢ ₰ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ ₰ square foot.
Sheet Copper Polished over 20 in. wide, 2¢ ₰ square foot.
Planished Copper, 1¢ ₰ square foot more than Polished.

METALS—
Tin—

Straits Pig ..... ₰ lb 34⅜@35¼¢

Copper—

Lake Ingot ..... ₰ lb 14⅜@15 ¢
Electrolytic ..... ₰ lb 14⅜@15 ¢
Casting ..... ₰ lb 14¼@14½¢

Spelter—

Western ..... ₰ lb 6¼@6½¢

Zinc.

No. 9, base, casks ..... ₰ lb 8 ¢ | Open ..... ₰ lb 8½¢

Lead.

American Pig ..... ₰ lb 5 @5¼¢
Bar ..... ₰ lb 6⅜@6⅝¢

Solder.

½ x ½, guaranteed ..... ₰ lb 22 @22½¢
No. 1 ..... ₰ lb 19 @19½¢
Refined ..... ₰ lb 17½@17¾¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₰ lb @9.10¢
Hoyt's ..... @10¢
Other Brands ..... @9½¢

Bismuth—

Per lb. $2.00@$2.25

Aluminum—

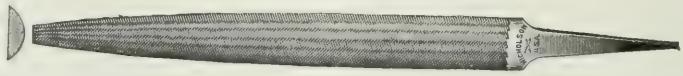
No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 34¢
Remelt Aluminum Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₰ lb 10.25@10.50
Copper, Heavy and Wire	₰ lb 10.00@10.25
Copper, Light and Bottoms	₰ lb 9.00@9.25
Brass, Heavy	₰ lb 6.75@7.00
Brass, Light	₰ lb 5.50@5.75
Heavy Machine Composition	₰ lb 9.25@9.50
Clean Brass Turnings	₰ lb 6.75@7.00
Composition Turnings	₰ lb 8.00@8.25
Lead, Heavy	₰ lb @3.50
Lead, Tea	₰ lb @3.25
Zinc Scrap	₰ lb @5.75

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THE IRON AGE

Established 1855 — New York, July 21, 1910 — Vol. 86: No. 3

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Wire Prices Adjusted

Otherwise Finished Products Are Unchanged

Quietness in All Markets—Advance for Puddlers and Other Iron Rolling Mill Workers

The announcement of the $1.70 basis for wire nails and $1.50 for plain wire in the past week does not represent a $3 per ton reduction, as has been stated in some quarters, but rather amounts to a formal notification that on the new basis buyers may safely contract for a time. Prices recently current have been in some cases within $1 a ton of the new figures.

Both as to prices and new demand iron and steel markets show no measurable change in the past week. The operation of the mills is generally close to the rate maintained in June. Expectations of a buying movement are now centering about late September. The policy of the railroads to buy on the most sparing scale is making more impression on the general situation as the summer advances. Yet it does not appear that the mills are making any aggressive campaign for new business. Enlargement of plant has been so general, that with a good many mills operating on a 75 per cent. basis no important producer has been found attempting to assert a special title to the full employment of all its capacity.

Structural work is one of the mainstays of the steel trade, and all the important fabricating plants have work that will carry them well into the fall. The Quebec bridge, calling for 60,000 to 70,000 tons, will come up formally September 1, and there are indications of sharp international competition involving at least German, British and American works. Tariff concessions have been asked on the material required.

Export business holds up well. A recent contract taken by the leading interest is 3000 tons of structural steel for a coal handling plant at Rio Janeiro.

Gas and oil pipe line inquiry continues heavy. Portland, Maine, is close to a decision on its large water pipe contract, which will mean either 20,000 tons of cast iron pipe or 10,000 tons of riveted steel pipe.

An agreement was reached this week between the Republic Iron & Steel Company and the Amalgamated Association on the wage scale for the coming year. Puddlers will receive $6.12½ on a 1.45c. card, which represents an advance of 50c. from the 1909 basis. On busheling the advances range from 7½c. to 37½c. a ton. To finishers the increases are from 3½ to 4.7 per cent.

Open hearth steel billets have shared in the decline in Bessemer steel, and are now on a $26, Pittsburgh, basis.

Pig iron buying shows some further shrinkage; the volume has been too small, indeed, to affect prices. Here and there foundries seek to contract for deliveries extending into 1911 at to-day's level, but producers hold back. In Virginia iron some business has been done at $13.50, and Alabama iron for prompt shipment has sold in a small way at $11.25 for No. 2; but consumers are not convinced that the decline has gone its full length.

On two lots of steel making iron bought in the Cincinnati district—5000 to 6000 tons of basic and 3000 to 4000 tons of Bessemer—new low prices are reported.

Coke is more active, and several long time contracts have been closed, the price on one large transaction in foundry coke being slightly below $2.25, at oven. Curtailment in coke output has gone far enough to make the market a trifle firmer.

Though 60 lake freighters have been out of commission since independent owners decided to tie up 20 per cent. of the tonnage for 30 days, there are still a good many more boats than cargoes. The effort of some blast furnacemen to have portions of their ore contracts carried over to 1911 have not been successful thus far.

In metals, pig tin has caused some commotion. Under remarkable buying, amounting to 700 tons in New York, the price has advanced in the week from 32.67½c. to 33.25c., and speculators for the rise are evidently aiming at higher prices, as no important arrivals are expected before August 1. Copper has declined to 12.25c. for electrolytic and a 12c. market is freely predicted.

The Decline in Iron and Steel Prices

The formal and general reduction in the price of wire products in the past week and the published comments upon it bring up the whole question of the readjustment in iron and steel prices that has been under way for some time. The impression conveyed by some of these comments is that what has happened in the finished steel market in the past few weeks represents abrupt and radical declines in price. This is not the case. It is true that the disparity between steel making capacity and the volume of new buying in finished products has become more marked in the past three months than in the first quarter of the year. The whole industry may be said to be working closer to-day, and has been so working, in fact, since it became well established early in the year that a stocking up process had been going on and that we had not come, so soon after the depression of 1907 and 1908, to a consumption of 31,500,000 tons of pig iron in a year. It is very clear now that in the buying movement of the fall of 1909 many consumers placed orders with the double purpose of making sure of material as needed and of protecting themselves against possible advances in prices. Time has been needed to digest the steel taken up in that broad movement and it is not to be expected that it will be repeated in kind or in degree this year. Meantime the contraction of demand will naturally be attended by some recession in prices.

It will be of interest to show the relation of prices now prevailing for pig iron, steel billets and representative forms of finished material with the high points of 1907, the low points of 1909 following the declaration of an open market on steel products in February of last year, and the high points of the early months of this year. The comparison is made in the following table:

Comparison of Prices of Iron and Steel Products in 1907, 1909 and 1910.

	High, 1907.	Low, 1909.	High, 1910.	July 20, 1910.
Bessemer pig iron, Valleys	$23.28	$14.58	$19.00	$15.50
Basic pig iron, Valleys	23.00	14.12	16.87	14.50
Southern No. 2 fdry iron, Cinti.	26.00	14.25	17.25	14.75
Bessemer billets, Pittsburgh	30.00	22.00	27.50	25.00
Plates, Pittsburgh	1.70c.	1.10c.	1.55c.	1.40c.
Structural shapes, Pittsburgh	1.70c.	1.10c.	1.55c.	1.40c.
Steel bars, Pittsburgh	1.60c.	1.05c.	1.50c.	1.45c.
Sheets, 28 gauge, Pittsburgh	2.55c.	2.10c.	2.40c.	2.30c.
Tin plates, Pittsburgh	$3.85	$3.45	$3.60	$3.60
Plain wire, Pittsburgh	1.90	1.40	1.65	1.50

The Bessemer and basic pig iron prices in the first three columns are monthly averages and represent the highest monthly average in 1907 and 1910 and the lowest monthly average in 1909. It should be noted also that the prices given in the third column as the highest for 1910 were also the highest for the movement of the second half of 1909, except in the cases of Southern iron and basic iron. The former reached $17.75 at Cincinnati for prompt delivery in December, 1909, and the latter reached $17.25 at valley furnace in the same month. With these exceptions all the products named entered 1910 at the high point of the buying movement that culminated in the latter part of last year.

In general it will be seen that present prices are between the low points of 1909 and the high points of late 1909 and early 1910. Pig iron has come much closer to the low points of last year than have finished materials. The latter have receded only moderately from the high level to which the heavy buying of 1909 carried them; though it is to be said in this connection that the bulk of the deliveries on finished materials in the eight months of 1909 following April were at prices averaging considerably less than those of to-day.

Raw material costs and labor costs to-day are higher than the average for 1909, so that with all the economies the various steel companies mastered last year, they could not stand any material reduction in the prices of their products without a noticeable shrinkage in earnings. What stands out prominently in the table we have given is that thus far the inroad upon prices indicates no serious struggle for tonnage. The record of the market in recent weeks has been to the same effect. The situation is quite different from that which brought out the low prices of 1909. And the chief significance of this difference is that to-day, with 12 months of unparalleled consumption behind them, steel manufacturers are not dealing with a market that waits for the stimulation of price reductions. Whatever differences of opinion there may still be as to the price policy of 1908 and 1909, it is plain that in the second half of 1910 iron and steel prices will be largely controlled by developments from without rather than from within the trade.

Safeguarding Shop Environments

An interesting object lesson in the necessity of making a very thorough investigation in the selection of a manufacturing location is afforded by the experience of an important enterprise which proposed to establish its plant near an Eastern city. The company purchased land in an industrial suburb, and prepared plans for a large factory, the initial unit of

which would employ 800 men, with expectations of an early increase. Some work had been done on the site before it was discovered that the atmosphere of the neighborhood was polluted by the operations of a rendering company. Desiring to proceed with its plans as prepared, the manufacturing company has appealed to the State Board of Health, asking for the abatement of the nuisance. The statement made to the board is an illuminating exposition of the danger of installing the most approved hygienic equipment where the environments are unwholesome, as shown by the following paragraphs taken from it:

As we would like to have our employees working under the very best conditions, we have paid special attention to the ventilating system in laying out the plans for our factory, and these plans include the equipping of our new works with large ventilating towers in which the incoming air will be cooled down in summer by means of refrigerating plants, and the air in the entire works will be changed eight or ten times an hour during summer, and four or five times per hour during winter. Without going further into the matter, we think you will readily see that the odor at present pervading the atmosphere about our plant would fill our works with foul instead of fresh air, so that working conditions would be impossible.

In view of the foregoing, our Board of Directors has decided to stop all work on the erection of our factory on this property and not to proceed with such work until we have a positive assurance from your board that the present conditions above complained of will be remedied—otherwise we will have to look around for a more suitable location for our works.

In all cities, but more particularly in their outlying districts, there are some processes conducted with accompaniments which approach the limits of the obnoxious. The modern industrial plant, with its splendid equipment designed to promote the health and increase the comfort of employees, should be hemmed in by no such nuisance. One of the first steps in the planning should certainly be a searching scrutiny of the surrounding territory.

Disreputable Ingenuity

It seems almost incredible that manufacturers of good standing will stoop to seriously fraudulent practices for the purpose of increasing their profits. Most flagrant instances of this character have recently been exposed by the Commissioner of Weights and Measures of New York City. For some time the city authorities have been unusually zealous in looking after the interests of consumers, especially the great body of people who are obliged to make their purchases in small quantities. It has been found necessary to adopt the most stringent regulations for the protection of retail buyers who have for a long time been imposed upon by the use of weights and measures which diminish the quantity presumed to be purchased. The commissioner has discovered that much ingenuity has been exercised in the manufacture of scales for the purpose of defrauding the consumer. Exceedingly clever arrangements have been devised by which the consumer has been cheated, the indicator in his view showing him to be getting full weight.

The worst feature about this matter is that the dealers who are using the fraudulent scales have not themselves originated nor suggested the methods by which the cheating has been perpetrated. It is alleged by them that certain manufacturers of scales have invented the peculiar constructions used for this purpose. The salesmen of such manufacturers have for years been canvassing the retail merchants and have induced them to adopt these methods of cheating. The object in doing this has been to secure greater profits in the sale of scales. A higher price has been realized for them by reason of the fact that such ingenious methods of deception have been incorporated in their construction. The merchants have paid well for the scales because the salesmen have shown how the profits realized on the shorter weights would quickly pay for the increased cost and be a steady source of remuneration thereafter.

The sale of these fraudulent weights and measures has undoubtedly been large in other parts of the country. The evil practice should receive such a thorough airing that honest manufacturers will be benefited. Many manufacturers of scales and other weighing and measuring devices are known to be thoroughly honorable and above resorting to such devious methods of increasing their profits.

The Sales Engineer and His Duties

The sales engineer is one of the latest institutions of the machine tool industry. His work is not new; it is to act with the selling force, notably with the dealers and their representatives in the field. The machinery manufacturer has always realized to a greater or less degree the necessity of active co-operation on the part of the practical engineering staff of his establishment with the sales end of the business. The sales engineer is the development of a better understanding of the advantages of a specialization in this department commensurate with the degree of specialization in the product of his house and in the methods of manufacturing of its customers.

The sales engineer holds himself in readiness for the call of the selling corps. He supplies the technical and practical knowledge which the customer may require in selecting equipment, especially where the expenditure of large sums of money is involved, and where the proposed venture goes beyond the machinery practice with which the user is familiar. The salesman often finds it difficult to prove to a buyer the economies of manufacture or the improvement in product which new equipment would effect, though the argument be based on facts and should be convincing. The technical engineer supplies the detailed information which may be the deciding factor of the negotiations. If a machine is purchased or is installed on trial, his expert knowledge is brought into play in the training of the men who are to operate it and who are to supervise its use. He stands to prevent the bad results which may follow the placing of a good tool in the hands of unskillful or prejudiced hands. Not only is his function one of high importance in selling machinery, but he also does much to reduce that not insignificant item of costs, the investigation of complaints and the correction of troubles. These often breed the indirect losses which come from unfavorable criticism founded upon the avoidable failure of an individual installation.

One Effect of Padded Inventories

Professional accountants observe a growing tendency on the part of manufacturing firms or close corporations, as distinguished from the larger stock companies, to eliminate the padding of inventories with old buildings and machinery of little actual worth, thus

enabling them to determine more accurately the true condition of their properties. The effect on the machinery market of this adherence to a better standard of factory accounting than in former years—a tendency which also manifests itself in other directions—cannot fail in the long run to be beneficial. Instances are known in which plants have suffered considerably from the lack of badly needed equipment because the inventories showed an apparent abundance of tools and the directors, located away from the works, could not see the necessity for buying more of the same kind. The padding of inventories has done much harm in many ways, but this is one result that has gone beyond the walls of the establishment to be felt by the general trade.

The Iron Age Index

The index to Volume 85 of *The Iron Age*, January 1 to June 30, 1910, has been compiled and printed and will be mailed to subscribers applying for it. A list of those who have received the index heretofore is kept in this office, and to all such the latest one will be mailed without notice from them. Additional names will be put upon this list on request.

Correspondence

Blast Furnace Results with Nature's Dry Air

To the Editor: In the June number of *Metallurgical and Chemical Engineering* appeared a letter by R. H. Sweetser giving some of the results of the work of the east furnace of the Columbus Iron & Steel Company, Columbus, Ohio, for the six months ending March 31, 1910. Mr. Sweetser's contention is that none of the dry blast furnaces have done any better, as far as known to him, than this furnace, and the general implication is that the dry blast is not necessary in such work.

This implication is essentially unfair. Mr. Sweetser has chosen the six months which covered what old residents of Ohio admit to be the longest, steadiest and most severe winter within the recollection of any one now living, the result being that he had the benefit of dry blast produced by nature without cost to him. And it is an interesting fact that in spite of his disbelief in the dry blast, Mr. Sweetser has a most excellent set of air inlet pipes to his blowing engines, which extend out of doors and turn down with a huge inverted funnel on the bottom, giving him outside air and effectually preventing the entrance of any suspended moisture. Therefore the natural outside air which nature supplied to all during the last winter was received by Mr. Sweetser's engines in its natural condition, not polluted with any moisture from the engine room as is so often the case.

In order to confirm the statement made above as to the natural dryness of the air during the six months in question, the records of the Columbus Weather Bureau were obtained, and the humidity for the six months ending with March as thus shown is given here in pounds of moisture per 1000 cu. ft.:

October	0.378	January	0.195
November	0.407	February	0.163
December	0.168	March	0.33

Average for the six months, 0.273.

The average for the six months is 1.9 grains per cubic foot in the more ordinary unit, and is as low as operators of dry blast plants aim to carry their humidity. In December, when Mr. Sweetser did his best month's work, the humidity was, in grains per cubic foot, 1.2, corresponding to an average dew point of about 22 degrees F. lower than it is commercially practicable to carry the blast with dry blast plants ordinarily.

Under the circumstances there does not seem to be any reason why Mr. Sweetser should not have obtained about the same results that the dry blast furnaces do, and this is apparently about what he has done, as the furnaces on dry blast at South Chicago, right on the lake shore, were running on about 1950 lb. of coke in the middle of last summer.

Mr. Sweetser is evidently proud of the tonnage produced by his furnace, which went to 9000 tons during one of the months in question, on a 55 per cent. ore mixture, but this tonnage will not seem remarkable to those who are familiar with the recent work of the No. 2 furnace of the Republic Iron & Steel Company at Thomas, which made 8992 tons of foundry (not basic) iron in May, with a 39 per cent. yield of ore, making 3100 lb. of slag per ton of iron. This furnace is 18 ft. in the bosh and 12 ft. in the hearth, the same as Mr. Sweetser's, the hight being 90 ft. This, if it is an advantage at all, does not more than offset the much greater hardness and irreducibility of the red ore, which constituted three-fourths of its burden, as against the softness and greater reducibility of the Mesaba ore, which constitutes 70 per cent. of Mr. Sweetser's burden. The coke consumption was naturally much higher than Mr. Sweetser's, on account of the irreducibility of the ore and the great slag volume, and particularly on account of the humidity, which averaged about 0.9 for the month. In December, when the humidity was about 0.35, the coke consumption was several hundred pounds lower, and if the same rate of driving had been attained during that month as was attained in May, the tonnage would have been far larger.

If this coming autumn Mr. Sweetser will report the records of the six months ending September 30, it will be very easy to determine whether his excellent work was caused by the dry blast provided by nature or whether he has some secret of producing such results without the aid of the dry blast.

The critical temperature and available heat charts published by Johnson several years ago indicate that for the current six months Mr. Sweetser's coke consumption, other things being equal, will be about 300 lb. per ton of iron higher. It will be very interesting to be able to compare the actual with the theoretical results, if Mr. Sweetser will give us the data to do so.

J. J. S.

New Toughness Tests in Tool Steels

To the Editor: In an article in *The Iron Age* of June 9, page 1398, the writer hopefully ventured to express the belief that although absolute hardness figures—that is, figures that not only place steels in their proper order of hardness, as does the Brinell test, but that also give the hardness ratios of these different steels correctly, as the Brinell test does not—were not strictly a necessity and could well be dispensed with, yet those who desired such figures could probably find them, either in elastic limits or in bend hardness figures—pounds per square inch necessary to produce a permanent bend (or break) with supports distanced in proportion to thickness of test piece. But he wishes to say now that actual trial has shown that both these guesses were very wild ones indeed. When the bend hardness of a 0.10 carbon steel is compared with the bend hardness of a quenched and untempered high carbon steel, and we find the latter but a fraction of the former, all idea that this bend test expresses hardness is of course rudely dispelled, and we see at once that what the test really shows is what the Shore test shows (except statically instead of dynamically), and that is hardness and brittleness together, but in low carbon steels principally the former, and in very hard steels principally the latter.

But this discovery was after all the reverse of a

disappointment, for a static toughness test is, we think, more valuable than an absolute hardness test. The latter is, in fact, of no value that we can see, and to us it seems that it is rather an advantage of the Brinell test that it gives us exaggerated ratios of hardness, as it therefore shows up plainer small differences in hardness—works like a microscope, so to speak. Our bend hardness test, therefore, in showing static toughness is more valuable to us than if it showed the absolute hardness we expected it to show, and a detailed description of it seems to us worth while. We proceed as follows:

If the strip of plate to be tested is 0.09 in. thick, the supports are distanced 3 in. apart, and in any other thickness of test piece this distance is altered proportionately. Three inches (in a 0.09 in. strip) are marked off on the piece, the dimensions taken at the middle, and the surface edge of this 3 in. of the piece used as a rule to draw a lead pencil line on a sheet of paper. The piece is then laid upon the supports in the proper position and pressure applied, 20 lb. at a time, by a Riehlé machine, until comparison with the lead pencil line shows that the piece has acquired a bend. The number of pounds per square inch required to produce this bend (or break) is divided by the number required in the case of a standard 0.10 carbon test piece, and this result is set down as "bend hardness." The static hardness, also in terms of the 0.10 carbon standard, is then found by the Brinell test, and the percentage the bend hardness is of the static hardness gives us the "static toughness" figure. The "dynamic toughness" figure is found in exactly the same way, except that the Shore test is substituted for the bend test.

The underlying theory in both cases is this: The Brinell figure (the writer's figure—the number of times the sample is harder than a standard 0.10 carbon piece) does not represent all hardness, but hardness plus exaggerated ratio error. The Shore figure (also in terms of the 0.10 carbon standard) or the bend figure each represents hardness diminished by brittleness. Now, if there was no such thing as the exaggerated ratio error in the Brinell test and no such thing as brittleness in the steel, the Shore hardness and the bend hardness would both agree with the Brinell hardness. That is, they would each be 100 per cent. of the Brinell hardness. If instead of this we find they are only, say, 20 per cent. of the Brinell hardness, that means that the steel is 20 per cent. toughness (and 20 is taken as the toughness figure) and the other 80 per cent. is exaggerated ratio error and brittleness. Now, the exaggerated ratio error is greater in proportion in high than in low carbon steels. Consequently this error in the hardness operates to give precisely a similar error in the toughness figure.

That is, although steels are placed in their right order as regards toughness, the ratios will be exaggerated ones—the brittler steels will not be so much brittler as the toughness figures indicate. But this, as in the hardness figures, is not a serious matter and does not destroy the usefulness of the test.

GEORGE AUCHY.

FACONY PHILADELPHIA, July 12, 1910.

The Thomas Steel Company, Niles, Ohio, is building an addition to its plant involving an expenditure of about $50,000. A new building, 70 x 250 ft., is being erected for use as a stock room for sheet bars. This will be equipped with a shear capable of cutting three sheet bars at a time, furnished by the United Engineering & Foundry Company, Pittsburgh, and a 15-ton crane built by the Pawling & Harnischfeger Company, Milwaukee, Wis. The McClintic-Marshall Construction Company has the contract for the building. Because of the construction work the plant was shut down June 30. Operations, however, were resumed in full July 18.

Raw Material Supplies of the Western Steel Corporation

The second cargo of iron ore and pig iron from China for the Western Steel Corporation's blast furnace and steel works plant at Irondale, Wash., leaves Hankow this month by the steamer Netherlee. Under the contract with the Han-Yeh-Ping Iron & Coal Company, which operates the Hanyang Iron & Steel Works at Hankow, China, a cargo will be sent each month for two years, after which the fleet will be increased so that three cargoes a month will be taken. The first cargo, which was unloaded at Irondale early this month, consisted of 5000 tons of Tayeh ore and 1400 tons of basic pig iron.

The Western Steel Corporation's domestic and Canadian sources of raw material, as described by the management, are stated by a Seattle newspaper to be the following: Thirty mineral claims, 1500 acres, on Quatsino Sound, Vancouver Island. Bog iron ore is delivered at the furnace at Irondale for $2 per ton, including duty. Magnetite deposits on Barclay Sound and Pitt Island, British Columbia. Same cost at furnace. Ashford coal properties at Ashford, Pierce County, 1400 acres under 99-year lease, 600 acres under 21-year lease. On Graham Island, British Columbia, 20,500 acres of coal lands. Limestone quarry in Skagit County.

It is stated that two open hearth furnaces at Irondale are now in operation and a third is under construction and that a plant will be built for the manufacture of horse shoes.

The Automobile Engineers' Convention

The Society of Automobile Engineers has issued the programme for its convention which is to be held at the Hotel Tuller, Detroit, Mich., July 28, 29 and 30. The programme is a long one, providing for the presentation of numerous papers and presenting a wide range of subjects for discussion. Among the papers named are the following:

"The Specification and Heat Treatment of Automobile Materials," by Henry Souther.

"Variation of Current Density in Anti-Friction Bearings," by D. F. Graham.

"The Pyrometer: Its Development and Use," by W. H. Bristol.

"Testing the Hardness of Metals," by A. F. Stanley and G. McCombs.

Report of Committee on Gear Steels, by Dr. H. W. Sargent, chairman.

"How to Make Gears Quiet by Grinding," by A. Ward.

"Seamless Steel Tubes and the Necessity for Standardization in Their Specifications," by H. S. Wilson.

"Slide, Rotary and Piston Valves versus Poppet Valves for Gas Engine Service," by Eugene P. Batzell.

"Test Data Upon Sheet Metal Frame Stresses," by A. Smith.

The Engineers' Society of Western Pennsylvania, on invitation of officials of the Department of Public Works, Bureau of Construction of the City of Pittsburgh, the Dravo Contracting Company and the Friday Contracting Company made a visit of inspection July 16 to the Twenty-second street bridge now being built over the Monongahela River at Pittsburgh and the new concrete arch bridge being erected over Negley Run at Meadow street, Pittsburgh. The construction work at both these bridges presented features of unusual interest to engineers.

The improvements made to the Blandon Rolling Mill, Blandon, near Reading, Pa., have been completed and the mill has been put into operation again, making skelp iron.

The plant of the American Sheet & Tin Plate Company, at Muncie, Ind., is being overhauled and additional machinery placed.

Peace in the Buck's-Gompers Case

Cincinnati advices state that representatives of the Buck's Stove & Range Company of St. Louis, President Samuel Gompers of the American Federation of Labor, and representatives of the several unions having workmen at that company's plant reached an agreement on Tuesday on the case which resulted in the sentence to jail of President Gompers, John Mitchell and Frank Morrison for contempt. William H. Cribben and Thomas J. Hogan represented the company.

By the terms of the agreement, the union men say that their representatives will go to St. Louis to confer with the employers of their men within 30 days and that then the hours of labor, wages and conditions of employment will be considered.

The Buck's Stove & Range Company, through its representatives at this conference, "agrees to withdraw its attorneys from any case now pending in the courts which has grown out of the dispute between the American Federation of Labor and any of its affiliated organizations on the one hand and the Buck's Stove & Range Company on the other, and that the said company will not bring any proceedings in the courts against any individual or organizations growing out of past controversies between said company and organized labor."

Mr. Gompers states that this agreement does not alter the case against him which is now before the Supreme Court of the United States.

Labor Notes

The bi-monthly settlement of the puddling and finishing scales was made in Pittsburgh last week. The price for puddling for July and August will be based on a 1.45 cent card rate for bar iron, giving $6.12½ per ton to the puddlers employed in the bar iron mills that have signed the new Amalgamated scale. Mills that have not signed the Amalgamated scale, including those in the Western Bar Iron Association, will pay the old rate of $5.62½ for puddling until a settlement of the scale is reached. None of the bar iron mills of the Republic Iron & Steel Company is running at present.

The following have signed the wage scales of the Amalgamated Association for the coming year:

Whitaker Glessner Company, Wheeling, W. Va., and Martin's Ferry, Ohio.
National Enameling & Stamping Company, Granite City, Ill., and St. Louis, Mo.
American Rolling Mill Company, Middletown, Ohio.
Carnahan Tin Plate & Sheet Company, Canton, Ohio.
Newport Rolling Mill Company, Newport, Ky.
Pope Tin Plate Company, Steubenville, Ohio.
Atlanta Tin Plate & Sheet Mill, Atlanta, Ga.
Follansbee Brothers Company, Follansbee, W. Va.
Empire Iron & Steel Company, Niles, Ohio.
Thomas Steel Company, Niles, Ohio.
De Forest Sheet & Tin Plate Company, Niles, Ohio.
Zug Iron & Steel Company, Pittsburgh, Pa.
Youngstown Roofing Company, Youngstown, Ohio.
N. & G. Taylor Company, Cumberland, Md.
Top Mill Sheet Mill, Wheeling, W. Va.
Licking Rolling Mill Company, Covington, Ky.
Joliet Iron Products Company, Joliet, Ill.
Texas Rolling Mill Company, Fort Worth, Texas.
Cleveland Hardware Company, Cleveland, Ohio.
Judson Mfg. Company, Oakland, Cal.

The Van Camp Hardware & Iron Company, Indianapolis, Ind., has increased its capital stock to $400,000. Three new stockholders have been admitted—George S. Winders, sales manager for the company, and J. A. Schlueter and A. R. Dewey, who have been connected for many years with a large iron and hardware house in Louisville. The addition of $100,000 to the capital stock was made necessary by the increased business. The company was organized in 1876 and has grown steadily. Beginning in a building with 12,000 ft. of floor space, changes were made at intervals to larger buildings until it reached its present eight-story home, with nine acres of floor space, built in 1906. It is one of the largest buildings in the country occupied exclusively for the hardware and iron business. The company also maintains 11 warehouses.

Lehigh Valley Freight Rates on Coal

Considerable interest has been aroused in Pennsylvania in regard to a possible test of the powers of the State Railroad Commission as a result of the notice given to the commission by the Lehigh Valley Railroad Company that it is not its purpose to comply with a recommendation of the commission that it readjust its rates for transportation of coal in the Lehigh Valley. This is the first instance wherein a railroad company has declined to accede to a recommendation of the commission, which has passed upon scores of cases involving rates charged by railroads for hauling coal, ore, iron and steel products and various manufactures. It is taken to mean that the commission will invoke the aid of the Attorney-General's department, which, under section 17 of the act of May 31, 1907, it is empowered to do through the Secretary of Internal Affairs.

The recommendation came after a complaint which attracted unusual attention. The Coplay Cement Mfg. Company protested against being compelled to pay 90 cents a ton for a haulage of coal about 21½ miles, setting forth that steel companies, foundry companies and other corporations having plants situated at a greater distance from the mines were not proportionately charged by the Lehigh Valley Railroad Company. The company replied that it was acting in a manner to enable it to supply its customers and to maintain competition with other manufacturing districts. The commission set this aside and contended that the section of the State constitution prohibiting discrimination in charges was being violated The commission will shortly meet to consider the matter.

A Decision on Moa Iron Mining Claims in Cuba

In the litigation between McLoughlin Brothers, New York, and the Juragua Iron Company (Bethlehem Steel Company), the Supreme Court of Cuba has recently given a decision in favor of the former, affirming their title to 11 mining claims of about 1100 hectares in the Moa district of northern Cuba. The claims are adjacent to the coast at the Bay of Moa, and the ore they contain is said to be the characteristic iron ore of the Moa district, low in phosphorus and sulphur. The amount of ore involved in this litigation is unknown, as there has been no thorough exploration. The original suit was begun by McLoughlin Brothers to enforce their "derecho de tanteo," or the right given under the Spanish law by which a partner has preference over an outsider in the purchase of a partner's interest. Under it a partner, within nine days after a conveyance to an outsider of any interest in the common property is filed by another partner, may deposit in court the purchase price, together with security for expenses of transfer, and may have the property deeded to him instead of to the outside purchaser. The above mentioned case passed from the court of first instance to the intermediate court and finally to the Supreme Court, the decision being uniformly in favor of the plaintiff's contention.

Charles A. Bookwalter, receiver of the Technical Institute, Indianapolis, Ind., has sent out letters announcing the usual fall term for the machinists' and molders' schools and the departments of lithography, printing and pharmacy. Ninety students are now attending the summer term of these schools.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July 20, 1910.	July 13, 1910.	June 22, 1910.	July 21, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.25*	$16.25	$16.50	$16.50
Foundry No. 2, Southern, Cincinnati	14.75	14.75	14.75	15.75
Foundry No. 2, local, Chicago	*16.50*	16.50	16.75	17.00
Basic, delivered, eastern Pa.	*15.75*	15.75	16.00	16.00
Basic, Valley furnace	14.50	14.50	14.50	15.00
Bessemer, Pittsburgh	16.40	16.40	16.40	16.40
Gray forge, Pittsburgh	*14.40*	14.40	14.90	14.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	25.00	25.00	25.00	24.00
Forging billets, Pittsburgh	*30.00*	30.00	31.00	28.00
Open hearth billets, Philadelphia	28.50	28.50	28.50	25.50
Wire rods, Pittsburgh	*29.00*	29.00	31.00	29.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	*13.00*	13.00	14.00	14.50
Steel rails, melting, Philadelphia	*14.00*	14.25	14.50	16.00
Iron rails, Chicago	*16.75*	16.75	17.00	17.00
Iron rails, Philadelphia	*18.50*	19.00	19.50	19.50
Car wheels, Chicago	*14.75*	14.75	15.50	16.00
Car wheels, Philadelphia	*14.00*	14.50	15.00	15.00
Heavy steel scrap, Pittsburgh	*14.50*	14.50	15.00	16.00
Heavy steel scrap, Chicago	*12.25*	12.25	13.00	14.00
Heavy steel scrap, Philadelphia	*14.00*	14.25	14.50	16.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.45*	1.47½	1.47½	1.45
Common iron bars, Chicago	*1.40*	1.40	1.45	1.35
Common iron bars, Pittsburgh	1.50	1.50	1.50	1.45
Steel bars, tidewater, New York	1.61	1.61	1.61	1.46
Steel bars, Pittsburgh	*1.45*	1.45	1.45	1.30
Tank plates, tidewater, New York	*1.56*	1.56	1.61	1.51
Tank plates, Pittsburgh	*1.40*	1.40	1.45	1.35
Beams, tidewater, New York	*1.56*	1.56	1.61	1.51
Beams, Pittsburgh	*1.40*	1.40	1.45	1.35
Angles, tidewater, New York	*1.56*	1.56	1.61	1.51
Angles, Pittsburgh	*1.40*	1.40	1.45	1.35
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.35
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.45
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.30*	2.30	2.40	2.20
Wire nails, Pittsburgh*	*1.70*	1.80	1.80	1.70
Cut nails, Pittsburgh	*1.65*	1.70	1.75	1.70
Barb wire, galv., Pittsburgh*	*2.00*	2.10	2.10	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.62½*	12.62½	12.75	13.50
Electrolytic copper, New York	*12.25*	12.37½	12.50	13.00
Spelter, New York	**5.20**	5.20	5.15	5.35
Spelter, St. Louis	**5.05**	5.05	5.00	5.27½
Lead, New York	**4.40**	4.40	4.37½	4.35
Lead, St. Louis	**4.25**	4.25	4.22½	4.20
Tin, New York	**33.25**	32.65	32.60	29.00
Antimony, Hallett, New York	*8.00*	8.12½	8.12½	7.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.55c., net; H-beams over 8 in., 1.65c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.50c., net; angles, over 6 in., 1.55c., net; angles, 3 x 3 in., and up, less than ¼ in., 1.65c., base, half extras, steel bar card; tees, 3 in. and up, 1.55c., net; zees, 3 in. and up, 1.50c., net; angles, channels and tees, under 3 in., 1.40c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.75c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates. Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.60c.; Nos. 17 to 21, 2.75c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3.10c.; No. 27, 3.20c.; No. 28, 3.40c.; No. 29, 3.50c.; No. 30, 3.75c. Painted roofing sheets, No. 28, $1.70 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	
⅜ in.	71	55	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
3½ to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, July 20, 1910. (*By Telegraph.*)

Pig Iron.—The only important transaction of the week was the purchase by a Kentucky steel interest of about 5000 tons of basic iron for remainder of the year delivery from Columbus, Ohio, furnaces and 3000 to 4000 tons of Bessemer for the same delivery from Ashland, Ky., furnaces. Prices paid are not disclosed, but are known to be low. The general pig iron market is quiet, with little new inquiry. Consumers seem to be waiting for still lower prices, in spite of the fact that to-day's figures on pig iron are below cost to furnaces that buy their ore and coke. We quote standard Bessemer iron at $15.50; basic, $14.50; malleable Bessemer $14.75; No. 2 foundry, $14.25, and gray forge, $13.50, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90 cents a ton.

Steel.—Not much inquiry is in the market, the continued decline in prices of steel in the past few months causing buyers to hold off in the belief that the market may go still lower. We quote Bessemer billets, 4 x 4 in., $25; Bessemer sheet bars in random lengths, $26; 4 x 4 in. open hearth billets, $26 to $26.50; open hearth small billets, $27 to $27.50; open hearth sheet and tin bars, $27 to $27.50, and forging billets, $30 to $31, all f.o.b. Pittsburgh, Wheeling or Youngstown district, with freight to point of delivery added.

(*By Mail.*)

Nothing of special moment has developed in the iron trade within the past week, the whole market being quiet and without special feature. The main disturbing factor in the situation is the pig iron market, which continues heavy, the output being considerably in excess of consumption, while prices are weak. The nominal price of Bessemer iron is $15.50 at Valley furnace, but very little business is offering. Basic iron is also weak, and reports are that $14.25 at Valley furnace, or very close to that figure, has been done. The steel market is dull and on a firm offer open hearth billets could be bought at $26, Pittsburgh. For several weeks prices on finished material have shown a declining tendency, and the reduction of $2 a ton made on wire products, effective from July 13, was the natural result of cutting in prices, and was done to put the wire market on a more stable basis. Structural material, tin plate and lap weld sizes of pipe are the most active items on the whole list of finished iron and steel, but other materials, such as sheets, wire products, small sizes of pipe and scrap and coke are dull, with prices tending downward. An official reduction in price of sheets, to meet the competition of the aggressive mills that has been going on for some time, may possibly be made within a short time. Buyers at present are pursuing a very conservative policy in making purchases, and are confining orders almost entirely to small lots to cover actual needs, but it is believed that early in September, if not before that time, there will be a better demand. The favorable crop reports of the past week are expected to have a decisive influence in bringing this about.

Ferromanganese.—The market is practically bare of new inquiries, and prices on the whole are weak. We quote 80 per cent. foreign, for delivery over the remainder of this year, at $39 to $39.50, Baltimore, the freight rate to Pittsburgh being $1.90 a ton.

Ferrosilicon.—There is little new inquiry, consumers being covered for a considerable period ahead. Prices are only fairly strong. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh. We quote 10 per cent. at $23; 11 per cent., $24, and 12 per cent., $25, all at Ashland furnace, to which $1.90 a ton should be added for delivery in the Pittsburgh district.

Rods.—Effective July 13, the leading makers of rods made a reduction of $2 a ton, putting Bessemer, open hearth and chain rods at $29, Pittsburgh. The Jones & Laughlin Steel Company has about completed the building of its new rod mill at Aliquippa and is now a factor in the rod market and actively seeking contracts. It is probable that this new mill, which will have a daily capacity of about 300 tons, will be put in operation not later than August 15. We quote Bessemer, open hearth and chain rods at $29, Pittsburgh.

Skelp.—Owing to recent heavy inquiry and the shutdown of a number of puddling furnaces in the Central West on account of the puddling scale not being settled, there is a decided scarcity in grooved and sheared iron plates, and mills that are in position to furnish these are asking higher prices. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—Reports that the Carnegie Steel Company had taken a contract for 1000 tons of standard sections for the Baltimore & Ohio Railroad are officially denied. The company has taken a good deal of business in the past week in light rails, entering new orders for considerably over 5000 tons and also receiving excellent specifications against contracts. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 to 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Structural Material.—The biggest job in the market at present is the Quebec Bridge, bids for which are to be opened September 1. It is probable that both leading local fabricating interests will bid on this work, which will take 60,000 to 70,000 tons. New inquiries in the local structural trade are numerous, and one local fabricator is so well filled up with work that it has recently returned four or five signed contracts, being unable to make the deliveries wanted by its customers. We quote beams and channels up to 15 in. at 1.40c. to 1.45c., f.o.b. Pittsburgh.

Plates.—The American Shipbuilding Company has taken a contract for a 10,000-ton bulk freighter to replace the steamer Frank H. Goodyear, which was lost in a collision on Lake Huron some months ago. The new boat is to be ready for spring trade. The Toledo Shipbuilding Company is assembling material for a new ferry steamer for the Ann Arbor Railroad. The plates and shapes for these two boats, 6000 to 7000 tons, will probably be rolled by the Carnegie Steel Company. The Baltimore & Ohio Railroad has placed an order with the Pressed Steel Car Company for 1000 steel gondola cars. The latter company is now making deliveries at the rate of four or five a day of steel passenger cars for the Interborough Company, New York City, the order calling for 175 cars of this type. The inquiry for steel cars is very light. A number of railroads have recalled inquiries and are holding off placing orders until the political situation is clearer, and crop reports are more reassuring. However, the leading mills are pretty well filled up for the next few months, and are running to nearly full capacity. We quote ¼-in. and heavier plates at 1.40c. to 1.45c., Pittsburgh.

Sheets.—A process of liquidation is going on in the sheet trade. Most of the mills are cutting prices on light gauge black sheets about $3 a ton, and on galvanized sheets about $4 a ton to jobbers, which concessions in turn are given to their customers. This is being done to allow both the sheet mills and jobbers to work off the heavy stocks they now have on hand. These cuts may possibly lead to a readjustment in prices of sheets later on, but nothing official as to this has been given out. The demand for blue annealed and electrical sheets keeps up well, and on these grades the mills are quite busy. Regular prices on sheets, which, however, do not now represent the actual market, are based on 2.40c. for No. 28 black and 3.50c. for No. 30.

Tin Plate.—The tin plate trade is in splendid condition, the new demand being fairly large, while consumers are specifying actively against their contracts. The vegetable canneries expect to use more tin cans this season than ever before in the history of the tin plate trade. Heavy demands are being made on the mills for shipments, and consumers of tin plate are not able to get it as fast as needed. Prices are very firm, and we continue to quote on the basis of $3.60 for 100 lb. cokes per base box f.o.b., Pittsburgh.

Bars.—Several of the leading steel bar mills state that specifications are already coming in on the contracts placed by implement makers and wagon builders in the latter part of May and early in June. The Republic Iron & Steel Company is having a conference to-day with the Amalgamated Association on the puddling scale and a settlement may possibly be reached. As yet no agreement has been made on the puddling and finishing scales between the Western Bar Iron Association and the Amalgamated Association, but another conference will very likely be held soon after the meeting with the Republic Iron & Steel Company has been concluded. A good many puddling plants in the Central West are closed down pending settlement of the wage scale. The demand for iron bars is only fair, and specifications against contracts are not being received at a very satisfactory rate. We quote steel bars at 1.45c. and iron bars at 1.50c., f.o.b., Pittsburgh.

Spelter.—Inquiry in the past week or two has been better, and prices are a shade firmer. We quote prime grades of Western at 5c. to 5.02½c., f.o.b. East St. Louis, equal to 5.12½c. and 5.15c., Pittsburgh.

Hoops and Bands. The new demand is only fair, but buyers are specifying quite liberally against contracts, some of which were made since July 1, and others that were held over from second quarter. We quote steel hoops for forward delivery at 1.50c. to 1.55c. and steel bands at 1.45c. to 1.50c., f.o.b. Pittsburgh, extras as per the steel bar card applying on the latter.

Spikes.—New buying of railroad spikes is confined almost exclusively to small lots for repair work, no large contracts for forward delivery having been placed in this market for some time. The demand for small railroad and boat spikes continues fairly active, and the makers are quite busy on these grades. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at 1.55c. to 1.60c. for Western shipment and 1.60c. to 1.65c. for local trade. Boat and small railroad spikes are lower in price and we quote these at 1.65c. to 1.70c., base, these prices being for carload and larger lots.

Rivets.—The demand, while only fair, is showing some improvement over June, while specifications on contracts are reported as coming in quite well. Official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but on desirable orders these prices are shaded.

Shafting.—The new demand is not so active as some time ago, but specifications on contracts, especially from the automobile builders, are quite heavy. The shafting makers have been able in the past month to catch up on deliveries to some extent, having been very much behind for some time. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of about 55 and 5 off.

Wire Products.—As a natural outcome in the cutting of prices in wire products that has been going on for some time, the leading makers announced a reduction of $2 a ton, effective from July 13, and as a result a good many contracts have been placed for wire nails and wire for shipment within 60 days from date of contract. It is believed that the demand, as a result of the reduction in price, will be more active on all kinds of wire products. We have reduced prices $2 a ton and now quote galvanized barb wire at $2; painted, $1.75; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails $1.65 to $1.70 in carload and larger lots, all f.o.b., Pittsburgh, freight to destination added.

Merchant Pipe.—No additional large contracts for line pipe have been placed since our last report, but several very heavy inquiries are in the market, and it is believed will develop into actual orders within a short time. The production of fuel oil in the California fields is enormous, and it is evident that a number of the producers there will have to build pipe lines to take care of their output. The demand for butt weld sizes continues light and has been for some months. Stocks of pipe held by the mills and by jobbers are still quite heavy. It is stated that discounts on both iron and steel pipe, printed on another page in this issue, are being fairly well maintained.

Boiler Tubes.—The demand for locomotive tubes has been quite active for some time, and the mills are pretty well filled up for several months. Merchant tubes are only in fair demand and discounts printed on a previous page are still more or less shaded.

Iron and Steel Scrap.—This material continues very quiet, with prices tending downward. A number of mills that are large users of scrap are still closed down pending settlement of the wage scales, and this is restricting consumption to a considerable extent. It is believed that the scrap trade will not show much improvement while the heavy stocks and low prices of pig iron continue to hang over the market. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.50 to $14.75
No. 1 foundry cast	14.25 to 14.50
No. 2 foundry cast	13.25 to 13.50
Bundled sheet scrap, at point of shipment	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.00 to 16.25
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	11.00 to 11.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	25.00 to 25.25
Steel car axles	21.00 to 21.25
Locomotive axles	26.00 to 26.25
No. 1 busheling scrap	13.00 to 13.25
No. 2 busheling scrap	9.00 to 9.25
Old car wheels	14.50 to 14.75
Sheet bar crop ends, shipping point	16.75 to 17.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	9.50 to 9.75

Coke.—The Westinghouse Electric & Mfg. Company closed last week on its inquiry of 12,000 to 15,000 tons of foundry coke for delivery over the remainder of the year, the price reported being a shade under $2.25 per net ton, at oven. Several other large inquiries for foundry coke are in the market, and considerable business for delivery over the last half of the year has been closed in this market recently. We quote best grades of furnace coke running under 1 per cent. in sulphur for delivery over last half of the year at $1.80 to $1.85, and best grades of 72-hour foundry coke at $2.15 up to $2.40 per net ton at oven for same delivery. Furnace coke loaded on cars which has to be moved is being offered at $1.65 to $1.70 for best grades.

Chicago

FISHER BUILDING, July 20, 1910. (*By Telegraph.*)

The market is quiet and featureless, as buyers have generally covered their requirements for some time ahead, and while there is some new business, the volume is not large. This is a natural condition of the market in July and does not indicate any notable weakness in conditions. General business on the whole is good through the West and agricultural conditions are far better from an average point of view than some of the market reports would indicate. The farmers, in fact, are so prosperous that they are buying for cash the greater portion of the output of the automobile industry, and the only crop advices that are really unfavorable are from the Northwest, where spring wheat is short. An indication of the course of general business is that the purchase of small lots of iron and steel from store continues on a very satisfactory basis. Individual orders are not so large as last winter, but there are more of these orders and they come from a broader field. The lack of car orders from the railroads has a depressing effect on the market for plates and structural shapes, but there is a good run of building contracts. Prices of wire products are weakening as a result of larger production rather than any drop in the demand. The nominal concessions that have been reported in black and galvanized sheets are merely a reversion to the prices at which most of the business done during the first half of the year was taken. Merchant mill products remain firm. There is a good run of new business in concrete bars as a result of which one of the hard steel bar mills in this district resumed operations Monday and another will resume next Monday. From a broad point of view the iron and steel business has become a buyers' market, not because of any notable decrease in consumption, but because production has increased to so great an extent in the past four years that the market is saturated during a year of large consumption. This has necessitated a readjustment to the prospect of smaller margins of profit in the production of iron and steel.

Pig Iron.—Allowing for the advance in wages last spring, Southern iron is now selling relatively lower than the lowest point touched in this market last year. Making the same allowance for the higher cost of Northern ore and labor, the Northern market is also relatively lower. There have been a few inquiries for delivery beyond January 1, and some Northern iron has been sold on terms running over into next year. The Southern interests are generally holding off on sales beyond the end of the year and are not making any aggressive effort to sell for last quarter. Meantime stocks are accumulating and the foundry and manufacturing interests are very indifferent regarding their requirements for the future so long as they are covered for three or four months. The enormous increase in furnace production and capacity may have the effect of bringing the pig iron market down for some time to a basis of buying for near delivery instead of the old custom of contracting for six months' or a year's requirements. There are scattering inquiries for 500-ton lots of malleable Bessemer and small lots are being sold right along, covering nearly all grades of Northern and Southern. The following prices are for July, August and September, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.00 to 16.50
North Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.60 to 16.10
Southern coke, No. 4	15.35 to 15.85
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	15.10 to 15.60
Southern mottled	14.85 to 15.35
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10	21.40 to 21.90

(*By Mail.*)

Billets.—There are only a few buyers in the Chicago district whose requirements run into any considerable tonnage, and their business is generally based on Pittsburgh prices. The mills in this district have not had billets to offer openly for a long time, but the Inland Steel Company may become a seller of billets when its two new open hearth furnaces

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come in. Construction on these furnaces has been delayed by the strike of the structural iron workers, but they are expected to be completed by August 1.

Rails and Track Supplies.—This is the quiet season of the year in rail orders, current business being represented by small orders by minor railroads. The market is a little weaker on track supplies, in sympathy with general conditions, but Chicago mills have had a heavy run of business this year. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.50; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—While the market for plain material has declined, there was a good run of structural business last week. The Minneapolis Steel & Machinery Company booked contracts for a church building at Boise, Idaho, and a bakery and some small bridges in Denver amounting to 250 tons. A contract for 250 tons of work for the Western Sugar Company, San Francisco, was taken by the Pacific Rolling Mill Company of that city. The Nicalaus Building at Sacramento, Cal., 190 tons, was taken by Millikin Brothers. The Athletic Club at Los Angeles, Cal., 2300 tons, was booked by the Llewellyn Iron Works. Buildings for the Kempsmith Machine Company, Milwaukee, Wis., 200 tons, will be erected by Heil & Company, Milwaukee. Contracts for buildings which will require 1400 tons, for the Oliver Chilled Plow Works, South Bend, Ind., were closed by the Indiana Bridge Company, Muncie, Ind. Prices are quoted $1 a ton lower on plain material. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.90c. to 2c., Chicago.

Plates.—The lack of inquiries from railroads for cars is having a weakening effect on the plate market, as car business furnishes the principal tonnage for the plate mills. Crop conditions in the West, however, will undoubtedly bring in new car business in the near future. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.90c. to 2c., Chicago.

Sheets.—The demand for blue annealed sheets is keeping up at a rate which holds prices firm, but the weakness in black and galvanized sheets is so persistent that the mill price quoted below is reduced 10c. this week on black sheets and 15c. on galvanized. The Inland Steel Company now has its full plant of 18 sheet mills in operation at Indiana Harbor. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.48c.; No. 28 galvanized, 3.53c. Prices from store, Chicago, are: No. 10 blue annealed, 2.20c. to 2.30c.; No. 28 black, 3c. to 3.10c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—Soft steel bars are now commanding a higher price in the market than plates or structural material. The mills are well covered with specifications for agricultural bars. Concrete construction is also keeping up in good demand for hard steel bars, on which the price is well maintained, although the raw material has gone off about $3 a ton since last winter. In bar iron the situation is quiet. There are inquiries in the market for over 10,000 tons, chiefly from railroads, but the mills hesitate to make contracts for the last half at current prices, which are based on scrap prices for early delivery. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago.

Rods and Wire.—Some of the daily papers have reported a reduction of 15c. in wire prices, but this is not confirmed from official sources. The official price, however, has become nominal and jobbing or industrial buyers who inquire for any considerable quantity can do 1.73c., Chicago, on annealed wire and 1.93c. on wire nails or painted barbed wire. Galvanized products usually take 30c. more than the plain material. The wire interests seem disposed to meet competition. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.73c.; wire nails, 1.93c.; painted barb wire, 1.93c.; galvanized, 2.23c., all Chicago.

Merchant Steel.—A very satisfactory feature of the market is the demand for merchant mill products from store. While the average order does not call for so large a quantity as last winter, the number of orders is larger and the business is not swelled now by distress purchases from the manufacturers who were short on deliveries from mill during the winter. The business at the present time is well distributed and covers practically every form of merchant steel.

Cast Iron Pipe.—The market is relatively quiet, the largest pending business being the items reported at Cheyenne, Wyo., 3000 tons, to be let this week. Decatur, Ill., is in the market for 500 tons. Waterloo, Wis., has awarded a letting of 375 tons to the Lynchburg Foundry Company, Lynchburg, Va. Railroad specifications are running light, but there is a fair amount of current business in gas pipe as well as small lots of water pipe. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for gas pipe.

Old Material.—Prices are generally very weak and dealers report the market dull. The rolling mills are booking very little new business for deferred deliveries and are therefor indifferent to the bargains offered them in wrought grades of scrap and other material for rolling mills. Steel scrap is also weak and dealers have trouble in placing their offerings excepting where they have old contracts. One of the local mills recently bought a round lot of rerolling rails at $15.85 delivered, the lowest price for this material since last summer. One of the leading railroads sold 1,000 tons of No. 1 wrought last week at $12.75, railroad malleable on the same list going at $11.50, long rails at $16, short rails at $13.50, and frogs, switches and guards at $13. These are better prices than dealers are able to get on new business and it is the general opinion that the material on which railroads have been getting better than market prices recently is being taken to cover old contracts with consumers. The large offerings by railroads in the past couple of months are not creating as much pressure on the market as might have been expected and it is believed that the dealers who have handled this large tonnage of material have generally protected themselves by contracts with their customers before submitting their bids to the railroads. One road sold 1000 tons of car wheels last week at $14.25 to $14.50, equal to $14.75 to $15 delivered. Another road is offering 1500 tons of old car wheels by special circular, bids to close this week. The car wheel foundries are generally carrying large stocks of old wheels and are not in the market except when forced to buy in order to protect their stocks. Malleable scrap is very hard to dispose of, but there is a fair demand for No. 1 cast. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.75 to $17.25
Old steel rails, rerolling	15.75 to 16.25
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.75 to 15.25
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.50 to $15.00
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.50 to 12.00
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	11.00 to 11.50
Steel axle turnings	9.00 to 9.50
Machine shop turnings	7.25 to 7.75
Cast and mixed borings	4.50 to 5.00
No. 1 busheling	10.50 to 11.00
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.25 to 11.50
Agricultural malleable	10.75 to 11.00
Pipes and flues	9.50 to 10.00

Philadelphia

PHILADELPHIA, PA., July 19, 1910.

Continued dullness characterizes the market in practically all lines, the trade showing but little interest in the situation and appearing satisfied to let business drift along pending further developments. There has been no movement worth mentioning in pig iron. Occasional moderate lots of foundry iron are sold at unchanged prices, but very little business has been done in the other grades. Weakness in prices of some classes of finished materials holds back business in those lines. Lower prices are being named for plates and shapes by some mills, particularly when competition is sharp, but consumers are waiting for the market to settle before placing business of any importance. Specifications on old orders, however, are coming out freely, as a rule, and enable mills to maintain about an even productive capacity. Considerable business in plates and shapes is being figured on, but under the circumstances it closes slowly. A very light demand for billets is reported. Sheets, however, show increasing activity at unchanged prices. Old material is quiet, with small transactions at somewhat lower prices.

Pig Iron.—Sales during the week have been small, neither buyer nor seller showing any marked interest in the market, which drifts along without any particular feature, both sides waiting further developments. The continued offerings of low price sellers, largely on the part of producers outside the territory, keep the market upset and make it difficult for others to maintain prices. Few of the furnaces in this territory show a willingness to meet quotations below $16.25,

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delivered, for No. 2 X foundry, for shipment during the last half, but that figure has been shaded. Some fair inquiry is still before the trade, and one consumer is in the market for a good sized lot for first half of 1911 shipment, on which the majority of producers refuse to quote. Few large lots for this year's delivery are to be noted, except for low grade iron, for which there has been some further demand on the part of the cast iron pipe foundries. That for some 5000 to 6000 tons, referred to last week, is understood to be still unclosed. In the higher foundry grades sales have been considerably scattered; aggregate sales of some 1200 to 1500 tons, covering different grades, to Baltimore, Md., foundries, are reported. In this immediate vicinity sales have been mostly in small lots and even these have, some sellers report, been fewer in number. Standard brands of Eastern Pennsylvania No. 2 X foundry are selling at $16.25 to $16.50, delivered in this vicinity, at which the majority of producers have prices pegged. Cast iron pipe foundries have purchased low grade iron at prices ranging from $15 to $15.25, delivered. Virginia No. 2 X foundry can be had at $13.50, furnace, for third quarter, and in some instances for last half delivery, although other sellers maintain a $13.75, furnace, basis for third quarter, at which prices scattered sales are reported. One sale of 300 tons of No. 2 X for second half delivery is reported at $14, furnace. Very little movement is to be noted in forge iron. A sale of a few hundred tons for rolling mill purposes was made last week at a shade under $15.50, delivered. The steel making grades are inactive. An inquiry for a few thousand tons of special basic is reported, but consumers in this territory show no interest in the market and sellers make no effort to force business. Standard low phosphorus iron has been sold in small lots at $22.50 to $23, delivered. This grade continues the strongest on the list. While the range of prices is practically unchanged, occasional transactions at concessions are reported, the following quotations, however, about represent the open market for standard brands delivered in buyers' yards in this vicinity:

Eastern Pennsylvania, No. 2 X foundry	$16.25 to $16.50
Eastern Pennsylvania, No. 2 plain	16.00 to 16.25
Virginia, No. 2 X foundry	16.25 to 16.75
Virginia, No. 2 plain	16.25 to 16.50
Gray forge	15.50
Basic	15.75
Standard low phosphorus	22.50 to 23.00

Ferromanganese.—Moderate inquiry from Western consumers is reported. In this territory, however, no fresh business has developed. Prices are nominally $39.50 to $40, Baltimore, for 80 per cent. ferro, although some sellers refuse to meet that level.

Billets.—The situation remains quiet. Very little demand beyond that for occasional small lots has developed in this district. The reported uncertainty in prices has not yet effected the situation in this territory, makers naming $28.50 to $29, delivered here, for ordinary open hearth rolling billets, and $31 to $32, at mill, for forging billets, the usual extras applying for high carbons and special sizes. Odd lots can probably be had at a concession, while it is intimated that a shade less might be done for desirable orders for large lots.

Plates.—Price uncertainties have influenced the market to some extent, and, while there is a fair volume of business from small and regular customers, usually at 1.60c. to 1.65c., delivered, for ordinary plates, this price has been shaded by some mills, and on a desirable order for several hundred tons and upward 1.55c. can be done. The larger buyers, however, are not placing business freely, awaiting a more stable price level. Specifications on orders in hand are reported as coming in very freely, so that mills have little difficulty in maintaining an even productive capacity. Current orders are largely of a miscellaneous character, although some fair business is being figured on.

Structural Material.—There has been no particular increase in the demand. Fresh inquiries are mostly of the smaller character, although several buildings in Baltimore, aggregating probably 1200 to 1500 tons, together with a fair amount of shapes for ship and bridge building, are being figured on. A very good run of specifications is reported by Eastern mills, a number of which still have considerable business on their books. Prices are not strong, and, while 1.60c. represents about the average for plain shapes delivered in this territory, 1.55c., delivered, can be done for desirable orders.

Sheets.—Mills accumulated sufficient orders during the recent suspension to enable them to start up at full capacity, and as a very satisfactory volume of day to day business continues to come out, makers in this territory take a rather optimistic view of the situation. Prices are unchanged and comparatively firm at the following range: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 and 26, 3c.; No. 27, 3.10c.; No. 28, 3.20c.

Bars.—The refined iron bar market is a shade weaker. The absence of any pronounced inquiry has made some mills more anxious for what little business there is offered, and prices are a trifle lower, 1.45c. to 1.55c. about representing the market for refined iron bars, delivered in this territory. Steel bars are unchanged, at 1.60c., delivered, mills being pretty well supplied with orders.

Coke.—The bulk of the business has been in the foundry grade, although there has been some inquiry for spot furnace coke. Prices are a trifle firmer, and some producers, being pretty well sold up, have practically withdrawn from the market. Standard foundry coke is quoted at $2.25 to $2.50, at ovens, furnace coke ranging from $1.65 to $1.85, at ovens, dependent on delivery. The following range represents quotations per net ton, delivered in buyers' yards in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—Consumers for the most part are pretty well supplied as to their near future scrap requirements and show little interest in the market. The few sales made recently have usually gone at somewhat easier prices. The associated mills will not offer over $14 for No. 1 heavy melting steel and $16 for No. 1 railroad wrought, but are making no important purchases. Outside interests would probably pay a shade more, but are not making purchases. The market has been bare of transactions in some grades and quotations continue largely nominal. The following range about represents bids and offers for deliveries in buyers' yards in this vicinity:

No. 1 steel scrap and crops	$14.00 to $14.25
Old steel rails, rerolling	15.75 to 16.25
Low phosphorus	19.25 to 19.75
Old steel axles	20.50 to 21.00
Old iron axles	26.50 to 27.50
Old iron rails	18.50 to 19.00
Old car wheels	14.00 to 15.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	14.00 to 14.50
No. 1 forge fire	12.50 to 13.00
No. 2 light iron	8.00 to 8.50
Wrought turnings	9.50 to 10.00
Cast borings	9.50 to 9.75
Machinery cast	15.00 to 15.50
Railroad malleable	14.00 to 14.50
Grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50

E. H. Wilson & Co., iron and steel merchants, have removed their offices from 411 Arcade Building to Room 917, in the same building.

Cleveland

CLEVELAND, OHIO, July 19, 1910.

Iron Ore.—About 60 lake boats have been taken out of commission since the independent vessel owners agreed to tie up 20 per cent. of their vessel capacity 30 days. The carrying capacity of these boats is more than 400,000 tons a trip. The ore movement continues quite heavy, but there are plenty of boats for the cargoes and more vessels will be tied up. The outlook in the lake trade shows no improvement and it is likely that the agreement to keep a portion of the boat capacity out of commission will be continued through August. In a few cases furnace companies that have bought more ore than they now expect they will need this season have asked that a portion of their tonnage be carried over until next year, but such requests are not being granted by the ore firms. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market continues very quiet, sales during the week being limited to small lots of 150 tons and under. While a few consumers who have had inquiries out are still holding off, the opinion prevails that the bulk of the foundry trade in this territory is covered for its requirements for the remainder of the year. There is a scattered inquiry from stove and agricultural implement makers for small lots of foundry iron for last half delivery. Two Akron, Ohio, makers of warm air furnaces have inquiries out for 1000 tons of No. 2 foundry, each for the first half of next year. Prices that are being quoted on these inquiries are about 50 cents a ton higher than last half prices. A maker of heating apparatus in Western Pennsylvania is in the market for 1000 tons for the last half. While one Cleveland interest has sold some foundry iron at $14 at furnace for outside shipment, underselling Valley furnaces, recent prices are being pretty well maintained for local delivery, although there have not been inquiries during the past two or three weeks of sufficient size to test the market. Two Valley interests that have recently been low sellers are now understood to be out of the market. There is little demand for Southern iron. A number of buyers in this market are holding off in the hope of getting lower prices than $11.50,

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Birmingham, for No. 2. For prompt shipment and the last half we quote, delivered, Cleveland, as follows:

Bessemer	$16.40
Northern foundry, No. 1	$15.65 to 15.90
Northern foundry, No. 2	15.15 to 15.40
Northern foundry, No. 3	14.65 to 14.90
Gray forge	14.15 to 14.40
Southern foundry, No. 2	15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—Foundry grades are slightly firmer. Owing to the fact that their output is pretty well sold up, some producers have advanced prices and others have withdrawn quotations. Foundry coke continues in fair demand, a number of contracts for the last half and an entire year having been placed during the week. Contracts for a full year are being made at last half prices. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment and $1.80 to $1.85 for the last half. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 for spot shipment and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—The demand in finished lines is only fairly active. The recent easing off in prices on plates and shapes has caused some buyers to hold off, thinking that prices may go lower and that other lines may be affected by the decline. The result of this is a tendency to buy in small lots for only immediate needs. Structural material is now being generally quoted at 1.40c., Pittsburgh, for round lots, the 1.45c. to 1.50c. price being maintained for small lots. Plates are generally quoted on the same basis. The Buffalo & Susquehanna Steamship Company has placed a contract with the American Shipbuilding Company for a lake freight boat for delivery next spring. The contract for the plates and shapes, about 3000 tons, has been placed with the Carnegie Steel Company. The contract for the new building for the Cleveland Athletic Club, requiring 1400 tons of steel, has been taken by the Forest City Steel & Iron Company of Cleveland. The contract for the steel has practically been placed. Steel bar specifications are good, but not much new business is coming out. Concessions have recently been made of $1 a ton in a few cases to the agricultural implement trade. The demand for iron bars continues light. The Union Rolling Mill Company, Cleveland, started up its plant July 18 on special steel bars, and will probably resume rolling iron bars next week. We quote iron bars at 1.40c. to 1.45c., Cleveland. While there is a fair demand for sheets, some of the smaller mills are in need of tonnage, and present price quotations are being shaded $3 a ton on black and $4 on galvanized. The demand for tin plate in this market has become quite active. Warehouse business with jobbers is only fair, orders being less numerous than during June.

Old Material.—The market is still very quiet and dealers do not look for much improvement during the next month. Prices remain weak, several grades being quoted from 25c. to 50c. a ton lower than last week. Mills have good stocks on hand and are not in the market for scrap except in small lots for immediate requirements. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.50 to $15.00
Old iron rails	16.50 to 17.00
Steel car axles	20.50 to 21.00
Heavy melting steel	13.00 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.50 to $22.00
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	6.75 to 7.25
No. 1 busheling	11.50 to 12.00
No. 1 railroad wrought	14.00 to 14.50
No. 1 cast	12.25 to 12.75
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, July 18, 1910.

While it is believed that a large tonnage of pig iron will be wanted to meet the requirements of mills and foundries in the Middle West for the remainder of the year, buyers show no urgency in placing contracts, owing to want of confidence in the market. In some cases foundrymen are short of molders and cannot run full. Reports of cancellations are made, together with a disposition by bankers to husband resources for the movement of the crops, resulting in slower payments by iron consumers. A seasonable demand for coke is reported. The metal market is fairly active and prices are ruling steady. A heavy demand for cement and reinforcement material is a feature reflecting active operations in construction. The outlook for a large fall business in building material is regarded as very promising by the leading distributers.

Coke.—A good business was done in coke the past week, though it is likely that some of it was worked at concessions. On the other hand, one of the leading brokers states that he cannot offer the Connellsville product, as the interests he represents in that field are out of the market, being heavily sold ahead. Virginia producers, however, seem to be anxious for contracts and some low prices were named. Among the sales reported was one of 1000 tons of foundry coke to a local foundry for shipment over a year; 1000 tons of by-product coke and 600 tons of Virginia foundry to an Illinois company, for shipment over a year. There is some irregularity in prices, depending on quantity, length of contract and the field making offers, the range being from $2 to $2.50, with most of the business being done at the inside figure, per net ton, f.o.b. oven.

Pig Iron.—A canvass of the offices brought only moderate indications of interest on the part of buyers in the pig iron market for the week. With some brokers there was little doing, and in case of a merchant seller, the remark was made that cancellations exceeded sales. One of the leading houses reported a sale of 1000 tons of foundry iron for shipment over the remainder of the year, with an inquiry for 800 tons of Southern foundry for the same shipment; miscellaneous country inquiries aggregated 500 tons, and for about the same number of tons from local parties. An inquiry is out from a stove manufacturer for 3000 tons. The sales of another broker aggregated 500 tons, and the following inquiries were received: 200 tons of analysis iron; 200 tons of No. 2 foundry; 1000 tons of malleable Bessemer; 300 tons of No. 2 foundry, all for shipment over the remainder of 1910. Some offices still quote $12, Birmingham, for No. 2 Southern foundry for shipment over the remainder of year; others are offering this iron for the same delivery at $11.50. Southern Ohio is held at $15, f.o.b. furnace. No offerings of 1911 iron are reported.

Old Material.—The demand for scrap iron and steel is very light. Stocks are smaller than at the corresponding time last year, notwithstanding railroad offerings have been larger, owing to the fact that the large dealers have been filling old sales. This has led to more or less business among the dealers and it is still a dealers' market, with no immediate prospect of much demand from consumers whose wants are known to be quite well supplied for the present. There were no railroad lists on the market the past week. Prices are fairly well maintained under existing circumstances, since but a few items in the list are quoted lower than our previous figures. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$15.00 to $15.50
Old steel rails, relaying	14.50 to 15.00
Old steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Tank plate	$14.00 to $14.50
Steel axles	21.00 to 21.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
Railway springs	14.50 to 15.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	6.00 to 6.50
No. 1 busheling	11.00 to 11.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.50 to 10.00
Pipes and flues	9.50 to 10.00
Railroad and tank scrap	8.50 to 9.00
Railroad grate bars	9.00 to 9.50
Machine shop turnings	8.50 to 9.00

The American Car & Foundry Company is advertising for bolt makers, axle turners, machinists and other mechanics.

The Big Niangus Hydro-Electric Company of Kansas City, Mo., has been incorporated. Capital stock, $50,000. Incorporators: R. E. Bremer, P. M. Bremer and H. M. Bremer.

The Crescent Forge & Shovel Company, Havana, Ill., certifies to an increase of capital stock from $75,000 to $100,000.

A new trunk line is assured to St. Louis, the Nashville, Chattanooga & St. Louis Railroad having arranged to enter the city over its own rails. It is proposed to construct a bridge across the Ohio River at Paducah, Ky., crossing to Metropolis, Ill. It is estimated that about two years will be required to build the bridge, which has already been passed upon by the Ohio River Commission.

The Commonwealth Steel Company is advertising for men for night shift, roughers, molders and laborers.

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The Hoyt Metal Company reports an excellent demand for finished metals.

St. Louis ranks fifth among 15 cities in fireproof buildings erected in 1909, the value totalling $22,422,929.

San Francisco

SAN FRANCISCO, CAL., July 13, 1910.

A quiet condition still prevails in the Pacific Coast market, though a little more business is being booked than at the beginning of the month, and the dullest period appears to be over. The lack of activity usual in the summer season is intensified by labor disturbances, and while a fully normal movement is expected during the fall no material change is likely during the next six weeks. Some improvement is noted in labor conditions at several points, nearly all the shops being in operation, though work now in progress is retarded, and there is some delay in the letting of new contracts. There has not yet been any tendency among consumers to place orders for distant delivery, and most of the small orders coming in can be readily filled from store. Most merchants are well supplied, and as it is possible to get prompt deliveries in several departments, they do not care to replenish their stocks on a large scale until later in the season. Fabricators in various lines in the interior of the State are comparatively busy, and the principal movement at present is in that direction. The demand for structural material shows some increase. Oil pipe remains dull, though inquiries for small merchant pipe are more numerous. Plates and sheets are moving more freely, and a fair tonnage of plates will be required for marine work. New vessels to be built on the Coast include two submarines for the Navy, at a cost of about $500,000 each, by the Union Iron Works, San Francisco, and a similar vessel to be built by the Moran Company at Seattle, Wash.; a large ferry for the Southern Pacific Railroad, and a 155-ft. steamer to be built by the Moran Company for the Puget Sound Navigation Company, Seattle.

Rails.—The movement is rather light at the moment in both light and standard rails, the principal requirements for this season's work having been purchased earlier in the year. The lightest sections, used for mining purposes, are less active than usual, and jobbers are fairly well supplied. Work is progressing on extensions for a number of small roads in the interior, and further improvements are planned for next summer, but most of the inquiries now in the market are of a rather indefinite nature. Several of the new projects are using very light material, 35 to 45 lb. sections being in most demand for interurban lines.

Bars.—The movement from Eastern mills is of about the same moderate volume as for some time past. Orders for round lots are an exception, most inquiries at present being very small, though the distributive movement is normal for this season. Merchants are booking numerous orders for delivery to interior points, both for reinforcing and manufacturing purposes, but the local demand is very light. The Sacramento Valley Irrigation Company has been in the market for 160 tons of reinforced bars. Bars from store, San Francisco, are quoted at 2.50c. for steel and 2.30c. for iron.

Plates.—The southern California market is still rather quiet, though the outlook there is better, and renewed activity is expected in the near future. In San Francisco and the interior there has been little, if any, curtailment, and the present demand is more than normal. The marine work under contract will cause some increase in the requirements and the outlook for tank and pipe work is very encouraging. Conditions in the oil fields are still uncertain, but if production continues at the present rate storage facilities far beyond those now projected will be necessary.

Structural Material.—June was a very quiet month in San Francisco, the valuation of building permits issued being $2,216,631, considerably below that of June, 1909, and less than for either April or May of this year. The record was also rather small in other coast cities, and conditions remain quiet, though several fabricating contracts of some importance have been placed. The Llewellyn Iron Company has taken the contract for the Los Angeles Athletic Club, requiring over 2000 tons. The Nicolaus, Gaven & Southworth building at Sacramento, Cal., 175 tons, was taken by Milliken Bros., and 300 tons for the Forum Building at the same place will be fabricated by the Palm Iron & Bridge Works. Bethlehem shapes being used. Other jobs on which contracts will probably be let soon are the Auditorium in San Francisco, about 1000 tons, and a new sea wall job requiring about 125 tons. There is talk of several other new buildings, and preliminary figures have been taken on a 10-story building for the Realty Syndicate in Oakland, though the bids were not opened. Plans have been completed for a six-story hotel for the regents of the University of California. A permit has been granted to the Northern Electric and Vallejo Northern companies to construct a large drawbridge over the Sacramento River. The Schrader Iron Works has a small job for the Southside Light & Power Company's plant in San Francisco. Plans have been completed for a Masonic temple at Fresno, Cal., and a large hotel is planned for Klamath Falls, Ore. It is announced that work will be started soon on a $250,000 station for the Southern Pacific Railroad at Sixteenth street, Oakland. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Merchant Pipe.—A slight revival is noted both in the jobbing trade and the movement from the mills, though the general condition is still quiet. Buying for new oil well projects has been greatly curtailed, partly on account of heavy withdrawals of land by the Government, and partly by the fact that the output of the Lakeview well alone greatly exceeds the transportation or storage facilities of that district. Some orders are being placed in fields more favorably located, but the over production tends to check new development in all directions. Some local merchants have greatly reduced their stocks, and are now buying in small lots for immediate delivery, but there is still a large tonnage in store. The demand, however, is becoming fairly general, and with the usual revival of business in the early fall supplies should be well cleaned up. Several large lots are being sold for use in water and gas plants in the interior.

Cast Iron Pipe.—Business is comparatively quiet at the moment, though a fair number of small orders have been booked this month, and there is an active inquiry from various parts of the State. There is nothing in immediate prospect calling for any unusual tonnage, but the outlook is favorable for a continued movement of small lots.

Pig Iron.—Foundry work is by no means active, and the prevailing tendency among melters is to keep out of the market as much as possible. Recent orders for future delivery have been few and of comparatively small volume, and the amount of iron in transit is smaller than usual, as importers are not inclined to add to their supplies on hand. The tonnage now held in local warehouses is considered more than ample to meet all probable requirements of the next half year, and most foundries are buying in very small lots for immediate needs. A larger movement is expected as soon as the labor troubles are adjusted, as there is a fair amount of work in prospect. The movement of domestic iron is very small, prices being quoted at $22.50 to $23 for No. 2 Southern foundry. Quotations on foreign foundry iron in small quantities, from store, are as follows: Chinese, $23; Continental, $23; English, $23 to $23.50; Scotch, $24 to $24.50.

Old Material.—The scrap market shows little change, most descriptions being quiet. Cast scrap is firmly held, though considerable heavy machinery scrap is being accumulated in local yards, and the foundries are buying on a rather small scale. Steel melting scrap continues to accumulate, and is rather weak in value, the local demand being small. Rerolling rails and wrought scrap are moving to some extent, though the present tonnage is not especially heavy. Prices are quoted as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

Birmingham

BIRMINGHAM, ALA., July 18, 1910.

Pig Iron.—Actual sales by all interests in the past week aggregate probably less than 750 tons and the trade manifests such indifference that the coming week's transactions are not expected to indicate any improvement in the demand. Rumors are current that a certain interest would accept a basis of $11, Birmingham, to move a significant proportion of its accumulation, but such reports cannot be verified and it is believed that $11.50, with the possibility of shading 25 cents per ton under especial arrangements, is the bottom price to-day. Those interests that have adjusted their output to order book requirements to such an extent as to take care of the capacity left in operation for some months adhere strictly to a $12 basis either for prompt shipments or deliveries to cover the remainder of this year. The interests that quote a basis of $11.50 do not limit the time of delivery to which that price applies, except, of course, to the last half of this year, and in some cases would probably accept $11.25 for strictly spot shipments. The lack of interest on the part of the trade generally is of necessity a very important consideration in arriving at quotations, and it is no doubt a fact that just at this time even a material reduction in asking prices would not stimulate the demand to an appreciable extent. The course being pursued by the producing interests is apparently a determined one, and it is not unlikely that quotations will remain as they are now, with the production kept at such [illegible] the supply-

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stock will be taken up and present prices made attractive. The total output of foundry iron in this State is now represented by 11 active stacks and, according to authoritative statements, two additional stacks will be added to the idle list during the coming week.

Cast Iron Pipe.—In the absence of evidence to the contrary, prices as last published are quoted, although, with the output unchanged and order-book requirements being gradually reduced, it is probable that slight concessions can now be had. There is as yet no accumulation of stock in this district, and all plants are being operated to capacity, but no large municipal contracts are being advertised and the outlook is not considered encouraging. This can also be said of the cast iron soil pipe industry, in which market a new low level for prices has recently been established. We quote water pipe as follows per net ton f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12 in., average $21, with $1 per ton extra for gas pipe. These prices can probably be shaded on large municipal contracts.

Old Material.—Hardly sufficient business is being transacted to afford an opportunity of judging the status of prices, but it is not believed that dealers are more anxious to sell than at the time of last report. The aggregate accumulation is comparatively light, but all reports indicate heavy stocks on consumers' yards and more healthy conditions are not expected at an early date. We quote dealers' asking prices (which are nominal in the main) as follows, per gross ton, f.o.b. cars here:

Old iron axles	$16.50 to $17.00
Old iron rails	12.50 to 13.00
Old steel axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.00 to 9.50
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light cast and stove plate	7.00 to 7.50

It is announced that the furnace of the Southern Iron & Steel Company at Trussville, Ala., will be blown out the coming week.

Repairs have been made to the plant of the Southern Pipe & Foundry Company at North Birmingham, Ala., which was recently damaged by fire, and operations will soon be resumed.

Cincinnati

CINCINNATI, OHIO, July 20, 1910.—(*By Telegraph.*)

Pig Iron.—The market is dragging. In foundry irons buying is of a hand to mouth character, and only small lots are changing hands. It is reported that the local steel making company referred to last week has bought 6000 tons of basic, to be furnished by an Ohio furnace. Only a fair volume of inquiries is before the trade, a few of which are for delivery the first quarter of next year. The furnace interests seem almost as indifferent about doing business on the present price basis as the buyers are in making contracts. Southern foundry No. 2 is quoted at $11.50, Birmingham, but it is understood this price can be shaded with some furnaces for prompt shipment. Northern irons are not firm and $15, at furnace, can easily be done, although some are holding out for better figures. Malleable can be obtained around $15 to $15.50, with few purchasers. It is rumored that two or three Ohio furnaces will go out of blast within the next 60 days. For immediate delivery and through the last half, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$15.25 to $15.75
Southern coke, No. 2 foundry	14.75 to 15.25
Southern coke, No. 3 foundry	14.25 to 14.50
Southern coke, No. 4 foundry	14.00 to 14.25
Southern coke, No. 1 soft	15.25 to 15.75
Southern coke, No. 2 soft	14.75 to 15.25
Southern gray forge	14.00 to 14.25
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.70
Lake Superior coke, No. 2	16.20
Lake Superior coke, No. 3	15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—A number of fair sized future contracts on foundry coke were closed last week, and there was some buying to fill immediate requirements. Several of the Connellsville interests have contracted for their entire output and present quotations on all grades are firm. There is not much doing in furnace coke, but prices are steady and we quote $1.70 to $1.75 per net ton at oven, with the usual 5c. advance for future shipment. Pocahontas furnace grades are quotable at $1.80 to $1.85. Connellsville foundry coke is quoted strong at $2.25, with a slight advance for future shipment, and Pocahontas foundry trails along at the same figure. Wise County coke remains around $2.10 to $2.25, and is a reasonably good seller.

Finished Iron and Steel.—Structural material continues active and a fair amount of reinforcing concrete bar business is reported. Beams and channels are in fair demand and are quoted, out of stock, at 1.90c. to 2c. It is reported that a modification in prices on steel bars has been made in the Pittsburgh district.

Old Material.—Railroad offerings continue light, and a very slim business is reported by practically all the dealers. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$11.50 to $12.00
Cast borings, net ton	4.00 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	16.50 to 17.00
Old iron rails, gross ton	17.00 to 17.50
Old steel rails, short, gross ton	14.50 to 15.50
Old steel rails, long, gross ton	14.50 to 15.50
Relaying rails, 56 lb. and up, gross ton	22.00 to 23.00
Old car wheels, gross ton	12.00 to 13.00
Low phosphorus scrap, gross ton	16.00 to 16.50
Heavy melting steel scrap, gross ton	11.50 to 12.00

The German Iron Market

BERLIN, July 8, 1910.

Reports emphasize the quiet, waiting tendency of the market. Consumers and traders continue to do as little new business as possible. The rate of production of pig iron in June was about 1500 tons per day below the record rate established in May, totaling 1,219,071 metric tons in June, against 1,261,735 tons in May, and 1,067,421 tons in June, 1909. That the furnacemen take a rather cheerful view of the outlook and mean to keep up a big production is evident from the unusually heavy imports of iron ores in June. The arrivals aggregated 1,495,000 tons, being almost twice as heavy as in May.

So far as the price situation is concerned, there have been no reductions here this month, so far as the trade reports indicate, but there is a growing feeling of uncertainty as to their further course. This week this uncertainty has been intensified by a further reduction of bar iron for export in Belgium by 1 to 2 shillings per ton. This news has made an unfavorable impression on the stock exchanges, causing declines in German iron companies' shares.

The chief attention of the trade continues to be given to the movement to reconstruct a pig iron syndicate in the Rheinish-Westphalian district. Further meetings have been held, but the news about the results is rather conflicting. According to one report the movement is at present confined to only six of the big mixed producers, in addition to the Niederrheinische Hutte; but it is asserted that the negotiations between these have so far progressed that a combination between them will certainly be effected, whatever comes of their efforts to give the organization a wider basis. On the other hand, it is denied in some quarters that the Niederrheinische concern has already come to terms with the movers of the new syndicate. There is a side issue to these negotiations; hitherto five concerns in that region were producing ferromanganese, but the Niederrheinische began to turn out this specialty some time ago and speedily beat down the price from about 180 to 150 marks, or even lower. The five works in question, which are apparently in part included among the six companies trying to organize the syndicate, are now attempting to induce the Niederrheinische to abandon the production of ferromanganese in return for a big allotment of pig in the new organization, and it is reported as being willing to accede to their wishes on that basis. This would mean the restoration of ferromanganese prices to a more profitable level for makers, who claim that the costs of producing 80 per cent. are as high as 145 to 150 marks per ton.

The wire rod producers can be well satisfied with their business for the first half of the year. After the shipments for the first quarter had exceeded the allotments of the mills by 5 per cent., the June quarter brought still more active business, shipments being fully 25 per cent. above the allotments. The association controlling this specialty had some months ago reduced the export bounty on wire and wire nails sold abroad, but it has recently restored it to its former figure of 21.50 marks per ton.

The dissolution of the pipe syndicates, mentioned in last week's report, has called forth an unusual volume of inquiries regarding prices. It is believed that these inquiries indicate that there will be active buying as soon as prices seem to be fixed, as it is known that dealers' stocks are low. Prices have probably fallen since the break-up of the organizations, but the reports do not say so.

A report on the hardware trade shows that its condition, while somewhat irregular in its various sections, is rather good. The cutlery trade at Solingen reports a considerable shrinkage of exports to the United States in con-

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sequence of the Payne law, and this business has recently suffered a further backset. Razors in particular have been sent to America in much smaller quantities. The cutlery trade with Canada, on the other hand, has greatly improved in consequence of the settlement of the tariff war between that country and Germany. The Russian business has improved, but trade with India is very slack. Some other sections of the hardware trade are apparently doing considerably better than cutlery. The makers of locks and keys are extremely busy, but chiefly on export orders. Other builders' hardware has suffered severely from the big lockout in the German building trades; but that has now been settled at last, and business in this specialty, as well as in many other lines of goods, like structural forms, should now pick up. Manufacturers of axes, hatchets and hammers are doing a good business, and the outlook for the continuance of their big run of foreign orders is regarded as good. The arms factories have good orders from Argentine for side arms; also smaller orders from Brazil and some other South American countries, as well as some of the Balkan States. Manufacturers of bicycles and automobiles are doing well.

New York

NEW YORK, July 20, 1910.

Pig Iron.—A few sales have been made for deliveries beginning in August and September and running through the year, but the average foundry appears to have provided for its needs in the third quarter. There is a certain amount of small buying to average on the cost of contract iron, but for the most part it is a listless market. Buffalo furnaces have been able to get canal tonnage more freely and thus to reach New York district and Long Island Sound points advantageously, so that relatively more iron will come from that district than has been the case in recent weeks. One New England buyer took 600 tons of Northern iron and about 500 tons of Southern iron, and a New Jersey producer of light gray iron castings is expected to add 2000 tons this week to considerable purchases made in June. A 500-ton inquiry for Lake Superior charcoal iron has come up in New Jersey. Offers recently received from pipe foundries have been declined by several furnaces; they were around $14.75 for gray forge, delivered in eastern Pennsylvania, in one instance. At $13.50 for No. 2 some business has been done in one or two brands of Virginia iron, but other Virginia producers are not meeting this price. We quote Northern foundry iron at tidewater as follows: No. 1, $16.50 to $16.75; No. 2 X, $16.25 to $16.50; No. 2 plain, $15.75 to $16.25. On Southern iron quotations are $16.25 to $16.50 for No. 1 and $15.75 to $16.25 for No. 2.

Finished Iron and Steel.—July is falling short of June in activity in all finished lines. Structural steel mills and fabricating companies have a fair supply of work for the summer, but they are looking a little more sharply for work for the fall months. In the case of the American Bridge Company, operations are now at about 85 per cent. of capacity. As against 48,000 tons in June, it is expected that over 50,000 tons will be turned out in July and that nearly full capacity may be reached by October, with plenty of work in hand to carry through that month. The Brooklyn subway work, taken last year, is only now beginning to come into the shops. The Northern Pacific has recently specified on 3500 tons of its 7000-ton contract of May, but there has been very little new work from the railroads, the Pennsylvania Railroad's orders the past week for several bridges, about 650 tons in all, and that of the Boston & Maine for a 200-ton bridge, being exceptions. The Chicago & Northwestern bought 300 tons of beams, however, which will be rolled at Johnstown, Pa. Levering & Garrigues secured the New York Plate Glass Insurance Company building, Maiden lane and William street, 600 tons, and the Hinkle Iron Works an apartment house on 121st street, near Broadway, 500 tons. The Oliver Chilled Plow Company, South Bend, Ind., placed a 1400-ton building with the Indiana Bridge Company. The building of the Athletic Club of Los Angeles, Cal., 2300 tons, was taken by the Llewellyn Iron Works, a local company. While deliveries of steel bars can be made a little earlier by some mills, the situation continues unsatisfactory for those who are in need of prompt shipments, as only a limited range of sizes can be furnished earlier than 30 days, most manufacturers making no promises on new business within 60 days. The leading bar iron mills are getting a good volume of orders and railroad inquiries are beginning to appear for requirements for the remainder of the year. The local plate business is confined to small lots, on which full prices have been obtained. The boilermakers of this vicinity are having labor troubles, due to the demand of workmen for an advance in wages. Quotations are as follows: Plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.61c., and bar iron, 1.50c. to 1.55c., all New York.

Cast Iron Pipe.—Inquiries are light and no important business is in sight in this vicinity. Competition is sharp and low prices have been made to some of the contractors who have recently received awards of pipe laying jobs from the city of New York. Carload lots of 6-in. are now quotable at $23.50 to $24 per net ton, tidewater.

Old Material.—Practically no business is being done in heavy melting steel scrap. The price offered by the associated eastern Pennsylvania steel mills is below the views of local dealers who announce their determination to pile their steel scrap rather than accept the price named. Our quotations below on this class of material are based on the eastern Pennsylvania offers, but it would probably be difficult for a buyer to secure any considerable quantity at the rates named. The demand for rolling mill stock is generally light, except for cast borings, wrought turnings and wrought pipe, which are in fair demand for mixture with higher priced material. It is a curious fact that borings sold during the week at a higher price than turnings. This, however, is a circumstance which often happens when prices are as low as at present. During these conditions various materials lose their usual relation with one another. The Isthmian Canal Commission sold 1000 tons of Panama scrap on dock at Hoboken, N. J., on Tuesday. It was secured by a dealer of Harrisburg, Pa., at $10.01 per gross ton. The next bidder was ¾c. per ton under this price, while other bids ranged down to $9.05. A somewhat better demand was experienced for cast scrap, and several sales of good size are reported, one being of 1000 tons. Quotations per gross ton, New York and vicinity, are nominally as follows:

Repolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.00 to 11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.25 to 13.75
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Wrought pipe	11.75 to 12.25
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Buffalo

BUFFALO, N. Y., July 19, 1910.

Pig Iron.—The market is traveling at a little better pace than during the preceding week both as respects inquiry and placement, although symptoms of midsummer quiet are not lacking. Inquiry is principally for foundry grades, and the orders placed are in most instances of only moderate size, averaging about 200 tons, although a few of considerably larger size have been booked, making a fairly good total for the week. Consumers as a rule appear to be covering for a percentage of business somewhat under normal requirements for the remainder of the year, and any improvement in business will make gaps in their stocks which will soon require replenishment. In malleable and basic the week has been productive of only a very small amount of business. Prices for all grades are being maintained at about the same level as during the previous week. We quote as follows per gross ton, f.o.b. Buffalo, for delivery through the last half:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.75 to 15.75
No. 2 plain	14.75 to 15.00
No. 4 foundry	14.50 to 14.75
Gray forge	14.25 to 14.50
Malleable	15.00 to 15.75
Basic	15.25 to 15.75
Charcoal	19.00 to 19.50

Finished Iron and Steel.—Some interests report that the reduction in the price of wire products made this week by the largest manufacturers has produced something of an unsettling effect upon conditions in general lines of finished steel products. The leading interest, however, reports no falling off in orders on this account and states that the current miscellaneous demand keeps up well and specifications on contracts are normal for the midsummer season. Canadian export trade from this district continues in good volume for the season, although it is feared that the strike of employees of the Grand Trunk Railway system may interfere somewhat with prompt shipments. In structural material the demand is not quite so good as during June, but specifications for fairly good tonnages are coming in right along. Bids are to go in Friday at Erie, Pa., for steel for the St. Vincent Hospital building, about 400 tons, and on Saturday for the Maine National Bank Building at Erie, about 600 tons. Specifications are out this week for steel for the new Sherman House, Jamestown, N. Y., 900 tons, and specifica-

THE IRON AND METAL MARKETS

tions will be issued shortly by Buffalo architects for the steel for the Utica Hotel, Utica, N. Y., about 1200 tons. The Jones & Laughlin Steel Company received contract for the steel for the machine shop of the Pennsylvania General Electric Company's plant at Erie, Pa., requiring a large tonnage, and L. F. Shoemaker & Co., New York City, received contract for the structural steel work for the Ohio street freight house extension for the New York Central Railroad, Buffalo, about 300 tons. The contract for the reinforced concrete work for the New York Central freight house in question and for a large freight warehouse which the same company is to erect for the use of the Western Transit Company at Ohio street and Buffalo river was let to the Eastern Concrete Steel Company, Buffalo.

Old Material.—The market is quiet and but little business is being done in any line. The mills are still holding back shipments on contracts and dealers are stocking such material as they are obliged to accumulate. Prices have a lower tendency. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.25 to $13.50
Low phosphorus steel	17.50 to 18.00
No. 1 railroad wrought	14.25 to 14.75
No. 1 railroad and machinery cast scrap	13.25 to 13.75
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	14.00 to 14.50
Railroad malleable	14.75 to 14.25
Boiler plate	11.25 to 11.50
Locomotive grate bars	11.00 to 11.50
Pipe	11.00 to 11.50
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

Metal Market

NEW YORK, July 20, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.—		Spelter.—	
	Lake	Electro lytic	Tin.	New York.	St. Louis.	New York.	St. Louis.
July 14	12.62½	12.37½	32.67½	4.40	4.25	5.20	5.05
15	12.62½	12.37½	{32.67½ {32.75	4.40	4.25	5.20	5.05
16	12.62½	12.25	32.80	4.40	4.25	5.20	5.05
18	12.62½	12.25	33.00	4.40	4.25	5.20	5.05
19	12.62½	12.25	33.12½	4.40	4.25	5.20	5.05
20	12.62½	12.25	33.25	4.40	4.25	5.20	5.05

There has been a heavy buying movement in pig tin and the available stocks for July delivery have been practically cornered. The copper market has been more active at lower prices. Lead has an upward trend and the spelter market is stagnant.

Copper.—Talk of copper curtailment has been revived, but there is no evidence in the trade of a concerted movement toward reducing the production. There has been some buying at lower prices and on Friday and Saturday good sales of electrolytic were made at 12.25c. Some of the leading sellers continue to ask 12.50c. for electrolytic, but this puts them practically out of the market as there are plenty of offerings at the lower price. Lake copper is bringing 12.62½c. and casting copper, which has become more plentiful, is down to 12.30c. In London to-day spot copper was sold for £53 6s. 3d., and futures for £54 8s. 9d. The sales amounted to 500 tons of spot and 1400 tons of futures. The market was firm.

Pig Tin.—The tin available for July delivery in this country has been practically cornered and the price has been advanced above 33c. It is a significant fact that it is costing more in this market than in the London market, the advanced price here being the equivalent of about £2 more than the price asked in London. It became known last Friday that there would be no important arrivals of tin until August 1, whereupon there was an immediate scramble to buy. The price at that time was 32.67½c. and on Friday and Saturday there was active trading that sent the price up until it had reached 32.80c. when the market closed on Saturday afternoon. This was the first time in a number of weeks that there was any trading on Saturday. There was further buying on Monday and Tuesday, and to-day it became apparent that the supply of spot tin was about cornered. It is estimated that the sales during the week for all accounts amounted to about 700 tons. It will be interesting now to see whether the consumption of tin will justify the judgment of the parties who have taken up the available supply. To-day there were sales of tin, scheduled to arrive by steamer here on August 1, at 32.80c. It is understood that on that day there will arrive a heavy cargo, and if recent purchasers realize on their speculations they will probably have to do so before that time. Spot tin was sold in New York this afternoon for 33.25c. In London to-day spot tin was sold at £148 10s., and futures at £149 12s. 6d. The sales amounted to 250 tons of spot and 270 tons of futures. The market was steady.

Tin Plates.—The strike among the sheet metal workers has lessened the demand for tin plate in the building trades and the general manufacturing industries are not taking a great amount at this time. The price in New York for 100 lb. coke plates is $3.84.

Lead.—Some good sales have been made, and although the American Smelting & Refining Company continues to hold the metal at 4.25c. St. Louis, and 4.40c. New York, outside sellers are getting higher prices. There have been sales at East St. Louis as high as 4.35c., which would make the price 4.50c. in the New York market. These sales have been made to parties who wanted the metal in a hurry. As the American Smelting & Refining Company is able to supply all the lead called for at present with reasonable promptness the price asked by that company rules the market.

Spelter.—The spelter market is very quiet. The demand from the galvanizing trade, which uses about 62 per cent. of the spelter produced in this country, has fallen off noticeably, but this has made no impression on the producers of spelter as regards price. It is said that the production is being quietly reduced and in this event the existing prices, which many consumers think are higher than they should be, may not go lower. Spelter is now selling at 5.05c. St. Louis, and 5.20c. New York.

Antimony.—There are heavy offerings in the market of brands of antimony that are not very well known and the persistent attempts to introduce them at low prices has brought about a reduction in the price of the better known grades. Consumers are holding off. Cookson's can now be had at about 8.25c. and Hallett's is being freely offered at 8c. Chinese and Hungarian antimony are being offered at 7.50c.

Old Metals.—The demand is light. Dealers' selling prices, which are nominally unchanged, are as follows:

	Cents.
Copper, heavy cut and crucible	11.75 to 12.00
Copper, heavy and wire	11.25 to 11.75
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.25 to 8.50
Brass, light	6.75 to 7.00
Heavy machine composition	11.00 to 11.25
Clean brass turnings	7.50 to 8.00
Composition turnings	9.25 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, St. Louis, July 18.—Lead is strong at 4.30c.; spelter is weak at 4.95c. to 5c., East St. Louis. Zinc ore is held at $38 to $40, Joplin base. Tin is quoted at 33.05c. per pound; antimony, 8.55c.; lake copper, 13c.; electrolytic copper, 12.70c., all St. Louis. The demand for finished metals ruled quiet the first of the week, but the last three days brought orders to the leading manufacturer for upward of 500 tons of miscellaneous stock.

Metals, Chicago, July 19.—Owing to the midsummer dullness and the fact that many foundries are closed, the demand is limited to spot or prompt deliveries. Consumers show little inclination to buy for the future. Tin is a little higher. Spelter continues weak with very little demand. We quote Chicago prices as follows: Casting copper, 12⅝c.; lake, 12⅞c. to 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 33¾c.; small lots, 35c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12c.; copper bottoms, 10½c.; copper clips, 12c.; red brass, 11c.; yellow brass, 9¼c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4⅛c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Foundries in the Youngstown, Ohio, district have agreed either verbally or by document to pay their coremakers and molders a minimum of $3.30 per day. The William Tod Company has not made any agreement with its men, but will probably run on the open shop plan, paying as high wages as its competitors, but refusing to deal with any labor organizations.

The work of changing the channel of the Calumet River at Gary, Ind., is proceeding rapidly. The new channel is 50 ft. deep and 1½ miles long. It will relieve from overflow a large tract of land heretofore waste and on which the Indiana Steel Company will have 960 coke ovens and additions to its plant.

The World's Production and Consumption of Metals

An abstract of the full statistical tables relating to the production and consumption of lead, copper, spelter, tin, aluminum, nickel and quicksilver, compiled by the Metall Gesellschaft, the Metallurgische Gesellschaft, and the Berg und Metallbank, of Frankfort-on-Main, has been made by the London *Ironmonger*. The world's production for the past four years is given as follows in metric tons:

	1906.	1907.	1908.	1909
Lead	975,100	986,000	1,061,200	1,084,900
Copper	712,900	766,000	744,000	811,100
Spelter	702,000	758,400	722,100	785,200
Tin	98,800	97,700	107,500	108,300
Aluminum	14,500	19,800	18,600	24,200
Nickel	14,300	14,100	12,800	16,140
Quicksilver	3,700	3,200	3,300	3,200

The percentage of increase and decrease for the four principal metals in the group is shown in the table below:

	1907 over 1906.	1908 over 1907.	1909 over 1908.	Ave. yearly increase in the last 10 years.
Lead	+1.3	+7.6	+2.0	2.0
Copper	−1.4	+5.9	+13.4	6.0
Spelter	−5.2	2.2	−8.5	1.8
Tin	−1.1	+10.0	+0.7	4.0

The consumption of the above mentioned metals in Europe and the United States was as follows, the figures representing metric tons:

	1906.	1907.	1908.	1909.
Lead—Europe	587,400	603,400	701,100	684,800
United States	351,400	295,300	293,000	365,000
Copper—Europe	404,800	406,800	474,700	451,800
United States	293,600	225,500	208,800	318,900
Spelter—Europe	494,200	503,300	532,000	540,200
United States	200,000	205,000	193,000	260,000
Tin—Europe	57,700	57,300	58,100	58,500
United States	43,700	39,700	32,800	42,800

The statistics of consumption are commented on as follows: "These figures show the remarkable difference between the development of metal consumption in Europe and in the United States, though in estimating tonnage an element of uncertainty is introduced by the fact that the lead and spelter stocks are all in private hands, and that as far as Europe is concerned it has been impossible to take into account any alterations in such stocks, while in the United States the estimates of stocks must not be taken without reserve. The figures above, however, indicate the broad lines of development."

Aquadag Used as a Cutting Compound

Some remarkable results have been obtained by the Niagara Machine Company, 825 Linwood avenue, Niagara Falls, N. Y., from the use of the graphite lubricant, Aquadag, made by the Acheson Oildag Company of that city, as a cutting compound. This lubricant is composed of pure deflocculated graphite and water, the particles of the former being so finely divided that they will remain permanently suspended.

Recently a large number of cold rolled steel rods having an average diameter of about 1 in. were being cut off in a lathe. The average number of cuts that the cutting-off tool would make with one sharpening was 60 when using an ordinary soap cutting compound, but when a small amount of deflocculated graphite was mixed with the cutting compound it was found that the tool did not become dull as rapidly as before and made 980 cuts with only one sharpening. In the second case the tool not only did about 16 times as much work as in the first, but the ends were very much smoother and the work was done much better.

The company has also used Aquadag for many other machine tool operations with the same good results. For instance, in boring and reaming a large number of holes in bronze bushings with an ordinary cutting compound, the hole is always about 0.0002 in. smaller than the reamer used, but by the addition of Aquadag to this compound a hole practically the full size of the reamer can be cut, which shows that in some way graphite increases the cutting possibilities of the tool. It has also been possible to effect a considerable reduction in the horsepower consumed. Certain machines which it was necesary to run with the back gears in when using an ordinary cooling compound, by the above mentioned addition of graphite to the compound, are now run with an open belt. In this case not only a reduction in the horsepower consumed by the cutting tool, but also that an increase of speed is made possible.

The Republic Wage Scale Settled

PITTSBURGH, PA., July 20, 1910.—At a conference held in this city yesterday between committees of the Republic Iron & Steel Company and the Amalgamated Association, a settlement of the Amalgamated wage scale for puddling and finishing mills was reached, which will be effective for one year from July 1.

The puddlers will receive $6.12½ a ton for boiling on a 1.45 cent card for bar iron, which is equal to an advance of 50 cents a ton. For busheling on cinder bottom, when cast borings are used, the advance is 37½ cents a ton over the old scale; 13 cents advance when light scrap is used and 10 cents when heavy scrap is used. For busheling on sand bottom, when heavy scrap is used, the advance is 7½ cents a ton and when light scrap is used 10 cents a ton.

The muck rollers are given an advance of 2½ cents a ton over the old scale. In the bar and 12-in. mill scales the roller is given an advance of 3½ per cent., catchers 3½ per cent., heaters 4 7-10 per cent., and roughers 4 7-10 per cent. In the guide mill scales rollers, heaters and roughers are given an advance of 4 7-10 per cent. over the old scale.

It is probable that the bar iron mills of the Republic Company, which have been closed since June 30 pending settlement of the wage scales, will be started up as soon as they can be made ready.

A conference now is likely to be arranged between the Western Bar Iron Association and the Amalgamated Association, and it is probable that the same settlement will be made.

Iron and Industrial Stocks

NEW YORK, July 20, 1910.

Some market authorities are now beginning to take a slightly more hopeful view of the situation in securities. This is quite a change from recent weeks, during which discouragement and doubt appeared to be universal. It is the critical period for important crops, however, and prices of stocks are expected to be influenced from day to day by developments in that direction. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chalm., pref.	30	Railway Spr., com.	33 - 33½
Beth. Steel, com.	25	Railway Spr., pref.	98 - 100
Can., com.	5⅝ - 5⅞	Republic, com.	29¾ - 30
Can., pref.	68⅛ - 69⅛	Republic, pref.	91 - 93
Car & Fdry., com.	49½ - 50½	U. S. Steel, com.	68⅝ - 71⅛
Car & Fdry., pref.	112¾	U. S. Steel, pref.	114¾ - 116¼
Steel Foundries	50 - 52½	Westinghouse Elec.	59 - 60
Colorado Fuel	31⅛ - 32¾	Am. Ship., com.	83½ - 84
General Electric	141½ - 144	Am. Ship, pref.	109¾ - 110
Gr. N. ore cert.	31 - 33½	Chi. Pneu. Tool	85
Int. Harv., com.	93⅜ - 94	Cambria Steel	42½ - 43½
Int. Harv., pref.	119¾ - 120	Lake Sup., com.	12 - 12½
Int. Pump, com.	13⅜ - 14¼	Pa. Steel, com.	65 - 75
Int. Pump, pref.	81⅛ - 82¾	Pa. Steel, pref.	100 - 100
Locomotive, com.	38⅝ - 40	Wash. S.	50 - 55
Nat. En. & St., com.	15⅝ - 16	Crucible St., com.	113⅝ - 115
Pressed St., com.	31 - 32⅜	Crucible St., pref.	77 - 77⅞
Pressed St., pref.	93⅝ - 96	Diam. W. R.	100 - 110

Dividends.—The American Rolling Mill Company, Middletown, Ohio, has declared a quarterly dividend of 1½ per cent. on the preferred and 3 per cent. on the common stock.

The Harbison-Walker Refractories Company, Pittsburgh, has declared a dividend of 1¾ per cent. on the common stock.

The Pittsburgh Malleable Iron Company, Pittsburgh, has declared a quarterly dividend of 2½ per cent. and an extra dividend of 2½ per cent., payable July 20.

The Machinery Markets

The machinery business in the New York territory is unusually good for this time of the year. There are inquiries before the trade which indicate that there will be a general buying movement within a few weeks, and some decidedly good orders were placed during the last week. A large drill manufacturer and a Western iron works were heavy purchasers in the New York market, and the General Electric Company, Schenectady, N. Y., through the Pennsylvania General Electric Company at Erie, has been negotiating some purchases. In other parts of the country the machinery business is on a satisfactory basis. In Cincinnati the machine tool builders are now working on full time and most of them have large orders ahead. In this branch of the machinery industry prices are particularly firm. In Chicago the prospects are bright for heavy buying in the fall and the second-hand machinery trade is active at good prices. In St. Louis there is a good market for heavy equipment and new construction work indicates that there will be increased activity later on. The market is quiet in Milwaukee, except for heavy sales of electrical equipment. In Detroit business is irregular, but plans for shop extensions will develop a good business later on. In the Northwest there has been good buying on account of hydroelectric plants and the demand for water power equipment is equally good. Mining and irrigation projects and proposed power plants have brought out a good business in the Southwest and in the farther West the machinery activity is confined to mining territory. The usual midsummer inactivity is noted in Philadelphia and Pittsburgh.

New York

NEW YORK, July 20, 1910.

The machinery market in New York is very active for this time of the year and in addition to a good general buying movement some large manufacturing projects are developing that will call for heavy expenditures for machinery. Last week the Ingersoll-Rand Company and a large Western iron works made heavy purchases of machine tools equipment and the New York Central Railroad gave some supplementary orders on a large list which is now about closed out. The Pennsylvania General Electric Company has inquiries in the market for some machine tools which may be bought through the General Electric Company at Schenectady, N. Y. From all indications the Delaware, Lackawanna & Western Railroad will shortly place orders against a heavy list it has had before the trade for some weeks for its Scranton shops and the United States Motor Company, 505 Fifth avenue, New York, has inquiries out which indicate that it will be a good customer in the machinery trade very soon.

The Pennsylvania General Electric Company, which operates the plant at Erie, Pa., owned by the General Electric Company of Schenectady, N. Y., has issued a list of machine tools which include one power hack saw, one 60-in. vertical boring mill, one wet tool grinder, one 1½-in. bolt cutter, a good sized engine lathe and other equipment to be installed in a gray iron foundry. It is said in the trade that the company will make further additions to its Erie equipment.

It has been announced that the Delaware, Lackawanna & Western Railroad Company will have its new shops at Scranton, Pa., in operation by January 1 next. There has been a list before the trade in this market calling for a large number of machine tools, and the trade has been waiting a long time to hear of some action on the railroad toward closing out for these requirements. Machinery men who are familiar with the company's affairs declare that the buying will be begun within the next few days.

The Auto Car Company of Ardmore, Pa., is looking for a site in the vicinity of New York for a plant to be used for the manufacture of automobiles. As soon as the necessary property is obtained the company will, no doubt, be in the market for machinery equipment.

The Butterick Pattern Company, New York, will later on require equipment for a plant for the manufacture of tissue paper. It is understood that the company is now looking for a site, as it expects shortly to begin to manufacture its own paper, and it is possible the plant will be located at some point where a hydroelectric power plant can be installed.

Westinghouse, Church, Kerr & Co., 10 Bridge street, New York, are preparing plans for two large shops to be erected for the Missouri Pacific Company, for which a large amount of equipment will have to be purchased. The Simms Magneto Company, 1780 Broadway, New York; the Griscom-Spencer Company, 90 West street, New York, and the Gunn Motor Company, Utica, N. Y., are all planning improvements which call for machinery expenditures. It is conservatively estimated in the trade that there is fully $300,000 worth of actual business in sight in this market, and the improvements contemplated by the companies mentioned above will call for expenditures covering a large part of that sum. This should clearly show that the machinery trade is by no means dull in this market, but nevertheless there is much pessimistic talk in the trade which the facts at hand do not seem to warrant. It may be true that in some lines the machinery trade is not particularly good. For instance, the demand for contracting equipment, such as excavating machinery and the like, which was good a few weeks ago, has fallen off largely because of the fact that most of the contractors have summer work well under way. There is also a lessened demand for second-hand machinery, but it should be taken into consideration that up until a month ago the call for some classes of second-hand machinery exceeded the supply and was decidedly more than normal. Within 50 miles of New York there is one manufacturer of mining machinery and shafting whose plant is working with a night shift. There are two machine tool builders in the Manhattan territory part of whose product is ordered up six months ahead, and the New York representative of one of the largest manufacturers of automatic equipment cannot promise any of the products of his plant for delivery under four months. Most of the foundries in this vicinity that make machinery castings have all they can do, and many of them are beginning to increase their manufacturing facilities before fall. This information is the result of a general canvass of the machinery trade covering a varied line of manufacture, and the instances where business was found to be light are entirely counterbalanced by the good demand experienced by the trade in general.

McLaughlin Brothers, Inc., 521 St. James street, Philadelphia, Pa., have designed a machine shop to be erected on Garfield avenue, Jersey City, N. J., for James Craig. The building will be 82 x 210 ft. and it will be of brick, steel and reinforced concrete. The structure will be equipped with electric traveling cranes and a model line of machine tools and other equipment for the construction of engines which are now being built by Mr. Craig at 556 West Thirty-fourth street, New York. McLaughlin Brothers laid out the entire plant and will supervise the installation of the equipment.

The Hazard Motor Mfg. Company, Rochester, N. Y., has been organized with a New York charter authorizing a capital of $400,000 to take over the business of the Hazard Engineering Company. The management of the company will not be changed and it will continue to manufacture gasoline motor power plants and special motor equipment.

The Berlin Construction Company has received a contract for rebuilding the fan shop of the Green Fuel Economizer Company, at Matteawan, N. Y., which was almost totally destroyed by fire some weeks ago. It is expected to have the new building erected and ready for occupancy about the middle of August. The new shop will have about 25 per cent. more floor space than the old shop, including a test room fully equipped with chambers, gauges, &c., suitable for making exhaustive tests on the capacity, pressure and efficiency of the improved fans built by the company. The new building will be of steel construction throughout and will be heated by the hot blast system, with frequent outlets near the floor to secure uniform distribution of the heat. This system has been applied by the Green Fuel Economizer Company with great success in several buildings that were peculiarly difficult to heat.

The Beaver Mfg. Company, Buffalo, manufacturer of wall boards and panels, has commenced the erection of its

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extensive new plant at Ontario street, Military road and the New York Central Railroad, North Buffalo. A large amount of paper mill machinery not yet ordered will be required, comprising digesters, rolls, cutters, trimmers, &c. A separate power house is to be erected for which boilers, a direct connected engine, electric generators and motors will be required. Wm. F. MacGlashan is president and manager, 228 Perry street; F. A. Shoemaker, 21 Builders' Exchange, mechanical engineer.

The Gaffney Wood Products Company recently incorporated at Bradford, Pa., will build a large chemical plant at Walton Station on the Buffalo & Susquehanna Railroad, 10 miles from Galeton, for the manufacture of wood alcohol, acetate of lime, potash, charcoal and other wood products, having acquired a tract of 30,000 acres of timber land in Potter County.

The Linde Air Products Company, Buffalo, Cecil Lightfoot, general manager, manufacturer of ogygen-oxyacetylene, &c., is building a brick and steel addition, 60 x 150 ft., one story, to its plant at Chandler street and Manton place.

The Empire State General Vehicle Company, Rochester, N. Y., has been incorporated with a capital stock of $100,000, by G. A. Hallister, R. M. Searle, and J. T. Hutchings, of Rochester, and will engage in the manufacture of vehicles and appliances. Arrangements are being made for a plant.

The National Lead & Battery Company, Niagara Falls, N. Y., manufacturer of storage batteries, &c., which recently increased its capital stock to $5,000,000, has had plans prepared for and will soon begin the erection of extensive additions to its plant on Elizabeth street, in the Niagara Power Land Company manufacturing district; D. M. Hepburn, manager, Niagara Falls.

The Troy Scale Company has been incorporated at Troy, capital stock $100,000, to manufacture measuring and weighing devices. The incorporators are F. A. W. Kelley and D. Eldon of Watervliet, N. Y., and W. M. Hall of Troy.

The United States Hoffman Company, Syracuse, N. Y., will erect a three-story and basement addition, 50 x 150 ft., to its factory on Temple street for the manufacture of clothes pressing machinery.

The Board of Supervisors of Erie County, F. B. Steele, clerk, room 36, City and County Hall, Buffalo, N. Y., is receiving bids for the construction of a power and lighting plant for the Erie County Penitentiary. The power house will be of stone, brick and steel, 60 x 65 ft., with brick stack.

The Henry Schenck Company, Erie, Pa., has received contract from the Hamet Hospital of Erie for the erection and equipment of a power house and laundry building at Second and State streets.

The Fulton County Gas & Electric Company, J. B. Hodgson, superintendent, Gloversville, N. Y., will build a high tension line from Gloversville to Epwatah, a distance of 9 miles, and will erect and equip a brick substation at Gloversville. One hundred and thirty-five steel transmission towers will be required, 46 to 52 ft., a frame construction.

As a result of the increasing demand for welded flanges, heads and bottoms on steel cylinders, tanks, &c., instead of the riveted work which was formerly considered satisfactory, the facilities of the American Welding Company, Carbondale, Pa., have been taxed to the utmost lately. The equipment in service, however, enables orders to be executed promptly.

Perforated metal for coal, ore and rock handling plants, as well as other industrial operations in great variety, is so largely in demand this year that the works of the Hendrick Mfg. Company, Carbondale, Pa., which are devoted to this product, have been kept crowded with orders. The railroad companies are also good buyers of this material.

Chicago

CHICAGO, ILL., July 19, 1910.

Dullness continues to prevail in the Chicago Machinery market. Many houses are busy taking inventory, and this, together with the vacation let-up is having its effect on the machinery business. Practically all of the buying done is of a pick up nature, and such orders as are placed are for single tools which are required for immediate use. It is the general opinion among dealers, however, that there is a considerable amount of business pending and that the approach of fall will bring out a large volume of orders. There is a fair demand for second-hand equipment considering the season of the year, and such machines usually bring a good price owing to the urgent needs of the buyer. No orders have been placed as yet against the Chicago, Burlington & Quincy list which has been before the trade for some time. On account of the favorable crop reports being received as a result of the recent rains, it is believed that the railroads will soon place the orders for the machine tools and equipment that have so long been pending and which are urgently needed.

The E. B. Hayes Machine Company, Oshkosh, Wis., has under construction a new building 60 x 250 ft., with a wing 30 x 80 ft., which will be used as a blacksmith shop, power house, &c.; also an apartment which will be devoted to a wash room, locker room and other conveniences for its employees. The main building will be served with an electric crane, the runway of which will extend for several yards in front of the building. All departments of the plant are being arranged into adjoining sections to facilitate the handling of raw material.

The Henry B. Lewis Structural Iron Works, Detroit, Mich., will commence work in the near future on a new structural steel shop and office building 115 x 200 ft., to be erected on a site recently purchased. The building will be served with an electric traveling crane, the runway of which will extend into the yard. The shop will contain two galleries in which light pattern work will be carried on. A complete equipment will be installed which will facilitate the handling and fabrication of steel shapes.

The Sharples Separator Company, West Chester, Pa., has purchased a lot at Washington and Jefferson streets, Chicago, which it will improve by the erection of a building at a cost of about $100,000, details of which have not been definitely determined upon. The building when completed will be occupied by the western branch of the company now located in the Plamondon Building, Monroe and Clinton streets.

Chickering Brothers, Chicago, manufacturers of pianos, have purchased the property at South Park avenue and Twenty-third street, 100 x 179 ft., and are having plans prepared for a seven-story factory building. The building will cost about $200,000, and it is understood that construction work will commence at once.

The Algoma Iron Works, Ltd., Sault Ste. Marie, Ont., which has been in operation a great many years, has been incorporated with a capital stock of $500,000. No improvements are contemplated.

The Reliance Engineering & Mfg. Company, 2009 Peoples Gas Light & Coke Company's Building, Chicago, has been incorporated with a capital stock of $100,000 to manufacture a gas governor and appliances which are now being manufactured on the Pacific Coast. It is the intention of the company to promote the sale of these appliances in Chicago territory and vicinity and erect a factory for their manufacture as soon as business conditions will warrant, which will probably be in the course of six or seven months.

Frederic Schafer & Son, South Bend, Ind., have opened a machine shop for doing repair work and manufacturing special tools and machinery.

The Crescent Forge & Shovel Company, Havana, Ill., has increased its capital stock from $75,000 to $100,000, and is contemplating improvements to its plant.

The Rock Island Plow Company has awarded a contract for the construction of a forge shop 150 x 300 ft., foundry addition 66 x 120 ft., pattern and experimental building 50 x 100 ft., warehouse 115 x 235 ft., and a core room building, which are to form the nucleus of a new plant.

Additions to be made to the water works system at Galesburg, Ill., will include two boilers of 350 hp. each, small centrifugal pumps and a crank and fly-wheel pumping engine of 6,000,000 gal. daily capacity.

The Chicago, Ottawa & Peoria Railway, Ottawa, Ill., is about to proceed with plans, mentioned some time ago, for the building of a machine and forge shop to be used in repair work.

Chalmers & Williams, Chicago, have taken one of the largest contracts for mining machinery recently let in the Southwest, comprising the complete equipment of a concentrating plant to be erected on the property of the Frisco Mines & Power Company, operating in Mohave County, Ariz. The order called for prompt delivery and a part of the machinery is already on the way.

An additional air compressor will be purchased for the municipal water works system at Monmouth, Ill.

The large quantity of steel wire rope which is being used this year in all parts of the country has created a very active demand for one of the products of the Chicago Steel Foundry Company, Chicago. This is a crucible cast steel socket with a spiral interior, which gives a gripping power that can be relied upon absolutely, in any situation, for firmly holding the rope.

Bids are about to be taken for a compound or triple expansion engine of 12,000,000 gal. daily capacity to be in-

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stalled by the city of Springfield, Ill., in connection with its water works system.

The Portland Foundry & Machine Company, Portland, Ind., which makes a feature of drop forgings for special service, has had enough business offered from motor vehicle manufacturers alone to keep its works very busy, and there seems to be no immediate probability of any let up in this demand.

The Inter-State Electric Light & Power Company, Galena, Ill., which supplies the mining districts of Southwestern Wisconsin with power for operating machinery at most of the mines, mills and smelters in the territory reached by its transmission lines, has passed under the control of the H. M. Byllesby Company, Chicago, who engineered the development. It is reported that they will add to the capacity of the generating station and extend the service.

An addition 35 x 50 ft. is to be made to the municipal power and pumping station at Batavia, Ill., in order to provide for the installation of new equipment.

The American Seeding Machinery Company, Richmond, Ind., has let contracts for a one-story foundry, 90 x 200 ft. and a four-story storage building 130 x 165 ft. A part of the equipment has been purchased.

Philadelphia

PHILADELPHIA, PA., July 19, 1910.

Characteristic midsummer inactivity is to be noted in nearly all branches of the trade, and the market drifts along with occasional small sales, the larger propositions, as a rule, receiving but little attention. There has been practically no railroad buying, and no fresh demand is reported, although revised bids on some few tools are being made. Merchants report a seasonable business, confined principally to smaller tools, usually in single lots. Manufacturers continue to take a fair run of business in the aggregate, although sales are quite irregular, orders coming from widely scattered points. Considerable figuring of special tools for export is being done, but no large orders have yet been reported by builders in this territory. The trade has a fair volume of business in prospect, not so much for new plants as for proposed improvements and extensions, which will require quite a good volume of equipment, which, however, will not develop to any extent, it is believed, until later in the year.

There has not been a great deal of business transacted in second-hand machinery and tools; in instances dealers have been pretty well cleaned out of desirable equipment in some lines and find it difficult to pick up good modern tools for resale. A fair business in boilers and engines continues to be done.

The vacation period has had the usual influence on business and in many cases transactions about to be closed have been deferred on that account. The general weakness of the iron and steel markets has also had some influence in holding back business, as buyers for the most part are inclined to make purchases along conservative lines until general business again shows a forward movement.

The Wilmington Malleable Iron Company, Wilmington, Del., is building an addition to its power house and will install two generators of about 700 hp. and an extra boiler.

The Edgar Allen American Manganese Steel Company is providing increased molding floor space at its New Castle, Del., plant. With the rearrangement of the plant, purchased from the Tropenas Steel Company, 7200 additional square feet of molding floor space was provided, increasing the former space 100 per cent.

The U. S. Engineer Office, 815 Witherspoon Building, Herbert Deakyne, Major Engineer, will receive bids until August 10 for constructing a steel twin screw suction hopper dredge for Southwest Pass, Mississippi River. Information can be had on application to the above address.

The Brylgon Steel Casting Company, New Castle, Del., is operating its plant at full capacity, and has sufficient orders on its books to keep so occupied for many months. A slight let-up in the demand for new business is reported.

The Jones Cold Storage Door Company, Hagerstown, Md., is having plans prepared, it is reported, by O. G. Simonson, Baltimore, Md., for a two-story manufacturing plant, comprising machine, finishing and assembling rooms, galvanizing department, offices, storeroom and boiler house, to be erected in Hagerstown, Md.

The Reading Iron Company, Reading, Pa., has taken out permits for the erection of a one-story steel and corrugated iron addition to its sheet mill. The building is of irregular shape, 84 x 34 x 8 ft., and will be located at Water and Spruce streets. It will house an additional heating furnace for the skelp or finishing mill.

The Falconer Company, Baltimore, Md., will build a new stationary manufacturing plant at Gay and Water streets, 70 x 125 ft., five stories. Charles L. Reeder, Equitable Building, is the engineer. Work on the building will be started, it is said, at an early date.

The Deemer Steel Casting Company, New Castle, Delaware, will erect an addition, 45 x 125 ft., to be used as a chipping department. The company has been steadily adding to its molding floor space and now is using its present foundry building, 70 x 325 ft., to its full floor space. Its present capacity is about 200 tons a month, which will be increased to 300 tons when a new converter, now building, is installed. Provision has also been made for the installation of additional cold saw cutting off machines, pneumatic chippers and sand blast cleaning apparatus.

Contracts for several improvements to manufacturing plants, referred to recently, have been let and the actual work of erection of the buildings started. Among these is the fireproof building for the Mayer & England Company, makers of electrical supplies, who will concentrate their various plants now located in other sections of the country, in the new building, for which J. N. Gill & Co. have the contract. The contract for the new factory for A. Mecky & Co., at Seventeenth and Allegheny avenue, has been let to H. C. Baton, while Doak & Co., contractors, have commenced work on a large commercial garage for the Auto Car Company at Twenty-third and Market streets.

The Cooper Heater Company, recently incorporated under the Pennsylvania laws, is erecting a plant at Carlisle, Pa., for the manufacture of hot water heating apparatus for trolley car service, as well as for dwellings. John H. Gardner is president, and Walter Stuart, treasurer. This concern has purchased the equipment of a plant at Dayton, Ohio, which is to be moved in its entirety to the new location.

Fire destroyed the main building of the Ehret Magnesia Mfg. Company at Port Kennedy, Pa., on July 16, entailing a very heavy loss. Plans are being made for immediate rebuilding, which will require about five months. Considerable new equipment will be required, but it is not known at present what the requirements will be.

The Autocar Company, Ardmore, Pa., which is building a large commercial car garage at Twenty-third and Market streets, Philadelphia, is now in the market for a 300-light electric light plant for the building, for which they want a 30 or 40 hp. gas engine, direct connected with the generator. At a later date the company will be in the market for machine tool equipment, an air compressor and equipment for a forging and brazing department. Every convenience for handling repairs will be installed, facilities being provided for storage of 200 to 300 cars.

The Tabor Mfg. Company, builder of molding machines, has purchased five acres of ground at Stockley street and the Port Richmond branch of the Philadelphia & Reading Railroad, upon which it will erect manufacturing buildings, and remove on their completion from the present plant at Eighteenth and Hamilton streets. Plans for the new buildings have been completed, and it is expected that work will be started at an early day.

Pittsburgh

PITTSBURGH, PA., July 19, 1910.

Taking everything into consideration, the opening weeks of July have shown an excellent record in the sale of machinery, orders for which have been coming in very regularly from every section of the United States, with considerable foreign trade. There have not been many large contracts let recently, but the buying is of a character that indicates further demand from the same sources. Municipalities are among the best customers of manufacturers in this district, and their requirements cover a wide range, from valves, hydrants, switchboard instruments, &c., up to electric generating units, pumping engines, filtration plants, &c., of large capacity. In the general industrial field inquiries originate chiefly with factories, mills and other establishments outside of the line of the metal working trades, indicating a condition by which the last named will be very favorably affected, as sales to these plants are closed. Purchasing on the part of coal mining companies also continues and coking operations not only call for considerable equipment to be used in connection with new ovens, but also many replacements of apparatus heretofore in service. Automatic devices are particularly wanted wherever they can be made applicable.

The demand for steel, gray and malleable iron castings is well sustained, and most of the foundries have all they can do, with the result that extensive additions and improvements are being planned. In some cases a greater output could be obtained with existing facilities were it not for

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the scarcity of molders and other skilled workers. For the lighter grades of castings molding machines are being used more than ever before, and the situation this season has given a decided impetus to their sale in this district. In some quarters there seems to be a reaction at present, from the tendency of the past few years, on the part of manufacturers, to install or enlarge their own foundries. Jobbing foundries that give prompt, efficient service are benefitting accordingly.

The foundation of the Keystone Tube Company's new building at Connellsville, Pa., has been completed, and work is now commencing on the structural steel frame. With the exception of some details that have not yet been fully decided upon, the machinery and other equipment needed have been purchased.

It is stated locally on what appears to be good authority that the Federal Government will soon advertise for bids covering work for the improvement of the Ohio River which will amount to nearly $4,000,000. This will undoubtedly stimulate the market for contractors' outfits, as those now in service will be practically all required for other large contracts recently placed.

Local machinery houses are advised that the American Zinc, Lead & Smelting Company will make improvements during the course of the present season in its plants at Caney and Dearing, Kan., designed to increase both the output and operating economy. Purchasing of equipment on this account will be done gradually, however, and mainly here or in the East.

The new plant of the Ellwood City Iron Works, Ellwood City, Pa., is starting out with a heavy run of orders.

The Ridgeway Dynamo & Engine Company has been awarded contracts for electric generating plants to be installed in the army posts at Fort Sill, Okla., and Fort Terry, N. Y.

Expenditures to the extent of $8000 will be made at Millersburg, Ohio, for improvements to the pumping plant and water works system, involving the purchase of some new equipment.

The Berwind-White Coal Mining Company, Pittsburgh, has made extensive purchases designed to increase its coal handling facilities, and a considerable percentage of the orders will be executed by the works of this district.

The Warren Foundry Company, recently organized at Warren, Ohio, has made arrangements for operating to its full capacity the local plant which was secured, and will provide increased facilities as the requirements of the business develop.

The Premier Pocahontas Collieries Company, Premier, McDowell County, W. Va., is about to dispose of considerable equipment used in construction and development work. During the next few months its mining operations will be considerably extended.

The Monterey Railway, Light & Power Company, Monterey, Mexico, in which Pittsburgh capital is interested, is placing orders for electrical equipment and other machinery.

A second test has been found necessary by the Pennsylvania Inspection Bureau, Johnstown, Pa., in its facilities for the examination and testing of bridge and structural material of all kinds. Rush orders now appear to predominate, as nearly every concern wants its work done in a hurry.

The department of the business of the Wm. B. Scaife & Sons Company, Pittsburgh, which is devoted to tank work, stack erection, &c., is experiencing no dearth of orders this season, and indications are that the coming autumn will be among the busiest in its history.

The Columbiana Boiler Company, Columbiana, Ohio, besides its line of high pressure boilers, has taken very good trade, thus far during the year, in the galvanizing pots, annealing boxes, &c., which it manufactures. The demand for equipment of this character is steadily growing.

Contracts have been placed by the American Can Company for electric power machinery of greater capacity than that now in service at its plant in New Castle, Pa. Some auxiliary equipment will be purchased later on.

It is understood here that some new machinery will be required in the near future for a four-story building to be added to the plant of the American Fork & Hoe Company, Geneva, Ohio.

It is reported from Washington that numerous inquiries have been made by Pittsburgh manufacturers and export houses in regard to the campaign for the extension of American trade in Europe, as outlined by James E. Dunning, American consul at Havre, France, during his recent visit to this city. One feature of this is covered by exhibits to be made in 1911 at the exposition held in Turin, Italy. The products of this district are now finding a very good sale abroad.

Local authorities, who have been making a vigorous compaign for the elimination of smoke, state that during the past month about 75 large manufacturing plants either installed or contracted for smoke consuming devices.

It is reported from Erie, Pa., that pumping engines of large capacity are to be purchased there within the next few months, in order to provide for the enlargement of the municipal water system. An expenditure of $150,000 for the necessary machinery is now proposed.

New pumping machinery will be installed this fall in the city pumping plant at Sistersville, W. Va.

The Mead-Morrison Company, whose representatives for this district have headquarters in the McChesney building, Pittsburgh, is finding this a very good year for the sale of machinery for coal handling plants, excavating and general contractors' service, such as is comprised in its regular lines. A good deal of especially designed equipment has also been called for within the past few months.

One of the large manufacturers here is figuring on two steam turbine units of 2500 kw. each, which are to be purchased by the city of Buffalo, N. Y., to furnish electric current for motors driving centrifugal pumps. Bids have not yet been formally invited, but will be taken in the near future.

The Dunn Mfg. Company, Pittsburgh, is putting on the market in considerable quantity a special extension trench brace, which is made with ball and socket joints that enable it to be used in any position.

The Finkel-Hackmeister Company, Pittsburgh, will erect a new three-story factory building and warehouse on a site recently acquired for the purpose. Building operations are not likely, however, to be undertaken before spring.

Visits to the plants of the Westinghouse Electric & Mfg. Company, Westinghouse Machine Company, Carnegie Steel Company, Macbeth-Evans Glass Company and other large manufacturing concerns will be made this summer, on a regular schedule, by engineering students of the University of Pittsburgh.

Electric generating units for city lighting service will be installed at the municipal power and pumping station in Youngstown, Ohio. The proposed equipment has not yet been purchased.

The Greenville Metal Products Company, Greenville, Pa., was chartered at Harrisburg with $250,000 capital. The incorporators include S. H. Penfield, B. S. Dean, F. P. Hall, C. M. Jones, F. Goodwell, Jamestown, N. Y.; E. S. Templeton and W. P. Nathews, Greenville, and R. R. Rogers, Corry, Pa.

Cleveland

CLEVELAND, OHIO, July 19, 1910.

The outlook with the local machinery houses is a little more encouraging. Some new prospective business has come out during the past few days, so that dealers are counting on more activity during the dull part of summer than they expected earlier in the month. Few orders were placed during the week in the local market and new inquiries were quite few in number, but those that did come out were for fairly good sized lots of tools. The demand for single tools is less active than during June. The Gaeth Automobile Company of this city came out during the week with an inquiry for machine tool and power equipment for a new plant, and another inquiry for machine tools, cranes and foundry equipment, aggregating about $30,000, is being figured on by Cleveland dealers. Several other lists that have been out for a few weeks have not yet resulted in orders, but there are no reports that the buying in any of these cases has been postponed for more than a limited time. Considerable work in the way of factory extension is either in progress or in prospect in this territory, but in most cases plants that are being enlarged are of a character that do not require much machinery equipment. At present new industrial enterprises that are being formed to engage in metal working lines are not very numerous and dealers are feeling the lack of orders from this source. During the past year a large number of new companies have launched into the manufacture of various automobile accessories, but this field seems to be pretty well filled up for the present. The demand for second-hand machinery is holding up well.

Little complaint is heard about conditions among local manufacturing plants. While some report a falling off in orders this month, this was to be expected during inventory time, and most plants are still comfortably filled with work. In the foundry trade there is a good demand for light gray castings and most of the local foundries are well supplied with orders.

The Gaeth Automobile Company, Cleveland, which will build a new plant, has issued a list of its machinery and power requirements, as follows: One No. 4 Cincinnati vertical milling machine; one No. 5 Potter & Johnson automatic chucking and turning machine; three 16-in. Reed lathes; one Warner & Swasey No. 2 hollow hexagon turret lathe; one 3½ x 6 in. low swing lathe; one No. 3 Brown & Sharpe universal grinder; one Dress radial drill press, with 4-ft.

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arm; one Grant-Less gear hobber; one Gleason bevel gear tester; one 18-in. Gleason generator; one No. 6 Pratt & Whitney miller; one 24-in. Fellows gear shaper; one Long Arm system chamfering machine; one cutter grinder for Fellows gear shaper; three Barnes sensitive drills; two Barnes drills, one 26-in. and one 20-in.; one Baker Bros. high speed drill, with compound table; one 11-in. Blount speed lathe; one No. 3½ Greenard bench arbor press; one No. 0 Springfield straightening press; one 12-in. stroke slotting machine; one 14-in. swing Fox lathe; 100 bench vises, 5-in. jaws; 250-lb. trip hammer; three open forges, No. 00S, Buffalo Forge Company; one straightening plate, 3 x 5 ft.; one No. 4 Blount combination grinder stand; one No. 2 Bridgeport combination water tool grinder; American Gas Furnace Company's brazing table; one No. 15 Lea simplex circular saw; one No. 3 La Point broaching machine; one No. 21 Gisholt lathe; two No. 1 Barnes horizontal boring machines; two 80-hp. engines; one generator; three 25-hp. motors; bake oven for paint shop, 10 x 16 ft.; air compressor, with capacity of 50 cu. ft. per minute; shafting, pulleys, hangers, &c. In addition considerable equipment will be required for the tin shop, including the following: One No. 3 planishing hammer; one 42-in. slip roll pipe former; one crimper and header combined; one grooving machine; one Hubbert double seamer, with reversible horn; one large turning machine; one sheet folder; shears, punches and other small equipment. While it has been announced that the new plant will be built in the vicinity of East Pittsburgh, officers of the company state that the site has not yet been definitely decided upon. The company's present Cleveland plant will be dismantled as soon as the new plant is built.

B. A. Worthington, receiver of the Wheeling & Lake Erie Railroad, announces that it will be 30 days before the lists of the railroad's requirements for the completion of its equipment of its locomotive shops at Brewster, Ohio, are sent out. The list as originally prepared has been cut down somewhat. The new list contains about 15 large tools. Their purchase will involve an estimated expenditure of $57,000.

The Cleveland Hardware Company will shortly install considerable new equipment and has an inquiry out for the following tools: Two 16-in. shapers; ten 24-in. shapers; one 18-in. lathe; one 48-in. planer; one 5-ft. radial drill; one 48-in. boring mill; one steam hammer.

The Seneca Chain Company, Kent, Ohio, has increased its capital stock from $300,000 to $600,000.

The American Steel & Wire Company has placed an order with the Case Crane Company for two 40-ft. electric cranes for the Central blast furnaces in Cleveland.

The Cleveland Wire Spring Company will enlarge its plant by the erection of a two-story building, 80 x 100 ft. The company finds the capacity of its present plant too small to accommodate its growing business.

The Diebolt Motor Car Company, Canton, Ohio, has been incorporated with a capital stock of $20,000. This is an old concern, but it is announced that the capacity of its plant will be increased. The incorporators are Robert J. Diebold, W. R. Meyers, D. T. Quinn, Ludwig Wolff and C. T. Heingartner.

The Board of Commissioners of Clay County, meeting at Brazil, Ind., will receive bids August 8, for plumbing, heating and electric plant for the county infirmary. J. L. Burns is auditor.

The Princeton Light and Power Company, Princeton, Ind., has increased its capital stock from $75,000 to $100,000. H. C. Barr is president.

The Cleveland Crane & Engineering Company is building an addition to its plant at Wickliffe, Ohio, and has installed considerable new machinery.

Cincinnati

CINCINNATI, OHIO. July 19, 1910.

July may not show as many orders booked as some of the previous months, but the situation, so far as the machine tool builders are concerned, is generally satisfactory. Practically all of them are working on full time, and quite a number have orders enough in hand to make them feel somewhat indifferent about taking on new business, especially that calling for prompt shipment. It is candidly admitted that had the railroads come into the market for their requirements, as was expected, the manufacturers would have been very seriously embarrassed in taking care of them and their other customers. Machine tool dealers are doing a fair business and have a satisfactory volume of inquiries in hand.

From present indications, buyers of machine tools who anticipate lower prices will doubtless be disappointed. There seems to be an under current of feeling among tool builders individually to the effect that prices will have to be stiffened. Labor is at the top notch and with operating and other expenses increasing, the tool builder will naturally consider seriously advancing figures to a more reasonable basis.

An erroneous impression as to the automobile industry appears to have been entertained by some of the trade. The weeding out of a few insufficiently capitalized automobile firms in different parts of the country gave ground for the report that the business had reached its topmost level; while as a matter of fact, the leading manufacturers are going ahead with proposed improvements and extensions, knowing that if the demand for pleasure vehicles should slacken, they could readily turn to building commercial trucks, which field, comparatively speaking, has been barely touched.

The American Tool Works Company is one of the local tool builders having such a number of orders in hand for its lathes, planers, shapers, &c., that it has been found necessary to increase its capacity by putting on every available man. While no building additions are planned, the company is using every inch of its present floor space, and indications point to a continued period of activity at its large plant on Culvert street.

The United States Paper Goods Company, Cincinnati, has purchased a site at Elsmore avenue and Reading road on which it intends erecting a large manufacturing plant. Building details are being worked out by L. P. Hazen & Co., this city.

The R. K. LeBlond Machine Tool Company has commenced work on additions to its factory which will give it 75,000 sq. ft. more floor space. Two of the buildings will be 45 x 250 ft., one story, and one 60 x 225 ft., four stories, all of brick, steel and concrete construction. The company is very busy on orders previously booked and is very optimistic as to the future.

The factory of the Cincinnati Punch & Shear Company is running full time, and it has orders enough in hand to keep it thus employed for some time. The company reports its export business as showing steady improvement.

It is understood that the business, good-will and patents of the Ritter Folding Door Company, Cincinnati, have been purchased by the Kinnear Mfg. Company of Columbus, Ohio, manufacturer of the Kinnear rolling steel shutter, and that the Ritter plant and office will probably be moved to Columbus.

With the idea in view of increasing its capacity, the American Oak Leather Company, Cincinnati, has awarded contract to the Kaps-Brehm Company, contractor, this city, for a boiler house addition 56 x 68 ft. of reinforced concrete construction.

The Chesapeake & Ohio Railroad Company has commenced work on the foundations of a roundhouse, blacksmith shop and coaling station at Silver Grove, Ky. Some machine tools will be needed for the shop. It also intends constructing a roundhouse and coaling station at Russell, Ky.

The Schneider & Goosmann Machine Company, Cincinnati, has moved from 20 East Ninth street to 1929 Race street, where it is fitting up a shop 35 x 50 ft. for the manufacture of small planers. It is the company's intention to make some additions to its new plant at an early date, for which some equipment will be required. It was recently incorporated with $15,000 capital stock, and the following are its officers: Fred. Schneider, president; Anthony Schemel, vice-president, and Fred Goosmann, secretary and treasurer.

The new building at the intersection of the Big Four Railroad and Carthage pike, now occupied by the Ritter Folding Door Company, has been sold by its owner, W. M. Greene, to the Steel Fireproof Construction Company, Covington, Ky., of which company Max Goldsmith is president. It is the reported intention of the company to move its Covington plant to the new location as soon as the Ritter Company can vacate the premises.

Tentative plans are under way for an addition to the brass foundry of the Ohio Pattern Works, Cincinnati. The proposed new building will be 83 x 100 ft., one story, and of concrete construction.

The August Ferger Company, Cincinnati, will erect a grain elevator, to cost $9000, at Hopkins street and President place.

The Sterling Metal Mfg. Company, with temporary quarters at 77 Elm street, Cincinnati, is a new incorporation with $50,000 capital stock. It is the purpose of the company to make metal filing cases and office appliances, but its manufacturing plans are not yet completed. The incorporators are Christian Keck, Alex. Dom, Harry H. Hyams, Alfred Cohen and Alfred Mack.

The E. H. Huenefield Company, Cincinnati, manufacturer and dealer in tin plate roofing, metals, &c., has purchased the business and machinery of the Cincinnati Tin & Japan Company. The machinery will be moved at once to the new plant of the Huenefield Company at Spring Grove

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avenue and Marshall street. The Huenefield Company was recently chartered with $1,000,000 capital stock. Its officers are: E. H. Huenefield, president; W. H. Huenefield, vice-president, and C. F. Pfau, secretary.

The Jenney Electric Mfg. Company, Indianapolis, Ind., is dismantling its plant in that city and removing the machinery to Anderson, Ind., where it is being installed in the new plant recently completed by the company at that place. The new plant is of sufficient capacity to engage about 1000 employees, and it is expected that enough equipment will be installed to have the plant in operation with several hundred employees within the next few weeks. The company is enjoying a very prosperous year and has orders enough on its books to insure its operation for many months.

The LeMarr Aero Company, Frankfort, Ind., has been incorporated with $50,000 capital stock to manufacture aeroplanes. W. B. Adams is president; Perry Gable, secretary, and Fay Cress, treasurer. The company will manufacture the LeMarr biplane.

The Overland Automobile Company, Indianapolis, Ind., will build an addition to its plant to cost $15,000.

The Premier Motor Mfg. Company, maker of automobiles, Indianapolis, Ind., has bought additional ground near its plant as a site for extensions. A large machine shop, with saw tooth roof, will be the main addition, and there will be a motor test shop 50 x 130 ft. A third new building will be a storage stockroom 50 x 100 ft. The machine shop and erecting room will be 90 x 490 ft.

The Miami Valley Machine Tool Company, Dayton, Ohio, has completed an addition to its plant which will considerably increase its output of machine tools.

New England

BOSTON, MASS., July 19, 1910.

Business in the machine tool trade has let down to a material degree. Buyers are showing no great interest; salesmen are having a hard time finding the men who have authority to decide on purchases of new equipment. The hot weather has driven many manufacturers to an early vacation, and small expectation is expressed that any marked revival will be felt before September. However, the intervening weeks will not be wholly lean, for some good business is in the air. The builders of grinding machines, milling machines and automatics continue to be deluged with orders. Other standard lines are only fairly busy.

The experience of a large dealer in machine tools and supplies, as taken from his books, affords an illuminating comment upon the business situation, especially in its application to the metal industries. The house has customers numbering into the thousands and comprising a vast diversity of product, including all of the multitudinous lines of this territory. The books reveal that the nine months ending July 1 gave a volume of business in supplies equaling 110 per cent. of the figure for the corresponding period of 1906-07, the previous high record, and 90 per cent. of the figure for machine tools. Several factors must be reckoned into the comparison. The normal growth of a prosperous concern must be considered. The fact that delivered goods averaged up to those of a period three years ago does not mean equally prosperous conditions, for were times as favorable the present volume of orders should be considerably greater. On the other hand, the previous period was abnormal, in that the market was at a maximum bordering on the feverish. It is also to be considered that buying during the last year has been for immediate needs as a general thing. The factories are not well stocked up with supplies. Had there been a firm confidence in conditions business would undoubtedly have exceeded all previous experiences. The supply trade holds well for July, indicating that manufacturers in general are busy.

Industrial stocks throughout New England are gradually going up. Dividends, too, are strengthening, several cases of increased rates being announced.

The Universal Boring Machine Company, Hudson, Mass., is preparing plans for an addition which will increase its manufacturing capacity 50 per cent. The company is bringing out a No. 3 Universal horizontal boring machine, containing several important improvements upon the previous design. The machine has a 3-in. boring bar, the length of bed is 80 in., the greatest distance of the face plate to the outboard support is 60 in., the automatic longitudinal feed is 53 in., and the automatic vertical feed is 23 in.

The Lapointe Machine Company, Hudson, Mass., manufacturer of broaching machines and other machine tools, has plans for a large addition to its shops.

The factory and business of the Bay State Screw Company, Hatfield, Mass., have been purchased by a new corporation known as the Hampshire Mfg. Company, with general offices at 1779 Broadway, New York. A. W. Hodgdon and C. S. Shattuck will retire from the business. The manufacture of spark plugs will be continued at Hatfield by the new owners.

The Malleable Iron Fittings Company, Branford, Conn., manufacturer of steam and gas fittings, malleable iron, steel and semi-steel castings, &c., has completed an addition to its steel foundry building with equipment which doubles the capacity, and are about completing an extension of the malleable foundry, 200 x 215 ft., which will soon be in use. The company is adding to its power a supplementary 625 k.v.a. General Electric turbo generator with Le Blanc condenser.

The Chandler Company, Springfield, Mass., is putting on the market a new line of etched name plates for machinery, which are so finished as to stand frequent polishing and cleaning without sacrifice to legibility.

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has brought out a type of automatic screw slotting machine containing various new features, special attention being given to procuring a maximum of time for sawing and reducing to a minimum the time required for handling the work.

The Crandon Mfg. Company, Bellows Falls, Vt., has been incorporated under Vermont laws to take over the business of the National Temperature Gauge Company, Inc., of that place, manufacturer of the National heat regulator, which will be known hereafter as the Crandon heat regulator. J. B. Crandon is the president, A. P. Williams vice-president, and R. C. Bidwell treasurer. The capital stock is $25,000. The company does not expect to purchase additional machinery at present. A large part of the work is assembling and bench operations for which a few jigs and hand tools will be required. The apparatus consists of aluminum plate, bronze gear wheel and arms, Franklin metal cranks and brass dash pots, with small double magnet and a dry battery.

Detroit

DETROIT, MICH., July 19, 1910.

So many manufacturers and dealers are now on vacation trips to the lakes and woods that it is difficult to gauge the present situation accurately. Business appears to be a little better than normal for this season of the year, but the demand in all lines is irregular and likely to continue so for the next four or five weeks. Plans for new factory buildings, foundries or forge shops are, however, announced almost daily; and, wherever one goes, there is almost invariably some mention of improvements to be made in existing plants or additions being outlined. In the metal working industries everyone seems to be very busy. More orders could be taken than are now in course of execution, but the quantity of work in hand is generally satisfactory and not a few establishments have contracts made for as far ahead as they care to book them. Machine tools are moving rather slowly and second-hand stock is less eagerly sought than formerly, with consequent widening of the difference in prices, but both of these remarks are only generally applicable. Some machines are wanted and cannot be obtained except on the basis of considerably deferred delivery, unless rebuilt tools are taken.

The demand from the automobile industries is turning more to power house machinery, motors, pumps, tanks, sprinkler systems, elevators and other equipment of general utility. Purchases from tool lists recently formulated have, in most instances, been at least tentatively agreed upon. Local dealers are getting a very good share of this business, and their counsel has been found of great value by the numerous concerns now entering upon the manufacture of motor vehicles or auto parts which have not heretofore had experience in those lines. In this respect a situation has developed here which is conducive to the best character of trade. Leading dealers not only gained the confidence of their customers, but they have done much to earn it.

Contracts are now being let and equipment will be provided for the new factory building of the Bradley Miller Company, Bay City, Mich. The plans call for a structure 100 x 168 ft., two stories. Electric power will be used.

John Scott & Co., whose office is in the Ford Building, Detroit, are preparing plans for a fabricating plant, 115 x 200 ft., which will be erected here by H. B. Lewis. Further details, including the extent of the equipment needed, have not been announced.

It is reported from Clyde, Ohio, that the plant of the Elmore Mfg. Company, automobile builders, will be extended and improved. No purchases of machinery appear to have been made as yet.

A one-story foundry, 75 x 100 ft. is to be built in September or later by the Kokomo Brass Works, Kokomo, Ind.

The Anderson Forge & Machine Company, Detroit, Mich.,

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is about to install a 250 kw. and a 125 kw. 60 cycle, three phase, 240 volt, alternating current generators in the new plant which it is building. They will be furnished by Allis-Chalmers Company, whose office here is in the Union Trust Building.

The John F. Byers Machine Company, Ravenna, Ohio, whose hoisting engines are constructed with steel frames and steel drums, have sold largely this season to contractors and others engaged in heavy construction work who have need of equipment that will stand long, severe service.

The purchase of a motor-driven centrifugal pump to handle the flow from an artesian well has been authorized by the city council of New Castle, Ind.

The Briscoe Mfg. Company, Detroit, has completed its new auto parts factory and most of the machinery is installed.

Contracts for the new plant of the Alden-Sampson Company at Pontiac, Mich., which will be 150 x 800 ft., one story, have been awarded to local contractors, and the equipment details are now being worked out, some purchases of machinery having already been made.

Plans are in preparation for the factory which the Champion Mfg. Company is to build at Pontiac, Mich. It will be devoted to a varied line of products, including small gasoline engines for motor boats.

The Walker Motor Company, Detroit, has been organized with a capital of $150,000. Its plans have not, however, been announced.

A new brass and aluminum foundry is now under way for the Buick Motor Company, Flint, Mich. It will be completed this summer.

The Saginaw Auto Company, Saginaw, Mich., has provided machine shop facilities for repairing motor cars. Some difficulty is encountered in obtaining skilled men for the work, but not so much as in other smaller manufacturing centers, as good mechanics have been attracted to Saginaw by the large factories now in operation there.

The McCord Mfg. Company, Walkerville, Ont., is turning out radiators for the automobile trade, and has found it necessary to enlarge its working force in order to keep pace with the requirements of the business.

The Jackson Cushion Spring Company, Jackson, Mich., now has its new plant practically completed and in service, the machinery being electrically operated. Contracts already in hand are sufficient to keep it running for some time to come.

The Western Foundry Company, Ltd., Wingham, Ont., is advertising in Detroit for molders, indicating that the situation on the other side of the boundary is practically the same as here.

John Dell, Ozark, Mich., will install a shingle mill at St. Ignace, Mich.

Steel foundry barrels, which are a specialty of the Ohio Mfg. Company, Painesville, O., have been called for to such an extent within the past few months that it will be necessary to arrange for a larger output in the near future.

The Alpena Motor Company, Alpena, Mich., has been incorporated for $450,000.

From Toledo, Ohio, it is reported that the General Electric Company will make extensive additions to its manufacturing plant there, in which the bulbs for incandescent lamps are produced. Plans include the immediate erection of a large new building.

Tools for sheet metal work are so largely in demand this year that the plant of the Consolidated Press & Tool Company, Hastings, Mich., in which a specialty of this class of machinery is made, has been very busy all through the season.

The Dayton Motor Car Company, Dayton, Ohio, has inquiries out here for men with which to operate the new screw machines recently installed, but there is a decided dearth of such labor all through this section, despite the large number that have been brought in from all parts of the country by the various automobile makers under promises of steady employment at good wages.

The Charles Amos Company, Detroit, is estimating on a good deal of structural steel work, which appears to be in greater demand here at present than in any previous period, owing to the activity in factory construction.

The Detroit Foundry Company, Detroit, which operates its machinery with direct current motors supplied from its own power plant, will probably require some additional electrical equipment later in the year, as enough business is offering to justify considerably extended facilities for the manufacture of castings.

The Sherwood Brass Works, Detroit, is working to its full capacity and more skilled men than are at present obtainable could be employed to advantage.

A three-story addition, 80 x 100 ft., will be made to the factory of the Bay View Furniture Company, Holland, Mich. No announcement has been made as to the details of the equipment required, but this has been largely provided for. Building contracts are now being let.

The Garford Company, Elyria, Ohio, is adding to its force and arranging for an increase of facilities to meet the demands of the automobile trade, a large percentage of its business being derived from the motor car plants in this city.

The new plant of the Reddinger Carving Works, Evansville, Ind., is being completed and furnished with a line of modern machinery electrically operated.

The Ireland & Matthews Mfg. Company, Detroit, which is equipped for spinning and drawing work, stamping, &c., has been filling a good many contracts this season for the account of the automobile factories, which demand a very high grade of product. Orders from the general industrial field have also been numerous.

A machine shop for motor vehicle repair work will be established in Zealand, Mich., under the management of J. J. Rookus.

Hayes & Housden, Detroit, are making a specialty of repairing electrical work and also undertake complete installations.

The Standard Die Cutting Company, Detroit, has been incorporated for $25,000 by Charles F. Springman and E. L. J. Mamer of this city. No further details have been made public.

The Otis Steel Company, which is represented in Detroit by Geo. W. House, Ford Building, has found this a very favorable district for the sale of the steel castings and forgings, including axles, which form a part of its product.

Interests said to be identified with the Union Mfg. & Lumber Company, Northville, Mich., have organized the Sanitary Churn Mfg. Company and will provide for the production of a patented machine.

The Detroit office of the Bethlehem Steel Company has placed with local automobile plants and machine shops, in general, that are engaged in the production of motor car parts, a large quantity of tool steel for high speed cutting and finishing. The bars are offered in certain special brands that show some very interesting results in hardening qualities, durability, &c., as demonstrated by actual shop practice.

The Northway Motor & Mfg. Company, Detroit, has increased its capital stock from $250,000 to $1,000,000 in order to provide for the plant extensions and improvements recently determined upon.

It is announced from Pontiac, Mich., that the Vulcan Gear Works, Detroit, will build a factory there.

Business interests of Bangor, Mich., are endeavoring to secure the location there of a manufacturing plant. A water power is available.

The Bower Roller Bearing Company, Dayton, Ohio, has been reincorporated under the laws of Michigan and will remove its plant to Detroit, where it will more than double its present capacity. Details regarding size of buildings to be erected have not been worked out, but the company advises it will probably erect a four-story building of concrete construction, for which considerable new equipment, consisting of automatic screw machines and grinders will be purchased.

The Smith-Matthews Foundry Company, Detroit, has just completed a new plant and will do a general jobbing business, making a specialty of small gray iron castings.

St. Louis

ST. LOUIS, July 18, 1910.

In the aggregate a satisfactory business is passing, as reported by both the merchant sellers of metal working machinery and by the local manufacturers of heavy equipment, light tools, pulleys, &c. Very good evidence of present activity and of preparation for the demands of the future is reflected in the weekly news of additions to plants and the installation of new equipment, both in St. Louis and in the Middle West.

The immense establishment of the Anheuser Busch Brewing Association is constantly being enlarged, either in buildings or equipment. It has now in service some 80 heavy electric trucks, for which a new garage and repair shop is being erected, which will cover, approximately, one-fourth of a city block. It has placed orders for an equipment of high grade machine tools, all of which will be direct driven by individual motors. The company is also building a large sight-seeing truck for transporting visitors over the plant.

The Missouri, Kansas & Texas Railroad system has been placing orders for considerable equipment for the Dennison and Sedalia shops, mostly of woodworking, though a part of the orders are for iron working tools.

The Illinois Steel Warehouse Company is erecting a large steel frame warehouse at Twenty-first and Gratiot streets, which will be equipped with three electrical traveling cranes. It is the purpose of the company to carry a heavy assortment of beams, &c., and thus be enabled to make prompt deliveries in this market.

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The Moon Motor Car Company and the Dorris Motor Car Company, manufacturers of automobiles, are full of work and have recently added considerable machine tool equipment.

The American Can Company has just entered upon the occupancy of a large addition to its factory, which was equipped with machinery manufactured in the machinery department of their plant.

The American Car Company, builder of street and interurban electric cars, is very busy at the present time on orders for equipment from various sections of the country.

The Brecht Butchers' Supply Company has placed orders for upward of $10,000 worth of assorted machine tool equipment, distributed among the dealers here.

The Wabash Railroad has inquiries out for several plate machines and a number of miscellaneous tools.

Second-hand machine tools are arriving in somewhat better quantities and the leading dealers have a very fair assortment of the same for inspection. The firm of Albert Bowman is just getting in a carload of second-hand tools and reports business moving satisfactorily for this season of the year.

The B. Reily Hank Supply Company, St. Louis, has been incorporated; capital stock, $10,000; incorporators: B. Reily Hank, Herman Ernest, Vincent McShane; to engage in manufacturing and dealing in machinery and supplies.

The St. Louis Truck & Specialty Company, St. Louis, has been incorporated; capital stock, $2000; incorporators: John F. Judd, Wm. Waltering and Wm. Berninger; to engage in the manufacture of trucks, tools and miter boxes.

The Harrisonville Pump & Foundry Company, St. Louis, Mo., the incorporation of which was recently mentioned, advises that its capital stock is $45,000 instead of $5000, as previously reported. The company has not decided upon its plans for the future as yet.

The Turley Gear & Machine Company, St. Louis, has been incorporated; capital stock, $25,000; incorporators: H. G. Turley, Anthony Rieth and W. A. Turley.

The Wilson Burner Company, Quincy, Ill., has been incorporated; capital stock $2500; incorporators: J. E. Stanley, Chas. C. Wilson, P. C. Elsey; to engage in manufacturing and dealing in oil burners, fixtures and appliances.

The Bignall & Keeler Mfg. Company, Edwardsville, Ill., is very busy on orders for its line of pipe threading machines.

Business among the shops in Memphis, Tenn., seems to be holding up well for this season. The Allen Engineering Company is just getting its new plant started, which is equipped with electric cranes and a line of high grade machine tools, together with a foundry outfit.

The William J. Oliver Mfg. Company, Knoxville, Tenn., is making extensive improvements to its plant, which will cost about $200,000. L. Le Van, for many years general superintendent of the Oliver Chilled Plow Works, South Bend, Ind., has become vice-president of the Oliver Company and will have entire charge of the manufacturing department. The proposed improvements include the installation of a malleable iron foundry and a general enlargement of the company's plow manufacturing facilities.

Milwaukee

MILWAUKEE, WIS., July 18, 1910.

Sales of power and electrical equipment, as well as machinery of general utility, continue heavy, the demand being pretty well distributed among the leading industries of the country. Otherwise the market is rather quiet.

During the past week the attention of manufacturers and dealers through this section, particularly the former, was largely occupied with the usual semiannual inventory taking, which began July 1 and is now far enough along in most cases to enable the figures to be available for consideration. Where these have come under the writer's personal observation, the percentage of new tools shown is surprisingly large, even allowing for the liberal purchases known to have been made during the last eight or nine months, and reports from various sources indicate that the condition is one which prevails quite generally in the leading industrial centers of Wisconsin. Apparently there has been a great deal of quiet buying with which the State has not been fully credited.

The situation mentioned in last week's report to *The Iron Age* from Chicago—namely, that machinery houses began the second half of the year with more unfilled orders on their books than they have had at any time since the fall of 1907, and that complaints are beginning to appear because the factories in some lines are so far behind—might also be stated with reference to this market. The open weather everywhere has given building contractors an opportunity to do exceptionally rapid work; consequently new plants have been finished ahead of schedule, and manufacturers who have been depending upon the usual delays, such as ordinarily prevent the customer from wanting his machinery at the time he said he would, find that the latter is crowding for delivery before the date specified. The condition thus far has not developed any serious aspects, but it threatens to do so. To the credit of dealers it may be said that, so far as machine tools, motors, &c., are concerned, they have shown much tact and ability in keeping the trade satisfied. There has seldom been a season when the three cornered relations between manufacturers, dealers and users were more harmonious.

The Wisconsin Bridge & Iron Company has the contract for the steel work on the new buildings to be added to the plant of the J. J. Vollrath Mfg. Company, Sheboygan, the character and dimensions of which have been previously reported in *The Iron Age*.

The agricultural implement trade has been a very prominent feature this season of the business of the Lakeside Malleable Castings Company, Racine, Wis., and sufficient orders are obtainable from this source alone to keep the foundry in steady operation. The company has, however, its regular customers in other lines, including the railroads, whose requirements are also being taken care of.

The Bucyrus Company, South Milwaukee, Wis., will begin in the near future the construction of the iron foundry recently mentioned, which is to be of large capacity. As soon as it is completed the present gray iron department will be remodeled for use as an extension of the steel foundry.

The T. L. Smith Company, whose main offices are now in the Majestic Building, Milwaukee, has quite a number of Symons crushers of the improved type in operation and is able to point to some excellent records of service. The demand for concrete mixers and other apparatus of its manufacture continues large, and the capacity of the company's present plant has been severely taxed. Prompt deliveries are, however, being effected.

The plant of the Buswell Lumber & Mfg. Company, Wausau, Wis., which burned recently will be rebuilt.

Among local sales recently made by the Milwaukee Boiler Company are included a 150 hp. boiler for the John Schroeder Lumber Company and one of 100 hp. for the R. Gumz Company.

The Northern Specialties Company, Phillips, Wis., whose incorporation was reported in *The Iron Age* last week, has been organized by John R. Davis, P. J. Demares and J. L. Davis, who are also identified with the John R. Davis Company of that place. The equipment will consist principally of woodworking machinery which is already available for the purpose.

The Modern Steel Structural Company, Waukesha, Wis., will supply the steel roof trusses and other material to be used in the construction of a large new warehouse for the Dells Paper & Pulp Company, Eau Cleare, Wis.

The Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis., which now has a large steam plant, equipped with engines, high pressure and low pressure turbines, will undertake an extensive hydroelectric development on the Wolf River, said to involve an expenditure of nearly $1,000,000. A site for the dam and generating station has been secured. There will be available a head of about 60 ft., which can be raised considerably, thus giving ample power for operating the interurban railway systems of the Fox and Wolf River valleys for years to come. It will be some time before the purchase of turbines, generators, &c., is considered.

Jacobsen & De Guerre, engineers of Appleton and Grand Rapids, Wis., are supervising the remodeling of the boiler house and mill at Ladysmith recently taken over by the Menasha Paper Company. Whether or not new equipment is needed has not been stated.

The Belle City Steel Casting Company, Racine, Wis., has increased its capital stock to $10,000 in order to provide for the growth in the business.

Plans for the new plant of the Appleton Chair Company, Appleton, Wis., include four two-story buildings, 58 x 96, 58 x 112, 32 x 54 and 32 x 32 ft., and several smaller structures; also a separate power house equipped with boilers, engines, &c.

The Geuder, Paeschke & Frey Company, Milwaukee, is doing a large amount of custom work this season in metal drawing, stamping, spinning, &c., in addition to its other regular lines, with which the trade is well acquainted. The extended plant, now covering 12 acres, gives it facilities of considerably greater magnitude than it has had in any previous year. In this line of business there is an excellent outlook for fall and winter trade.

Equipment required for the new three-story factory of the Schwahn-Seyberth Company, Eau Claire, Wis., which is 50 x 105 ft., will include a steam generating plant, shafting, belting and electric motors. A freight elevator will also be needed.

The Allis-Chalmers Company announces the [illegible]

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steam turbine for a particularly interesting installation to be made by the Standard American Dredging Company, San Francisco, Cal. This unit, which comprises a standard turbine and alternating current generator of 500 kw., will be placed in the engine room of a large dredge and provide power for the operation of a motor driven suction pump used in dredging operations. The exciter will be direct connected to an engine furnished by the American Blower Company, Detroit, Mich. Steam is to be supplied to the turbine at 175 lb. pressure and 100 degrees superheat.

The contract for conveying machinery to be used in connection with the addition to the Brokaw plant of the Wausau Paper Mills Company, Wausau, Wis., has been let to H. W. Caldwell & Sons Company, Chicago, Ill.

The Advance Mfg. Company, Racine, Wis., is making a feature of producing patented articles or other specialties for the account of those who do not possess adequate manufacturing facilities of their own or wish to bring out a new line for which they lack the necessary equipment.

In addition to the boilers and pumps recently mentioned, the city of Wausau, Wis., will require for its pumping plant addition a 6 x 125 ft. stock of brick or steel.

The Malwaukee Bridge Company has the structural contract for a new steel frame building to be erected by the Badger Foundry Company, Racine, Wis. It will be 60 x 60 ft. Construction work is expected to be completed and equipment installed by Sept. 1.

The Beloit Electric Light, Water & Power Company has been requested by the local authorities, with the approval of the Wisconsin Railroad Commission, to extend its service, and this will probably lead to the purchase of some additional power and pumping machinery.

Although it is prepared to undertake bridge and structural work of every kind, in any locality, the Worden-Allen Company, Milwaukee, appears to have had as much as it could do for the past few months, outside of its regular trade, in providing material and erection gangs for the numerous machine shops, foundries and forge shops for which it has taken contracts in this immediate vicinity. The amount of local business offered is probably the largest in the history of this market.

The Hirschberg-Williams-Washburn Company, Milwaukee, is preparing plans for a three-story addition, 50 x 150 ft., to be made to the new factory of the Bradley Knitting Company, Delavan, Wis.

Hoffman & Baur, Milwaukee, have the contract for the sheet metal work on the new buildings of the National Brake & Electric Company, Milwaukee.

The plant of the Brooks & Ross Company, Schofield, Wis., which was destroyed by fire, will probably be rebuilt.

The gas and pumping engine departments of Allis-Chalmers Company, which have kept very closely in touch with foreign practice, will be represented at the joint meeting of the Institution of Mechanical Engineers and the American Society of Mechanical Engineers, in Birmingham, England, by E. T. Adams, who went abroad some months ago. Mr. Adams is an engineer of broad experience and has designed some of the largest and most successful power and pumping plants in this country. At present he is manager of both of the departments mentioned.

A three-story addition, 70 x 150 ft., will be built to the factory of the Rhinelander Refrigerator Company, Rhinelander, Wis. Whatever new machinery is needed has been practically provided for.

The Tomahawk Power Company, Tomahawk, Wis., is arranging for the construction of a dam, preliminary to the proposed hydroelectric power development.

A one-story addition, 20 x 80 ft., will be made to the plant of the Sears-Hitchcock Company, Berlin, Wis.

The Kenosha Electric Railway Company, Kenosha, Wis., is considering plans for the erection of a new steam turbine power station, as the site of its present plant is needed for factory purposes.

The Reliance Engineering & Equipment Company, Milwaukee, would like to have for the standard file set in its main offices, 1417-19 Majestic Building, catalogues of power, electrical and contractors' machinery.

Bids are now being taken on an additional factory building, 75 x 86 ft., four stories, and a power plant, 43 x 54 ft., for the C. B. Henschel Mfg. Company, Milwaukee. An electric generating unit will be installed and motors used for driving the machinery. The installation of a sprinkler system is also contemplated.

The Milwaukee Brass Mfg. Company, which does casting, finishing, polishing and plating work in considerable variety, has had its plant crowded with orders for some time past, and some extension of facilities will probably be provided for within the next few months.

Two electric generators of 750 kw. each and a large line of alternating current motors, probably 45 or more, will be required for the power department of the Wausau Sulphate Fibre Company, Wausau, Wis. Bids are to be taken about Aug. 1.

One feature of the business of the Geo. H. Smith Steel Casting Company, Milwaukee, in which it has built up a large trade, is the production of castings for electric motor yokes and frames, some of the largest manufacturers of electrical machinery being among its customers.

Work is commencing on the construction of an addition to the power plant of the Delavan Heat, Light & Power Company, Delavan, Wis. The equipment now consists of Russell engines driving two direct current Westinghouse generators of 225 kw. What it is proposed to add to this has not been announced.

A great deal of interest has been awakened in this section, as well as elsewhere through the country, in the new line of lathes built by the Milwaukee Machine Tool Company, which was described in *The Iron Age* some months ago. When the new plant of the company in West Allis is placed in service, the production of these machines will be a prominent feature in the tool trade of the State.

The Chain Belt Company, Milwaukee, has thus far had a very favorable season in the sale of its mixers, which are now being utilized on large construction work in various parts of the country. Considering the short time these machines have been on the market, their widespread adoption is noteworthy.

The Southwest

KANSAS CITY, MO., July 18, 1910.

The greatest activity of any in this territory, as recently emphasized, now prevails in the mining and smelting districts of the farther Southwest, where plans for extensive developments, including irrigation, power and oilfield projects, are gradually being worked out. From Texas and Oklahoma inquiries continue fairly numerous, although sales are somewhat slow; and saw mills, stave factories, &c. in Arkansas have recently been buying to some extent. Trade through Kansas and Missouri is dull. Local industries, however, are busy on orders and manufacturing is considerably more diversified than it was only a year or two ago. In some quarters it is stated that quite a number of plants are now manufacturing for stock, but inquiry fails to substantiate that fact to any marked extent, as most of the products of this section are moving out freely on sales previously made. Eastern houses have, however, been more liberal lately with their representatives in the matter of consigned stock, and local branches are more generally providing warehouse facilities than in former years, together with better facilities for repair work.

The Capital Iron & Wire Works, Kansas City, is representing the Milwaukee Concrete Mixer & Machinery Company in the sale of the latter's products, which, although placed on the market only a few months ago, have met with considerable favor in this section.

An electric generating unit will probably be installed during the coming fall in connection with the municipal pumping plant at Nacogdoches, Texas. Plans to that end are now being considered. An entirely new plant may be constructed.

Two all-steel cars have been placed in service by the Little Rock Railway & Electric Company and more are likely to be ordered. The experiment is being observed with much interest by other traction companies of the Southwest.

Pumping machinery of greater capacity than that now in use is expected to be purchased this year at Kinsley, Kan.

The Ash Grove Lime & Portland Cement Company is increasing the capacity of its power house at Chanute, Kan. This was originally equipped with four simple engines with 22-in. cylinders and 43-in. stroke. It has now ordered a 46 x 42 in. low pressure machine, which will be combined with one of the older units to form a cross compound engine. Power is transmitted to the machinery in the works by means of rope drive.

The Kansas City Bridge Company, Kansas City, has secured the contract to construct a number of bridges in the vicinity of Oklahoma City, Okla.

Four new tubular boilers of 300 hp. each will be installed in the Quindaro pumping station at Kansas City to supply steam for the pumping engines that have been ordered, which are for 20,000,000-gal. daily capacity. Contracts covering the entire equipment have been placed.

The combined drilling and milling machine which the W. B. Knight Machinery Company, St. Louis, Mo., is putting on the market, has been showing excellent results wherever introduced for toolroom service and experimental work. It is of light but substantial construction and takes up very little room.

Electrically operated pumps of large capacity are about to be installed in the shafts of the Haynes Copper Company, Jerome, Ariz.

The Southwestern-Port Huron Company, Wichita, Kan.,

THE MACHINERY MARKETS

which handles the products of the Port Huron, Mich., Engine & Thresher Company through a large section of the Southwest, has found the present season a very favorable one for the sale of heavy steam rollers of the company's standard line.

A new pumping plant with improved equipment is to be built by the Texarkana Water Company, Texarkana, Texas.

The C. A. Burton Machinery Company, Kansas City, which handles the steam hoists and haulage engines built by the Stroudsburg Engine Works, has had liberal inquiries from contractors and other users, with a fair percentage of sales during the buying season. The market for apparatus of this character is gradually widening.

The complete contract for an electric power and pumping station, water works system, &c., at Ola, Ark., has been awarded the Kress Construction Company, Stuttgart, Ark.

The Desert Power & Water Company, Kingman, Ariz., is having completed in the shops of the Nordberg Mfg. Company, Milwaukee, a cross compound engine of 1500 hp., which will be direct coupled to an alternating current generator of 1000 kw. Auxiliary machinery will also be provided.

The Bennett Stephenson Mining & Milling Company of Las Cruces and Organ, N. M., is about to undertake extensive development work and will soon erect an ore reduction mill of 200 tons daily capacity. Power and operating machinery will be needed.

An elevated steel tank of 90,000 gal. capacity will be erected in connection with a water works system planned for municipal service at Center, Texas. Construction contracts have been let.

J. P. Hanson, who was formerly connected with the Nordberg Mfg. Company, Milwaukee, Wis., will manage the new plant which is being established at Globe, Ariz., by the Globe Foundry & Machine Company. There is an excellent opening in that district for business from the mines and smelters.

The Greenfield Light & Power Company, Greenfield, Mo., has ordered for its plant a belted alternating current generator of 100 kw., three phase, 60 cycles, 2300 volts, which was purchased from the Kansas City representatives of Allis-Chalmers Company, Milwaukee, Wis.

The Theodore Hiertz Metal Company, St. Louis, Mo., which makes a feature of babbitt metal for power machinery, has had a good run of business during the first half of the year, and prospects for the immediate future are quite satisfactory.

Plans are now in preparation for a pumping plant to form part of the proposed municipal water works system at Windsor, Mo.

A large electric hoist is being installed on the property of the Old Dominion Copper Mining & Smelting Company, Globe, Ariz., and other improvements will be effected during the season.

The Southwestern Portland Cement Company, El Paso, Texas, has ordered from Northern builders a motor-driven centrifugal pumping unit, the installation of which will be of interest on account of the operating conditions. Power will be transmitted to the induction motor used, and the motor controlled, from a generating station about 1½ miles distant. The current issues from the dynamos at 480 volts and will be stepped up to 2200 volts for transmission to the motor, which is wound for about that pressure. The pump will deliver 2000 gal. of water per min., against a total head of 80 ft., to a reservoir that supplies the company's works.

It is reported from San Antonio, Texas, that the Commercial Motor Company, headed by Z. Z. Brandon of Toledo, Ohio, will build a plant there for the manufacture of autotrucks, a site having recently been secured.

The city authorities of Seymour, Texas, have contracted with E. J. Dalton, Dallas, Texas, for the construction of an addition to its water works, to cost about $25,000.

The municipal authorities of Altus, Okla., have appointed the J. W. Maxcy Company, Scanlan Building, Houston, Texas, supervising engineer on improvements to its water works, sewer system and electric lighting plant, to cost about $200,000.

The South

NASHVILLE, TENN., June 18, 1910.

The market for machinery continues quiet, business being mostly of a mail-order character. In the line of shop equipment contracts recently placed have been almost entirely for tools to be used in repair work, automobile garages being among the buyers. Sheet metal plants, which have been very busy for months past, are doing some purchasing, but foundries and machine shops generally find their requirements light at present. All, however, appear to have considerable work in hand, and there is no dullness visible in any quarter. Consequently the outlook for a renewed buying movement a few weeks hence is encouraging. The large mills and factories contribute about their usual quota of business, while the mine operators, saw mill owners and companies engaged in various branches of woodworking are also sending in a fairly steady stream of small orders. It is a dealers' and jobbers' market, and, except for the representatives of Northern plants, manufacturers are not making much of an effort just now to place apparatus or supplies directly with the users.

The T. Murphy Iron Works, Jacksonville, Fla., has established an excellent trade in hoists and haulage engines, the demand for which has been more active this year than in any previous season.

The Richmond Forgings Corporation, Richmond, Va., has kept its Belle Island works busy to a considerable extent lately on orders for drop forgings to be used in automobile construction, including nickel, chrome nickel and other special steels. Much more of this business could be obtained, if desired, as there is an abundance of it offering.

Contracts are now being made for the equipment of the new electric generating station to be erected by the Richmond & Henrico Railway, Richmond, Va., in Fulton, Va.

The Roanoke Bridge Company, Roanoke, Va., has been awarded the contract for 13 steel highway bridges to be built in that vicinity.

The Florida Power Company, Ocala, Fla., will install three 300-kw. oil-filled, self-cooled, 60-cycle, 66,000-2300-volt power transformers, to be used in an extension of the company's service. An order for the equipment has been placed with the district manager of Allis-Chalmers Company, Fourth National Bank Building, Atlanta, Ga.

A new steam boiler has been installed and other improvements made in the mechanical equipment of Z. T. Thompson & Son's plant at Grange, Miss.

The General Chemical Company, Pulaski, Va., has purchased two direct current motors for extending electric drive in its plant.

The American Iron & Steel Mfg. Company, Lebanon, Pa., whose Southern business is very closely looked after by representatives having headquarters in the Fourth National Bank Building, Atlanta, Ga., has had a large trade during the first half of the year in bolts, nuts, rivets, &c., for machinery building, plate and structural work. This is particularly interesting as a barometer of prevailing industrial conditions, being one of the most accurate of any that could be referred to.

A new steam boiler has been installed by the Louisville Point Lumber Company, Louisville, Ky.

Plans for an electric power and pumping station are nearing completion at Easley, S. C. Bids covering machinery and other equipment will be called for in the near future.

The large new works of B. F. Avery & Sons, Inc., Louisville, Ky., have been placed in operation.

Preliminary plans are being made for a pumping plant and water works system at Comer, Ga.

Boswell Brothers, Pinola, Miss., are in the market for a second-hand, 13-in. wood planer.

A factory is being erected in Chase City, Va., by the newly organized Jeffreys-Spaulding Mfg. Company.

Pumping machinery for city water service is expected to be installed this year at Clearwater, Fla.

An elevated steel tank will be purchased shortly by the city of Loreauville, La.

The capacity of the municipal power station at Cairo, Ga., now equipped with a Crocker-Wheeler generator of 60 kw., driven by a Harrisburg engine, will probably be enlarged, another boiler also being added to the one originally built for this station by the J. S. Schofield's Sons Company, Macon, Ga. Bonds to the amount of $15,000 have been voted for the improvements.

The C. W. Hunt Company, whose trade in coal and ore handling equipment, hoisting machinery, conveyors, &c., has been largely extended all through the South, has established district headquarters in the Rhodes Building, Atlanta, Ga. An office was also recently opened at Richmond, Va.

The Petroleum Iron Works Company, Sharon, Pa., whose Southern offices are in the Brown Marx Building, Birmingham, Ala., have found this a season of unusual activity in blast furnace construction and repairs, of which they are making a specialty. In Louisiana, Texas and Oklahoma much business is also being derived from the oil refineries. The company has a branch at Tulsa, Okla., to aid in looking after this trade.

Machinery for a pumping plant may be required this fall at Kirkwood, Ga., where plans to that end are now being worked out.

A mechanical filtration plant of 10,000,000 gal. daily capacity will be built for the city of Atlanta, Ga., by the New York Continental Jewell Filtration Company, New York City, which has to its credit the largest number of installations of this character in the South.

Shook & Fletcher, Birmingham, Ala., through whom a

good deal of the pig iron from that district is marketed, have been selling quite largely to machinery building plants, and, while trade at present is rather quiet, there are evidences that considerably more buying will be done in the near future.

A large woodworking plant, electrically operated, is to be built in Mobile, Ala., by the Vredenbaugh Saw Mill Company.

The business interests of Louisville, Ky., are organized in a strong effort to bring more manufacturing plants to that city. A Bureau of Industries has been formed by the Commercial Club. Correspondence is invited.

Electric power and pumping machinery will be purchased shortly for installation at Sylvania, Ga. Bids on the construction of a new municipal plant, water works and sewage system will be taken until Aug. 1.

The Birmingham Valve & Fittings Company, Birmingham, Ala., is being organized to take over the business of the Stockham Pipe & Fittings Company, manufacturer of steam fittings, soil pipe and fittings. The company has acquired a 10-acre site and will erect four or five buildings of reinforced concrete and steel. Machinery for manufacturing iron and brass specialties will be installed, and the entire plant, it is expected, will cost about $300,000.

The Excelsior Foundry & Machine Shops, Columbia, Miss., of which W. B. Greand is manager, is erecting a foundry and machine shop, to cost about $15,000.

San Francisco

SAN FRANCISCO, July 13, 1910.

The Pacific Coast labor situation is unchanged. The employers at Los Angeles are taking a very firm stand for the open shop, and the strike there promises to be of long duration. The demand for machinery in general is well sustained, and as buyers are having some difficulty in getting prompt deliveries at other coast points there is somewhat more inquiry at San Francisco for articles of local manufacture.

The outlook is favorable for an increasing demand for some lines of equipment manufactured in this territory. Several operators are accordingly developing plans for future improvements, and a few installations are being made, though no general movement in this direction is to be expected until the labor question is settled. Owing to the powerful position and overbearing attitude of union labor in San Francisco, there is some tendency toward the establishment of manufacturing industries at nearby towns rather than in the city itself.

June has been a very quiet month in the machine tool department. So far no business has resulted from the larger inquiries from the Government and the Southern Pacific, and no very important orders have been placed by local metal working establishments, though one or two good inquiries are in prospect. The smaller railroads of the State are keeping out of the market for shop equipment almost entirely.

A few fairly large orders for woodworking machinery have been taken by local merchants recently, but the demand for new machinery is not as active as the number of new mills would indicate, owing to the amount of second-hand equipment on the market. Logging machinery is in fair demand. A contract has been closed for logging 16,000,000 ft. of timber from the Santa Fe right of way, for which some new equipment will probably be required.

Dealers in harvesting machinery report an exceptionally active season. One of the most active departments has been road building machinery. The amount of road work in progress or projected by counties and municipalities of California is greater than ever before, resulting in a heavy demand for scrapers, graders, steam rollers, &c., and there has also been a general inquiry for street flushing machines and oil and water sprinkling devices. Gravel and ore cars are also in fair demand.

The market for pumping machinery remains very active, both for oil and water works. A large volume of business in centrifugal pumps for irrigation is coming from southern California, with numerous orders from the central valley and neighboring States.

Marine work consists principally of repairs, though many small gasoline engines of local make are being used, and the United Engineering Works is installing machinery in a new steam schooner. The largest repair job undertaken here for some time has just been awarded to the Moore & Scott Iron Works, who will repair the army transport Thomas at a price of $428,889, the work to be completed in 199 working days. Figures have also been taken on repairs to the steamer Yucatan, which was submerged for several months in Alaskan waters.

The Pacific Coast Steel Company, which built a shop at South San Francisco last year, has let contracts for another building, and is buying a number of machines for general sheet metal work. A large steam engine formerly used by the Union Iron Works has been purchased.

The plant of the Byron Jackson Iron Works is working at full capacity on turbines and pumping machinery, most of which consists of small units for irrigation purposes. The largest work now on hand is a 500-hp steam turbine direct connected with a centrifugal pump, for an irrigation project in the Hawaiian Islands.

The Samson Iron Works, Stockton, Cal., is withdrawing its San Francisco office, which has been maintained for some time at First and Market streets, and will conduct all business in the Stockton office.

The Western Pipe & Steel Company has concluded the purchase of a 12-acre tract at Richmond, Cal., and will proceed at once with the erection of an up-to-date plant for the manufacture of all descriptions of riveted pipe, well casing and tanks up to 65,000-barrel capacity. No detailed list of machinery required is given out, but the equipment will cost between $75,000 and $100,000. The company has on hand a large amount of tank work for the oil fields, where it has a plant in operation, in addition to large shops in San Francisco and Los Angeles.

It is announced that the shops and main offices of the Hoover Auxiliary Spring Company will be moved from Fresno, Cal., to San Francisco.

Figures have been received for a 15-ton traveling crane with three motors for the United States Navy Yard at Mare Island, Cal.

About 100 cars of the Hicks Locomotive Works, which have been in use by the Ocean Shore Railway, have been sold to E. F. Clark and R. C. Gillis of Los Angeles.

The brick making equipment of the Popular Brick Company, San Francisco, including a 300-hp. Corliss engine, boilers, presses, &c., was sold at auction July 1.

It is reported that the Sierra & San Francisco Power Company will next year add about 15,000-hp. capacity to its steam generating plant.

The Empire Mine, near Grass Valley, Cal., is planning to install two large Oliver filters and a cyanide plant.

The Henderson Mechanical Motor Starter Company has been incorporated in San Francisco, with a capital stock of $20,000, by J. C. Henderson, A. Miller and J. J. Doyle.

The Los Angeles Steel & Malleable Iron Company, Los Angeles, has taken options on a 20-acre tract at Long Beach, and plans to erect a plant for the manufacture of a patent rail locking device. It is announced that work will be started next fall on the reinforced concrete shop building.

The Pacific Electric Railway Company, Los Angeles, is planning to install a large shop for the purpose of building its own cars.

The Rose Quartz Mining Company, Gibsonville, Cal., is planning to erect a stamp mill.

The Oil Well Equipment Company has been incorporated at Coalinga, Cal., with a capital stock of $25,000, by W. L. Ebaugh, C. A. Martin, W. E. Holbert, C. Augee and R. W. Wales.

A ten-stamp ore mill is to be erected this summer by the Karnac Mining Company near Jamestown, Cal.

The Modern Auto Machine Shop has been incorporated at San Diego, Cal., with a capital stock of $25,000, by C. M. Orr and others.

The Lawndale Water Company, Los Angeles, Cal., will double its pumping capacity, replacing gas engines with electric motors.

Salt Lake City, Utah, is taking figures on a large dredger.

Government Purchases

WASHINGTON, D. C., July 18, 1910.

The Isthmian Canal Commission will open bids August 15, under circular No. 597, for furnishing the following supplies, being the annual estimate: 320 water meters, 5/8-in., and 25 water meters, 3/4-in.

The Isthmian Canal Commission will open bids September 14, under circular 596, for furnishing and erecting machinery to operate the Stoney gate valves for controlling the main culverts and to operate the cylindrical valves for controlling the lateral culverts of the canal locks.

The Bureau of Yards and Docks, Navy Department, will open bids July 30 for condensers and piping for the power plant at New York.

The Isthmian Canal Commission opened bids July 7 for 160 boiler tubes and 40 tubular stays, as follows: Reading Iron Company, Reading, Pa., $516.22, shipment two weeks.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Liability of Employer for Negligence of Employee.—In Iowa an employer is not liable for injury to a workman resulting from the negligence of a fellow workman, where the employees are engaged in the same line of work, his obligation being discharged by providing a reasonably safe place for work, a sufficient number of competent workmen, the necessary appliances and proper materials. (Iowa Supreme Court, Hamm *vs.* Bettendorf Axle Company, 125 Northwestern Reporter 186.)

Duty to Employees Respecting Place of Work.—A vessel to which iron plates are being attached is a "structure" within the provisions of the New York labor law, which require employers to furnish safe scaffolding, &c., to employees working upon structures. (New York Supreme Court, Appellate Division, Fourth Department, Herman *vs.* P. H. Fitzgibbons Boiler Company, 120 New York Supplement 1074.)

Duty and Negligence of Employer.—An employer who uses a shop for storing metal beams must use reasonable care to make the floor safe, so as to avoid the falling of the beams upon employees working among them. An employer is liable for injury to an employee resulting from the former's negligence in omitting to provide a safe place to work, notwithstanding concurrent negligence of a fellow employee. (Iowa Supreme Court, Bell *vs.* Bettendorf Axle Company, 125 Northwestern Reporter 170.)

Duties of Employers to Employees.—An employee need not warn a workman against unexpected, improbable and unusual occurrences, but only against such probable consequences that may result in the exercise of proper care by the employee. An employee assumed the risk of injury from a dangerous condition which had occurred occasionally in the operation of a machine, where, with knowledge of the condition, he continued work without notifying the employer and without receiving assurance that the danger would be obviated. (Indiana Supreme Court, W. B. Conkey Company *vs.* Larsen, 91 Northwestern Reporter 163.)

Payment by Bills or Notes. Substitution of New Debtor.—While checks, duebills and similar instruments given to evidence an indebtedness are not payment until they themselves are paid, yet the contract between the parties may make them so. Where a creditor, holding an indebtedness against a single debtor, takes the joint duebill of this debtor and a third person, with a recital therein that it is in settlement of the account out of which the indebtedness arose, the creditor cannot thereafter sue the original debtor upon the account. (Georgia Court of Appeals, Lang vs. Shaw, 65 Southeastern Reporter 789.)

Description of Property in Chattel Mortgage.—A chattel mortgage covering "five wagons" is void for insufficiency of description where the mortgagor owns more than that number of wagons. (United States Circuit Court of Appeals, Eighth Circuit, *in re* Bothe, 173 Federal Reporter 597.)

Corporation Not "Citizen."—A corporation is not a "citizen" within the first section of the fourteenth amendment to the United States constitution, prohibiting the abridgment of privileges and immunities of citizens. (Indiana Supreme Court, Mutual Mfg. Company *vs.* Alspaugh, 91 Northeastern Reporter 504.)

Liability of Limited Partners.—A partner though not known in the business to creditors, and though receiving no profit from it, is liable for firm debts. (South Carolina Supreme Court, McGhee *vs.* Montgomery, 65 Southeastern Reporter 721.)

Liability of Agent Contracting in Own Name. Sellers of machinery who sign a contract in their own name, which contract does not show upon its face that they were acting as agents for another, and is acted upon according to its terms, are bound thereby and cannot on suit for a breach thereof assert that they contracted merely as agents. (Washington Supreme Court, Gordon *vs.* Brinton, 104 Pacific Reporter 832.)

Satisfaction of Claims. The cashing by a creditor of a check containing the words "paid in full," signed by the debtor, does not bar the creditor from claiming a further balance, unless there is a genuine dispute between the parties as to the amount due. (New York Supreme Court, Appellate Term, Caravia *vs.* Levy, 119 New York Supplement 160.)

Validity of Contract in Restraint of Trade.—An agreement by one selling stock in a corporation, conducting a particular business, not to engage or become employed in the same line of business in the same town, unless for that company, is enforceable as a reasonable restraint of trade. (North Carolina Supreme Court, Anders *vs.* Gardner, 66 Southern Reporter 665.)

Acceptance of Orders for Goods.—In the absence of express authority a traveling salesman has authority only to solicit orders and transmit them to his concern for approval, and cannot make an absolute contract of sale. Where a company rejected an order for an article, and offered to return the amount of a check sent by plaintiff with the order, the fact that on receipt of the check it deposited the same for collection did not amount to an acceptance of the order. (Mississippi Supreme Court, L. A. Becker Company *vs.* Clardy, 51 Southern Reporter 211.)

Rights of Seller Under Installment Contract.—If one who agreed to execute promissory notes for the unpaid price of machinery payable in installments refused to do so, the seller could regard the contract of sale as terminated and sue for damages, or he could treat it as in force and sue for the installments as they matured, each default in the payment of the installments being the subject of an independent action. (Connecticut Supreme Court of Errors, House Cold Tire Setter Company *vs.* Ingraham, 75 Atlantic Reporter 80.)

Rights of Third Person Under Conditional Sale.—Under a lease of machinery with an agreement to sell at the expiration of the lease if the lessee performed certain conditions, a subsequent buyer for value without notice of the conditions attached to the sale acquired no greater rights than the lessee had under his contract. (Arkansas Supreme Court, Cullin-McCurdy Construction Company *vs.* Vulcan Iron Works, 124 Southwestern Reporter 1023.)

Effect of Balance Struck in Bank Book.—Where a balance is struck in a pass book it becomes an account stated between the bank and the depositor, and the bank will be precluded from denying its liability as shown by that balance, unless fraud or error is shown. (Pennsylvania Supreme Court, Greenhalgh Company *vs.* Farmers' National Bank, 75 Atlantic Reporter 260.)

Rights Under Contract.—Where a contract provides for the sale of "about 1000 tons" of coal per month, each month stands by itself, and, if delivery during any month be waived, the seller cannot be required to make up the amount by delivering a greater quantity in a succeeding month. (New York Supreme Court, Appellate Division, First Department, Thedford *vs.* Herbert, 119 New York Supplement 1025.)

Agreement Not Constituting Monopoly.—An agreement between a manufacturer of goods under a secret process and a retail dealer, providing that the latter will not sell for less than the price fixed by the manufacturer, is not in restraint of trade, notwithstanding the provision of the California statutes that any contract by which anyone is restrained from exercising a lawful business shall be void. (California Supreme Court, Grogan *vs.* Chaffee, 105 Pacific Reporter 745.)

Validity of Reservation of Title to Heating Plant.—A heating plant installed in a building under an agreement with a building contractor to which the owner was not a party becomes a part of the building, and cannot be removed by the seller, though by such agreement he reserved title until payment of the purchase price. (Arkansas Supreme Court, Peck Hammond Company *vs.* Walnut Ridge District, 123 Southwestern Reporter 771.)

The Illinois Steel Company has made a change in its relations to the Scully Steel & Iron Company, Chicago, jobber of structural materials, plates and merchant bar steel. Formerly the Illinois Steel Company from time to time sold the Scully Steel & Iron Company a definite tonnage of these materials at agreed prices for extended deliveries, such deliveries in many instances running through several months. Hereafter the Illinois Steel Company will sell the Scully Steel & Iron Company its product at agreed prices from month to month, deliveries of these materials being made to the latter company from stocks which the Illinois Steel Company will carry under its ownership in the warehouses owned by the Scully Steel & Iron Company. A similar arrangement has been entered into by the Carnegie Steel Company, the National Tube Company and the American Sheet & Tin Plate Company with the Scully Steel & Iron Company relating to their respective materials.

The Taft-Pierce Mfg. Company, Woonsocket, R. I., announces that it has opened an office in Detroit at 1311 Majestic Building, where members of its staff will give attention to the designing and construction of special tools, jigs, fixtures, &c.

The Crucible Steel Company of America, Pittsburgh, has received a contract from the Government for 300 10-in. projectiles at $135 each and 700 8-in. at $74.95 each.

New Publications

Grades of Steel. By H. P. Parrock. Cloth bound; pages 55, 5 x 6½ in. Published by the author at Buffalo, N. Y.

Mr. Parrock has brought together in this booklet a considerable amount of data which promises to meet the end he had in mind, namely, to instruct the machinist and the tool maker, the final users of tool steel—the men upon whom the ultimate economies depend. The author emphasizes the increasing necessity of economy in steel, arguing that if it pays to select grades at $30 a ton it surely pays to choose carefully at $3000 per ton, however relatively small the more expensive item may be.

Illustrating the care taken to select the less expensive grades of steel various analyses are given, and the uses of steels of the different compositions are indicated. Some of these classes are dead soft basic, soft basic, tubing, tin bar, rivet, nut and screw, structural, hard structural, soft forging, forging, medium forging, hard forging, very hard forging and steel casting. Upwards of 150 analyses are given showing the variations in composition of steels adapted to the various uses enumerated. A very brief résume is given of methods of manufacture, the Bessemer and open hearth processes being referred to by way of introduction to the crucible process, since it is the product of the latter with which the booklet chiefly deals.

The crucible steels are taken up by the author under the headings, "Carbon Steels," "Carbon Alloys," "Special Gear Steels," "Self-Hardening" and "High Speed" steels. The tempering of carbon crucible steels and the hardening of high speed steels are treated with considerable detail, some of the data being reproduced from F. W. Taylor's monumental work on the "Art of Cutting Metals." Illustrations are given of different shapes of tools, and the great importance of shaping is properly pointed out, since the labor of shaping the steel usually exceeds the cost of the material. The author does not claim originality for his work, but he has done a great service in compressing into small space so much that is of value to tool users. Though a seller of tool steels, he does not hesitate to say that there is a great waste of money in the purchase and use of such steels. Here is an example of the suggestive features of the little book:

> The selection of tool steel for various purposes is a man's job. Large users of tool steels carry on experimental work all the time, tabulating brands, prices, cutting angles, hardening temperatures, drawing colors, cutting speeds, wear, waste and outputs; small users would do well to pool their interests for the same purpose, for it is probable that about three to four times as much tool steel is made and sold as is needed to do the work now required to be done. Two-thirds or more is lost; wasted, burned, badly worked—and the price stays up. The first chance of error in treating tools occurs at the heating to work to shape. Carbon steel breaks down very quickly and it pays well to spend plenty of time and care in shaping tools under the hammer. Even in heating to cut off a section be careful to keep carbon steels below a "red." Keep at medium red and cut slowly.

The hardness diagrams, of which there are several, are based on determinations by the Shore scleroscope. The author concludes with a page of suggestions on the handling of tool steels. He does well to call attention to the need of co-operation between the users and makers, and gives the former more of an idea than they ordinarily entertain of the care and precision that go into specifications and the treatment of steel. One of the striking comparisons, illustrating how large a factor labor is, puts the cost of steel in a given case at $4 and that of labor at $400. The author suggests that the user can quite well afford to pay double, or $8, for the steel, thus increasing the total cost by only 1 per cent., while in many cases doubling the yield, providing the user does not injure the $8 steel. "If, however, the $4 steel will make what we have to make and becomes scrap afterwards, it is the steel to use." The author is a member of the firm of Cadwell & Parrock, Buffalo.

Metallography. By Cecil H. Desch. Pages x + 432; 5 x 7¼ in. Illustrated with 14 plates and 108 figures. Price, $3, net. Published by Longmans, Green & Co., London and New York.

The author of this latest work on metallography, Dr. Cecil H. Desch, is Graham Young lecturer in Metallurgical Chemistry of the University of Glasgow. The book is one of the series of text books of physical chemistry edited by Sir William Ramsay, the previous members of which are already well known and appreciated. A few lines from the author's preface may be quoted as outlining the purpose of the book: "The study of metallic alloys by physical and microscopic methods has reached so great a development in recent years as to form a distinct branch of physical chemistry. In the following pages I have sought to present an account of the methods employed in this branch of study and of the conclusions which have been reached, and also to indicate the directions in which further research is needed."

The first chapter consists of an introduction, which begins with an admirable definition of metallography—namely: "The study of the internal structure of metals and alloys, and of its relation to their physical and mechanical properties." One of the most noticeable features of the introduction and of the whole book is the large number of accurate and valuable references given in the footnotes and the appendix. The next four chapters take up the Diagram of Thermal Equilibrium, thus recognizing the fundamental importance of thermal analysis in the study of alloys. A simple binary system of metals which are insoluble in each other is first considered, and a few pages are devoted to the bearing of the phase rule on this subject. In the same chapter is considered the case of a compound of the two metals being formed, and concrete examples are given. Then in succeeding chapters the cases are taken up where the metals are partly and wholly soluble in each other; those of ternary and more complex systems with a short chapter on metals, which are only partially miscible in the liquid state. These chapters are a good presentation of a difficult subject, and are greatly helped by the numerous diagrams and descriptions of typical examples.

The next three chapters are on Practical Pyrometry and Thermal Analysis; The Preparation of Micro Sections, and Microscopical Examinations of Prepared Sections. These relate to the practical part of metallography, and are about as detailed as the size of the book allows, but hardly sufficiently so for beginners in the science. Chapters 9, 10 and 11 deal with the Crystallization of Metals and Alloys, Undercooling and the Metastable State, and Diffusion in the Solid State. Chapter 10 is especially worthy of notice, clearly bringing out the importance of the metastable and labile states in alloys. Chapters 12 and 13 deal in an able manner with the physical properties of alloys that are used in investigating their constitution, but are of minor importance to pyrometry and microscopy.

Chapter 14 is on the Construction of the Equilibrium Diagram, the various lines composing the diagram being taken up in order. Chapter 15 deals with the little studied question of the Molecular Conditions of Metals in Alloys and the Nature of Intermetallic Compounds. Following this comes a very interesting consideration of Plastic Deformation, including a discussion of fatigue.

The last two chapters are brief presentations of the metallography of iron and steel and of some industrial alloys. The latter include the copper alloys, the alloys of gold, of aluminum, lead and tin, and bearing metals.

The book is the best presentation up to date of the

accomplishments in this comparatively new science, and is of especial value to those who are already somewhat familiar with it. G. B. W.

Power Required to Drive Rolling Mills.—By J. Puppe. Pages, 177; 7½ x 11 in. Illustrations, 29 figures, xi plates, 33 diagrams, and many illustrations without numerals, accompanying tables. Price, $4.50, net. Published by J. B. Lippincott Company, Philadelphia, 1910. London: Charles Griffin & Co., Ltd.

Dr. Puppe undertook in 1906 to carry out an extensive series of experiments to determine the power required to drive rolling mills. The tests were made at first in the electrically driven rolling mills at Peine, Germany. Later a heavy plate mill was taken up in the same way and afterwards two other mills. In December, 1906, the author solicited the support of the Verein Deutscher Eisenhüttenleute for the enlargement of the inquiry and finally this society appointed a commission to take the subject in hand and widen the scope of the work. The results of the commission's investigations were published in German in a special volume of which the title translated was "Experimental Investigations on the Power Required to Drive Rolling Mills." The commission decided to limit its inquiries to the power requirements of the passes for different shapes, with due consideration of the temperature and the mechanical properties, excluding the question as to the most suitable motive power. The experiments were carried out on six electrically driven trains, two of them double two-high trains for bars, two others three-high mills for rolling mine rails, while two were reversing mills. One of the latter was a blooming mill and the other had stands for rolling beams and rails.

In *The Iron Age* of March 11, 1909, five pages were devoted to a summation of the results of a portion of the inquiry and to diagrams and sections illustrating various passes and the power requirements for each. At that time the text of the commission's report existed only in German. The volume before us is a translation into English, together with all the tables and the voluminous data secured by the commission, these involving roundly about 200,000 calculations. The analysis of the various passes in each of the rollings is exhaustive and gives information never before presented in book form.

It is again true that the iron industry—in this case the rolling mill engineer, in particular—is under great obligation to the painstaking and the high technical ability of German engineers for data of the greatest value. Seventy-two tables in the Appendix to the report are devoted to the details of the tests and 29 sections are represented in the final forms of the finished material produced in the experiments. The translated work is certain to be in large demand among rolling mill engineers in the United States and Great Britain.

Principles and Practice of Iron Founding.—By E. L. Rhead. Pages, 505; 5¾ x 8¾ in.; illustrations, 247. Price, 7 shillings 6 pence, net. Published by the Scientific Publishing Company, Manchester, England.

The author states in his preface that the volume is the result of a series of lectures written up as articles for the technical press which were published during 1905 to 1908. The practice as described may then be assumed to represent English conditions at the present time. Glancing through the volume and comparing with the published reports of foundrymen's and other meetings in that country, one is inclined to believe that Mr. Rhead is in some respects a little in advance of actual conditions and more nearly at the American standpoint, especially in regard to the use of analyses in foundries. On the other hand, he is, perhaps, a little hard when stating that "there is probably no industry in which empiricism of the crudest type is more commonly to be met with." Thanks to our associations and an exceptionably able technical press along foundry lines, this condition would seem a long way behind us already.

One thing to be commended in the book is the getting down to basic principles as much as possible. The author rightly says that a man may be perfectly competent to get out first-class work without any knowledge of governing conditions or of influences determining the character of the materials he uses. But if these conditions or materials change, he is so badly left that it costs time and money to overcome the trouble he is certain to get into.

Mr. Rhead begins with the general physics and chemistry of cast iron, giving quite a lot of information. Perhaps the subject might be made simpler for the foundryman by interweaving it less with the microstructure of cast iron and by going more fully into mixture calculations, without the complication of manganese and phosphorus. The chapter on testing cast iron is not up to date, too much emphasis being laid on the now practically obsolete ½-in. test bar, while the standard American and German practice in this direction are omitted. If these had been given fully three-quarters of the chapter could have been cut off and the foundryman saved much unnecessary study.

The chapters on molding sand contain a lot of valuable information and bear out the general understanding that this end of foundry practice is better cared for in Europe than in this country. The same may be said to some extent of the chapters on molding, where the principles of the operations are discussed. Our molding practice, coming from England, will naturally be about the same. Cores and core machinery are next taken up and gone into extensively. Perhaps the illustrations could be improved in the book as a whole. One does not like to see advertising cuts included in a text book, particularly if they are very poor reproductions. Machine molding comes in for a special chapter, which each edition of Mr. Rhead's book will no doubt find greatly enlarged, particularly if our English friends emulate the American molding machine manufacturers and get up such great exhibits as those connected with the conventions of the American Foundrymen's Association. The stimulating effect of these side-by-side exhibitions of working machinery by business competitors cannot be overestimated in value to the industry at large. Chilled and malleable castings are discussed sufficiently for the purposes of the book, which concludes with a chapter each on the cupola, the blast and the air furnace.

The book on the whole will be more valuable in England than here, though well worth adding to the foundry library for comparison between English and American practice. R. M.

Work, Wages and Profits; Their Influence on the Cost of Living. By H. L. Gantt. Size, 5 x 7½ in.; pages, 194. Bound in cloth. Publisher, the *Engineering Magazine*, New York City.

In this work Mr. Gantt has gathered a number of his papers and articles which have been either presented before technical bodies or have been printed in the *Engineering Magazine* from time to time since 1904. The author was employed by Frederick W. Taylor in 1887 to assist in the development of a scientific solution of the problem of increasing the efficiency of workmen. The gathering of these articles in book form will enable students of modern methods of works management to secure conveniently most valuable data in the prosecution of their labors. The book is illustrated with colored diagrams showing comparisons of results accomplished under bonus op-

erations, as the efficiency of the workmen increases by such methods.

Elevators, Care and Operation.—Under this title the accident and liability department of the Aetna Life Insurance Company, Hartford, Conn., has published a pamphlet calling attention to certain matters in connection with the care and operation of elevators which should not be overlooked or neglected if accidents are to be prevented. These suggestions are divided into a number of groups, such as suggestions to the owner, engineer, passengers, operator, safety of equipment, and careful operation. The 47 pages of text are supplemented by illustrations of standard types of elevators, hoisting machines and accessories.

The first number of "Crane-ing," a monthly publication, has been issued by the Cleveland Crane & Engineering Company, Wickliffe, Ohio. It contains 16 pages, 4½ x 6 in., in addition to a cover with illustrated title page. The subject matter and dress are attractive. The magazine deals in part with Cleveland cranes, and is in part made up of entertaining paragraphs arranged after a manner that has been in vogue in individual company publications.

Obituary

Charles C. Townsend, a well-known manufacturer and member of the firm of C. C. & E. P. Townsend, makers of wire nails and rivets, New Brighton, Pa., died at his home in that place on July 9. At an early age he became identified with the concern, which was then known as W. P. Townsend & Co., and at the time of his death was the president of its successor, C. C. & E. P. Townsend Company. The deceased was formerly a member of Congress from the Twenty-fourth Pennsylvania district.

Henry Harrison Smith, president of the Diamond Iron Works, and a pioneer lumberman and manufacturer of Minneapolis, Minn., died at his home in that city July 2, aged 72 years. He was born in St. Stephens, N. B., and moved to Minnesota when he was 27 years old. He established the Diamond Iron Works 26 years ago and remained at the head of the company until his death. He also established the Diamond Boiler Works of the same city, of which company he was also president.

A. E. Silk, manager of the Hewell Belting Company, Chicago, died suddenly of heart failure in Detroit, July 12.

Justus H. Nieding, vice-president and treasurer of the Cleveland Iron Works Company, Cleveland, Ohio, formerly the Zeman Iron Works Company, died suddenly July 18, aged 51 years.

Fifteen of the 16 hot mills of the sheet mill department of the Youngstown Sheet & Tube Company, Youngstown, Ohio, have resumed operations. The new mills are manned largely by workmen from the old mills, supplemented by others hired within the past two months. Some of the day hands among the striking sheet mill men have returned to work. In addition to the sheet mills, the steel plant, four-lap weld and two-butt weld tube mills have also started up. Furnace C of the blast furnace department will be completed this week, but will not be blown in until August or possibly later. Furnace B will likely be blown out for repairs at the same time.

The Thomas Furnace Company blew out its furnace at Milwaukee, Wis., at the end of last week. The stock of pig iron on hand will be sufficient to take care of contracts for some time.

The Rationale of Dried Blast*

A Discussion of Qualitative and Quantitative Considerations

BY PROF. JOSEPH W. RICHARDS, SOUTH BETHLEHEM, PA.

The higher maximum temperature of the furnace gases in the smelting zone (region of the tuyeres) is the sole and the sufficient reason for the advantages produced by drying the blast. Removing the moisture of the blast results in saving the heat formerly required for its decomposition, and enables the furnace gases to attain a higher maximum temperature of combustion. The higher maximum temperature of the furnace gases quickens the rate of transfer of the necessary smelting heat to the slag and pig iron, and thus increases the rate of smelting.

The smelting down of slag and pig iron to the liquid and superheated state requires to have added to those materials, at a temperature at and above their melting points, their latent heats of fusion and the sensible heat of superheated liquid material. This is the principal thermal work done in the smelting zone of the furnace. It can only be accomplished by the agency of furnace gases possessing maximum temperatures far above the melting points of these materials, and is accomplished only by the sensible heat which these gases are able to give out in cooling down from their maximum temperature to the melting points of the slag and iron.

The Gain in Effective Smelting Heat

The sensible heat which the furnace gases possess above the melting points of the slag and iron is therefore the only effective smelting heat which they possess, and is a direct measure of their smelting capacity. Any rise in the maximum temperature of the furnace gases increases in a large proportion the part of their sensible heat available above this necessary smelting temperature and thus increases largely their smelting power. When the smelting power of the carbon burned in the tuyere region is increased, more iron and slag can be smelted per unit of carbon there oxidized, and therefore the fuel consumption in the smelting zone is greatly decreased per unit of pig iron produced. This decrease of carbon consumption in the smelting zone does not necessitate the use of more carbon for reducing purposes in the upper part of the furnace, because there is ordinarily produced in the smelting region by the oxygen of the blast such a large excess of CO gas that only a small fraction of it can be possibly used up in reducing the ore. The poor ratio of CO^2 to CO in the gases of the ordinary furnace is not due to imperfect reduction of ore by CO, but to the fact that such a great excess of CO gas is formed in the tuyere region that the oxygen of the ore can only convert a small fraction of this CO into CO^2.

The smaller amount of carbon consumed in the tuyere zone when using dried blast is therefore more perfectly changed into CO^2 in the upper part of the furnace, during the reduction of the ore, and therefore gives greater thermal service in the furnace per unit of carbon consumed. This improvement in the ratio of CO^2 to CO in the throat gases is a direct result of the smaller carbon requirement in the smelting region.

The smaller amount of carbon consumed per unit of pig iron, or of burden charged, results in a smaller volume of CO and N^2 gases rising through the furnace per unit of burden. They therefore perform reduction more thoroughly, and become cooler before leaving the furnace. While, therefore, the smelting zone is working hotter, the upper part of the furnace works cooler. Since the furnace works faster, the radiatrix and conductrix losses per day being no higher or even less than before, these losses expressed per unit of output

*A paper read at the International Congress of Mining and Metallurgy, Duesseldorf, Germany, June, 1910.

become lessened. Since less blast is required per unit of product, the stoves can heat it hotter and the blowing engines have less work to do, unless the blast is kept constant and the output increased to its maximum. In any case, the blowing engine power per unit of output is decreased.

Regularity and Uniformity

Besides these direct results of the higher temperature in the tuyere region, there are secondary advantages of removing or rendering uniformly low the moisture in the blast, which are of great value to the management of the furnace. These are the regularity of running, of output, of fuel consumption and of grade of pig iron produced. The manager does not have to fear sudden changes in the quality of iron produced, nor to carry an excess of fuel in the furnace charge in order to provide against such unforseen changes. This regularity gives such great relief to the manager that the practical man may well count it as the chief advantage, as far as he is concerned of using the dried blast.

But uniformity and regularity are only one side of the advantages of dried blast; the other side is the economy resulting directly from the absence of high moisture and the consequent high temperature in the tuyere region. Regular and uniform running at high efficiency is the combination which in its entirety has made such a great advance in practical blast furnace running with dried blast.

Reasons for Increased Output

With dry air blown upon incandescent carbon, the maximum temperature of the gaseous products of combustion, CO and N^2, will be 1678 degrees for cold blast, and 84 degrees hotter for every 100 degrees that the blast is heated. With moisture present in the blast, these temperatures may be reduced as much as 235 degrees when the air is warm and saturated with moisture, giving a theoretical maximum temperature of only 1443 degrees with unheated blast. Details of these calculations, and tabulation of temperatures for various atmospheric conditions and temperatures of blast may be found in the writer's "Metallurgical Calculations." Part II, pp. 282-286. As an illustration, if the outside air carries 40 g. of moisture per cubic meter and the blast is heated to 500 degrees, the maximum temperature of the gases of combustion in the tuyere region is 1848 degrees; while if the moisture is reduced to 5 g., and the blast temperature is unchanged, the maximum gas temperature rises to 2061 degrees.

Assuming a smelting temperature of 1250 degrees as required while melting is being performed, the first case gives an excess, or temperature head, of 598 degrees, available to transfer heat to the charge as it is being smelted; the second case gives an excess of 811 degrees, or an increase of temperature head of 213 degrees, or 36 per cent. Under these conditions, the furnace would smelt down charge approximately 36 per cent. faster with the dried blast than with the moist. Admittedly, these atmospheric conditions are extremes: The average increase on the Atlantic Coast of the United States has been 15 to 20 per cent. for the year's running. The three blast furnaces producing the largest number of tons of pig iron in 1909 in the United States were all three running on dried blast.

The increased smelting power per unit of carbon burned in the tuyere region, when using dried blast, is also calculable. When a kilogram of carbon is burned to CO, it evolves 2430 calories; if the blast necessary is preheated, there is added to this the sensible heat in the blast. The total available smelting heat per kilogram of carbon, using dry air blast, can be thus calculated:

Temperature of blast.	Available heat
degrees	2,430
degrees	2,817
degrees	3,285
degrees	3,740

If, however, moisture is present, it rapidly absorbs heat and reduces the available heat in the smelting region. Its effect is, therefore, to leave less heat available at a lower initial maximum temperature. Taking again the example of blast at 500 degrees and air with 40 g. of moisture to the cubic meter, the total heat available is 3137 calories from combustion and the blast, diminished by 574 required to decompose the water vapor, leaving only 2563 calories available. The calories available for smelting purposes in the tuyere region is thus decreased 18 per cent. by the presence of the moisture. Remove this moisture, and the weight of carbon necessary to be burned in the tuyere region to do a given amount of smelting work will be reduced 18 per cent.; *i. e.*, the fuel requirement of the furnace will be reduced at least 18 per cent., calculating per unit of output. Other incidental advantages will increase the saving even above the calculated 18 per cent.

If less carbon is burned in the tuyere region per unit of output, the oxygen from the solid charges given off by reduction, and which is fixed in amount, will produce a relatively greater proportion of CO^2 in the issuing gases. This means that a greater proportion of the CO formed will be converted into CO^2, and therefore a greater utilization in the furnace of the calorific power of the carbon of the fuel. For example: If in a given furnace 75.3 kg. of carbon is burned at the tuyeres to CO, producing there 175 kg. of CO, and the solid charges give up in being reduced 41.8 kg. of oxygen, this can convert 73.15 kg. of CO into CO^2, and the total heat of oxydation of the carbon to this proportion of CO and CO^2 can be calculated as 6119 calories per kilogram of fixed carbon consumed. If, by using dried blast, 18 per cent. less carbon is thus consumed (giving, however, just as much available heat in the tuyere region and 61.75 kg. is burned to CO, producing 144.1 kg. of CO, 73.15 kg. of this will be likewise converted into CO^2 by the 41.8 kg. of oxygen from reduction (producing just the same amount of heat in the upper part of the furnace) and the total heat of oxydation of the carbon to this proportion of CO and CO^2 can be calculated as 6928 calories. The carbon burned in the furnace is therefore utilized with some 13 per cent. greater thermal efficiency when using the smaller quantity in the tuyere region required by dried blast.

Similar calculations could be made as to the smaller velocity with which the smaller amount of cooler gas passes through the upper part of the furnace, and the consequent better utilization of its reducing power and of its sensible heat in heating the descending charges. Analogous calculations could be made showing quantitatively the smaller radiatrix and conductrix loss per unit of product, when using dried blast. The data for such calculations are, however, not as abundant or as trustworthy as those already used. A longer experience with dried blast in practice will enable these data to be also used quantitatively, with convincing results.

Resume

The drying of the blast increases the available heat in calories in the smelting region per unit of carbon there consumed. This increase of available heat quantity increases correspondingly the maximum temperature of the gases in the smelting region.

The increased quantity of heat, available at a higher initial temperature, increases in a multiplied proportion the smelting power of the furnace; *i. e.*, increases the rate of smelting down in unit time and increases the quantity of smelting down done per unit of fuel.

As secondary or incidental results of these favorable conditions, the furnace works cooler above, the proportion of CO^2 to CO in the gases is increased, the radiatrix and conductrix losses are decreased per unit of output, and the furnace works with great regularity and uniformity.

Fluxes as Employed in the Brass Foundry*

BY ERWIN S. SPERRY, BRIDGEPORT, CONN.

In the early days of brass founding two things were guarded jealously: the mixture and the fluxes. At that time it was not an uncommon occurrence to hear one say, when speaking of a new proprietor of a brass foundry: "He will get along all right. His father left him all his formulas for mixtures and fluxes." It seemed to be taken for granted that even capital itself was subsidiary to these heirlooms. Soon the chemist began to make serious inroads into the mixtures, and their secrecy faded away gradually but surely. The mystery of the fluxes was more difficult to eliminate, as, unlike the castings themselves, they did not go beyond the foundry. They could not be analyzed without obtaining at least a small quantity, and this was difficult to do as the brass founder carefully guarded them and the materials from which they were made. In the course of time, however, the secret fluxes went the way of the brass mixtures so that by the process of evolution "secrets" finally became general technical knowledge. Few brass founders are now found who claim to have anything original or remarkable in the flux line.

Fluxes Overdone

When fluxes are mentioned it is frequently asked, What is their advantage, and are they actually necessary? To answer this question, I will say that I believe the flux question is greatly overdone and likewise imperfectly understood. It was only a short time ago that I discovered a brass founder using lime in making an 88-10-2 mixture from new metals. He said "somebody" had told him that it was good for bronze. Cheap substance that it is, he was wasting his lime, as it remained on the metal like so much dirt and had no more effect than sand. In another instance I found that a brass ingot maker used a couple of handfuls of a mixture of common salt and borax on the top of a pot of yellow brass after it had been skimmed and immediately before pouring. The mixture was thrown on, and then at once skimmed off without waiting for the borax even to stop swelling. He, too, would have been equally as well off without the flux. A diametrically opposite case was that of a brass founder who attempted to melt his emery grindings in a crucible without a flux, and obtained about a pint of metal and half a bushel of dross. In this case a flux was needed.

It hardly would be advisable to go into a detailed enumeration of all the fluxes known to mankind, and that can be used in brass melting as it would be of little value. Many substances once used for this purpose have now become obsolete, and many others have proved to be valueless. It seems preferable, therefore, to give a description of those fluxes that the test of time has proved valuable and the manner in which they should be used.

For Aluminum

For years those who melted aluminum used no fluxes at all on it, not even charcoal, as it was soon found that this material did more harm than good. On account of the lightness of aluminum, charcoal does not readily free itself and is apt to become entangled in the metal and produce small, black spots in the casting. It is within the past few years that a flux has become used. The one most extensively used and which has proved to be so valuable is chloride of zinc. It seems to react with the aluminum, forming chloride of aluminum and metallic zinc, which alloys with the aluminum. When this takes place the dross is changed to a fine, granular condition and is readily skimmed off. When aluminum is melted the surface is covered with a rather thick mass; but the chloride of aluminum will change it to a perfectly clear one closely resembling in appearance molten tin or lead. It is needless to say that such clean metal gives better castings.

The method of using chloride of zinc as a flux in melting aluminum is simple. Small pieces are thrown on the surface after the melting has been completed. Enough has been added when the surface is clear. A very small amount usually suffices, and for 50 lb. of aluminum a piece the size of a walnut is generally enough. The metal is stirred immediately after the addition and then skimmed. Those who have not used chloride of zinc should try it, as it is an excellent material.

For Nickel

The flux used by makers of nickel anodes has proved to be a good one. It was first used by A. M. Hill of New Haven, Conn., one of the first in the United States to make nickel anodes, and the inventor of the well-known "Hill barrel" for grinding brass furnace ashes. Mr. Hill has retired from the anode business, but for many years he used this flux with the best results. It is not only good but cheap. It is composed of the following:

Lime	3 parts
Fluorspar	1 part

The manner of making it is to take the lime and slake it as though mortar were to be made. Then stir in the flourspar and allow it to become solid. It is then broken up into small pieces for use.

While flourspar alone is a good flux it becomes very fluid when melted and rapidly attacks a crucible. I have seen a new plumbago crucible ruined in one heat when flourspar was used alone. It seemed to soak in and dissolve out the clay from the crucible mixture and leave nothing but the graphite. The crucible collapsed like an egg shell when grasped with the tongs. The use of the lime with the flourspar is to increase the melting point so that it will not so readily attack the crucible. The proportions previously mentioned have been found satisfactory for nickel. Less lime will render it more fusible.

This flux has been found particularly serviceable in melting old anodes, as it dissolves any earthy matter that may be on them. It is used for both new and old material, however, and may be called the standard flux for nickel. The proportions used are about a pint or a good handful for new nickel and twice this quantity for old material.

It must not be imagined, because the fluorspar is toned down with lime, that the flux will not act on the crucible, for it certainly will. The crucibles last only five or six heats. In this connection it should be borne in mind that all fluxes act on the crucible to a greater or less extent, otherwise they would not be of value as a flux.

For Copper

Probably more fluxes have been proposed or used for copper than for any other one metal or its alloys. The reason is that copper cannot be melted alone and yield sound castings. Practically every known chemical has been tried. In the selection of a flux for copper it should be known whether pure copper castings are to be made or whether it is to be alloyed to make brass or bronze.

* A paper read at the meeting of the American Brass Founders' Association, Detroit, Mich., June, 1910.

To make sound copper castings with a flux alone, and without the use of "physic" like silicon-copper, magnesium or similar materials (which, strictly speaking, are not fluxes), is a difficult matter. For this purpose I have found that yellow prussiate of potassium (potassium ferrocyanide) is excellent. With it sound copper castings can be made, but I do not advise it, as far better results may be obtained by the usual deoxidizing agents, such as silicon-copper, magnesium and phosphorus.

In melting copper for producing brass or bronze the question is different from the preceding one. For this purpose there is nothing better than common salt. Its value lies in the fact that it possesses the property of reducing any oxide of copper which may form during the melting. It has been used for many years in the brass industry.

Common salt is so efficacious in reducing oxide of copper that as far back as 1882 R. Monger, in the *Chemical News,* proposed it as a means for determining the quantity of oxide that copper contains. His method was to melt salt in a clay crucible and then drop in the weighed sample of copper. After allowing it to remain for a short time the crucible was cooled and broken when the button of pure copper was obtained. The difference in weight gave the amount of oxygen (or its equivalent of oxide of copper). Some very satisfactory results were cited.

In melting copper for making brass or bronze, about a handful of salt is used and is preferably put in after it has begun to melt. If introduced with the copper it melts before it and is apt to volatilize and waste. The action on the crucible is also greater. Too much salt produces a liquid that is apt to penetrate the crucible like fluorspar, although not as violently or as rapidly. The amount of salt previously given is used for a pot of metal holding about 150 lb. The quantity need not be exact, as a variation either way does no harm as long as a sufficient quantity is used to do the work. The theory of the action of the common salt seems to be that, at the temperature of the molten copper, it breaks up or dissociates into metallic sodium and chlorine gas. The latter escapes and the sodium performs its work in deoxidizing.

For Brass

The flux almost universally and exclusively employed in brass melting is common salt. As previously mentioned, its action is to reduce the oxide of copper formed in melting the copper previous to the addition of the spelter. The brass rolling mills in the Naugatuck Valley, Connecticut, and elsewhere all use it, and one large company uses approximately half a ton a day. It is the universal and only flux used in making brass for rolling. For years it has been employed for this purpose, and in my own remembrance always has been. It seems to give all that is desired and has the distinct advantage of being cheap. Any kind of salt will answer and a pure material is unnecessary.

The quantity used is about a handful to the crucible. One concern uses one handful, while another believes that double this quantity should be used. A good sized handful, however, seems to be sufficient. It is added after the copper begins to melt, as this appears to be the best time to introduce it. When the right conditions have been produced there will be a little slag on the top of the brass when it is skimmed.

It is worthy of note that, although every brass rolling mill uses salt in brass melting, few brass founders who make sand castings employ it. Many of them never have heard of it and others seem to think it is a waste of time. I advocate its use under all conditions, and as it is theoretically correct, has been found by actual practice to improve the quality of the brass and is so cheap that the cost of the brass is not appreciably increased, it seems to me that every brass founder should use it, whether he makes new metal or melts scrap, as the character of his castings will be improved.

For Bronze and Composition

What has been said about the use of common salt in melting yellow brass applies equally well to composition or bronze, and it is used in identically the same manner and in the same quantities. It makes no difference whether phosphorus or other deoxidizing agents are employed, the salt is used just the same.

For German Silver

German silver is such a refractory material in the rolling mill that much time and thought have been given the subject of a suitable flux for it. It is a singular fact that the bulk of the German silver manufactured in the United States is made by two concerns. One uses a flux in making it, while the other uses none. In justice to the concern which uses no flux at all, I will say that their German silver has a little better reputation, and they have the more particular trade. I cite these examples simply to indicate that fluxes do not constitute the "secret" of making German silver by any means.

The use of the flux by the other concern dates back to 1869, when Frederic Wilcox, a brass caster who was engaged in making German silver, had trouble with black, minute spots in his metal. Tradition states that he gave the matter much thought, and finally believed it was caused by carbon in the metal. More thought indicated to him that the only method of removing it was to use a nitrate of some kind which would evolve oxygen and oxidize the carbon. Nitrate of soda, therefore, was used, and upon its use in German silver he obtained a patent (U. S. Patent No. 96,524, November 2, 1869). As this material was found to work better with black oxide of manganese, the two afterward were used together and now constitute the flux of the aforesaid concern.

Personally, I doubt if this flux has much value, and the fact that it is possible to make good German silver without it would seem to point that way. I feel quite sure that there is no oxidation of carbon, as nitrate of soda, when allowed to melt on copper, will not oxidize it, but instead will actually render it sounder. It is also a singular fact, which I have already demonstrated in practice, that a mixture of nitrate of soda or the nitrate of potash (nitre), mixed with black oxide of manganese and used as a flux on copper, will actually introduce metallic manganese into the copper, showing that there is a reducing action. This explains, I believe, the reason for the action of the flux. A slight amount of manganese is introduced. This is also borne out by the fact that within the last few years, metallic manganese has come into use as a deoxidizing agent for German silver and similar nickel alloys. Its use is preferable to introducing manganese through the agency of a flux as the results are then positive and certain, and predetermined amounts of manganese always can be added. Its use has been attended with excellent results, and it seems to be the natural deoxidizing agent for nickel and nickel alloys.

In making German silver common salt is used in the same manner, and with the same results as those obtained in brass and bronze.

For Washings, Grindings, Etc.

In the melting of washings from the reclaiming of brass foundry ashes, a flux must be used in the majority of instances unless they have been washed very clean, and this is rarely done. Even with clean washings a flux is advisable. The same rule applies to grindings, skimmings and similar waste materials. Unless a flux is used when they are melted a union of the particles of metal is prevented by the presence of so much foreign matter, and instead of fluid metal there

usually is obtained a small quantity in the bottom of the crucible and a large mass of pasty material fritted together. When a flux is used the foreign matter is dissolved and clean metal is left.

For use in melting brass, bronze or composition washings, grindings, skimmings and similar material, I have found nothing better than plaster of Paris. It is a cheap and excellent flux for this purpose. How far back it was employed for this purpose I cannot say, but it was first called to my attention in 1890 by the late C. S. Moore. With due respect to him, I believe he can really be called the father of the present scrap metal industry in the United States, as he was responsible for many innovations (like the "transmutation" of yellow washings into red), and I firmly believe he was the first to use plaster of Paris as a flux. He informed me to this effect and I have no reason to doubt his word.

The value of plaster of Paris as a flux in melting washings, grindings and similar material is that it possesses the property of dissolving what foreign matter may be present in the shape of sand, slag or oxide, and it has practically no action on the crucible. In addition, it is quite cheap. On account of the fact that it has no action on the crucible, any desired quantity can be used. It melts readily and forms a thin slag.

To melt washings or grindings with plaster of paris, mix about 5 lb. of it with the washings when they are placed in the crucible. Then melt in the usual manner. If the slag at the conclusion of the melt is not sufficiently fluid, more should be added. When the metal is completely melted pour the entire contents of the crucible into ingot molds. Do not attempt to skim it. The slag will run into the molds with the metal and rise to the top. Allow the mass to cool and then dump the ingot molds. The slag of plaster of Paris can be readily detached by a blow from a hammer, or it usually will fall off under normal conditions. If desired, it may be used again. It will be found a very satisfactory flux for this purpose.

Plaster of Paris is calcium sulphate, and when used as a flux the action seems to be one of simple solution: The molten plaster dissolves the foreign matter as sugar is dissolved by water.

When coal is present in washings, as it usually is, there is a slight reduction of the sulphate to sulphide and there will be an odor of sulphur during the melting. This seems to do no harm, and I have never been able to find that it injures the metal. In fact, it appears to act in an opposite manner, and any iron that may be present is changed to sulphide and enters the slag. I have always advocated the use of plaster of Paris in melting scrap materials containing iron, and have invariably found it to be followed by good results.

The Necessity of Charcoal

I have made no previous mention of the use of charcoal for the reason that it is not properly a flux, although it takes the place of one. I can say without hesitation that charcoal should be used as a covering in melting all the metals previously enumerated. Its value lies in the fact that in burning it supplies a reducing atmosphere and thus prevents the oxidation of the molten metal. At the same time it covers the metal and prevents the products of combustion from coming in contact with it. It is free from sulphur, which renders it the ideal material for this purpose. It should be coarsely granulated and not powdered so as to allow its covering the metal completely without danger of immediate combustion. Fine coke or coal, although frequently used, is much inferior to charcoal as it contains more or less sulphur, which injures fine grades of metal.

The blast furnace of the Clinton Iron & Steel Company, which went out of blast April 10 for general repairs, was blown in on Saturday, July 16.

Personal

J. C. Bunten, manager and director of the Anderston Foundry Company, Glasgow, Scotland, is spending a few weeks in this country and Canada. He is making his business headquarters while here with Thomas A. Lewis, 50 Church street.

F. W. Jaeger, manager of the American office of Alfred Schutte, 90 West street, New York, sailed for Europe July 14, to be absent four weeks or more.

Walter B. Snow, publicity engineer, Boston, Mass., has added to his staff H. Ross Callaway.

The Wagner Electric Mfg. Company, St. Louis, announces the removal of its Charlotte, N. C., office to the Woodward Building, Birmingham, Ala., to be in charge of J. F. Jones. North and South Carolina, which have heretofore been handled from the Charlotte office, will now be handled from the Philadelphia office, which is located in the Real Estate Trust Building, in charge of John Mustard.

Sylvester S. Howell has become associated with Paul M. Chamberlain, engineer, Marquette Building, Chicago, under the firm name of Chamberlain & Howell. The firm will carry on the designing and consulting engineering practice established by Mr. Chamberlain.

C. H. Todd of Washington, Pa., has been elected president of the Petroleum Iron Works Company, Sharon, Pa., in the place of E. G. Wright, resigned. Mr. Todd was one of the founders of the company. The plant is running full, with sufficient orders booked to insure steady operation for several months.

J. O. Henshaw, New York, resident partner of Hickman, Williams & Co., sailed for Europe last week.

Louis M. Henoch, identified for many years with the sale of iron and steel from store at Chicago, has become treasurer of the Scully Steel & Iron Company.

Clyde M. Carr, vice-president and general manager of Joseph T. Ryerson & Son, Chicago, has returned from Europe after an absence of two months.

William J. Diehl has resigned as auditor of the Manufacturers' Light & Heat Company, Pittsburgh, effective August 1, and has accepted a similar position with the Arkansas Natural Gas Company at Pittsburgh.

O. E. Reinhardt, formerly identified with the Carnegie Steel Company, at South Sharon, Pa., has been made manager of sales of the Radium Spray Company in the western Pennsylvania district, with offices at Sharon, Pa.

Fred N. Beegle, president of the Union Drawn Steel Company, Beaver Falls, Pa., has sailed for Europe, and will combine business with pleasure.

S. S. Stewart, formerly Pittsburgh representative of the Foster Engineering Company, with offices in the Park Building, has resigned his position to engage in street railway building in Iowa.

E. H. Jennings has resigned as president of the Manufacturers' Light & Heat Company at Pittsburgh. His successor will probably be elected at a meeting of the directors of the company to be held July 26.

J. I. Buchanan of Pittsburgh has been elected a director of the Manufacturers' Light & Heat Company, succeeding Thomas Alexander of Franklin, Pa., resigned.

J. J. Connelly has been appointed general manager of the Air Tight Tank Company, with offices in the Oliver Building, Pittsburgh.

The Massillon Rolling Mill Company, Massillon, Ohio, has increased its capital stock from $200,000 to $1,000,000. The increase is made to provide treasury stock to be sold in case it is found necessary to enlarge the business or make extensive improvements.

Allis-Chalmers Pumping Engines for Grand Rapids

In the last few years Grand Rapids, Mich., has probably done more in the way of municipal improvements than any other city of the same size in the country. The first one, the straightening and deeping of the Grand River, and the building of retaining walls to confine the stream in its new channel, was a big undertaking in itself. This was followed by the construction of a complete system of intercepting sewers and pumping stations to free the river from pollution, and at the present time the pumping equipment of the water works is being added to. The next step looks toward the housing of the water works and the electric light station in a single structure, and probably it will be only a short time before this is done.

The new equipment under construction for the pumping station is a vertical triple expansion condensing crank and flywheel Corliss pumping engine built by the Allis-Chalmers Company, Milwaukee, Wis. Fig. 1 is a view of the steam end, while Fig. 2 illustrates the water end. As will be seen by the engravings which are reproduced from photographs taken in the company's shop, this pumping engine embodies the most advanced ideas in the engine builder's art. Some of the features which will attract the engineer's interest are tubular frame, Corliss valves for the high pressure and poppet valves for the low pressure steam, jacketed cylinders and outside packed plungers. The engine is equipped with steam cylinders 28, 50 and 74 in. in diameter and uses steam at a pressure of 140 lb. This pump has a capacity of 12,000,000 gal. per 24-hour day, against a head of 251 ft., and is intended to provide for the future needs of the city for some time, as it is stated that this style of pumping engine develops a duty which cannot be equaled by any other type.

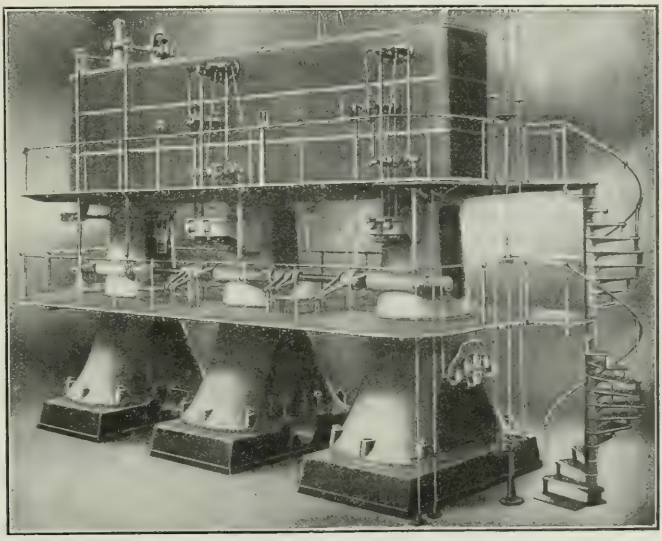


Fig. 1. Steam End of the Vertical Triple Expansion Pumping Engine Built by the Allis-Chalmers Company, Milwaukee, Wis.

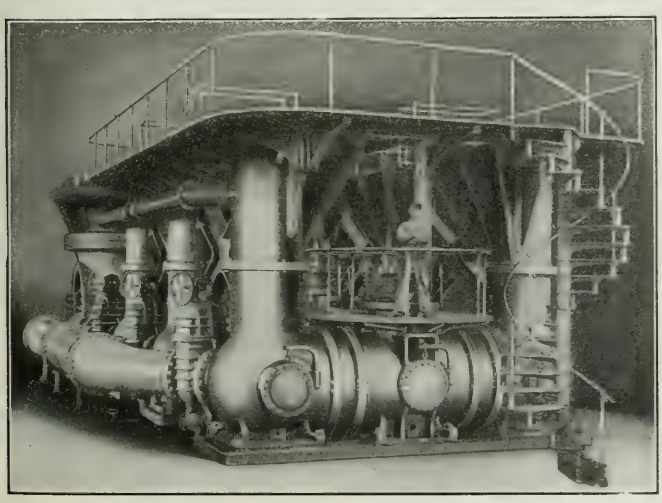


Fig. 2.—Water End of a 12,000,000-Gal. Pumping Engine Built for the City of Grand Rapids, Mich.

New England Foundrymen's Outing.—The New England Foundrymen's Association held the first of its summer outings at Mt. Tom, Holyoke, Mass., July 13. A good sized company from Boston, under the leadership of Secretary Fred F. Stockwell, was joined by guests and members from western Massachusetts, Connecticut and Rhode Island. Dinner was served on the summit of the mountain, the wonderful view from which was much enjoyed. After dinner the Committee of Arrangements, headed by Charles L. Newcomb, general manager of the Deane Steam Pump Company branch of the International Steam Pump Company, took the party for an automobile trip through the adjacent country, including Holyoke, Northampton and Hadley, to the Nyassett Club of Springfield, where the members were Mr. Newcomb's guests. The Deane Excelsior Quartette, composed of employees of the Deane Steam Pump Company, provided vocal music.

Hickman, Williams & Co. announce that the Virginia Iron, Coal & Coke Company, Roanoke, Va., has decided that its best interests will be conserved by allowing any agent to offer its brands of iron rather than to sell them exclusively through its sales offices as heretofore. Hickman, Williams & Co. state that they will continue to sell the brands of this company, which include Dora, Crozer, Radford, Max Meadows, Bristol and Watts, and will be able to make as low prices and as liberal terms as any one.

A 15-Ton Hulett Ore Unloader

A New Machine with 50 Per Cent. Increase in Bucket Load and with Receiving Hopper, Larry Car and Mechanism for Weighing the Ore

BY WALTER G. STEPHAN.

Some years ago, when George H. Hulett had perfected the design of his 10-ton automatic ore unloader and the machine itself had demonstrated its practicability and its great speed, the opinion was frequently ventured by men experienced in this line that the limiting size of a single unloading unit had been reached. They believed that further development must be in the direction of smaller sized units which would be handled more rapidly in order to increase the capacity. This theory seemed to be entirely sound to every one except Mr. Hulett himself, whose genius for stupendous undertakings, where other men would hardly dare to risk their reputation, is well known to the iron ore interests. He not only proposed a machine of 15 tons capacity (which is one-half again as large as the former type), but has actually built four unloaders which are being operated with great success at the Lake Shore docks of the Pittsburgh & Conneaut Dock Company at Ashtabula Harbor, Ohio. Seven other similar 15-ton unloaders are now building—four for the Lake Shore & Michigan Southern Railroad at its docks at the same harbor, and three for others. These will be ready for operation in a very few months. These two new plants will give to Ashtabula two of the most modern docks on the Great Lakes and will add very greatly to the ore unloading facilities at that port.

Fig. 1 gives a good view of the complete battery of four unloaders, while Fig. 2 is a view of a single machine, showing the details of design and operation to good advantage. The distinguishing features of the new unloader are the 15-ton bucket and the mechanism for weighing the ore, which consists of a receiving hopper at the front end of the machine, together with a larry car traveling on tracks underneath and carrying an operator who does all the weighing of the ore. These new features it is the principal object of this article to describe.

General Features

Naturally, the first impression of this new unloader is one of its great capacity. It hardly seems possible that a bucket of 15 tons capacity can be guided through the hatches and into the hold of a modern ore boat, but the facility with which this is accomplished is astonishnng. The writer had the pleasure of a trip with the man in the bucket leg of one of the machines and could not help admiring the skill of the operator in handling so huge a bucket. The sensation was one of smooth, even movement under perfect control, and the ore was picked up with seemingly little effort, the bucket filling to the brim every time it landed on the ore pile. It averages 30,000 lb. per trip throughout the day's run and has lifted as much as 42,000 lb. at one time by actual weight. Another fact worth mentioning is the arrangement by which the entire bucket "shoe" can be removed from the "leg" for repairs. It is evident that the "shoe" on a Hulett bucket leg sometimes wears out and needs "resoling." The arrangement is clearly shown in Fig. 3 which shows the bucket "cleaning up" in the hold of a modern ore boat. The operators do not always have such a clear space to work in, but the modern ore boats are all being built along these lines.

Instead of these much larger machines looking clumsy and unwieldy, there is a poise and symmetry about the walking beam and trolley which is pleasing to the eye. Solid web plates are used extensively, giving a satisfactory impression of stiffness and rigidity.

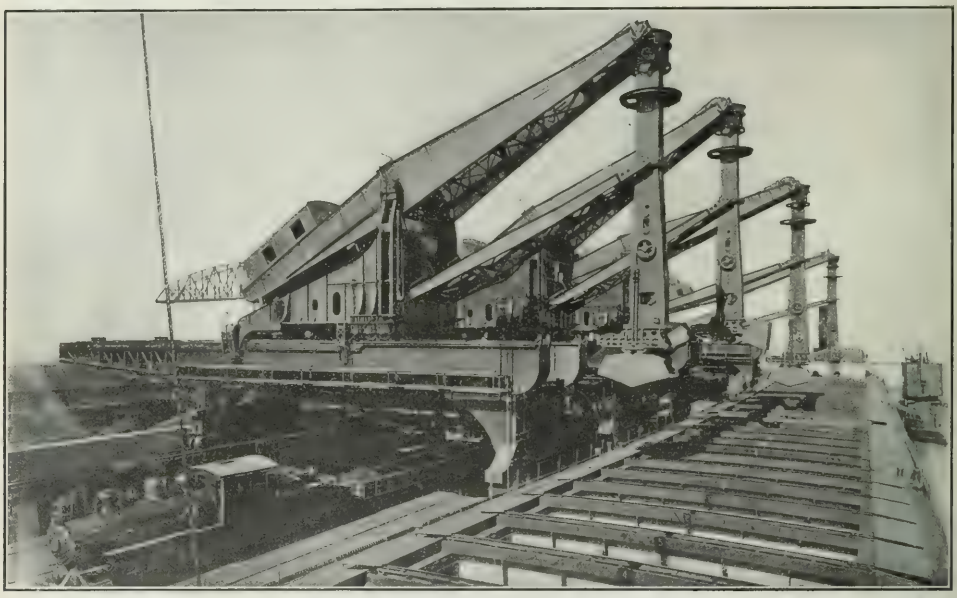


Fig. 1. Battery of Four 15-Ton Hulett Ore Unloaders at the Lake Shore Docks at Ashtabula Harbor, Ohio.

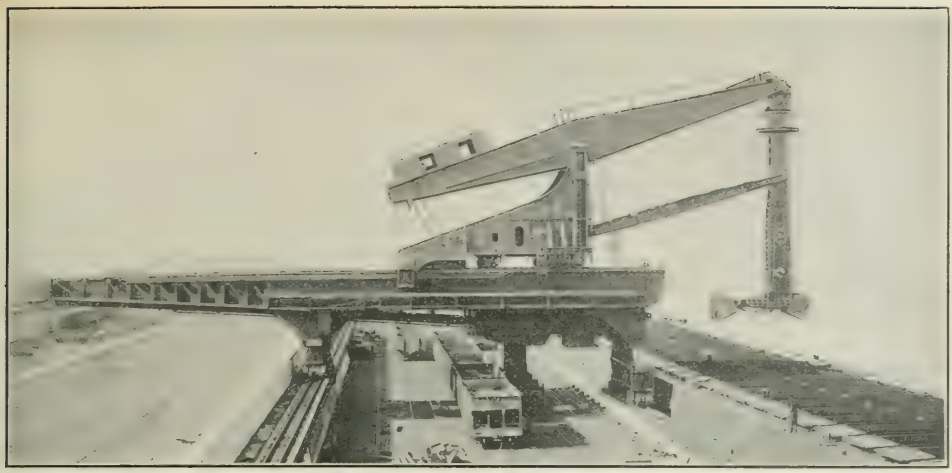


Fig. 2.—View of 15-Ton Hulett Unloader Showing Underneath the Larry Car.

The trunnion bearing and support at the top of the leg is also neat in design.

The lines of the trolley are graceful and clean cut. The rear wheel supports consist of a box girder extending across the back of the trolley at each end where the wheels are supported. The wheels run on inverted tracks which are riveted to the main girders about on the level with their top flanges. The conduit rails carrying current to the trolley are fastened on insulated brackets at the lower side of the main girders, and a structural bracket carrying the sliding contacts is dropped from the trolley frame. Each of the front trolley trucks consists of six wheels, the load being equalized by means of heavy coil springs. The trolley is provided with the usual safety devices consisting of solenoid and mechanical brakes and electrical cut-outs, as have been previously described in connection with the 10-ton unloader.*

The main girders span five standard railroad tracks with ample overhead clearance for switching locomotives. The distance center to center of front and rear legs is 71 ft., the front legs being set back 5 ft. from the face of the dock. Both legs are of solid plate construction and rest upon equalized trucks running on two rails. There are four 4-wheel trucks under the front leg, the two outside ones being driven and the two inside being idler trucks. Notwithstanding the increase in total load of the entire machine, the wheel load is not as great as on the 5-ton gravity machines in use along the Great Lakes. Supporting the rear leg are four 4-wheel equalized trucks, the two outside being driven and the center ones being idlers. Unlike the 10-ton unloader, there is no operator's house on the rear leg. The moving mechanism is located on the front side of one of the girders, and it is operated by the man in the larry car, which will be described later. The operating levers are located above the front leg, and the man in the larry car can step from the car to a platform within easy reach of them. No rail clamps are used, the heavy moving brake always being set, except when the operator has his weight on the lever.

* *The Iron Age*, October 8, 1908, page 985.

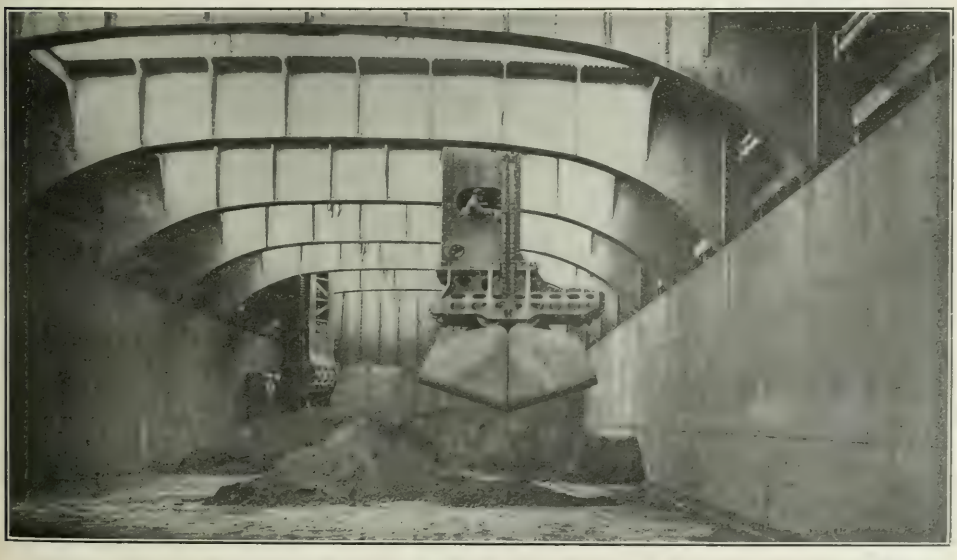


Fig. 3.—Hulett Bucket "Cleaning Up" in the Hold of a Modern Ore Boat. The Entire Bucket "Shoe" May Be Removed from the "Leg" for Repairs.

All the moving gears are steel cut gears and all are well guarded.

The main girders are extended at the rear to form cantilevers 56 ft. long, which overhang the usual concrete trough for storing the ore temporarily, until it can be rehandled to the stock pile. A noticeable feature is the absence of lateral bracing on the main girders, the omission adding much to the neater appearance of the whole machine. Direct current at 220 volts is supplied for the entire battery of unloaders by two insulated rail conduits running along the inside face of the concrete wall supporting the rear trucks.

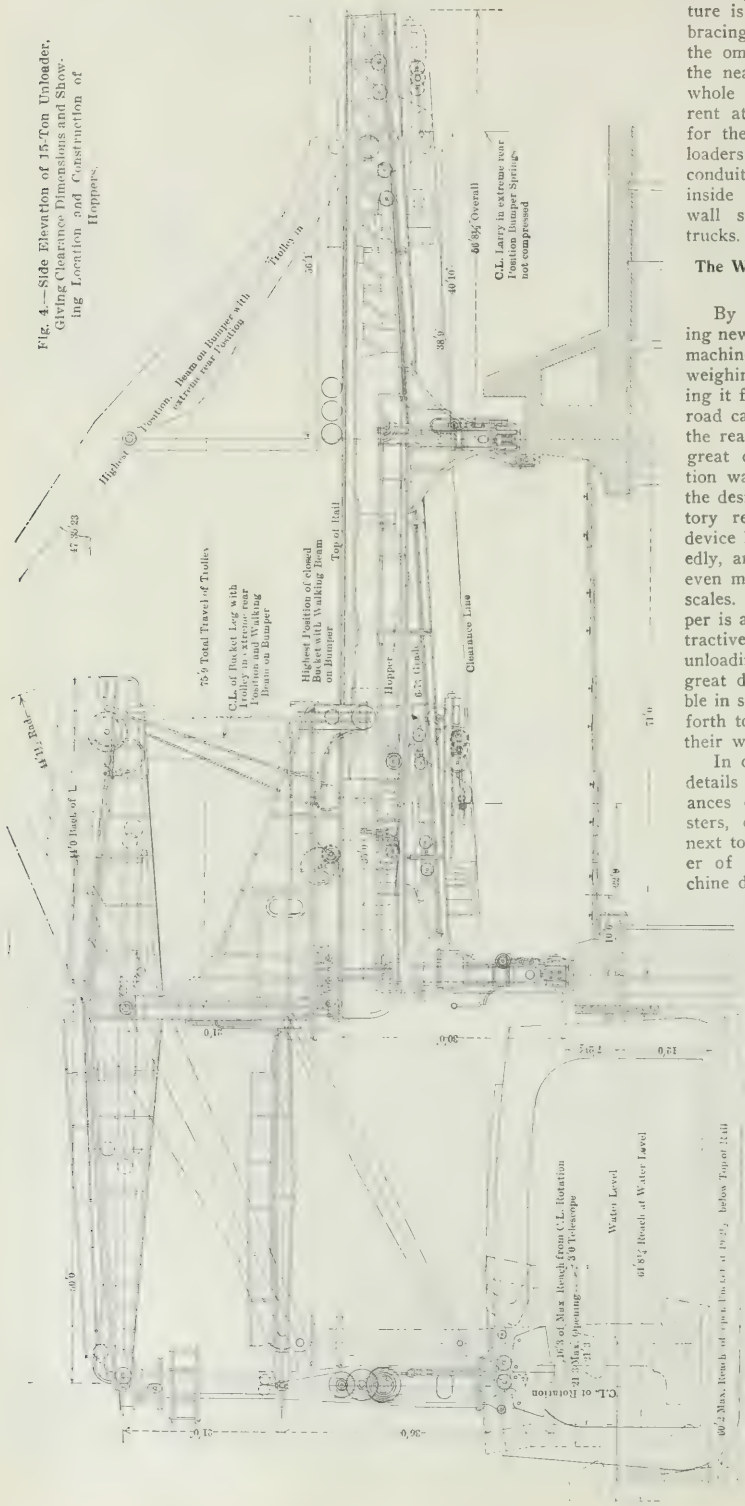


Fig. 4.—Side Elevation of 15-Ton Unloader, Giving Clearance Dimensions and Showing Location and Construction of Hoppers.

The Weighing Mechanism and Larry Car

By far the most interesting new feature on these large machines is the apparatus for weighing the ore and delivering it from the bucket to railroad cars or to the trough at the rear. One can see that a great deal of careful attention was paid to this part of the design with most satisfactory results. The weighing device has been tested repeatedly, and it was found to be even more reliable than track scales. This to the ore shipper is a most valuable and attractive devolopment in ore unloading because it saves a great deal of time and trouble in switching cars back and forth to correct and check up their weights.

In order to appreciate the details of the weighing appliances on these Hulett monsters, one must realize that next to reliability, the designer of an ore unloading machine desires to secure speed, or, in other words, great capacity per hour. The ore season is short and less time consumed in unloading means more trips per boat per season, as well as less wear and tear upon the boat captain's good nature. For the reasons just given, the Hulett unloader is so designed that the bucket can deliver its contents, not into the railroad car or ore trough at the rear, as one might suppose, but at the earliest possible moment into an ore hopper located at the very front end of the machine between the main girders. Then, while the bucket is returning

for another "bite," the last bucketful can be carried to its destination, thus saving a great deal of time.

The ore hopper just mentioned has a capacity of four full buckets, and is mounted on four wheels running on I-beam tracks between the main girders. Ordinarily it is stationary, but it is mounted on wheels for the purpose of removal when the bucket leg is to be lowered through the girders. The hopper itself is divided into two sections conical in shape. Closing the bottom of each is a horizontal circular flat disk which can be rotated in a horizontal plane by means of bevel gearing and an adjustable coupling and shaft running to a motor on the outside of the main girders. Along the center line of the hopper and slightly inclined to the axis of each disk is a stationary plow which scrapes the ore off of the disk into a larry car underneath the ore hopper.

This larry car is a most interesting development, since it carries in a cage at the front end its own operator, who controls all of the operations of the car and who also weighs the ore. The car hopper is of 30 tons capacity, and is shaped like an inverted truncated pyramid, the lower discharge opening being closed by double swinging gates which are opened and closed by a 25-hp. motor through worm and spur gearing and connecting rods. The hopper is suspended from the main frame of the car by heavy weight rods similar to the usual scale hopper construction. The levers are connected to two scale beams, which stand in front of the operator in the cage. The main frame rests upon eight equalized wheels which travel on rails suspended between the main girders on a 7 per cent. grade. The car is moved back and forth on these tracks from the front end of the machine to the extreme rear position above the ore trough, by means of two drums located on the car at its rear end. These drums are driven through spur gearing by a 125-hp. motor. Two 1-in. ropes wind on and off of them and operate to move the car to any desired position.

By an ingenious arrangement of the scale beams it is possible for the weighman to weigh and load 25 tons into one end of a 50-ton ore car on the track below, return and weigh 25 tons additional and load it in the other end of the ore car, with only two movements of the scale beam weights. At the same time the total weight delivered to the railroad car below is registered on a card for official record. As stated previously, this weight is reliable, even more so than track scale weights. The simplicity of the system is very striking, the operator being able to weigh faster than the empty cars can be delivered under the machine. The railroad companies do no reweighing of the cars, but place a weighmaster of their own on the larry car to record the weighing of each load. At the present time the cars are handled to and from the unloaders by switching locomotives, but a cable haulage system is about to be installed, which will facilitate the handling of cars very greatly.

The Machine Stores 105 Tons of Ore

It will be noted that each machine in itself has a storage capacity of over 105 tons, while waiting for empty cars—15 tons in the bucket, 60 tons in the receiving hopper and 30 tons in the larry car. The bucket is capable of making a complete cycle in one minute during the unloading of the first part of a cargo. The regular force of operators required for this battery of four unloaders is as follows: One man in each bucket leg; one man in each scale larry; one oiler on each machine.

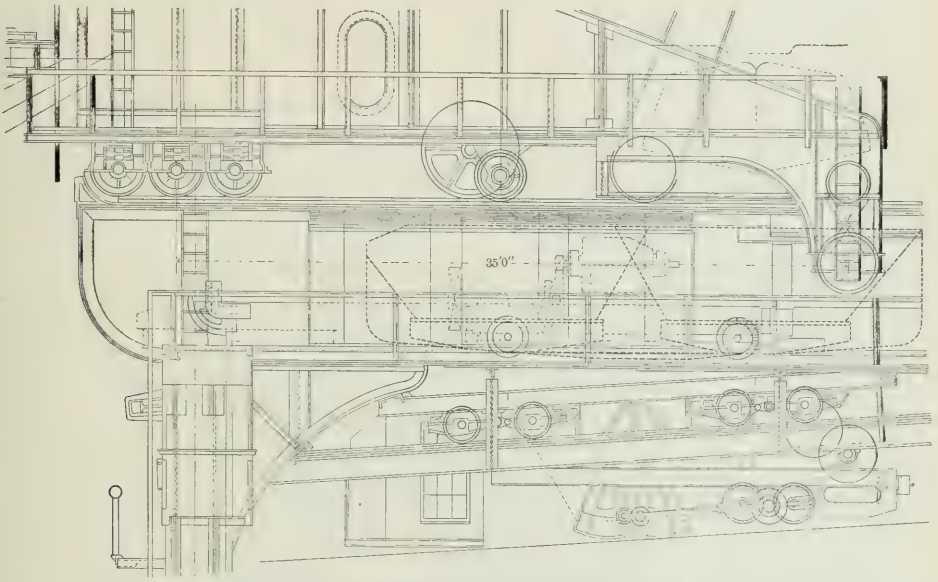


Fig. 5.—Enlarged View of a Portion of Fig. 4, Showing 60-Ton Hopper and the Larry Car with 30-Ton Hopper and Weighing Mechanism.

The length of the ore dock is about 1100 ft. At the rear of the machines is the usual concrete V-shaped trough which is paved with steel rails laid lengthwise. Back of the trough is the ore stock yard which is served by a Hoover & Mason ore bridge. The capacity of the ore stock yard is 1,000,000 tons of ore.

No attempt has been made to ascertain the maximum capacity of these machines; still, some remarkable unloading records have been made. On one occasion in June of this year when the docks were congested, three large ore carriers were unloaded and the fourth cargo was started in one day. The total ore unloaded for the day was something over 34,000 tons.

"Exchange Value of Farm Products" is the title of a speech made by Senator Reed Smoot of Utah May 27, 1910, which has been issued in document form by the American Protective Tariff League of New York as document No. 99.

Sir Andrew Noble

Notable Jubilee of the Chairman of Armstrong, Whitworth & Co., Ltd.

BY ROBERT I. CLEGG.

Andrew Noble and some 25,000 men work together. For 50 years ago Andrew Noble joined the mammoth manufacturing organization of which he is now chief, and in September this long service of the scientist is to be appropriately celebrated. This student of steel, shot and guns, afloat and ashore, was born in Greenock, near Glasgow, on September 13, 1832, the son of a naval officer. His mother was an American and therefore Andrew Noble is all the more of interesting ancestry to us. He early manifested a leaning toward a military career and was in due course entered as a student at the Royal Military Academy at Woolwich. Subsequently he became identified with the Royal Artillery and by the year 1855 he had attained a captaincy. As Captain Noble he was known until 1893, when knighthood was conferred upon him by Queen Victoria. In 1903 he received the rank of baronet.

Returning to Andrew Noble's army career, we find him in 1857 secretary of the Royal Artillery Institution at a time when Great Britain trembled under the shock of a great war. From the climax of the Crimea came immediately the inception of the classic researches of Noble as well as of Whitworth. The former naturally became identified with the heavier ordnance, and the latter for a time investigated small bore armament. But the two were not of the caliber to remain so restricted, and their work became more nearly parallel and ultimately the forces combined and fused in one commercial organization.

Captain Noble served as secretary of the Committee on Rifled Cannon when he was an officer of artillery. In 1859 he was also a member of a committee which studied the relative strength of guns and armor plate, and there were also added to the responsibilities of the same crowded year his duties as an assistant inspector of artillery. He was also a member of the Ordnance Select Committee and a member of the Committee on explosives.

Joining Forces with Armstrong

So energetic a personality could not help being well known and appreciated. It was therefore quite in the course of events that he should be invited in 1860 to join his forces with those at the Elswick plant in the north of England. The Elswick Works date back to 1846 and were founded by William G. Armstrong. From the purchase of a small piece of land, five and a half acres, in 1847 the site has steadily grown to an acreage of 250. Five years ago high water mark was reached with a payroll of £36,802 per week, but with the present contracts in hand it is believed that the palmy days will be renewed and that former prosperity may perhaps, indeed, be speedily surpassed.

Captain Noble in his long association with Lord Armstrong and with Professor Abel, made scientific inquiry into the allied subjects of rifling, explosives and projectiles. He was elected a Fellow of the Royal Society in 1870 and was awarded the royal medal in 1880. When the British Association met at Leeds in 1890 Sir Andrew Noble was president of the mechanical science section. He has published many essays and has frequently lectured on the subjects in which he has acquired a considerable degree of fame. The Durham College of Science conferred the degree of D. C. L. on him in 1897. He was created a C. B. in 1881 and a K. C. B. in 1893 and has been decorated with the orders of Italy, Portugal, Spain and Brazil.

Sir Andrew Noble became chairman of Sir W. G. Armstrong, Whitworth & Co., Ltd., as successor to the late Lord Armstrong in 1901, but for 20 years before that event the active direction of the company's affairs was almost entirely in the hands of Sir Andrew. The extent of the business in all its ramifications is surprising. Mitchell's shipyard at Walker was linked to the Elswick plant in 1882, and properly supplemented the ordnance division in its naval gun construction and installation. Originally a general engineering or tool plant the pioneer shop at Elswick received a renewed impetus along its first path, when in 1897 the combination was effected with Whitworth's famous works at Openshaw. Latterly these shops at Manchester have done much to improve and popularize high speed steel practice, and the literature of the subject has had notable additions made to it by A. H. Gledhill and Walter Carter. Elswick's history begins with engine building; then came the ordnance department, next a steel plant, then the Walker shipyard, the shipyard at Elswick, the Pozzuoli Works in Italy, the Openshaw plant at Manchester, and the Scotswood Works at Newcastle-on-Tyne. Armstrong, Whitworth & Co. build war vessels, ordnance, armor plate and projectiles, as well as many of the important auxiliaries to the manufacture of these imposing products, such as high speed steel and machine tools.

Machines That Have Made History

Built up in the way these respective plants have come to their present proportions, they are instructive reminders of the personalities that have made themselves and them famous. The present writer entered the office at the Openshaw Works, a few years ago, was most hospitably received, and given an opportunity to sign his name in the register with a quill pen. He was further permitted to watch the operation of rolling armor plate and to see various engineering practices that in most countries are not commonly exhibited to foreigners and sometimes not to natives. A Porter-Allen engine of the early sixties was smoothly and silently driving the shafting of one of the shops. It was reminiscent of the time when Whitworth and Porter agreed to disagree. The full account will be found in the recollections published by the latter party to the pact. That the engine should have so long survived the years of experiment, when American design was grafted upon English methods of production, was not at all surprising to the guide who expected the fit to survive and to keep at it. In the tool room he pointed out a lathe having the date of 1849, and pronounced it the best there was around, an opinion in which he was loyally supported by the foreman.

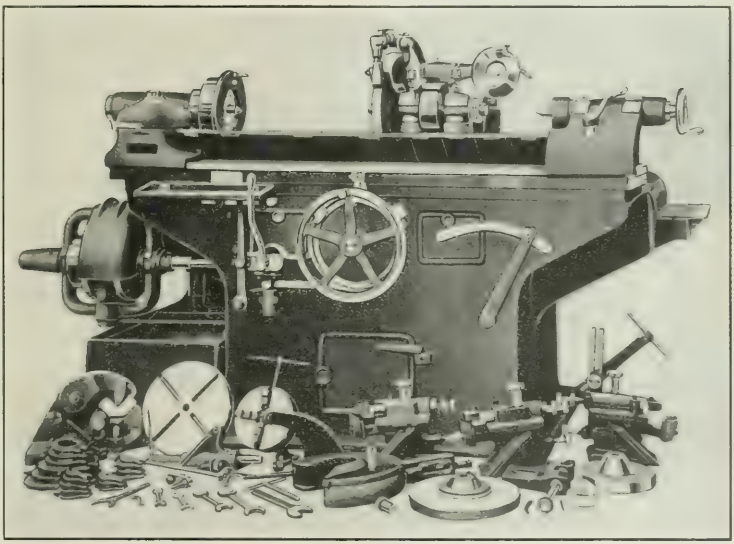
It was in just such an atmosphere that the early experiments on true screws were brought to a high pitch of success, and it was with the self-same devotion and confidence that similar researches were prosecuted upon such diverse subjects as the compressing of fluid steel, the flattening of the trajectory of a musket ball, the settlement of the proportions of the projectile and of the rifling, the production of accurate surface plates, the manufacture of measuring tools of a high degree of precision, and the making of hollow shafts for propellers. The allied plants are alike of the greatest engineering interest, and they have filled so large a place in the industrial world that the approaching celebration of Sir Andrew Noble's jubilee year should strike a responsive chord of far-reaching goodwill. For a further reason will 1910 be notable at Elswick and at the sister plants, since it also happens that 100 years ago, on November 26, 1810, there was born at Pleasant Row, Shieldfield, Newcastle, he that was afterward Lord Armstrong.

The S. Keighley Metal Ceiling & Mfg. Company, Pittsburgh, whose plant is at Follansbee, W. Va., recently secured a contract for 700 Phœnix metal lockers to be installed in a school at Richmond, Ind., and 400 for a Washington, Pa., school. Other contracts for Keighley lock joint metal ceilings keep the manufacturing departments operating to good capacity.

Landis No. 3 Universal Grinding Machine

At the convention of the Master Mechanics' and Master Car Builders' Associations recently held at Atlantic City, the Landis Tool Company, Waynesboro, Pa., exhibited two grinding machines which were especially adapted for railroad work. One of these, a 16 x 72 in. plain self-contained grinding machine with gap, was illustrated and described in *The Iron Age* April 21, 1910, and the other is the No. 3 universal grinding machine, which is illustrated herewith. This machine embodies many new features and improvements which it is stated enable it to produce accurately and highly finished work rapidly and economically. It combines both an external and an internal grinder and is especially adapted for tool room service for finishing such work as straight and taper spindles, arbors, rolls, gauges, dies, reamers, milling cutters and a large variety of other work that can be held by either a face plate or chuck. To change the machine from an external to an internal grinder, it is simply necessary to swivel the wheel head end for end and replace the wheel guard and wheel with the internal fixture and driving pulley respectively.

The table swivels for grinding tapers, and has two scales graduated in degrees and inches per foot. The maximum number of degrees for which a taper can be ground is nine and the greatest taper is 4 in. per foot. The headstock is made to swivel for short abrupt tapers, the setting of which is indicated by graduations on its base. The outer of the two pulleys shown is for driving the work on dead centers while the inner, which is cupped to allow the greatest possible length of bearing, is for driving the spindle. The spindle is of large diameter made of high grade steel hardened and ground to size, and runs in phosphor bronze bearings which are adjustable for wear. The tailstock spindle is operated by a hand wheel and is provided with a variable tension spring or it may be held rigidly for supporting the center to the work.



The No. 3 Universal Grinder, Made by the Landis Tool Company, Waynesboro, Pa.

The construction of the grinding wheel head is very rigid and the slider has long guides with large bearing surfaces. It is so arranged as to take up any back lash that might occur in the feed gearing automatically, thus preventing any possible jumping in of the wheel when feeding. A micrometer lateral feed is provided for the spindle, which is useful in grinding shoulders and similar work, such as the sides of disks, points of snap gauges and other pieces which must be ground to an exact size with the sides of the wheel. The entire grinding wheel head swivels on the carriage for taper grinding and is graduated through arcs of 90 degrees on each side of the center line. The wheel can be fed to the work either automatically or by hand, through the hand wheel at the right of the head. The grinding wheel travel is automatic and is controlled by dogs which are positively set. The dogs drive against the sliding bar in the reversing lever which can be released, thus permitting the wheel to be moved beyond the reversing point in either direction and return and reverse as before without disturbing the setting. The dogs are set by lifting the adjusting screws out of engagement with the circular rack on which they are mounted and sliding them to the approximate position required. A fine screw adjustment is used when setting them to shoulders. The lever at the left of the hand wheel on the front of the base is for reversing by hand and the slide lever near its upper end between it and the hand wheel is for starting and stopping the power traverse. Grouping these two levers and the hand wheel so close together is a very simple and convenient arrangement, as all the operating levers, handles and adjustments are within easy reach of the operator from the front of the machine and the grinding wheel is always in plain view of the operator when making any speed change or adjustment. The wheel carriage tarries automatically at the reversing points, thus permitting the wheel to clear itself at shoulders before reversing, and if desired this time of tarrying can be varied. The automatic cross feed operates at each reversal of the carriage and can be adjusted to reduce the diameter of the work each time the carriage reverses from 0.00025 to 0.005 in. The feed is regulated by a thumb latch, the pressing of which sets it for the required size and the feed will size work accurately to within 0.00025 in. and stop automatically when the work is finished to the size at which the mechanism is set. The speed of the grinding wheel traverse is controlled by the lever moving over the quadrant at the right of the machine.

The rests support the work at two points, underneath and in front, each support being adjusted independently of the other, which it is said is essential to perfect grinding. Another advantage of these rests is their compactness and narrowness, which is desirable when grinding between the shoulders of cranks and similar work.

The following table gives the principal dimensions and specifications of the machine:

Diameter of headstock spindle, inches	2⅜
Diameter of tailstock spindle, inches	2⅛
Diameter of work carrying centers, inches	1¼
Width of work driving belt, inches	2
Number of speeds	12
Diameter of grinding wheel spindle, inches	1¼
Diameter of grinding wheel driving pulley, inches	5¼
Width of grinding wheel driving belt, inches	2½
Diameter of grinding wheels, inches	12 and 14
Face of grinding wheels, inches	1 and 1½
Diameter of countershaft pullers, inches	11
Speed of countershaft, revolutions per minute	475
Width of countershaft driving belt, inches	4
Power required, horsepower	8
Floor space required, feet and inches	4 x 9 6
Net weight of machine, pounds	5,800

The accessories regularly furnished with this ma-

chine include two grinding wheels and centers, a grinding wheel truing device, a No. 4 internal grinding fixture, a 7½-in. four-jaw independent chuck, face plate, center rest, stationary back rests, traveling and stationary cutter rests, cutter chuck, pump and tank for supplying water to the work being ground, a set of dogs and a set of wrenches.

A Model Machinery Warehouse

The Jersey City Warehouse of Manning, Maxwell & Moore, Inc.

The accessibility of Jersey City to New York, since the completion of the Hudson tunnels, has prompted a number of large firms in the iron, steel and machinery business to establish warehouses in Jersey City for the purpose of storing and displaying goods. The crowded conditions in the New York machinery district has made this imperative in a number of cases. The latest structure of the kind to be built in Jersey City has just been completed at 446-452 Communipaw avenue for Manning, Maxwell & Moore, Inc., whose general offices are at 85-89 Liberty street, New York. Besides being a storage and distributing branch of the company's business, a section of the building is used for the purpose of displaying machinery in motion to demonstrate the working parts of intricate machinery to prospective purchasers.

The new warehouse is a model of its kind, particular attention having been paid to the question of handling heavy machinery which, under the most favorable circumstances, is a difficult matter. The building is a one and two story structure, 100 x 200 ft., and contains 27,000 sq. ft. of floor space. It is practically fireproof, the only wood in the building being that used in making the bins for the storage of mill supplies, &c.

How Heavy Machinery Is Handled

The arrangement of the main floor is given in the accompanying plan, Fig. 1, while Fig. 2 is a cross section showing the hight and other features of the structure. There is an open space on all sides of the building so that it is admirably lighted by an abundance of windows. The only excavation made under the building was to provide sufficient space for the elevator machinery and the boiler, which are reached by spiral stairs. The first floor, which is laid in concrete, was placed at a hight above the street level, sufficient to allow the loading and unloading of drays and freight cars. This floor is divided into two equal parts by a partition with openings from the store on the right to the storage department on the left. There is an office 23 x 32 ft. in size, around three sides of which is a mezzanine gallery reached by spiral stairs. This gallery is used for filing cases.

At the front of the building are four canopy doors, which mechanically fold up and give access to four runways or pits for electric trucks, extending into the front of the building. When trucks are backed inside, their floors are flush with the first floor of the building. At night the trucks are kept in the pits. A spur from the Central Railroad of New Jersey enters the building, and there are accommodations on it for two cars within the structure.

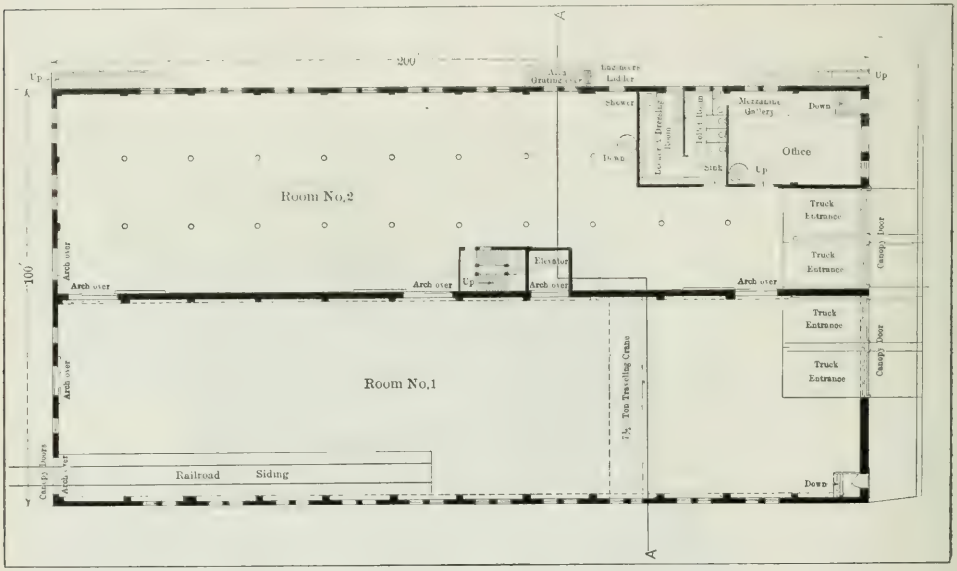


Fig. 1.—Ground Plan of Manning, Maxwell & Moore's Jersey City Warehouse.

This section is used for receiving, storing and shipping loaded machinery, and is served by a 7½-ton standard Shaw electric traveling crane with a 46-ft. 8-in. span on a 200-ft. runway. A crane of this capacity is sufficient to handle all machines usually carried in stock, as anything in the line of mechanical equipment heavier than that weight is generally made to order and delivered from the works.

Near the center of the structure is a hydraulic elevator of 5000 lb. capacity for the purpose of con-

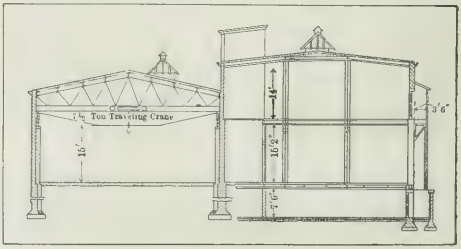


Fig. 2.—Cross Section at A A.

veying heavy machinery to the second story. Any piece of machinery of a weight up to the capacity of the crane can be handled by two men and placed anywhere in the warehouse. The warehouse section of the building is only one story in hight, and besides having windows in the side walls is lighted by a number of skylights. A door opens from the side of the office into the store.

How Lighter Stock Is Handled

About 5 ft. back of the electric truck pits is a city counter 15 ft. long. This is closed at the front, while at the back are bins for small goods, which have been ordered and are awaiting delivery. The counter is cut through at one part of it, and hinged at the back and supported on castors. The hinged part is opened to permit loaded warehouse trucks to be run directly on or off of any one of the electric trucks. In the rear of the counter are bins and shelving for the storage of goods. On this floor are kept drills, files, cutters, reamers, leather belting, babbitt metal and other supplies. The bins and shelving are far enough from the outer wall, not to be exposed to fire from the outside of the building.

The floor space in the rear of the elevator is used as a display room for machinery, which has been stripped of crating, polished and put up as it would appear in a shop.

The second floor, which covers half of the full length of the first floor, can be reached by a slate staircase as well as by the elevator. On one side of the room are bins for D-handled shovels, with a platform above for long handled goods, the latter not interfering with the light from the windows. On this floor are also carried wheelbarrows, forges, oil tanks and other bulky goods.

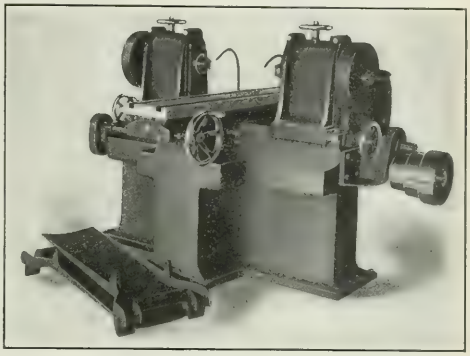
A 1-ton truck makes three trips a day between the New York store and the Jersey City building to supply needs for either one. The Jersey City building is used as a distributing center for New Jersey and Pennsylvania points, and has its own corps of traveling salesmen. The entire equipment is so conveniently arranged that besides the manager, clerk and stenographer in the office, two men to handle incoming and outgoing goods are all the force required.

The Phillips Sheet & Tin Plate Company, with plants at Clarksburg, W. Va., and Weirton, W. Va., is operating both to full capacity. The Weirton plant is the newer of the two, being a 10-mill plant. It is here that 10 new sheet and tin mills are to be added. The buildings have been erected and ground is being broken for the foundations for the machinery, which will be installed and ready for operation about October 1. The Nicola Building Company, Pittsburgh, has under construction 100 new workmen's houses that will be ready for occupancy about September 15, making 200 houses in all. When running to capacity the Weirton plant will employ 1500 men. Additions are being made to the water works system to care for the new mills and for furnishing water to the workmen until a town water system is installed. A sewage plant is under construction and gas and electric lights are available in the houses. With the exception of the mill engines, all the machinery in the Weirton plant will be operated by General Electric motors. The company manufactures sheets and tin and terne plates.

The Commercial Association of Pontiac, Mich., has succeeded in securing four new industries for that city as follows: The Michigan Stamping Company, capitalized at $150,000; Vulcan Gear Works, capitalized at $100,000; Pontiac Foundry Company, $80,000, and Champion Mfg. Company, $50,000. Each will erect a factory, and it is announced that ground will be broken this month.

The Garvin No. 3 Duplex Milling Machine

The Garvin Machine Company, Spring and Varick streets, New York City, has recently brought out the new model duplex milling machine illustrated herewith, which is known as the maker's No. 3 duplex milling machine. In the design of this machine the object sought was to obtain a feed of 60 in. without any cramping or deflection of the slide and to take care of the drippings and chips from the cuts. The slide table is 64 in. long, and the saddle bearing supporting it is 4 in. shorter. The feed to the table is by a spiral rack cut out of the solid on the under side of the slide, which meshes with a large diameter square thread steel worm, which is made in two parts so that wear can be easily compensated for. The slide shown in the illustration is made with grooves for special work,



The No. 3 Duplex Miller Made by the Garvin Machine Company, New York City.

but the regular pattern is provided with three standard T-slots.

In the engraving tool shield castings are shown on the floor in front of the machine. These are bolted to the saddle and serve to drain all drippings from the overhang of the slide to the oil chip channels cast around the upper end of the base on all sides. These channels all communicate with one another, and are provided with chip strainers located at about half their depth, thus leaving a clear oil space all around. The pump draws its supply through a fine strainer and delivers it to the work through a number of flexible pipes provided for the purpose.

The spindles are driven from a common splined shaft through spur gearing from a three-step cone pulley, which in its turn takes power from an overhead countershaft. Back gears having a ratio of 6 to 1 are also provided. The hole in the spindle conforms to the No. 11 Brown & Sharpe taper, and has a positive slot drive. A draw rod reaching through from the rear end of the spindle holds the taper shanks in their seats. The thread on the outside of the spindle which is 3¼ in. in diameter is cut according to the Brown & Sharpe standard 3½-in. pitch, and is furnished either right or left hand as may be desired.

The principal specifications and dimensions of the miller are as follows:

Width of working surface of table, inches	12
Length of working surface of table, inches	64
Maximum distance between spindles, inches	27
Minimum distance between spindles, inches	4½
Minimum distance between spindle and table, inches	1¼
Maximum distance between spindle and table, inches	9
Speed changes	3
Positive feed changes	12
Domestic shipping weight, pounds	5,480

The customary accessories, such as cutters, feed change gears and tools, are regularly furnished as a part of the equipment of the machine.

A New Case Crane Trolley

One Especially Adapted to Steel Mill Service

The latest trolley for mill service cranes designed and built by the Case Crane Company, Columbus, Ohio, is shown in the accompanying Fig. 1. This machine is built to meet the most severe requirements, and high claims are made for it from the standpoint of efficiency, accessibility, facility of repairs, workmanship and design. By referring to Fig. 2 it will be seen that the frame consists of two heavy iron castings connected by a very wide and heavy steel girt or separator. The slides are of box section, insuring a rigid connection with the girt. The efficiency of the machine as a whole depends very largely upon the trolley frame, and this one is made rigid enough to withstand the heavy shocks and severe strains that it may be called upon to sustain in this class of service.

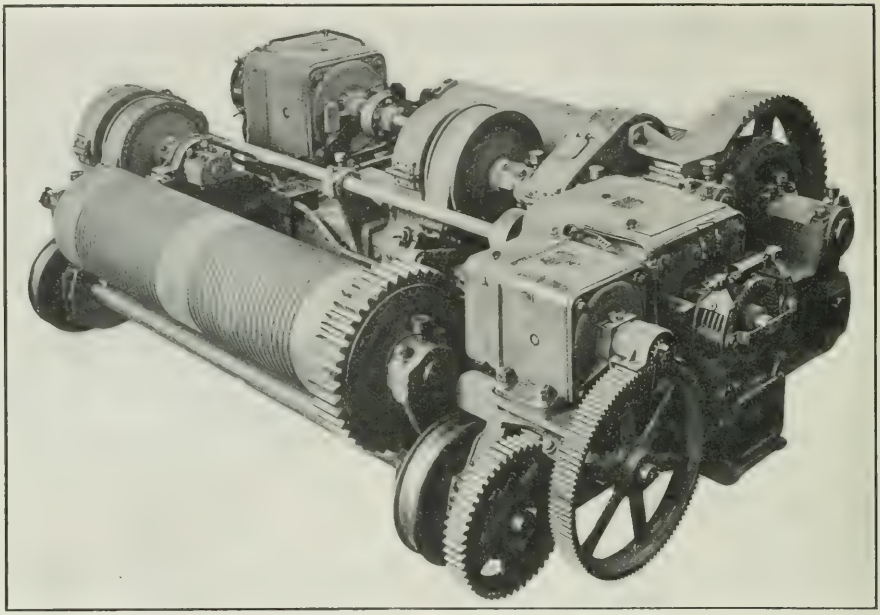


Fig. 1.—The Improved Mill Service Crane Trolley Built by the Case Crane Company, Columbus, Ohio.

To facilitate repairs, when such may become necessary, and to insure after they have been made that every part of the machine is in perfect alignment, all fastenings throughout are made by through bolts with United States standard nuts, and all bearings are provided with caps and fitted in split bronze bushings, eliminating the necessity of pressed fit bushings. All gears are of cast steel and pinions of forged steel cut from solid stock. There are no overhung gears in the hoisting mechanism, and all gears except the drum gear are inclosed by cases having inspection lids, as will be noticed from Fig. 1. The entire upper half of the gear case is hinged, allowing free inspection without removing the bearing caps, these being independent of the lids as is shown in the illustration.

The truck wheels are either of cast iron with chilled tread, cast steel, or manganese steel, all ground to size. They are keyed to axles revolving in M. C. B. type bearings, which allow removing the wheels with their axles by simply relieving them of the load. All shafts with their gears and pinions can be lifted out without disturbing any part of the machine by simply removing caps. All shafts are of 0.40 to 0.50 per cent. carbon steel, ground to size, with shoulders. The drum gears are keyed on the drum, which is removable in the same manner as the shafts, and the hoisting motors can also be removed without disturbing the motor armature or electric brake, which are mounted directly on the trolley sides.

The load retaining brake is a modification of the Weston type, and is either provided with friction material or wood or bronze and cast iron disks for holding the ratchet wheel in the lowering direction. The differential flexible band has been adopted instead of the ordinary pawl and ratchet; the band releases automatically when hoisting, and speedily grips the brake wheel when lowering. The advantage of this type of brake is that it applies itself without undue shock, prevents the locking of the brake, and the operation is smooth and noiseless. For cranes of large capacity a combination band wheel with pawl and ratchet extension has been adopted, as shown in Fig. 4. This ratchet wheel is in the nature of an extra safety device, since the rupture of the strap may cause the load to drop, although such an occurrence is hardly possible, as the strap is designed with a very large factor of safety. However, should the band fail to engage through breakage, the pawl and ratchet arrangement

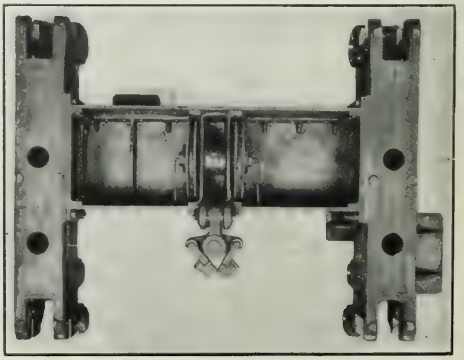


Fig. 2.—A Bottom View of the Trolley Frame.

provides the hoisting mechanism with a holding device until such a time as the necessary repairs can be made. This arrangement has the advantage that the machine cannot be put out of commission, which is very important in steel mill service.

The motor brake drum is coupled to the armature

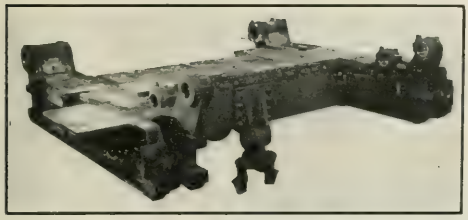


Fig. 3. A Normal View of the Stripped Trolley Frame.

shaft of the hoist motor, as shown in Fig. 1, and the solenoid frame is bolted to the trolley side. The brake is of the shoe type, combining the advantages of the self-contained motor brake, no end thrust on the armature shaft, perfect accessibility and ease of adjustment and repair. The brake is ample in proportion, constant in action, its retarding torque is uniform and brings the armature quickly to rest without shocks or blows, and is powerful enough to insure accurate stopping.

The limit switch comprises a traveling nut and screw, with a positive guide, usually attached to the drum shaft, and when the hook has reached the upper limit the contact is formed which throws a circuit breaker located in the crane bridge cage upon the switchboard.

Nearly all gears and operating parts are contained within the trolley sides, so that the weight is very equally distributed, which prolongs the life and insures uniform wear of the parts as far as possible. Such parts as are likely to require renewing are readily accessible, and replacements can be made with little time and labor.

R. W. Valls, the new chief engineer of the Case

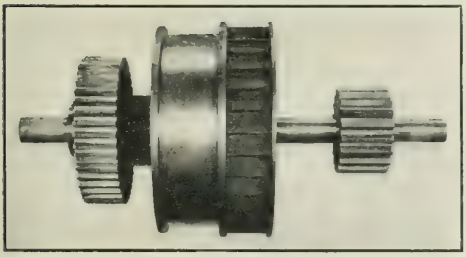


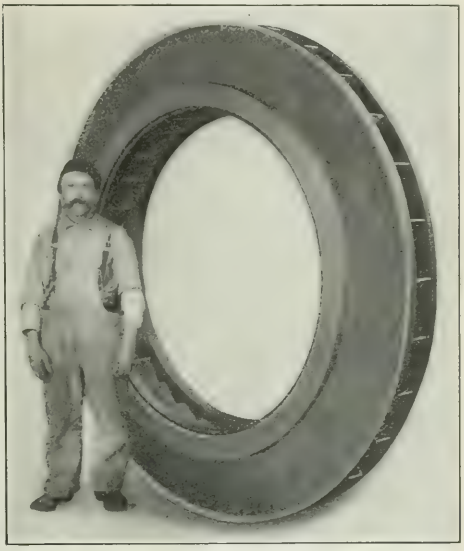
Fig. 4.—A Combination Band Wheel with Pawl and Ratchet Extension Used on Large Capacity Crane Hoists.

Crane Company, is the designer of the new features which have been embodied in this trolley.

That steam plant owners are realizing more and more the necessity of clean boilers is evidenced by the number of orders placed with the Wm. B. Scaife & Sons Company, Pittsburgh, Pa., manufacturer of the Scaife and We-Fu-Go water softening and purifying systems, not only for steam boiler feed use, but for other industrial uses. Some recent We-Fu-Go orders received are as follows: Carnegie Coal Company, Oakdale, Pa., 750 hp.; Twin State Gas & Electric Company, Dover, N. H., 575 hp.; American Sheet & Tin Plate Company, Gas City, Ind., 1800 hp.; Wickwire Steel Company, Buffalo, N. Y., 3000 hp. addition to present 6000 hp.; Cleveland Hardware Company, Cleveland, Ohio, 1000 hp.; Pocahontas Consolidated Collieries Company, Switchback, W. Va., 5000 hp.

A Large Manganese Bronze Water Wheel Runner

One of the largest pieces of manganese bronze ever cast was recently shipped by the Whitlock Coil Pipe Company, Hartford, Conn., to California for the Pelton Water Wheel Company, Philadelphia, Pa. Some idea of the enormous size of the casting can be obtained from the engraving, which shows the diameter of the piece in comparison with the hight of an ordinary man. When the casting reaches the Pacific Coast it will form the runner for a large water wheel which the Pelton Company is installing there.



A 2800-Lb. Manganese Bronze Water Wheel Runner. Cast by the Whitlock Coil Pipe Company, Hartford, Conn.

The weight of the casting is 2814 lb., the internal and external diameters are approximately 5½ and 8 ft., respectively.

Joseph T. Ryerson & Son, Chicago, announce the removal of their New York office to the seventh floor of the Hudson Terminal Building, 30 Church street, New York City, and the maintenance in connection therewith of machinery display rooms and warehouses immediately adjacent to the Jersey City terminal of the Hudson and Manhattan tunnel. In addition to a complete stock of boiler, structural and machine shop specialties and fittings, Morison corrugated furnaces, Glyco bearing metal, tool steel, metal working shop supplies and equipment, including both hand and power tools, their increased facilities will permit of immediate shipment from stock of staple lines of iron and steel, including structural shapes, universal plates, &c. In keeping with the establishment of Eastern warehousing facilities and machinery display and demonstration rooms, the personnel of the New York office will be increased sufficiently to insure the most careful attention to the firm's Eastern trade.

The Whitaker-Glessner Company, Wheeling, W. Va., has sent out specifications asking for bids on its new steel plant to be built near Yorkville, Ohio, across the river from Wheeling. The initial plant will consist of three 60-ton or 75-ton open hearth furnaces. The company is selling treasury stock to defray the cost of the new plant.

Feats with the Oxy-Acetylene Torch

Difficult Cutting Jobs for Which It Is Peculiarly Adapted

An extremely difficult undertaking in the way of cutting was successfully accomplished recently with the oxy-acetylene torch by the Autogenous Welding Equipment Company, Springfield, Mass. The Springfield Five-Cent Savings Bank has a vault which was built in 1875, and during the course of remodeling the bank it was necessary to put a new vestibule and door in this vault because the old one was too narrow. This, together with the installation of an entirely new vault, was undertaken by the Diebold Safe & Lock Company, Boston, Mass., under the personal direction of George A. Getschell.



Fig. 1.—A Bank Vault of Steel Rails and Chrome Steel Bars Imbedded in Cement, Cut with the Oxy-Acetylene Torch.

The old vault was armored with 60-lb. railroad rails, which were purchased from the Boston & Albany Railroad at the time the safe was built. These were bent so as to follow the ground work of the vault, including the vestibule, and were built so that they dove-tailed into each other, the rails being set in a very strong cement. The roof of the vault was built up in a similar manner. It was necessary to make a cut on each side of the vestibule and across the top and bottom; the total cutting was about 30 ft. and the thickness of the wall 5¼ in. This would not have been very difficult to remove in the ordinary manner by drills and hack saws if it had not been that the makers of the safe had laid a bar of three-ply chrome steel between each rail, a material which it is impossible to saw or drill. The necessary cutting was done, however, with the Davis-Bournonville positive mixture oxy-acetylene cutting torch.

The presence of cement between the rails complicated the work, as it was necessary to knock it away from between each rail as the cutting progressed. The laminated chrome steel did not offer any difficulties with this method of cutting. It would, however, have been a very much simpler matter to cut the same amount of solid steel compared with the cutting of this built up material, owing to the fact that a very slight film of cement over the surfaces of the metal interferes seriously with the cutting operation. The vault is shown in Fig. 1, the vestibule being partly cut away, and the ends of the rails and the chrome bars can be distinguished on the right vestibule wall. The new vault door is to the left and sections of the rails that have been cut are seen on the floor between the doors.

Another interesting example of cutting can be seen in Fig. 2, which shows an exhibit placed in one of the windows of the principal Springfield drug store during the recent Springfield Products Week when all the local manufacturers exhibited their products in the windows of the tradesmen through an arrangement made by the Springfield Board of Trade. This enabled the residents and the large number of visitors who came to the city during the week to realize the importance of the city's industries, and is a plan that could be advantageously adopted in other cities. The Autogenous Welding Equipment Company took this occasion to exhibit its welding which, though not a product, was termed "Springfield Skill and Brains." A demonstrator was seen at work in the window surrounded by samples of various cla ses of work, together with a Davis-Bournonville high pressure acetylene generator and other parts of the equipment. The exhibit illustrated was the name of the company cut in a 5-16-in. steel plate, 7 ft. long and 10 in. wide by its president, Henry Cave, with a jet of oxygen from one of the cutting torches. The ⅜-in. round steel was then welded around the plate to form a bead, giving the sign a neat appearance. The time taken to cut the name was approximately 45 minutes. Mechanics will realize the difficulty of cutting this sign in any other way, and can readily see the usefulness of the cutting process for roughing out trimmer plates for drop forgings and dies of a similar nature for other purposes, as well as the large amount of other work, such as trimming boiler flanges, and also, owing to the portability of the equipment, for cutting structural iron work in the field.

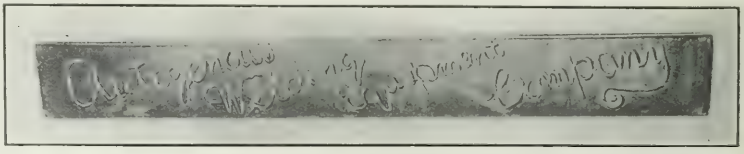


Fig. 2.—A Name Cut in a 5-16-In. Plate, 7 Ft. Long and 10 In. Wide, with a Cutting Torch.

The company makes a specialty of repairing large

breakdowns in power plants and other machinery, having an equipment on hand for immediate shipment to repair a breakdown with the least possible delay. Not only is the work carried out at a less cost than replacements, but there is a tremendous saving in time and the reduction in the time of a shutdown is often of the greatest importance. The company also does a large amount of manufacturing and repair work at its plant at 41 Bay street. It has made a specialty of repairing street railway motor frames, and has had some of them in use for several years after being repaired, none of which have been known to break again in the same place. The cost of repairing in this manner is very moderate.

Handling Small Articles Economically

The plant of the National Cash Register Company, Dayton, Ohio, has a reputation throughout the world of representing the latest development in both factory construction and equipment. The latter was especially designed to meet the demands of this particular shop,



Fig. 1.—Interior of the Foundry of the National Cash Register Company, Equipped with Industrial Railways, Built by the Orenstein-Arthur Koppel Company, Pittsburgh, Pa.

which require the rapid movement of the hundreds of small parts which enter into the construction of a cash register by the engineers of the Orenstein-Arthur Koppel Company, Pittsburgh, Pa. What they have done to promote plant efficiency along these lines is shown by the three half-tone engravings which are reproductions of photographs taken in the foundry of the plant.

This building covers 157,500 sq. ft., and every portion of this large area is thoroughly served by industrial railway lines. All the raw material that enters



Fig. 2.—Handling Small Brass Castings on Industrial Railway Cars.

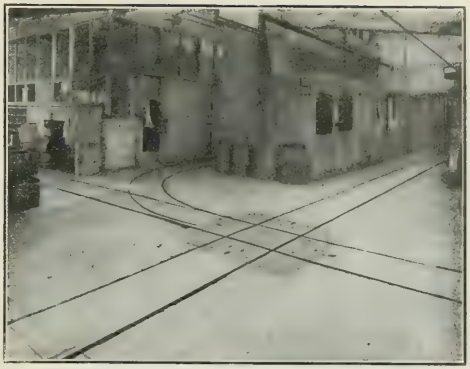


Fig. 3.—View of the Track, Turntable and Siding.

into the manufacture of brass castings and the finished castings themselves are handled on the railway, the system being arranged so that no other trucking is necessary. All metals are stored in a weighing-out room and are distributed from there to the different furnaces. A like routine is observed with regard to the molding sand, which is prepared at a central location and served out to various points in the foundry requiring it.

The output of the foundry is about 25,000 lb. of brass castings per day, most of which are very small and must be handled several times. This large output, coupled with the fact that all of these parts are finely machined and must be handled with extreme care to prevent breakage or other forms of injury, will serve to give some idea of the amount of labor required to move this material. The monetary value of the saving in time and labor effected by the installation of this industrial railway system has never been determined exactly, but it is stated that three men are doing what it formerly required six men to do, and the work is being done with greater speed.

One of the novel features about this installation is that only one type of car, which is the ordinary flat platform model shown in Fig. 2, is required to perform all the transportation work about the plant, as it is capable of handling all the raw materials and the output of the foundry easily.

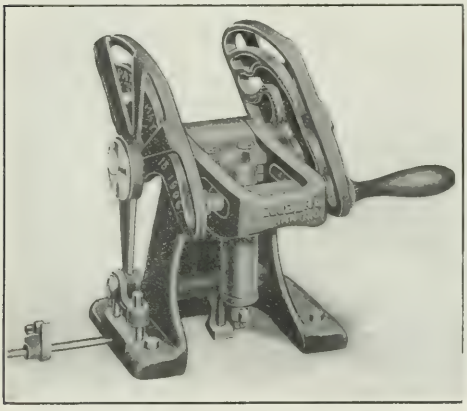
J-M Metallic Packing.—The H. W. Johns-Manville Company, Cleveland, Ohio, announces a new mechanical packing for which high claims are made for endurance, economy and efficiency. It is named the J-M metallic packing (Bulock patent). It is the outcome of years of careful study and investigation of all conditions and experiences met in the sale and use of mechanical packings. It is manufactured in Cleveland under the direct supervision of the company's own experts. While of segmental construction, when assembled on the rod it takes the form of a solid ring; that is, it is impossible for one segment to turn up on edge and score the rod. It is also a self-lubricating packing, being so constructed that small reservoirs are formed in the various rings which contain lubricating oil, thus insuring a constant, thorough and economical lubrication.

The use of hardness testing devices on rolled brass is referred to by the *Brass World*. Brass is rolled in many different "tempers." Usually when a sample of sheet brass is sent in so that an order to be filled may match it, bending or scratching is resorted to to determine its temper, the result often being only a guess. The hardness testing methods used with steel are beginning to be employed for brass, but the ability to determine the "temper" of a sample of brass is not yet well established.

The Mellberg Tube Closing Machine

A Novel Device for Mechanically Sealing Collapsible Metal Tubes Rapidly

The use of flexible metal tubes for pastes of various kinds, paints and medicinal preparations has become very common. The customary method of sealing the bottom of these tubes after they have been filled has been to turn over the bottom of the tube with a pair of pincers to form a seal. The Mellberg Machine Company, 473 Washington street, Newark, N. J., has recently placed on the market a patented machine for doing this class of work, for which the principal advantages claimed are a much more rapid rate of production and at the same time a much reduced cost, as the use of this machine does away with the use of hand labor, which in itself is not expensive where only a few are employed to seal the tubes, but runs to quite a large amount where the output is large and the number of girls employed great. Another feature of the machine is a printing attachment which labels the closed capsules, or if desired prints the advertising card of the



Patented Tube Closing Machine, Made by the Mellberg Machine Company, Newark, N. J.

maker across the folded end of the tubes. This printing or stamping of names or cards across the folded end possesses the further advantage of more closely sealing the capsule as the parts are pressed closer together and consequently more firmly united.

In the accompanying illustration the machine is shown in position to receive a capsule for closing, and it will be noticed that it consists of a frame provided with a flaring base flange and vertical side members and two forwardly projecting members connected at the front by an integral cross member. The back portion of the frame extends over at the upper part to form a hood and slotted cams are provided on either end of the shaft which passes through it. Horizontal guide slots are provided in the forwardly projecting members and a sliding plunger is mounted therein which fits into the large semicircular slots in the upper part of the slotted cam. Antifriction rollers are provided on the ends of this plunger for the purpose of reducing the friction between the plunger and the cam slot.

The folder consists of a cylindrical shaft so mounted to oscillate in the frame of the machine that its bearings are substantially in alignment with the horizontal slots in the projecting members of the frame. Crank arms are secured to either end of this shaft by set screws and have pins with antifriction rollers at the other end which take into the lower cam slot. This slot, which is shown more clearly at the right of the engraving, is irregular in contour, the front portion being substantially straight while the other part is curved backward and is an involute of the shaft in the hood at the back of the frame. A small shaft with a ratchet wheel having an even number of teeth is mounted between the side pieces of the frame behind the tube shown in front of the hood. This shaft is operated from the handle at the right of the machine through a spring pawl and the ratchet wheel.

A horizontal shaft is mounted in the lower portion of the frame and projecting upward therefrom is an arm which has a roller at its upper end engaging with a lobed cam having half as many lobes as there are teeth on the ratchet wheel referred to in the preceding paragraph. Two arms project forward from the sleeve of this horizontal shaft and a saddle having a seat and socket for receiving the capsule is suspended from their outer ends by adjustable pivots. This socket is the cylindrical tube shown in the illustration between the horizontal forwardly projecting members of the frame. When placed in position the socket has a tendency to fall backward so that the upper portion makes contact with one of the lobes of the lobed cam, but the socket and its saddle also tilt forward so that the inserted capsule may be removed by hand. Provision is made for varying the depth of the socket to provide for different sizes of collapsible tube by an adjustable seat. When this seat is properly adjusted the open end of the tube will project upward between the plunger and the anvil of the sealing device which are fastened to the under side of the hood.

The printing device is on the left side of the machine and is operated by the rotation of the shaft which actuates a crosshead containing a line of type through an eccentric and a connecting rod. The horizontal rod projecting from the base of the machine serves as a gauge to bring the folded end of the capsule under the type bar and an adjustable yoke is provided for different sized tubes.

The operation of the machine briefly is as follows: With the handle in the position shown, the filled tube is inserted bottom upward in the socket so that it projects between the plunger and the folder. Moving the handle causes the plunger to be forced backward, thus compressing the upper edge of the capsule and at the same time the folder is rotated through the action of the lower cam-slot and the cranks so as to fold the upper edge of the tube at right angles to its length and a further movement of the handle retracts the plunger and brings the folder into contact with the face of the anvil so that the upper edge is folded down against the capsule. The handle by this time has reached the limit of its travel and on the return stroke the capsule is raised slightly by the horizontal shaft and the levers and arm connected thereto until it is in position for the second fold. This is made in identically the same manner as the first one and when the handle is brought back to its initial position the socket, containing the tube, is tilted forward. The sealed capsule is removed and placed with the folded end resting upon the type bar. Repeating the folding operation for a second capsule forces the cross head down on the folded end of the first one and prints the desired inscription thereon. These two operations are repeated for each capsule. To secure the requisite pressure for printing upon the folded end, an adjusting screw is provided which limits the motion of the handle and stops the eccentric when the desired degree of compression is reached.

To prevent any interference between the folder as it is rotated to form the first fold and the front edge of the plunger, the two sections of the lower cam slot are joined in an ingenious manner. Between the straight and involute portions there is a short section which is concentric with the shaft in the hood. Thus the combination of the three portions of the slot pro-

duces a varying oscillating velocity of the folder so that for a portion of the stroke of the handle, when the plunger is in close proximity to the anvil, the folder remains stationary and all interference of the parts is avoided.

Rubber cushions are inserted in the upper cam slots to prevent any shock being sustained because of careless handling. Holes are provided in the base so that the machine can be fastened to any fixed support and thus rendered more stable.

The Wattles Stoking Register

An Apparatus Which Gives Photographically a 24-Hour Record of Smoke Density in Chimneys

The Wattles stoking register is designed to give a complete record, automatically obtained, of the density of smoke in a chimney during each minute of the 24 hours. The purpose is to procure an exact knowledge of the stoking of boilers, with the double motive of decreasing the coal consumption and of eliminating any smoke nuisance by compelling consistent scientific firing. The apparatus is manufactured by the Wattles Stoking Register Company, Butler Exchange, Providence, R. I. The invention is the result of the vigorous efforts of the municipal authorities of the city to abate the smoke nuisance in the business districts. The inventor, Cyra B. Wattles, is in charge of several power plants installed in large mercantile buildings. Being unable to maintain a visual watch upon his chimneys, he finally devised the apparatus.

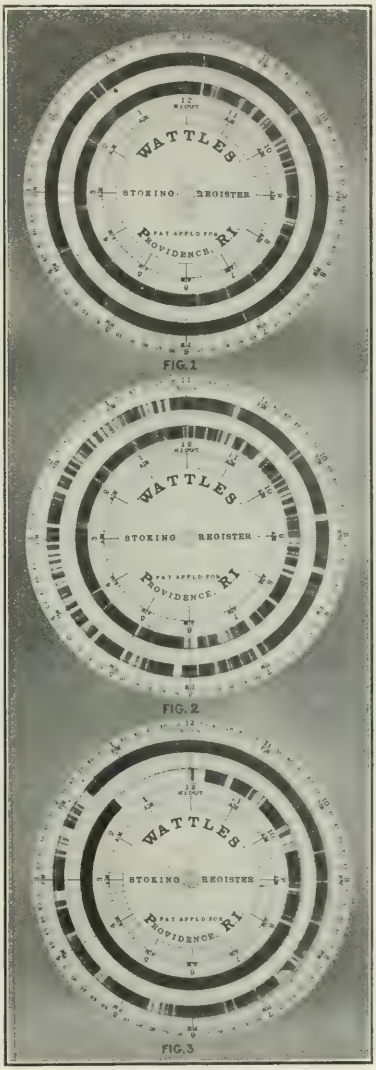
On one side of the interior of the boiler flue is an electric lamp. On the opposite side is a sensitized white paper dial fixed on the shaft of a clock. The dial covers a complete 24-hour day. The lamp and dial mechanism are each placed in a sheet iron cone at the end away from the flue, and far enough from it not to be in direct contact with the hot gases and not to become begrimed. Air holes around the lamp admit circulation to keep it cool and clean. All of the apparatus is readily accessible.

In front of the dial toward the inside of the chimney is a light tight plate or door with two slots; one slot is opposite the inner recording space, the other opposite the outer. Each operates for 12 hours. A tripping device in the clock mechanism serves to close the slot which admits the light during the first 12-hour period, and opens the slot for the second period, which in its turn is closed automatically at the end of 24 hours. The person in charge then removes the dial and replaces it with a clean sheet. Each dial, which is a disk of standard inexpensive photographic paper, is contained in a metal envelope so that no light can reach it excepting that which is admitted through the slots. The developing of the print completes a graphic record.

The rays of the electric lamps shine unobstructed through the slot in the recording mechanism when the chimney is clear of smoke, and a proportionately less pronounced photographic impression is made when the flue is obscured by the unconsumed gases of combustion. Therefore, the photographic record varies from white when smoke is passing in dark masses to black, which indicates a clear chimney. The chart reveals each time that coal is fed to the boiler. Unscientific stoking is seen at a glance.

In Fig. 1 it will be seen that the boiler was in very good hands most of the day. As the inner circle indicates between 9.30 a.m. and noon the work was less intelligently done. From 1 p.m. in the afternoon on through the night the chimney was consistently free from smoke. In Fig. 2 there are plentiful evidence of bad firing from 6 a.m. to 7 p.m.

A study of the dial readings soon determines the best period of time between stoking. The most economical use of fuel is established and the abolition of unnecessary smoke assured. The weaknessness of firemen may be remedied if the men have the usual intelligence. They can be taught the maxim of firing light and often. The moral effect in a boiler room must be great, for every employee knows that the office will be given a graphic and detailed account of



The Wattles Stoking Register.

his accomplishments. The owner may find out that a supposed need of larger boiler facilities is in reality the abuse of his existing installation. With poor stoking the larger unit may result in an increase rather than a decrease of the smoke nuisance and of his coal bill.

The inventor of the device works out the operation of his own power houses on the percentage basis, figuring the number of minutes where the smoke is dense and consequently obnoxious, by adding together the white markings of the day. The register is also of value in chimneys where automatic stokers are employed to feed the boiler fires, because it deter-

mines with accuracy the regulation of the mechanism to produce a maximum combustion. It serves a useful purpose in connection with the generating system. The time that the generator is shut down is shown by white spaces, one such being indicated in Fig. 3, covering the period between midnight and 1.30 a.m. Thus the person in charge receives exact information, which otherwise might not come to his attention. The device is so sensitive that it registers any variation in the voltage of a generator. Naturally the degree of voltage is reflected in the degree of light diffused by the lamp, and with a smokeless chimney the dial receives these delicate changes in intensity.

As used by Mr. Wattles the dials are changed at noon. The very black lines seen at the outer circle, Fig. 1, indicate the amount of back lash of the clock gearing, in taking up which the dial rests in one position for a brief time and the photographic paper receives a longer exposure. The stoking register has proved the source of material economy in the installation at Providence, as will be seen in the following statement:

Report of coal consumption and electric current for 1908-1909. Lauderdale Building, Providence, R. I. This plant has an equipment of three Babcock & Wilcox boilers of 125 hp. each; one 125-hp engine, driving one 100 kw. generator; two 85 hp. engines, driving two 40 kw. generators.

It is operated continuously, and also furnishes steam for the operation of seven hydraulic elevators, of which five are for passenger and two for freight service.

Average cost of coal for the years 1908 and 1909, $3.32 per ton.

Coal consumption, 1908	2,871.50 tons.
Coal consumption, 1909	2,638.18 tons.
Saving.	
	233.32 tons at $3.32 per ton. $774.62
Removal of ashes, 1908	6,507 cans.
Removal of ashes, 1909	5,509 cans.
	998 cans at $0.05 per can 49.90
Electric current, 1908	281,503,882 watts.
Electric current, 1909	289,715,584 watts.
	8,211,762 watts increase for 1909.
Estimated cost of producing increased electric current for 1909:	
	55 tons of coal at $3.32 per ton 182.60
Total saving for 1909	$1,007.12

The Wattles stoking register has been in operation on this plant during 1909, saving 10½ per cent.

In the first six months of 1910 the coal consumption has remained practically unchanged, as compared with last year. The tons of coal consumed were 1281.76, as against 1280.63 in 1909, while during this same period the plants have furnished 11,000,000 additional watts.

Customs Decisions

Circular Files

A protest filed with the Board of United States General Appraisers by Edward Starks & Co., raising the question of the classification under the new tariff of circular files of cast steel used in sugar beet machinery has been decided adversely to the importers. The files were returned for duty at the rate of 45 per cent. under the provision in the tariff for articles composed in chief value of metal. The importers set up the contention that the articles should be admitted at the specific rates provided in paragraph 155 for "files," according to length and value. The decision states that an examination of the sample, alone, and without some trade testimony showing that these machinery parts are in fact "files," is insufficient to warrant a finding in favor of the importers' claim.

Parts of Plows

The board in overruling a protest made by W. White rules that parts of plows are not included in the provision in the act of 1909 for "plows." It appears that the parts of plows imported by the protestant were taxed at the rate of 45 per cent. under the tariff paragraph for "manufactures in chief value of metal." Under the claim advanced by the importer, the rate, if granted, would have been only 15 per cent. General Appraiser Fischer, in overruling the contention, says that paragraph 476 provides for "plows" only and not for their parts.

Metal Furniture

The S. & G. Gump Company has been defeated in a controversy with the customs authorities regarding the classification of furniture claimed by the officials to be composed in chief value of metal, whereas the importer alleged that a rate lower than 45 per cent. should accrue on the merchandise. The paragraph under which the importer's claim is made provides for "house or cabinet furniture wholly or in chief value of wood, wholly or partly finished." The decision for the Board of General Appraisers says that the local appraiser's return of metal chief value, not having been controverted, it follows that such furniture is subject to duty under paragraph 100 of the tariff act of 1909 as assessed.

Iron Drums as Containers

The board has sustained a protest filed by Atkins, Kroll & Co., asking free entry for iron drums containing oil of mirbane. It was alleged by the importers that the drums in question are the "usual coverings" for the merchandise, and this contention is upheld. The appraiser reported that the drums are similar to glycerine drums, except that they are of larger capacity.

Another firm involved in litigation with the Government regarding the question of whether drums are "usual," or "unusual," is Whittier, Coburn & Co. The drums in this case contained wood preservative. The drums were assessed as unusual, under paragraph 199 of the tariff of 1909, and were claimed to be dutiable as usual coverings, or under paragraph 151, at the specific rates applicable to "tubes." In overruling the protests the board holds that the coverings are unusual, while paragraph 151, under which the importers make an alternate claim, is construed to cover only gas tanks, reservoirs, holders and tubes used not only in the transportation of their contents, but designed for use in holding gas or liquids and subsequently used to regulate and control the use of their contents.

Bronze Castings Not Statuary

Adverse action has been taken by the board on protests filed by O. G. Hempstead & Sons and others. The merchandise consists of cast bronze busts and imitation bronze figures composed of zinc. Duty was assessed at 45 per cent. under the provision in the Dingley tariff for manufactures of metal. The importers' claim was that the articles should be allowed to enter as "statuary" at the rate of 15 per cent. ad valorem. Judge White states in his decision overruling the protests that, according to the report submitted by the local appraiser, the articles are not "wrought by hand" according to the sense of that term as used in the law, and hence are dutiable properly as assessed as commercial bronzes under the provision for "manufactures of metal."

The Richards-Ingalls Iron Works Company, recently incorporated, has succeeded the Richards Iron Works, Birmingham, Ala., taking over an established business. The entire plant is being overhauled and is now practically ready to do all kinds of ornamental and structural iron and steel work, making and installing freight and passenger elevators, hoisting rigs, fire escapes and jail work, also general castings in iron, steel and brass and engine and repair work. The company will further deal in new and second-hand engines and boilers. J. C. Richards is president; M. J. Gregg, vice-president; R. I. Ingalls, secretary, treasurer and purchasing agent.

A Heavy Standard Embossing Press

A New Knuckle Joint Machine Exerting a Pressure of 350 Tons

The style G knuckle joint embossing press shown in the illustrations is designed by its builder, the Standard Machinery Company, 7 Beverly street, Providence, R. I., for work where an exceptionally heavy pressure not exceeding 350 tons is required. Fig. 1 is a view of the front and side of the press and Fig. 2 a rear view of the machine, showing the toggles and gearing.

The construction of the machine is massive and powerful throughout, as can be seen from the engravings. The frame is a single steel casting having a tensile strength of 80,000 lb. per square inch, and weighs 7000 lb. The bed is 10 in. thick. The crank shaft is of forged nickel steel, while the main toggle, which it drives in a horizontal direction, is of forged steel, bronze bushed around the wrist pin. The main driving toggle has a net weight of 600 lb. The two upright toggles, which straighten out to give the vertical motion, are of forged steel, the lower one being seated in phosphor bronze thrust shoes in the cast steel slide. The supporting pin of the slide, as well as the two toggle pins, are of hardened and ground tool steel and

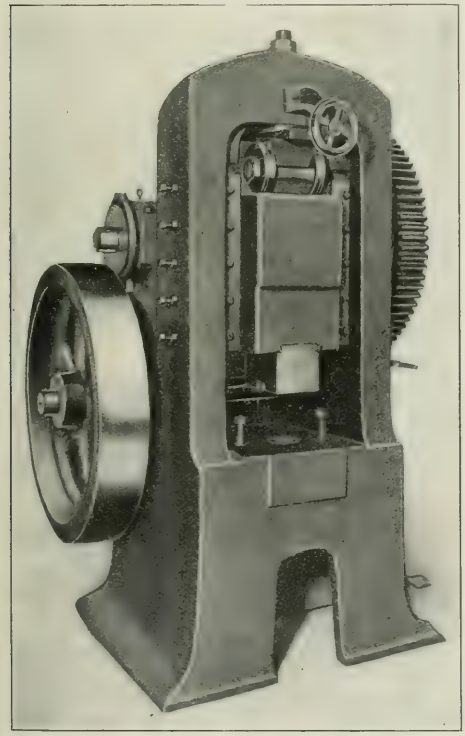


Fig. 1.—The Style G Knuckle Joint Embossing Press, Built by the Standard Machinery Company, Providence, R. I.

are provided with oil grooves. The maximum width through the section of the upright is 12 in. and the maximum length, the distance from front to back, is 27 in.

The driving shaft, running in solid cast steel boxes, bushed with phosphor bronze, is fitted with a 1300-lb. flywheel, 42 in. in diameter, with 7-in. face, set close to the frame and supported by an outboard bearing. On the opposite end of the shaft is a forged steel pinion, which drives a cast steel clutch driving gear, shown at the right of Fig. 2. Both the pinion and the gear have cut teeth, and the latter is fitted with a roller friction clutch of the company's patented instantaneous type, which is designed to withstand unusually heavy duty and at the same time to stop so quickly as to give only 1-32 in. of travel after engagement. The dog or latch of the clutch is fitted with a special counterweight for high speed, relieving the strain of the quick stop.

The adjustment of the press is controlled by the hand wheel in front at the top of the arch and con-

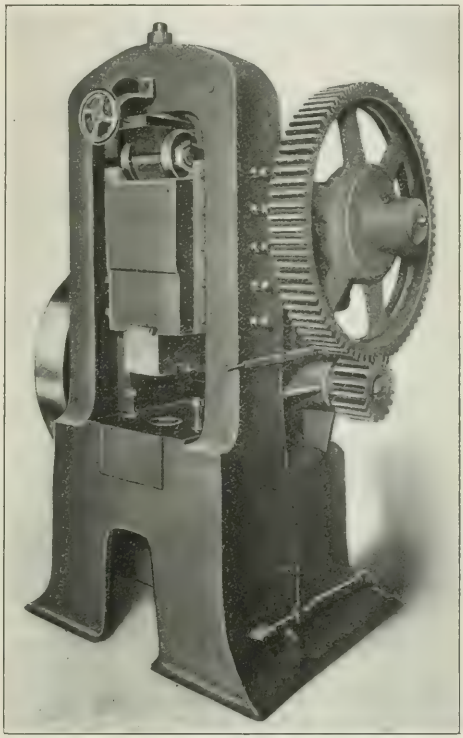


Fig. 2.—Rear View of Press, Showing Toggles and Gearing.

sists of a hardened and ground steel wedge sliding between wedge collars and an adjusting screw running through the arch and controlled by a large swivel wrench, the collars acting as check nuts. With this wrench the operator is able to lift the entire weight of the plunger and toggles with comparative ease.

The machine has both hand lever and treadle tripping devices, which are shown in Fig. 2 at the right under the gears, and is set upon a substantial cast iron base which is hollow underneath. The distance between the uprights at the bed of the press is 17½ in. and the minimum distance between them is 15¾ in. When a hole in the bed is provided it is regularly 5 in in diameter, but can be made as large as 15 in. in diameter for circular holes or the same size as a maximum for either dimension of a rectangular hole. For special purposes the machine can be made with a minimum space of 8 x 12 in. between the uprights at the point of contact, for small pieces requiring heavy pressure for their formation. The gibs are of the finest cast iron, forming an excellent bearing surface for the cast steel, and are of extra length, giving the slide a complete bearing.

Further details of the style G back geared press follow:

Weight of press, pounds	13,800
Weight of flywheel, pounds	1,300
Diameter of flywheel, inches	42
Face of flywheel, inches	7¼
Length of stroke, inches	1¼
Adjustment of slide, inches	⅜
Size of bottom of slide, inches	14½ x 10
Thickness of bed, inches	10
Width of bed, inches	34
Depth of bed, inches	32
Floor space, feet and inches	6 9 x 5 6
Total hight, feet	8
Distance between gibs, inches	16
Ratio of gearing	5 to 1
Pressure at bottom of ram, tons	350

The press is also made in a plain type, which has the same general dimensions as those given above, except that the pressure exerted is only 240 tons. The weight of the plain press is 12,500 lb. and of the balance wheel 1800 lb., its diameter being 50 in.

The Monarch Bolt and Rivet Heating Furnaces

New Models Intended to Protect the Operator from the Heat

Two new types of furnaces using oil or gas and air for fuel have been developed and placed on the market

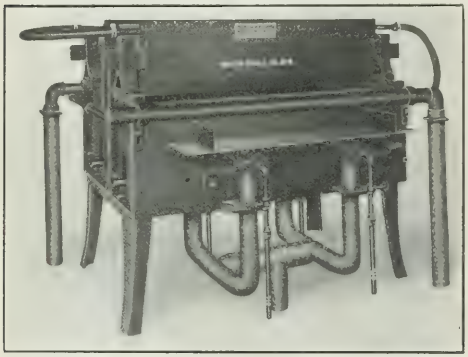


Fig. 1.—View of the Monarch Eclipse Bolt Heating Furnace, Manufactured by the Monarch Engineering & Mfg. Company, Baltimore, Md.

by the Monarch Engineering & Mfg. Company, 1200 American Building, Baltimore, Md., for heating bolts and rivets. The particularly noteworthy features about the bolt furnace are the protection of the operator during the placing and withdrawing of the blanks from the furnace, an improved type of table to prevent the blanks from coming in contact with and adhering to each other during the heating process, provision to prevent the surface of the table from becoming overheated because of its proximity to the furnace lining, an adjustable bracket for enabling the operator to feed the furnace easily, and a novel arrangement of the firebrick in the furnace. Figs. 1 and 2 are exterior views of the bolt heating furnace, while Fig. 3 shows sectional and exterior elevations of a preheating rivet furnace.

The bottom of the bolt furnace is supported on standards and is provided with a back and sides. The bottom also supports a front plate and the shelf shown in the illustrations is fastened thereto with brackets. This shelf has upright supports at either end, which can be adjusted to take care of any desired number of blanks. The firebrick lining of the furnace extends almost to the top of the front plate, where there is a table extending the length of the furnace and protected by a firebrick lining. This table, which is shown clearly in Fig. 2, just below the water chill plate is pro-

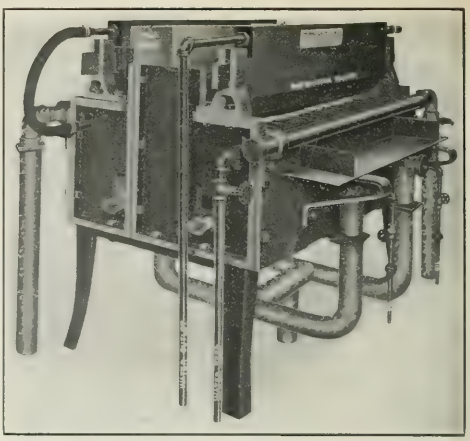


Fig. 2.—Side and End View of Bolt Heating Furnace.

vided with a number of transverse grooves across its upper face for the reception of the bolt blanks and is hollowed out for the reception of water which is introduced by the water feed pipe and is carried off by the water outlet pipe at the opposite end of the table. Over the table is a vertical protector, which is chambered to receive water introduced through the connecting pipes shown at the right and left of Figs. 1 and 2, respectively, the waste water being carried off through an overflow pipe. This protector consists of a flat chamber of substantially rectangular cross section, which is provided with a beveled lower edge to permit the introduction of the blanks on the table and is provided with a lining of firebrick or similar material. The burner, which can be of any ordinary construction, is supported by the back of the furnace and is surrounded by a lining of firebrick of such a form as to produce a central cavity in the furnace, which flares toward the firebrick lining of the front and is provided with an opening at the top through which the burning gases can escape.

This arrangement enables the operator to place a

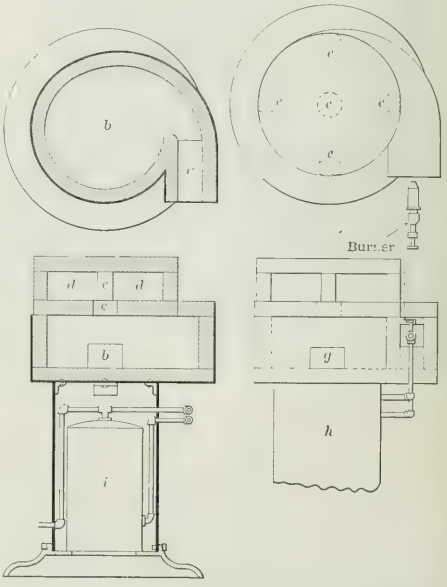


Fig. 3.—Section and Elevation of the Gyratory Flame Pre-Heating Rivet Furnace.

number of blanks upon the lower shelf and adjust the supports at either end. He then places the blanks on the upper table in the transverse grooves and while doing so is protected from the heat of the furnace by the vertical water chill plate and the table through which a continuous circulation of water is maintained.

In the rivet heating furnace illustrated in Fig. 3 the flame is directed into the combustion chamber *a*, where the oil becomes thoroughly ignited before passing into the heating chamber *b*, which is so constructed as to give the flame a rotary motion, thus distributing the heat uniformly throughout the entire interior. The excess heat escapes through the opening *c* and distributes itself through the open chamber *d*, where the rivets may be placed prior to their being put into the heating chamber. The top tile is supported by four piers, *e*, and two doors, a front and a back one, *f* and *g*, are provided for putting in and taking out work.

The furnace is supported on a cylindrical steel sheet containing the small fuel oil tank *i*, which draws its supply from the larger one, *h*, outside. The whole furnace is supported on a cast iron base. The top is made of steel securely welded together, with angles riveted to the bottom of it, so that the top may be set on the steel sheet without being permanently attached thereto. The supply for the small fuel oil tank is obtained through the same pipe as that feeding the burner.

This furnace is portable and made in standard sizes, so that it can be readily carried around from place to place by two men. This furnace is especially recommended for ship, bridge, boiler and general construction work, and it is stated will produce better results than those heretofore secured from the hard coal or coke forge, as, being used in connection with oil or gas fuel, they are effective and economical. This furnace is a rapid heater, due to the pre-heating feature, and the rivets can be brought to a white heat in 3 min. with a compressed air pressure of 20 lb. and a volume of 15 cu. ft. per minute. It can also be used in connection with the maker's high pressure blower, which is furnished in various sizes, according to the number of forges in use. This furnace is said to be able to supply rivets for one or more gangs faster than they can be driven by pneumatic riveting machines, and the capacity of the furnace is merely the rate at which the rivets can be driven. The rated capacity of this furnace is given as 3000 ¾-in. rivets per day. The fuel consumption is said to be very low, due to the fact that the burners are regulated for the largest volume of air consistent with the lowest consumption of oil, which varies from 1½ to 2 gal. per hour, according to the quantity of rivets to be heated.

New Tools and Appliances

Stocks and Dies for Automobile Kits.—The Wiley & Russell Mfg. Company, Greenfield, Mass., has placed on the market a set of stocks and dies put up in a leather roll to meet the demand for a small and convenient form. Eight dies, ranging from ¼ to ⅝ in. in size, for threading bolts and nuts with the A. L. A. M. standard threads, comprise the set. The dies are round with a 1½-in. external diameter side adjusting screw and the stocks have gun lock centers. With a set of this kind jammed threads can be recut quickly and broken bolts instantly replaced. The leather roll, which is substantially made, is 14 in. long by 4 in. wide when closed and weighs about 2 lb.

Smoke Consuming Boiler.—The Smoke Consuming Boiler Company, Johnson City, Tenn., is now getting equipped to manufacture a boiler which is claimed to positively burn its smoke and effect a saving of 20 to 30 per cent. in the fuel. It is described as extremely simple in construction, having a large hopper that incloses the firebox, which extends above the top of the boiler and is filled with coal, holding 2 tons or more. The coal is automatically fed down on the grate and is converted into coke before it reaches the grate. The gas and smoke is drawn through a small opening directly over the hottest part of the fire, where it is consumed. In a test of a boiler rated at 45 hp. there was actually developed 88.4 hp., or nearly twice the commercial rating without emitting black smoke from the stack. The boiler evaporated 12.77 lb. of water per pound of combustible from and at 212 degrees F. and consumed 3.16 lb. of coal per horsepower per hour, generating steam at an average pressure of 97 lb. The boiler is the invention of W. J. Ellis of Andrews, N. C.

Mandrel and Drill Presses.—The G. T. Eames Company, Kalamazoo, Mich., will engage in the manufacture of a newly patented mandrel press, embodying a number of improvements, and a line of drill presses. Later it is intended to manufacture a complete line of emery wheel grinding machinery.

Converter.—J. V. Bretaud, 488 Cass avenue, Detroit, Mich., has designed a steel converter that embodies a number of novel and practical features. The renewal of converter linings is expensive and an important item in the cost of making steel, as it necessitates a converter being out of service from 12 to 18 hours. This new converter was designed to reduce the inactive period to a minimum and render the operation continuous. The converter is divided into two parts and after the slag has been cleaned off, the top part is taken off and inverted so that the lining of both sections is exposed to the action of the air and cools in about 4 hours. The patching, it is said, can be done in about 2 hours, which makes the total time the converter is out of service only 6 hours. If it is desired to reduce the time for making repairs still further, a spare top can be kept lined up ready to replace the one to be repaired. These converters are built in three sizes, having capacities of one, two and three tons, respectively, and all the auxiliary equipment for making steel is furnished. The capacity of the smallest size can be reduced to ⅓ ton by increasing the thickness of the lining.

The Scott Brazing Furnace.—C. U. Scott, Davenport, Iowa, has brought out a brazing furnace designed for operation by either illuminating gas or gasoline and provided with two burners mounted on standards located on each side of the table. The blocks by which the burners are attached to the standards may be adjusted in either a vertical or horizontal flame or vertically on the standards, thus enabling the flame to be brought to bear on any part of the furnace. The connections with the air and gas pipes are made by flexible hose and valves at the side of the table provide a convenient means for proportioning the mixture admitted to the burners. The top of the furnace is supported on well-braced legs and is provided in the center with a rectangular opening through which long pieces can extend. Heating the work without scaling it and the elimination of all possibility of the burners blowing out while in operation are two of the important advantages claimed for the furnace. A temperature of 1872 degrees is available as soon as the burners are lighted.

Fractional Adding Machine.—The Keuffel & Esser Company, 127 Fulton street, New York, has developed and placed on the market a simple but practical instrument for adding fractions in sixty-fourths or multiples thereof up to 16 integers. The adder consists of a white xylonite disk revolving on an octagonal polished wood base covered with the same material and having near its circumference 64 indentations corresponding in position to the fractional graduations marked on the base. A nickel plated stop is attached at the lower edge of the base and projects over the disk so that if a pointed instrument or pencil point is placed in the small indentation at the circumference of the disk opposite the fraction to be added and the disk rotated until arrested by the contact of the stop with the pointer the fraction will be registered in the counter in the disk. To add a number of fractions it is simply necessary to place the pointer in the indentation opposite each term to be added and rotate the disk until the pointer comes against the stop. The counter will show each successive total through the two windows in the disk, one of which gives the integer and the other the fraction.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅞ in. round and square	₩ lb 1.90¢
1½ to 4 in. x ⅛ to 1 in.	₩ lb 2.10¢
1½ to 4 in. x 1⅛ to 5-16	₩ lb 2.10¢
Rods—⅜ and 11-16 round and square	₩ lb 2.10¢

Angles:	Cts ₩ lb
3 in. x 1¼ in. and larger	2.10¢
3 in. x 3 16 in. and ⅝ in.	2.35¢
1½ to 2½ in. x ⅝ in.	2.20¢
1½ to 2¾ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.30¢
1 to 1¼ x ⅝ in.	2.30¢
⅞ x ⅝ in.	2.40¢
¾ x ⅝ in.	2.50¢
⅝ x ⅝ in.	3.55¢
½ x 3-32 in.	4.35¢

Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.25¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1, to 6 x 3-16 to No 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ₩
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.90¢	3.00¢
Nos. 18 to 21	₩ lb 2.95¢	3.10¢
Nos. 22 and 24	₩ lb 3.05¢	3.25¢
No. 26	₩ lb 3.10¢	3.30¢
No. 28	₩ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½¢

Patent Planished, W. Dewees Wood & Co. A, 13¢, B, 9½ net

Galvanized.

Nos. 11 to 16	₩ lb 3.30¢
Nos. 22 to 24	₩ lb 3.55¢
No. 26	₩ lb 3.75¢
No. 28	₩ lb 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.80
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 107 ₩	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ lb

Brass Wire—

List August 1, 1908. 14½¢ ₩ lb

Copper Wire—

Base Price. Carload lots net 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished

METALS—

Tin—

Straits Pig ₩ lb 34¾@35¼¢

Copper—

Lake Ingot	₩ lb 14¾@15 ¢
Electrolytic	₩ lb 14¾@15 ¢
Casting	₩ lb 14¼@14¾¢

Spelter—

Western ₩ lb 6½@6¾¢

Zinc.

No 9, base, casks ₩ lb 8 ¢ | Open @ 8¼¢

Lead.

American Pig	₩ lb 5 @5¼¢
Bar	₩ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed	₩ lb 22 @22½¢
No. 1	₩ lb 19 @19½¢
Refined	₩ lb 17½@17¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb @10¢
Hallett's	@10¢
Other Brands	@9½¢

Bismuth—

Per. ₩ $2.00@$2.25

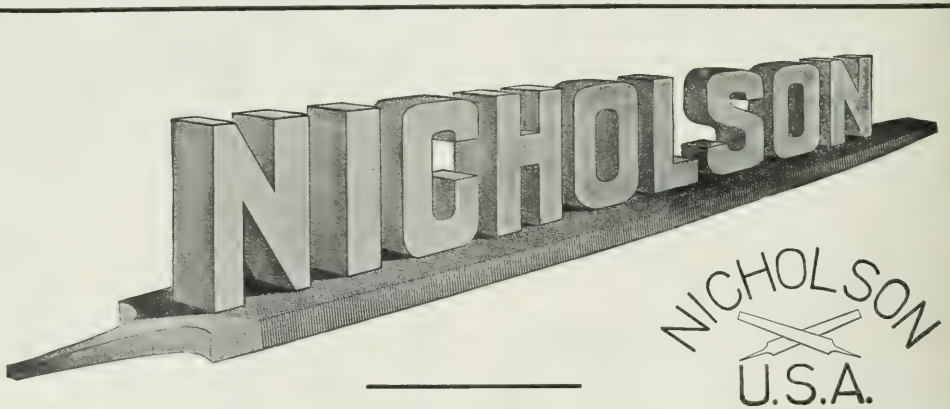
Aluminum—

No 1 Aluminum (guaranteed over 99% pure), in ingot for remelting	24¢
Rods & Wire	Base Price 31¢
Sheets	Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 10.25@10.50
Copper, Heavy and Wire	₩ lb 10.00@10.25
Copper, Light and Bottoms	₩ lb 9.00@9.25
Brass, Heavy	₩ lb 6.75@7.00
Brass, Light	₩ lb 5.50@5.75
Heavy Machine Composition	₩ lb 9.25@9.50
Clean Brass Turnings	₩ lb 6.75@7.00
Composition Turnings	₩ lb 8.00@8.25
Lead, Heavy	₩ lb @3.50
Lead, Tea	₩ lb @3.25
Zinc Scrap	₩ lb @3.75



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THE IRON AGE

Established 1855 | New York, July 28, 1910 | Vol. 86: No. 4

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

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Structural Demand the Leading Feature

Pig Iron Is Quiet and Easy, but All Finished Lines Except Rails Are in Fair Demand

The splendid showing of earnings for the second quarter of this year made by the United States Steel Corporation should be a most effective answer to those who have been inclined to take a gloomy view of trade conditions. Such earnings could not have been made unless full specifications on contracts had been received. This is taken as proof that consuming interests generally have not made cancellations. The recession in prices of iron and steel this year has not been so largely due to shrinkage in business as to the great increase in productive capacity. This has been referred to before, but it is a fact which needs to be impressed upon the public.

The pig iron trade continues comparatively quiet, with little change in prices. Such buying of pig iron as is now being done comes from consumers whose purchases have been postponed until the iron was actually needed, and a particularly attractive officer then gets the business. This explains why some sales occasionally come to light which cover deliveries running over several months. Probably the largest transaction of the week was the purchase by a steel company in the Cincinnati district of 11,000 tons of basic and 3500 tons of Bessemer pig iron in addition to purchases it made in the previous week. Prices are easy, as the production of pig iron has not yet been sufficiently cut down to exert a stiffening influence on the market.

The demand for fabricated structural material is one of the most prominent features of the market in finished lines. It is a remarkable fact that more business of this kind is coming into the shops than is going out. The largest transaction reported during the week was 4600 tons of bridge work placed by the Chicago & Northwestern, which was divided between two fabricating companies. Bids on 10,000 tons for the New York Central terminal work in this city go in to-day. The number of small jobs steadily coming out is very large. The elimination of grade crossings in Cleveland, for which a bond issue by the city was favorably voted on July 22, will involve the use of quite a large tonnage of steel for viaducts. The work is to be started this fall. The tin plate trade is fully equal to the fabricated structural trade in point of the engagement of productive capacity.

The wire business is now excellent, new orders

and specifications being received in much larger volume than for some time. The heavy consumption of steel bars, which has so long been a noteworthy feature of the market, still continues. Buying of plates and sheets is in small lots, but the leading makers are receiving orders from all parts of the country, indicating a good consumptive demand. The plate trade is interested in a large contract shortly to come up for plates for riveted pipe for the water works of Los Angeles, Cal., involving about 20,000 tons. The wrought pipe trade is in fairly satisfactory condition, due to the very large orders recently placed for line pipe. Rail orders are neither large nor numerous, the contracts for the past week having aggregated only 3600 tons for the entire country. This, however, is not the time of the year to expect large tonnages.

Cleveland reports the placing of a contract for 400,000 tons of furnace coke for deliveries running over two and a half years, to be paid for on a sliding scale, based on the price of basic pig iron at Valley furnace.

A good buying movement is now on in electrolytic copper, and the price has advanced ¼ cent per pound the past week. Pig tin appears to be cornered, as the price for six days has been stationary, which is the first time that such a state of affairs has prevailed in a number of years.

The Copper Situation

Unless indications are completely misleading, the downward course of the copper market has been checked. Persistent reports are in circulation that the leading producers throughout the world are about to restrict production. The specific statement is made by those who should be well informed that the restriction will be at least 25 per cent. for the coming three months and 10 per cent. for the following six months. The producers themselves are reticent with regard to details, simply stating that the trade can draw its own conclusions when the price of copper is seen to be advancing and when copper securities are observed to be commanding higher values on the stock exchanges. The cause of this reticence is asserted to be the attitude of the United States authorities relative to trade combinations. Undoubtedly the copper producers are acting wisely in making no announcements of an agreement that can be traced to an official source, as an example has been given in the past week of the readiness of the Department of Justice to proceed against manufacturers who are even presumed to have rendered themselves liable to prosecution under the Sherman antitrust act. Despite the absence of such an official announcement, we have seen in the past few days an awakening of interest in copper securities and a stiffening in the price of ingot copper which would appear to indicate strongly the existence of a belief in high quarters that the copper market is no longer to be free from regulation. Additional evidence comes in the more cheerful views of leading domestic copper producers with regard to the outlook and the cabled reports of a firm belief abroad that restriction of production is positively to be effected.

The position of ingot copper has for a considerable period been the particularly weak feature of the general business situation. The producers have steadily gone ahead with their maximum output, although nearly every month the statistics of the Copper Producers' Association have shown an increase in the stocks of unsold copper. They have seen their prices crumble until only a moiety of the producers can show anything like a fair profit on their output, and the dividends of large companies are in danger of being wiped out. A very few of them have recognized the folly of thus sacrificing their resources and have cut down their production to some extent, but with these exceedingly few exceptions all have continued to push their operations in the ill-founded hope that their competitors may feel the strain of an ever declining market too great for them. Unrestrained competition has here shown its inevitable result. If persisted in much longer it would surely become destructive competition, which is deplorable from every standpoint.

Thus far the copper trade has escaped actual demoralization, but if the conditions of the first half of this year should be persisted in there must eventually be forced sales of ingot copper, in which event the price would probably drop much below the lowest figure thus far realized. This would of course be to the advantage of such consumers as are in financial condition to avail themselves of the opportunity to lay in cheap supplies, but they would then in turn make it exceedingly unpleasant for their competitors and thus the disturbance of trade would extend to a much wider field.

It is plain that restriction of production is now imperatively needed. A year ago there was some hope that the general improvement in business then in progress would bring with it such an increase in the consumption of copper that the surplus would not be greater than needed for the safeguarding of consumers' interests. But the tide of business improvement did not rise to a sufficient hight to accomplish this result, and it is now receding. With little hope in the immediate future for an adequate expansion of consumption, the producers are driven to rely upon themselves to check the growth of their surplus stocks.

The Export Iron Trade Prosperous

In contrast with what occurred when the American iron trade contracted after the panic of 1907, the present very gradual recession in the United States is not now being charged, either in Germany or in Great Britain, with any responsibility for iron and steel conditions there. Sentimentally, influences affecting in an important way the iron and steel consumption of the United States, which in the first half of this year exceeded the combined requirements of Germany, Great Britain, France and Belgium, supplied respectively by their home works, would affect the iron markets of all four countries. Thus far, however, the changes in our own iron trade have expended their force at home. Until estimates published on this side show better agreement as to the extent of the recession here and the probabilities in the remainder of the year, European onlookers can hardly be expected to draw definite conclusions. Yet it would not be surprising if the "American peril" were again an issue in British and Continental iron markets, in view of some of the pessi-

mistic cablegrams that have gone out concerning American business conditions and prospects, with the inference that more of our steel must find its outlet in the foreign trade.

What is clear in the record of international trade in iron and steel in the past six months is that consumption has been at a greater rate than in 1909. Germany, for example, increased her pig iron production from 6,252,489 metric tons in the first half of 1909 to 7,202,032 tons in the first six months of this year, or at a yearly rate of 14,400,000 tons, whereas 12,875,000 tons in 1907 has been the maximum for a calendar year, while the total for 1909 was 12,734,000 tons. The export trade is responsible for most of this increase. For the five months ending with May, this year, Germany's exports of iron and steel products, including machinery, were 2,087,101 tons, against 1,669,090 tons in the first five months of 1909, a gain of 25 per cent.

Great Britain's statistics of iron and steel exports in the first half of this year also show an important increase. Of pig iron and rolled products the shipments out of the country were 2,370,639 gross tons, against 2,083,135 tons in 1909 to June 30, and a valuation of £21,239,134 against £18,548,402. The increase is 287,000 tons and £2,700,000.

For the United States, as has been indicated in the statistics in our columns from month to month, the twelve-month ending with June was the banner year in exports of iron and steel. Counting only pig iron and rolled products, and taking no account of machinery and other iron and steel products which are not reported by weight, our exports in the last fiscal year were more than 1,400,000 tons, while for the year ending June 30, 1909, they were 1,058,794 tons. Our rail exports have been growing substantially, being 344,000 tons for the 11 months ending with May. We have also had a good increase in sheets and plates and in pipe and fittings.

What is said above applies only to international trade in iron and steel. The year has been notable also for its increases in practically all branches of international commerce. It is true that in some cases this increase only restores the conditions which existed before the financial depression of 1907-1908, but compilations of the Department of Commerce and Labor show that for many countries the figures of the year recently ended are materially larger than for any preceding year. It is entirely probable that 1910 will be the greatest year, both in tonnage and value of shipments in all the records of international trade.

Labor Bureaus as Shop Employment Offices

The Labor Bureau conducted by the Rhode Island Branch, National Metal Trades Association, is now acting as the employment office of numerous manufacturing establishments of Providence and vicinity, and hires a large percentage of their men. The results are notably beneficial, demonstrating the correctness of the national body in urging a concentration of effort in this direction. Joseph A. Holland, secretary of the branch, went into the details of this side of the system in a paper read recently before the National Metal Trades Association.

It is obvious that if all applicants for employment in the district must first register with the bureau and are sent thence to the manufacturers, the great evil of shops hiring men away from one another is largely eliminated. Of this Mr. Holland says:

> A practice calculated to cause ill will among manufacturers is that of pirating on each other for their help. Employees take advantage of this fact and are constantly shifting around, causing excessive rates to be paid by the employers who wish to retain their workmen. I have known a great many cases where the employees have positively no intention of severing their connections with their present employers, but call on some other manufacturer and secure a position, knowing that they can use this latter fact for the purpose of commanding an increase in wages from their present employers. When the employees know that they can jump from one shop to another at any time there is a constant feeling of unrest and dissatisfaction, and that makes it practically impossible for a manufacturer to maintain a good organization.
>
> The labor bureau in no way prevents a man from making a change, but, on the other hand, will assist any worthy workman to better his present conditions if the circumstances warrant it. . . . We have found that the men stick to their jobs much longer when they know that they have to apply to the bureau every time they sever their connection with a firm. They realize that too frequent visits to the bureau for positions will in no way add to their laurels on the records.

Doing away with the waste of material which comes with ignorance of the presence of workmen in a city looking for employment is treated thus:

> Is it not a fact that in a great many cases employees who are not referred to the bureau apply at two or three factories, which at that time may not need men of that type, but these same men may be badly needed by some other employer? You can readily see how the bureau could more quickly overcome the wants if they were directed to apply to the bureau, and when the employees in general realize that the different firms make all their wants known to the bureau, from ordinary mechanics to employer and the employee. In several cases we have shown former active union men the folly of trying to unload their stock in trade, which is their mind, muscle and skill, in a direction which offers no market for value given, but, on the other hand, we have proved to them the possibilities they could and have attained, and they are now most diligent and faithful workers for their employer's interests.

In this same connection is the economy of production gained in manufacturing plants by relieving the works of a large part of the duty of selecting new workmen, of which Mr. Holland says:

> Another very important feature to the employer is that the superintendent's or foreman's valuable time will not be taken up, as has been the custom in the old way, in talking to all applicants who may apply in the usual way, the majority of whom, perhaps, are absolutely incapable of filling the vacancies as existing. The secretary is paid for this work and the superintendents and foremen are paid for increasing production, improvement of facilities, decreasing costs, &c. We have found that when a department is crippled from a scarcity of help, then several other departments may be tied up for stock, parts, &c., that ought to be forthcoming from the department in question, thereby probably causing the manufacturer the loss of much money and possibly the cancellation of orders. If all applicants be referred to the bureau, in due course of time the person in charge comes to know the men personally and is therefore able to prevent trouble brewers, agitators, &c., gaining a foothold and controlling the situation in any shop. With this assurance of a dependable organization, you will be able to accept orders and quote deliveries unhampered and according to your factory's facilities.

Even where no branch of the Metal Trades Association exists in the smaller manufacturing communities employing a large proportion of skilled men, it is not difficult to see the advantages which would accrue from the establishment of a co-operative labor bureau, employing help for a number of works as far as the initial selection is concerned. Disadvantages might develop, but they would be overbalanced by the sharply defined benefits. Where unskilled labor predominates, the question is an entirely different one.

The migration of farmers from our Western States to Canada, which has received so much anxious consideration from bankers and publicists, appears to have

been checked. The scanty crops in the Canadian Northwest have, in fact, caused a stream of immigration from Canada to the United States. A correspondent in that section states that for some time hundreds of farmers have daily been leaving Alberta for their old homes across the border. It is further said that while we have heard much of the movement to Canada by our Western farmers, little has been published with regard to the discontented thousands who abandoned their Canadian lands and returned to the United States after a year's experience.

Western Canada Wants Reciprocity with the United States

TORONTO, July 23, 1910.—Sir Wilfrid Laurier's replies to deputations in the West on the subject of tariff revision and reciprocity with the United States are not agreeable to the manufacturing interests in this Province. It was not realized that the sentiment of the West was so strongly in favor of these lines of trade policy, and the Premier himself was probably surprised at the urgency of the appeals to abandon protection. It was known that the opinion of the West always leaned toward a low tariff, but in recent years there has been no very vigorous expression of anti-protection views. Possibly that was because the West was flourishing. But that part of the country is now on the eve of a harvest from which not more than half an average yield seems likely to be obtained. The hot, dry spell came at a critical time in the growth of the crop and did very serious damage. This somewhat depressing outlook may have stimulated the feeling of the people against the existing tariff. Also, public opinion in that country is always sympathetically affected by public opinion on questions of common interest across the line. There there has developed a strong reciprocity sentiment, and the western Canadian feeling may in some measure be in response thereto.

At Brandon the Grain Growers' Association of Manitoba presented to Sir Wilfrid a memorial in which they recalled his pledge of 1894 to abolish protection in accordance with the platform adopted by his party in the previous year, and in which they demanded the total abolition of protection. The president of the association also presented a separate memorial on the subject of reciprocity with the United States from which the following extract is taken:

> The farmers know that a lowering of our tariff, or freer trade with the United States, will be strongly opposed by the united strength of the protected interests which have developed such strength and grown to such power and wealth under our protective tariff and because of it. But these interests have shaped our fiscal policy too long. The farmers demand that these interests be accorded such protection as a revenue will allow and no more. The Western farmers will watch with intense interest the negotiations between the United States Government and our government regarding reciprocal trade between the two countries, and strongly urge that everything consistent with national honor to secure such a measure should be done.

Sir Wilfrid promises to lay the views of the association before the Finance Minister, and strongly urge upon the latter the importance of endeavoring to meet them.

At Yorkton, where the Premier received like petitions from the Grain Growers' Association of the Province of Saskatchewan, he promised that the tariff should be raised from time to time, and said that if he had his own way he should have free trade as it is in England. On the matter of reciprocity with the United States in the agricultural machinery trade, he said, he would consider the opportunity afforded by the American tariff for that exchange if the arrangement provided for the trade in parts as well as in entire machines.

C. A. C. J.

Greatest Pig Iron Production for Six Months

The statistics just published by the American Iron and Steel Association, representing returns from all the manufacturers of pig iron in the United States, show that the production in the first half of 1910 was 15,012,392 gross tons, against 14,773,125 tons in the last half of 1909 and 11,022,346 tons in the first half of 1909. The following table gives the half-yearly production since 1907 in gross tons:

	1907.	1908.	1909.	1910.
First half	13,478,044	6,918,004	11,022,346	15,012,392
Second half	12,303,317	9,018,014	14,773,125	.....
Total	25,781,361	15,936,018	25,795,471	.....

The increase in production in the first half of 1910 as compared with the second half of 1909 was 239,267 tons, and as compared with the first half of 1909 it was 3,990,046 tons. In the first half of 1910 we exceeded by 1,223,150 tons the production of the whole year 1900, when 13,789,242 tons was made.

The production of Bessemer and low phosphorus pig iron in the first half of 1910 was 6,323,883 tons, against 6,084,888 tons in the last half of 1909 and 4,472,482 tons in the first half. The production in the first half of 1910 includes 118,466 tons of low phosphorus pig iron, against 91,620 tons in the last half of 1909 and 120,995 tons in the first half of that year. The production of basic pig iron in the first half of 1910, not including charcoal of basic quality, was 4,953,810 tons, against 4,952,644 tons in the last half of 1909, an increase of 1166 tons, and 3,297,581 tons in the first half.

The production of charcoal pig iron in the first half of 1910 was 219,653 tons, against 204,614 tons in the last half of 1909 and 171,389 tons in the first half. These figures include a few tons made with charcoal and electricity.

The production of bituminous coal and coke pig iron in the first six months of 1910 amounted to 14,416,000 tons, as compared with 14,138,582 tons in the last half of 1909; the production of anthracite and coke mixed in the first half of 1910 was 371,957 tons, as compared with 422,138 tons in the last half of 1909; of anthracite alone the production was 4782 tons, as compared with 7791 tons in the last half of 1909.

The production of spiegeleisen and ferromanganese in the first half of 1910 was 129,978 tons, against 133,465 tons in the last half of 1909 and 91,575 tons in the first half. The production of spiegeleisen alone in the first half of 1910 was 84,602 tons, and of ferromanganese alone the production was 45,376 tons.

The whole number of furnaces in blast on June 30, 1910, was 293, against 338 on December 31, 1909, and 258 on June 30, 1909. The number of furnaces idle, including furnaces being rebuilt, on June 30, 1910, was 180, against 131 on December 31, 1909, and 205 on June 30, 1909. In the first six months of 1910 the number of furnaces actually in blast during a part or the whole of the period was 374.

Detailed pig iron statistics for the first six months of 1910 are given in the tables on the following page.

Proposed Freight Advances Suspended

Both the Eastern and Western railroads have notified the Interstate Commerce Commission that they have voluntarily suspended their proposed increased freight rates until November 1. This action on the part of the railroads follows the announcement by the commission that it had decided to suspend all important increases pending an investigation into their reasonableness. The decision of the railroads, however, relieves the commission of making the suspensions by piece-meal. The schedules of increases were

PRODUCTION OF PIG IRON IN THE UNITED STATES IN THE FIRST SIX MONTHS OF 1910.

Statistics collected from the Manufacturers by The American Iron and Steel Association, all ... Gross Tons.

Production in the First Half of 1909, 11,022,346 Gross Tons; Second Half of 1909, 14,773,125 Tons; First Half of 1910, 15,012,392 Tons.

Total Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON BY STATES.

States.	Blast Furnaces In blast Dec. 31, 1909.	June 30, 1910. In.	Out.	Total.	Production—Gross tons (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) First half of 1909.	Second half of 1909	First half of 1910
Massachusetts	2	1	1	2	9,685	8,703	7,505
Connecticut	2	2	1	3			
New York	17	18	10	28	688,828	1,044,847	1,017,951
New Jersey	5	3	6	9	118,219	176,255	155,087
Pennsylvania	134	116	50	166	4,755,079	6,163,745	6,099,342
Maryland	4	4	1	5	115,260	171,596	170,708
Virginia	13	11	15	26	183,019	208,115	244,275
Georgia	0	0	4	4	10,101	15,971	6,725
Texas	0	0	4	4			
Alabama	29	24	27	51	800,708	962,909	1,012,545
West Virginia	3	1	3	4	63,200	165,082	137,439
Kentucky	2	3	5	8	49,580	36,791	46,520
Tennessee	13	12	8	20	152,628	181,217	235,969
Ohio	61	50	25	75	2,242,987	3,308,558	3,210,562
Illinois	23	20	6	26	1,057,874	1,409,282	1,552,160
Indiana	7	6	3	9	420,191	544,098	716,832
Michigan	11	11	4	15			
Wisconsin	6	4	3	7	171,277	176,900	170,814
Minnesota	1	1	0	1			
Missouri	2	2	0	2			
Colorado	3	4	2	6			
Oregon	0	0	1	1	183,710	199,056	227,958
Washington	0	0	1	1			
California	0	0	0	0			
Total	338	293	180	473	11,022,346	14,773,125	15,012,392

PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

New York	17	18	3	21	688,178	1,043,256	1,017,901
New Jersey	5	3	4	7	93,091	163,755	152,975
Pennsylvania	106	98	25	123	4,510,843	5,744,487	5,722,392
Maryland	3	4	0	4	114,860	169,496	170,108
Virginia	12	11	11	22			
Georgia	0	0	1	1	187,862	216,863	247,731
Texas	0	0	3	3			
Alabama	27	23	23	46	784,712	945,264	997,206
West Virginia	3	1	3	4	63,200	165,082	137,439
Kentucky	1	2	5	7	48,928	35,088	45,963
Tennessee	12	11	7	18	151,595	179,314	234,393
Ohio	61	49	21	70	2,242,987	3,308,558	3,210,342
Illinois	23	20	6	26	1,057,874	1,409,282	1,552,160
Indiana	7	6	3	9			
Michigan	2	2	1	3	*440,358	*531,479	673,580
Wisconsin	5	3	3	6			
Minnesota	1	1	0	1			
Missouri	1	1	0	1	197,967	226,658	253,610
Colorado	3	4	2	6			
Washington	0	0	1	1			
Total	289	257	122	379	*10,582,455	*14,138,582	14,416,000

* Includes a small quantity of iron made experimentally with manufactured gas.

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	0	0	5	5			
New Jersey	0	0	2	2	268,502	429,929	376,739
Pennsylvania	25	14	23	37			
Total	25	14	30	44	268,502	429,929	376,739

PRODUCTION OF CHARCOAL PIG IRON BY STATES.

Massachusetts	2	1	1	2			
Connecticut	2	2	1	3	*10,335	*10,294	*7,555
New York	0	0	2	2			
Pennsylvania	3	4	2	6	862	1,829	2,323
Maryland	1	0	1	1			
Virginia	1	0	4	4	1,557	4,031	965
Alabama	2	1	4	5	15,996	17,645	15,339
Georgia	0	0	3	3			
Texas	0	0	1	1			
Kentucky	1	1	0	1	5,786	8,898	5,037
Tennessee	1	1	1	2			
Ohio	0	1	4	5	0	0	20
Michigan	9	9	3	12	103,733	128,000	155,740
Wisconsin	1	1	0	1			
Missouri	1	1	0	1	*33,120	*33,917	*32,674
Oregon	0	0	1	1			
California	0	0	0	0			
Total	24	22	28	50	*171,389	*204,614	*219,653

* Includes a small quantity of pig iron made with charcoal and electricity.

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Bituminous	289	257	122	379	10,582,455	14,138,582	14,416,000
Anth. & anth. & coke	25	14	30	44	268,502	429,929	376,739
Charcoal	24	22	28	50	171,389	204,614	219,653
Total	338	293	180	473	11,022,346	14,773,125	15,012,392

Miscellaneous Pig Iron Statistics.

PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO

District.	Blast Furnaces In blast Dec. 31, 1909.	June 30, 1910. In.	Out.	Total.	Production—Gross tons (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) First half of 1909.	Second half of 1909.	First half of 1910.
Pennsylvania: Lehigh Valley	17	16	10	26	310,058	380,430	369,529
Schuylkill "	12	10	7	17	363,562	358,967	404,553
L. Susq. "	14	10	9	19	251,939	358,032	358,511
Juniata "	5	3	6	9	69,387	61,628	96,357
Allegheny Co.	46	38	9	47	2,370,043	3,127,329	2,895,729
Shenan. Valley	20	20	5	25	632,825	994,805	1,041,381
Miscel. bitum.	17	15	4	19	756,403	880,727	933,729
Charcoal	3	4	2	6	862	1,829	2,323
Mahoning Val.	20	20	2	22	977,596	1,301,054	1,345,926
Ohio: Hocking "	0	0	1	1			
Lake Counties	14	10	6	16	605,357	959,846	866,805
Miscel. bitum.	15	10	6	16	420,223	833,937	722,360
H. R. bitum.	12	9	6	15	239,841	213,721	275,451
H. R. charcoal	0	1	4	5	0	0	20

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	285,882	342,544	464,263
Pennsylvania	1,040,109	2,211,137	2,466,797
Maryland	114,860	169,496	170,108
Virginia, West Va., Kentucky, and Tenn.	102,677	191,160	184,281
Ohio	1,507,204	2,120,842	1,912,744
Illinois	799,748	1,004,654	1,035,681
Michigan, Wisconsin, Minn., Col., and Cal.	21,642	45,055	60,379
Total	4,472,482	6,084,888	6,323,883

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

Pennsylvania: Lehigh Valley	70,889	71,708	88,779
Schuylkill Valley	593,924	579,950	599,674
Lower Susquehanna Valley	873,410	1,269,999	1,322,242
Allegheny County	636,296	809,880	906,881
Shenango Valley	806,996	875,843	874,185
Ohio: Lake Counties	410,194	641,135	595,293
Hanging Rock bituminous	290,014	603,864	760,000
Miscellaneous bituminous			

PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	76,411	390,508	274,032
Pennsylvania: Allegheny County	1,422,199	1,765,518	1,480,013
Other counties	817,850	1,250,678	1,228,391
Virginia and Alabama	181,603	221,300	402,427
Ohio	238,789	607,167	612,331
Indiana, Illinois, Missouri, and Colorado	560,729	717,473	956,616
Total	3,297,581	4,952,641	4,953,810

PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania	69,197	97,904	90,412
Illinois	22,378	35,561	39,566
Total	91,575	133,465	129,978

PRODUCTION OF ALL KINDS OF PIG IRON FROM 1905 TO 1909.

States—Gross tons.	Production—(Includes spiegeleisen, ferro-manganese, etc.) 1905	1906	1907	1908	1909
Massachusetts	15,987	20,239	19,119	13,794	18,388
Connecticut					
New York	1,198,068	1,552,659	1,659,752	1,019,495	1,733,675
New Jersey	311,039	379,390	373,189	225,372	294,474
Pennsylvania	10,579,127	11,247,869	11,348,549	6,987,191	10,918,824
Maryland	332,096	386,709	411,833	183,502	286,556
Virginia	510,210	483,525	478,771	320,458	391,134
Georgia					
Texas	38,699	92,599	55,825	24,345	26,072
Alabama	1,604,062	1,674,848	1,686,674	1,397,014	1,766,617
West Virginia	298,179	304,534	291,066	65,551	228,282
Kentucky	63,735	98,127	127,946	45,096	86,371
Tennessee	372,692	426,874	393,106	290,826	333,845
Ohio	4,586,110	5,327,133	5,250,687	2,861,325	5,551,545
Illinois	2,034,483	2,156,866	2,457,768	1,691,944	2,467,156
Indiana					
Michigan	288,704	369,456	436,507	348,096	964,289
Wisconsin					
Minnesota	351,415	373,323	322,083	148,938	348,177
Missouri					
Colorado					
Washington	407,774	413,040	468,486	313,071	382,766
California					
Total	22,992,380	25,307,191	25,781,361	15,936,018	25,795,471

to have become effective on August 1. Before that date the commission would have filed formal orders holding them up for 120 days.

The commission expects to be able to clear up this question of increased freight by October 1, but the railroads in their voluntary offer of suspension give the commission a month's leaway, or until November 1. In the event of the commission not having reached a decision by that date it will, of course, have the power to suspend the rates for six months longer. The advantage of the action taken by the railroads, which was done by the Eastern lines July 20 and the Western lines July 22, lies chiefly in the fact that it will allow the Interstate Commerce Commission to begin to work at once on the general investigation into advances.

The blast furnace of the Perry Iron Company, Erie, Pa., was blown out last week.

United States Steel Corporation's Earnings.

The statement of the United States Steel Corporation's earnings for the quarter ending June 30, 1910, makes the following showing, as compared with the corresponding period of 1909:

	1910.	1909.
April	$13,414,956	$8,163,244
May	13,229,289	9,661,228
June	13,526,715	11,516,019
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, employees' bonus funds and interest on bonds and fixed charges of the subsidiary companies	$40,170,960	$29,340,491
Less charges and appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies	$720,256	$506,096
Depreciation and reserve funds	5,569,949	5,511,000
	$6,290,205	$6,017,096
Net earnings	$33,880,755	$23,323,395
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,849,363	$5,911,862
Sinking fund for the quarter on U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	450,099	387,601
	$7,311,962	$7,311,963
Balance	$26,568,793	$16,011,432
Dividends for the quarter:		
Preferred	$6,304,919	$6,304,919
Common	6,353,781	3,812,269
Surplus for the quarter	$13,910,093	$10,117,188
Less appropriated on account of expenditures for property, new plants and construction	7,500,000	.....
Balance of surplus for the quarter	$6,410,093	$5,894,244
	Tons.	Tons.
Unfilled orders on hand, June 30	4,257,794	4,057,939

The earnings for the quarter ending March 31, 1910, were $37,616,876. For the half year the total earnings were, therefore, $77,787,836, against $52,261,759 in the first half of 1909.

As the unfilled orders March 31 were 5,402,514 tons, there was a shrinkage in this respect of 1,144,720 tons up to June 30.

The directors adopted the following resolution at their meeting Tuesday afternoon: "That the officers hereafter make public on the 10th day of each month the aggregate tonnage of unfilled orders on hand at the close of the previous month."

Receivership for the Dunbar Furnace Company

On application of L. & R. Wister & Co., Philadelphia, Walter C. Harris of that city was made receiver of the Dunbar Furnace Company, July 22. Mr. Harris is president and L. & R. Wister & Co. are general manager and general sales agents of the furnace company, whose two blast furnaces and coking plant are located at Dunbar, Fayette County, Pa. The authorized capital stock of the company is $1,000,000, of which $886,700 is outstanding. There is an issue of $500,000 of second mortgage bonds, due in 1913, of which a sufficient amount has been reserved to retire $119,000 of prior liens. The receiver will continue the operation of the company's plants. A Philadelphia dispatch says that it is not intended under the receivership to liquidate the concern completely. It is added that the company had a stock of about 42,000 tons of pig iron, or 40 per cent. of a year's output, and that all of it was sold, but, owing to the condition of the iron trade, customers could not be compelled to complete their contracts. The company has assets of about $3,000,000, against liabilities of about $1,400,000.

Sanitary Enameled Ware Manufacturers Sued

The Department of Justice filed in the circuit court at Baltimore, July 22, a suit under the Sherman anti-trust law against an alleged unlawful combination of 16 manufacturers of sanitary enameled ware. The defendant concerns are scattered over nine States and control, so the Department of Justice alleges, 85 per cent. of the total output of sanitary enameled ware in this country.

The suit differs from others that have been instituted under the Sherman act, in that the defendants have attempted, so the Department charges, to conceal their unlawful purposes under the guise of a licensing arrangement under a patent. The concerns involved assigned a patent to a person selected by them and then all took licenses to manufacture and sell under the patent, and by these license agreements, fixed prices and all the terms of the combination. The Department of Justice charges that they attempted to use the patent laws as a screen while violating the Sherman anti-trust law.

The charges are that there is a general understanding among the defendants as to discounts to be allowed to jobbers; that they compel all jobbers to sign contracts stipulating the prices at which the goods are to be retailed and making other binding combinations; that they refuse to sell their goods to any jobber who declines to sign one of these uniform contracts; that they have divided up the country into trade zones among themselves; that they have by agreement limited their respective outputs, and that they impose a severe penalty upon any member that departs from the rules of the combination.

The alleged trust began operations openly on June 1. The most important products of the companies are bathtubs, washbowls, lavatories and sinks. The Department asks for an injunction restraining the defendants from continuing the combination. The suit in equity is directed also against the officers of the company. The 16 companies involved are named, as follows:

Barnes Mfg. Company, Mansfield, Ohio.
Cahill Iron Works, Chattanooga, Tenn.
Colwell Lead Company, New York City.
Day-Ward Company, Warren, Ohio.
Humphreys Mfg. Company, Mansfield, Ohio.
Kerner Mfg. Company, Pittsburgh, Pa.
J. L. Mott Iron Works, New York.
McCrum-Howell Company, New York.
MacVay & Walker, Braddock, Pa.
National Sanitary Mfg. Company, Salem, Ohio.
Standard Sanitary Mfg. Company, Pittsburgh, Pa.
United Sanitary Mfg. Company, Noblesville, Ind.
United States Sanitary Mfg. Company, Pittsburgh, Pa.
L. Wolff Mfg. Company, Chicago, Ill.
A. Wieskittel & Son Company, Baltimore, Md.
Wheeling Enameled Iron Company, Wheeling, W. Va.

A press dispatch from Louisville, Ky., quotes Theodore Ahrens, president of the Standard Sanitary Mfg. Company, as follows:

This suit grows out of certain patents we have taken up, resulting in a rearrangement of prices. It is true, as stated, that we control 85 per cent. of the output of sanitary enameled ironware, but it is not true that we have advanced prices nor have we compelled jobbers to sign ironbound contracts as a condition to obtaining our goods. We have not refused to sell to any one not signing such contract. Before we took up these patents we laid the matter before the Department of Justice and were assured that our plans were perfectly legal.

One of the recent orders received by the Allis-Chalmers Company, Milwaukee, was from the Finnish American Copper Company of Helingfors, Finland. This order was for a complete "fine" concentrating plant for the extraction of copper, lead and zinc. There was also included the power equipment, made up of boilers, engines, generators and everything necessary for the entire plant.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July27, 1910.	July20, 1910.	June29, 1910.	July28, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2. standard, Philadelphia	$16.25	$16.25	$16.25	$16.75
Foundry No. 2, Southern, Cincinnati	14.75	14.75	14.75	15.75
Foundry No. 2, local, Chicago..	*16.50*	16.50	16.75	17.00
Basic, delivered, eastern Pa....	*15.50*	15.75	15.75	16.50
Basic, Valley furnace.....	14.50	14.50	14.50	15.25
Bessemer, Pittsburgh.....	16.40	16.40	16.40	16.90
Gray forge, Pittsburgh.....	*14.40*	14.40	14.90	14.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh....	*24.50*	25.00	25.00	24.00
Forging billets, Pittsburgh.....	*30.00*	30.00	31.00	28.00
Open hearth billets, Philadelphia	28.50	28.50	28.50	25.50
Wire rods, Pittsburgh.....	*29.00*	29.00	31.00	31.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago....	*13.00*	13.00	13.50	14.75
Steel rails, melting, Philadelphia	*14.00*	14.00	14.25	16.00
Iron rails, Chicago.....	*16.50*	16.75	17.00	17.00
Iron rails, Philadelphia.....	*18.00*	18.50	19.50	19.50
Car wheels, Chicago.....	*14.75*	14.75	15.50	16.00
Car wheels, Philadelphia.....	*14.00*	14.00	14.50	15.00
Heavy steel scrap, Pittsburgh..	*14.00*	14.50	15.00	15.75
Heavy steel scrap, Chicago.....	*12.25*	12.25	12.75	14.25
Heavy steel scrap, Philadelphia.	*14.00*	14.00	14.25	16.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.	*1.42½*	1.45	1.47½	1.45
Common iron bars, Chicago....	*1.40*	1.40	1.45	1.35
Common iron bars, Pittsburgh..	1.50	1.50	1.50	1.45
Steel bars, tidewater, New York	1.61	1.61	1.61	1.46
Steel bars, Pittsburgh.....	1.45	1.45	1.45	1.30
Tank plates, tidewater, New York	*1.56*	1.56	1.61	1.51
Tank plates, Pittsburgh.....	*1.40*	1.40	1.45	1.35
Beams, tidewater, New York....	*1.56*	1.56	1.61	1.51
Beams, Pittsburgh.....	*1.40*	1.40	1.45	1.35
Angles, tidewater, New York....	*1.56*	1.56	1.61	1.51
Angles, Pittsburgh.....	*1.40*	1.40	1.45	1.35
Skelp, grooved steel, Pittsburgh.	1.50	1.50	1.50	1.35
Skelp, sheared steel, Pittsburgh.	1.60	1.60	1.60	1.45
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.25*	2.30	2.40	2.20
Wire nails, Pittsburgh*.....	*1.70*	1.70	1.80	1.80
Cut nails, Pittsburgh.....	*1.70*	1.70	1.75	1.75
Barb wire, galv., Pittsburgh*...	*2.00*	2.00	2.10	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	*12.62½*	12.62½	12.75	13.50
Electrolytic copper, New York..	**12.50**	12.25	12.37½	13.00
Spelter, New York.....	5.20	5.20	5.20	5.35
Spelter, St. Louis.....	5.05	5.05	5.05	5.27½
Lead, New York.....	**4.40**	4.40	4.37½	4.35
Lead, St. Louis.....	**4.25**	4.25	4.22½	4.20
Tin, New York.....	**33.25**	33.25	33.00	29.30
Antimony, Hallett, New York...	*8.00*	8.00	8.12½	7.50
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York...	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.55c., net; H-beams over 8 in., 1.65c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.50c., net; angles, over 6 in., 1.55c., net; angles, 3 x 3 in., and up, less than ¼ in., 1.65c., base, half extras, steel bar card; tees, 3 in. and up, 1.55c., net; zees, 3 in. and up, 1.50c., net; angles, channels and tees, under 3 in., 1.40c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.75c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.20c.; No. 27, 2.20c.; No. 28, 2.25c.; No. 29, 2.30c.; No. 30, 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.15c.; No. 28, 3.35c.; No. 29, 3.50c.; No. 30, 3.70c. Painted roofing sheets, No. 28, $1.65 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	56	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	55
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	65	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	59	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, July 27, 1910.—(*By Telegraph.*)

Pig Iron.—The week has been extremely quiet with not enough pig iron being sold to establish prices. Some of the furnaces are refusing to take business for the remainder of this year at present low prices, believing the market will improve later on. Inquiries are out for 1500 to 2000 tons of basic for August and September delivery, and indications are that this business, if placed, will go below $14.50, Valley furnace. No sales of Bessemer have been made. We quote standard Bessemer iron at $15.50; basic, $14.50; malleable Bessemer, $14.75; No. 2 foundry, $14.25, and gray forge, $13.50, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90 cents a ton.

Steel.—Some inquiry is in the market for Bessemer 4 x 4 in. billets and several small lots have been sold at $24.50, Pittsburgh, for prompt delivery. We quote Bessemer billets, 4 x 4 in., $24.50 to $25; Bessemer sheet bars, $26 to $26.50; 4 x 4 in. open hearth billets, $26 to $26.50; open hearth small billets, $27 to $27.50; open hearth sheet and tin bars, $27 to $27.50, and forging billets, $30 to $31, all f.o.b. Pittsburgh, Wheeling or Youngstown district, with freight to point of delivery added.

Muck Bar.—Sales of about 500 tons of standard grade muck bar, made from all pig iron, are reported on the basis of about $29.50, Pittsburgh. This high price was obtained largely because of the shutdown of puddling plants in the Central West, awaiting settlement of the wage scale.

(*By Mail.*)

The present unsatisfactory conditions in the iron trade and the rather uncertain outlook for the near future are due largely to two causes, the first being that the railroads are buying very little material of any kind, and the second, there is a large overproduction of all material. The enormous additions to capacity that have been made by the leading steel companies in the past two years are being felt, and the country does not seem to be able at present to absorb this large increase in output. The railroads for years have been paying dividends to their stockholders with money that ought to have been used in renewals and building new lines, with the result that securities have been issued time after time by the railroads, until the point is about reached where the railroads are having trouble in marketing their securities on favorable terms. How soon this condition will change is a problem for the future, but no permanent betterment in the iron trade can be expected until the railroads are more liberal buyers. It seems certain, too, that further restriction in output on nearly all kinds of iron and steel will have to be made, so that demand can catch up to supply. The week under review has been quiet, with the tendency in prices still downward. Hardly enough pig iron is being sold to establish a market, and the same is true of steel. In finished lines, tin plate, structural material and large pipe are active, but the balance of the finished list is dull. There is very little movement in scrap from dealers to consumers, but there is quite an active inquiry for foundry coke for delivery over the next year from July, quite a number of consumers not having yet covered their requirements. Prices are reported to be a shade firmer.

Ferromanganese.—There is practically no new inquiry, but an occasional resale is made by consumers who for some reason do not desire to take in Ferro for which they have contracted. A carload sale of about 30 tons was made here the other day by a consumer for prompt shipment on the basis of about $39.50 Baltimore. We quote 80 per cent. foreign Ferro for forward delivery at $39 to $39.50 Baltimore, carrying a freight rate of $1.90 a ton for delivery in the Pittsburgh district.

Ferrosilicon.—The market is very quiet and there have been no sales in this district for some little time. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh. We quote 10 per cent. at $23; 11 per cent., $24, and 12 per cent., $25, all at Ashland furnace, to which $1.90 a ton should be added for delivery in the Pittsburgh district.

Rods.—It is stated that since the reduction of $2 a ton in rods, which went into effect July 13, some contracts for forward delivery have been placed, while specifications on old contracts are coming out a little better. We quote Bessemer, open hearth and chain rods at $29, Pittsburgh, but on desirable tonnage this price might be shaded.

Skelp.—The settlement between the Republic Iron & Steel Company and the Amalgamated Association of the puddling and finishing scales with the probability that an early settlement will be made with the Western Bar Iron Association has allowed a number of mills rolling iron skelp to be started up and the scarcity of grooved and sheared iron plates will probably soon disappear. New inquiry for skelp is light except for the wide sizes, which has been quite active for some time. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—New demand for light rails continues very active from the mining and lumber interests, and in the past week the Carnegie Steel Company has booked quite a heavy tonnage. The Mexican Central Railroad is reported to be in the market for 20,000 tons of standard sections, and there is a possibility that business may come to a local mill. The Carnegie Steel Company is pretty well filled up on light rails for the next several months and is operating its Edgar Thomson mills, on which light rails are rolled to practically full capacity. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 to 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Structural Material.—It is hardly probable that bids on the Quebec bridge, which will take about 65,000 tons, half or more of which will be nickel steel, will be ready by September 1, and it is likely an extension of time will be given. There is strong probability that a good part of the material for this structure will come from English or German mills. Another large job in the market is the New York Central Depot in New York City, bids on which will go in in a short time. The Jones & Laughlin Steel Company has taken about 2000 tons for new machine shops for the Pennsylvania General Electric Company at Erie, Pa., and the national Construction Company has taken a number of small bridges for the New York State Barge Canal, about 1200 tons, this material to be rolled by the Carnegie Steel Company. The Oregon Railway & Navigation Company intends to build a bridge over the Willamette River at Portland, Ore., which will take about 6500 to 7000 tons, but bids on this structure have not yet been asked. Local fabricating concerns are pretty well filled up and are passing by some inquiries that otherwise would be of interest. We quote beams and channels up to 15-in. at 1.40c. to 1.45c., f.o.b. Pittsburgh.

Plates.—The biggest job in prospect in the plate trade is the plates for the water line now building by the city of Los Angeles, Cal. This line is about 240 miles in length and will be constructed partly of concrete and the balance steel pipe. The work will require upward of 20,000 tons of plates, and bids on these plates will likely be asked in a short time. No new car orders have been placed in the past week and there is very little new inquiry from the railroads. It is stated that the Baltimore & Ohio will buy some more cars, but inquiries have not yet gone out. The plate mills have a good deal of work on their books that will carry them pretty well up to October, but beyond that there is very little. We quote ¼-in. and heavier plates at 1.40c. to 1.45c., Pittsburgh, but are advised that on narrow sizes some of the smaller plate mills are naming 1.35c. in some cases.

Sheets.—As yet no change has been made in official prices of sheets by the leading mills, these being 2.40c. for No. 28 box annealed one-pass black sheets and 3.50c. for No. 28 galvanized. These prices, however, do not represent the actual market, No. 28 black being pretty freely quoted as low as 2.25c., and in some cases 2.20c. is being done. No. 28 galvanized sheets are offered at 3.30c., and in exceptional cases 3.25c. is being named. In fact, actual prices ruling on sheets are from $3 to $4 a ton below the official figures on black sheets and $4 to $5 a ton on galvanized sheets. The mills will not take contracts at these prices as a rule, but will only enter current orders. New demand for black and galvanized sheets is only fair, but on blue annealed and electrical sheets is quite active, regular prices on the latter being well maintained.

Tin Plate.—This is the dull season of the year in the tin plate trade as far as new demand is concerned and there is not much new buying, but consumers of tin plate are more concerned just now in getting deliveries from the mills on their contracts. Reports on the corn and tomato crops are very reassuring and the tin plate mills look forward to a very active condition in the trade for the balance of this year. The American Sheet & Tin Plate Company is turning out the largest product of tin plate in its history, and the leading independent mills are also making records for output of tin plate. All labor troubles at the plant of the Standard Tin Plate Company, Canonsburg, Pa., have been amicably settled and this plant is running full. The

THE IRON AND METAL MARKETS

market is firm and we quote on the basis of $3.60 for 100 lb. cokes per base box, f.o.b. Pittsburgh.

Bars.—As noted last week the Republic Iron & Steel Company has come to an agreement with the Western Bar Iron Association on the puddling and finishing scales, and the bar iron mills of the Republic Company that were closed down are being started up. A settlement with the Western Bar Iron Association on the same basis that was reached with the Republic Company is likely to be made to-day or to-morrow without a conference. The steel bar trade continues active, specifications on recent contracts coming in freely and the leading steel bar mills are still behind in shipments. New demand for iron bars is not so active, but is reported a little better since the adjustment of the wage scales. We continue to quote steel bars at 1.45c. and iron bars about 1.50c., f.o.b. Pittsburgh.

Spelter.—The market continues quiet, new demand being light and mostly for small lots. Prices are only fairly strong. We quote prime grades of Western spelter at 5c. to 5.05c., East St. Louis, equal to 5.12½c. and 5.17½c., Pittsburgh.

Hoops and Bands.—Consumers are specifying in a fairly liberal way on contracts made since July 1 and on old contracts which were extended into third quarter. New demand is only fair, and buyers are inclined to limit their purchases to small lots to cover current needs. We quote steel hoops for forward delivery at 1.50c. to 1.55c. and steel bands at 1.45c. to 1.50c., f.o.b. Pittsburgh, extras as per the steel bar card applying on the latter.

Spikes.—No new orders of any moment for railroad spikes have been placed with local makers for some time, new demand being confined to small lots for repair work. We note that small railroad and boat spikes are in fairly active demand, and prices are ruling firm. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at 1.50c. to 1.55c., for Western shipment, and 1.55c. to 1.60c., for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, these prices being for carload and larger lots.

Rivets.—New demand is light, and specifications on contracts are not coming in at a very satisfactory rate. Official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but on desirable orders these prices are shaded.

Shafting.—New demand for shafting, particularly from automobile builders, continues fairly active, but is not as heavy as some time ago. The shafting makers are better caught up on deliveries now than they have been at any time this year and have a fair amount of work ahead on their books. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of about 55 and 5 off.

Wire Products.—The reduction of $2 a ton on wire products, which went into effect on July 13, has stimulated new demand to some extent, but not as much as anticipated by the mills and would be the case when the reduction was made. Some contracts for wire nails and wire have been made at the lower figures for shipment within 60 days from date, and specifications on these contracts are now being received by the mills. We quote galvanized barb wire at $2; painted, $1.75; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65 to $1.70 in carload and larger lots, all f.o.b. Pittsburgh, freight to destination added.

Merchant Pipe.—Some fairly large inquiries for line pipe are in the market, and two or three large contracts are being worked up, but have not reached the stage where they can be given publicity. The Arkansas Natural Gas Company is inquiring for 10 to 12 miles of 10-in. and about seven miles of 6-in. pipe, and this is likely to be placed this week. A local gas company is in the market for eight to nine miles of 10-in. and another gas concern for 15 to 20 miles of 10 to 12-in. pipe. The Ohio Fuel Supply Company will probably buy in the near future about 15 miles of 10-in. steel pipe and 30 miles of 16-in. steel pipe. On the lap weld sizes of pipe, the mills are busy and are pretty well filled up over balance of this year. On the butt weld sizes the heavy stocks held by the mills and jobbers are reported as moving out a little more freely, but new demand continues light. Official discounts on the larger sizes of iron and steel pipe are being shaded to some extent and on the smaller sizes are reported as being maintained.

Boiler Tubes.—Some fairly large contracts for locomotive tubes have recently been placed with local mills, one of these being the contract for seamless tubes for 500 locomotives of the Mikado type to be built for the Baltimore & Ohio Railroad by the Baldwin Locomotive Works. New demand for merchant tubes is only fair, and official discounts, printed on a previous page, are more or less shaded.

Coke.—We note quite active inquiry for foundry coke for shipment over balance of this year, a number of consumers not yet having covered for their supply. The Westinghouse Air Brake Company is in the market for quite a large tonnage of foundry coke for shipment over the year, and it is probable this business will be closed within a short time. A number of Eastern consumers also have inquiries in this market for both furnace and foundry coke, but their ideas of prices are somewhat below those of the coke makers, and contracts are slow in being closed up. The Jamison Coal & Coke Company, one of the largest producers of high grade foundry coke in the country, reports that its product for some time ahead is sold up, and the concern is practically out of the market for the time being. This concern states that all its contracts for foundry coke are based at $2.50 per ton to consumers. Output of coke is still high, running about 400,000 tons per week in the Upper and Lower Connellsville regions. There seems to be no doubt but that there is an over production of coke and no improvement in prices can be expected until output is materially curtailed. A number of leading producers have blown out a considerable number of ovens in the past week. We quote best grades of furnace coke running under 1 per cent. in sulphur for delivery over last half of this year at $1.80 to $1.85 and best grades of 72-hour foundry coke at $2.15 and up to $2.50 per net ton at oven for same delivery, the higher price being paid for foundry coke with very high reputation for quality. Furnace coke loaded on cars, and which has to be moved, is being offered at $1.60 to $1.65 in net tons at oven.

Iron and Steel Scrap.—About the only transactions that are being made in the scrap market are between dealers, consumers being pretty well covered and out of the market for the time being. The tendency in prices on scrap is still downward, but in some quarters the opinion is that prices have probably reached bottom, or nearly so. While heavy steel scrap has shown a still further decline, it is stated that the supply of this material is not as large as generally supposed, and at $14 it is believed has about reached bottom. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.00 to $14.25
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.75 to 10.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.75 to 14.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	21.00 to 21.50
Steel car axles	19.00 to 19.50
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.50
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.50 to 7.75
Machine shop turnings	9.25 to 9.50

Sales are reported of about 2000 tons of cast iron borings at prices that will net slightly under $8, Pittsburgh.

Chicago

FISHER BUILDING, July 27, 1910.—(*By Telegraph.*)

The tone of the steel market is a little better this week, owing to a slight improvement in the volume of current business. Good specifications for plates and structural shapes are reported by the mills, and contracts for fabricated material were equal to the weekly average in this territory for the past two months. The soft steel bar mills are covered with specifications almost as far ahead as they were last winter, but, of course, the business on the books now is of a different character. Large buyers are now specifying far enough ahead to avoid the congestion in the bar mills which embarrassed them last winter. All the merchant mills rolling hard steel bars are now in operation, the Sylvan Mill at Moline having started this week. The Republic bar iron mill at East Chicago also started Monday, following the settlement of the wage scale. The demand for blue annealed sheets continues very good and the market for lighter gauges is also firm at the lower prices which have prevailed recently. The demand for wire products has been light for some time, as this is the dullest season of the year in that line, but the market is apparently firm on this basis, now reported, although there are no official quotations. Store prices in Chicago were reduced this week 10c. per 100 lb. on plates, structural shapes and soft steel bars, making the base price from store 1.80c. The store distributers are now operating on a smaller margin of profit, as they no longer receive the benefit of the differential of $1 a ton from mill prices, which was allowed them until recently. As announced last week, the subsidiaries of the leading in-

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terest are now carrying stocks on consignment in one of the two large store distributing houses here. The weather has been unfavorable for crops the past week. No new orders or inquiries for cars are reported from Western railroads and their miscellaneous purchases are also restricted to the lowest possible limit. The stocks of the railroad storekeepers are running very low. The scrap market is weak and lower and buyers of metals restrict their purchases to early deliveries.

Pig Iron.—There is a little better feeling in the Northern iron market and more business is being done. A local foundry has been in the market for 1500 tons of Northern foundry, but has postponed closing. There is another inquiry for 2500 tons of Northern which may lead to an early sale, as well as the usual scattering inquiries for lots of 500 tons and less. A steel foundry interest at Milwaukee has recently closed for 1000 tons of low phosphorus. In Southern grades the market is very quiet. The quotation of $11.50, Birmingham, for No. 2 has become practically a nominal price in this market, as no business of any moment is being done at this figure excepting occasional small lots. It is generally conceded by the Southern interests in this market that a firm offer for a round lot of iron for August and September shipment would establish a price of $11.25 or even lower, but so long as no business of this character is reported below $11.50, the price can be allowed to stand as a nominal quotation for this territory. The foundries are all reported busy and the melt is not far, if any, below the normal for this season of the year. Buyers, however, are generally covered for several months and are awaiting more definite information regarding crops, the attitude of the railroads and other factors that will influence business during the fall and winter. More activity on the part of the railroads in buying material and equipment would have a decided influence in the market, as it would increase the melt in this territory and create more interest in last quarter deliveries. The Northern interests are getting better shipping orders on contracts, but the Southern interests report many requests for suspension of deliveries. The following quotations are for July, August and September, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	16.35 to 16.85
Southern coke, No. 2	15.85 to 16.35
Southern coke, No. 3	15.60 to 16.10
Southern coke, No. 4	15.35 to 15.85
Southern coke, No. 1 soft	16.35 to 16.85
Southern coke, No. 2 soft	15.85 to 16.35
Southern gray forge	15.10 to 15.60
Southern mottled	14.85 to 15.35
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.90 to 18.40
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—Buyers are dependent upon Eastern mills for their supplies, as the local mills report that they have none to offer.

Rails and Track Supplies.—There is a fair run of business in standard rails coming in the form of small orders from minor roads. The track supply business continues good and Chicago mills have good specifications on their books. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.50; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—A satisfactory feature of the market is that there is a good run of structural contracts notwithstanding the fact that promoters of office buildings are having more difficulty in financing loans. The Chicago & Northwestern Railroad placed orders for 4600 tons of bridges last week. The Pennsylvania Steel Company received 2100 tons of this business, and the American Bridge Company 2500 tons, while a small lot of 300 tons of ordinary beam bridges was divided between Jones & Laughlin and the Cambria Steel Company. The American Bridge Company also booked 715 tons of bridge business from the Denver & Rio Grande Railroad and 300 tons of wharf shed construction to be erected at Fort Mason, Cal. The Amicable Life Insurance Building at Waco, Texas, was let on a general contract to the Westlake Construction Company of St. Louis, and it is reported that the steel work, amounting to 1550 tons, went to the Noelke-Richards Company of Indianapolis, who also booked 200 tons for a State university library at Austin, Texas. The general contracts have been let on two important office buildings for the Harriman lines, on which the letting of the steel construction has not yet been decided or reported, one of these buildings being for the Union Pacific at Omaha, which will require about 2600 tons of steel, and one for the Southern Pacific at Houston, on which the plans call for about 1700 tons. The mills report a little better specifications and prices are apparently firm on the basis recently established with small lots in many cases going $1 a ton higher. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The mills are doing a little better on specifications owing to car and structural work which has come in recently, but it is reported that there are no car orders pending in the West nor any important inquiries at the present time. Store prices on both structural plates and shapes are reduced this week, following the recent reduction in mill quotations. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Conditions have been such for some time in the sheet market that it is very difficult to follow the prices at which business is actually going. Blue annealed sheets are holding firm at the old figures, and there is a fair demand for black and galvanized, but quotations on both grades of No. 28 sheets are reduced 5c. this week, making the figures below 15c. less on No. 28 black and 20c. less on galvanized than the quotations which prevailed during the winter. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.48c. Prices from store, Chicago, are: No. 10 blue annealed, 2.20c. to 2.30c.; No. 28 black, 3c. to 3.10c.; No. 28 galvanized, 4c. to 4.10c.

Bars.—The bar mills of the leading interest here are sold almost as far ahead on soft steel bars as they were last winter, owing to the heavy specifications that have come in from the agricultural trade. The hard steel mills are also doing well, as there has been a great increase in concrete construction this year, which makes a large demand for concrete bars. The iron bar market, however, continues very quiet. One leading railroad is in the market with an inquiry for 10,000 tons, deliveries running into the first half of 1911, but the mills are not eager to take any long time contracts at the present price of bar iron. It is possible that 1.40c. might be shaded on very attractive business for early delivery, but this figure is the bottom price for current business. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—The lack of official quotations from the leading interest has caused more or less confusion in the wire trade, but the market seems to have found a pretty firm bottom, for ordinary industrial or jobbing trade, at 1.50c., Pittsburgh, base, for plain annealed wire; 1.80c. for galvanized fence wire; 1.70c. for nails and painted barb wire, and 2c. for galvanized barb wire. The readjustment came at a time when stocks were light among industrial buyers as well as jobbers, a condition which should be favorable for a more active demand. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Store prices have been reduced in Chicago on bars, structural and plates. On the higher grades of merchant steel the demand continues good and customers are willing to pay fair prices. Inquiry from the automobile trade is light at present and industries identified with the agricultural trade are also disposed to hold off awaiting final information on crops. However, the mills which specialize on agricultural steel have received heavier specifications than in any former year at this season.

Cast Iron Pipe.—The leading pipe interest booked 500 tons of water pipe for Decatur, Ill., last week, but the Cheyenne, Wyo., letting has not been reported as yet. Current prices are maintained on routine business, but the weakness in pig iron is reflected in special quotations on any large lettings. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for gas pipe.

Old Material.—The scrap market continues very dull and values show a sagging tendency. Chicago dealers are carrying relatively small stocks and do not show confidence in the future of the market by laying down much material in their yards, although in a few cases it is reported that they are taking in material they have bought and storing it rather than dispose of it at a loss. The scrap market, in fact, feels the brunt of adverse conditions and is affected by the lack of railroad buying of equipment and new material. A leading railroad recently offered a round lot of car wheels in a circular which was sent to the wheel foundries, but received no bids. The maximum that can be obtained for heavy melting steel is $12.50, delivered in the Chicago district. The prices quoted below are for delivery to consumer's works, all freight and switching charges paid. Sellers of scrap, especially from industrial plants, usually receive 50c. to $1 less than the prices quoted in this report, on account of very high switching charges in the Chicago

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district, and to allow also for the dealer's margin. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.50 to $17.00
Old steel rails, rerolling	15.75 to 16.25
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.75 to 15.25
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	9.00 to 9.50
Machine shop turnings	7.25 to 7.75
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.25 to 10.75
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

Philadelphia

PHILADELPHIA, PA., July 26, 1910.

Little interest in the trade is being shown by either buyers or sellers, and the market drifts quietly along with a general tendency, however, toward trifle easier prices. The crude materials transactions have been extremely light, and while new business in finished materials in this territory is also of small volume, specifications in a number of instances have been quite satisfactory and enable mills to operate on a fairly even basis. There has been practically no business in billets, quotations are nominal, and could be shaded for desirable orders. More irregularity has developed in sheets and prices are lower. Little change is to be noted in the old material situation. Coke is somewhat firmer on moderate sales of foundry grades.

Pig Iron.—The market could scarcely be much quieter. Sales during the week have been small individually and in the aggregate do not reach a very large total. A waiting market characterizes the situation, with neither buyers nor sellers showing any pronounced interest in the situation. The monthly report of the Eastern Pig Iron Association shows stocks on hand to be practically unchanged, with unfilled orders less than 5 per cent. below those of a month ago. One less stack is active, as compared to the number in blast a month ago. This would indicate that consumption was being maintained on a fairly even basis in this district. The bulk of the transactions continue in the foundry grades. The majority of the sales are small, ranging from carloads to those of a few hundred tons, at prices ranging from $16.25 to $16.50, delivered, for standard brands of No. 2 X foundry. Occasional odd lots at a slight concession from these figures are reported, but definite information is lacking. There is no doubt but that some sellers would be willing to accept orders for fair size lots, say, 1000 tons and upward, at $16, delivered, for No. 2 X for last half shipment, although for moderate tonnages hold firmly at $16.25, minimum. Several occasional sellers from outside the territory would doubtless make the same concession. There is, however, an absence of inquiry for any large quantities, buyers as a rule being disposed to take on small lots and await further developments before entering the market for future requirements. Further small lots of low grade iron have been taken by the cast iron pipe foundries, and there are several inquiries still before the trade. The movement in Virginia foundry grades has been light, several small sales at $13.50 to $13.75, furnace, for No. 2 X foundry are reported. At the inside figure and the most favorable freight rate this is equal to $16.30, delivered here. Forge iron continues inactive, $15.25 to $15.50 is a nominal quotation for rolling mill grades, although foundry forge for cast iron pipe making is closed to $15, delivered. Moderate sales of standard low phosphorus iron have been made at the recent market. Basic iron shows no movement. While some makers hold at $15.75, delivered, for this grade, others would willingly take $15.50, and report has it that that figure could be shaded. Eastern consumers, however, show little interest in the market. While prices are practically unchanged, they are by no means strong, and with the exception of those quoted for low prosphorus iron could no doubt be shaded, at least for some brands if desirable business were offered. For moderate lots delivered in buyers' yards, eastern Pennsylvania and nearby points, the following range about represents the market:

Eastern Pennsylvania No. 2 X foundry	$16.25 to $16.50
Eastern Pennsylvania. No. 2 plain	16.00 to 16.25
Virginia No 2 X foundry	16.25 to 16.75
Virginia No. 2 plain	16.25 to 16.50
Gray forge	15.00 to 15.50
Basic	15.50 to 15.75
Standard low phosphorus	22.50 to 23.00

Ferromanganese.—The market is quiet, no inquiry from consumers in this territory being reported. While $39, seaboard, is understood to have been done recently for Western business, sellers in this territory have, in a number of instances, refused to meet this figure.

Billets.—There is very little business reported. A few small lots have been sold, but the larger consumers do not appear interested in the market. Prices are probably less firm, small transactions in open hearth rolling billets being reported at $28.50, delivered in this territory, although that basis could, no doubt, be shaded for any desirable business. Forging billets are still comparatively firm, at $31 to $32, Eastern mill, with the usual extras for high carbons and special sizes.

Plates.—While several Eastern mills refuse to meet lower quotations made by others, adhering to a 1.60c., minimum basis, producers in instances openly quote 1.55c., delivered in this district, for carload orders. New business of any amount does not come out very freely, although there is a better inquiry for ship plates, against bids being made by builders. Specifications are coming to some mills very freely, and in one instance were particularly heavy last week. The bulk of the new orders recently taken have been small individually, large buyers being disposed, under present market conditions, to await developments.

Structural Material.—The demand shows irregularity. No further large propositions have come out, although several fair sized buildings are being figured on. Current business has been largely of a miscellaneous character, sufficient, however, in the aggregate to keep mills comparatively active. Eastern mills still report satisfactory specifications against business already on the books. While prices are not particularly strong, 1.55c. to 1.60c. represents the market for plain shapes delivered in this territory.

Sheets.—Mills show irregularity in point of activity, some being well engaged, with others less active. A fair day to day business is reported, with prices easier. Small lots for prompt shipments are quoted as follows: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c. For good size lots, however, these prices would, no doubt, be shaded.

Bars.—Business transacted has been confined to small lots. On desirable orders for refined iron bars, prices can be shaded, some mills being willing to accept 1.42½c., delivered, for good specifications. Under ruling conditions it is difficult to fix a definite range, although 1.42½c. to 1.55c. about represents the market for refined iron bars, delivered in this vicinity. Steel bars remain firm at 1.60c., delivered.

Coke.—There has been some stiffening in prices of foundry grades, which are now held pretty firmly at $2.25 to $2.50, at ovens, with fairly good sales in moderate quantities. Furnace coke has been inactive, the majority of the consumers having contracted for a good share of their requirements. The following range about represents the quotations per net ton, delivered in buyers' yards in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—The market continues very quiet, but little business being transacted in any grade. The associated mills have not changed their offering price for No. 1 heavy melting steel, or No. 1 railroad wrought, but are not buying very freely. Extensive rejections of shipments on the part of a number of the large consumers is reported, who insist on material being strictly up to grade to insure acceptance. Cast borings have been a little more active at $9.50 to $9.75, delivered. In some grades, however, not enough business has been done to establish a market. The following range about represents bids and offers for delivery in buyers' yards eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	$14.00 to $14.25
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50
Old iron axles	26.50 to 27.50
Old iron rails	18.00 to 18.50
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	14.00 to 14.50
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	9.50 to 10.00
Cast borings	9.50 to 9.75
Machinery cast	14.75 to 15.25
Railroad malleable	14.00 to 14.50
Grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50

The Alan Wood Iron & Steel Company has removed its

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offices from 519 Arch street to the Morris Building on Chestnut street above Broad street, where they will occupy the entire fifteenth floor. The offices of the Heckscher & Sons Company, furnace department, will also be moved from Fourth and Walnut streets to the new location.

Pullman & Stevens, iron, ore, coal and coke merchants, will remove from 238 South Third street on August 1, taking offices in rooms 506-507 Pennsylvania Building. This firm succeeded some years ago J. Wesley Pullman, who conducted the business at the old location since 1887.

Cleveland

CLEVELAND, OHIO, July 26, 1910.

Iron Ore.—The ore movement is still quite heavy, and it is expected that lake shipments during July will exceed 6,500,000 tons, as compared with 7,316,592 tons during June. Ore shippers are now practically entirely out of the market for wild vessel capacity and will furnish cargoes only for the vessels under contract. This means the making of more surplus tonnage and that more boats will have to go to the docks. Taken altogether the condition of the lake trade is worse than at any previous time during the season. A meeting of the independent vessel owners, who in June agreed to withdraw 20 per cent. of their capacity for 30 days, was called for to-day to take action extending the agreement through August. There is no demand for ore. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market is still very dull. Foundries that have not yet covered for their last half requirements are holding off as a rule. Prices are weak, but quotations remain about stationary. There has not been an inquiry for some time large enough to test prices in this market. Some of the local and Valley interests state that they will stay out of the market until foundry iron advances to a basis of $15 at furnace for No. 2. One northern Ohio foundry has an inquiry out for 500 tons of No. 2, and inquiries from Erie, Pa. include one 500 ton lot and a 300 ton lot. In Southern iron the sale of a few small lots of 150 tons and under for the last half are reported, but a number of buyers who will need larger tonnages are holding off for lower prices. For the last half $11.50, Birmingham, is being maintained for No. 2, but this price is being shaded to $11.25 for spot shipment. For prompt shipment and the last half we quote, delivered, Cleveland, as follows:

Bessemer	$16.40
Northern foundry, No. 1	$15.50 to 15.75
Northern foundry, No. 2	15.00 to 15.25
Northern foundry, No. 3	14.50 to 14.75
Gray forge	14.15 to 14.40
Southern foundry, No. 2	15.60 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—An Eastern furnace interest has placed a contract for 400,000 tons of furnace coke for delivery during a period of two and one-half years on a sliding scale price, based on the price of basic pig iron in the Valley. Another sale reported is 20,000 tons to a local furnace interest for delivery during August. There is still a fair amount of contracting being done in foundry grades, a large share of the buyers covering for their requirements until July 1, 1911. We quote standard Connellsville furnace coke at $1.55 to $1.65, per net ton, at oven, for spot shipment, at $1.80 to $1.85 for the last half. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 for spot shipment and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—The market is generally quiet. Mill agencies report a fair volume of specifications on contract, but not much new business is coming out. The most active demand is for structural material in small lots. The King Bridge Company, which recently took the contract for bridge work in connection with grade crossing elimination work in East Cleveland, placed the contract for the steel during the week, the 1900 tons required being divided between two mills. At a special election held July 22 the voters of Cleveland authorized a $2,000,000 bond issue, the proceeds to be used in eliminating practically all the remaining grade crossings in the city. As the law requires the railroads to bear 65 per cent. of the cost, the work will involve an expenditure of about $5,700,000, exclusive of sidings and switches. This work will require several thousand tons of steel, and it is expected that it will be started in the fall. The bulk of the track elevation planned is along the line of the Pennsylvania Railroad. There is an inquiry out for 500 tons of structural material for a plant for the Seneca Chain Company, Kent, Ohio. Considerable new work is expected to come out shortly in Detroit. We quote structural material at 1.40c. to 1.45c., Pittsburgh, the latter price being for small lots. There is a fair demand for small lots of plates, orders coming from the structural, boiler and tank shops. Plates are quoted at 1.40c. to 1.45c., Pittsburgh. Eastern mills are not meeting these prices in this market. Very little new business in steel bars is coming out, but most consumers are under contract. Good specifications are coming from the agricultural implement makers. Steel bars are firm at 1.45c., Pittsburgh. There is a good demand for steel reinforcing bars. Sheet prices are still very irregular, quotations of different mills varying from $1 to $3 a ton. There is a moderate demand for iron bars and prices are not firm. The usual quotation is 1.40c. at mill. The Empire mill, Cleveland, will start up August 1. Jobbers report a fair stock business, but very few mill orders.

Old Material.—The market continues very quiet and prices on several grades are lower. Mills that have resumed operations still have stocks on hand, and the only demand is for very small lots, for which mills are not willing to pay the usual quotations. The railroad tonnage offered this week includes lists of about the usual size from the Nickel Plate and New York Central railroads. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.50 to $15.00
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.75 to 7.25
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.50 to 12.00
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.75 to 12.25
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, July 27, 1910.—(*By Telegraph.*)

Pig Iron.—No change in general conditions is to be noted from last week. Rumors have been circulated of some quiet business being done, which would aggregate a nice tonnage, but when investigated these only turn out to be the regular run of small orders to fill immediate requirements. The exception is the local steel company referred to last week, whose additional purchases foot up 11,000 tons of basic and 3500 tons of Bessemer, which was purchased from three different furnace interests. Some firms are holding Southern No. 2 at $11.50, but for prompt shipment $11 is a more correct figure. Northern irons can easily be obtained at $15, with indications that a firm offer for prompt shipment would shade this a trifle. An inquiry has been received from an Ohio firm for 1000 to 2000 tons of malleable. Malleable is still quoted around $15 to $15.50. As a rule the local interests seem to take a more optimistic view of the situation. For immediate delivery and through the last half, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$15.25 to $15.75
Southern coke, No. 2 foundry	14.75 to 15.25
Southern coke, No. 3 foundry	14.25 to 14.50
Southern coke, No. 4 foundry	14.00 to 14.25
Southern coke, No. 1 soft	15.25 to 15.75
Southern coke, No. 2 soft	14.75 to 15.25
Southern gray forge	14.00 to 14.25
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.70
Lake Superior coke, No. 2	16.20
Lake Superior coke, No. 3	15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Foundry coke continues reasonably active and prices are firm. The foundry interests are waking up and those who have not already contracted for a future supply are closing for their requirements. Furnace coke is still inactive, but prices are steady around $1.70 to $1.80 per net ton at furnace. An advance of 5c. to 10c. for Pocahontas furnace grades would be about correct. Both Connelsville and Pocahontas foundry coke are selling around $2.25 furnace, and Wise County is still quoted at from $2.10 to $2.25. With several of the operations having their output sold out, it would not be at all surprising to see all grades of coke take on a small advance at an early date.

Finished Iron and Steel.—With the exception of a reasonable amount of structural material business being booked the finished iron and steel market is very quiet. Beams and channels, cut to lengths, if desired, are quoted at 1.90c. to 2c., warehouse.

Old Material.—There is practically no business being transacted. The yards are well stocked up and both buyers

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and sellers are indifferent. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$11.50 to $12.00
Cast borings, net ton	4.00 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	16.50 to 17.00
Old iron rails, gross ton	17.00 to 17.50
Old steel rails, short, gross ton	14.50 to 15.50
Old steel rails, long, gross ton	14.50 to 15.50
Relaying rails, 56 lb. and up, gross ton	22.00 to 23.00
Old car wheels, gross ton	12.00 to 13.00
Low phosphorus scrap, gross ton	16.00 to 16.50
Heavy melting steel scrap, gross ton	11.50 to 12.00

Birmingham

BIRMINGHAM, ALA., July 25, 1910.

Pig Iron.—The total tonnage of pig iron actually sold during the past week was comparatively light. Inquiries were also off. The average consumer seems very slow in covering his wants, evidently believing and hoping that he will be able to buy at $11 at the furnace. There has been quite a little talk the past week in regard to $11 iron, but as yet none of the Birmingham producers or selling agencies will admit of having offered or made sales on such a basis; hence $11.50 represents the market here. It is understood that certain high phosphorus Tennessee irons have reached the $11 price, but such is not the case for standard Alabama iron. Some inquiries have been made for delivery during the first quarter of 1911, but the furnace interests refuse to name a price for shipments beyond the present year. It is generally understood that by August 1 two more Alabama stacks will have been blown out, which means a still further reduction in output. The general outlook for the pig iron business, as viewed by those in close touch with the situation here, is not at all encouraging for the next two months. However, it is pointed out that there is good reason to believe that by October 1 there will be a substantial uplift. Charcoal pig iron is quoted at $22 to $22.50, at the furnace. Some sales of this class of iron are being made, but the general market is about in keeping with the coke iron situation.

Cast Iron Pipe.—Business is rather quiet, and in all probability one of the largest plants in the district will be closed down the coming week. The small buying continues, but on account of the unsettled pig iron market most pipe buyers hold back and await developments. No material improvement is looked for until there shall have been a change for the better in pig iron. The following prices are quoted per net ton, f.o.b. cars at the plants here: 4 to 6 in., $23; 8 to 12 in., $22; over 12-in., average $21, with $1 a ton extra for gas pipe.

Old Material.—Nothing startling has occurred in the scrap market, the usual small transactions continuing. The midsummer season, of course, has its bearing, and many of the plants of the country requiring scrap are now idle for repairs, wage adjustments, &c. Only a schedule of nominal prices has prevailed for some time, which is about as follows, per gross ton, f.o.b. cars here:

Old iron axles	$16.50 to $17.00
Old iron rails	12.50 to 13.00
Old steel axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.00 to 9.50
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light cast and stove plate	7.00 to 7.50

W. W. Jacobs of Hartford, Conn., president of the Shelby Iron Company, was in the district the past week inspecting the company's properties and conferring with the men in charge of operations.

Buffalo

BUFFALO, N. Y., July 26, 1910.

Pig Iron.—The market has been very quiet during the past week, with only a small amount of new business originating in territory tributary to the Buffalo district. Such buying as is being done is for short period deliveries, principally foundry grades. Both inquiry and sales have fallen off materially as compared with the previous week. Consumption on contracts keeps up well, at about the same rate as for several weeks past. Quite heavy shipments are going forward by Erie Canal to New York City and vicinity, mostly on old contracts, but it is only by taking advantage of water shipments that Buffalo furnaces are able to meet competition for new business in that territory. Prices continue to have a sagging tendency. The schedule quoted below gives a close approximate line on the current market, for deliveries covering last half, per gross ton, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.50
Malleable	15.00 to 15.50
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—Most of the mill agencies report a good volume of buying for current requirements in bar products, plates and shapes, but that consumers are not yet contracting for fall business, buyers evidently hoping for same reduction in prices in sympathy with the reduction in wire products. Prices on steel bars are being held firmly, with deliveries in six to eight weeks and no lowering of prices in other lines except for wire products. There has been good inquiry during the week for plain shapes and bridge material in connection with Erie Barge Canal work, also for sheet piling, and some contracts have been closed. In fabricated structural lines inquiry has slackened slightly, attributable to some extent to the summer vacation period; but good business is looked forward to for fall construction. Bids are to be received shortly for steel for the Skinner Engine Company's foundry building at Erie, Pa., 150 tons, and for steel for the factory addition to be erected by the Eastman Kodak Company, Rochester. The T. H. Brooks Company, Cleveland, has received contract for the steel work for the five factory building structures of the National Carbon Company, Niagara Falls, 1000 tons. The Buffalo Structural Steel Company for the fabricated steel for the new factory of the Niagara Machine & Tool Company, Buffalo, 400 tons, and the Syracuse Bridge Company for steel work for the Catholic Church of the Assumption, Syracuse. The Lackawanna Bridge Company has the contract and has started work on the large addition to the present general office building of the Lackawanna Steel Company, Lackawanna City (South Buffalo), including the stone and brickwork as well as the steel fabrication and erection.

Old Material.—The market is stagnant, with light demand from mills and very little business being transacted in any line. Prices are stationary, there being no quotable change from last week. The nominal schedule is as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.25 to $13.50
Low phosphorus steel	17.50 to 18.00
No. 1 railroad wrought	14.25 to 14.75
No. 1 railroad and machinery cast scrap	13.25 to 13.75
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.75 to 14.25
Boiler plate	11.25 to 11.50
Locomotive grate bars	11.00 to 11.50
Pipe	11.00 to 11.50
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

St. Louis

ST. LOUIS, MO., July 25, 1910.

As common at this season, the managers of many establishments are taking vacations and in some cases plants are temporarily shut down. Others, on the other hand, are advertising for more operatives. On the whole, general business is in satisfactory condition and this is reflected in the bank clearings, the gain for the week over last year in this city being 13 per cent., and the increase at Kansas City, 12 per cent. There is considerable inquiry for pig iron, but marked irregularity in prices. Coke continues in good demand and prices are firmer.

Coke.—Continued interest is shown in coke, as indicated by inquiries and some resulting sales. In some instances a firmer to a slightly higher market is claimed. Among the sales reported is one of 2500 tons of Virginia foundry, for shipment over a year. Another broker reports an inquiry for 35 cars of Connellsville foundry for a year's shipment. There is some irregularity in prices, with Pennsylvania held stronger than Virginia. For round lots 72-hour Connellsville foundry, for shipment over a year, $2.25 per net ton at oven is asked. In a jobbing way, the price is $2.50.

Pig Iron.—While there is a good deal of inquiry for pig iron, a large percentage of it is regarded as feelers from parties wishing to keep posted. There are, however, fairly good indications of a buying movement partly, it is believed, of a speculative character. There is more disposition to contract for far forward delivery than of late, provided low offers would be entertained. Some business has been booked for the first half of 1911, and there is more pending, though sellers are unwilling to disclose prices at which the contracts were worked. The following transactions were reported: One house, sale of 800 tons No. 2 Southern foundry,

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and 700 tons, mostly Southern, in small lots, and inquiries for about 7000 tons for last quarter and first half of 1911 delivery; another, sales of three lots of 1000 tons each of No. 2 Southern foundry, one lot of 500 tons of No. 2 Southern and one lot of 1000 tons Northern malleable; a third states that specifications on contract are coming in freely. The irregularity in quotations, for Southern iron more especially, was more pronounced, the range being a dollar per ton for the same grade and indicates that some furnacemen are anxious, while others are indifferent for business except at their figures, which are nominally $12, f.o.b. Birmingham; but with others offering at $11.50, $11.25 and even as low as $11, no sales are possible at the outside figures. These figures cover contracts for the remainder of 1910. Southern Ohio is quoted at $15 per ton, f.o.b. furnace.

Finished Iron and Steel.—The leading interest reports the demand for standard rails in this section as limited, but for light rails there is an excellent inquiry coming from both lumber and mining interests, particularly from the coal districts. In structural material there is a fair business doing, both with local and outside fabricators. For bars there is a good demand from all industrial sources, and prices are stronger. The call for track supplies is becoming more general and urgent.

Old Material.—A very dull market still prevails, but the leading dealers are fairly busy making deliveries on prior contracts. There were no railroad offerings the past week. Prices remain unchanged and more or less nominal for most of the list. Car wheels are somewhat firmer. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$15.00 to $15.50
Old steel rails, rerolling	14.50 to 15.00
Old steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	21.00 to 21.50
Steel car axles	20.00 to 20.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	6.00 to 6.50
No. 1 bushelling	11.00 to 11.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.50 to 10.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	9.00 to 9.50
Machine shop turnings	8.50 to 9.00

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

New York

NEW YORK, July 27, 1910.

Pig Iron.—Sales amounting in all to probably 6000 to 7000 tons have been made through local offices in the past week. The buyers were chiefly foundries whose purchases have been postponed until the iron was actually needed and then under a particularly attractive offer deliveries running over several months were contracted for. One Brooklyn foundry took 1000 tons and there was also some covering by New Jersey melters. The greater part of the business went to the Buffalo district and deliveries will be made before the close of canal navigation. Little has been done in Virginia, Alabama, eastern Pennsylvania or New Jersey irons. For No. 2 X foundry, Buffalo furnace quotations in this district have been as low as $14.50 at furnace. As a rule foundries show little interest in the market, which is lower than in the previous week. We quote Northern foundry iron at tidewater as follows: No. 1, $16.50 to $16.75; No. 2 X, $16 to $16.25; No. 2 plain, $15.75 to $16. On Southern iron quotations are $16 to $16.50 for No. 1 and $15.75 to $16 for No. 2.

Finished Material.—A large number of small jobs are coming before fabricators week by week, with an occasional contract of considerable size. The largest award in the past week was of 4600 tons of bridge work for the Chicago & Northwestern, the Pennsylvania Steel Company taking 2100 tons and the American Bridge Company 2500 tons. The Pennsylvania Steel Company was also awarded a Scherzer bridge over the new Cape Cod Canal. An important letting of next month is that of an eight-span bridge over the Connecticut River between Saybrooke and Lyme, Conn. It will be built by the State. Several small contracts for railroad bridges are reported in the past week, including 250 tons for the Boston & Maine and 250 tons for the Queen & Crescent, taken by the American Bridge Company; 200 tons for the B. & O. subway at Chicago, and 550 tons for the Louisville & Nashville, the latter being divided between the Virginia Bridge & Iron Company and the Louisville Bridge Company. The Cambria Steel Company was awarded the contract for the new paper mill at Fitchburg, Mass., of the Crocker-Burbank Company, 600 tons, and the new building of the Markle Banking & Trust Company, Hazleton, Pa., 700 tons. The steel for the new railroad shops in Kansas City, Mo., and Hoisington, Kan., calling for 1000 tons, will be fabricated by George W. Jackson, Inc., Chicago. In New York City an apartment house at 102d street and Riverside Drive, 500 tons, was awarded to H. H. Uris. The bids on the New York Central terminal work, over 10,000 tons, go in to-day. Prices of both steel and iron bars are easier, as the developments in general business during the week have not been reassuring and buyers are even less inclined than they were to anticipate requirements. While a number of the Eastern bar iron mills are still closed, the leading mills are supplied with a good volume of work which will keep them engaged for some little time. The plate trade is quiet. Quotations are as follows: Plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—The most important Eastern business now in sight is the letting of 5060 tons by the city of Washington, D. C., on which awards are to be made to-day. This business will probably go to one of the Virginia foundries. The general demand continues exceedingly quiet. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Ferroalloys.—It is apparent that there has been some speculative selling of ferromanganese as it has been offered under $39 by parties who do not as a rule deal in it. Most sellers in this market, however, are demanding from $39.50 to $39.75, Pittsburgh, and some fair sales are reported at that price. Offerings of Swedish brands of ferrosilicon at $55 to $56 have rather upset the market. The majority of people who have domestic and English ferrosilicon to sell are holding firm at $57 to $58, Pittsburgh.

Rails.—The only sales reported during the week were 2000 tons to a Western railroad, 800 tons to an Eastern railroad and 800 tons of open hearth to a Southern railroad.

Old Material.—No transactions are reported in heavy melting steel scrap. The demand for rolling mill stock is light, about the only business reported in this line being in wrought iron pipe, with some inquiries for old steel axles. The volume of business in scattered lots is probably not up to what it was last week, although some interest continues to be shown in cast scrap, borings and malleable scrap. Quotations per gross ton, New York and vicinity, are nominally as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.00 to 11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.25 to 13.75
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Wrought pipe	11.75 to 12.25
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, July 27, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
July.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
21	12.62½	12.25	33.30	4.40	4.25	5.20	5.05
22	12.62½	12.25	33.30	4.40	4.25	5.20	5.05
25	12.62½	12.25	33.30	4.40	4.25	5.20	5.05
25	12.62½	12.50	33.30	4.40	4.25	5.20	5.05
26	12.62½	12.50	33.30	4.40	4.25	5.20	5.05
27	12.62½	12.50	33.25	4.40	4.25	5.20	5.05

The copper market has been active during the week and some heavy sales of electrolytic have been made by leading interests. The tin market is cornered and prices have been stationary. Lead shows an advancing tendency. Spelter is quiet but firm.

Copper.—A buying movement in copper, which seems to be due more to the fact that consumers need stocks than because of renewed talk of curtailment, has resulted in advanced prices. The market is firm and there is an undercurrent of confidence as to the future. It is apparent that

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a great deal of copper is going into consumption, and, if there is any curtailment, electrolytic copper at 12c., which some people were freely predicting a week ago, will be a very remote possibility. We quote electrolytic at 12.37½c. to 12.50c. There have been some sales at the former figure, but a large majority of sellers are asking the higher price. One leading interest has disposed of more than 20,000,000 lb. at that figure within the week. Lake copper is held firm at 12.62½c. The exports of copper to date this month have been 19,609 tons. When the London market closed to-day spot copper was selling for £54 10s., and futures for £55 2s. 6d. The sales amounted to 400 tons of spot and 1000 tons of futures.

Pig Tin.—The corner in pig tin, mentioned last week, seems to have been entirely successful and for the first time in several years the price of spot tin, New York, has remained unchanged for a period of six days, as the daily quotations above will show. There will be some good sized arrivals of spot tin in New York around August 1, and this will probably break the corner. In the meantime, however, those who have tin to sell for immediate delivery are getting their price and there has been a steady buying all the week, although the purchasing has not been heavy, as consumers have bought only to tide them over. The London market has been comparatively lower than this market during the week. The arrivals of tin so far this month have been 2959 tons, and there are 2590 tons afloat. In London to-day spot tin was sold for £149 5s., and futures for £150 7s. 6d. Sales amounted to 500 tons of spot and 220 tons of futures. The market was firm. Spot tin sold in New York this afternoon for 33.25c.

Tin Plates.—There have been some cancellations in the tin plate trade owing to the strike among sheet metal workers in New York and vicinity. This has not affected the price, however, as many of the mills are still behind on deliveries. The quotation in New York for 100 lb. coke plates is $3.84.

Lead.—Lead is firmer and the market has a decided upward tendency. The American Smelting & Refining Company continues to quote lead, New York, at 4.40c., but outside sellers are getting as high as 4.45c. There are indications that the leading interest will advance its price soon and the advance will undoubtedly be made at once by other sellers. Sales in the West are very good and during the week the market there has at times been comparatively from two to three points above the New York market. We quote the market at St. Louis at 4.25c., and New York at 4.40c.

Spelter.—Because of the lack of stock in this market, spelter for spot delivery in New York is now 4.35c., but sales are being made in this market for immediate shipment from East St. Louis for 5.20c. Consumers have covered their needs for the present, however, and there is no demand for spelter for spot delivery, so that prices for spot are largely nominal. The market now is 5.05c., St. Louis, and 5.25c., New York.

Antimony.—The antimony market has weakened and outside lots of both Cookson's and Hallett's are being offered at shaded prices. Consumers are taking but little of the metal. The market price for Cookson's is 8.25c., and Hallett's is 8c. Lesser known brands of antimony are offered at 7.50c.

Metals, Chicago, July 26.—A number of orders have been booked for fair sized lots of copper, but consumers are not disposed to buy far ahead. Tin is quoted at 34 cents Chicago, for spot delivery, but the demand is nominal and in many cases consumers trade stocks with each other rather than buy at this figure, a condition which is encouraged by the fact that carload lots for August delivery are quoted a half cent lower. The market prices that are quoted at St. Louis on spelter appear to be limited to large lots, as firm offers for small quantities cannot be placed except at higher figures. The independent producers of lead are well sold up and are asking slightly higher figures, but the leading interest in lead has not changed its quotation. Consumers of antimony in Chicago buy only in small lots, practically a retail business, which explains the spread between New York and Chicago quotations. Old metals are very dull. We quote Chicago prices as follows: Casting copper, 12½c.; lake, 12⅞c. to 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 34c.; small lots, 35c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12c.; copper bottoms, 10½c.; copper clips, 11¾c.; red brass, 11c.; yellow brass, 8¾c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, July 25.—Lead is strong at 4.35c.; spelter is quiet at 5c. to 5.05c., East St. Louis. Zinc ore is quiet at $38 per ton, Joplin base. Tin is quoted at 33.95c. per pound; antimony, 8.55c.; Lake copper, 12.95c.; electrolytic, 12.85c., all at St. Louis. The demand for finished metals ruled fairly good the past week.

Iron and Industrial Stocks

NEW YORK, July 27, 1910.

The market for securities has gone through another period of heavy liquidation since last week's report. It began when announcement was made of a sharp reduction in the dividend rate on National Lead common on Thursday. This occurred when the stock market was improving under the stimulus of advances in the copper shares. The decline then begun continued through the remainder of last week and was intensified on Monday and Tuesday by reports of serious damage to the growing corn in the Southwest. In this latest downward movement the lowest prices of the year were realized on numerous stocks. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows, the low prices given having almost invariably been recorded on Tuesday:

Allis-Chalm., com..	8 - 8⅝	Railway Spr., com.	28 - 31
Allis-Chalm., pref.	28	Republic, com.	27 - 31⅝
Beth. Steel, com.	22	Republic, pref.	85½ 91
Can., com.	8½	Sloss, com.	50⅝ - 64⅞
Can. pref.	62 - 68⅞	Pipe, com.	14⅝ 15
Car & Fdry., com.	39½ - 50⅝	Pipe, pref.	51 - 56
Car & Fdry. pref.	109 -111⅞	U. S. Steel, com.	64½ - 70⅛
Steel Foundries	38 - 51⅝	U. S. Steel, pref.	116⅝-116¾
Colorado Fuel	22½ 32	Westinghouse Elec.	49½ - 60¼
General Electric	134 -144	Am. Ship, com.	80 - 82½
Ge. N. ore cert.	49 - 52⅝	Am. Ship, pref.	108 -109½
Int. Harv., com.	85½ - 94¼	Chi. Pneu. Tool	25½ 34
Int. Harv., pref.	119 -120	Cambria Steel	40 - 43
Int. Pump, com.	36⅝ - 43⅝	Lake Sup. Corp.	15¼ 18
Int. Pump, pref.	78½ - 80⅞	Pa. Steel, com.	106½-107
Locomotive, com.	29 - 38⅝	Crucible St., com.	98 114
Locomotive, pref.	104 -106½	Crucible St., pref.	67½ - 77⅝
Nat. En. & St., com.	16	Harb.-W. Ref., com.	32
Pressed St., com.	25 - 32	Harb.-W. Ref., pref.	92½
Pressed St., pref.	93 - 95¾		

Dividends.—The Wheeling Steel & Iron Company has declared a quarterly dividend of 2 per cent.

The Cambria Steel Company has declared a quarterly dividend of 1¼ per cent., payable August 15.

The United States Steel Corporation has declared the regular quarterly dividends of 1¾ per cent. on the common stock and 1¾ per cent. on the preferred stock.

The Pritchard-Strong Company, Rochester, N. Y., announces that its name has been changed to Pritchard Stamping Company, effective July 15. This has been done so that the name of the company may be more closely identified with the character of its business, which is rapidly expanding into more varied lines of kitchen and household utensils. The management remains identically the same as when the business was established, A. R. Pritchard being president and general manager and A. Q. Pryor, secretary and treasurer. The company now operates factory space amounting to more than 150,000 sq. ft. and manufactures nearly one-third of all the tubular lanterns used in the United States.

The More-Jones Brass & Metal Company, 3122-3144 North Broadway, St. Louis, Mo., has purchased all the machinery and equipment for its new factory addition. The company manufactures car and engine brasses, brass and bronze castings, axles and armature bearings, solder, babbitt metals, &c. It is claimed that the factory will be one of the most complete in this country for the manufacture of alloyed foundry products. The officers of the company are as follows: Edward A. More, president and treasurer; Henry T. Jones, vice-president and general manager; John B. Strauch, vice-president and secretary; Thomas L. Hamilton, assistant secretary; S. W. Crawford, manager railroad department.

A conference was being held in Chicago at the time of going to press between committees of the Western Bar Iron Association and the Amalgamated Association.

Personal

J. Sharpless Worth, president of the Worth Brothers Company, Coatesville, Pa., who has been seriously ill, is reported somewhat improved.

Mark Steese, superintendent of Mary Furnace of the Ohio Iron & Steel Company at Lowellville, Ohio, has resigned, effective August 1. He will be succeeded by William Holtzworth, formerly superintendent of Hannah Furnace of the Republic Iron & Steel Company and for the past year connected with the Worth Brothers Company at Coatesville, Pa.

Harvey Fessler, formerly with the Allegheny Steel Company, Pittsburgh, Pa., has been appointed manager of the new Canton Sheet Steel Company, Canton, Ohio.

Henry W. Nuckols has been made president of the Columbia Motor Car Company, Hartford, Conn., one of the constituent corporations of the United States Motor Company. He is promoted from the vice-presidency.

Edgar Meyer of Eugene Meyer, Jr., & Co., bankers, New York, has been elected a member of the Executive Committee of the Southern Iron & Steel Company, thus completing its membership.

George Gilmour, who has been selected by the Employers' Liability Commission of the State of New York as consulting engineer and special investigator, sailed for Europe last week to inquire into methods of prevention of industrial accidents in Great Britain, France, Belgium, the Netherlands, Switzerland, Germany and Sweden. As American member of the Association for Industrial Insurance and Betterment he will attend the meeting of the General Committee at The Hague September 5, 6 and 7, and will represent the American Museum of Safety at Berlin in October. The tour of investigation will take four months.

Obituary

WM. D. REES, for 25 years well known in the iron ore and vessel trades at Cleveland, Ohio, died in that city July 22, in his sixty-fourth year. As a young man he was interested in iron mining at Marquette, Mich. Mr. Rees was for a number of years president of the Republic Iron Company, whose iron mine on the Marquette range is historic in the Lake Superior ore trade. Its specular ore was the standard of lake ore values in the early days. The property is now owned by the Cambria Steel Company. Mr. Rees was also connected for a time with the Lake Superior Iron Company, which in 1901 was acquired by the United States Steel Corporation. The management of the Republic Iron Company's ore and vessel properties was transferred to the offices of M. A. Hanna & Co. several years ago.

RALPH SCOTT, who was for many years one of the business representatives of *The Iron Age*, died in New York City recently from a complication of diseases. Mr. Scott was over 70 years of age, but retained not only his faculties but a great deal of vigor, and at the time of his death was engaged in a number of enterprises. He had a wide circle of acquaintances, particularly in the South, in which he took a great interest and to which he devoted much of his time. He was an Englishman by birth and a year ago spent some time at his old home.

The Lack Malleable Iron Company's Enlargement.—The Lack Malleable Iron Company, Paducah, Ky., has recently overhauled its plant, installing a new melting furnace, making extensive improvements in the annealing department, and adding nickel plating, japanning, tinning and machine departments. The company has absorbed the Wm. P. Brown Mfg. Company, Racine, Wis., manufacturer of an extensive line of saddlery, hardware and malleable iron castings. The Lack Malleable Iron Company has taken up this line, adding tank lugs, clevises, automobile hardware, wagon and carriage hardware, and all classes of malleable iron castings. Wm. P. Brown and J. F. Brown, formerly of the Wisconsin concern, have interested themselves in the Lack Malleable Iron Company. The former has been engaged in the foundry business for the past 30 years, and is well versed in this class of work. Indications point to a very busy year with this company, whose operations, in connection with the Lack Singletree Company, the largest manufacturer of its kind, make one of Paducah's largest industries.

National Irrigation Exposition

In conjunction with the Eighteenth National Irrigation Congress at Pueblo, Colo., September 26 to 30, a National Irrigation Exposition will be held in that city from September 19 to October 1. The scope of the exposition will be as follows:

1. Machines and devices for the development of power used in irrigation and drainage.
2. Methods and devices for the transmission of power used in irrigation and drainage.
3. Machines and devices for raising surface and ground waters for irrigation and drainage purposes.
4. Methods and devices for distributing water to users thereof and to lands.
5. Machinery, devices and methods for the economical cultivation of irrigated and agricultural lands.
6. Plans and models of existing or contemplated irrigation and drainage systems.
7. Products of agricultural and horticultural lands.
8. Literary, graphical and pictorial presentation of knowledge pertinent to the subject of irrigation and drainage.
9. Miscellaneous exhibits, including measuring instruments and devices, weirs, automatic water registers, smudge pots, spraying devices.

Further information can be had from L. M. Markham, director of exhibits, Pueblo.

Texas Iron Ore Tested in a Pennsylvania Furnace.—The initial shipment of some 600 tons of Texas iron ore, which arrived some weeks ago on the steamship Luckenbach at Philadelphia, Pa., consigned to E. J. Lavino & Co., has been worked with entire satisfaction in one of the Schuylkill Valley furnaces. Further shipments will be made as soon as the necessary machinery for the economical handling of the ore can be installed, deliveries of which are then to be made to furnaces in the East as well as the Central West. It will be several months, however, before any extensive shipments will be made. The analysis of the above cargo, from samples taken by A. S. McCreath & Son, was printed in *The Iron Age* of July 7.

Blast Furnaces Building and Rebuilding.—The American Iron and Steel Association reports that on June 30, 1910, there were 16 entirely new furnaces in course of construction, of which 15 will use mineral fuel and 1 will use charcoal, as follows: New York, 3; Pennsylvania, 6; Ohio, 4; Illinois, 2, and Michigan, 1. In addition 1 furnace in Virginia was partly erected but work had been suspended. Six furnaces were being rebuilt, all mineral fuel, as follows: New Jersey, 1, Pennsylvania, 1; Alabama, 2; Tennessee, 1; Wisconsin, 1.

The E. I. du Pont de Nemours Powder Company, Wilmington, Del., is extending the use of electric power in all its plants. Among its recent orders from the Allis-Chalmers Company, Milwaukee, are 11 type K direct current motors for its plant at Wilpen, Minn., and 15 induction motors for its works at Hillside Junction, Pa.

The Machinery Markets

The railroads have become more active in machinery buying in many parts of the country. There are inquiries before the trade from the Eastern lines, and Cincinnati reports good sized inquiries from the Pennsylvania lines west, the Baltimore & Ohio Southwestern and the Louisville & Nashville. The Chicago, Burlington & Quincy and the Rock Island have recently been buying machine tools. The automobile trade also shows signs of increased activity. An Eastern motor manufacturing company has just bought against a good sized list, and in New England the Providence Engineering Works is making inquiries on a long list of machine tools to manufacture automobile parts. In both Cleveland and Detroit inquiries from automobile manufacturers are attracting attention. Good reports come from the Gulf States, where manufacturers are buying chiefly for repair work. The outlook is excellent in Pittsburgh, where a deal of figuring is being done on future requirements. In San Francisco there is a lull, which is considered a result of labor troubles which have rather upset manufacturers' calculations. In St. Louis new enterprises and factory additions are attracting attention, and business in that market is generally reported from fair to excellent. In Philadelphia the usual summer dullness prevails. In a number of machinery centers the export houses are doing a good business. This is particularly true in New York, where there has been some buying for sugar plantations for Cuba and Porto Rico and in the South where equipment is being purchased for shipment to Central and South America.

New York

NEW YORK, July 27, 1910.

Business in the New York machinery trade continues good, and there is every indication that a number of the leading houses will book a better business in July than they did in June. During the week the New York Central Railroad has been making inquiries which indicate that the company will shortly spend about $20,000 for machine tools for shop needs. The Pennsylvania Railroad officials are showing more interest in machine shop equipment, according to inquiries before the trade, and there are hopes that other railroads will soon become active buyers. Orders were placed in this territory by a recently formed motor company for equipment aggregating more than $25,000, and a number of other large orders were booked during the week.

The Canadian railroads and locomotive and car manufacturers are by far more active than those in the same lines in this country. Most of the car repair shops in Canada, according to machinery men who have recently visited that country, are especially busy and car and locomotive manufacturers who are running their shops full time have been placing some good orders for machinery requirements in this market.

Manufacturers of sugar mill machinery, power equipment, &c., have been doing some good business with Cuban and Philippine plantations of late and some fair orders have come from Porto Rican sugar mills. It is said that the sugar crop in those countries has been especially heavy this year and a good crop is always followed by extensive purchases of machinery on the part of the owners of the sugar plantation. The Hoover-Owens-Rentschler Company, through its New York office, 39 Cortland street, has within the last few weeks booked a number of large orders for heavy engines which are to be sent to sugar plantations in the countries mentioned.

Westinghouse, Church, Kerr & Co., 10 Bridge street, New York, will construct, for the Utah Light & Railway Company, Salt Lake City, Utah, a hydroelectric plant to generate 11,000 hp., which will be used as a reserve station for the light and railway company. The plant will be located on the Jordan River, near the company's present transformer station and steam plant, and the cost of the proposed plant is estimated at about $600,000. When completed it will supply electricity for lighting, power and street railway operations in Salt Lake City and Ogden. In addition to steam turbines there will be installed automatic coal handling equipment, including link belt conveyors and automatic stokers. The building has been designed so that it can be expanded to an ultimate capacity of 75,000 hp.

The improvements at the plant of the Pennsylvania General Electric Company, Erie, Pa., for which a small list of machinery is out, mention of which was made in *The Iron Age* of last week, will include the construction of a gray iron foundry, 372 x 400 ft. in size, and a machine shop 160 x 400 ft. Contracts have been closed for the construction of both of these buildings and each of them is designed so that it may eventually be extended to a length of 800 ft., doubling the capacity of the present construction. These improvements seem to indicate that the General Electric Company is going right ahead with the construction of a large plant at Erie for the establishment of which preparations have been under way for several years. It is understood that a temporary power plant will be installed in the machine shop, the size of which is unknown.

The United States Motor Company, 505 Fifth avenue, New York, is building a plant, 150 x 1050 ft., at Detroit, Mich., for the manufacture of Sampson trucks. The company has announced that the entire building will be completed by September 15 and will be put in operation at once. When the plant is completed it will include a drop forge foundry and miscellaneous shops, and it will enable the Alden-Sampson Mfg. Company to produce all of its two-ton trucks in Detroit. Its heavy duty 3, 4 and 5-ton trucks will be made at its Pittsfield plant, where $125,000 was recently spent for new machinery.

The Griscom-Spencer Company, 90 West street, New York, which was reported as having taken over the plant of the Goubert Mfg. Company, Bergen Point, N. J., announces that it has not taken over the plant, but has acquired the patterns, good will and unfilled orders of the Goubert Mfg. Company, and will continue to manufacture Goubert heaters and Stratton steam separators at the shops of the Griscom-Spencer Company at Jersey City, N. J. A. A. Goubert has become identified with the Griscom-Spencer Company, and will have charge of the sales of the Goubert specialties.

Contemplated extensions of the elevated lines in Manhattan and the Bronx will result in heavy expenditures on the part of the Interborough Rapid Transit Company for power equipment. The plans include extensions to the Second and Third avenue lines and an extension on Jerome avenue, with a new bridge over the Harlem River. It is understood that the company is only awaiting the approval of the Public Service Commission before going ahead with the work.

An automobile garage and repair shop to cost $30,000 is to be built at Halsey and Bleecker streets, Newark, N. J., for Benjamin Lissner. The structure will cover an area 51 x 89 ft., and will be four stories. In addition to a line of machine tools and other equipment for repair shop purposes, a three-ton freight elevator will be installed.

The Niagara & Erie Power Company, which is controlled jointly by the Niagara, Lockport & Ontario Power Company and the Buffalo & Lake Erie Traction Company, is making preparations to erect transmission lines to furnish Niagara power to Dunkirk and Westfield, N. Y., and other towns along the southern shore of Lake Erie as far west as Erie, Pa., with a branch to Jamestown, N. Y. It has applied to the Public Service Commission, Second District, for permission on this account to issue $100,000 in capital stock and $500,000 in bonds, with a mortgage to bondholders which will permit the increasing of the bond issue to $1,250,000. The Niagara, Lockport & Ontario Power Company already has a transmission line in operation from Niagara Falls to the Lackawanna Steel Company's plant, South Buffalo, from which point the new line will be extended westward along the right of way of the Buffalo & Lake Erie Traction Company. A number of substations are to be built and equipped.

Charles H. Everett, 424 White Building, Buffalo, N. Y., was low bidder for the power and lighting plant to be built by the Erie County Penitentiary at Pennsylvania street and the Erie Canal, including power house and equipment.

Col. Francis G. Ward, commissioner of public works, room 1, city hall, Buffalo, N. Y., is considering the purchase of two steam-turbo generators of 5000 kw. capacity for the new water works pumping station, foot of Porter avenue; also generators for the lighting of streets and public buildings, and bids will be asked for as soon as proper resolutions are passed by the Common Council.

THE MACHINERY MARKETS

In accordance with resolutions passed by the Board of Councilmen, city of Buffalo, N. Y., Francis G. Ward, commissioner of public works, will advertise for apparatus and equipment for vocational school in district No. 20, comprising 25 direct connected motor head lathes, Oliver No. 53 A, or equal; one direct connected motor head lathe, Oliver No. 53 E, or equal; one 10-hp. motor generator; one universal saw, with motor; one band saw, with motor; one grinder; one jointer; 26 Sheldon woodworking benches, Sioux City model, or equal.

The Sufferson-Weisburg Company, dress manufacturer, 145 Greene street, New York, will establish its manufacturing plant at Lyons, N. Y., where a two-story brick factory 150 x 150 ft. with boiler and engine room 30 x 30 ft. will be built and equipped.

The David Madole Hemmer Company, Norwich, N. Y., has let contract for construction of a two-story factory building 30 x 48 x 200 ft.

The Erie Lithographing Company has completed plans for the extensive enlargement of its plant at Erie, Pa.

The National Carbon Company, Cleveland, Ohio, has awarded contracts for construction of its Niagara Falls, N. Y., plant, which will consist of five factory buildings to cost $250,000. The buildings were designed by the Osborne Engineering Company, Cleveland.

The Kelly Electric Machine Company, Buffalo, N. Y., Guilford W. Frances, president, 36 West Seneca street, manufacturer of routing machines, floor scraping machines, &c., is having plans prepared for a factory building 50 x 140 ft., to be erected in the Black Rock manufacturing district.

The Babcock & Wilcox Company, New York, has received contract from the Elmira Water, Light & Railroad Company for two 600-hp. boilers to be installed in its plant on Madison avenue, Elmira, N. Y., where extensive improvements and additions to equipment are being made.

The Empire Electric Company, Franklinville, N. Y., has had plans prepared for a complete new lighting system and for rebuilding its distributing system. Considerable new equipment, including transformers and switchboard, will be required. H. B. Sweet, consulting engineer, Clarendon Building, Utica, N. Y.

The Electrolytic Products Company, Buffalo, N. Y., Frank A. Abbott, secretary, 707 D. S. Morgan Building, has purchased a factory site of two acres at Elmwood and Hertel avenues and is having plans prepared for a plant to be erected and equipped for the manufacture of radiators for automobiles. Copper radiators will be made by an electrical deposit process under patents which the company owns.

The Dominion Abrasive Company, Toronto, Ont., has secured a factory building at New Toronto and will equip same for the manufacture of emery wheels.

Chicago

CHICAGO, ILL., July 26, 1910.

Business is running light in the Chicago machinery market, but dealers generally concur in the opinion that the dullness in the trade is no more pronounced than is usual at this season, based on the experience of former years. The hot humid summer through the West has had a dragging effect on new enterprises, and business men who are not away on vacations are not in the mood to take up new business except when absolutely necessary. Salesmen who are out through the shops report that manufacturing activity is going on at a comfortable rate, as machine shops and factories are all busy. A feature of the market which creates a strong undertone of confidence is that practically all of the very large industrial concerns in the Chicago district are either purchasing new machines and tools or have inquiries out on which they expect to close in the near future. This refers to large industries like the Illinois Steel Company, the International Harvester Company, the Western Electric Company, the Otis Elevator Company, the Allis-Chalmers Company and other interests of the same character. This business will undoubtedly prove a strong feature of the fall trade. There is also talk of more business with railroads in the near future. The Northwestern has closed on the list which that company issued some time ago, and the Chicago, Burlington & Quincy will close in the very near future on its list of tools for the Havelock, Neb., shops. The Rock Island has recently purchased $15,000 to $20,000 worth of tools on a small list.

News from the automobile industry is not so encouraging. Some of the largest concerns in the automobile business are canceling orders which they placed some time ago for delivery this fall or winter, and in other cases they are asking the machine tool people to delay shipments. Evidently conditions in the automobile industry are not so favorable for further expansion as was expected a few months ago. Fortunately for the machine tool manufacturers, their market has broadened out in the past year to such an extent that the loss of new business from the automobile people will not prove so embarrassing to them. It will enable them to make earlier deliveries to other customers for milling and automatic machines.

Plans are now in preparation for a manufacturing plant to be erected by the Illinois & Missouri Automobile Company, Quincy, Ill.

The commissioners of the National Transcontinental Railway, Ottawa, Ont., have ordered from the Whiting Foundry Equipment Company, Harvey, Ill., a large line of foundry cranes. The contract calls for 20.

A two-story factory, 80 x 180 ft., is being erected in Indianapolis, Ind., by the Ceneral Folding Box Company.

Machinery for a water works system will probably be purchased within the next few weeks at Toulon, Ill.

The Illinois Cast Iron Pipe & Foundry Company, Chicago, has been incorporated by A. M. Ozburn, W. M. Umbdenstock and A. G. Bower.

Clapp, Nordstrom & Riley, Chicago, representatives of the Davenport Locomotive Works and the Western Wheel Scraper Company, have purchased a tract of land at Clyde, Ill., which they are fitting up for handling the implements which they carry in stock. A shop, 60 x 100 ft., is being erected which will be used for repairs. This shop will be equipped with a number of machine tools, none of which have been purchased.

H. E. Hoskin has opened a yard at 558-60-62 Maxwell street, Chicago, and will deal in scrap iron, metals, rubber, old machinery, &c., and is in the market for a motor driven scrap cutting shear.

The Marshall & Huschart Machinery Company, Chicago, is moving its large stock of machine tools from 62 and 66 South Canal street to the company's large new building at 17 South Jefferson street.

S. F. Bowser & Co., Fort Wayne, Ind., manufacturers of oil storage systems, automatic measuring tanks, &c., have increased the capital stock of their Canadian branch for the purpose of making extensive additions to the plant at Toronto.

The Andrews Wire & Iron Works, Rockford, Ill., has acquired a plant at Watford, Canada, located on the Grand Trunk Railway, which it expects to have in operation in a short time. While manufacturing will only be done on a small scale at present, it is the intention of the company to gradually increase its facilities for the manufacture of the entire line now made in its plant at Rockford. Stockholders of the company will meet in special session August 8 to consider the question of increasing the capital stock of the company from $20,000 to $140,000 and the installation of a sprinkler system in its Rockford plant.

The George Whiting Company, 1413 West North avenue, Chicago, manufacturer of punches and shears, has purchased property at the northeast corner of Elston and Wabansia avenues on which it will erect a machine shop at an expenditure of from $40,000 to $50,000, plans for which are now being prepared. It is understood that the company will not purchase any new equipment, as the new shop will be equipped with machinery from the company's present factory.

The Brown-Smith Battery Company, Bloomington, Ind., has been incorporated with $25,000 capital stock to manufacture storage batteries. The directors are G. H. and C. S. Smith, Charles Rawles, N. O. Pittinger and O. W. Brown.

The Indiana Box Company, Anderson, Ind., has increased its capital stock from $100,000 to $250,000. J. E. McIlwraith is president.

The Elkhart Paper Company, Elkhart, Ind., has been incorporated with $300,000 capital stock to manufacture paper. The directors are George F. Frederick, H. F. Dayton, Alexander G. Gilman, James B. Coleman and B. Hopper.

Philadelphia

PHILADELPHIA, PA., July 26, 1910.

Transactions in the local market have been unimportant, the usual midsummer dullness being reported by the trade generally. A disposition on the part of buyers to put off placing orders is to be noted, while the vacation period interferes to a considerable extent with propositions under negotiation. The usual run of business, covering day to day sales of shapers, drill presses, lathes and other small tools, has hardly been up to the average. There has been little inquiry from the railroads, an occasional request for a single tool comprising about the bulk of the demand. Manufacturers report an irregular trade, tools and equipment asked for being principally those of the smaller character. As a rule, however, makers report order books still in pretty satisfactory shape, full enough in a number of instances to keep plants fairly well engaged for some four

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to six months ahead. Several contracts for fair sized power equipment have been recently placed, and negotiations for a number of small installations, as well as several of comparatively large capacity, are under negotiation.

In the second-hand machinery and tool trade business drags, the more desirable tools having in a number of cases been pretty well cleaned up.

The trade generally expresses no anxiety as to the ultimate betterment of conditions, although few feel that any marked buying movement will develop during the summer months, the disposition of both buyers and sellers to permit business to drift quietly along, particularly during the heated term.

Revised bids are being taken, it is reported, for the brick and concrete addition, 90 x 141 ft., to the packing plant of the Jacob Ulmer Packing Company, Pottsville, Pa.

The Baldwin Locomotive Works has received an order for 20 Mallet type articulated locomotives from the National Railways of Mexico, delivery on which begins in December.

Dodge & Day, engineers, are at work on preliminary plans for the new plant of the Tabor Mfg. Company, to be located at Stockley street and the Philadelphia & Reading Railway. These engineers are at work on several other large industrial plants, including a power plant proposition, but are not yet prepared to make any announcement.

William H. Boardman has been appointed consulting hydraulic engineer by the Water Committee of City Council of Camden, N. J., and will prepare plans and specifications for the proposed auxiliary water supply for commercial and manufacturing purposes, as well as for additional fire protection. Bonds for $400,000, for financing this separate water supply, have been authorized. The proposed auxiliary system will have a capacity of 10,000,000 gal. daily.

The Norristown Transit Company, Norristown, Pa., has been granted a charter under the State law. A four-mile line in Norristown and extending to Sweedeland, is to be constructed. The directors are Charles E. Engersoll, president; J. R. McAllister, George H. Frazer, E. B. Smith, Garland Holsman and H. S. Farquhar. It is stated that the work of building the road will begin at once.

The Vandyke-Churchill Company, machinery and tool merchant, has removed from 917 Arch street to the Bourse, opening offices in room 652, while a display of tools will be made in the Bourse Machinery Hall, the surplus stock being carried in its warehouse.

Joseph Greer has let a contract for a two-story brick factory, 49 x 195 ft., to be erected at Church and Tacony streets, Frankford, which will be occupied by F. P. Woll & Co., manufacturers of curled hair. The contract for the engine and boiler has been placed, and, while a large amount of the machinery in the concern's present plant will be removed to the new one on its completion, some additional equipment will, it is said, be required.

The R. S. Newbold & Son Company, Norristown, Pa., has recently shipped a large converter, built for the Pierce-Smith Company, for export to Russia. The Newbold Company reports a fair inquiry for small equipment, and is quite busy in its boiler and machine shop departments. A considerable quantity of tube mill equipment has been recently completed for various customers.

The Philadelphia & Reading Railway Company has placed a contract, and city permits have been taken out by Hoover & Sons, to erect a two-story carpenter and paint shop, 42 x 133 ft., on Brown street, east of Ninth street. This work is in connection with the company's improvements and track elevation in that neighborhood.

The Pennsylvania Railroad Company states that the reported new order for 65 locomotives for lines west of Pittsburgh is incorrect. The report was the result of a redistribution of the allotment to build, under an old order, for 90 engines at its Pittsburgh plant. Under the present agreement 65 engines will be built at the Dunkirk plant, and but 25 at the Pittsburgh plant of that company.

The Bartlett Garage Company, Inc., has purchased property from the Porter Estate, between Market and Commerce streets and Twenty-first to Capital streets, on which it proposes to erect a large brick and steel modern garage. J. C. Bartlett is president of the company, which operates a smaller garage at the above location.

The Energy Elevator Company notes the usual summer falling off in demand, although sufficient orders are in hand to keep the plant fully occupied for a long period. The bulk of the recent demand has been for elevators of the hand power type, although several electric power elevators are being installed. Orders for a number of automobile lifts are reported, one of the hand power duplex gear type, 4000 lb. capacity, now being installed in Mount Holly, and another in Medford, N. J. A fair share of orders come from the West and South, while the local demand continues fairly active.

The Bergdoll Motor Company, with an extensive plant at Thirty-first and Dauphin streets, has taken possession of a portion of the C. C. Knight Building, at Sixteenth and Callowhill streets, in which will be established a branch plant for painting and finishing purposes. The new addition gives the company a total factory floor space of over 200,000 sq. ft.

It is proposed at Lancaster, Pa., according to the understanding of manufacturers here, to install an auxiliary pumping station. An ordinance to that effect is now pending.

Dealers here have been figuring with the Mack Motor Car Works, Allentown, Pa., on equipment for a machine shop extension of considerable size.

The Bonney Vise & Tool Works, Allentown, Pa., is reported to be enlarging its machine shop.

Pittsburgh

PITTSBURGH, PA., July 26, 1910.

There is at present considerable demand for special machinery, which runs chiefly to the larger sizes, and for some of the plants in this district a very profitable line of business has recently developed in equipment of that character. In current inquiries outside of the metallurgical field nearly all leading industries of the United States are well represented. For some of these the actual purchases are being delayed until early fall, but they have, in most instances, been practically determined upon at this time. Nearly every contract also involves power machinery, which takes the form mainly of electric drive. This is usually bought separately, however, and can be ordered some weeks or months later than the operating equipment, owing to better deliveries.

The machine tool market is suffering a temporary lull. Dealers are taking some orders from day to day, and they have been called upon this month to do a good deal of figuring on future requirements, but one hears of few bookings of any size. A large amount of business is in prospect, however. Manufacturers expect to be in a position to make autumn deliveries with much greater certainty than last year, when the sudden rush of fall buying caught them unprepared. Some have managed to accumulate considerable stocks, either of complete machines or of the parts which it takes longest to produce, and there will be far more system in their operations than during the period of general demoralization which prevailed not many months ago.

The annual meeting of stockholders of the Westinghouse Electric & Mfg. Company comes this week. A very satisfactory report will undoubtedly be presented. It is reliably stated that the company is starting in on the second half of the calendar year with the best prospects that it has had for some years.

The McKeesport & Mifflin Bridge Company has been organized to build a bridge over the Monongahela River at McKeesport, Pa. The incorporators are stated to be C. P. Goehring, Irwin, Pa., and M. M. Kirkland, J. M. Hoffman, T. Frank Wolf and Geo. Baehr, McKeesport.

Contracts are being let by the Baldwin Forge & Iron Company for the construction of its new plant at Parkersburg, W. Va., which will be two stories, 70 x 680 ft. The business has heretofore been conducted in Columbus, Ohio, where one of the prison shops was operated under a lease from the State.

Among the light manufacturing companies of this district, the Wolverine Company, Pittsburgh, which occupies quarters in the Imperial Power Building, has been extremely busy all through the season. Its activities comprise metal specialties, stamping, die making, &c., together with experimental work in considerable variety.

The Union Utilities Company, Morgantown, W. Va., is engaging V. F. Hammel of Pittsburgh to supervise the construction of its power house improvements and water supply system.

Mackintosh, Hemphill & Company, Pittsburgh, have started the second half of the year with a greater number of unfilled orders for rolling mill machinery, including power units, reversing engines and blowing engines, than for a number of seasons. Heavy steel castings for various purposes are also largely in demand.

Orders for De Laval steam turbines and turbine pumps, which are handled by the Dravo-Doyle Company, Pittsburgh, have been coming here this season in liberal volume, as the result of the economy demonstrated by units already in service. These units, including low pressure turbines, are being extensively used in steel mill service.

B. M. Everson, Pittsburgh, who handles second-hand and rebuilt machinery, is finding a good sale for power house equipment of every description.

Machinery for an electric power plant will be required in due course by the Pittsburgh, Steubenville & Wheeling Street Railway Company, which has been organized to build a

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traction line connecting the cities mentioned. The incorporators include W. E. Hildebrand, whose address here is given as the Oliver Building. The charter application mentions as the first link in the system a line of 4 miles between Dormont and Bridgeville.

Activity in the petroleum producing districts of the United States has kept the eight manufacturing plants of the Oil Well Supply Company, whose headquarters are in Pittsburgh, operating to their full capacity. The company's output includes complete equipments for drilling wells and maintaining them in service. In the natural gas districts a similar line of work has been extensively taken up with equal success, thereby creating a demand for much auxiliary machinery which other companies are supplying.

Heavy machinery, designed for an output of 500 to 600 tons of crushed rock daily, together with pulverizing mills, will be installed by the Wheeling Limestone Company, recently organized at Wheeling, W. Va.

The J. & J. B. Milholland Company, Pittsburgh, has been awarded contracts for power plant equipment as follows: Dennison Coal & Fuel Company, Dennison, Ohio, a 200-hp. boiler and engine, a tailrope haulage system and tipple equipment; Sterling Coal Mining Company, Washingtonville, Ohio, a complete haulage system; Pittsburgh-Buffalo Company, for installation at the Mariana mines, an endless rope haulage system.

Reports are that George A. Wallace of New Castle, Pa., with some associates has made plans for the building of a large manufacturing plant at Haselton, Ohio. It is stated that 25 acres of land has been purchased for the proposed plant. No information has been given out as to the lines of product to be made.

The Irvine Steel Forge Company, Irvine, Pa., is about to erect a forge building 40 x 150 ft., and a machine shop 40 x 60 ft. The company will engage in the manufacture of forgings for all kinds of engine and automobile construction.

The Pittsburgh Emery Wheel Company, Park Building, Pittsburgh, Pa., works at Rochester, Pa., has recently made a change in its management. Charles G. Smith is now president; J. Walter Hetzel, vice-president and secretary, and Albert W. Smith, treasurer. David B. Hyde, formerly vice-president, has resigned.

The Bessemer Gas Engine Company, Grove City, Pa., has recently made sales as follows: National Aluminum Company, Clarksburg, W. Va., 300-hp. engine to drive generator; Pittsburgh Piping & Equipment Company, Pittsburgh, 75-hp. engine.

The Riddle Construction Company, Johnstown, Pa., recently incorporated, has not yet completed its organization, but Henry Riddle will be president. The company will manufacture coal mine equipment, and will also construct water works and engage in other kinds of engineering work.

Cleveland

CLEVELAND, OHIO, July 26, 1910.

The local machinery market has apparently settled down to a period of midsummer dullness. Some fair business was booked during the week, but dealers now have very little in prospect and new inquiries, which are scarce, are mostly for single tools. While the demand for standard tools has become very light, makers of some lines of machinery report a fair volume of orders. In electrical equipment no large inquiries are being figured on, but there is a fairly good demand for small motors. Builders of electric cars and locomotives report a good amount of work on hand and considerable inquiry. The demand for electric cranes is also holding up well, and crane building plants in this territory are well filled with work. Some new contracts for ore handling machinery are being figured on. Locomotive cranes are also moving fairly well. Railroad orders for machine tools are being held up, and very little business is coming from the automobile industry.

While some manufacturing plants in metal working lines still have enough orders to keep running full and have not experienced a slackening in the demand, others notice some falling off in business and have laid off some of their workmen. In the foundry trade the demand for light gray castings continues very good, and most of the local foundries have about all the work they can do.

The Reliance Electric & Engineering Company, Cleveland, will have plans completed August 1 for a new plant that it will erect on East Collamer street. There will be a one-story machine shop 80 x 160 ft. and an office building 40 x 100 ft. The new plant will give the company double its present capacity. The company will buy some new machine tools, but its purchases will not be large as its intention is to gradually add to its equipment. Its requirements are largely lathes, milling machines and drill presses in medium sizes.

F. E. Myers & Bro., pump makers, Ashland, Ohio, have bought a tract adjoining their present site and will shortly begin the erection of a new foundry. Owing to the growth of the company's business their foundry capacity has been inadequate for some time and outside foundries have been furnishing some of the castings. Plans for the new foundry have not yet been prepared. It is the intention to build a plant that will employ 75 additional workmen.

The Baldwin Forging & Tool Company, manufacturer of spades, shovels and scoops, which is now operating at the Ohio Penitentiary, will remove from that institution on account of the operation of the Wertz law abolishing contract labor and will build a large plant at Parkersburg, W. Va. The buildings will be of brick and concrete and will occupy a ground space of about 100,000 sq. ft. They will consist of the following: Main building, 60 x 860 ft.; warehouse, 60 x 200 ft.; handle warehouse, 60 x 200 ft.; machine shop, 60 x 100 ft.; pickling room, 50 x 60 ft.; steel warehouse, 60 x 100 ft.; office building, 50 x 50 ft. The new plant will cost about $300,000 and give employment to about 500 men.

The Akron-Selle Company, Akron, Ohio, will branch out into the manufacture of automobile trucks and will erect a new plant for that purpose, probably at Akron, although an option has been secured on a site in Kent, Ohio. The plans provide for a four-story steel and concrete building 62 x 162 ft. It is expected that the contracts will soon be placed.

The Brown Hoisting Machinery Company, Cleveland, has secured the contract from the Navy Department for rebuilding the superstructure of the floating pontoon crane Hercules, which recently broke from its moorings at the Brooklyn Navy Yard and was wrecked in a storm. The crane was originally built by this company. The Brown Hoisting Machinery Company has also recently taken a contract for car haul for the Semet-Solway Company of Syracuse, N. Y.

A number of business men in Mansfield, Ohio, are interested in a company that has been formed to establish a plant in that city for the manufacture of automobiles. The company has been incorporated, with a capital stock of $200,000, under the name of the Forth Automobile Company. The incorporators are W. M. Hahn, Charles Hoffman, W. H. Shryock, C. S. Ashbrook and S. J. Colwell.

Arthur J. Peet has established a machine shop at 520 Prospect avenue, S. E., Cleveland, under the name of the Peet Machine Company. The company will make special machinery and dies.

Ground has been broken for a large addition to the Elmore automobile plant at Clyde, Ohio, owned by the General Motors Company. The present plant is overcrowded with machinery and it is announced that no additional machine tool equipment will be purchased for the present.

The plant of the Damascus Brake Beam Company at Sharon, Pa., was almost entirely destroyed by fire July 23. The company has not yet decided on its future plans, but may decide to build a new plant in Cleveland, where its headquarters are located.

It is reported from Akron, Ohio, that the McNeil Boiler Company of that place will be obliged, in consequence of the pressure of business offering, to extend its present facilities. An additional force of men is to be put on at once.

The Morgan Engineering Company, Alliance, Ohio, will furnish an electric traveling crane of 140 tons capacity for the shops of the National Transcontinental Railway, Winnipeg, Man., contracts for the equipment of which are now being placed under the supervision of the Dominion authorities.

Cincinnati

CINCINNATI, OHIO, July 26, 1910.

It is reported that some good sized inquiries have been received by the local machine tool people from the Pennsylvania Lines West, the Baltimore & Ohio Southwestern and the Louisville & Nashville Railroads. The Chicago, Burlington & Quincy is understood to have lately bought some tools on a list issued sometime ago, and the New York Central has also made some additional purchases. This is encouraging, and it is the general opinion that no matter how hard the railroad heads may hold back on financial estimates the time has arrived when the mechanical and operating departments must be supported in obtaining equipment if the railroads are to live up to operating standards already set.

Some of the foundries are very busy, while others claim there has been a slackening up. The second-hand machinery houses are meeting with about the same conditions, although those fitted up with repair shops state that business is in a very healthy condition as far as they are concerned.

The machinery exhibits will be very extensive at the Ohio

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Valley Exposition, which will be held in Cincinnati August 29 to September 24. Practically all available space in the machinery hall has been contracted for, and much interest is shown in the enterprise, both by the local and some of the outside machinery interests. As the exposition will be held at the commencement of the usual buying season of the year, it is expected that a large number of orders will be booked by visiting purchasers of machine tools and other equipment.

The Webb Coal Mining Company is a new Ohio incorporation with $100,000 capital stock and will develop coal lands in Kanawha County, W. Va. Work has already been started on two drift entries and the company hopes to be shipping coal by December 1. The power plant machinery has been purchased, but a hoist and other coal mining equipment will be needed. The main office of the company is at 702 Mercantile Library Building, Cincinnati. Lewis M. Webb is president and treasurer; E. H. Shonk, vice-president; B. R. Appleton, secretary, and John Holmes of Garrison, W. Va., general manager.

The Isaac Joseph Iron Company, 525 Hunt street, Cincinnati, has acquired a tract of land adjoining its plant on which will be erected an addition at some time in the future. Building plans have not yet been made up.

The Webster & Perkins Tool Company, manufacturer of automatic bolt threading machinery, &c., which has been in business at Springfield, Ohio, for some time, has incorporated, with $25,000 capital stock. No immediate improvements are contemplated as the company has recently doubled its capacity, but it is its intention at no distant date to erect a new factory for which equipment adapted to its particular needs will be required. H. Voges, Jr., is president and treasurer.

The William Powell Company, Cincinnati, manufacturer of valves and other engineering specialties, is making quite a success of its Spanish-American business. It has adopted the policy of sending its own Spanish speaking representative to create a demand for its goods and to get personally acquainted with the trade in question.

Mowbray & Robinson, 1219 West Sixth street, Cincinnati, have purchased a tract of land in Breathitt County, Ky., on which is about 100,000,000 ft. of white oak timber. They are working on plans for building a band mill of 75,000 to 100,000 ft. daily capacity near Jackson, Ky. Part of the necessary equipment has already been contracted for.

The Newport Rolling Mill, Newport, Ky., which has been shut down three weeks for the usual midsummer repairs, started up half of its plant July 25, and the company hopes to have the balance of the mill ready for operation by August 1. The demand for black and galvanized sheets, roofing, siding, &c., is very encouraging and a busy fall season is anticipated.

The Miller Improved Gas Engine Company, Springfield, Ohio, was awarded contract by the Board of Control, Norwood, Ohio, a Cincinnati suburb, for one 300-hp. gas engine. The company's bid was $7835 for the engine installed in the water works and light plant.

R. Rost, maker of carriage woodworking machinery, Cincinnati, has awarded contract to the Roche-Bruner Building Company, Johnston Building, this city, for a factory building 50 x 57 ft., which will be erected at the intersection of Gest street and Mill Creek.

The cooperage factory of L. Haehnle & Sons, McMicken avenue and Eliza street, Cincinnati, was almost totally destroyed by fire July 23. A lot of valuable machinery was ruined. The estimated loss is $25,000, covered by insurance. It is stated rebuilding plans are already under way.

Among the busy factories at Oakley suburb is that of the Triumph Electric Company, which is running on full time. While there has been a recent decrease in the number of orders received for larger electrical units, which is usual at this time of the year, the company's small business is holding up reasonably well.

The pattern storage room to be erected by the Lodge & Shipley Machine Tool Company, Cincinnati, will be a fireproof building 30 x 100 ft., of brick and concrete construction. A covered passageway will connect it with the company's pattern shop.

The Ryder Brass Foundry, Bucyrus, Ohio, is busy installing equipment in its new building and expects to be in operation by August 1.

The Wapakoneta Wheel Company has been organized at Wapakoneta, Ohio, and will construct a brick factory building having 37,000 sq. ft. of floor space. The officers are Edwin Abe, president; C. T. Kolter, vice-president. L. N. Blume, treasurer; John Taeusch, secretary, and E. Trau, general manager.

The Vulcan Plow Company, Evansville, Ind., has increased its capital stock from $150,000 to $400,000. Extensive improvements are contemplated at its plant, including the erection of a new foundry building at Ingle and Second streets on a site now occupied by the storage warehouses of the company.

Work has commenced on the foundations for the new factory of the Angldile Scale Company, Elkhart, Ind. The main building will be 120 x 507 ft., one story, with a portion of the front 35 x 120 ft., two stories. The plant is located on Elkhart avenue, near the C. G. Conn Company factory.

The customs foundry department of the Dean Gas Engine & Foundry Company is very busy, and the company also reports a rapidly increasing demand for Fox four-port two-cycle gasoline motors, of which it is the patentee and manufacturer.

The new manufacturing plant to be erected at Geneva, Ohio, by the American Fork & Hoe Company will be 50 x 230 ft.

The International Harvester Company will shortly proceed with the erection of one-story buildings 150 x 700 ft. and 150 x 350 ft., together with several smaller structures, at Springfield, Ohio.

The Foos Gas Engine Company, Springfield, Ohio, is operating its plant with full day and night shifts in order to keep up with bookings, prompt deliveries having been one of the chief factors in building up its present large trade.

The Commercial Car Company, Indianapolis, Ind., has increased its capital stock from $100,000 to $500,000, and has purchased a site in that city on South Meridan street and the Belt Railroad. It is the intention of the company hereafter to manufacture its own engines and transmission and other parts used in the construction of its cars.

The National Pottery Company, Evansville, Ind., will break ground within the next 30 days for a four-kiln pottery plant, details of which have not been worked out as yet.

The Jeffrey Mfg. Company, Columbus, Ohio, is changing the location of its Denver office from 1711 Tremont place and after August 1 will occupy a commodious suite of rooms in the First National Bank Building. This company, besides maintaining a large selling force in over a dozen of the leading cities of this country, maintains a corps of engineers at its branch offices situated in the following cities: Chicago, St. Louis, Denver, Montreal, Pittsburgh, Charleston, W. Va.; Boston, New York and Birmingham. There are also nearly 100 Jeffrey agencies in additional cities in this country and abroad.

The Ross Gear & Tool Company, Lafayette, Ind., has increased its capital stock from $50,000 to $100,000.

The S. G. Taylor Chain Company, Maxwell, Ind., has resumed operations after a brief shutdown. The company has orders that will tax its capacity.

The Huntington Wagon Company, Huntington, Ind., has let contracts for two new buildings, a paint shop 54 x 146 ft. and a blacksmith shop 41 x 146 ft., both of brick.

The Fudge Bros. Mfg. Company, Marion, Ind., has been incorporated, with $25,000 capital stock, to manufacture automobile tires. The directors are John W. Fudge, Leroy M. Fudge and Lewis M. Fudge.

The American Spark Arrester Company has been organized at Indianapolis, Ind., with $100,000 capital stock, to manufacture spark arresters for locomotives and other steam engines. The directors are Thomas A. Van Horn, Charles A. McCotter, Harry N. Knight, Charles F. Remy, James W. Sale, Elmer E. Perry and Vernon E. Butler. Purdue University, Lafayette, Ind., has been testing the device for two weeks on a Chicago & Northwestern large freight locomotive taken from service on the road and loaned for the purpose. There is a new design and arrangement of the smoke box which catches the sparks and prevents them going out of the smokestack. Prof. Louis E. Endsley of the university has charge of the tests.

The Indianapolis Switch & Frog Company, Indianapolis, Ind., has decreased its capital stock to $200,000. N. H. Fairbanks is president of the company.

The Acorn Boiler Compound Company, Evansville, Ind., has been incorporated, with $10,000 capital stock, to manufacture boiler compounds. The directors are William W. Pinder, William J. Muensterman and Julius Muensterman.

The Peerless Wire Goods Company, Lafayette, Ind., has been incorporated, with $10,000 capital stock, to manufacture wire goods. The directors are Edward R. Clegg, Elbert Jackson and Ernest Schilling.

The Stutz Auto Parts Company, Indianapolis, Ind., has increased its capital stock from $10,000 to $50,000.

The Fletcher Enamel Company, Anderson, Ind., is enlarging its plant by the addition of two muffle furnaces, which will be completed by August 1, and the installation of three or four additional pieces of machinery which it is understood have not been purchased. The company is also contemplating the erection of a building to contain from 15,000 to 20,000 sq. ft. of floor space, the latter part of this year, to be used for its finished product.

The Premier Motor Mfg. Company, Indianapolis, Ind., has under course of construction several buildings which will almost double its present floor space. These buildings are being erected on ground recently purchased by the company opposite its present site, and consist of a motor test shop 50 x 150 ft., a machine shop 90 x 490 ft., one story, of saw

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tooth roof construction; stockroom 50 x 100 ft. and a repair shop.

The Overland Automobile Company, Indianapolis, Ind., is erecting a concrete building, at a cost of $60,000, to increase the capacity of its motor department, into which will be installed more than $40,000 worth of new machinery. Plans for an increase in the capital stock of the company from $2,800,000 to $6,000,000 and for a consolidation of the Indiana and Ohio corporations will be considered by the directors of the company at a meeting in Toledo this week. It is understood that a large portion of the proposed increase will be used for further improvements at the Indianapolis plant.

Detroit

DETROIT, MICH., July 26, 1910.

For the past week there has been a good deal of buying of miscellaneous equipment, including some forge and machine shop tools, in behalf of new automobile plants that are being located at Michigan, Ohio and Indiana points outside of the Detroit district; and quite an appreciable percentage of this trade is of a nature that marks it as but the forerunner of more important purchasing a few weeks later on. Following inventory taking, the larger manufacturing plants are also making up lists of their probable requirements for the next few months.

Plans for new buildings to be erected by automobile companies and others engaged in metal working or the production of machinery of various kinds have absorbed the attention of the trade to such an extent that the enormous increase in other forms of manufacturing, such as those that have to do with household articles, small appliances used in buildings, hardware, toys, clothing, knit goods, &c., have been largely overlooked. Some dealers, however, have made a specialty of following up the requirements of light manufacturing plants, and they are securing a very satisfactory line of business from them. One concern that sells motors and electrical devices exclusively has met with a phenomenal growth in the demand for apparatus of that kind, in capacities from 1 to 20 hp. up to an ordinary maximum of 10 to 15 hp. where individual drive is used. For light shafting, to which several machines are belted, the sizes may run somewhat higher; but the popularity of the small motor is increasingly manifest. This is notably true of mills and factories where women and girls are principally employed.

The Nielsen Motor Company, Detroit, has awarded the contracts for building a two-story automobile factory 50 x 80 ft. The machinery to be installed has been largely purchased. Some buying on this account will be done later.

The extremely heavy demand this summer for gasoline engines to be placed in motor boats and launches has been very noticeable at some of the plants in this vicinity. Among others, the Strelinger Marine Engine Company, which builds these machines in sizes from the smallest to the largest ordinarily used, together with accessories, has found its manufacturing facilities severely taxed to fill orders promptly. Shop expansion will be the probable result. The company's plant in Detroit is located on East Congress street.

The main building of the manufacturing plant to be constructed in Alpena, Mich., by the Alpena Motor Car Company will be 40 x 170 ft., with two wings, each 60 x 200 ft. The equipment needed is now being arranged for.

The Michigan Marble Company, Detroit, is installing machinery and will open a quarry at Ishpeming, Mich. Later some additional equipment will be required. The company has increased its working capital to $100,000.

The Packard Motor Company, Detroit, is adding to the force in its forging department, the facilities of which have also been increased.

The Sun Stove Company, Detroit, which operates a brass foundry and machine shop as a part of its plant, is making a specialty this season of custom work, particularly on a contract basis.

Ground for new building will be broken soon on a tract of 40 acres which the Metzger Motor Car Company has acquired in Detroit for its new motor truck plant.

The Port Huron Bridge & Iron Company, Port Huron, Mich., has a large amount of work on hand at this time. Among recent orders is one for building two bridges at Bourrett, Mich.

The new factory building to be erected in Detroit by the Van Dyke Motor Company will be 60 x 600 ft. Construction contracts have not yet been let, but a part of the machinery required has already been decided upon.

An increase in its capital stock has been made by the Sibley Motor Car Company, Detroit, in order to provide for necessary additional manufacturing facilities.

A crushing plant and cut stone works, equipped with modern machinery, will be installed by the Ohio Oolitic Stone Company, recently organized with headquarters at Bloomington, Ind., the president of which is Wm. W. Dodgson, Dayton, Ohio. A new quarry will be opened and equipped by fall. The machinery will include apparatus for the production and application of both pneumatic and electric power.

Considerable interest is being taken by representatives of equipment houses in the project for building the Hamilton, Waterloo & Guelph Railway, whose organization headquarters have been at Hamilton, Ont. Some time ago Westinghouse, Church, Kerr & Company made an investigation of this undertaking, and it is generally understood that a favorable report was prepared. Unless hydroelectric power is available, steam turbine units will undoubtedly be utilized for the service.

The Midland Machine Company, Detroit, has kept fully occupied this season in the manufacture of special tools, jigs, &c., as well as machinery parts.

One of the busiest manufacturing plants in this section for some time past has been that of the Kerr Machinery & Supply Company, Detroit, whose steam turbines and centrifugal pumping units are now in service throughout the United States as well as in foreign countries. One of the uses to which turbines of the smaller sizes are now being extensively put is in driving dynamos for exciting the fields of large alternating current generators.

The Wilson-Robinson Mfg. Company, Detroit, has been largely occupied within the last few months in supplying the automobile trade on contracts, its output including brass, bronze and aluminum castings in considerable variety.

The Weber Detroit Mfg. Company, Detroit, which does a large business in model making, has also had in hand during the spring and early summer a great deal of experimental work for manufacturers and inventors of machinery parts, particularly those of an automatic or semi-automatic character used in the automobile and related industries.

Construction will soon begin of the frame work for a three-story factory 70 x 100 ft. to be erected by the Detroit Carriage Company, Detroit, which it is stated will be used for the production of parts used in the manufacture of motor vehicles.

The Michigan Pattern Works, Detroit, which executes orders in both wood and metal, is deriving a very profitable line of business from the automobile companies, both of this vicinity and elsewhere in the country. By another year the plant will be enlarged and more extensively equipped.

E. J. Kruce & Co., 243 Lafayette avenue, Detroit, are building a new three-story machine shop, 50 x 150 ft.

W. B. Mershon, Saginaw, Mich., one of the most prominent of the heavy machinery builders of the State, has been elected president of the newly organized water works board at that place. The business of his firm continues very active. For one plant, recently, nine of the resaws which it manufactures were ordered, and numerous smaller installations are being made in all parts of the United States and Canada.

The Virn Motor Mfg. Company, Sandusky, Ohio, is arranging for the construction of a factory building 60 x 130 ft.

The J. E. Bolles Iron & Wire Works, Detroit, is having a very brisk trade in supplying wrought and cast iron work of all kinds for building purposes, together with various fabricated material. The outlook for autumn business could hardly be better.

The Argo Electric Vehicle Company, Saginaw, Mich., has filed articles of incorporation with a capital stock of $200,000; the incorporators are Theodore Huss, Fred Buck, Benton Hanchett and Otto Schupp of Saginaw, and A. M. Marshall of Duluth, Minn. The company will occupy the building now being vacated by the Sommers Match Company of that city, which it will fit up for the manufacture of electric pleasure vehicles. Mr. Huss is secretary of the Lufkin Rule Company of Saginaw.

The Muskegon Motor Specialties Company, Muskegon, Mich., has broken ground for a machine shop, 119 x 155 ft., and a furnace room, 50 x 80 ft. The buildings will be of brick construction, one-story, and are expected to be ready for occupancy by October 1.

St. Louis

ST. LOUIS, July 25, 1910.

The introduction of new factories and the enlargement of old plants, either at their present sites or in new localities, is making a demand for additional new machinery in St. Louis. All the home manufacturers and the branch offices report business ranging from fair to excellent. The leading house in railroad supplies states that for the first half of the year it was very busy in some of its specialties,

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but the demand for the present month is not so brisk. Reports referred to above cover the country at large in the case of some companies, while others mention St. Louis and St. Louis territory. The local machine tool houses are carrying a good assortment of stock.

The Century Electric Company, maker of single phase A. C. motors, is very busy, and has been adding new equipment steadily for the past year.

The Alex. Kirkpatrick & Sons Foundry Company has put its plant in running order after the disastrous fire suffered recently, and is now in the market for an electric traveling crane.

The Kupferle Foundry Company has moved into its new plant at Main and Wright streets.

The St. Louis Malleable Casting Company is quite busy, and a heavy tonnage is being got out for some large implement manufacturers and others.

Work has begun on the foundation for the new plant of Fayette R. Plumb, Inc., manufacturer of hardware and special tools.

The district office of the Hamilton-Corliss Engine Company reports a good number of sales. Among these are a 1500 hp. tandem compound unit for the Southwestern Knitting Company, Kansas City; an 800 hp. outfit for the Mt. Vernon Car Mfg. Company, Mt. Vernon, Ill.; a large Hamilton cross compound Corliss engine for the Board of Public Works, Hannibal, Mo.; an installation at the plant of the N. O. Nelson Mfg. Company, Le Claire, Ill.; a 1500 hp. cross compound Corliss engine, direct connected through generator, for the terminal power house at Venice, Ill., of the Illinois Traction System, preparatory to its entrance to St. Louis over the company's new bridge across the Mississippi River.

The Heine Safety Boiler Company reports an excellent demand for its safety boiler, which is coming from a territory embraced by both coasts and is taxing the large facilities of the new plant.

The Handlan-Buck Mfg. Company states that the demand for some of its new railroad specialties has been very satisfactory; for example, the ventilation apparatus for switch lamps, a new style lantern. There is also a good demand for automobile spring washers. While the call for railroad specialties up to July 1 was remarkably good, it has slackened up, doubtless temporarily, since that date.

The Ingersoll-Rand Drill Company reports a very fair demand from the district covered by the St. Louis office.

The St. Louis Architectural Iron Company is quite busy on structural fabricating; in fact, needs more men for jobs under contract.

The Hall's Patent Tool Company, St. Louis, has been incorporated; capital stock, $50,000; incorporators, James G. Hall, O'Fallen, Ill.; Joseph A. Sauls, Bessie Sauls, Philip Wagner and others; to engage in manufacturing tools, &c.

The Neverbreak Wrench Company, St. Louis, has been incorporated; capital stock $2000; incorporators, A. U. Oge, Adolph Nierhoff and S. F. Raab.

The Pittsburgh Plate Glass Company, at Crystal City, Mo., is increasing its plant by the addition of a large steel frame building at the east side of the St. Louis & San Francisco Railroad tracks.

The Central Steel Company, Ottawa, Ill., has been incorporated; capital stock, $10,000; incorporators, Fred L. Fisher, Louise P. Fisher and Benj. D. Wood.

The Hermann Ice Mfg. Company, St. Louis, has been incorporated; capital stock, $25,000; incorporators, William Hermann, Josephine C. and Joseph Hermann.

The Ringen Stove Company is erecting at Kingshighway and Daggett avenue, St. Louis, a new plant to cost upward of $500,000. The buildings will be one and two stories, the floor space of which is approximately 22,000 sq. ft. The factory will front on 2500 ft. of switching tracks. The daily output will be 1500 stoves and 800 hands will be employed.

Millard Bryan is equipping and developing a new quarry in the vicinity of Carthage, Mo. When the new transmission line of the Empire District Electric Company reaches Carthage, this and other quarries will be operated by electric power.

Steam turbine generating sets have been ordered for the new municipal electric plant at Little Rock, Ark.

The Fairfax Light, Heat & Power Company has been organized at Fairfax, Mo., to establish an electric plant for public service.

The Nevada Water, Light & Traction Company has been organized at Nevada, Mo., by Edward Willard and others to establish a public service plant. The purchase of the necessary machinery has not yet been considered.

The planing mill at St. Joseph, Mo., owned by Willis R. Munger, will be disposed of to other interests and possibly enlarged. It is electrically operated.

New England

BOSTON, MASS., July 26, 1910.

The week is featured by the announcement of the establishment of the C. W. Kelsey Company, Hartford, Conn., which will equip works immediately for the manufacture of a very low price motor car; and of the action of the Providence Engineering Works, Providence, R. I., in its decision to go ahead with a large addition. Its inquiries in the trade indicate large purchases of machine tools, but the dealers have not received a list as yet. The C. W. Kelsey Company will also be a factor in the market in the near future, but its president, C. W. Kelsey, states that no list has been prepared. The equipment required will be a complete one.

Apart from these promising influences the trade is uneventful, with a few good orders. The average indicates a lull in buying, which is to be expected, considering the season and the weather. Salesmen report that never in their experience have so many buyers been absent from their offices at this period of the summer. The strike on the Grand Trunk Railroad is affecting shipments to some extent. The various labor troubles are gradually clearing away. The drought is reducing the efficiency of water power installations throughout New England, including that of the Connecticut River Power Company, some of whose customers have been compelled to fall back on their steam plants. The Worcester Works of the American Steel & Wire Company are affected by this dearth of current, but the Connecticut River people are still able to furnish power for the electric steel furnace at the South Works.

A strongly backed corporation, the C. W. Kelsey Company, has leased the factory at Hartford, Conn., recently operated by Cheney Bros., silk manufacturers, and will occupy it for the building of a low priced motor car to be called the Motorette, which will sell for from $330 to $360. The work of remodelling and equipping the premises will begin immediately. No machinery has been purchased; no list of equipment has been prepared. While production will be on a considerable scale, the beginning will be a conservative one, the company proposing to feel its way before proceeding on a really large basis. Several hundred men will be employed as soon as manufacturing is under way. The capital stock is $250,000. C. W. Kelsey, Hartford, formerly with the Maxwell-Briscoe Company, is the president; W. D. Disston, Henry Disston & Sons Company, Philadelphia, vice-president; James W. Robbins, New York, secretary, and M. Kelsey, Hartford, treasurer. E. D. Freeman, general counsel for the Union Tea Company, is a director. F. S. Hyatt, formerly with the Columbia Motor Car Company, Hartford, is the purchasing agent, and G. F. Kuhn, for many years with the German house of Seaman-Halsky, and an engineer of the Maxwell-Briscoe Company, is the engineer. The Cheney plant is a large one, and several acres of land will permit of large increase in manufacturing space when it is required. The initial cars of the company were built under contract by outside parties.

The detailed plans of the Providence Engineering Works are not yet announced, but there is good authority for the statement that the large addition will be built very soon, on land adjacent to the present buildings. Under the new ownership of the United States Motor Company the operations of the plant will be on a much larger scale, particularly on the automobile end, which manufactures engines and transmissions in connection with the Maxwell-Briscoe Motor Car Company, whose works are located in the neighboring village of Auburn, R. I. The Rice & Sargent engine will continue a product of the business, and doubtless there will be some development on the steam engine department of the business. The new building will have a large amount of new equipment, which will be devoted to the manufacture of automobile parts.

The public spirit prevailing in some of the New England towns is exemplified by an offer of the Electric Light and Power Department of the Goodell Company, Antrim, N. H., manufacturer of cutlery and hardware. A circular letter states that any new manufacturing establishment recommended by the local board of trade which will employ not less than 10 people will be furnished electric current for power, not to exceed 50 hp., free until September 1, 1911, and for five years from that date power at a rate 10 per cent. less than companies furnishing electric power in New Hampshire. The offer includes the installation of a transformer.

The superintendent of the Boston State Hospital at Mattapan, Mass., states that an entire new equipment of machine tools and woodworking machinery will be required in connection with large additions to the institution buildings, which will include spacious shops, but no list has been prepared to date.

The Aroostook Electric Railway will extend its system

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through the towns of Woodland and Perham to Matawaskeag Lake, a distance of 19 miles, opening up one of the most fertile sections of Maine.

The addition to the shops of the Lapointe Machine Company, Hudson, Mass., will be 36 x 68 ft., three stories. The new space will be devoted to the manufacture of reamers and will be ready for occupancy about September 1.

The new corporation which will manufacture the Orson motor car at Springfield, Mass., has been named the Brightwood Motor Mfg. Company.

The Novelty Mfg. Company, Waterbury, Conn., manufacturer of brass goods, has increased its capital stock from $12,500 to $200,000.

The Terry Steam Turbine Company, Hartford, Conn., manufacturer of steam turbines, has increased its capital stock to $196,500, the proceeds of 218 new shares having been devoted to the purchase of machinery.

The great number of concerns of this territory making automobile parts and accessories will have a prosperous year, in fact will be pushed to their utmost capacity, if the estimate of next year's production of cars is fulfilled. The figure quoted is 300,000, as compared with 210,000 for the current year and 82,000 for 1909. Under present conditions it is difficult to find an establishment serving this trade which is able to keep up with orders accepted, and which has not been compelled to discourage new business. With an increase of 50 per cent. in the demand for their products it will be necessary to increase producing power very materially, which should make the industry an even more important factor in the market for equipment, including machine tools, and for supplies.

Strikes of molders and coremakers are on in several of the foundries of Hartford, Conn., but the owners are making rapid gains in filling the vacant places.

The aeroplane is exciting interest in machinery and supply circles because of the plans of several companies to create plants in New England for the manufacture of the machines and their parts and accessories. W. Starling Burgess, Marblehead, Mass., is forming a company, which proposes to establish works for the building of aeroplanes at Newburyport, Mass. Hugo C. Gibson, New York, is interesting Hartford capital in a company which will manufacture aeroplane gas engines and propellers. A meeting to forward the project was held recently at the office of E. C. Frisbie, Hartford. The Gallaudet Engineering Company, Norwich, Conn., has been incorporated under Connecticut laws, with capital stock of $100,000, to build a new type of aeroplane. The promoters are E. F. Gallaudet, Denison Gallaudet and Grosvenor Ely, all of Norwich. Various New England manufacturers are already producing parts of machines, including motors.

The trade, particularly the supply end, is interested in the impending consolidation of worsted mills, which include those of the Waterhouse Worsted Company, Providence, R. I.; Fred L. Sayles and A. L. Sayles & Son, Pascoag, R. I., and others at Warren, Mass.; Utica and Syracuse, N. Y., and Philadelphia. A corporation is organizing to take over these industries, with capital stock reported to be $25,000,000.

The latest step in the shoe machinery situation is a suit brought by the United Shoe Machinery Company, Beverly, Mass., against the Thomas G. Plant Company and Thomas G. Plant as an individual, alleging a breach of the lease under which the Plant factory was equipped with the plaintiff's machinery. Mr. Plant is head of the Wonder Worker Shoe Machinery Company, which proposed to put a full line of shoe machinery on the market in competition with the United Shoe Machinery Company. The litigation is considered to be of vital importance, not only in its direct results upon the machinery lease, but as involving questions of patent rights.

Geo. H. Booth, New Bedford, Mass., is organizing a company for the manufacture of cotton goods. The corporation will have a capital stock of $1,250,000, and will build a great plant, which will require large power, as well as the usual great amount of transmission equipment and general supplies and a modern machine shop, if present plans are consummated.

The new power plant of the Worcester Consolidated Street Railway Company, Worcester, Mass., to be located in the adjacent town of Millbury, will have a generating capacity of 5000 kw.

The city of Lynn, Mass., will establish a filtration plant for its water supply, to cost between $300,000 and $400,000. A new water filtration plant at Bangor, Me., will cost $66,200.

Whipple & Choate, Bridgeport, Conn., will erect a three-story addition to their pattern building, 30 x 40 ft., for which no equipment will be required.

Harry B. Ingraham has been made manager of the Fay Welding Company, South Boston, which does oxy-acetylene welding of iron, steel, cast iron and other metals.

Industrial extensions and new works planned for New England include the following: Rostand Mfg. Company, Milford, Conn., brick mill building 40 x 103 ft., one story; New England Brick Company, plant at Farmington, Conn., to cost $40,000, with a capacity of from 40,000 to 50,000 bricks; Louis M. Kenny and Alonzo M. Bates, Leominster, Mass., comb factory, 24 x 60 ft., two stories, with fireproof power house for steam equipment; Aroostook Lumber Company, Presque Isle, Maine, starch factory with capacity of 1000 barrels a day; Attawaugan Company, Killingly, Conn., steam electric unit of 700 hp.; Brass Products Company, Southington, Conn., addition 30 x 80 ft., two stories; Giron Bros. & Co., St. Etienne, France, velvet ribbons, plant at Norwich, Conn., 100 x 140 ft., with sawtooth roof; A. H. Berry Shoe Company, Portland, Maine, factory 50 x 150 ft., three stories.

The Providence Engineering Works has issued a long list of machine tools on which the New England trade is now bidding. The company has arranged to erect a new building for the manufacture of automobile parts, and it is in this structure that the machinery to be bought will be installed. Work on the new plant will be begun immediately.

Milwaukee

MILWAUKEE, WIS., July 25, 1910.

The market for machinery is steady at present, with no features of especial interest. It cannot, however, be characterized as dull. Orders continue to come in quite freely from various parts of the United States and Canada, and there is an excellent trade with Mexico in power, mining and crushing machinery.

Export business has also been quite brisk lately. Owing to the large and varied line of machinery which it manufactures, the Allis-Chalmers Company is, of course, the most prominent in this line of any local industry. At present it is engaged in filling two orders for copper plants which are of considerable interest from the fact that they represent the extremes of the earth. One comprises equipment for immense reduction works to be installed by the Compania Minera du Haut Kantanga, Brussels, Belgium, near the shore of Lake Tanganyika in south central Africa, and the other is for concentration works of the Finnish American Copper Company, Helsingfors, Finland. In both contracts are included the complete power and electrical equipment. Other machinery, including steam stamps, will be sent to the ore mill of the Pan American Mining Company in Dutch Guiana, S. A.

In the line of shop and foundry equipment there has been no change from the situation recently reported.

The Optenberg Iron Works, Sheboygan, Wis., has the contract for the iron work of the S. W. Miller Piano Company's new factory at that place, which will be three stories, 60 x 185 ft.

The project for a municipal electric plant at La Crosse, Wis., will be brought up again this fall. A bond issue to provide funds for the purpose is to be voted on in September.

The city of Columbus, Wis., has engaged Vaughn & Meyer, Milwaukee, to prepare plans for remodeling the municipal electric plant and improving the service.

The West Allis Iron Works Company has been organized by Henry Biegel and Alois Hartl, together with Henry Schauten. Mr. Biegel is in charge of the foundry of the West Allis works of Allis-Chalmers Company, and Mr. Hartl is an assistant superintendent in the erecting department. A site for a plant is understood to have been secured, but it will not be constructed at present, as the plans of the company do not appear to have been fully matured. No machinery will be needed this year.

The manufacturing plant of the Chippewa Falls Chair Company, Chippewa Falls, Wis., which recently burned, will probably not be rebuilt.

The Smalley Mfg. Company, Manitowoc, Wis., is having plans drawn for a three-story addition to its plant. The new building, 80 x 300 ft., will be used for foundry, metal and wood working shops.

The Manitowoc Electric Light Company, Manitowoc, Wis., which has a power plant equipped with General Electric generators of 500 kw., will add a new unit of 100 kw. built in the West Allis shops of Allis-Chalmers Company to furnish the increase in current demanded by an extension of its system.

Ore docks will probably not be built by the Minneapolis, St. Paul & Sault Ste. Marie Railway at Superior, Wis., as originally contemplated. A new site near the Great Northern docks at Allouez is under consideration. The purchase of a large quantity of handling machinery will be involved.

A portion of the plant of the Globe Foundry & Machine Company, Sheboygan, Wis., was recently destroyed by fire. It will be rebuilt and the capacity somewhat extended.

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The Koehring Machine Company, Milwaukee, has increased its capital stock to $100,000.

Plans for a pumping plant and water works system are under consideration at Kendall, Wis.

An addition 50 x 100 ft. is to be made to the factory of the Vudor Porch Shade Company, Janesville, Wis. Some light equipment may be needed.

The Bradley Iron Works, Milwaukee, has been incorporated for $25,000 by J. A. Wallis, August Moeller and H. C. Mullen.

The Brodesser Motor Truck Company, Milwaukee, is receiving bids on power equipment for its new factory at Juneau, Wis. The equipment has, however, been practically decided upon.

The Ritter Automobile Company has been organized at Madison, Wis., by Henry R. Ritter and others.

The Worden-Allen Company, Milwaukee, has been awarded the structural contract on the new four-story building, 70 x 200 ft., to be erected by the Kimberley-Clark Company, Kimberley, Wis.

Ground has been broken at Fort Atkinson, Wis., for a new enameling shop to be erected by the Cornish, Curtis & Greene Company. It will not be of very large proportions.

A two-story and basement factory building is to be erected in Dodgeville, Wis., by the New Stratman Vehicle Company. It will be 40 x 200 ft., probably of brick and steel construction.

Plans are reported to be in preparation for a new factory building to be erected by the Harvey Spring Company, Racine, Wis.

The plant of the Vulcan Iron & Steel Works, Milwaukee, has been purchased at a bankruptcy sale by Bernhard Becker.

W. G. Kirchoffer, Madison, Wis., is in charge of plans for a new pumping plant and water works system at Bessemer, Mich.

It is announced that a municipal repair shop, to combine the present shops of the various departments, will be established in the near future by the city of Milwaukee. The site will be on the river, so that boilers and machinery from the fire boats may be readily handled. All heavy machinery is to be on the first floor, and the shop will be laid out in such a way as to permit of indefinite expansion. The equipment will cover foundry, forge, machine and carpenter work. Aside from repairs, the intention is to have the city build much of the apparatus which it uses. This is done to some extent at present by the fire department.

The Prime Steel Company, Milwaukee, has filed an amendment to its articles of incorporation, increasing the capital stock to $500,000.

The largest building fee ever taken by the city has just been paid in connection with the new foundry of the International Harvester Company, which will be in point of ground area the largest manufacturing building in Milwaukee, viz., 237 x 781 ft. The plans call for a four-story structure.

The Milwaukee Stove Works has been bought by John A. McCormick, an attorney, in the interest of creditors.

The Knight Power Company, Provo, Utah, in ordering two hydraulic turbines of 1630 hp. each, from Allis-Chalmers Company, Milwaukee, have specified bronze runners for one and cast iron runners for the other, in order to ascertain the results obtainable in wear and efficiency from the two metals under the conditions of service at its plant. Another interesting feature is that the turbines will not be provided with governors. A regulating cylinder operated by the penstock pressure, and subject either to electrical control from the switchboard or mechanical control from the turbine, will be ordinarily used, but in case of emergency a direct mechanical gear can be operated. The turbines will operate under a head of 170 ft. at 514 rev. per min.

Among recent installations in the Southwest made by the Nordberg Mfg. Company, Milwaukee, is one of a large hoisting engine at the Old Dominion mine in Globe, Ariz., where it will replace two smaller hoists built by the Wellman-Seaver-Morgan Company. In the same vicinity there will also be placed in service this fall for the Desert Power Company, Kingman, Ariz., a cross-compound, heavy-duty engine driving an alternating current generator of 1000 kw., both of which were ordered from the Nordberg company.

The J. I. Case Threshing Machine Company, Racine, Wis., advises it will commence work on the operation of its new foundry 200 x 800 ft., this fall.

The Badger Foundry Company, Racine, Wis., is building a steel and brick foundry.

The Globe Foundry & Machine Company, Sheboygan, Wis., advises in regard to its recent fire, its loss was about $6000 on its warehouse and stock. The company expects to be able in a few days to take care of its trade.

The Wisconsin Foundry & Machine Company, Madison, Wis., recently incorporated with a capital stock of $60,000, has taken over the plant and business of the King & Walker Company of that city, manufacturer of the Monona leverless series of cylinder presses. It is the intention of the company to continue the manufacture of these presses and conduct a general foundry and machine shop business and act as manufacturers' agent for steam fitters' supplies. A new shop, 60 x 132 ft., will be erected, but details of the equipment have not been decided upon.

The Wisconsin Engine Company, Corliss, Wis., has installed one of its "higher speed" Corliss engines in the new factory of the Weinbrenner Shoe Company, Milwaukee, Wis. The engine will develop 300 to 450 hp. and drives a 200-kw. generator at 150 rev. per min. The flywheel is but 11 ft. in diameter, and the whole unit occupies very little space for one of its capacity.

The South

NEW ORLEANS, LA., July 25, 1910.

Trade in all of the Gulf States has been exceptionally good of late, although it is, of course, not nearly as brisk as it was during the late winter and beginning of spring. Oil producers and refiners are contributing quite freely to the present activity in equipment and supplies, and this business is moving more to the eastward than formerly. The same is true of natural gas, which is providing cheap fuel for local industries. About 25 miles north of Shreveport, La., there has been developed an oil and gas field of very promising proportions, both in respect to the total area and to the flow from the wells thus far drilled. Various private reclamation projects, involving drainage, pumping, &c., are also bringing in a steady run of small orders, although most of the buying for large projects is practically over for the season. The saw mill, rice and flour mill and sugar mill trade runs chiefly to repair work at present, with some replacements and extensions of equipment. Fabricated metal of all kinds, including bridge and structural material, is in fairly steady demand, a good many contracts being still pending.

A prominent feature of local trade is the business being done by export houses in machinery and supplies for transhipment to Central and South America and the islands of the Caribbean Sea. For the first half of the year this increased fully 20 per cent. over that of any previous season, and for many lines that figure would be regarded as a very conservative estimate. With better steamship communications, and particularly after the opening of the Panama Canal, the trade will grow steadily in importance.

Work is about to begin on the addition to the power plant of the Knoxville Railway & Light Company, Knoxville, Tenn. In this there will be installed a new steam turbine set of 3000 kw., together with auxiliary apparatus, some of which is to be purchased later.

The Southern Iron & Equipment Company, Atlanta, Ga., has rebuilt for service, or put in good operating condition, a large number of locomotives used on industrial railroads and in construction work, both for narrow and standard gauge, up to 75 tons weight. A heavy stock is carried at the company's plant in Atlanta, Ga.

Contracts for electrical machinery with which to equip its new plant were recently placed with manufacturers by the Birmingham Rail & Locomotive Company, Birmingham, Ala. Some further purchases on this account, particularly of motors, controllers, &c., will probably be made in the fall.

The construction of a pumping plant of moderate capacity, with complete water supply system, is under consideration at Talbottom, Ga.

The Goulds Mfg. Company, Seneca Falls, N. Y., through its district representatives in New Orleans, is placing a large number of diaphragm suction pumps, both for power and hand operation, with contractors all through the lower tier of Southern States, where a great deal of dewatering needs to be done in connection with work now under way.

The Henry Vogt Machine Company, Louisville, Ky., has been awarded the contract for a complete steam generating plant at Fort Sam, Houston, Texas, including boilers, feed water, heat, &c.

A small pumping plant for public service will be required in the near future at Chipley, Fla.

It is reported from Crowley, La., that bids will be asked for by the city on a water tube boiler of 250 hp. and an engine driven generating unit of 175 kw. for electric power and lighting service.

The Southern Clay Products Company, Chattanooga, Tenn., is reported to be in the market for a hoisting engine of the type used in mining work.

Electric hoists have figured quite prominently this season in the sales for Southern territory of the Mead-Morrison Mfg. Company, which maintains a district office in New Orleans at 110 North Peters street.

In connection with the improvements to be made in the shops of the Georgia Southern & Florida Railroad at Macon, Ga., a large number of motors will be installed for

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driving the machinery. The company will not be obliged in future to maintain its own power plant, having concluded an arrangement with the Central Georgia Power Company, Macon, for supplying electric current.

The R. D. Cole Mfg. Company, Newnan, Ga., is deriving a good deal of business at present from the Southwest. It was recently awarded the contract for an elevated steel tank to be used for municipal water service at Fort Worth, Texas.

It has been decided at Gainesville, Ga., to install for auxiliary service a motor-driven centrifugal pump of 1200 gal. per min. capacity.

An engine or turbine-driven power plant of about 1000 kw. initial capacity is to be built at Elkins, W. Va., by the Elkins Electric Railway Company. Rails were recently ordered for an eight-mile road.

The Southwest

KANSAS CITY, MO., July 25, 1910.

Were it not for the buying which continues to be done by municipalities, county boards, central power stations, electric railroads and some of the larger mining and lumber companies, the machinery trade, outside of contractors' equipment, would be almost at a standstill. Orders from these sources are, however, sufficient to keep dealers and sales offices fairly busy. At the various metal working plants, including the machine shops maintained by some of the agencies, repairs and rebuilding work also keep a good many men steadily employed; so that the aggregate volume of business is quite satisfactory for July. The month, as a whole, will show up very much better than last year, sales of power and pumping machinery being alone sufficient to bring that about.

The fact that natural gas is now available over a wide stretch of territory, extending from the vicinity of Atchison, Kan., on the north to beyond Sapulpa, Okla., at the south, and that cheap fuels, including lignite coal, can be readily utilized in producers, has led to cumulatively growing interest in gas engines as prime movers for electric power plants. Each new installation made in a locality, if successful in its operation—which, unfortunately, some of them are not, results in several others before the year is over. The requirements, however, are not the same as those of the East, where the fuels are richer in thermal units, and local conditions need to be carefully studied before any recommendations of equipment are made. Ignoring that fact has caused some manufacturers no end of difficulty, and their prestige has, in not a few cases, received a setback in certain sections from which it will be a long time in recovering.

Plans have been prepared for a municipal power and pumping plant at Bridgeport, Okla., the equipment of which will include a direct acting triplex pump of moderate capacity driven by a gas or gasoline engine. All of the machinery needed will be purchased the latter part of August.

It is proposed by the city officials at Emporia, Kan., to install a new pumping engine of 3,000,000 gal. daily capacity, retaining the unit now operated, which has been in service over 20 years, as an auxiliary machine.

Work is now under way in Wichita, Kan., on the new shops of the Kansas City, Mexico & Orient Railroad, which will be the largest and best equipped of any in the Southwest.

Owing to the numerous plant improvements being made this season the repairing department of the Hervey Machine Company, Kansas City, has not experienced the lull ordinarily felt during the heated term. Work on engines, pumps and machinery auxiliary to them appears to predominate at present.

The Campbell & McClintock Company, Bloomberg, Texas, will establish a woodworking plant in Texarkana, Texas. Machinery heretofore in service will be utilized, with some additions a little later on.

The Mess Mining Company, Galena, Kan., has installed the machinery for a 200-ton concentrating plant, which is equipped throughout with electric motor drive.

It is expected that funds will be provided this year at Columbus, Kan., for building a water works system, with modern high-duty pumping machinery.

The Pacific Copper Company, Harrington, Ariz., will install a larger hoisting engine and air compressor than those now in service, together with other machinery.

A large power plant is to be built within the coming year by the St. Louis-Kansas City Electric Railway Company, whose headquarters are in Kansas City. It is stated that a bond issue amounting to $15,000,000 has been placed with bankers in Paris, France, thereby enabling the construction work to be undertaken at once. Purchase of electric generating machinery and operating equipment will not need to be considered until later. A steam-driven plant is contemplated.

An electric generating plant for lighting purposes is to be constructed at Osage, Okla., by the Osage Land & Development Company.

Funds are being provided for the purchase of new machinery to be installed in the municipal power plant at Brownsville, Texas.

An engineer has been engaged by the city of Hamilton, Texas, to prepare plans and specifications for a pumping plant and system of water supply adequate for at least some years to come.

Through the efforts of the Commercial Club, Ottawa, Kan., a planing mill, electrically operated, will be located there by W. T. Smith, who can probably be best addressed in care of that organization. Some of the machinery needed will be removed there from another place.

The Kansas City Bolt & Nut Company is crowding its plant at Sheffield, Mo., near Kansas City, to the full limit of the capacity afforded by the present equipment, and it is the expectation locally that provision will be made before long for some enlargement of the works.

In connection with the car barns which are planned for erection in Galveston, Texas, the Galveston-Houston Electric Company will install a machine and forge shop for repair work.

It is reported from Yoakum, Texas, that machine shops for maintenance and repair work will be built there by the San Antonio & Arkansas Pass Railroad. The machinery list has been completed.

The contract for constructing a steel bridge at Fort Sill, Okla., has been awarded the El Paso Bridge & Iron Company, El Paso, Texas.

The Marshall & East Texas Railway, Marshall, Texas, will erect at that place a blacksmith shop, 50 x 160 ft.; planing mill, 40 x 60 ft.; store room, 40 x 60 ft., and a car repair shop, 40 x 140 ft., for which all necessary equipment has been purchased. A little later it is the intention of the road to put in a 70-ft. turning table and a coaling station.

The Temple Iron Works, Temple, Texas, has signed a contract with the Chamber of Commerce of San Angelo, Texas, for the removal of its plant to that city. The works will be located on a site donated by the Chamber of Commerce.

The Northwest

ST. PAUL, MINN., July 25, 1910.

Buying on account of hydroelectric plants has again become a prominent feature of the market and is doing much to dissipate the usual summer dullness. Not only are there a number of large projects which have advanced to the stage where machinery is required, after months of preliminary construction work on dams, canals, forebays, penstocks, power stations, &c.; but numerous mining companies, saw mill operators and others engaged in Western developments are also planning to install plants of moderate capacities, by means of which current for running motors to drive their machinery will be furnished by water power. The situation is one which the leading manufacturers of such equipment are watching closely. In many cases hydraulic turbines of standard design can be used for the service last mentioned, just as well as the more expensive machines of special design which must ordinarily be adopted where high commercial efficiency is indispensable, as in central power and lighting stations. Hence, a considerable percentage of this Western business can be handled by local equipment companies at a minimum of engineering expense and with benefit to all concerned.

A natural corollary of the activity in hydroelectric and pumping plant construction is an extensive demand for valves and control apparatus of all kinds, from the small sizes to the largest. Jobbing houses, as well as manufacturers' agents located in this territory, have had an excellent trade in such appliances since early in the spring and it is keeping up very well through the summer.

Dealers in second hand machinery, with the possible exception of two or three leading houses, have not been doing much lately and buyers have more choice of such equipment than they were given a month or so ago. Prices, however, appear to be still maintained at a relatively high level as compared with new machines. This is particularly true of shop tools.

The Minneapolis Steel & Machinery Company, Minneapolis, has been awarded the contract for six hydraulic turbines, two alternating current generators of 250 kw. each, two centrifugal pumps with an aggregate capacity of 2,100,000 gal. daily, exciter unit, switchboard, power-house, crane,

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&c., for a hydroelectric power and pumping station to be erected for the city of Idaho Falls, Idaho.

The Superior Iron Works Company, Superior, Wis., is making a feature of special machinery, including hoists, engines, &c., designed for operation under such conditions of service that standard types cannot be used to advantage. Much of this business originates in and around Duluth.

The Water & Light Commission, Anoka, Minn., has ordered from R. B. Whitaker & Co., St. Paul, two water tube boilers aggregating 300 hp., together with feed water heater and auxiliary apparatus. The same firm will furnish the stack for the furnaces. An electric generator of 175 kw. capacity, driven by a cross-compound Corliss engine, motor driven pumps, &c., will be separately contracted for this week. This equipment is to be added to the plant of the Western Water, Light & Traction Company, which the city purchased some time ago and will enable continuous 24 hr. service to be maintained, with possible use of commercial day load for local industries.

The Green Engineering Company, which has a district office in St. Paul, is introducing its chain grate stokers quite extensively through the Northwest, many owners of power plants having adopted them on account of the operating economy which they make possible.

The Bismarck Mining Company, Keystone, S. D., is preparing for a resumption of operations which will lead to the purchase, in due course, of considerable machinery. Other mines in the same district are also to be further developed.

W. I. Gray & Co., Minneapolis, have been awarded a contract by the Government to remodel the electric system at Fort Snelling.

Plans are now being worked out in detail by the engineers of the Lewiston-Clark Improvement Company for a large electric power station to be constructed in the vicinity of Lewiston, Idaho.

An election is to be held at Butler, S. D., to vote on the question of issuing bonds for the construction of a pumping plant and water distribution system.

The contract for an elevated steel tank to be used in municipal service at Raymond, Minn., has been let to the Des Moines Bridge & Iron Works, Des Moines, Ia.

Some additional equipment will probably be required in the near future for the plant of the Crookston Water Works, Power & Light Company, Crookston, Minn., where extensions in the service are under consideration.

A power plant is now in operation at the site of the Minnesota Steel Company's works near Duluth, together with temporary structures for the manufacture and handling of materials to be used in construction work, the concrete block factory being already a heavy producer. The erection of permanent buildings is just beginning. A double-decked bridge across the St. Louis River will soon be completed, and after this the delivery of material of all kinds will be considerably facilitated.

The installation or purchase of a municipal water works system is being discussed by the authorities at Stillwater, Minn.

The American Hoist & Derrick Company, St. Paul, Minn., will erect a building of steel construction 90 x 200 ft. for fabrication steel work. It will be equipped with electrically operated machinery which will be moved into the new building from other departments.

The Albia Business Men's Association, Albia, Iowa, has signed a contract with John Z. Evans of that city for the establishment of a factory to make mine equipment, consisting of coal cars, drills, tools, &c. The factory will be erected on a site 66 x 132 ft.

The Christie Engine Company, John T. Christie, secretary, Hummel Hotel, Waterloo, Iowa, has bought a tract of about 31 acres in North Waterloo, about one-third of which will be used by the company as a factory site. The plant to be erected by the company will consist of factory buildings, power plant and foundry. The power plant building will be erected at once, and when completed will be equipped with a 300 hp. Christie air-steam Corliss engine, which is now being built in Milwaukee, Wis. The other buildings will be erected as rapidly as possible.

The Russell Grader Mfg. Company, 2429 University avenue, Minneapolis, Minn., may purchase later on a large drill press, a standard size punch press, a multiple punch and a special forming machine to form half sections of corrugated pipe for a plant it is having erected at Minneapolis.

San Francisco

SAN FRANCISCO, CAL., July 20, 1910.

Reports from Los Angeles and from the northern cities indicate that the labor troubles are approaching an end, and the shops are expected to be in full operation within a few weeks under practically the same conditions as formerly prevailed. The situation at San Francisco is still unsettled, but a better feeling prevails, as the local unions are disposed to admit that hours and wages here cannot be radically different from those at other coast points. While San Francisco could not be placed on an open shop basis without a struggle, it is believed that the necessary readjustment of terms can be effected with little difficulty. If so, a renewal of activity in the local machinery trade is assured.

The machine tool market has not yet shown any signs of life, as the present equipment is adequate for most of the work in hand, and machine shop operators are unwilling to make any large purchases until the future is more definitely assured. No individual orders of consequence have been booked, and no large inquiries are in the market. A quiet condition is expected at this time of year, however, and local merchants take a cheerful view in regard to the fall trade. A fair volume of very small orders is coming from various shops in the interior.

The demand for miscellaneous machinery continues on about the same lines as before, with a little more activity in some departments. The largest movement is probably in road machinery. Inquiries are still coming in from all parts of the coast for every description of equipment used in highway improvements, and local dealers are having some difficulty in making prompt deliveries. Considerable improvement is noted in rock crushing machinery. Several large crushing plants of some importance have been sold, and dealers are getting behind on deliveries of small crushers. Agricultural machinery and implements still find some demand, though most lines are less active than a month ago.

Pumping engines of both local and Eastern make find a ready market, small irrigating pumps being one of the leading features. Equipment for handling oil is also in good demand, though oil well machinery is less active than for some time past, and some second-hand well rigs are on the market. This condition is due to the impossibility of transporting the oil now produced, and well equipment will probably be in small demand during the fall.

Local gas engine manufacturers report a material increase in their foreign business, and many orders have been placed by California interests for both local and Eastern makes of gas engines. The C. L. Best Gas Traction Engine Company has completed its factory in Oakland, Cal., and has recently placed several orders for engines with the Buffalo Gasoline Motor Company. This company is now demonstrating its engines, and announces that it will manufacture combined harvesters next summer.

Several large woodworking machines have been purchased by the Pacific Lumber Company, Eureka, Cal., and the Weed Lumber Company, Weed, Cal.

Henshaw, Bulkley & Co., local merchants, are furnishing an Austin rock crushing plant with a capacity of 2000 tons per day for the San Dimas Quarry Company, Los Angeles, Cal.

The Geo. E. Dow Pumping Engine Company, whose plant is in Alameda, Cal., has moved its San Francisco offices from First and Howard streets to the Sheldon Building, First and Market streets. The company has booked orders for two complete surface condensing plants for the Japanese Government. It is also installing an electrically driven pump of 3,000,000 gal. per day capacity for the city water works of Marysville, Cal., and is supplying all pumps for a new ferry boat which the Union Iron Works is building for the Santa Fe Railroad.

The Sacramento Valley Irrigation Company is planning to install a large pumping plant on the Sacramento River, near Red Bluff, Cal.

The San Francisco office of the Buffalo Gasoline Motor Company has been moved to 23 Main street, where a large display of gas engines is shown.

The volume of marine work is increasing, the most important item being the contract for two submarine torpedo boats, awarded to the Union Iron Works. Bids have been taken for new engines for the United States tug El Aguador. The Southern Pacific Railroad is preparing to build a large ferry steamer, and a number of smaller vessels are in prospect.

The Board of Public Works at Los Angeles, Cal., has been authorized to spend $10,000 for repair parts for machinery used on the construction of the Owens River aqueduct.

Work has been started on the new machine shop building of the Santa Fe Railroad at San Bernardino, Cal.

The Grandjean Gas Machine Company has been incorporated at San Diego, Cal., with a capital stock of $1,000,000, by G. R. Harrison, G. H. Ellerman, R. A. Wood and W. R. Gross. The company intends to manufacture gas engines under a patent held by Arthur Grandjean.

The Pendleton Iron & Metal Company has been incorporated at Los Angeles, Cal., by H. H. Benner, J. H. and A. M. Pendleton, J. H. and F. P. Alexander, with a capital stock of $50,000.

The Western Pacific Railroad has purchased a large

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concrete building adjoining its track in East Oakland, Cal., to be used as a machine shop.

The Griffin Car Wheel Company of Chicago has purchased a 15-acre tract at Los Angeles.

The Bunting Iron Works has been incorporated at Coalinga, Cal., with a capital stock of $150,000, by G. A. Scott, R. D. Jones, R. S. Essen, H. W. Bedford and J. T. Hall.

The Denver Rock Drill & Machinery Company, Denver, Colo., is preparing to enlarge its business facilities at El Paso, Texas.

The El Paso Bridge & Iron Company, El Paso, Texas, is planning to erect a new foundry.

The Farther Central West

OMAHA, NEB., July 25, 1910.

Except for purchases made by municipalities and public service corporations, activity in the machinery market is confined almost wholly at present to the Western mining territory. Buying for the account of industrial establishments is practically suspended. Some small orders are being placed, but nothing of consequence has developed very recently. Manufacturers of gasoline engines, concrete mixers, crushers, drilling outfits and contractors' machinery of various kinds are, however, shipping quite freely to other parts of the country, and many local plants are busy on tank, sheet metal and repair work, as well as iron and steel fabrication. Some inventory taking is being done. Conditions generally are merely what they have usually been during the heated season and possess no particular significance. For the future the outlook is bright, as the industries of this section are unquestionably on a sound basis of prosperity, and, with the good crops that are now expected, the purchasing power of the various States will be large.

The installation of an improved system of water works, with one or more pumping units, is proposed at Ephraim, Utah, where a bond issue has been provided for the purpose.

An electric generating plant will be installed at Ansley, Neb., for city service and the equipment of the pumping station strengthened. Purchases for that purpose are to be made in the near future.

C. Miller & Sons, Clermont, Iowa, are figuring on the installation of several electric power and lighting plants in that vicinity, contingent upon the granting of franchises by the local authorities in the communities affected.

Improvements in the water works system, involving the purchase of some new mechanical equipment, are being considered by the authorities at Red Cloud, Neb.

It is expected that plans will be determined upon in the near future for an electric power station to supply the Greeley, Denver & Northwestern Railway, Greeley, Colo., a company for the construction of which has recently been organized there.

The municipal authorities at Belle Plaine, Iowa, have under consideration an application for a franchise from H. R. Mosnat, who proposes to install a modern gas plant. The city itself maintains an electric power and lighting station of 125 kw. capacity.

The Salt Lake City, Utah, office of the Sullivan Machinery Company, whose works are at Claremont, N. H., and Chicago, Ill., is in receipt of numerous inquiries for air compressor outfits to be used at the mines. Sales recently have been excellent and there are indications of a heavy run of trade later on.

Owing to the rapidly increasing use of electric power at the mines and concentrating plants of the district, there will need to be additional distributing capacity provided for the plant of the Gilpin County Light, Heat & Power Company, Central City, Colo. The station from which it derives its power may also require some new machinery in the near future.

A concentrating plant will be erected before long and other improvements in its property made by the Continental-Morris Mining Company, Encampment, Wyo.

Some purchases of equipment are being made at present by the Charles City Western Railway, Charles City, Iowa, which has a new traction line under construction.

The Golden Sun Mining & Milling Company, Gilpin, Colo., is at work on a new ore reduction plant, the machinery in which will be driven by electric motors throughout.

A battery of boilers, engine, dynamo, motors and other mechanical equipment will be required in connection with a new county building at Marengo, Iowa, the plans for which are now being prepared by O. A. Hoagland, Chariton, Iowa.

The Omaha & Council Bluffs Street Railway Company, Omaha, Neb., has awarded the contract for the structural steel to be used in its new power house to the Wisconsin Bridge & Iron Company, Milwaukee. The building will be 140 x 245 ft. Some of the machinery required has been provided for and more will be purchased in the late summer and fall.

The North Pacific Coast

SEATTLE, WASH., July 22, 1910.

Trade remains quiet, but with excellent prospects for the future. At present a good deal of business is being derived from British Columbia, with scattering inquiries from the Northwest provinces; and the buying across the border, which is, in fact, largely for the account of Seattle, Tacoma and Portland interests, has gone far in compensating for dullness in other directinos. Orders for marine work have also helped out and Government contracts are an appreciable factor at this time. The labor situation is very well covered by statements issued in behalf of the Metal Trades Associations of the coast. So far as the north is concerned, manufacturers are successfully maintaining the non-union policy that has been adopted, and no complaint of unfilled contracts is heard.

At the Bremerton, Wash., navy-yard the Government is installing a very complete cutting and welding plant operated on the Davis-Bournonville system, which will be put in service at once.

An ore crusher of larger capacity than that heretofore in service is being installed by the Kennedy Mining Company, Susanville, Ore., which will extend its operations further during the fall. A new shaft is to be opened. This will probably necessitate the purchase of a heavier compressor, hoist and other machinery.

The Star Machinery Company, Seattle, which handles heavy contractors' outfits, as well as saw mill, planing mill, wordwooking, mining, crushing and marine machinery, is doing particularly well in that line at the present time, owing to the great amount of construction work now in progress. The machine shop which this company operates in connection with its businesss gives it the best of facilities for placing all equipment in first-class operating condition before delivery.

Contract for the erection of four steel bridges over the Chehalis River and other streams in the vicinity of Chehalis, Wash., has been awarded the Penn Bridge Company, Beaver Falls, Pa. This is one of the few such contracts that have gone East recently.

Machinery equipment of various kinds will be needed at intervals, within the next few months, by the Globe Mining Company, Orient, Wash., which is running a long tunnel to develop its property there.

The Mianus Motor Works, Seattle, Wash., are making a specialty of gasoline engines, for which the demand recently has been quite heavy. For the coming year an enlarged output will be necessary.

A new engine built in the shops of the Brownell Company, Dayton, Ohio, has been installed by the Hartford Shingle Company, Everett, Wash., which will probably make further improvements in its plant later on.

The engines of the International Harvester Company have been placed to a considerable extent in this section by the Poulsen Implement Company, Seattle, Wash.

The Chamber of Commerce, Aberdeen, Wash., is carrying on a vigorous campaign for the location of new industries in that city.

The Seattle Engineering Company, whose offices are in the Central Building, Seattle, Wash., are making a specialty of hydroelectric power and pumping plants, in the construction of which there has recently been great activity.

The Norwalk Steel Company has been organized by T. L. Croteau, Albert F. Jones and others, of Portland, Ore., to establish a plant for the manufacture of iron and steel. It is incorporated for $50,000. Further details have not been made public.

A large new timber cutting plant will be built at Ellensburg, Wash., by the Walther Lumber Company, whose main office is in the Lindell Building, Spokane, Wash.

The Pacific Ornamental Iron Works, Seattle, Wash., as the result of the activity in building operations, have been doing a very satisfactory business for some months past, and the outlook for fall trade is good.

The manufacturing plant of the Onn Lumber & Shingle Company, Tacoma, Wash., which was destroyed by fire on June 28, will be rebuilt at once for considerably increased capacity. Motor drive is to be used and the machinery laid out in accordance with the most modern practice.

The Central-Chehalis Company, Chehalis, Wash., is having a new steel gas holder of 100,000 cu. ft. capacity built in connection with its new plant, which will be completed Sept. 1.

By the sale of bonds recently voted at Ashland, Ore.,

THE MACHINERY MARKETS

funds will be provided for the completion and equipment of the municipal power plant as originally planned.

The Ocean Falls Company, composed of American interests, is erecting a large pulp mill and other buildings at Ocean Falls, B. C., for the account of which heavy purchases of machinery have recently been made. A hydro-electric plant will be established in connection with the enterprise and various auxiliary industries started. Included in the equipment will be tools for repair work.

The Standard Pattern & Model Works, Seattle, Wash., which is located at 1028 First avenue, South, continue to have a good run of business, despite the dullness in some lines, and an increase in facilities is reported to be contemplated.

Electric generating units aggregating 1500 kw. in capacity will be provided some time this year for the power plant of the Crook County Water, Light & Power Company, Redmond, Ore.

The Robinson Mfg. Company, Everett, Wash., has placed an order with the Seattle office of Allis-Chalmers Company for a 155 kw., 900 rev. per min., 60 cycle, three phase, 480 volt, alternating current generator, and a number of induction motors, to be installed in a new plant which the company is now constructing.

The Wright & Smith Company's machine shop, which was removed to the King Street Dock, at the foot of King street, is doing a good business in the new location. A good deal of repair work is offering at this time.

The firm of Daggett & Jacobsen, with headquarters in the Peyton Building, Spokane, Wash., succeeds to the engineering business established by G. F. Daggett.

The new pumping station at Spokane, Wash., which has a capacity of 36,000,000 gal. daily, has been placed in operation.

The Ransome-Crummy Company has leased two rock quarries at Klamath Falls, Ore., where a large crushing plant will be installed.

Government Purchases

WASHINGTON, D. C., July 25, 1910.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids August 9 under schedule 2740, for one punching and shearing machine, one planing and jointing machine, one chain saw mortiser, one drop table molder and one sensitive press drill.

The Isthmian Canal Commission, under circular 597, will open bids August 2 for furnishing dredge chains, attachments, plugs, &c.

The Isthmian Canal Commission will open bids August 19, under circular 598, for sluice gate valves, pumps, condenser tubes, &c.

The Bureau of Supplies and Accounts, Washington, D. C., Navy Department, opened bids July 19, as follows;

Class 51.—One universal cold saw cutting machine—Bidder 102, Manning, Maxwell & Moore, New York, $5950; 106, Newton Machine Tool Works, Philadelphia, Pa., $6512 and $6855, $6900; 109, Niles Bement-Pond Company, New York, $6417; 155, Tindall-Morens Company, Eddystone, Pa., $5954.

Class 61.—Boiler, stoker, &c.—Bidder 64, G. & W. Mfg. Company, New York, $2651, $8443 and $6693; 84, E. Keeler Company, Williamsport, Pa., $6122; 72, Heine Safety Boiler Company, St. Louis, Mo., $5900; 173, Babcock & Wilcox Company, Philadelphia, Pa., $5748.

Class 71.—Thirteen compressd air driven hammers and two drilling machines—Bidder 33, Chicago Pneumatic Tool Company, Chicago, Ill., $686; 39, Cleveland Pneumatic Tool Company, Cleveland, Ohio, $659.50; 56, Fairbanks Company, Washington, D. C., $485.60; 78, Independent Pneumatic Tool Company, Chicago, Ill., $685.50; 79, Ingersoll-Rand Company, New York, $548.64 and $363.20; 124, Pittsburgh Pneumatic Company, Pittsburgh, Pa., $250.90, part.

Class 72.—Two sets of gasoline machinery—Bidder 37, Camden Anchor Rockland Machine Company, Camden, Maine, $700; 151, Tasker & Strobridge, Philadelphia, Pa., $910; 168, Wallace Brothers, Norfolk, Va., $1058.05.

Class 91.—Motor generators, motor generator sets and spare parts—Bidder 46, Diehl Mfg. Company, Elizabethport, N. J., $1641.30; 54, Fort Wayne Electric Works, Fort Wayne, Ind., $1383; 59, General Electric Company, Schenectady, N. Y., $3026; 174, Crocker-Wheeler Company, Ampere, N. J., $1410.

Brazil to Encourage Its Iron Industry

In transmitting the following announcement, made by President Pecanha on May 12, Consul-General George E. Anderson of Rio de Janeiro, says that it is chiefly significant of the policy of the Brazilian Government, and that a definite contract for the actual establishment of a plant would probably contain other and special concessions:

"Consideration has been given to several proposals which have been made to the government for the establishment of the iron industry, and it has been decided to make general provisions relative thereto. To establishments which shall undertake to operate furnaces for the smelting of iron ore, with facilities for the reduction and refining of the same and machinery adapted to the production of plates, rods and various iron and steel products, the following concessions will be granted, with special privilege to none:

"Reduction of freight rates on Federal railroads for raw and manufactured products on the bases of the following: Coal, coke and other materials destined for use in ore reduction and iron working shall pay 8 reis per ton-kilometer, or about 0.4 cent per ton-mile; pig iron in bars and ingots shall pay 12 reis per ton-kilometer, or about 0.6 cent per ton-mile; iron or steel in a manufactured or partially manufactured state shall be given a rate of 14 reis per ton-kilometer, or about 0.7 cent per ton-mile; exemption from consumption taxes and charges for dispatching through customs for all machinery and apparatus and for necessary materials for use in such establishments; privilege of constructing quays, bridges, docks and other apparatus necessary for the handling of ore and other material going to or from the establishments; reduction of dock charges for ore and coal; privileges for building connecting spurs or switches from the mines or furnaces to any Federal railroad; and special facilities for the transfer of materials in transit from a railroad of one gauge to one of another.

"The government claims the right to insist upon the installation of special equipment for supplying armament and naval equipment and to fiscalize the establishments temporarily. Time limits for the installation and equipment of these establishments and the minimum amount of production in each case will be determined in accordance with the needs of each case and with local conditions."

The Dayton Motor Car Company's Large Plant

The Dayton Motor Car Company, Dayton, Ohio, is pushing construction on its No. 3 plant. This plant will have 86,000 sq. ft. of floor space in the foundry; the forge shop will have 12,000 sq. ft., equipped with 12 drop hammers and other fabricating machinery; the frame room, in which are installed hydraulic presses, punches, &c., contains 12,000 sq. ft.; the radiator and sheet metal departments occupy about 14,000 sq. ft. In addition to this there will be two assembly buildings with a total of 125,000 sq. ft. of floor space. These buildings are erected on a 25-acre tract of land within the corporate limits of the city, and around the entire tract is being constructed a testing track 20 ft. wide. All the cars assembled in this plant, as well as those built in plants Nos. 1 and 2, will be tested on this track. There will be few changes in Nos. 1 and 2 plants. These will continue about as they have been for the past year, with a few extensions. The Stoddard-Dayton cars, all parts for which the company manufactures, will be built as heretofore in the No. 1 plant, which occupies about 350,000 sq. ft. of floor space. The Courier car, now known as the Stoddard-20, will be built in the No. 2 plant, with about 80,000 sq. ft. of floor space. All machinery at present required has been purchased.

The W. H. Clore Mfg. Company, Washington, Ind., recently incorporated, will occupy an L shaped building, 50 x 750 ft., located on 5 acres of ground and served with ample switching facilities. The company is not considering the purchase of any new equipment at present, but as the plant to be occupied at Washington is considerably larger than the one now occupied by the company it is quite likely that additional machinery will be needed in the future and manufacturing facilities extended.

Steel for Rails and Cars

American Experience as Given at the Berne Congress

Two papers by representatives of the railroads of the United States attracted attention at the recent International Railway Congress at Berne, Switzerland. From abstracts given by the London *Times' Engineering Supplement* we take the following:

In an important report presented by M. L. Byers of the Missouri Pacific Company, it was pointed out that there has been a considerable increase in the weight of locomotives in the United States, and that, although for a time the increase in the size of the locomotive was checked by the difficulty of securing sufficient heat from the narrow firebox to meet steam-generating requirements, that condition has of late years been met by the more extended use of the Mallet type of locomotive with two independent sets of drivers and cylinders. The effect of that departure in design has been to secure a larger and more powerful locomotive without adding to the existing maximum load. Mr. Byers instanced the severest load per foot of track arising from any American rolling equipment of today as that produced by the Pacific type passenger locomotive of the Pennsylvania Railroad, with its three pairs of driving wheels having a load of 61,300 lb. per axle on a total driving wheel base of 13 ft. 10 in. He believed, however, that present standard American tracks could be so strengthened as to make it improbable that there will be any immediate need for a radical change in the type of roadway construction. He also pointed out that experiments suggested possibilities of economy in rail wear by the use of a single rail section specially designed for straight track, and of one or two rail sections specially designed for curves. He believed that no compromise section of rail could be designed which would be economical under all conditions of curvature.

The increase in the permissible percentage of carbon in rail steel due to the reduction in the percentage of phosphorus obtainable by the use of the basic open hearth process has resulted in a steel of such superior qualities as to point to the gradual abandonment of the acid Bessemer process, as the high grade ores with low content of phosphorus become exhausted. Alloy steels were referred to as offering great possibilities for steel rails if the cost could be reduced. The design of the rail section to permit of the rolling of the head at low temperatures was regarded as of the utmost importance. With regard to the strengthening of bridges, it would seem that no special rules can be laid down, but that each case must be considered on its merits. In deciding whether a bridge is to be strengthened or rebuilt the reports stated that the question of cost is an important factor, but that in the case of bridges of small span it is preferable to replace them with new structures. Mild steel is used in current practice in strengthening work, and ingot iron could be employed without hesitation for strengthening wrought iron bridges. The average cost of strengthening works was estimated at twice the ordinary cost per ton of new bridges.

Steel in Railroad Equipment Construction

In Section 2 the first group of reports taken were those dealing with the use of steel in the construction of locomotives and rolling stock. A somewhat monumental report was brought up by D. F. Crawford of the Pennsylvania Company, which has used steel for the construction of freight and passenger cars for many years. Mr. Crawford largely confined his report to the modern freight car, which since its construction in steel has had the effect of creating an entirely new industry. He told the Congress that in 12 years the larger car manufacturing companies in the United States had built over 300,000 all-steel cars and about 250,000 steel underframe cars. There are now in use on American railroads over half a million such cars, representing from 20 to 22 per cent. of the freight-carrying cars in use. It is impossible, he said, to give any accurate comparison of the first cost of steel cars and cars of wooden construction, as the steel cars are of much stronger design, and part of the higher cost is therefore due to increased strength rather than to the change in the material. A large portion of this extra cost is, however, soon replaced by the lower maintenance charges for the all-steel car. Statistics show that such cars can be maintained for about $30 per car per year, compared with $60 per car per year for cars of wooden construction. Some interesting figures were also quoted in regard to weight and capacity of cars of steel construction or having steel underframes. It was shown that with an increase of 67.5 per cent. in the average paying load per car the average weight of the vehicle increased but 47 per cent. This diminished percentage of dead weight to capacity has had the effect of enabling a given locomotive to haul about 60 per cent. more paying load than it could have hauled in the cars of lower capacity formerly in service. In the case of passenger cars for which steel is now being largely used, over 1000 being now in service, a high factor of safety is, of course, desirable, and the design of the center sill construction of a car illustrated in the report was based on end shocks equivalent to 400,000 lb. compression. In the construction of steel passenger cars open hearth steel of low carbon content containing about 0.06 per cent. of phosphorus is used.

Correction.—In the illustrated description of the Mellberg tube closing machine printed in *The Iron Age*, July 21, 1910, the name of the maker by a typographical error was given as the Mellberg Machine Company. It should have been the Mellberg Mfg. Company.

The June 30 bank statement in Oklahoma shows that there was little ground for the fear that the national banks in that State, being outside the pale of the guarantee of deposits in State banks, would lose accounts to the latter. Between January 31, the date of the last previous report, and June 30, deposits in the guaranteed banks declined from approximately $50,000,000 to $45,000,000. In the same period the number of State banks increased from 668 to 691. Resources of the State banks declined from $68,000,000 at the time of the January report to $60,000,000 on June 30.

The United Steel Company, Canton, Ohio, has purchased 137 acres of land about a quarter of a mile distant from the location of its present plant. This land has been secured to take care of future extensions, the present site not being adapted to further enlargement, as it is hemmed in on all sides by other plants. It is probable that the company will build a blast furnace next year, but it states that it does not expect to start any new construction work this year.

The Chickamauga Steel & Iron Company has been incorporated under the laws of New Jersey with a capital stock of $5,000,000, divided into common shares of the par value of $100 each. The incorporators are George W. Adams, Montclair, N. J.; Robert W. Pollock, 51 Chambers street, New York City, and Francis Van Winkle, 134 Guernsey street, Brooklyn, N. Y. The Registrar & Transfer Company, 15 Exchange place, Jersey City, N. J., is the registered agent.

The New York Metal Exchange will open Monday, August 1, in new quarters in the Trinity Building, 111 Broadway, New York. It is an interesting coincidence that 28 years ago to the exact date the Metal Exchange was instituted in the building at 34 Pearl street, which was recently sold.

New Tools and Appliances

The Linsley Drill Holder for Lathes.—The Linsley Tool Company, Cleveland, Ohio, has brought out a drill holder for use with lathes where the shank is turned to fit the tailstock spindle and the outer part or body is bored to fit the drill or tool shank. A cross pin having a loose sliding fit in a hole bored through the holder has a grove cut in it whose sides extend down over the tang of the drill and prevent the latter from turning. The bottom of the groove is cut on an incline so that the pin can be used to force the drill from the holder and in use the end of this pin bears against the tool rest.

Recording Thermometers.—The Taylor Instrument Companies, Rochester, N. Y., has brought out and perfected a new type of recording thermometer covering various ranges of temperature. Among the advantages claimed for this instrument are ease in reading the chart, as the scale divisions are uniform throughout the entire range, and a large recording space, 3⅜ in. being provided for that purpose on a 10-in. chart, as compared with a space of 3½ in. on the 12-in. charts ordinarily used. These thermometers are provided with a temperature bulb which actuates the recording mechanism, the connection being made by 6-ft. capillary tube.

Expanding Boring Bar.—The Buck Boring Bar Company, Huntington, W. Va., is making a bar designed for boring car wheels which is provided with four cutters that are all independently adjustable so as to divide up the metal to be removed. The inner ends of the cutters rest against wedges in the center of the bar and are adjusted by set screws located along the center line of the end of the bar. A cutter is provided for chamfering the end of the bar and there is also a water attachment so that a small stream of water is directed to the cutting tools. Each size of bar has a range of adjustment of 2 in., so that it will bore two sizes of M. C. B. standard wheels. It is stated that with this tool from 70 to 80 steel wheels have been bored in a 10-hour day.

After 40 years' service the oak floor in the works of the Charter Gas Engine Company, Sterling, Ill., has been taken up and is being replaced by concrete. Although there has been a great deal of trucking and moving of flywheels and other heavy castings on this floor, it is stated that there has been comparatively little wear and that some of the flooring is in better condition than the new material purchased in the market at the present time.

The American Institute of Chemical Engineers has issued Vol. II. of its *Transactions,* covering the proceedings and papers of its first semiannual meeting, held at the Polytechnic Institute, Brooklyn, N. Y., June 24 to 26, and of the second annual meeting, held at Hotel Walton, Philadelphia, December 8 to 11, 1909. The volume comprises 308 pages and has been published for the Institute and is for sale by the D. Van Nostrand Company, New York.

The A. L. Greenberg Iron Company, Terre Haute, Ind., has purchased a site containing 13 acres, and will immediately begin the erection of four one-story factory buildings. It will also erect a building for the manufacture of road machinery, culverts and steel bridges. It is the intention of the company to raze its old plant upon completion of the new buildings, which will be equipped throughout with new machinery.

Creditors of the March Brownback Stove Company, Pottstown, Pa., have petitioned the court for a receiver. Bills in equity were filed by Willis G. Roberts, executor of James Rogers, deceased; Michael March, administrator of T. J. March, deceased, and Henry M. Miller, executor of Franklin March, deceased. The company is one of the important industries of Pottstown. The receiver has not yet been named.

The city of Providence is establishing a half time or co-operative school in which the Rhode Island Branch, National Metal Trades Association, is co-operating. Russell C. Lowell, instructor in mathematics and electrical engineering at the Providence Technical High School, has been placed in charge of the new course.

The Fayette County Gas Company, Connellsville, Pa., has made an advance in rates charged for natural gas, effective August 1. The general consumer will pay 27½ cents net, instead of 25 cents, per 1000 ft.; for the second 150,000 ft. per month, 20½ cents will be charged, and for over 300,000 ft., 14½ cents.

The new ore boat, W. C. Moreland, being built for the Jones & Laughlin Steel Company, was launched at Cleveland on Wednesday. She is a sister ship of the B. F. Jones and James Laughlin, owned by the same company, for which company a fourth ore boat is being built at Cleveland, to be named Willis L. King, in honor of the vice-president.

A contract for the erection of a new roundhouse for the Bessemer & Lake Erie Railroad at Greenville, Pa., has been placed with the Pittsburgh Construction Company, Pittsburgh. The plans call for a reinforced concrete building, containing 17 stalls for locomotives.

The Warwick Iron & Steel Company, Pottstown, Pa., blew in its No. 1 Furnace on July 22. This stack has been undergoing repairs for several months, and will be operated on foundry iron, for which the company has a large number of orders.

E. E. Brosius, Pittsburgh representative of the Atlas Car & Mfg. Company, Cleveland, Ohio, has sold to the McKeesport Tin Plate Company, McKeesport, Pa., 135 steel cars to be used in handling plate in the company's tinning and hot mill buildings.

The Aluminum Company of America, New Kensington, Pa., has let contracts for the erection of two new buildings, each 40 x 116 ft., one to be used as a melting room and the other as a warehouse.

The new No. 2 furnace of the Detroit Iron & Steel Company, on Zug Island, below Detroit, was blown in last week. It is 80 ft. high, 12½ ft. hearth and 18½ ft. bosh, and is equipped with four McKee hot blast stoves.

Spang, Chalfant & Co., Inc., operating the Etna Iron & Tube Works, Pittsburgh, have increased their capital stock from $900,000 to $2,000,000, to cover improvements in plant already made and others that are contemplated.

The recent labor trouble at the plant of the Standard Tin Plate Company, Canonsburg, Pa., has been satisfactorily adjusted to both sides, and the entire plant of this concern is now in full operation with plenty of orders ahead.

A Pennsylvania charter has been granted to the Greenville Metal Products Company of Greenville, Pa.; capital stock, $250,000, to manufacture drop forgings and parts of automobiles, steel cars and other vehicles.

Trade Publications

Electric Motors.—Sprague Electric Company, 527 West Thirty-fourth street, New York City. Bulletin No. 600. Gives general description and specifications for a line of single and polyphase induction motors. The different models of both types of motors are described and the different parts shown. Dimension tables and diagrams of the connections for both forms of motors are included. The polyphase motors are made for voltages of 110, 220, 440 and 550, while the larger sizes above 20 hp. are also wound for 2200 volts. The single-phase motors range from ¼ to 5 hp. and are wound for 110 or 220 volts, the latter being the standard winding for the larger sizes.

Recording Instruments.—The Bristol Company, Waterbury, Conn. Booklet. Size 8¼ x 10¾ in.; pages 64. Is not a catalogue but rather a series of illustrations of the more important Bristol instruments, with a partial explanation of the instruments and their applications. Contains a brief account of the progress made in the last 20 years in the development and manufacture of recording instruments for pressure, temperature and electricity. This is followed by illustrations of the different instruments, which include gauges for recording pressure, vacuum, draft, differential pressures and water levels; recording thermometers; thermometer-thermostats; indicating thermometers; electric pyrometers, indicating and recording and combined; recording ammeters, voltmeters and wattmeters; electric and mechanical time recorders; long distance recording tachometers; and a radii averaging instrument. Illustrated descriptions of the electric time recorder and the radii averaging instrument were printed in *The Iron Age* November 19, 1908, and June 30, 1910, respectively.

Lever Shears.—American Roll & Foundry Company, Canton, Ohio. Bulletin No. 10. Illustrates and describes a line of lever shears which are built in both low and high knife models in either right or left-hand types designed to be driven either by a direct-connected electric motor or by a belt from shafting. Six sizes in all are built, ranging in capacity from 1½ and 1¼ in. square stock to 6 in. square stock and miscellaneous scrap.

Steel Shafting.—Columbia Steel & Shafting Company, Pittsburgh, Pa. Catalogue and standard price-list of turned cold die rolled and polished steel shafting; drawn and polished squares, hexagons and flats; screw stock, and piston and pump rods. Tables are appended giving the weight per lineal foot for the different shapes, one of which shows the weight of finished shaft from 15-16 to 6 in. in diameter and from 1 to 24 ft. in length. The customary tables of decimal equivalents and standard wire and thickness gauges are also included.

Hydraulic Dredges.—Ellicott Machine Company, Baltimore, Md. Catalogue. Size 6 x 9 in.; pages 48. This is the company's 1910 catalogue describing and illustrating a line of hydraulic pipe line dredges. These vessels are built with capacities ranging from 1000 to 1500 cu. yd. per hour and are capable of delivering the excavated material through pipe lines exceeding two miles in length. Both wooden and steel hulled types are built, the latter being designed more especially for service in tropical waters where wood destroying worms are present. The illustrations include a number of different styles of dredges and views of the engines and dredge pumps employed.

Self-Measuring Gasoline Tank.—S. F. Bowser & Co., Ft. Wayne, Ind. Catalogue No. 2. Deals with the Bowser gasoline storage outfits. These are made in a number of different styles for storing the liquid underground in accordance with the Fire Underwriters' requirements, a portable wheel tank for supplying a large number of automobiles in a very short time, a direct-connection storage outfit which is the same as the one first mentioned except that the pump is connected directly to the tank, a special outfit in which the liquid can be pumped to different floors of a building, a number of cabinets and tanks for outdoor use where it is desired to locate the tank outside of and away from buildings, and fireproof cabinet in which the lumber used in its construction is covered both inside and out with galvanized sheet steel. All of the different tanks are illustrated and described and space is given to accessories such as a nozzle filter, a meter for recording the amount of gasoline pumped, hose for use with a portable filling nozzle, and a siphon and force transfer pump for transferring oils and liquids from the barrel to the storage tank.

Battery-Charging Rheostats.—Cutler-Hammer Mfg. Company, Milwaukee, Wis. Booklet. Size 5¼ x 8¼ in.; pages 48. Describes the company's entire line of battery-charging rheostats, which include two types for charging ignition batteries and six types for general charging work. All of the standard types are illustrated as well as several special ones, such as a motor-generator set panel and a panel for use with a gas engine driven dynamo and storage battery. Another section is devoted to descriptions and illustrations of protective panels and devices, and the application and advantages of these are pointed out.

Automobile Gauges.—The Industrial Instrument Company, Foxboro, Mass. Bulletin No. 36. Describes and illustrates a number of different types of gauges for use on automobiles for showing the oil pressure on the lubricating system, water circulating pressure, air pressure forcing fuel to the carbureter, boiler and fuel pressure on steam cars, illuminating gas tanks, tire pumps, and testing the cylinder compression. These instruments are made with eccentric and concentric dials and are equipped with either bottom or back connections and plain or beaded rings.

Vacuum Cleaning Systems.—The Blaisdell Machinery Company, Bradford, Pa. Catalogue. Describes the portable and stationary types of mechanical vacuum cleaning plants which this company builds and a number of buildings in which these plants have been installed. The layout of a typical vacuum piping system is shown and a diagram showing the approximate dimensions of plants having a capacity of from 1 to 20 sweepers is appended.

Steel Oil Derricks.—Carnegie Steel Company, Carnegie Building, Pittsburgh, Pa. Pamphlet. Devoted to steel derricks and drilling machines for oil, gas, salt, and other wells. Space is given to a description of the progress made in the art of designing from 1808, when the first well was drilled, to 100 years later, when the first all-steel drilling machines were placed on the market by this company. The different types of machine are described and this description is supplemented by complete and detailed illustrations.

Hoisting and Conveying Machinery.—Victor R. Browning & Co., Cleveland, Ohio. Catalogue, 6 x 9 in.; pages 24. Calls attention to a line of hoisting and conveying machinery which includes plain and geared I-beam trolleys and I-beam track systems for foundries, jib cranes, hand-power floor operated cranes, electric traveling cranes operated either from the floor or a cage, gantry bridges, man trolleys for handling coal, sand and granulated slag, and clam shell and orange peel buckets. The different pieces of apparatus are described and illustrations show some of them in use.

Expansion Bolts.—A. S. Seaman, 1638 Hutchinson street, Philadelphia, Pa. Price-list of the Positive expansion bolt and iron and brass expansion machine screws. These bolts are made in a number of different types, having a square head, a nut, hook, eye, and hitching ring, a hanger bolt for supporting mine hangers, and an eye shoulder expansion bolt for fastening guys for smokestacks, derricks, signs, stone dock walls, and supporting trolley wires. The screws are made with either flat or round heads. The different styles of bolts and screws are illustrated and tables are appended showing the different sizes and lengths made in each style.

Upholsterers' Wire Spring Machines.—Henry Spühl, St. Gall, Switzerland; Ed. Brand, 472 Moss Lane East, Manchester, England, sales agent. Pamphlet. Illustrations and descriptive matter explain the operation of a line of winding machines for turning out upholsterers' wire springs in a number of different sizes and styles. The machines include winding machines for ordinary double and single cone springs, others for knotting the springs and fixing the metal ties on the springs, and apparatus for setting both the single and double cone springs so that they will maintain their hight when in use. Specifications for the different machines and a partial list of users are appended.

Condensers.—Allis-Chalmers Company, Milwaukee, Wis. Two bulletins. No. 1070 covers the type B barometric condenser, which is built entirely of cast iron. The interior construction includes no bolts, rivets, screws or other parts that can get out of place and nothing that requires adjustment or attention. When once set up and put in operation it is stated that the condenser will give satisfactory service as long as the cast iron lasts. No. 1071 deals with the type C jet condenser, which is said to be the only jet type of condenser where the vacuum can be formed or recovered with full load on the engine or turbine without stop valves in the main exhaust pipe or auxiliary forced injection. This piece of apparatus is so designed that all the parts exclusive of the piping are placed entirely beneath the turbine and between the foundation columns, which make it possible to place the turbines as close together as may be desired. The exhaust opening of the condenser is bolted to the exhaust opening of the turbine through an expansion joint, an arrangement which eliminates all the exhaust piping and decreases the number of joints to the two required for the expansion connection, thus reducing the opportunity for leakage of air and consequent impairment of the vacuum. All the internal parts of the condenser are so arranged that they naturally lock together when the outer heads are bolted to the flanges on the outside of the shell, and special care has been taken to prevent water getting into the exhaust end of the turbine if the water pumps should stop for any cause.

Pyrometers and Related Apparatus.—S. H. Stupakoff, Pittsburgh, Pa. Catalogue. Treats of a number of different styles of pyrometers, such as portable base metal pyrometers, stationary pyrometers for medium and high temperature furnaces, thermo-electric pyrometers for blast furnaces, the Fery radiation pyrometers and electric resistance pyrometers. Other apparatus illustrated and described includes mechanical thermometers, automatic temperature regulators, indicating gauges, hydrostatic draft and pressure gauges, and a hydrostatic velocity gauge for the gases of combustion, the last two being of the recording type.

Combination Feed Water Heater and Softener

Where condensate from a surface condenser or returned water from heating or drying systems forms a considerable part of the boiler feed supply, it is often necessary to make up the full amount of feed water required by the boiler by adding water which is of a scale forming or corrosive nature. On account of the disproportionately large cost of putting in a softening system of the usual type for this small amount of water, it is usually fed to the boilers without treatment, with the result that scale is formed in the boilers. While the scale so formed is less than the amount that would be deposited if raw water alone were used for the boiler feed supply, the scale is, on the other hand, apt to be hard, and, because of its slow formation, apt to be overlooked, resulting frequently in the unexpected burning of plates and tubes, leakage at seams and tube ends, &c.

This problem has been attacked by the Harrison Safety Boiler Works, North Philadelphia, Pa., in its recently published *Engineering Leaflet,* No. 7, entitled "Combination Feed Water Heaters and Softening Systems," which describes an apparatus designed for plants in which such conditions obtain. This apparatus differs from its well-known Sorge-Cochrane hot process system in that provision is made for heating the two separate water supplies independently and for treating only one with a reagent. The condenser discharge or other returns, after passing over heating trays, pass directly to the pump supply chamber or pure water compartment, whereas the raw water, after heating and mixing with the reagent, falls into a spacious sedimentation chamber and afterward passes through a filter bed before entering the pure water compartment. To insure a continuous supply of water to the boilers in case of clogging of the filters, there is an automatic by-pass which, in case the level of the water in the pump supply chamber should fall below a certain level, will supplement with sufficient hot treated water to supply the pumps.

In a hot process system the "temporary" hardness or carbonates are precipitated by heat, and the only reagent required is that needed for the transformation of "permanent" hardness, such as sulphates, chlorides, nitrates, acids, &c. Due to the use of only one reagent, the management of the apparatus is much simplified, no complicated chemical analyses being required, as where two reagents must be proportioned to the varying requirements of the water. The apparatus has the further great advantage over a cold process system that it performs, in addition, the functions of the feed water heater, which should be installed in any case. For this purpose it can be adapted to any of the various forms assumed by open feed water heaters; that is, it can be used as heater and receiver in connection with an exhaust steam heating system, &c. This pamphlet should prove of interest to engineers having to do with steam plants where scale forming water is encountered.

The Keuffel & Esser Company Celebrates.—On the evening of July 19 the Keuffel & Esser Company, Hoboken, N. J., manufacturer of drawing materials and engineering supplies, celebrated the forty-third anniversary of the founding of the house by a banquet to its employees at Grand View Park, in Jersey City Heights. Interest was added to the occasion by the fact that four employees this year complete their twenty-fifth year of service with the company. Appropriate gifts were presented to them by the firm, and some very handsome testimonials were also given by their fellow workmen. The unusual spectacle of 12 veteran employees, who have completed a quarter of a century's service with the company, occupying the places of honor with the officers of the company was an inspiration to the 500 younger employees present. The affair proved such a success in cementing the interests of all concerned that the banquet will no doubt be made an annual institution.

Texas Coal Deposits

It is estimated by Dr. William B. Phillips, director of the Bureau of Economic Geology of the University of Texas, that the known deposits of coal in the State aggregate approximately 8,000,000,000 tons and of lignite 23,000,000,000 tons. This is enough fuel to keep Texas supplied for 3000 years at a rate of 10,000,000 tons production per annum. M. R. Campbell, of the United States Geological Survey, who investigated the coal and lignite resources of Texas, gives an estimate that tallies with that of Dr. Phillips. During the year 1909 the coal production in Texas was 1,144,108 tons, valued at $2,714,630. The production of lignite in the same year was 715,151 tons, valued at $592,421. It will be years until the production of coal and lignite in the State will aggregate 10,000,000 tons per annum. In addition to the domestic fuel that is used, large importations of coal are made from Oklahoma and Alabama each year. This is mainly due to the fact that comparatively little attention has so far been given to the development of the native resources, largely on account of the lack of direct lines of railroad between the coal fields and the industrial centers of the State.

There are two coal producing districts in the State, one in the northern counties of Palo Pinto, Parker, Wise and Young, and the other in the southwestern counties of Maverick and Webb. The lignite production area includes the counties of Bastrop, Fayette, Hopkins, Houston, Leon, Medina, Milan, Robertson and Wood. It is the belief of geologists that the coal belt in the southwestern part of the State extends for a great distance along the Rio Grande. There is an enormous territory in which no exploration has been made. In some localities of this remote region coal outcroppings are known to exist.

The Canton-Hughes Pump Company's Enlargement

The Canton-Hughes Pump Company, Canton, Ohio, announces that it will build a new plant at Wooster, Ohio, which will double its present output. Owing to the growth of its business the company finds its present factory capacity entirely inadequate. In addition to requiring more room the company feels the need of a type of plant somewhat different from its present one because of the larger work that it is building each year. At present it has contracts for high duty pumping engines weighing from 200,000 to 300,000 lb. The new plant will be equipped for taking care of not only the smaller work, but more particularly the heavier class of work.

Plans for the new plant have not been completed, but it is the intention to build a plant that will furnish employment for 300 men. To secure the plant for that city, the Wooster Board of Trade agrees to furnish a 5-acre site and give the company a bonus of $30,000. The present plant at Canton will be retained. As Wooster is but 32 miles from Canton, the company expects no inconvenience in the operation of the two plants. The Canton-Hughes Company reports that it is receiving orders from a very extended field, a good volume of foreign business coming from the trade centers of Europe and from China, Japan, Australia, South Africa and the Philippines.

Correction.—In the article descriptive of the large manganese bronze water wheel runner printed in *The Iron Age,* July 21, 1910, the address of the Pelton Water Wheel Company was erroneously given as Philadelphia. It should have been San Francisco.

Floor Surfaces for Machine Shops

In a pamphlet entitled Wearing Surfaces for Factory Floors, the Aberthaw Construction Company, Boston, Mass., presents the results of an investigation into the experience of machine shops and other factories with granolithic and wood floors. The inquiry was undertaken because the question has been repeatedly asked by the owners of new fireproof buildings which type of floor is cheapest and best. While the firm whose specialty is concrete construction is satisfied that the granolithic surface, when properly laid under favorable conditions is the cheapest and for all-round service the most durable floor, it undertook to gather testimony from a large number of machine shops, textile and paper mills, architects and engineers and the 118 replies received form the basis of the report and discussion.

Sixty-eight per cent. of the replies came from machine shops, including many of the largest in the region east of the Mississippi and north of Baltimore. Twenty-seven per cent. of these reported no experience with granolithic finish, and hence no basis for comparison; 25 per cent. were in favor of granolithic floors on all considerations as the result of their own experience with both types, while the remaining 48 per cent. offered various criticisms of the granolithic surface, either for its effect on the health of the operatives or for unsatisfactory wear.

Discussing the effect on operatives, the report states that workmen who have to stand still on an unheated cement floor, as at bench or lathe work, may suffer from sore feet and from lameness in the legs, which is attributed to the efficiency of concrete as a conductor drawing heat from the feet and legs and not to the hardness of concrete floors. Two remedies suggested are the use of wooden gratings for men at stationary work to stand on and the heating of concrete floors by hot air ducts or steam pipes laid in them, making the concrete floor slab the radiating surface for the warming of the building, which has been successful in the plant of the Morse Chain Company, at Ithaca, N. Y. Many shops, however, report that there is little or no complaint on the score of hardness.

Regarding wearing qualities, the conclusion is that the success of the granolithic floor is finally a question of good workmanship, as floors laid in certain ways are bound to be dusty, chip badly and be all-round failures. On the other hand, the Aberthaw Company maintains that a granolithic floor can be laid so as to be absolutely free from dust, and to resist all sorts of wear as well as any other type of floor and at much lower cost than a wood top on a concrete slab. In comparing costs, the report says that a granolithic surface can be laid for about the cost of maple top flooring delivered at the site of the work. Thus the wood top is more expensive by the cost of the stringers, planking for the under floor and the fill between the stringers. Granolithic finish laid on the green concrete slab reinforces it and bears part of the compression strains, while the wood top, on the contrary, is a dead weight on the floor slab, thus making heavier slabs and supports necessary and raising cubic foot cost for the entire building. Wear under trucking, which is the most serious cause of complaint from machine shops, is due largely to the practice of using trucks with small, flat faced, square edged wheels, which will cut up any surface. Rounded faces are recommended as a partial remedy, as are also rubber tires or wheels of hardwood, and where there is very heavy trucking the Aberthaw Company has used steel plates or steel tracks embedded in the fresh concrete successfully.

The common difficulty of making repairs to a granolithic surface is admitted, but the contention is made that with cement floors of the best quality the need of repairs will be so slight that this drawback need hardly be considered. Attaching machines to the cement floor is easily and inexpensively done by those who are used to the work, and the report holds that the usual objections on this score are hardly practical or reasonable.

The choice of a floor surface for any particular building is a question to be decided largely by the circumstances in each case. If the conditions are such as to permit laying a granolithic surface in the proper manner, the Aberthaw Company holds that this surface will give in the long run more and better wear, but if the cement finish is put on carelessly poor results are pretty certain to follow. Where an absolutely dustless floor is required and construction conditions are unfavorable to good cement work, or the product is so delicate that dropping it on a masonry floor would break or chip it, the wood floor surface is the wiser choice, in spite of its higher cost and its increasing the fire risk and insurance rates.

The Simonds Mfg. Company's New Plant.—The Simonds Mfg. Company, Lockport, N. Y., has awarded contracts for the construction of the greater part of its new saw factory, comprising six buildings. The Durolithic Company, Buffalo, N. Y., will put in the foundations and furnish the reinforced concrete work, while the Kenwood Bridge Company, Chicago, will furnish the structural steel work. These buildings are as follows: Gas producer house, 30 x 325 ft.; steel melting department, 80 x 325 ft.; three manufacturing buildings, of which No. 1 is 110 x 325 ft. and Nos. 2 and 3 are each 60 x 120 ft.; office building, 45 x 85 ft., two stories. The office building will be constructed of reinforced concrete and face brick, with stone trimmings, while the other buildings will all be of concrete, steel and brick, with reinforced tile roof, metal sash, rolling steel doors and sheet metal louvers.

The second International Congress of Refrigeration will be held at Vienna, Austria, October 6 to 11, 1910. The American Association of Refrigeration, of which J. F. Nickerson, 315 Dearborn street, Chicago, is secretary, is making efforts to increase its membership with a view to securing the third international congress for the United States. A Senate joint resolution passed by Congress in June authorized the President of the United States to invite the congress to hold its next meeting in this country. F. W. Pilsbry, 1660 Monadnock Block, Chicago, is chairman of the Committee on Transportation, which is working up representation from this country to the Vienna meeting.

The United States Stamping Company, Moundsville, W. Va., has acquired the Stewart Stamping Company, also of Moundsville, and as the two properties adjoin they are now being conducted as one plant. The combined factories give employment to 650 hands and are among the largest producers of white lined enameled ware. Both are under the management of J. M. Sanders, president of the United States Stamping Company.

The old red cedar rail fences of Middle Tennessee now furnish the world's main supply of cedar pencils, according to information received at Nashville from large pencil manufacturers. The farmers in that section are selling their fences for what their forefathers would have considered fabulous sums. The price received for such a fence will build four wire fences of the same length.

Blast furnace No. 4 of the Carnegie Steel Company at Youngstown, Ohio, was blown out last week for relining and repairs. The other five furnaces at the Ohio Works are all in blast.

The Mexican Market

A Market Which Should Be Properly Cultivated

BY WM. H. WONFOR.

If some one put the question to the general run of men in the street, "What is your impression of the industry of Mexico?" I think the majority would answer, "A big mining country." If you approach a manufacturer with an idea of selling his goods in that country you are often thought visionary and your scheme is dismissed either as another "impracticable" idea or one designed to separate him from hard won dollars. After all, there is a romance about business, and those of us who have burned up gray matter with the midnight oil in studying ways and means to increase the sale of our employers' products are often surprised and pleased that a statement, perhaps discovered by chance, opens up a field that had hitherto been thought sterile.

The Diversity of Climate and Products

To the student of business, on his first visit to the country, the diversity of climatic conditions in Mexico and the varied aspect of the landscape are very interesting and productive of much thought. He hears and sees things that are old and new. Traveling along the railroads he sees a group of buildings located far away from the station in the midst of a plain, and there a cluster sticking to the side of a mountain with apparently no cause for being there than that explained by the dump pile that to the unpracticed eye looks like a landslide that has met with an obstruction in its course. Again he meets a freight train loaded with machinery of all kinds, steel beams and pipe, all pointing to the development of a country whose riches are hardly known.

The buildings he saw clustered in the plain are the homes of the owner and workmen on a hacienda, whose size often triples that of the much extolled, large wheat farms of our own Northwest. The diversified nature of the country in which this hacienda may be situated is illustrated in the crops raised. Here the owner's effort may be directed toward cattle; there it is sugar; again it is part cotton; a few hours' distant coffee, pineapples and bananas are seen, which change as one climbs to higher altitudes to corn, beans and the general line of garden vegetables found in the farms scattered along the railroads between our own Atlantic seaboard and the Mississippi River. In fact, Mexico can supply any climate to order, from the perpetual snows of the highest hills to the tropical heat of the *tierra caliente* and the change can be made, in some parts of the country, in a few hours.

The manufacturers of farm implements in this country long ago woke up to the fact that in Mexico they had a market at their doors and took the opportunity to develop their interests there with satisfactory results. The mining machinery men also knew of the field early in the game, and those of them who went at it in the proper way are doing a satisfactory business.

Special Products of Mexican Energy

That Mexico raises a fine grade of cotton is not generally known. The Laguna district is covered with cotton farms, and the entire product is sold to the large spinning and weaving mills located mostly in the southern part of the republic. Sugar is another product that receives considerable attention. The annual crop ranges from 52,000 metric tons for the State of Morelos to 400 or 500 metric tons from the States with a smaller average and the greater part of it is consumed in the country. Such products as soap, blankets, rubber, alcohol, shoes and clothing, are manufactured on a large scale, while there are the usual numerous smaller industries to be found in nearly every country.

These various industries require machinery and other supplies that American manufacturers produce. Taking the cotton weaving industry as an example, the articles required to supply this trade from the initial motive power to the finished cloth cover a very wide range. When it is considered that many of these plants are practically isolated, on account of the necessity of being near to water power, it will be readily seen that a cotton manufacturing company represents a little government in itself. It not only has to buy for its own needs, but for the daily needs of its several thousand workmen. It is the custom of these large textile manufacturers, as well as the large mining companies and owners of haciendas, to organize a store for the benefit of their employees, supplying the needs of the body, both inside and out. Many of the articles seen on the shelves are familiar household furnishings in the United States. That this business is not a small one can be judged by the fact that it pays over $1,000,000 gold in direct taxes to the general government annually, and this does not take into consideration the local taxes paid to the State governments of the various sections in which the factories are located.

The manufacture of soap is so important as to be specially mentioned. The factory in Torreón is possibly larger than any we have in the United States. The quality of the product compares favorably with that of our own country, and it is sold to all classes of people. The small cake of soap sold for 1 or 2 cents to the peons and the highly perfumed cake that is a delight to the senoritas may be found in the same shop and are both made in the same factory. The manufacture of rubber from the guayule plant is another industry that has made marked strides in a very short time, and the finished product may be seen almost any day either rolling along our streets as automobile tires or protecting our feet in the form of rubber overshoes and boots.

A Land of Big Enterprises

Mexico is already a country of big enterprises. Capital is awakening to its opportunities, and American, English, French and German industrial engineers are opening their eyes to possibilites that are unusually large. An incident may be cited in one project, now in course of construction, for which the initial order for electrical machinery and supplies amounted to over $8,000,000. Yet the contrasts in Mexico are very great. In many places antiquated methods are used, which, though antiquated from the standpoint of an American, may be nearly as effective as perhaps the more modern ones seen in another location. It is the adaptability of the people to the means at hand, and which have been thoroughly studied through centuries of use. The home made plow or irrigation pump is the outcome of earnest thought in the time when the modern steam plow or irrigation pump was not known, but after being convinced of the value of modern methods the Mexicans adopt the latter without hesitation. They are slow to change until convinced, but when convinced of the merit of an article it is quickly accepted and put to use.

Points for Salesmen

In the point of convincing the people of the value of modern methods, it is well to make haste slowly. It is not practicable to do business with them after the approved American salesmen's method of three towns a day, as they do not understand that way. A Spaniard's or Mexican's "manana" often means a desire to familiarize himself with your article and yourself, and not, as popularly supposed, to put off a decision indefinitely. They are keen business men in every sense of the word, and our greatest mistake has been

in our method of approaching them. Too much stress cannot be laid on the necessity of a knowledge of Spanish. The salesmen who are making a success in Spanish-American countries are those who give the people the courtesy of believing that their opinions are of value, and that they have a right to use their own language as we would insist on a foreigner using ours when he attempts to sell goods to us.

To illustrate the foregoing observations, a comparison may be given of the methods of two salesmen. One, an American salesman, whose firm manufactures a product that is a household word, was grumbling around the hotel because his interpreter had not shown up that morning, and he was anxious to get away. "Why don't you learn Spanish and do away with the annoyance?" he was asked. "What's the use?" he replied; "I can usually get an interpreter." In the same hotel was a German salesman who also sold a product of general use. He needed no interpreter, being a university graduate and speaking English, German, French and Spanish with fluency. The German is received in the homes of his customers and is looked upon as a friend. It is obvious which of the two salesmen would be more successful.

A very lively contempt is felt by the people for a representative of any well-known house who goes around with an interpreter and which incidentally reflects on the house itself. If you have an intricate article to sell or desire to offer special inducements, without any knowledge of the language, you can never be entirely sure that you are not laying up trouble for yourself by your interpreter's lack of technical knowledge. The American manufacturer, however, is now waking up to the fact that he has a large market at his door, and one that is ready and willing to give a hearing to any good proposition that may be made to it. But we must not lose sight of the fact that this market must be studied, and that due consideration must be given to methods that the people have every right to believe are as good as our own.

Large Leather Belts

What is said to be the largest belt ever made in this country was recently shipped by the Estate of E. R. Ladew, 82 Fulton street, New York, to the Southwestern Milling Company, Kansas City, Mo. The belt is 120 ft. long, and will run over a driving pulley 18 ft. in diameter to a driven pulley 8 ft. 6 in. in diameter at a speed of 85 rev. per min., transmitting 2000 hp. The belt is made of three thicknesses of leather, is 96 in. wide and ¾ in. thick, weighs 3500 lb., and in making it the hides of 275 steers were used.

Geo. Rahmann & Co., belt manufacturers, 6 Ferry street, New York, also state that, despite the contentions of the advocates of the direct motor drive, they are receiving orders for some very large leather belts. They have just completed one 5 ft. wide, threeply, and about 100 ft. long. This belt was made for the American Bronze Powder Company, operating one of the largest powder plants in this country, and the order was given at the instance of a prominent engineering firm. The firm claims that there never have been so many large belts in work as at the present time, which would show a tendency toward the more increasing use of the efficient and economical leather belt as a power transmitter.

The Eastern Pig Iron Association.—The July meeting of the Eastern Pig Iron Association took the form of an excursion to the Port Henry and Mineville, N. Y., properties of Witherbee, Sherman & Co., Inc. The company had between 80 and 90 guests on the trip, a special train leaving New York Tuesday night, July 26. Wednesday morning was spent in visiting the Northern Iron Company's blast furnace and the electric power house at Port Henry, and in the afternoon the iron mining and concentrating operations at Mineville were inspected. After a short meeting of the Eastern Pig Iron Association Wednesday evening at Port Henry the party took train for New York.

The Sierra & San Francisco Power Company

The Sierra & San Francisco Power Company, San Francisco, Cal., has authorized the issuance of first mortgage bonds in the sum of $6,500,000 for the purpose of enlarging its plant and so extending its facilities that it may be enabled to supply prospective purchasers with all the power required. It is proposed by the company to expend $1,000,000 in the next three years toward the construction of a distributing system in San Francisco and elsewhere, making an additional equity over the first mortgage bonds. The company has purchased the entire power plant of the United Railroads of San Francisco, and has entered into a 44-year lease to supply that company with power for the operation of its lines. The district served with power by the company includes the counties of San Mateo, Santa Clara, Alameda, San Joaquin, Tuolumne, Stanislaus and Calaveras.

The principal power station is on the Stanislaus River north of Sonora, and the transmission line passes through Vallecito, Angels Camp, Copperopolis, Tracy and Mission San José, thence around the southern end of the bay of San Francisco and along the east shore. There is an effective head on the Stanislaus River, and the station has a present capacity of 46,000 hp. Two other plants bring the total hydroelectric capacity up to 50,000 hp. An auxiliary steam station in San Francisco, with a capacity of 12,500 hp., makes the total present generating capacity 62,500 hp. The steam capacity is to be increased to 28,500 hp. next year, and the total generating capacity will then be 78,500 hp.

The company intends to develop, when warranted, additional water rights on the Stanislaus River that will enable it to more than double its present hydraulic capacity. It is now delivering 12,000 hp. to San Francisco over its transmission line, and this is soon to be increased to the full amount required by the railroad company for the operation of its system. The company has control of sufficient rights of way to enable it to increase its transmission system to a total capacity of more than 90,000 hp.

A New Electric Furnace Installation.—The Riverside Metal Refining Company, Connellsville, Pa., is installing two electric furnaces. These furnaces were patented by Raymond S. Wile, formerly with the American Sheet & Tin Plate Company, Pittsburgh, but connected with the Riverside Company for the past 14 months. They are of the shaft type, with one carbon through the bottom, this being the permanent carbon, and the other one through the top being movable. The slag used is on the bottom, with the top carbon immersed in it to the depth of 3 or 4 in. The heavier metal falls to the bottom, while the dross stays on the top of the slag. The furnaces are used for smelting tin and terne drosses and are 20 in. in diameter, taking care of about 2 tons of dross per day. They can be used individually, in series, or in a voltage and current range of wide dimensions, both on account of the transformers used and the furnaces themselves. Current is obtained from the West Penn Railways Company.

The Niles Forge & Mfg. Company, Niles, Ohio, states that its recent increase in capital was made to provide some money owing to its steadily increasing business. No new additions or improvements to its plant are contemplated at this time.

A New Waterbury Automatic Screw Slotter

The automatic screw slotting machine shown in the illustration, built by the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., embodies several new features, the chief purpose is to secure a maximum of time for the sawing and a minimum for handling the work to and from the sawing position.

The screw blank is held rigidly while the slotting is taking place, the frame that carries the saw and its arbor being of ample proportions to avoid chattering. It has sensitive adjustments both side to side and front to back and locates accurately the position of the saw with respect to the screw head. There are other adjustments operated while the machine is running for determining the depth of the slot and allowing the maximum time for slotting, even though the slots are of varying depths.

The saw, which is 2¾ in. in diameter, with a hole not smaller than ¾ in., is held on its spindle between two clamps by a nut. Saws slightly larger than standard may be used, as they can be ground down. When the saws are changed the spindle is prevented from revolving while the clamping nut is being loosened or tightened by a pin which is inserted temporarily in the driving gear or pulley. The saw spindle runs in bronze bushings, that next the saw being tapered and split for taking up any wear.

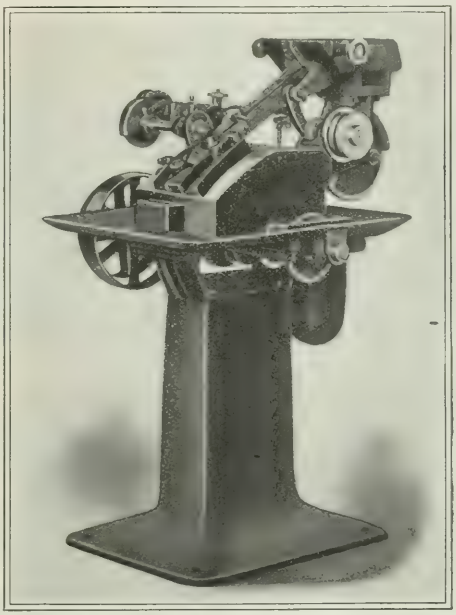
In operation the blanks are placed in the hopper, where they are caught by their heads in a blade which has a slot along its top a little wider than the body of the blank. The blade swings vertically through the center of the hopper, and when in its lower position is parallel with the bottom. As it is elevated through the mass of blanks some get caught by their heads and are carried to the upper position, which is an extension of the inclined chute, where they slide into the chute. Near the point where they leave the blade is a rapidly revolving toothed wheel adjusted so that any blanks which attempt to enter the chute excepting in the proper position are thrown back into the hopper. This leaves the entrance to the chute clear and prevents clogging. The chute cover is hinged, so that it can be swung up for removing any blanks that may become lodged. At the foot of the chute the blanks enter the carrying dial, which is 2 7-16 in. in diameter and ½ in. thick. If a blank becomes held half in the dial and half in the chute a slight special motion of the dial agitates the column of blanks and starts the feed after the loss of only one revolution of the machine. The carrying dial has V notches in its periphery which convey the blanks from the chute to the slotting point. After being slotted the blanks are carried a little further and delivered into their receptacle.

The hopper blade is made with a removable top containing the pick-up slot. The top is changed for different sizes of screws. The hopper is driven by a round belt from the machine itself through cone pulleys, which provide for speeding the hopper to suit the work. The hopper feeding mechanism is provided with simple adjustments to adapt the machine not only for work which is done in long runs, but short ones as well. To shift from one size of blank to another it is necessary to replace two pieces only. The machine handles blanks with short shanks equally as well as those with long ones up to the limit of its capacity, which is 1½ in. long under the head. The largest diameter or shank allowed is ¼ in. Blanks having a length of shank equal to one diameter have been successfully fed by the hopper and slotted in the machine.

A special feature of this machine is that the sizes of the head and the slot determine the machine to be employed rather than the diameter of the screw. For example, a ⅛-in. screw may be made with a very large head and slotted on this machine, a ¼-in. screw with an extraordinarily large head might require a larger size machine, while a ¼-in. screw with an ordinary head would be handled easily.

The machine is so arranged that the chips and finished blanks are delivered into separate receptacles. The chip receptacle is the small removable box shown in the illustration, and the screws are delivered into a pan placed at the right of the box. Provision is made for lubricating the blanks and the saw while the slotting is being done. The lubricant is pumped from a small tank located below the bed by a small geared pump and delivered through valves and piping to the operating point. From there it flows with the chips into the chip box, where the chips sink to the bottom and the lubricant flows over the sides, draining back on the table and into the tank. The tank is readily removable for cleaning.

The main drive for the machine is through a two-step cone pulley. If the countershaft runs 270 rev. per min. the saw can run at either 1215 or 405 rev. per min. and the machine at either 90 or 60 rev. per min. By varying the speed of the countershaft these speeds are changed proportionately. The countershaft has 10 x 2½ in. tight and loose pulleys. The power for driving the saw is obtained through a belt from the countershaft to a pulley 4 in. in diameter with a 1½-in. face, which is geared 3 to 1 to the saw spindle for steel work, while for brass work a pulley of the same size is located on the saw spindle itself. The floor space required is 30 x 34 in.; the weight of machine 600 lb., and weight of countershaft 225 lb.



The New Automatic Screw Slotting Machine. Built by the Waterbury Farrel & Foundry Company, Waterbury, Conn.

The National Metal Trades Association has issued in a volume of 174 pages a synopsis of the proceedings of its twelfth annual convention, held at Hotel Astor, New York City, April 13 and 14, 1910. This volume possesses special interest in the reproduction in full of the exceedingly interesting papers which were presented on that occasion. The papers are fully illustrated. The entire work reflects much credit on the commissioner. Robert Wuest, New England Building, Cleveland, Ohio.

A Large Coal Tipple and Washer

The New Searles Plant of the Alabama Consolidated Coal & Iron Company

The rebuilding of the tipple and coal washing plant of the Alabama Consolidated Coal & Iron Company, Birmingham, Ala., at its Searles property, following the fire of last year, has resulted in a tipple and washer which are considered the most up-to-date in the South. The capacity of the plant is also exceptional, as it can take care of and wash 3000 tons of coal in 10 hours. The accompanying illustrations give a good idea of the arrangement and the extent of the Searles operation and the relation of the tipple and washer to the coke ovens.

For 22 ft. from the ground the wet coal bin, dry coal bin and jigs are built of solid reinforced concrete. Arriving from the mines the coal first passes over scales and then to a Phillips crossover tipple, where it is dumped. Passing on a shaking screen the coal is delivered into a feeder and the fine portion goes directly to a boot at the bottom of the dry coal elevator. The coarse is fed into a Bradford breaker, which removes a large portion of the slate and bone. From the Bradford breaker the coal passes to another screen, the undersize going into the boot mentioned above, and the oversize into a Jeffrey hammer pulverizer, which discharges also into the same boot. The coal is then elevated to the top of the dry coal bin, which has a capacity of 1500 tons, and from the dry coal bin is fed into the jigs, of which there are eight, each with an easy capacity of 30 tons per hour of washed coal. Each

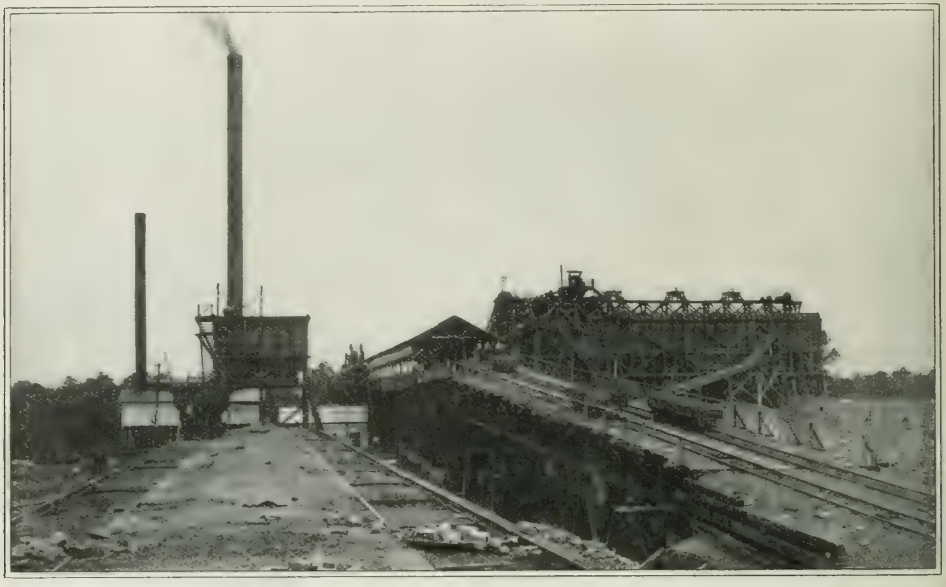


Fig. 1. Coal Tipple and Dry and Washed Coal Bins of the Alabama Consolidated Coal & Iron Company's Searles Plant.

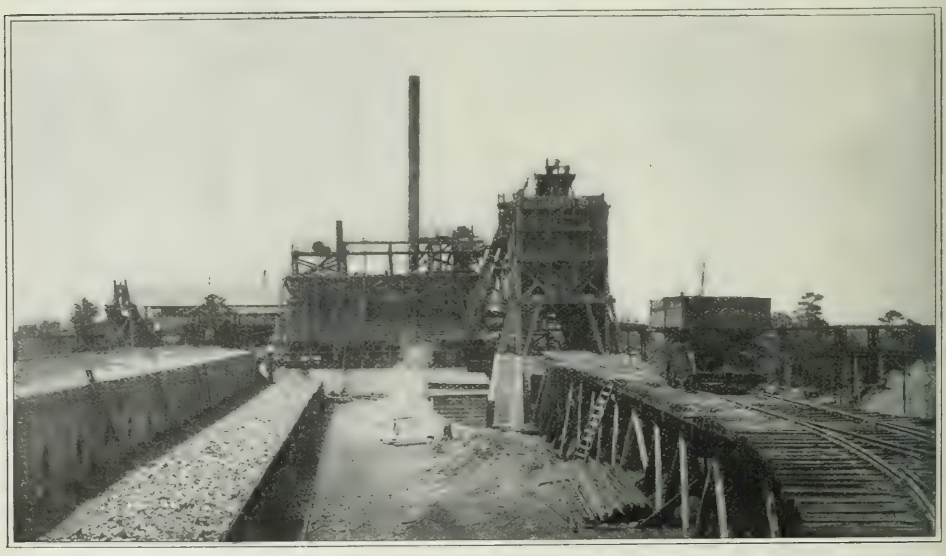


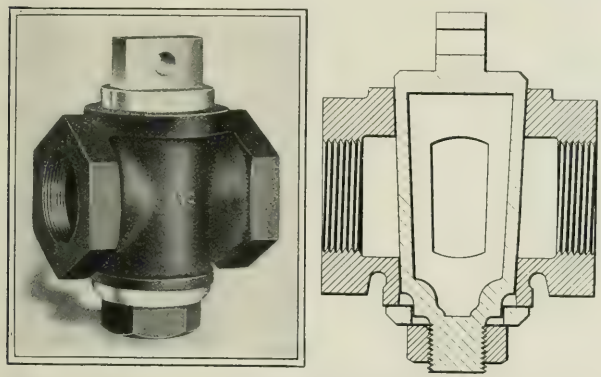
Fig. 2.—Washer and Coal Bins, with Tipple in the Background. A View at Right Angles to That in Fig. 1.

pair of jigs is served with a slate elevator, all of the latter discharging on a belt conveyor. After washing, the coal goes into a settling tank 56 ft. long, also made of solid concrete; thence it is elevated to the wet coal bin, which has a capacity of 2500 tons. From this bin it is drawn either into larries or into railroad cars, as may be desired. Both wet and dry bins are controlled as to distribution of coal by trough conveyors.

To prepare for emergencies the company built alongside the settling tank a supplementary concrete tank capable of holding all the water contained in both jig boxes and settling tank. The supplementary tank is controlled by two powerful 6-ft. Lawrenceville centrifugal pumps, each driven by a Buckeye engine.. In case of a breakdown of the wet coal elevator, or of any part relating thereto, the valves are opened and both jig boxes and settling tank are drained in a few minutes. As soon as repairs are made all the water and coal will be picked up by the centrifugal pumps and delivered again to the jig boxes and settling tank. The machinery is all driven by a Lane & Bodley Corliss engine of 400 hp.

The National Tested Iron Service Cock

The accompanying illustrations show exterior and sectional views of a 1¼-in. special tested iron service cock which the National Tube Company, Frick Building, Pittsburgh, Pa., has brought out especially for use on the street service mains of gas companies or for hard mill service.



Exterior and Sectional Elevations of No. H-1312 Tested Iron Service Cock Made by the National Tube Company, Pittsburgh, Pa.

Brass and iron are both used in the construction of this cock, the line between the two metals being very clearly indicated in the sectional elevation at the right. The plug and the washer are both made of brass, and the former is ground in by special machinery. The advantage claimed for this type of construction is that the bearing parts are all brass to iron, which prevents corrosion. The hub is closely joined to the body and as will be noticed from the engravings, the whole cock is very compactly built, thus reducing to a minimum the probability of wrenching any part out of shape when the pipe is being made up.

When the cock is assembled it is tested with air pressure under water, which insures a tight seal. Another advantage possessed is that of cheapness, as the price is considerably less than that of an all-brass cock and it is stated that for some purposes the service given is even superior to the higher priced model.

The Longmead Iron Company, Conshohocken, Pa., has recently completed the installation of a nipple department. It is now placing on the market wrought iron nipples, standard and extra heavy, black and galvanized, in sizes ⅛ to 3 in. in diameter and ¾ to 12 in. long, with the usual variety of threads. A price-list covering the entire range of sizes has been prepared for distribution.

The New Bureau of Mines

George Otis Smith, director of the United States Geological Survey, who has also been made acting director of the newly established Bureau of Mines in the Department of the Interior, has issued a circular relative to the work of the new bureau. Its substance is given below.

The act establishing the Bureau of Mines became effective July 1. As originally approved, it contemplated the transfer of the entire Technologic Branch of the United States Geological Survey, including investigations of mine accidents, fuel and structural materials, to the Bureau of Mines; but the Sundry Civil Appropriation act amended the law so that the structural material investigations were transferred to the Bureau of Standards, Department of Commerce and Labor. The investigation of mine accidents and the work of fuel testing together with the fully equipped testing station at Pittsburgh go to the Bureau of Mines. The work of the Bureau of Mines for the first year will be a continuation and extension of that carried on by the Technologic Branch of the Geological Survey. In all $310,000 was appropriated for mine accident investigations. For analyzing and testing coals, lignites, &c., $100,000 was appropriated.

The publications of the Geological Survey relating to mine and fuel investigations, those prepared by the Technologic Branch, will in future be distributed by the Bureal of Mines. The publications relating to structural material will continue to be distributed by the Geological Survey. The first of the Bureau of Mines bulletins, the "Volatile Matter of Coal," by H. C. Porter and F. K. Ovitz, will be published in the next few months. Then will follow "Coal Analyses," by N. W. Lord and J. S. Burrows; "Final Data Regarding Steam Tests," by L. P. Breckenridge; "North Dakota Lignite as a Boiler Fuel," by D. T. Randall and Henry Kreisinger; "Producer Gas Tests in 1905-1907," by R. H. Fernald; "The Coke Industry as Related to the Foundry," by Richard Moldenke; "Coals for Illuminating Gas," by A. H. White and Perry Barker, and "Pertroleum for Combusion Under Steam Boilers," by I. C. Allen. These publications, when issued, can be obtained by addressing the Director of the Bureau of Mines at Washington.

The National Eight-Hour Law Construed

Attorney-General Wickersham, on request of the Secretary of the Navy, has given a ruling on the eight-hour clause of the act appropriating money for new battleships. He holds that it applies only to work actually done in the Government navy yards, and not to work on machinery and armor done outside by private contractors. This ruling will be a surprise to labor men throughout the country, who hailed the insertion of the eight-hour provision in the bill as a great victory in regard to shops not controlled by the Government. The attorney-general says it is clear that the act "must be construed to apply simply to work done upon the vessel itself at the place where it is built and not as applying to the manufacture of machinery or other material elsewhere which is to enter into the construction of the vessel."

Coal and Ash Handling in an Office Building

Modern Methods Employed in Chicago's Latest Skyscraper

The congested traffic in the business streets of Chicago made necessary the construction of an underground system of tunnels which will permit the handling of a large amount of material. The next step was to devise ways and means of receiving and distributing the materials from the tunnels to the buildings in the quickest and most economical manner. One thing which every building needs for heat or power is coal, and this requires machinery which will handle both the coal and the ashes. In the new building erected for the People's Gas, Light & Coke Company, Chicago, Ill., machinery for handling these materials has recently been installed by the Stephens-Adamson Mfg. Company, Aurora, Ill., who also designed and manufactured the entire equipment, including the bunkers, hoppers, chutes and transmission and conveying machinery. Fig. 1 shows a front elevation of the boilers with the cross conveyor and bunkers, Fig. 2 is a section through the bunkers, Fig. 3 illustrates the telescoping elevator for handling the ashes, and Figs. 4 and 5 are views of the horizontal and vertical conveyor bucket runs.

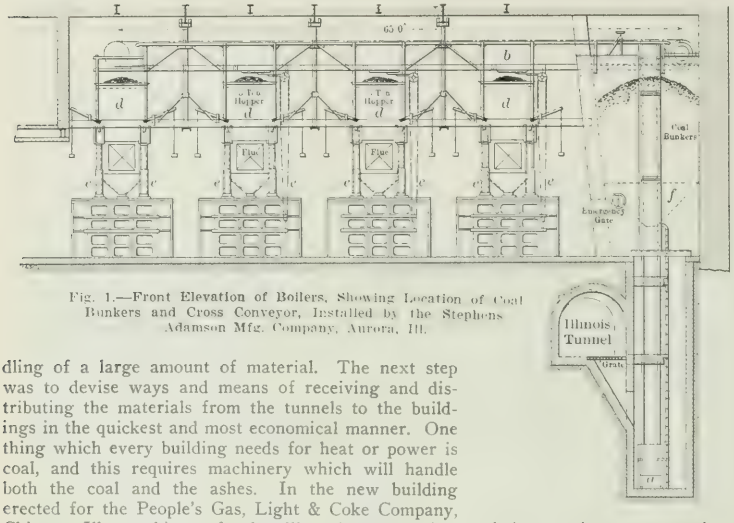


Fig. 1.—Front Elevation of Boilers, Showing Location of Coal Bunkers and Cross Conveyor, Installed by the Stephens Adamson Mfg. Company, Aurora, Ill.

The coal is delivered to the building in steel cars running in a branch of the Illinois tunnel 45 ft. below the ground level. These cars are emptied on a steel bar screen in the tunnel floor through which the coal passes into the concrete chute shown in Figs. 1 and 2. The chute discharges into the steel boot *a* of the S-A Gravity Discharge Bucket Elevator and Conveyor, which is equipped with V-shaped steel buckets, bolted every 2 ft. to two endless strands of steel bushed roller chains. When traveling horizontally, as in Fig. 4, the rollers run on steel tracks and support the buckets, which act as flights and push the material along in a steel trough. When traveling vertically, Fig. 5, the buckets automatically adjust themselves and lift the material, and the chain rollers running between two angle iron tracks act as guides.

The coal is first elevated 27 ft. and then conveyed horizontally to a point 44 ft. distant, passing directly under the coal bunkers, Fig. 2, which have a capacity of 200 tons. It is then elevated 21 ft. and conveyed horizontally over the coal bunkers. There are gates *c* in the upper horizontal run, which may be opened to allow the coal to drop into the bunkers for storage. Should it be necessary, however, to deliver the fuel directly to the boilers, it can be done in the following way:

Running at right angles to the S-A gravity discharge elevator and conveyor, and above and in front of the boilers is an S-A steel flight conveyor 65 ft. long, Fig. 1. This machine consists of steel flights fastened every 2 ft. to two endless strands of the builder's standard chain, running over sprockets at the ends of the machine. The flights push the coal along in a steel trough which is provided with sliding gates operated by a rack and pinion which are located over the 3-ton hoppers *d*. One of these hoppers is over each boiler. The operator may open or close these gates at will, from the boiler room floor by pulling the coil chain which passes over a chain wheel keyed to the pinion shaft of the gate. The coal can now be spouted directly into the automatic stokers through the steel chutes *e*, and the flow may be regulated by the gates shown on the drawing in each chute.

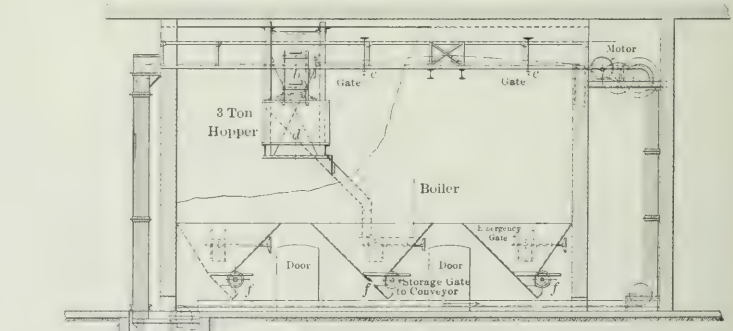


Fig. 2.—Section Through Coal Bunkers.

In this system there are the following ways of delivering coal to the boilers: First, it can be drawn directly from the 3-ton hopper *d* over each boiler; second, it can be delivered directly from the cars in the tunnel to the boilers; third, since the first conveyor passes under the storage bunkers *f* the coal may be drawn from them and elevated and conveyed again to the flight conveyor and thence into the 3-ton hoppers;

and fourth, there is an emergency gate in each bunker through which the coal can be delivered to wheelbarrows and wheeled to the boilers. It is intended to have coal in the storage bunkers at all times, so that

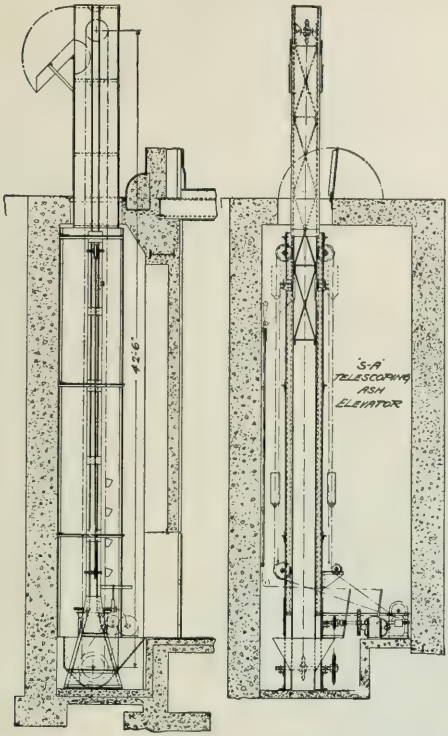


Fig. 3.—Ash Handling Machinery, Extended and Telescoped.

there will be no inconvenience if the tunnel company is unable to deliver coal for several days.

The ashes are disposed of by the S-A telescoping ash elevator shown in Fig. 3. This machine is equipped with malleable iron buckets attached to an endless strand of chain. The ashes are dumped into the elevator boot and elevated to a hight of 43 ft., where they are discharged into wagons and hauled away. The entire steel casing and elevator machinery of this equipment telescopes to a point below the alley level when not in use. It is raised and lowered by counterweights



Fig. 4. A Horizontal Run of Conveyor Buckets.

and electric hoists, the same motor furnishing the power for elevating the ashes.

Stanley G. Flagg & Co. expect on or about September 15 to remove their offices in Philadelphia, Pa., to the new Morris Building, 1421 Chestnut street. The offices have since 1882 been located at the firm's Philadelphia plant at Nineteenth street and the Philadelphia & Reading Railway subway, but this location is not central. In the new offices in the Morris Building will be gathered all the executive staff, including sales departments. The firm manufactures malleable iron and small steel castings.

The Morris & Bailey Steel Company's Improvements

The Morris & Bailey Steel Company, Pittsburgh, is making improvements in its plant at Wilson Station, Pa., in addition to those mentioned in *The Iron Age* of July 14. Its main building is being extended and reconstructed, brick walls and slate roof taking the place of sheet iron construction. The floor is being changed from wood to asphalt block. Steel sash is also being used for the windows, allowing a maximum amount of light which is necessary in the manufacture of the company's highly finished product. The hot rolled warehouse has been extended 100 ft. Additional power has been installed, amounting to 700 hp. in water tube boilers, and 500-hp. electric current has been contracted for to be used for motors. These motors will be used to drive a number of finishing mills, including two 10-in. mills, just received. The pickling facilities have been doubled, with the installation of new automatic machinery.

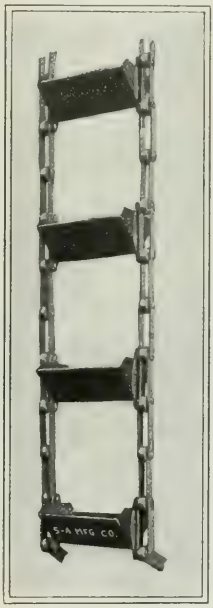


Fig. 5. A Vertical Run of Buckets.

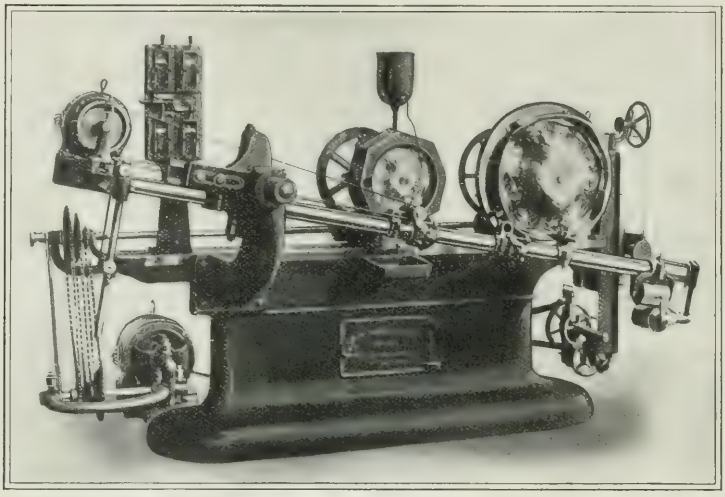
Within a short time the company will have in operation its new 36-in. plate mill for cold rolling plates up to 30 in. wide. This mill will be the most powerful of its kind ever built, and will supply a demand for the finest grade of deep drawing cold rolled material in widths not hertofore made, the company's present limit being 22 in. wide. This material, considering width, will be noteworthy for accuracy to gauge, fine finish and drawing ability, and will be used largely for automobile stampings and other fine work. To take care of it after rolling, new machinery has been added, including heavy shears and flatteners. These additions will increase the output greatly, and the company will be in good condition to handle its trade with more promptness.

American Peat Society.—At the fourth annual meeting of the American Peat Society, in session this week at Ottawa, Canada, the list of papers includes the following: "The Development of Gas Producers for Peat and Lignite," by Prof. R. H. Fernald, United States Bureau of Mines; "The Future of the American Peat Industry," by William Eichhoff, Erie, Pa.; "The Latest Developments of the Akerlund Gas Producer," by the Gibbs Gas Engine Company, Atlanta, Ga.; "The Work of the Peat Engineering Company," by F. J. Bulask, Toledo, Ohio; "A Well Equipped Peat Fuel Plant and How to Operate It," by Philip Heseltine, Detroit, Mich.; "Peat Litter," by J. Bordollo, New York. Prof. Charles A. Davis, United States Bureau of Mines, was expected to give some account of the peat investigations of the United States Geological Survey and of the organization and work of the new Bureau of Mines. The president of the society is Dr. Eugene Haanel of the Department of Mines, Ottawa.

A Motor Driven Engraving Machine

An Ingenious Device for Forming Dies Mechanically

The work of die making as ordinarily performed demands the most painstaking manual skill. Following the intricate designs of the patterns from which the dies for stamping sheet metal, silverware and hardware are reproduced was formerly thought to require an accuracy and refinement of tooling which could not be duplicated by any machine. While this may still hold good for the last finishing touches on the highest quality of dies, engraving machines are now made which relieve the skilled hand of a large portion of its former tedious labor and preserve its craft fresh for the finest work. Among the machines that will turn out a very creditable product of tooling without the intervention of any manual agency is the motor driven mechanical engraving machine, illustrated herewith, which was devised and built by W. A. Wauman and is now manufactured and marketed by the Keller Mechanical Engraving Company, 570 West Broadway, New York City.



Motor Driven Machine for Engraving Dies, Built by the Keller Mechanical Engraving Company, New York City.

The ingenious motor driven engraving tool reproduces on a steel blank, which is later hardened to form the die, the design of the metal pattern carried on the revolving face plate at the right of the illustration. The die itself, undergoing the process of cutting, is shown on the smaller chuck near the center of the machine. Both the pattern and the work revolve at the same speed, while the double pivoted tool arm, which is carried on a bracket at the opposite end of the machine from the pattern, is fed back and forth across both, the tracing stylus following the relief of the pattern. The engraving cutter, located nearer the pivot, thus shares proportionately the movement of the guiding point and reproduces faithfully the various features of the design on a diminished scale. The cutting tool is not dissimilar to an acutely sharpened cannon drill and revolves at a speed of from 5000 to 8000 rev. per min., being belt driven from the 1-3-hp. motor manufactured by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., which is mounted on the tool arm.

The rotation of the work and the pattern, as well as the motion of the tool arm across the work, are both accomplished at comparatively slow rates to insure more accurate and detailed work. It is evident that as the cutting operation nears the periphery of the die some reduction in the rate of the rotative speed of the work must occur if the die is to be as well finished near the edges as at the center. To secure this necessary speed reduction recourse is had to a parabolic speed governor constructed on the flyball principle, but having its maximum permissible speed controlled through a rod and lever from a special cam bolted on the vertical slide. The friction clutch in the governor thus remains close until the maximum allowable speed as determined by the cam shape is attained when it releases, thus keeping the rotative speed within the proper predetermined limits. The rotation of the face plate carrying the pattern and the die holding chuck is accomplished by the 1¼-hp. Westinghouse motor on the floor at the left of the machine. This motor also furnishes the required power for the swing of the tool arm. It is said that the Westinghouse motors were chosen for driving these engraving machines because of their light weight in proportion to their output, efficiency and economy, characteristics which were especially desirable in the small motor mounted on the pivoted tool arm.

Two cuts are ordinarily made in sinking one of these dies, a coarse tracing point and a comparatively large drill being employed for the first cut, which roughs out the blank by following the larger details of the pattern. This relieves the fine cutting point used for the finishing cut of the removal of too much of the thick metal, which would render it too dull for the fine work. During the second or finishing cut a very fine tracing point is used and the cutting tool is sharpened to a diameter proportionately less than the tracing stylus in the same ratio as the reduction of the pattern.

For very deep relief with steep slopes the tracing point itself is sometimes revolved to enable it to climb more easily. The pressure on the tool arm, which holds the engraver and the tracer against their respective surfaces, is supplied by a weight of a few ounces, which is attached to the extreme end of the arm by a cord running over a pulley. This pressure must be very light and adjusted with some care to enable the tool arm to follow the design closely and yet not be enough to cause the tracer and the engraving tool to dull rapidly.

The patterns usually employed are of hardened plaster or cast bronze electros made from plaster molds of the model originally prepared by the artist and are several times the size of the finished die, thus enabling considerable refinement of detail to be secured in the finished work. Although the tool motion is extremely sensitive, hard patterns have been found to give the best results for reproducing with the mechanical engraving machine as the details of the pattern can be followed more accurately. When sheet metal is to be stamped the dies are usually made in pairs, upper and lower relief. These cameo and intaglio dies are backed with reversed reproductions of the patterns made from plaster casts which are themselves car-

ried through to hard patterns in the usual way. This machine also provides an interesting automatic method for gaining relief in a pair of dies, as the cutting away which must be done on the highly inclined surfaces of the backing die in order to make room for the metal of the stamping is called. The pattern for the backing die is a reversed duplicate of the other in all respects, but when the die itself is cut a tool which is larger than the tracing point is used, so that by side cutting it removes material beyond the traced surface and thus accomplishes the effect of relief.

The tool is capable of performing many allied operations requiring a variety of adjustments. For example, should a die become broken in use the parts have merely to be clamped together and the machine set to reproduce on a one to one ratio. Thus a solid new die, the exact duplicate of the damaged piece, is quickly turned out. By varying the speed ratio between the pattern and the work a simple pattern, or some portion of a design, such as a scallop, can be multiplied on the work as many times as the pattern revolves faster than the work. An example of this adaptation was afforded by a piece of work recently turned out by one of these machines, where it was necessary to mill out the blades and steam passages for an experimental turbine. First the theoretical curve of the blade was accurately laid out and a large pattern made to conform to this shape. This pattern was then placed in the machine and with the engraving tool set very nearly at the fulcrum several hundred little blades of the turbine were accurately milled out of a solid block, each one exactly duplicating the theoretical curve of the pattern. In addition to cutting dies for metal stamping, the machine can also be used for making dies for coins, medals and other similar work, and the quality of the product turned out is said not only to rival, but outclass, that produced by the most skillful hand operators.

Valve Seating Tools

The Valve Seating Tool Company, Southport, Conn., has been organized with a Connecticut charter to manufacture portable electric valve seating tools and drill press and hand valve seating tools. B. A. Bulkley is president; J. W. Perry, treasurer, and William D. Sherwood, mechanical engineer. The product is the design of Mr. Sherwood.

The portable tools are electric driven and of two forms. One has an oscillating movement only, suitable for grinding and seating any form of poppet valve. It runs at high speed and does the work now being performed by hand, at a saving of labor cost. The other form is a combination tool having both an oscillatory and rotating movement, as determined by the operator, which makes it a tool for seating valves and also one which can be used for drilling, polishing, &c. A flexible shaft is fitted to the apparatus as a special equipment. The drill press tool is made for use in a drill press and will do the first seating operation in the machine shop, as it also has an oscillating movement like the portable type. The hand tool is made to seat valves by means of a crank which turns completely around, but gives an oscillatory movement to the valve tool. The company is at present having the machines built under contract by outside parties, but expects to manufacture for itself later.

Governor Draper of Massachusetts, has appointed a commission to investigate the general subject of workmen's compensation for injuries sustained during their employment. The commission was created by the Legislature and will report at the next session, in 1911. James A. Lowell, Newton, is chairman, and Amos W. Saunders, Clinton, is secretary. Carroll W. Doten, professor of economics at the Massachusetts Institute of Technology, has been appointed chief investigator and will do the greater part of the research work.

The New Buffalo Electric Forge Blower

The electric forge blower, illustrated herewith, is a new type known as the Buffalo Universal blower which has been brought out by the Buffalo Forge Company, 490 Broadway, Buffalo, N. Y. The name Universal is applied to the blower because of its adaptability, the motor being of such a design that it will operate efficiently and equally well on any 110-volt circuit either direct current or alternating current of any frequency. Fig. 1 shows a blower and motor suitable for use in connection with a forge already installed, while Fig. 2 illustrates a forge equipped with the blower inverted, which gives a short straight blast directly into the tuyere iron.

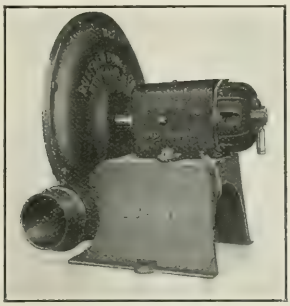


Fig. 1.—The New Universal Electric Forge Blower, Made by the Buffalo Forge Company, Buffalo, N. Y.

In addition to the adaptability of the motor for use on either direct or alternating current circuits, the motor possesses other advantages. One of these which distinguishes it very markedly from all other motors operating an alternating current circuits is that its speed is entirely independent of the number of poles of the motor and the frequency of the current. With an ordinary alternating current motor it is stated that it is impossible to get a speed of more than 1500 rev. per min. on a 25-cycle circuit, while this motor has a maximum speed of 4000 rev. per min. on this or any other circuit of the same voltage. Another unusual characteristic of the motor is that a variation in speed can be obtained just as easily when the motor is operating on an alternating current circuit as when on a direct current one. This, the maker claims, is the peculiar feature that renders the motor so satisfactory for forge blower work, as the speed can be adjusted by a rheostat to suit the kind of work being done on the forge. In the point of the amount of power consumed this motor is also very satisfactory, as it is claimed that not more than 1-25 hp. is required to serve one medium fire at an average cost for the current consumed of about 3 cents per day.



Fig. 2.—Forge Equipped with New Buffalo Electric Forge Blower.

The Federal Coal Company has sold to the Keystone Coal & Coke Company, Greensburg, Pa., 3040 acres of coal land in West Virginia for $1,050,000 in cash.

German Open Hearth Processes

Practice at Various Works Using Direct Metal and Ore—An Inroad Upon Basic Bessemer Operations

At the recent International Congress of Mining and Metallurgy at Duesseldorf, Germany, a paper was read before the Section of Practical Metallurgy on "The Pig Iron-Ore Process in Germany." The author is R. Genzmer, general manager of the Julienhuette in Upper Silesia. This paper was abstracted briefly in our report of the International Congress in *The Iron Age* of July 14, but its importance calls for a fuller synopsis, which is given below.

Owing partly to the increasing scarcity of scrap it has become necessary to develop open hearth processes in Germany to work charges cheaply and quickly, consisting either of pig iron alone or of a large percentage of pig iron. These depend upon using the oxygen of rich iron ore to remove the impurities from the pig iron, the action being assisted by the oxidizing power of the flame. A modification has been introduced owing to the use of pig iron in the molten condition. This was first done on a large scale at Donawitz, Austria, in 1893, and has already been followed by a number of German plants. Indeed, it is possible that the open hearth process, in Germany as in the United States, will one day surpass the Bessemer process. This is more than possible because the phosphorus in the pig iron can be as conveniently removed by some of the newer processes, although it was formerly believed the basic Bessemer was the best. Since the capacity of the furnaces has been so increased that productions of 150 to 200 tons per furnace per day have been reached, the consequent lowering in production cost has itself brought about an active competition to the basic Bessemer.

In Germany the following forms of the pig iron and ore process are in use:

1. Molten pig iron of low and medium phosphorus used direct from the blast furnaces.
2. As above, but with the interposition of an ordinary heated mixer.
3. As above but with partial refining in the mixer.
4. The Hoesch process, a modification of the Bertrand-Thiel, for molten pig iron with high phosphorus.

As neither the Talbot nor the duplex process is in use in Germany these are not taken into consideration. Following a statement of advantages which the open hearth process offers over the basic Bessemer, comes a list of 11 plants where molten metal is used in open hearth furnaces. Then the four processes given above are taken up in order.

1. Process Using Direct Metal of Low and Medium Phosphorus

If the phosphorus exceeds 1 per cent. the process cannot be worked, especially with a small amount of scrap and a stationary furnace, when very good quality is desired. Of the plants using this process the Hubertushuette in Upper Silesia, is particularly worthy of mention, because the furnaces are heated almost altogether with coke oven gas. There are three furnaces, two of 22 tons and one of 25 tons capacity. Molten pig iron has been used since December, 1903. The first method was to simply bring the metal over in 15-ton ladles from the higher level of the blast furnaces to the proper position in front of the open hearth; a tapping hole was opened in the bottom and the metal run through a trough. One result of this rather crude practice was a desulphurization of the metal, sometimes amounting to 30 per cent. Now an 18-ton tilting ladle is used.

First ore, lime and scrap are charged, and then molten pig iron in amount from 50 to 60 per cent. From time to time, however, charges are worked without any difficulty of molten metal alone. In Table I. are given analyses showing the course of a typical charge where pig iron alone is used:

Table I.

	Analysis of metal.					Analysis of slag.				
Time.	C.	Mn.	P.	Si.	S.	SiO_2.	FeO	MnO.	P_2O_5.	Remarks.
12.45	3.61	2.32	0.67	1.890	0.044	....	....	....	...	Additions finished.
1.45	2.72	0.038	0.005	0.500	0.030	20.99	33.25	10.86	7.33	Warm and boils.
2.15	2.45	0.046	0.035	0.050	0.030	20.98	33.70	11.00	7.30	Begins to foam.
2.45	2.34	0.046	0.027	0.031	0.028	21.15	30.14	11.29	6.96	Warm and foaming.
3.15	1.94	0.054	0.020	0.042	0.026	22.35	24.47	11.68	7.59	Foams and is colder.
3.45	1.76	0.061	0.040	0.065	0.026	23.66	19.02	11.91	7.81	Foams and is colder.
4.15	1.68	0.084	0.044	0.033	0.030	23.83	15.57	12.24	7.95	Foams and is colder.
4.45	1.17	0.154	0.065	0.053	0.026	24.55	11.12	12.19	7.40	Cold.
5.00	1.14	0.199	0.094	0.035	0.034	25.76	9.57	11.80	7.21	Warmer and boils.
5.15	0.82	0.261	0.140	0.017	0.028	....	....	....	...	
5.45	0.71	0.307	0.138	0.015	0.028	22.67	7.44	10.43	6.41	Warmer and boils.
6.00	0.61	0.192	0.051	0.031	0.040	21.32	11.46	9.67	5.43	Warmer and boils.
6.20	0.375	0.253	0.019	0.015	0.036	22.56	9.90	9.28	6.89	Warmer and boils.
7.00	0.09	0.261	0.059	0.010	0.030	21.87	10.57	8.38	6.30	Carbon low enough.
7.15	0.084	0.269	0.035	0.020	0.038	21.17	10.34	7.95	6.21	
7.30	0.089	0.499	0.067	0.004	0.042	20.29	9.45	9.24	5.73	Steel.

The charge consisted of 49,385 lb. of molten metal, 10,360 lb. of Swedish magnetite and 1985 lb. of south Russian ores. From 1.45 to 5.00, 3 to 4 per cent. of lime was added. At 5.45 880 lb. of south Russian ore was added, and the same amount at 6.20. At 7.15 353 lb. of ferromanganese was thrown in, and the charge was tapped at 7.30. The reaction takes place between the ore and the molten metal and is quite lively; indeed, if the ore has been thoroughly warmed for a long time in the furnace it may become explosive. A foaming slag is formed and the ore is dissolved in about an hour. Very often, and especially with a pig iron high in silicon and carbon, the slag runs out of the doors. To avoid too large a loss of iron this slag must be charged back into the furnace some time later.

The course of removal of the impurities may be plotted, taking the figures and times of Table 1 as a basis. It will be seen that the manganese and phosphorus are quickly removed, but subsequently re-enter the metal. After working in this way for several years the need of a mixer has become very apparent. The iron changes in analysis so much that it is difficult to know just the right amount of ore to use. If too little is charged, the steel comes high in carbon, when

more ore must be added, and time is consumed. If too much is charged, the steel comes too low in carbon, when more iron or spiegel must be added; but there is danger of bad quality through overoxidation.

The best method of working is to charge the larger part of the necessary amount of ore. Then the molten metal is added. Towards the end of the foaming period about half the slag is removed. This has 15 to 18 per cent. iron, as opposed to from 10 to 11 per cent. in the final slag, so that the loss of iron is increased, but the quality of the steel is improved, for this slag contains the bulk of the phosphorus and sulphur.

In Table II. are shown some details of the practice at the Hubertus plant.

Table II.

Year.	Furnaces.	Production.	Amount molten metal.	Output. Ingots.	Output. Scrap.	Use of material. Ore.	Use of material. Lime.	Use of material. Coal.
		Tons.	%	%	%	%	%	%
1905	1 and 2	42,783	50-55	94	3.0	13	4.8	35.6
1906	1 and 2	47,184	50-55	96	3.0	14.8	3.3	31.8
1907	1, 2 and 3	61,340	50-55	96	3.0	15.9	4.8	25.0
1908	1, 2 and 3	51,214	50-55	96	3.0	11.7	3.6	18.7
1909	1, 2 and 3	26,934	100	101.85	3.15	11.6	4.7	17.0

The figures for 1909 only cover six months. The output is in percentage of the metal charged, not reckoning the ore, and the percentages of ore, lime and coal are with regard to the weight of good ingots.

2. Process with Molten Pig Iron of Low and Medium Phosphorus, with the Use of a Heated Mixer

The chief part of a mixer is to serve as a collection apparatus and as a desulphurizer. One plant where this method has been in use for four years is the Julienhuette, Upper Silesia. The mixer has a capacity of 150 tons and is electrically tilted. The blast furnace metal and slag are charged and discharged on the same side, and the mixer metal poured out on the other. It is heated with producer gas, and the air alone passes through the regenerators. The temperature, therefore, is not high. The coal consumption is about 8 tons in 24 hours, from 400 to 500 tons of pig iron passing through in this time.

The chief advantage of the mixer is to give uniform iron from the greatly varying ores which are in use, and at the same time considerable desulphurization takes place. Records are shown covering two days and giving the increased uniformity and better analysis obtained. Further advantages are that one avoids having to use in the open hearth the varying amounts frequently cast by the blast furnace. Then if a heat comes low in carbon the exact small amount of liquid pig iron is quickly supplied and much time saved. In this way, also, overoxidation is guarded against, which must be taken very carefully into consideration in the direct process.

The practice at Julien is similar to that at the Hubertus plant, but in almost every case a part of the slag is removed during the foaming period. The small loss of iron in the slag is compensated for by the markedly increased tonnage, while the slag is used to advantage in the blast furnaces. The plant has six furnaces, each of 40 tons. Usually four heats per furnace are made in 24 hours and the output varies from 150 to 160 tons. The slag removed during the process shows from 20 to 30 per cent. iron, about 20 per cent. silica, from 1.5 to 2 per cent. phosphorus and 8 per cent. manganese. The final slag has about 10 per cent. iron, 20 per cent. silica, 0.5 per cent. phosphorus and from 6 to 7 per cent. manganese.

3. Process with Iron Similar to No. 2, but Using the Mixer as a Preliminary Refiner

This process is practiced at the Georgsmarien plant, Osnabrueck, the Huestener plant at Huesten, and the Bethlen-Falva plant is building a mixer to hold from 150 to 175 tons. The first mentioned plant has five 40-ton furnaces and a mixer holding 150 tons. A 250-ton mixer is in course of construction. The mixer at present in use is a Wellman tilting furnace, and its mechanical operation and equipment are therefore familiar to American furnacemen. Blast furnace gas is used, the particular method of application being kept secret. After the blast furnace metal is poured into the mixer from 5 to 6 per cent. of ore and from 3 to 4 per cent. of lime are added. The metal averages 3.8 per cent. carbon, 2.75 per cent. manganese, 0.4 per cent. phosphorus, 0.05 per cent. sulphur, 0.6 to 1 per cent. silicon and 0.4 per cent. copper. The amount of ore mentioned above has been found to give better results than a larger amount. About 11 per cent. is then necessary in the open hearth furnaces, the total percentage being from 16 to 17 when the charge is about 70 per cent. iron and 30 per cent. scrap. In February, 1909, the mixer was in constant operation 26½ days out of 28 and 61,400 tons of pig iron were treated. The slag contained 6.86 per cent. iron. Swedish magnetite was used containing 67 per cent. iron and 90 per cent. of this was reduced and entered the metal.

The average analysis of the mixer metal was 3.5 per cent. Carbon, 1.2 per cent. Manganese, 0.08 per cent. Silicon, 0.15 per cent. Phosphorus and 0.02 per cent. Sulphur. With the use of such metal the reactions in the open hearth are naturally less violent and the life of the furnace is increased. From the records the output of two furnaces and one mixer is equal to the output of three furnaces with ordinary iron. It must be remembered that the mixer, with proper care, lasts two years, and the repair cost is very low. Further advantages of the mixer are:

1. Lower labor costs, for two men can handle it.

2. Lime, dolomite and ore consumption are greatly reduced.

3. The high percentage of good ingots, the scrap being immediately thrown back, amounting to 103 to 104 per cent. When the second mixer is built it is hoped with both mixers and three furnaces to double the production and make from 786 to 835 tons a day.

4. The Hoesch Modification of the Bertrand-Thiel Process for Iron with High Phosphorus

This process is followed at the Hoesch works in Dortmund and at Phoenix and Hoerde in Westphalia. The latter plant uses cold basic Bessemer iron. Several other plants are introducing it. The following data are taken from the excellent recent papers of Dr. Peterson and Dr. Springorum. The best results are obtained when the silicon does not exceed 0.06 per cent. and the manganese 2 per cent. in the blast furnace metal. The practice at Hoesch is to charge high phosphorus Swedish magnetite, roll scale and lime into a 30-ton furnace. Of mixer metal, 20 to 22 tons is then added. In two to three hours the ore has dissolved and the bath is sufficiently warm. The whole is tapped into a ladle, which is held at an angle, so that the high phosphorus slag can easily overflow into a vessel at the side. This slag contains from 20 to 25 per cent. P_2O_5, of which from 80 to 90 per cent. is soluble in citric acid. It is sold for from 3½ to 5 marks per ton. The tap hole of the furnace is closed, the necessary amounts of spathic ore, lime and scrap added, and the refined metal poured in. In about two hours the steel is finished. The characteristic metallurgical features of the process are these: In the first part the silicon and manganese are almost completely removed and the phosphorus to a very large extent, while the carbon is only about half oxidized. In the second period the rest of the phosphorus and the necessary carbon are removed. Sulphur is taken up by the slag during both periods. The exact chemical history of a heat is given in Table III.

Table III.

Time.	Analysis of metal.—Per cent.— C.	P.	Mn.	Si.	S.	Analysis of slag.—Per cent.— FeO.	MnO.	Al_2O_3.	CaO.	MgO.	P_2O_5.	S.	SiO_2
First Period:													
12.15	3.28	1.86	0.96	0.32	0.132	....	....	....	....	....	....	....	....
1.10	2.47	0.59	0.17	Tr.	0.102	....	....	....	....	....	....	....	....
1.30	1.90	0.47	0.22	Tr.	0.098	10.25	5.03	1.36	41.56	4.32	22.85	0.069	12.2
1.40	1.65	0.37	0.22	Tr.	0.098	7.26	4.96	1.38	45.48	4.00	22.26	0.124	11.8
2.05	1.46	0.26	0.34	Tr.	0.082	4.67	3.93	1.60	48.86	4.00	22.13	0.138	11.4
Second Period:													
3.50	0.38	0.09	0.29	Tr.	0.100	19.64	13.49	3.17	33.64	6.92	6.25	0.110	12.2
4.10	0.20	0.05	0.23	Tr.	0.089	15.78	12.08	3.00	35.78	6.70	6.70	0.165	15.4
4.30	0.09	0.045	0.26	Tr.	0.090	15.83	8.88	2.32	43.88	6.00	5.50	0.289	13.2
4.45	0.07	0.035	0.26	Tr.	0.080	14.13	10.19	2.21	43.79	6.10	5.57	0.206	14.2
5.05	0.06	0.035	0.27	Tr.	0.078	16.23	8.32	2.20	45.30	5.90	5.55	0.275	14.0
5.10	0.04	0.03	0.25	Tr.	0.077	17.20	7.67	2.00	46.19	6.12	5.15	0.316	13.1
5.15	0.08	0.04	0.47	Tr.	0.067	17.03	10.25	1.90	46.28	5.92	5.00	0.344	12.4

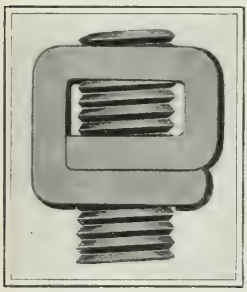
The original charge consisted of 51,323 lb. of mixer metal, 4144 lb. of lime, 7583 lb. of Swedish ore and 1697 lb. of roll scale. At 2.35 the following was charged in the emptied furnace: 4806 lb. of spathic ore, 11,931 lb. of scrap and 2843 lb. of lime. At 4.30 231 lb. of roll scale was added and 352 lb. of lime at 4.45, followed by 454 lb. in 10 minutes. At 5.10 440 lb. of ferromanganese was thrown in, and the heat was tapped at 5.15. In the year 1908-1909 74.72 per cent. of pig iron was used and 24 per cent. of scrap, and the output was 49,745 tons of good ingots. The percentage of output, based on metal charged, was 104.42. Based on this good showing, two or three new furnaces are to be built of 50 to 60 tons capacity.

The pig iron ore process is also in use at Phœnix, and of course at Hoerde. From the results given under the above four headings it may be seen that in Germany iron with 1 per cent. phosphorus, indeed with 1.5 per cent. phosphorus, can be worked profitably. It thus opens up a field for vast quantities of iron ore, which at present would give iron incapable of use by the ordinary open hearth process or the basic Bessemer.

G. B. W.

A Spring Loop Nut Fastener

The Loop Nut Mfg. Company, Madison, Wis., is manufacturing a special type of spring fastening known as the loop nut which is shown in the accompanying engraving. This fastener consists of a strip of steel folded as shown, which has a lateral opening and possesses sufficient tension to throw the threaded ends slightly out of alignment, thus taking up any slack between the bolt and nut. This fastener was invented during the winter of 1907-08 by W. C. Schoelkoff, the general manager of the company, in response to a demand for a device to regulate the stroke of the plunger of an oil pump. This was formerly done by the use of jam nuts which possess the disadvantages of being difficult to adjust and also liable to work loose.

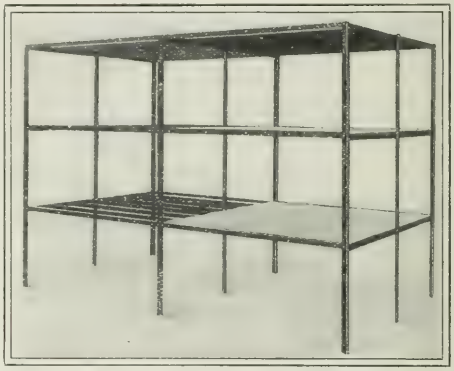


The Standard 1¼-In. Spring Nut, Made by the Loop Nut Mfg. Company, Madison, Wis.

This nut, being made of one piece of metal, is not apt to get out of order and is very simple to manufacture. The special applications of this device are for fastening wire on the terminals of storage batteries, spark coils and commutators and in other places where spring washers and jam nuts are now used on gasoline engines, windmills, automobiles, railroad rails, locomotives, rolling stock and harvesting machinery. In addition to the standard type of fastening, which is the one illustrated, other special types are made for rail bolts and places where the screw does not occupy all the lateral opening and pass through the third transverse member of the fastener.

An Improved Pattern Storage Rack

The Manufacturing Equipment & Engineering Company, Boston, Mass., has recently brought out an improved type of pattern storage rack, designed more especially for wooden patterns, which possesses a number of valuable features, the chief of these being the shelves



A New Pattern Storage Rack Constructed Entirely of Angle Iron and Wire Cloth, Made by the Mfg. Equipment & Engineering Company, Boston, Mass.

which are constructed of No. 16 gauge galvanized iron wire cloth having a 2-in. mesh.

The wire cloth shelf has the important advantage of keeping the patterns from warping, as both sides are equally exposed to the air. This type of shelf allows the dirt to drop through to the floor, instead of accumulating on the patterns, and also allows the light to pass through the vacant spaces where the shelves are not covered with patterns, thus making it easy to locate patterns on the lowest shelf. These shelves are especially framed for securing rigidity and the minimum amount of material to make the rack stiff and sufficiently strong to carry any wooden pattern load. All the shelves are complete units, and can be removed, adjusted from one hight to another or new shelves inserted without any change in the main frame. This is built of angle iron posts, so constructed that any section can be removed from the main rack or new ones added at any time.

This type of rack is self-supporting, is not attached to the building in any way and can be moved as often as desired. In other words, these racks admit of all of the adjustments required and can be built over to suit the different sizes of patterns whenever it is necessary. It reduces the cost of metal shelving to a minimum and decreases the fire risk in pattern storage, it is stated, even to the extent of doing away with insurance when these racks are used in fireproof buildings. Although these racks are more especially designed for wooden patterns, they can be easily adapted to metal patterns by using heavier gauges of wire cloth, and are being installed in many of the leading manufacturing plants throughout the country.

The Standardization of Motor Drives for Machine Tools

Report of Progress of the Joint Committee of the Machine Tool Builders and the Association of Electric Motor Manufacturers

At the Rochester convention of the National Machine Tool Builders' Association the Committee on the Standardization of Motor Drives for Machine Tools, consisting of P. A. Montanus, F. R. Ratliff and A. L. De Leeuw, made a report of progress of its negotiations with the committee of the American Association of Electric Motor Manufacturers. Seven points have been agreed upon, as published in the official report, which has just been issued, but the final adoption of the new standard practice by the two associations has not yet come up for formal action. The schedule as agreed upon is as follows:

1. *Horsepowers.*—It is thought that the following horsepowers will meet practically all the requirements of electric drives for machine tools: 1, 1½ (for D. C. only), 2, 3, 5, 7½, 10, 15, 20 and 25. Though it was agreed that horsepowers more than 25 and less than 1 are used, it was not thought advisable to embody them at the present in the attempted standardization, but it was held out that they might be embodied some time in the future among the standardized sizes. The chief consideration was to limit the demands to the lowest practical amount, so as not to defeat the object of your committee at the start by insisting on more than the electrical people could grant.

2. *Voltage.*—It is recommended that for D. C. motors 115 and 230 volts be adopted as standard, and for A. C. motors 110 and 220 volts.

There is now a good deal of confusion as to voltages for D. C. motors. The motor manufacturers have reached an agreement among themselves as to these voltages, and 115 and 230 voltages recommended by them represent the nominal voltage of the system, and not the real voltage at the motor.

3. *Horsepower Ratings for Drives.*—It is recommended that the horsepower ratings for machine tool drives be the standard ratings of the American Association of Electric Motor Manufacturers—*i. e.,* (a) that motors be given the continuous constant horsepower rating where approximately standard load conditions exist; (b) for adjustable speed motors used for intermittent service the standard two-hour continuous duty rating be used for ordinary shop conditions, and that the name plates of such motors indicate the time as well as horsepower ratings of the motor, and further that the horsepower be figured at the high as well as the low speed for adjustable speed service.

4. *D. C. Motors.*—It is the recommendation of the Joint Committee that constant speed motors, adjustable speed with a range of 2 to 1, and adjustable speed motors with a range of 3 to 1, be included in the attempt at standardization. It is the opinion that this will cover practically all the requirements of the majority of machine tool manufacturers, and these ratios are recommended for the guidance of tool and motor designs.

This does not exclude the occasional use of motors with a different speed range, such as 4 to 1, or even more, but it was the opinion of the committee that motors with a higher range of speed than 3 to 1 are not used to a sufficient extent and are not so absolutely necessary for machine tool construction, as to include them among the standardized motors.

5. *Speeds.*—The following table of speeds is recommended as the standard for adjustable speed D. C. motors:

Hp.	2 : 1	3 : 1
25	900—450	900—300
20	900—450	900—300
15	1,200—600	1,200—400
10	1,200—600	1,200—400
7½	1,200—600	1,200—400
5	1,200—600	1,200—400
3	1,500—750	1,500—500
2	1,500—750	1,500—500
1½	1,500—750	1,500—500
1	1,500—750	1,500—500

The tendency of the electrical manufacturers is of course toward higher speed motors, but it was thought desirable by your committee to hold out for lower speeds, on account of mechanical difficulties in gear and chain driving when higher speeds are used. The schedule as given above is a compromise, and will allow of motor drives with reasonable linear speed of first driving gears, and limits the number of revolutions of the motor to within the limits given by chain makers for the proper speed of their chains.

6. *A. C. Motors.*—It is recommended that the following table of polyphase 60-cycle A. C. motors be adopted:

25 hp	900 and 600	5 hp	1,200
20 hp	900 and 600	3 hp	1,200
15 hp	900 and 600	2 hp	1,200
10 hp	1,200 and 600	1 hp	1,800 and 1,200
7½ hp	1,200 and 600		

7. For the consideration of the constant speed A. C. motors, 60 cycles is to be used as the basis.

Points 8 up to 15 were not jointly discussed by the Electric Committee of the Motor Manufacturers' Association, and are given here below, to show you in which direction your committee wishes to accomplish the standardization.

8. *Shaft Diameter.*—It is recommended that the shaft diameter be figured according to the formula $D = C\sqrt{\frac{H.P.}{S}}$ in which C is a constant to be agreed upon by motor manufacturers, D the diameter, and S the speed; it is further desired that all diameters up to and including 1½ in. be given in ⅛ in., and all diameters above 1½ in. be given in ¼ in.

9. *Length of Shaft.*—It is recommended that there shall be a fixed proportion between diameter and length; the constant to be determined by the motor builders. Further, that the shaft be rounded at the end.

10. *Keyways.*—It is recommended that keyways be made for square keys, and that the key be equal to one-fourth the diameter of the shaft.

11. *Driving Fit.*—It is recommended that there be added to the standard dimensions of the shaft .0005 in. for every ½ in. diameter of the shaft or fraction thereof.

12. *Variation.*—It is recommended that shafts shall not be under the specified size, but may exceed same by .0005.

13. *Hight of Center.*—The hight of center to be given in full ¼ in., and shall not be less than figured dimension, but may exceed this dimension by one thirty-second.

14. *Clearance Circle.*—It is recommended that the clearance circle around the motor shall have a diameter of ½ in. less than twice the center hight.

15. *Base.*—All motors to be held down by four bolts. Bolt holes to be drilled one-sixteenth above size of bolt required. Bottom of motor to be planed parallel with the shaft of motor. It is further recommended that the bolt holes be placed in a configuration of constant proportions, preferably in a square, and that the dimensions of this configuration be made a function of the horsepower divided by the speed, and further that all dimensions be given in the nearest higher ¼ in. The feet of the motor should extend beyond the body sufficiently to allow for drilling and reaming of dowel pinhole while motor is in place.

The Du Charme Clamping Devices

Ability for Instant Adjustment Is a Special Feature

The Du Charme Wrench & Novelty Mfg. Company, Johnstown, Pa., has developed a line of clamping devices such as wrenches, planer clamps and pipe vises, some of which are illustrated herewith. The wrenches are the result of 10 years' experimenting, and are offered by the manufacturer as one of the most practical wrenches manufactured. Figs. 1, 2 and 3 show three different styles of drop forged steel wrenches manufactured by this company; Figs. 4 and 5 are two views of the Du Charme adjustable planer clamp, and Fig. 6 illustrates one of a line of open top pipe vises.

The self-adjusting wrench illustrated in Fig. 1 is built with but three parts, and is said to be simple, strong and durable, meeting every requirement of the old type of monkey wrench with the slow method of adjustment eliminated. The three pieces of the wrench are the body, a swiveled head working on a cam joint, and a loose jaw which responds instantly to the motion of the hand of the operator. This wrench will adjust



Fig. 1.—Self-Adjusting Wrench.



Fig. 2. Alligator Wrench.



Fig. 3.—Turret Head Wrench.

Three Types of Wrenches Made by the Du Charme Novelty & Mfg. Company, Johnstown, Pa.

itself to any size pipe or nut from ⅛ in. in diameter to the full capacity of the tool.

The quick adjustment of an alligator wrench has never been accomplished before to the satisfaction of the user, it is stated, because too many sizes of wrench were required. In the one illustrated in Fig. 2 the maker claims to have overcome this objection and to have produced a wrench that can be instantly adjusted to fit any sized pipe or nut by the single adjustment of a set screw which is easily applied. The jaws are said to possess such strength as to be able to meet the demands of the hardest and heaviest work they may be called upon to perform.

Fig. 3 illustrates the turret head wrench, so called because of its resemblance to the turret head of a lathe. This tool consists of five standard sizes of jaws on one handle, which are held in place by a spring controlled by the small button near the upper end of the handle. It is claimed for this tool that it will prove the handiest in any kit, and it is especially adaptable to the chauffeur and automobile owner where room is most desirable. The locking spring clamps the jaws firmly in position, thus making the tool rigid and free from slipping and a perfect jaw wrench at any adjustment for any angle. It is also capable of being used as a straight or an S wrench.

The Du Charme adjustable clamp in Figs. 4 and 5 is designed for holding materials on the bed of a planer, drill press or other flat bed machines. These clamps can be instantly adjusted to any hight. A sliding motion of the lever to which the jaw is attached, either up or down, places the clamp in the desired position, and another movement of the lever clamps the work securely and solidly with no possible chance of slipping. As will be noticed from Fig. 5, the base of these clamps is of such a shape as to slide readily into the T-slot of the machine on which the work is to be fastened. These clamps can be placed in any desired position and can be used either singly, in pairs or in any required combination to hold the work in position.

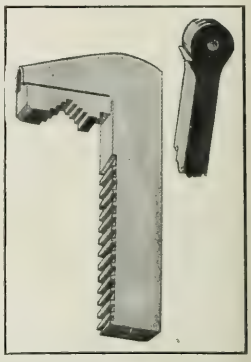


Fig. 4.—Detail of Du Charme Clamp for Flat Bed Machinery.

The open top pipe vise shown in Fig. 6 is especially desirable for new work where a vise is needed on the job because of its adaptability for instantaneous adjustment and its light weight combined with strength. The special feature of the vise is its instant adjustment from ⅛ in. to its capacity, which is accomplished by a single movement of the jaws and hand lever. This movement grips the vise securely and the same operation releases it as quickly. In fact, it is stated this vise can be adjusted in less time than a single turn of the ordinary screw vise can be made. In common with all the other tools manufactured by this company, the pipe vise is made of high carbon steel with drop forged movable jaws, and the gripping jaws are of tempered high carbon steel. Four sizes of vise in all are built, the minimum capacity of the smallest being ⅛ in. and the maximum of the largest 6 in.

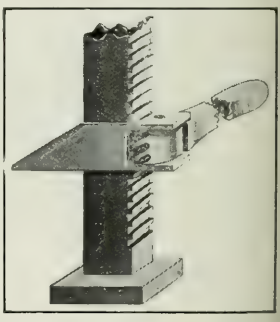


Fig. 5.—Du Charme Planer Clamp.

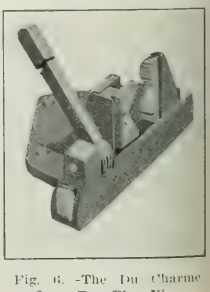


Fig. 6.—The Du Charme Open Top Pipe Vise.

The new battleship Rio Janeiro, which is being built by a British firm of shipbuilders for the Brazilian Government, will, according to *Engineering*, be far the largest in the world, displacing 32,000 tons, and mounting 12 14-in. guns. The cost will be approximately $14,500,000. The Rio Janeiro will be almost twice the size of the original Dreadnought, which displaces 17,500 tons. Great Britain's biggest warship, the Lion, which is to be launched in August, has a displacement of only 26,000 tons.

The Kane & Roach Channels

Machines for Forming Special Shapes from Flat Stock Cold

Two of an extensive line of special machines built by Kane & Roach, Niagara and Shonnard streets, Syracuse, N. Y., are illustrated in the accompanying engravings. These machines are what the maker terms channeling machines and are used for making up almost any sort of shape from cold flat stock. Figs. 1 and 2 are front and rear views, respectively, of a machine for ordinary work, while Fig. 3 illustrates a 4-roll channeling machine designed for handling very large and very wide work.

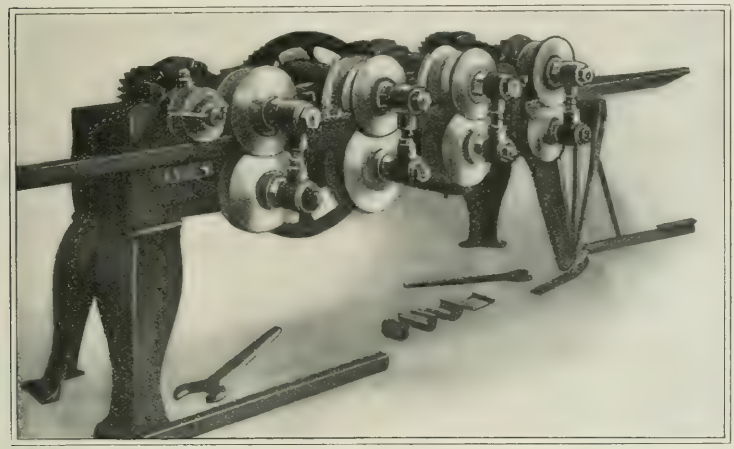


Fig. 1.—Front View of a Channeling Machine Built by Kane & Roach, Syracuse, N. Y.

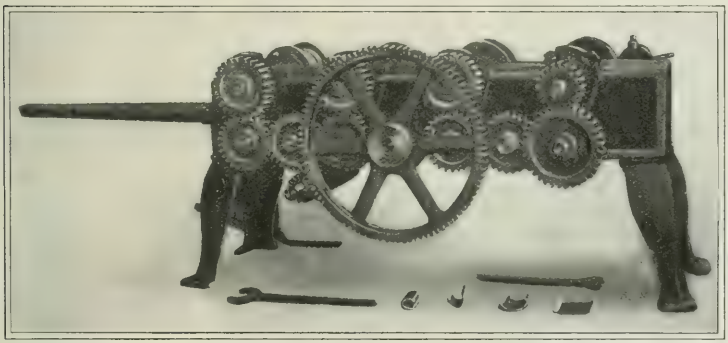


Fig. 2.—Rear View of a Channeling Machine for Forming Metal Shapes from Cold Flat Stock.

The use of these machines is not confined to any one particular piece or one shape of metal. The cold flat stock can be formed into complete circles, such as tubes or bent to form channels or half circles, as the rims for clincher automobile tires. If desired, the metal can be turned out in a straight strip by equipping the machine with straightening rolls. In making the rims for automobile tires the forming of the flat bar into the proper shape for the rim and bending the shape thus formed into a circle can be done in one operation by putting on rolls of the proper shape and size.

In Fig. 1 a number of short pieces will be noticed lying on the floor. These are samples of the work turned out by the machine, and the first one at the right represents flat stock after passing through the first roll. The second and third pieces show the shape into which the next two rolls bend the piece, and the one at the left shows the form in which the finished product leaves the machine. This engraving also shows a bar of flat cold steel 6¼ in. wide by 3-32 in. thick being fed into the machine at the right and coming out bent into the finished shape at the left.

The 4-roll channel, illustrated in Fig. 3, handles very large and very wide work, and is intended particularly for a number of different lines of sheet metal work. Different sizes and shapes of rolls are furnished for it, which make it capable of rolling all shapes and sizes of cornices or other sheet metal articles. Both of these machines are built for belt or electric motor drive, as preferred, and the upper rolls can be adjusted up and down to provide for any decrease in diameter due to wear and also to take care of the different thicknesses of metal handled.

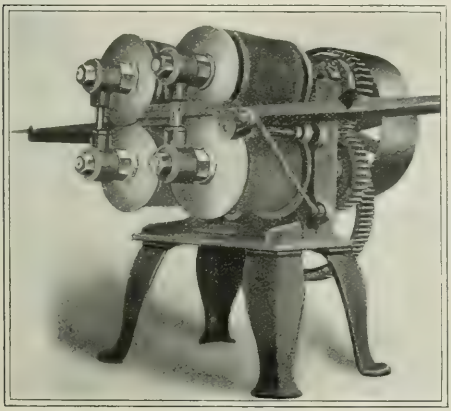


Fig. 3.—A Four-Roll Machine for Very Large and Very Wide Work.

According to the *Marine Journal*, the Navy Department is dissatisfied with the skeleton masts of woven wire with which some 15 of our battleships have been equipped at an expense of $10,000 each. "The fact that so many ships were fitted with them before they had been thoroughly tried out in one or two vessels seems to evidence lack of foresight. The most serious drawback to this innovation is that on account of the altitude of the platform at the top there is an appreciable amount of vibration at certain speeds, and besides, the system of observation, calculation and communication is thereby a complicated one."

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅞ in. round and square	₱ lb 1.90¢
1½ to 3 in. x ⅜ to 1 in.	₱ lb 1.90¢
1½ to 4 in. x ¼ to 5-16	₱ lb 2.10¢
Rods—⅜ and 11-16 round and square	₱ lb 2.10¢

Angles:

	Cts ₱ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 3-16 in. and ⅛ in.	2.35¢
1½ to 2½ in. x ⅛ in.	2.20¢
1½ to 2¼ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.20¢
1 to 1¼ x ¼ in.	2.30¢
⅞ x ⅛ in.	2.40¢
⅞ x ¼ in.	2.50¢
¾ x ⅛ in.	3.55¢
⅝ x ¼ in.	4.05¢
½ x 3-32 in.	

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.45¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢

Beams	2.10¢
Channels, 3 in. and larger	2.40¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	2.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.50¢

Merchant Steel from Store—

	per ₱
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C. R. Soft Steel	R. G. Cleaned.
No. 16	₱ lb 2.90¢	3.00¢
Nos. 18 to 21	₱ lb 2.95¢	3.10¢
Nos. 22 and 24	₱ lb 3.05¢	3.20¢
No. 26	₱ lb 3.15¢	3.30¢
No. 28	₱ lb 3.25¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₱ lb 12@14½¢

Patent Planished, W. Dewees Wood & Co.'s A, 10¢; B, 9¢ net

Galvanized.

Nos. 11 to 16	₱ lb 3.30¢
Nos. 22 to 24	₱ lb 3.55¢
No. 26	₱ lb 3.75¢
No. 28	₱ lb 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₱ lb 5.55¢
No. 26	₱ lb 6.25¢
No. 28	₱ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₱ 100 sq. ft. $3.85	4.80
No. 26	₱ 100 sq. ft. 2.95	4.00
No. 28	₱ 100 sq. ft. 3.00	3.75

Tin Plates—

American Charcoal Plates (per box.)

A. A. A. Charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.40
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.35

American Coke Plates—Bessemer—

IC, 14 x 20 .07 ₱	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908 Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 Base price 18¢

Copper Tubes—

List November 13, 1908 Base price 22¢

Brazed Brass Tubes—

List August 1, 1908 19½¢ ₱ ₱

High Brass Rods—

List August 1, 1908 14½¢ ₱ ₱

Roll and Sheet Brass

List August 1, 1908 14½¢ ₱ ₱

Brass Wire—

List August 1, 1908 14½¢ ₱ ₱

Copper Wire—

Base Price 17¢ and lots under 14¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity 18½ ₱ ₱ 18¢

Sheet Copper Cold Rolled, 14 ₱ ₱ advance over Hot Rolled

Sheet Copper Polished 2 in. wide and under, 2¢ square foot

Sheet Copper Polished over 2 in. wide, 2½¢ square foot

Planished Copper, 1¢ square foot more than Polished

METALS

Tin—

Straits Pig 35@35¼¢

Copper—

Lake Ingot	₱ lb 14¾@15¢
Electrolytic	₱ lb 14½@14¾¢
Casting	₱ lb 14¼@14½¢

Spelter—

Western ₱ lb 6¼@6½¢

Zinc.

No. 9, base, casks ₱ lb 8¢ Open 8¼@8½¢

Lead.

American Pig	₱ lb 5@5¼¢
Bar	₱ lb 6⅜@6⅝¢

Solder.

½ & ½, guaranteed	₱ lb 22@22½¢
No. 1	₱ lb 19@19¾¢
Refined	₱ lb 17½@17⅝¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₱ lb @10¢
Halletts	@10¢
Other Brands	@9½¢

Bismuth—

Per ₱ $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 24¢

Rods & Wire Base Price 31¢

Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Price Paid in New York

	Cents
Copper, Heavy cut and crucible	₱ lb 10.25@10.50
Copper, Heavy and Wire	₱ lb 10.00@10.25
Copper, Light and Bottoms	₱ lb 9.00@9.25
Brass, Heavy	₱ lb 6.75@7.00
Brass, Light	₱ lb 5.50@5.75
Heavy Machine Composition	₱ lb 9.25@9.50
Clean Brass Turnings	₱ lb 6.75@7.00
Composition Turnings	₱ lb 8.00@8.25
Lead, Heavy	₱ lb @3.50
Lead, Tea	₱ lb @3.25
Zinc Scrap	₱ lb @3.75



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You can all avoid a "rut" —
Just by stocking up and selling
Files like these that *always cut.*

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TRADE NICHOLSON U.S.A. MARK



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THE IRON AGE

Established 1855 | New York, August 4, 1910 | Vol. 86: No. 5

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Contraction in Iron and Steel

Less at Steel Works Than at Blast Furnaces

Nearly 20 Per Cent. Curtailment in Pig Iron Since February—A 1.40c. Basis for Steel Bars

The blast furnace statistics for August 1 show plainly the contraction that is going on in the iron trade. In July, the production of coke and anthracite iron was 2,142,442 tons, or a daily rate of 69,111 tons, as against 2,265,478 tons in June, representing a daily rate of 75,516 tons. The falling off is chiefly in the output of steel works blast furnaces, their production being 4500 tons a day less in July than in June.

It should be noted, however, that steel production has not declined in the same ratio as that of pig iron, since the large steel producers are now drawing upon their stocks of pig iron and scrap. These have grown in recent weeks and the accumulation has been accentuated by an increase in stocks at merchant furnaces producing steel making iron. In the Mahoning and Shenango Valleys there was a very considerable increase in stocks of Bessemer and basic iron in July.

The United States Steel Corporation is now operating 72.5 per cent. of its blast furnace capacity, having 39 furnaces out of blast, as against 35 furnaces July 1 and 31 furnaces June 1.

With 256 coke and anthracite furnaces in blast August 1, or 57 less than on February 1, the country was producing pig iron at the rate of 25,500,000 tons, or nearly 20 per cent. less than the maximum rate of the year, which was reached in February. The present rate is less than that of 1907 or 1909.

In the past week there have been evidences of rather more pressure on foundry iron prices. A number of sellers have been more actively seeking business and $11, Birmingham, for No. 2 Southern iron is now not uncommon. In the East, Virginia iron has been sold as low as $13, at furnace. Most buyers are willing to wait longer, though the low priced business that has been done lately, particularly in Southern iron, is probably underestimated.

Bessemer and basic iron under the weight of large stocks have declined to $15.25 and $14.25, respectively, at Valley furnace. The widely reported sale of 10,000 tons of basic iron at $14, at furnace, is regarded as speculative and was for cash.

The lower prices for billets and sheet bars have attracted some consumers. One sheet bar contract is reported, covering the balance of the year, at close to $25.50, Pittsburgh, and a tin plate manufacturer has bought his supply of tin bars for this year on a sliding scale governed by average monthly prices of Bessemer pig iron.

The making of Chicago district prices on forging billets, without regard to the Pittsburgh price plus freight, marks further progress toward an independent Chicago basis on all steel products.

New business has come to the books of the large steel companies at a less rate in July than in June.

Rails have been the least active line. Further important rail orders are not now to be expected for rolling in 1910, and the mills have not formally opened their books for 1911.

Heavy products have been less active as a rule than the lighter. Several plate mills have little work ahead. The Riter-Conley Mfg. Company has taken 2½ to 3 miles of riveted pipe work for New York City, and the plates will be rolled at Pittsburgh. The Texas Company is expected to buy 60 to 75 miles of 3 to 8 in. line pipe this week.

The sheet trade has been somewhat unsettled by low prices, and 2.20c., Pittsburgh, for No. 28 black for the remainder of the year has been reported. Recently rather better business has been done by some mills.

Sales of wire products by the leading interest averaged about 7300 tons a day in July, the total making a new July record. The reduction in prices also stimulated specifications which were at the rate of 4600 tons a day.

The 1.40c. price for steel bars, which was made on agricultural contract business some time ago, and on contract business of other descriptions in the past month, is now more common. However, on early deliveries, 1.45c. still generally prevails.

The larger fabricating works have contracts on hand that will occupy them well toward the end of the year. July was a light month for new business, however, the total being about 100,000 tons, of which the largest producer took 30,000 tons.

Two Iron Trade Readjustments

The iron trade of 1910, in disappointing the high hopes entertained at the beginning of the year, has furnished support for the view of some students of financial and industrial movements who said last year that the recovery of 1909 was too rapid to be lasting. One year ago when market reports were noting each week the rising tide in iron and steel, these commentators were finding a parallel between 1895 and 1909 and suggesting that the revival then attracting so much attention might be followed in 1910 by reaction. It was pointed out in reply, and truly, that conditions in the two years were widely different. The unsoundness of our currency basis then and the menace of free silver, which in the Presidential campaign of 1896 brought the country close to financial calamity and chaos, were palpably in contrast with the thorough establishment of the gold basis of to-day. The poverty of Western farmers then and their close approach to opulence in recent years also furnished the strongest ground for distrusting the parallel, not to mention other differences, including the country's enormous increase in wealth since 1895, its sounder credit basis and the general prevalence of confidence in its financial institutions.

As the fall months of 1909 came on and pig iron production rapidly increased, while prices continued to advance, it was recalled that the boom of 1895 began to wane in the fall of that year, and again the attempt to draw a parallel seemed to break down. Early in 1910 the statistics of pig iron production appeared, showing that 1909 had made a new record and that in the second six months of the year the greatest previous half year's production—13,478,044 tons in the first half of 1907—had been exceeded by 1,300,000 tons. And now that the first half of 1910 has shown an increase of 240,000 tons in pig iron production over the last half of 1909, whereas in the first six months of 1896 there was a decline of 7 per cent. from the previous six months, it is evident that the movement of 1909 in the iron trade was far more substantially backed than the short lived boom of 1895.

Those who would emphasize the resemblance between business conditions in the two periods mentioned, in spite of the contrasts, including the fact that the reaction has been much later in coming this time and thus far more gradual, will be interested in the following table of pig iron production for 1895 and 1896 and for 1909 and 1910:

Pig Iron Production in 1895, 1896, 1909 and 1910. Gross Tons.

	First half.	Second half.	Total
1895	4,087,558	5,358,750	9,446,308
1896	4,976,236	3,646,891	8,623,127
1909	11,022,846	14,773,125	25,795,471
1910	15,012,392	.....	.....

Noteworthy parallels in the statistics are the increase in pig iron production in the second half of 1895 and the second half of 1909 over the first half of those two years, respectively. It was close to one-third in each case—31 per cent. in the former and 34 per cent. in the latter. Further, both years established a new pig iron record, 1895 exceeding 1890 by 240,000 tons, while 1909 exceeded 1907 by 14,000 tons. What the last five months of this year will determine is the extent to which the decline in the second half of 1910 will parallel that of the last half of 1896.

It is true that the specter of free silver is not now stalking abroad as in 1896; but instead of the doubt then prevalent as to the currency basis we have now, in the pending anti-trust cases, uncertainty as to the basis of business organization and further uncertainty as to railroad security values and earning power, due to the clouding of the whole question of rates for transportation. We have been told for many months now that underlying conditions are sound—a somewhat hazy way of saying that the financial structure is not endangered by serious credit abuses or by extended speculation. Perhaps the expression is intended to emphasize the difference between business conditions to-day and those of the years following the panic of 1893, including the very years to which reference is made above. Nevertheless, the view finds strong support that so far as real readjustment is concerned the work following the panic of 1907 was by no means what was looked for. One view of the process of sifting which is now under way is that it will eventually accomplish what was left undone in the recent depression, and there are those who see ahead a general readjustment of commodity prices and labor and who believe that there must be a period of economy and thrift before our available capital can be increased so that we can safely go ahead on a larger scale. Such a view will be combated by those who are always persuaded that the interruptions to prosperity are fortuitous, and that but for politics or mistaken or dishonest banking, or poor crops or unfortunate speculation there need be no serious fluctuations. Yet there is no mistaking the fact that a certain shrinkage is now going on in the volume of business. It has been accompanied by no spectacular happenings and there is widespread confidence that it will result in healthier conditions, with prices on a level that will eventually

broaden consumption. One thing that will count for an orderly readjustment, without violent disturbance, is the abundant attention given for months to every possible menace to business and the fact that capital, with the possible exception of one conspicuous line, has been unwilling to venture upon large extensions.

Utilizing Idle Helpers

A correspondent asks for assistance in solving the problem of the utilization of helpers in a manufacturing plant during such time as they are not needed in their regular employment, his statement of the case being as follows:

In our press shop we have a large number of helpers. As some press jobs are more difficult and require more handling than others, there are times when we need all the men we can get. But as these conditions are constantly changing, say, up to four times a day, you can readily see that there will be frequent intervals when a helper will have nothing to do. At these times he keeps busy and out of the foreman's sight by doing work that there is no need of his touching. Of course, this shoots up the costs on jobs to which such helpers charge their loafing time. The problem is, What shall we do with our helpers when we do not need them for half an hour or a day? We make stampings and do light and heavy drawing, hardening, annealing, plating and forging and solicit jobbing work.

A shop I know of uses a large number of castings. When helpers are not busy they are sent to a big work bench in the center of the shop, where they clean castings and smooth them up with brushes and cold chisels. Their time is charged to the job that the castings are intended for. Having gone over the details of our press work I can find no job that will correspond with these castings. If I want to use the work bench plan I might introduce some by-product. Could you suggest anything that would fill the want and still be simple enough for our men to handle?

The problem is one that has to be solved in many plants. In some cases, such as that last cited by our correspondent, it is an easy one. In others, it resolves itself into a matter of equipment. To illustrate the point, presuming that the wasted time of helpers averages to equal one man for a full year, with a dead loss of $500 in wages, the owner might very well consider an investment in new equipment for the conversion of a waste into a producing force. The factory in question makes staple lines and probably special pressed metal parts on contract in large quantities. Some of these goods could be produced at odd times by unskilled men, if a press, or several, were kept set up for the purpose. Such equipment should be in addition to machines which are constantly employed. They would be reckoned into the manufacturing facilities, but with the understanding that they would be out of commission at intervals. This would constitute a loss of interest on its cost, but against it would be the saving of idle time of workmen. The expenditure of $500 annually is 5 per cent. on an investment of $10,000. The tying up of, say, $1000 in a press is small indeed when compared with such a leakage. If the machine should remain unused for half of the year the economy would still be large. It should be set up for a year's supply of some standard article, or on a large contract for a customer, such as a pressed steel company has constantly on its books. Ferrules and ball bearings and stove knobs are manufactured in large lots in standard and special forms. An economy exists in completing press jobs on one setting of tools, for diemakers' time is valuable. Money is tied up to some extent, but manufacturing is cheaper. This is the policy of the more progressive of the automobile builders; they are lavish in their equipment, one important reason being the conservation of labor.

In case this solution of the problem is impossible, the wasted effort of the helpers should not be charged up to any one job, but to the account of non-productive labor, for the cost should be distributed in the overhead expense. Otherwise a fictitious cost will be saddled upon some order, which is misleading, and may even be demoralizing in its effect. With a comprehensive cost system, however, if a workmen must have a job ticket in order to be credited with his time, it would seem an easy matter to correct a tendency to keep out of a foreman's sight and still have the opportunity to labor. The foreman assigns each task. The payroll is made up from the tickets turned in by the men. It should not be forgotten that helpers can do much of the non-productive labor of a manufacturing establishment, including the sweeping and cleaning. Above all, it is important to retain efficient helpers, even if some of their time is valueless to the employer. The fact should never be lost sight of that it costs money to break in new men. Not only is their own time lacking in efficiency during the early days of their employment, but they require the time of well paid men who should be using it to better advantage elsewhere. Should it be necessary to seek outside work for the special purpose of giving employment to the helpers, a careful scrutiny of neighboring works may reveal the desired chance.

The Automobile Industry

Two widely different aspects of the automobile industry have presented themselves within the past two weeks. One of these is the exceedingly prosperous condition of certain automobile companies, as shown by the declaration by the Chalmers Motor Company of a cash dividend of 30 per cent. and a stock dividend of 1000 per cent. and by the notification of the General Motors Company to its stockholders that it will shortly declare a stock dividend of about 500 per cent. These two companies have probably made larger profits in the past year than others in the same line, but undoubtedly the entire industry has fared exceedingly well until quite recently.

Another picture is now presented. Indications are unmistakable of a slowing down in the demand for automobiles. It is announced on good authority that several makers of lower-priced cars have begun to accumulate stocks. Already some of the Western manufacturers have made arrangements to curtail their production heavily for the remainder of this season. Makers of automobile parts have been hit hard. A company whose principal product is automobile castings had 1100 men at work a few months ago, but now is able to employ a force of only 400.

Out of this development it is likely that more healthy conditions will be established. The automobile industry has been marvelous in its growth, when the fact is considered that a motor car is an article of luxury and its use is only available by a limited number of persons in any community. Nevertheless, the demand for motor cars for pleasure has grown by leaps and bounds, the volume of business up to this time having been uninfluenced by the condition of general trade. The great increase in the demand had to be met by the efforts of automobile manufacturers, and they continued expanding the productive capacity of their plants for the purpose of being able to make

shipments desired. It seems probable that, having caught up to the demand, the business will hereafter be more amenable to general conditions. When prosperity prevails more automobiles will be bought and used, but when depression sets in the automobile business will slacken as do other lines of trade.

The Non-Cancellation Campaign

The National Machine Tool Builders' Association is pushing with much vigor its campaign to secure the adoption of the principle of non-cancellation of orders. The movement will have the active co-operation of the dealers. No reasonable argument has been advanced against the change. While no one anticipates that the reform of so long standing an abuse can immediately be accomplished, the manufacturers can make the beginning from which it should be a matter of no great time to establish the new custom. Some dealers object to taking a conspicuous position during the initial stages of the effort, because of their intimate business relations with certain of their customers. Every house has its own particular buyers to whom favors must be accorded. The right to cancel orders has been one of these; the understanding has always existed that such is the case, except with machines which are special in their nature. The dealer feels that should he wish to release a customer from a contract which the latter desires to cancel, because of some change in conditions, he should have the right to do so for the present. He would like to have the manufacturers make a beginning by the creation of a rule that all orders must be considered as binding contracts, not subject to cancellation. With this information in his possession the dealer would be at a great advantage in his relations with his customers. His explanation of the changed conditions in his own dealings as a middleman with the manufacturers would have a strong influence in creating the beginning of the new order of affairs, and the trade would be placed on the new basis in a comparatively short time.

The dealers desire the change for other reasons which are peculiar to their own establishments. In not infrequent cases salesmen secure orders with the understanding, unknown to the management, that cancellation may follow, if later on the buyer decides that the machinery will not be needed. Another important element is the effect of the non-cancellation rule on the crafty buyer who safeguards against possible needs of equipment by placing orders, knowing very well that the chances are good that he will not take the tools. Some salesmen encourage this practice, "fattening up" their current business, with the chance of making an actual delivery later.

As has been stated many times, the machine tool industry is at a disadvantage in its trade as compared with other lines of machinery and equipment. The argument is made that contracts for heavy tools should be framed along lines similar to those of the engine builders, who require one payment with the order, another when the machine is on the premises of the customer and a final settlement when the engine is accepted. The contract is a fair one, and the same conditions confront the builder of heavy machine tool equipment.

Regarded from every side, including that of the customer, the effort of the National Machine Tool Builders' Association is logical. In common with every other radical change in industrial conditions, criticism and complaint will be heard, but, as always where a cause is just, the community will soon adapt itself to the new conditions and will forget that they have not always existed.

Correspondence

Blast Furnace Results with Natural Air

To the Editor: It will not be necessary to wait until the end of next September in order to give the data requested by "J. J. S." in his letter published on page 128 of *The Iron Age* for July 21, 1910, relating to the good results secured with natural air blast at the East furnace of the Columbus Iron & Steel Company. By giving the data for July, August and September of 1909 and April, May and June, of 1910, the whole year will be included and the six months of spring and summer can be compared with the autumn and winter months. The facts regarding the work of East furnace for the 12 months ending June 30, 1910, are as follows:

The average coke per ton of pig iron (2268 lb.) for the six months ending March 31 was 1977 lb. The average coke per ton of pig iron for the months of July, August and September, 1909, and April, May and June, 1910, was 2085 lb., and the average for the entire year was 2031 lb. Therefore the increase for the summer months was only 108 lb., instead of the 300 lb. predicted by "J. J. S." Part of this increase was due to the fact that 38 per cent. of the product for July was foundry iron (all the rest was basic), and part of the increase was due to bad coke used in September and April when cold ovens were being started.

The East furnace is a merchant furnace, and in times like the present all its product must be well within the limits. A steel works furnace is not thus handicapped in its tonnage figures. R. H. SWEETSER.

COLUMBUS, OHIO, July 27, 1910.

Land and Irrigation Show at Pittsburgh.—Extensive preparations are being made for the mammoth land show to be held October 17 to 29 in Pittsburgh, Pa. The show will be known as the National Land and Irrigation Exposition, and will consist of United States Government exhibits and special models of irrigation and drainage systems sent in by the various State immigration boards and chambers of commerce of the country. The object of the exposition is to provide for the homeseeker, the farmer, manufacturer and investor authentic and graphic information regarding land openings and possibilities throughout the entire country, and to show samples of the mineral, agricultural and horticultural products of the various sections represented. Many interesting exhibits are being arranged for, and a large attendance is expected.

The Bethlehem Steel Company's Half Year.—The six months' statement of net earnings of the Bethlehem Steel Company, just issued, $1,161,930, is the most favorable of any like period for five years. The total income showed a gain compared with the first half of 1909 of $654,982. With an increase in interest charges of $96,754, there remained an increase of $558,227 as net available for dividends. The company's plants are running at full capacity, and orders on the books of the structural mills bid fair to insure operation at full capacity for at least the remainder of the year. A favorable feature is the more active operation of the ordnance plants as a result of the $10,000,000 contract in connection with the two battleships being constructed for the Argentine navy in this country.

The Mechanical Engineers En Voyage

BIRMINGHAM, ENGLAND, July 25, 1910.—A list of those representing the American Society of Mechanical Engineers who would attend the joint meeting with the Institution of Mechanical Engineers in England was printed in *The Iron Age* of June 14. The party which sailed on the Celtic of the White Star Line arrived in Liverpool the evening of July 24, and the next forenoon took a special train to Birmingham, where the first sessions were held. The trip across the Atlantic was one that will be long remembered by those who were of the party, for the weather was especially favorable, the programme of entertainment exceedingly attractive, and the opportunity to make new friends and become better acquainted with old ones unusual even on shipboard.

The Entertainment Committee, headed by George M. Brill of Chicago, earned and received the gratitude of all for the extensive preparations made for the occasion. The society's party constituted the majority of the first cabin passengers, but all were included in the invitations to participate in the games and evening functions, and it proved mutually agreeable.

Monday evening the officers and past presidents of the society and the ship's principal officers held a reception on the boat deck followed by a dance. Tuesday evening, Past President Worcester R. Warner gave an illustrated address on "What Are the Astronomers Doing?" showing a number of splendid photographs of the moon and planets and views of the Lick and Yerkes telescopes, both of which were built by Warner & Swasey, Cleveland, Ohio. Wednesday evening there was an enjoyable informal musicale of passenger talent. Thursday evening Past President John R. Freeman, one of those on the last commission sent with then President-Elect Taft to inspect and report on the work at the Isthmus, gave an illustrated address on "The Construction of the Panama Canal."

Friday evening a dance was held, and Saturday evening the concluding entertainment and the awarding of prizes for games won during the week—bridge whist, shuffle board tournament, potato races, &c. Prof. F. R. Hutton presided, and introduced the performers in what amounted to an amateur vaudeville show. Past President James M. Dodge proved the headliner. He was scheduled for a lecture, "An Exhaustive Review of the Formation of the Earth and Its Oceans, with Some Conclusive Educational Remarks on the Solar System and Prognostications on the Ultimate End of the Universe," in which he was assumed to controvert the theories of all other scientists. A jury to sit in judgment on his arguments solemnly filed in and took its position before him, impressively gowned in ladies' kimonos of varied hues. The jury was composed of Ambrose Swasey, chairman of the Committee of Arrangements for the trip; John R. Freeman, William H. Wiley, Oberlin Smith, Jesse M. Smith, George M. Brill, Calvin W. Rice, H. L. Gantt, Prof. W. F. M. Goss, Prof. Arthur M. Greene, Jr., James Hartness and F. H. Stillman. While pretending to lead up to his subject, the speaker deftly avoided it by repeatedly digressing in the telling of dialect stories, and his Irish, French and German impersonations would have done credit to a professional. A poem, "What's the Use?" referring to all kinds of engineering activity, by G. T. Whitney, superintendent of the Detroit Iron & Steel Company, was read by A. T. Baldwin, and Professor Hutton concluded the evening with a collection of limericks apropos of the voyage and a little personal at times.

Several of the party disembarked at Queenstown and Holland, but the majority continued on to Liverpool, and before landing were met by representatives of the Institution of Mechanical Engineers and John Lea as a deputy of the Lord Mayor of Liverpool. The latter extended a welcome to the visitors for that city, and President J. A. F. Aspinall of the institution welcomed them generally to the meetings, seconded by Professor Watkinson of the Liverpool University. Prof. W. F. M. Goss, Sr., vice-president present, responded for the American Society.

In Birmingham the party was met by other representatives of the institution and several earlier arrivals of its own society, and at the time of the sending of this communication is preparing to enjoy the elaborate instructive and delightful programme of papers, excursions, &c., which awaits it and was outlined in a previous issue. H. R. C.

Gary Sheet Mill Contract Placed

PITTSBURGH, PA., August 3, 1910.—(*By Telegraph.*)—The American Sheet & Tin Plate Company, Pittsburgh, has awarded a contract to the William Tod Company, Youngstown, Ohio, for 16 sheet and 4 jobbing mills for the new sheet and tin plate plant to be erected at Gary, Ind. The contract for the castings for these mills has been placed with the Wheeling Mold & Foundry Company, Wheeling, W. Va. Further contracts for machinery and other equipment will be awarded by the American Sheet & Tin Plate Company in a short time. The American Bridge Company has had the steel buildings to contain these mills under erection for some months, and they are pretty well on toward completion. The foundations for the mill buildings were built by the Raymond Concrete Pile Company, New York and Chicago.

The William Tod Company has also received a contract from the Republic Iron & Steel Company for tables and transfers for the new 40-in. blooming mill to be installed in its open hearth steel plant now being built at Haselton, Ohio.

Westinghouse Foundry Concentration

A tract of land comprising 70 acres adjoining the property owned by the Westinghouse Machine Company has been bought at Trafford City, Pa., by the Westinghouse Electric & Mfg. Company for the purpose of erecting a large foundry. The purchase of the ground involves an expenditure, it is said, of about $250,000. The foundry will be one of the largest of its kind in the world, and 2500 men will be employed.

When the plant is completed the Cleveland foundry belonging to the same company and the one on the north side of Pittsburgh will be centralized at the new location, and thus place all of the foundries of the Westinghouse interests in one town, making great economies possible and reducing the cost of shipment of castings to a minimum. The site has already been connected with the Westinghouse Electric and Westinghouse Machine Company plants by what is known as the Interworks Railroad.

The Alan Wood Iron & Steel Company, Philadelphia, Pa., resumed operations on Monday at its Ivy Rock plant. Extensive repairs and alterations have been made, particularly in the open hearth steel department, the furnaces in which have been prepared to use hot metal, which will later be supplied from the company's Swede furnaces. Four open hearth furnaces are in operation, and others will be put in as fast as possible. The rolling mill is now running at full capacity.

The first passenger train passed through the Michigan Central Railroad tunnel under the Detroit River July 27. The tunnel will probably be completed by October 1, and trains will then run regularly.

Pig Iron Production

A Sharp Falling Off in July

Active Capacity August 1 Was 1,600,000 Tons a Year Less Than on July 1

Returns which have come with unusual promptness from the blast furnace companies show a production of 2,142,442 gross tons of coke and anthracite pig iron in July, a very considerable reduction from that of June, which was 2,265,478 tons. The falling off becomes more marked in comparing the daily rate (June being a short month), which was 69,111 tons, against 75,516 tons in June. The number of furnaces in blast was reduced by 12 in July, being 256 August 1, against 268 July 1. From the maximum of 313 on February 1, six months ago, the net reduction has now been 57.

The July output has shrunk more than is indicated by the number of furnaces going out, as there has been slower working of a good many furnaces to avoid piling iron. The Chicago district shows the heaviest curtailment, the output there for July being nearly 20 per cent. less than in the 30 days of June. Our figures show that the 256 furnaces in blast August 1 had a daily capacity of 68,768 tons, which is 4500 tons a day less than the figure for July 1, or at a yearly rate over 1,600,000 tons less than that of a month ago.

Production is now at the rate of about 25,500,000 tons a year, or less than the respective outputs of 1907 and 1909. From the high rate reached in February, which was 31,650,000 tons a year, output has now been cut down about 20 per cent.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with July, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
July, 1909	48,670	19,123	67,793
August	51,354	21,192	72,546
September	55,361	24,146	79,507
October	57,067	26,789	83,856
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,876	27,740	85,616
March	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,225	24,867	77,102
June	51,637	23,879	75,516
July	47,183	21,928	69,111

July Output by Districts

The table below gives the production of all coke and anthracite furnaces in July and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)
New York	180,005	166,307	171,461	163,575	162,901
New Jersey	29,557	29,092	22,973	18,443	18,962
Lehigh Valley	52,224	64,910	70,344	66,944	61,014
Schuylkill Val.	62,865	61,084	65,725	60,349	61,340
Lower Susquehanna and Lebanon Val.	70,738	71,694	65,667	60,315	60,043
Pittsburgh dis.	592,494	543,531	510,514	483,909	502,711
Shenango Val.	137,315	124,440	120,301	130,290	113,280
West. Penn.	143,308	141,246	144,578	132,344	129,786
Md., W. Va. and Kentucky	78,761	77,032	82,071	82,181	75,051
Wheeling dis.	113,753	106,736	94,217	76,166	73,164
Mahoning Val.	241,653	225,588	218,243	208,988	211,282
Central and North. Ohio.	218,660	181,805	144,344	145,393	139,627
Hocking Valley, Hanging Rock and S.W.Ohio.	47,935	48,264	43,290	41,521	30,163
Mich., Minn., Mo., Wis., Col., Wash.	77,209	75,802	71,588	68,051	65,863
Chicago dis.	348,972	351,272	358,509	328,953	264,136
Alabama	180,836	173,071	165,937	160,970	140,313
Tenn., Georgia and Texas	41,664	41,889	40,418	37,086	32,806
Totals	2,617,949	2,483,763	2,390,180	2,265,478	2,142,442

Capacity in Blast August 1 and July 1

The following table shows the daily capacity of furnaces in blast August 1 and July 1. These figures are based largely on the performance of the furnaces in July and August:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	August 1 — Number in blast.	August 1 — Capacity per day.	July 1 — Number in blast.	July 1 — Capacity per day.
New York:					
Buffalo	16	14	4,635	15	5,085
Other New York	7	3	537	3	558
New Jersey	8	3	612	3	615
Spiegel	2	..	...	..	...
Pennsylvania:					
Lehigh Valley	23	13	1,895	14	2,004
Spiegel	3	–	160	2	155
Schuylkill Valley	16	8	2,063	8	1,962
Low. Susquehanna	7	5	935	5	1,053
Lebanon Valley	10	7	932	7	937
Pittsburgh district	50	42	16,010	41	16,130
Spiegel	3	2	302	2	281
Shenango Valley	20	12	3,310	15	3,809
Western Penn.	27	17	4,280	16	4,285
Maryland	4	4	973	4	1,102
Wheeling district	14	7	2,360	7	2,340
Ohio:					
Mahoning Valley	22	19	6,575	20	7,160
Central and North.	22	14	4,505	14	4,846
Hocking Val., Hanging Rock and S. W. Ohio	15	8	887	10	1,238
Illinois and Indiana	31	20	8,245	21	9,135
Spiegel	3	2	277	3	330
Michigan, Wisconsin and Minnesota	10	6	1,075	6	1,064
Colorado, Missouri and Washington	7	5	1,170	5	1,301
The South:					
Virginia	23	11	1,360	11	1,280
Kentucky	5	1	125	2	312
Alabama	46	20	4,510	22	5,065
Tenn. and Georgia	20	11	1,035	12	1,235
Totals	414	256	68,768	268	73,262

The list of furnaces blown out in July, or that were banked and remained inactive over August 1 includes one Lackawanna at Buffalo; one Bethlehem in the Lehigh Valley; one Brooke in the Schuylkill Valley; one Steelton of the Pennsylvania Steel Company; Alice, Fannie and Sharpsville in the Shenango Valley; Perry in western Pennsylvania; Ivanhoe in Virginia; Norton in Kentucky; Hamilton and Sarah in the Hanging Rock district; one Calumet and one South Chicago in the Chicago district; Thomas in Wisconsin; one in Colorado at Pueblo, Gadsden in Alabama, Chattanooga in Tennessee, and Girard in the Mahoning Valley.

Among furnaces blown in last month were one Warwick in the Schuylkill Valley, one Paxton at Harrisburg, Clinton at Pittsburgh, one Cambria and Colonial in western Pennsylvania, Victoria in Virginia, one new Detroit furnace on Zug Island and Irondale in Washington.

The Curves of Pig Iron Production and Prices

The curve of pig iron production from January, 1907, to the present time is shown in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	39,619	59,232	84,459
April	73,885	38,289	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	36,444	64,656	75,516
July	72,763	39,287	67,793	69,111
August	72,594	43,851	72,546	.....
September	72,783	47,300	79,507	.....
October	75,856	50,554	83,856	.....
November	60,937	52,595	84,917	.....
December	39,815	56,158	85,022	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907. Sou. No. 2 Cin.	1907. Loc. No. 2 Chi.	1908. Sou. No. 2 Cin.	1908. Loc. No. 2 Chi.	1909. Sou. No. 2 Cin.	1909. Loc. No. 2 Chi.	1910. Sou. No. 2 Cin.	1910. Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	....	....
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	....	....
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	....	....
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

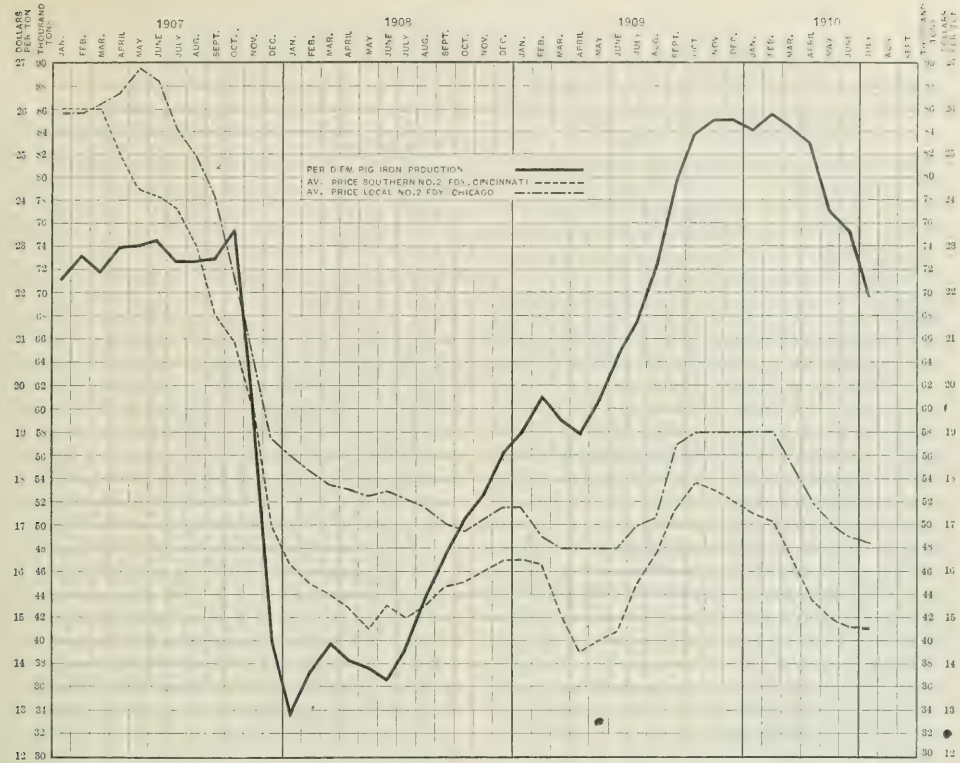


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to August 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago.

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1908.	1909.	1910.	1909.	1910.
January	664,415	1,117,823	1,773,201	12,325	19,538
February	745,802	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,553	1,739,212	23,743	25,591
April	725,548	1,093,092	1,669,898	22,478	22,304
May	759,674	1,256,448	1,619,283	20,854	26,529
June	717,689	1,365,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,991	.....	22,313	.....
September	933,514	1,660,839	.....	28,148	.....
October	996,481	1,769,094	.....	25,384	.....
November	981,167	1,689,994	.....	23,376	.....
December	1,090,339	1,768,799	.....	20,791	.....

The Record of Production

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,960	1,231,129	2,103,431	2,142,442
August	2,250,410	1,359,831	2,248,930	.....
September	2,183,487	1,418,998	2,385,206	.....
October	2,336,972	1,567,198	2,599,541	.....
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

Cincinnati Metal Trades Outing.—The fifth annual outing of the Cincinnati Metal Trades Association was held July 30 at Chester Park, the city's great amusement grounds. Ideal weather conditions helped to bring out a large attendance, and it is estimated that over 30,000 people took part in the festivities, making this the largest gathering of its kind in the history of the association. Employer and employee joined with equal enthusiasm in the athletic games, and the management is to be complimented in its successful efforts to bring about more amicable relations between these two interests. Secretary Manley of the Trades Association, who arranged the programme, and Harry Lewis, who superintended the athletic sports, have both received many congratulations on the happy outcome of the affair.

The De Kalb Fence Company, De Kalb, Ill., has sold its plant and business to the American Steel & Wire Company. The plant will continue in operation and a mill office will be maintained at De Kalb, but the sales department and general office business will be carried on in the future from the Chicago office of the American Steel & Wire Company. The office employees at De Kalb have been offered positions in the Chicago office, it being the policy of the American Steel & Wire Company to take care of them.

In the Chicago district one Calumet furnace of the Wisconsin Steel Company was blown out on July 3 for relining, and will be ready again for blast in the latter part of August. At the South Works of the Illinois Steel Company No. 8 furnace was blown out July 8.

The report of the American Railway Association shows that on July 20 the net surplus of idle cars on the lines of the United States and Canada was 133,301, a decrease of 9564, or about 6 per cent., in two weeks. Idle coal cars increased by about 500, while box cars decreased by 6200.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 3, 1910.	July 27, 1910.	July 6, 1910.	Aug. 4, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.00*	$16.25	$16.25	$16.75
Foundry No. 2, Southern, Cincinnati	*14.50*	14.75	14.75	16.25
Foundry No. 2, local, Chicago	*16.50*	16.50	16.75	17.00
Basic, delivered, eastern Pa.	*15.25*	15.50	15.75	16.50
Basic, Valley furnace	*14.25*	14.50	14.50	15.25
Bessemer, Pittsburgh	*16.15*	16.40	16.40	16.90
Gray forge, Pittsburgh	*14.40*	14.40	14.90	14.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*24.50*	24.50	25.00	24.00
Forging billets, Pittsburgh	30.00	30.00	30.00	28.00
Open hearth billets, Philadelphia	*27.50*	28.50	28.50	27.00
Wire rods, Pittsburgh	*28.50*	29.00	30.00	31.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.00	13.50	15.25
Steel rails, melting, Philadelphia	*13.75*	14.00	14.25	16.50
Iron rails, Chicago	*16.50*	16.50	17.00	17.50
Iron rails, Philadelphia	*18.00*	18.00	19.00	19.50
Car wheels, Chicago	*14.50*	14.75	15.00	16.00
Car wheels, Philadelphia	*14.00*	14.00	14.50	15.00
Heavy steel scrap, Pittsburgh	*14.50*	14.00	15.00	16.00
Heavy steel scrap, Chicago	*12.25*	12.25	12.75	14.75
Heavy steel scrap, Philadelphia	*13.75*	14.00	14.25	16.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.42½*	1.42½	1.47½	1.45
Common iron bars, Chicago	1.40	1.40	1.40	1.37½
Common iron bars, Pittsburgh	*1.45*	1.50	1.50	1.45
Steel bars, tidewater, New York	*1.56*	1.61	1.61	1.46
Steel bars, Pittsburgh	*1.40*	1.45	1.45	1.30
Tank plates, tidewater, New York	*1.56*	1.56	1.61	1.56
Tank plates, Pittsburgh	*1.40*	1.40	1.45	1.40
Beams, tidewater, New York	*1.56*	1.56	1.61	1.56
Beams, Pittsburgh	*1.40*	1.40	1.45	1.40
Angles, tidewater, New York	*1.56*	1.56	1.61	1.56
Angles, Pittsburgh	*1.40*	1.40	1.45	1.40
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.35
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.45
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.25*	2.25	2.30	2.20
Wire nails, Pittsburgh*	*1.70*	1.70	1.80	1.80
Cut nails, Pittsburgh	*1.65*	1.70	1.75	1.75
Barb wire, galv., Pittsburgh*	*2.00*	2.00	2.10	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.62½	12.75	13.50
Electrolytic copper, New York	**12.50**	12.50	12.37½	13.00
Spelter, New York	5.20	5.20	5.20	5.60
Spelter, St Louis	5.05	5.05	5.05	5.45
Lead, New York	4.40	4.40	4.40	4.35
Lead, St. Louis	4.25	4.25	4.25	4.20
Tin, New York	**33.20**	33.25	32.80	29.50
Antimony, Hallett, New York	*8.00*	8.00	8.12½	7.50
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c. plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.20c.; No. 27, 2.20c.; No. 28, 2.25c.; No. 29, 2.30c.; No. 30, 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.15c.; No. 28, 3.35c.; No. 29, 3.50c.; No. 30, 3.70c. Painted roofing sheets, No. 28, $1.65 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	67	51	59	47
½ to 1 in.	70	58	66	54
1¼ to 3 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2¼ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28.50 to $29; open hearth and chain rods, $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, August 3, 1910.—(*By Telegraph.*)

Pig Iron.—Inquiry is light and usually for small lots to cover current needs. Regarding the reported sale by a Valley furnace of 10,000 tons of basic iron to a speculator at $14, at furnace, it is stated that cash is to be paid for the iron, and it is to be piled at the expense of the buyer, with 6 per cent. interest added for storage charges. Several small lots of basic have been sold by dealers in the past week at $14.25, Valley furnace, and a sale is also reported of 1500 tons of standard Bessemer iron to a local steel casting interest at $15.25, Valley furnace, or $16.15, Pittsburgh, deliveries being August, September and October. There is an inquiry out for 1500 tons of gray forge for delivery over the next three months, which may be closed this week. We quote standard Bessemer iron at $15.25; basic, $14.25; malleable Bessemer, $14.50 to $14.75; gray forge, $13.50, and No. 2 foundry, $14.25, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Steel.—The lower prices ruling for billets and sheet and tin bars are attracting consumers, and considerable tonnage has been closed in the past week, referred to in the report by mail. We quote Bessemer billets, 4 x 4 in., $24.50 to $25; Bessemer sheet bars, $25.50 to $26; 4 x 4 in. open hearth billets, $26; open hearth sheet and tin bars, $26.50 to $27; open hearth small billets, $27, and forging billets, $30 to $31, all f.o.b. Pittsburgh, Wheeling or Youngstown district, with freight to point of delivery added.

(*By Mail.*)

Continued quietness characterizes the iron market, new buying being done very conservatively. Large consumers are placing orders only to cover actual needs, not being assured that present prices will be maintained. It is estimated that the large steel interests are not operating to over 75 per cent. of capacity, and in some lines less than this. There is still too much pig iron being made, and stocks held by the Valley furnaces and some of the steel interests are very heavy. A sale of about 1500 tons of standard Bessemer pig iron has been made at $15.25, at Valley furnace, and a sale of a round lot of basic iron is reported at $14, Valley furnace, the quantity being 10,000 tons, but it was said to have been bought for speculation. The steel market is showing further weakness, open hearth billets having been offered at slightly less than $26 and declined. A local sheet mill has contracted for its supply of sheet bars for the remainder of this year at a shade under $26, Pittsburgh, for Bessemer bars. A leading independent tin plate concern has also covered for its supply of tin bars for this year on a sliding scale, based on the average monthly price of Bessemer pig iron; if the contract works out satisfactorily to the buyer, it will probably be renewed for next year. The scrap market is showing some betterment, prices of heavy steel scrap having advanced about 50c. a ton. There is a heavy inquiry for foundry coke and several more season contracts have been closed.

Ferromanganese.—The market is very quiet. We quote 80 per cent. foreign for forward delivery at $39 to $39.50, Baltimore, carrying a freight rate of $1.90 a ton for delivery in the Pittsburgh district.

Ferrosilicon.—Nothing new is doing in this line. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh. We quote 10 per cent. at $23; 11 per cent., $24, and 12 per cent., $25, all at Ashland furnace, to which $1.90 a ton should be added for delivery in the Pittsburgh district.

Rods.—Not much new inquiry is coming out for rods, most consumers being covered by contracts, some of which were placed early last week and the week before. We note sales of 2000 to 3000 tons of open hearth and chain rods at $29, and in a few cases $29.50 for small lots. The new rod mill of the Jones & Laughlin Steel Company at Aliquippa, Pa., will be placed in operation the week of August 8. This is a modern, continuous rod mill of the Morgan type, built by the Morgan Construction Company, Worcester, Mass., and will have a weekly capacity of about 3000 tons. It will probably be a month, however, before the mill can operate to full capacity. We quote Bessemer rods at $28.50 to $29 and open hearth and chain rods at $29, Pittsburgh.

Skelp.—Some large inquiries for grooved and sheared steel plates came out last week, sales being reported of 3000 to 4000 tons. The settlement of the wage scales with the Republic Iron & Steel Company and the Western Bar Iron Association has resulted in a number of plants starting up that roll grooved and sheared plates. There is some inquiry for wide sizes of sheared iron plates. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp 1.90c., all f.o.b. mill, Pittsburgh.

Muck Bar.—A local concern reports sales of about 2000 tons of high grade muck bar made from all pig iron, at $29 to $29.50, Pittsburgh. These prices are slightly above the market, but were obtained because of the idleness of a number of puddling plants for which the wage scale was not signed until the middle of last week.

Steel Rails.—The Carnegie Steel Company booked last week quite a large tonnage of light rails, the new demand for these having been very active for some time. Nothing of moment is doing in standard sections. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 to 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Structural Material.—New inquiries are fairly active, but there is some hesitation by the large interests in placing contracts. In July the new bookings of the American Bridge Company were only slightly over 30,000 tons, or about half the business it took in June. The Riter-Conley Mfg. Company has taken 1500 tons for a new building for the Semet-Solvay Process Company, at Detroit, Mich., and 2000 tons for a new steel building for another concern. The Jones & Laughlin Steel Company has taken about 400 tons for the Holy Rosary schools in Homewood, Pa., and 300 tons for the new building of the Twentieth Century Club in this city. Several of the local fabricating concerns report they are pretty well filled up for the next two or three months and are passing up some of the cheap work. Complaint is still made about the low prices at which some jobs have recently been taken, and it is stated that if 1.40c., Pittsburgh, was paid for the plain material some of this work went below cost. We quote beams and channels up to 15-in. at 1.40c. to 1.45c., f.o.b. Pittsburgh.

Plates.—The New York Central Lines placed an order last week for 46 locomotives, divided between the American Locomotive Company and the Montreal Locomotive Company. The Riter-Conley Mfg. Company has taken 2½ to 3 miles of steel riveted pipe work for the city of New York, the plates for which will be rolled by the Carnegie Steel Company. No new car orders have been placed in the past week and inquiries from the railroads are very light. A better buying movement in cars by the railroads is expected in the fall. Some of the plate mills are decidedly short of work, having very little ahead. The steel car companies are also pretty well cleaned up on orders on their books. We quote ¼-in. and heavier plates at 1.40c. to 1.45c., Pittsburgh, but on the narrower sizes some of the smaller plate mills are naming 1.35c., Pittsburgh.

Sheets.—The trade is looking for announcement by the leading makers of a reduction in prices of sheets in the near future to meet the lower prices that have been ruling in the market for several months. One local sheet mill is reported to be accepting business for delivery through the remainder of this year on the basis of 2.20c., at mill, for No. 28 black. In the present condition of the market, consumers are placing orders cautiously. The new demand for blue annealed and electrical sheets is fairly active. We quote the sheet market on the basis of 2.20c. to 2.25c., for No. 28 box annealed one-pass black sheets and 3.45c. to 3.50c. for No. 28 galvanized. It is stated that some makers will not accept new orders for extended delivery at the minimum named.

Tin Plate.—A vote is now being taken among the lodges of the Amalgamated Association with a view of calling off the strike in the tin plate mills of the American Sheet & Tin Plate Company, which was declared July 1, 1909, against the "open shop" policy. The strike was lost by the men months ago, and it is very likely it will be officially declared off. If this is done it will allow Amalgamated members to work in the tin plate mills of the company and still retain their good standing in the organization. The new demand for tin plate is quiet, but all the leading mills are running to full capacity and shipping the output as fast as made. The market continues very firm, and we quote on the basis of $3.60 for 100-lb. cokes, per base box, f.o.b. Pittsburgh.

Bars.—At a conference held in Chicago last week the Western Bar Iron Association came to a settlement with the Amalgamated Association, agreeing to pay the same scale as the Republic Iron & Steel Company. This disposes of all possible labor troubles among the bar iron mills and some of the plants in the West have since started up. The new demand for iron and steel bars is only fair, but the agricultural interests are specifying freely on the season's

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contracts and shipments by the steel bar mills are heavy. Iron bars are only in fair demand, specifications from railroads and other consumers not coming in as freely as desired. Recent contracts for steel bars were made on the basis of 1.40c., Pittsburgh, and this is the absolute minimum of the market. We quote steel bars at 1.40c. to 1.45c. and iron bars at 1.45c. to 1.50c., Pittsburgh.

Spelter.—The market continues quiet. We quote prime grades of Western at 5c. to 5.05c., East St. Louis, or 5.12½c. to 5.17½c., Pittsburgh.

Hoops and Bands.—Specifications against contracts are being received in a fairly satisfactory way, but new orders placed are mostly in small lots to meet current needs. We quote steel hoops for forward delivery at 1.50c. to 1.55c. and steel bands at 1.45c. to 1.50c., f.o.b. Pittsburgh, extras as per the steel bar card applying on the latter.

Spikes.—Some fair sized orders for railroad spikes are being placed by the railroads, a local maker having taken contracts in the past few days for about 2000 kegs for the Baltimore & Ohio and 1500 kegs for the Wabash. The new demand for small railroad and boat spikes is not heavy. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at 1.50c. to 1.55c., for Western shipment, and 1.55c. to 1.60c., for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, these prices being for carload and larger lots.

Rivets.—Specifications on orders are coming in fairly well, but new business being placed is light. Official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but on desirable orders these prices are shaded.

Shafting.—Specifications on shafting from the automobile makers have fallen off to some extent lately, and the new demand from other consumers is not as heavy as it was some time ago. However, the shafting makers are fairly well filled with work for several months. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of about 55 and 5 off.

Wire Products.—The new demand for wire nails and other wire products was stimulated to only a slight extent by the recent reduction of $2 a ton in prices, the increased demand not being as heavy as expected. A notable increase in the demand for barb wire on 80 rod spools is reported, and new prices on this product were recently sent out by the American Steel & Wire Company and the Pittsburgh Steel Company. We quote galvanized barb wire at $2; painted, $1.75; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65 to $1.70 in carload and larger lots, all f.o.b. Pittsburgh, freight to destination added.

Merchant Pipe.—The Texas Company, which bought 200 miles of 6 and 8-in line pipe not long ago, is in the market for 60 to 75 miles of 3, 4, 6 and 8-in., and the contract is expected to be placed this week. On the larger sizes of pipe the mills are pretty well filled up for the rest of this year, but on butt weld sizes the new demand continues light, as it has been for practically all of this year. Official discounts on iron and steel pipe are reported as being fairly well maintained.

Boiler Tubes.—The order for 65 freight locomotives recently placed by the Pennsylvania Railroad with the American Locomotive Company will be filled from the latter's shops in this city, and the contract for the boiler tubes is reported to have been placed with a local mill. On merchant tubes the new demand is fair. Regular discounts on both merchant and locomotive tubes are more or less shaded.

Coke.—The Westinghouse Air Brake Company is reported to have closed for 5000 to 6000 tons of foundry coke for shipment over the remainder of this year at a price equal to about $2.25 per net ton at oven. Several large inquiries are in the market for foundry coke for shipment over the remainder of this year and in the first half of next year. The output of coke is being restricted, but there is still an overproduction and prices are weak. In the past week the Upper and Lower Connellsville regions turned out about 397,000 net tons of coke, a slight decrease over the previous week. We quote best grades of furnace coke running under 1 per cent. in sulphur for delivery over last half of this year at $1.80 to $1.85 and best grades of 72-hour foundry coke at $2.15 and up to $2.50 per net ton at oven for same delivery, the higher price being paid for foundry coke with very high reputation for quality. Furnace coke loaded on cars, and which has to be moved, is being offered at $1.60 to $1.65 per net ton at oven.

Iron and Steel Scrap.—Some new inquiry for heavy steel scrap came up in the past week, and several local dealers report sales of 3000 to 4000 tons, for delivery in Monessen, Pa., and Steubenville, Ohio, at prices ranging from $14.50 to $14.75, delivered. A local dealer also reports sales of 1000 tons of heavy steel scrap at $14.50 and 2000 tons at $15, delivered, carrying a 60c. freight rate. There is more inquiry for other grades of scrap and the tone of the market is stronger. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.50 to $14.75
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.75 to 10.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.75 to 14.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	21.00 to 21.50
Steel car axles	19.00 to 19.50
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.50
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.50 to 7.75
Machine shop turnings	9.25 to 9.50

Chicago

FISHER BUILDING, August 3, 1910.—(*By Telegraph.*)

The physical movement of business throughout the West continues a great deal better than the business done on paper and the general discussion in commercial circles. Manufacturers as a rule are comfortably busy and there is no lack of employment for all the labor that can be had. Crop conditions average better than public discussion would indicate, as rains throughout the West, which relieved the situation, have not been given as much publicity as the threatening hot wave of the week before. It is a curious condition that business should be better than generally accepted reports would indicate, but this condition has prevailed for several months in the West. The only halting tendency is on purchases for forward delivery. Industrial buyers appear to be satisfied for the present that more iron and steel is being produced than the country will need, and they are taking advantage of the situation by purchasing only for immediate or early delivery without placing long time contracts as they have done in the past whenever they had reason to fear a scarcity of materials or advancing prices. The steel mills are kept comfortably busy with the specifications in hand and would be as busy as they were last winter if the demand for structural shapes and plates had not been checked by financial conditions this summer, which have kept the railroads out of the car market and restricted loans for large steel buildings. The demand from store continues good, especially for structural material in small lots, and the fabricators who handle small jobs are all busy. The demand for open hearth sheets has been so active that the local mill has not been able to stock its large warehouse, which has been erected for that purpose. Current consumption of iron and steel appears on the whole to be fully equal to the normal rate, excepting in the industries which sell to railroads. The scrap market continues weak, but all the material that arrives is disposed of readily at present prices and dealers are not accumulating stocks in their yards.

Pig Iron.—The undertone of weakness which has prevailed for some time in the Southern market has developed into a general admission that the market is now on the basis of $11, Birmingham, for No. 2 foundry. Very little business is known to have been done. Buyers generally have all the iron bought or in their yards that they will need for the third quarter, and many of them are covered for the fourth quarter. Inquiries are coming forward for the first quarter and first half of 1911, but the buyers who submit these inquiries generally qualify them by expressing the opinion that they expect to buy at the current price. The furnace interests are not willing to consider 1911 business at the prices which have prevailed recently, and some of them are still holding at $12 or $12.50, Birmingham, for the last quarter. Recent events in the financial world have had considerable influence on the course of the market. Buyers generally concede that iron is cheap at $11, and that it would pay them to take in spot iron and hold it several months, but the average buyer would have to use bank funds to do this, and the bankers are pursuing a cautious policy with their customers until the future of the financial situation is more assured. This condition in the financial world also has a tendency to check interest in deliveries beyond the end of the year. In Northern iron a little more business is being done locally, but it does not amount to a buying movement. The weekly sales of the local interests are about equal to their production, and the business on their books covers their output about as far ahead as they seem willing to go. Several very attractive inquiries

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for first quarter and first half of 1911 have appeared, and the tone of the Northern market is somewhat better, but only a few sales have been made under special conditions in which deliveries run beyond December. The railroad situation will probably become an important feature of the market in the near future, especially in Southern iron. Railroad equipment has been running down steadily for three years, both in cars and motive power, and car shortages and delays in transit will undoubtedly be more serious the coming winter than in the past four years, if not worse than four years ago. This will make it prudent for foundries to have good stocks of iron when winter sets in. Buyers generally took this precaution last fall, and although there was a check in business early in the winter the Southern furnaces reported a great deal of trouble in getting cars. The following prices are for August and September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.90 to 18.40
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(By Mail.)

Billets.—A few sales of forging billets have been made quietly in this market by local mills, establishing a base price on forging billets of $29 to $30. A sale of 1500 tons of billets for shipment to Canada was also made recently. Chicago mills are now making this market a basing point for billets independent of Pittsburgh, quoting lower prices than Pittsburgh, plus freight to Chicago. If this policy is continued it will mark a forward step in the progress of the steel industry in Chicago. Ultimately it is expected that this market will make as low prices as Pittsburgh on billets and the principal lines of rolled products, as the crude steel is produced here at as low a cost as anywhere else in the world, and it is only a question of time when the mill capacity will be large enough to supply the demand.

Rails and Track Supplies.—Inquiries for rails are light, as the standard roads have contracted for their requirements for the year. The demand for traction rails has been checked somewhat this summer by the financial situation, which has restricted the promotion of new street car and interurban lines. Track supplies, however, continue an exception to the general policy of the railroad purchasing departments, as good orders and specifications for spikes and bolts continue to come in. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.50; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—The market for structural shapes is holding up well under the depressing influences that have affected this market. The difficulty that builders have encountered in obtaining loans has held back many important projects in the way of new buildings, and, while it is believed the situation is clearing up in this respect, it will be some time before building operations reflect the improvement in the money market. Railroad contracts for bridge material have also been disappointing in their volume. Last week, however, there was a good run of small contracts. The American Bridge Company booked 630 tons for shops at Sacramento for the Western Pacific Railroad; 250 tons for the Solano County court house in California; 630 tons for Government wharf sheds at Fort Mason, Cal.; 200 tons for a power house for the Empire Zinc Company, Leadville, Colo., and 175 tons of steel columns for the Fisher Building at Denver, a reinforced concrete building in which it has been decided to use steel columns. The Noelke-Richards Company, Indianapolis, has taken the steel contract, 2600 tons, for the Union Pacific office building at Omaha. The Paxton-Vierling Iron Works, Omaha, has taken a 390-ton contract for a freight house for the Chicago, Burlington & Quincy Railroad at Omaha. The Minneapolis Steel & Machinery Company will furnish 910 tons of ore spouts for the Great Northern ore docks at Allouez Bay, Wis. The Worden-Allen Company, Milwaukee, booked 550 tons for new machine shops for the Calumet & Hecla Copper Company. The Wisconsin Bridge Company, Milwaukee, will fabricate 465 tons for additions to the shops of the National Brake & Electric Company in that city. The Orpheum Theatre, Peoria, Ill., 305 tons, was let to the Joliet Bridge Company. The power house of the Wichita (Kan.) Electric Light Company, 250 tons, went to the Indiana Bridge Company. A local foundry at St. Louis took the contract for 260 tons of cast iron bases for a freight house at St. Louis for the Missouri, Kansas & Texas Railroad. Plans will be revised for the office building of the Dime Savings Bank, at Detroit, and the warehouse of Marshall Field & Co., in Chicago. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—There is a good demand for boiler plates, but car shop business, which furnishes the largest tonnage in this market, is not as good as was expected. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—New business in sheets is coming forward at a very satisfactory rate, and the 18 mills of the Inland Steel Company have been kept in operation since they were started a month ago. This, however, may be due in part to the growing preference among buyers for open hearth sheets, the only kind made in the Chicago district. The demand for these sheets from the West has been so steady that the Inland Steel Company has not been able to stock its new warehouse, which is now completed and ready for use. The original plan was to stock this warehouse with all the standard sizes of open hearth sheets, so that prompt carload shipments can be made. This plan will be carried out as soon as surplus stock can be accumulated. It is not intended to engage in store distribution, but merely to have a large warehouse stock for the convenience of carload buyers, so that they can obtain prompt shipments without awaiting their turn on the rolling schedules of the mills. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.48c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—The bar trade continues to lead the market, with soft steel bars in the unusual position of commanding higher prices than structural shapes or plates. The hard steel bar mills report a good run of new business, principally for concrete work. The bar iron market remains quiet, as railroad purchases, which make the greater part of this market, are under the restriction of orders given to the purchasing departments by the presidents of the railroads some time ago. There is a good run of orders from wagon manufacturers and other buyers of bar iron. The bar iron mills are more depressed than any other branch of the trade, as general business is good in the West and the consumption of iron and steel is normal, excepting in railroad equipment and repair work. The rolling mill wage scale was settled last week by a renewal for another year of the agreement of the Western Bar Iron Association. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.63c. to 1.68c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.50c. to 1.60c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Jobbers are generally carrying light stocks of wire products and in some cases they have offered to stock up if they could be assured of an advance in prices during the fall. It is understood, however, that no assurances of this character have been given, as the growing competition in the wire trade will make the market dependent upon general business conditions as reflected by supply and demand. It is understood that the leading interest has discontinued the policy of holding official prices to be shaded by independent mills and will follow the market in the future. Current business is good and an active demand is expected for fall trade as a result of the general depletion of stocks. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—There is a satisfactory run of routine orders and several municipalities are in the market for lots of a few hundred tons each. All bids were rejected at Cheyenne, Wyo., where a letting of 3000 tons of water pipe had been advertised. The market for water pipe has been affected somewhat by the condition of the bond market this summer, which has restricted the sales of municipal bonds by cities. This is particularly true in Oklahoma, where the disposition of the Legislature to authorize defaults or delays in the payment of interest has made it difficult to place bonds with Eastern investors. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $28; 6 to 12 in., $27; 16-in. and up, $26, with $1 extra for gas pipe.

Old Material.—The market is drifting along without enough transactions to afford a close check on prices. There is no congestion, as dealers are able to place at current prices all the material that arrives, but the leading buyers have accumulated large stocks and are very indifferent when material is offered them. A Western railroad obtained $16.25 for rerolling rails last week, and to make a delivered price

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switching charges would have to be added to this figure, but the mills are able to buy rerollers in the market at a shade under $15.75, delivered, making a spread of nearly $1 on different transactions in this material. A similar difference is found in the prices of railroad malleable, as recent sales have been made by railroads at higher prices than dealers can obtain, and this has also been true of frogs, switches and guards. Heavy melting steel remains practically unchanged in price, but short rails are higher, as the large lots which depressed the market some time ago have been disposed of. No. 1 cast scrap, which held steady for a long time when other grades of scrap were declining, is now reported a little weaker. Old car wheels are also lower, a lot of 500 tons going last week at $14.25 on the tracks of the road making the sale, equal to $14.50, delivered. The prices quoted below are for delivery to consumers in this district, all freight and switching charges paid, sellers of scrap usually receiving 50c. to $1 per ton less. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.50 to $17.00
Old steel rails, rerolling	15.75 to 16.25
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	9.00 to 9.50
Machine shop turnings	7.25 to 7.75
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.25 to 10.75
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

Philadelphia

PHILADELPHIA, PA., August 2, 1910.

Buying continues light, and prices, particularly in pig iron, are easier. Foundry grades move along slowly, the principal buyers being the cast iron pipe makers. In finished materials specifications are coming out fairly satisfactorily, but current business is mainly in small lots. Plates and shapes seem to be a trifle firmer. A new basis has been established for open hearth rolling billets, the leading Eastern maker naming $27.50 to $28, delivered, for third quarter, with forging billets at an advance of $2 a ton above rolling billets. Sheets and refined iron bars are dull, with prices easy. Coke remains firm, while the situation in the old material market is practically unchanged.

Pig Iron.—Comparatively few sales of any size are reported. Consumers frequently inquire for fair tonnages, but when it comes to placing orders quantities are usually scaled down considerably. The cast iron pipe foundries have been the most aggressive buyers, taking lots of several thousand tons of low grade Northern and Virginia iron. In the higher grades sales are closely confined to small lots, usually at a shade lower prices than recently quoted; $16, delivered, has and can be readily done for fair sized orders for standard brands of Northern No. 2 X foundry iron, although $16.25 is the more usual price for ordinary business, and occasionally a small sale at $16.50 is reported. Several buyers are feeling around for iron for early 1911 delivery, but so far no seller is willing to quote so far ahead. The range between No. 2 X foundry and No. 2 plain foundry is not so wide; at $16 for No. 2 X the majority of sellers would only concede a difference of 25 cents between the two grades. The situation in Virginia foundry iron is somewhat confused. Sales at $13.50, furnace, for No. 2 X foundry are reported in small and moderate lots, although some sellers contend that $13.25 can be done. The leading sellers have in a number of cases flatly refused to accept the lower figure, although it is contended that iron has been offered consumers in other districts at that figure by other sellers. No sales at the lower level have yet been reported, although the market does not have a very strong appearance, as there are still some weak sellers in the district. Basic iron shows no movement, but sellers manifest a willingness to accept lower prices should business be offered. The nominal price for this grade is $15.25, delivered in this territory, although it is not improbable that this price could be shaded 25 cents if the tonnage was satisfactory and the delivery point favorable. Forge iron for rolling mill purposes has not been active, but sales of this grade to cast iron pipe makers are reported at confidential prices. For good brands $15 to $15.25, delivered in this territory, about represents the range of the market. Sales of upward of 1000 tons of standard low phosphorus iron are reported at prices equal to $22.50 to $22.75, delivered in this territory. The following range of prices about represents the market for moderate lots, delivered in buyers' yards, eastern Pennsylvania and nearby points:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.50
Eastern Pennsylvania, No. 2 plain	15.75 to 16.25
Virginia, No. 2 X foundry	16.25 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	15.00 to 15.25
Basic	15.25
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—Sales are reported in the West, although the demand from consumers in this territory remains practically at a standstill. No particular change is to be noted in prices, $39, seaboard, about representing the minimum for 80 per cent., although some sellers are out of the market at that figure.

Billets.—There has been a slightly improved demand, particularly for deliveries during the third quarter, but the amount of actual business booked has been small and mostly for prompt delivery. Prices are lower, the leading producer in this territory now quoting $27.50 to $28 for ordinary open hearth rolling billets, delivered in this vicinity, during the third quarter, and forging billets at $29.50 to $30, at mill, with the usual extras for high carbons and special sizes.

Plates.—A very satisfactory run of specifications continues, and the majority of the producers are able to maintain a comparatively even production. A good demand for small lots of boiler and bridge plates is reported, with an increased demand for tank plates, a few fair sized lots of the latter being before the trade. Prices are being pretty well maintained, minimum quotations rangingfrom 1.55c. to 1.60c., delivered in this vicinity, with 1.60c. to 1.65c. named for small lots. More effort on the part of consumers to contract for the remainder of the year at present prices is to be noted, but, as a rule, Eastern mills are not inclined to accept business for extended delivery.

Structural Material.—There is still a scarcity of large propositions in this district, and revised bids will probably be taken on some of the building work recently figured upon. A very fair volume of small business continues to be offered, not sufficient, however, to enable mills to gain very much, as, at the present rate of production, orders on hand are being steadily reduced. Prices are unchanged, 1.55c. to 1.60c., delivered, about representing the minimum for plain shapes, dependent on specifications.

Sheets.—Business continues of a hand to mouth character, and mills are not very well fixed for forward business. Sales are principally for early delivery and confined to small lots, for which the following range of prices is named, although concessions could be had if a desirable tonnage came out: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

Bars.—The situation is practically unchanged. Refined iron bars are not in active demand, and while prices for delivery in this territory range from 1.42½c. to 1.52½c., it is believed that on desirable specifications concessions might be had. Mills are not actively engaged and show more anxiety for business. Steel bars remain strong at 1.60c., delivered here.

Coke.—A few sales of foundry coke for delivery over the last half of the year are reported, one fair order going at $2.40, at oven. Some sellers are firm at $2.50 for this grade, although others will accept business at $2.25. Furnace coke is rather quiet at unchanged prices. The following range about represents the market, per net ton, delivered in buyers' yards in this territory:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—A trifle better movement in some of the cheaper grades of scrap, particularly borings, is reported. The general market, however, continues dull. Consumers endeavor to buy a trifle under present quotations in some instances, but sellers refuse to let go, even at the present market, when any tonnage is involved. Very little has been done in heavy melting steel scrap. The associated mills, being well supplied, have reduced their offering price to $13.75, delivered. The same buyer offers $16 for No. 1 railroad wrought and $8 for No. 2 light iron, delivery in all cases at eastern Pennsylvania mill. In several lines of scrap not enough business has been done to establish a market. Bids and offers for delivery in buyers' yards, eastern Pennsylvania

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and nearby points, carrying a freight rate from Philadelphia of 45c. to $1.30, range about as follows:

No. 1 steel scrap and crops	$13.75 to $14.25
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	9.00 to 9.50
Cast borings	9.50 to 9.75
Machinery cast	14.50 to 15.00
Railroad malleable	14.00 to 14.50
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cleveland

CLEVELAND, OHIO, August 2, 1910.

Iron Ore.—Shipments from docks to the furnaces are rather light, and, owing to the limited dock space, boats are being delayed in disposing of their cargoes. The ore movement down the lakes continues quite heavy, but August is expected to show some falling off as compared with July. General conditions in the lake trade show no change. Contract boats are taking about all of the ore tonnage, so that there is little demand for wild boats. We quote ore prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—An inquiry is out for 10,000 tons of basic and some improvement is noted in the volume of foundry iron inquiries from a few of the larger consumers that appear to be feeling the market. Among these is one from northern Ohio for 2000 to 4000 tons of foundry iron for the last half and two from Michigan stove manufacturers for the last quarter and first half, one for 2000 tons and the other for 7500 tons. A few inquiries for lots of 500 tons and under have also come out. The sale of about 2500 tons of malleable is reported. A Valley interest reports the sale of 500 tons of No. 2 foundry. Quotations remain about stationary. Several interests are refusing to meet present quotations on foundry iron, holding for $14.50 for No. 2. Quotations as low as $14, at furnace, however, are being made for No. 2 foundry by one or two interests. For prompt shipment and the last half we quote, delivered, Cleveland, as follows:

Bessemer	$16.40
Northern foundry, No. 1	$15.25 to 15.75
Northern foundry, No. 2	14.75 to 15.25
Northern foundry, No. 3	14.25 to 14.75
Gray forge	14.15 to 14.40
Southern foundry, No. 2	15.60 to 15.85
Jackson Co silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—A fair volume of business is being done in foundry coke contracts for the last half of this year and the first half of next. Furnace grades are very quiet. Some of the producers that have been selling foundry grades at $2.25 have advanced their price to $2.50. We quote standard Connellsville furnace coke at $1.55 to $1.65, per net ton, at oven, for spot shipment, and $1.80 to $1.85 for the last half. Connellsville 72-hour foundry coke is held at $2.15 to $2.40 per net ton, at oven, for spot shipment, and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—Following the recent concession in steel bar prices to the agricultural implement trade in this territory, the expected reduction to general consumers has been made by a leading independent interest, which is now making the quotation of 1.40c., Pittsburgh, for fair sized lots. The leading interest and other independent mills have not yet met this price, but it appears very probable that they will do so. Contracts made with some of the implement trade before the price cutting have been revised on the 1.40c. basis. Business in all finished lines is generally quiet, both in the volume of specifications and new orders. The falling off in orders has resulted in some improvement in steel bar deliveries and fairly good shipment can now be secured on some sizes. The demand for iron bars is not active and prices are weak. The usual quotation is 1.40c., at mill, but this can probably be shaded. There is a fair demand for small lots of plates, but consumers are buying only for their immediate requirements. Prices are firm at 1.40c. to 1.45c., Pittsburgh, the former being the usual quotation for carload lots. There is a fair demand for small lots of structural material, but work requiring large tonnages, considerable of which is pending, is slow in coming out. The contract for a new plant for the Republic Rubber Company, Youngstown, has been let to the Forest City Steel & Iron Company, Cleveland. It will require 600 tons of steel. The erection of the Marine National Bank Building, Erie, Pa., for which there was an inquiry out for 800 tons, has been held up. We quote plain structural material, 1.40c. to 1.45c., Pittsburgh. The demand for sheets continues quiet. While prices are weak, there appears less irregularity in quotations than during the past few weeks. The usual quotations at present on No. 28 are 2.20c. for black and 3.30c. for galvanized. Blue annealed sheets remain firm. Warehouse business with jobbers continues fairly good. Store prices on steel bars have been reduced to 1.80c.

Old Material.—There was some buying in moderate lots by mills in the Pittsburgh district in this market late last week, but this spurt of activity has subsided and the market is again lifeless. Prices still show a downward tendency, but the absence of transactions in some grades makes such quotations largely nominal. Heavy melting steel is slightly weaker, and quotations on busheling and cast scrap have been reduced 50c. a ton. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.50 to $15.00
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.75 to 7.25
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., July 31, 1910.

Pig Iron.—The volume of business transacted in this market the past week was no larger than that reported for the two weeks just previous. As to whether or not there has been further decline in prices by reason of the continued inactivity a definite statement is not warranted, owing to the lack of interest by the trade generally, even in small lots for immediate shipment. It is not believed that sales effected the past week will aggregate 1000 tons and inquiries now pending that can be expected to result in sales involve hardly so much. It is understood that with one probable exception all producing interests in this district would accept a basis of $11.50, Birmingham, for deliveries to cover the remainder of this year. Spot shipments and even round tonnages for delivery during a limited period are also quoted on a basis of $11.50, and no sales are known to have been made at lower figures; yet, in view of the lack of demand for any deliveries, quotations are considered nominal and in some cases are no doubt subject to shading. The daily output of furnaces now in operation is being moved, and it is believed that reports for August 1 as to stock accumulations will show that no increase was made in the month of July. An addition to the output of foundry grades has just been effected by a change of operations at a local plant, and it is understood that two stacks now in operation that were scheduled to go out of blast in July will be kept going for some weeks longer. The total production of foundry iron in this district is now represented by 15 stacks, with four additional stacks producing basic iron. There is as yet no tangible evidence of an improvement in the condition of the foundry trade, and the best authorities on existing conditions would not be surprised at further curtailment in the production in order to adjust the output to the consumption. It is believed that stocks on founders' yards have been very materially reduced, but in a number of cases second quarter, and even first quarter, sales are still undelivered, with frequent requests that third quarter shipments be deferred.

Cast Iron Pipe.—The curtailment in output which was anticipated has not occurred and reports are more favorable as to new business for early placing. The city of Gadsden, Ala., is to place from 750 to 1000 tons of water pipe the coming week, and a number of round tonnages for Pacific Coast points are now under consideration. Prices have declined with prices for other finished materials and we revise quotations as follows, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., average $20.50, with $1 per ton extra for gas pipe. These prices are arrived at from transactions involving comparatively small tonnages and are probably subject to shading for large municipal requirements.

Old Material.—This market is in practically the same condition as at the time of last report. Dealers find it difficult to replenish their stocks readily, owing to the scarcity of certain grades, but there is no report as yet of a scarcity

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of any grades to consumers. Prices as last quoted are adhered to as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.50 to $17.00
Old steel rails	12.50 to 13.00
Old steel axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.00 to 9.50
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light cast and stove plate	7.00 to 7.50

The furnace of the Southern Iron & Steel Company at Trussville, Ala., did not go out last week in accordance with report to that effect in these columns.

The Woodward Iron Company, Woodward, Ala., has put both its active furnaces on the production of foundry iron.

The Alice Furnace of the Tennessee Coal, Iron & Railroad Company at Birmingham has been put on foundry iron instead of basic.

Cincinnati

CINCINNATI, OHIO, August 3, 1910. (By Telegraph.)

Pig Iron. A Columbus machinery manufacturer has an inquiry out for 2000 tons of malleable, to be distributed over eight months, beginning November. A central Ohio stove interest is asking for 1200 tons of foundry iron, and it is also reported that the leading pipe manufacturer wants a 1000-ton lot of foundry iron for one of its Ohio plants. While $11.50 is still being asked for Southern No. 2 foundry, at furnace, some interests are reported as soliciting offers under this, and for prompt shipment $11 is possible. A St. Louis consumer is stated to have purchased 1000 tons of No. 2 Southern foundry at $11.50, Birmingham, for first half delivery next year. Northern irons are not very strong, and $14.50 to $15 is quoted for No. 2, with very little actual business doing, although there are some inquiries out both for last half and first quarter delivery. For immediate delivery and through the last half, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$15.00 to $15.25
Southern coke, No. 2 foundry	14.50 to 15.00
Southern coke, No. 3 foundry	14.00 to 14.25
Southern coke, No. 4 foundry	13.75 to 14.00
Southern coke, No. 1 soft	15.00 to 15.50
Southern coke, No. 2 soft	14.50 to 15.00
Southern gray forge	13.75 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

Coke.—Local offices report business quiet but prices are firm. To a certain extent, coke has been a puzzling proposition. Ordinarily, it follows pig iron, but while there has been a softening in figures for the latter, coke has stubbornly remained steady. A local interest closed last week a contract for a 12 months' supply of Pocahontas furnace coke aggregating 7000 tons at a price around $1.85 per net ton at oven. Considerable buying to fill immediate requirements of foundry coke is reported, though a large percentage of the foundries is understood to have made future contracts. Connellsville furnace coke is quoted at $1.70 to $1.85 at oven. Pocahontas furnace ranges from $1.85 to $1.90. From $2.10 to $2.25, at oven, would cover foundry coke of the Connellsville, Pocahontas and Wise County districts. A small tonnage of Connellsville changed hands last week on a $2 basis, but it was an emergency sale for immediate shipment.

Finished Iron and Steel.—Business is quiet, although some sellers state that July will average up very well with any previous month of the year. Some steel bars have lately been sold out of stock, and the demand for structural material is about the same. For beams and channels we quote from stock 1.90 to 2.

Old Material.—The market is very slow, with no desire on the part of seller or buyer to start things moving. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Heavy scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

St. Louis

ST. LOUIS, MO., August 1, 1910.

Though the market for pig iron is quiet, some of the leading brokers confidently look for a gradual increase in the demand during the present month. The firmness beginning to be apparent on the part of producers has eliminated short selling by merchant houses and is attracting the attention of consumers. With one exception, the leading brokers find the large buyers of coke among their customers have supplied their wants for the present. Bank clearings for this city, Kansas City and St. Joseph again exceeded the corresponding week last year. Skilled mechanics are fully employed and more men in some lines of manufacture are wanted. Lower prices for grain and cotton show improved crop conditions. Money is fairly easy and collections are good. Railroad buying is still being curtailed, awaiting the outcome of the crops and a better outlook in the stock market.

Coke.—The demand for coke from large buyers, with all but one office, has slackened up as the normal result of some weeks of activity, and such demand as is now passing is coming from medium to small consumers. The only large transactions reported came from the office referred to, which in the aggregate booked contracts for 8100 tons for a year's shipment—all Virginia coke. The market is firming up, especially on Connellsville makes. Some of the leading brokers state that the ovens are pretty well filled up with orders and are not pressing for new business. The lowest price mentioned for standard Connellsville 72-hour foundry is $2.35 for long contracts, ner net ton, f.o.b. oven. Virginia is held at $2.25. Jobbing lots command 25c. per ton more.

Pig Iron.—At the close of the past week a firmer tone developed for pig iron. Leading brokers that have admitted giving buyers encouragement to submit offers of less than the nominal price state that instructions have been received to support it. As far as can be learned, no one is offering Southern No. 2 foundry at $11, Birmingham, at least where the standard analysis is the basis for trading. With some offices, however, the week was very quiet and no business of consequence booked. One of the leading brokers reports scattering orders aggregating about 1000 tons, all Southern iron and for shipment over the remainder of the year, while another office reports about the same tonnage of all grades, with scattering inquiries for about 800 tons. The nominal price for Southern No. 2 foundry for shipment over the remainder of the year is $11.50, and other grades at the usual difference, and there is more disposition than has obtained of late to stand for this price. Southern Ohio is held at $15, f.o.b. furnace.

Old Material.—Leading dealers state that the market is very dull; even the trading which for some time has been going on among dealers was very light during the week. Being the last of the month, no railroad lists are posted. Owing to this inactivity prices on several items have been reduced and the tone of the market is weaker. Relaying rails, though in quite moderate supply, are lower. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.50 to 6.00
No. 1 busheling	11.00 to 11.50
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

The new railroad bridge which is to span the Ohio River at Metropolis, Ill., will be built by the Paducah & Illinois Bridge Company.

The American Car & Foundry Company is reported to have undertaken to build for its own account and lease to the St. Louis & San Francisco lines 500 box cars, 500 dumping stock cars and 250 tank cars. During the severe elec-

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trical storm, with high wind, of July 25, an electric traveling crane at the company's plant, foot of St. George street, which weighed 30 tons, was blown off its track and badly damaged.

The contract for the iron work for the new Union railroad station at Memphis, Tenn., has been awarded to the Noelke-Richards Iron Works, Indianapolis, Ind.

San Francisco

SAN FRANCISCO, CAL., July 27, 1910.

No real activity is manifest in any department of the iron and steel market, little if any improvement being noted over the condition at the beginning of the month. The current needs of most consuming interests are provided for by purchases made earlier in the season, and so far there is no indication of any general movement to provide for the future. This condition is causing no discouragement, as a month or two of dullness is to be expected in the midsummer season. Conditions are favorable for a renewed demand from Pacific Coast manufacturing interests within the next month, as there is considerable work in sight as soon as the labor troubles can be brought to an end. A fair tonnage is being booked by local jobbers, who are maintaining prices in all lines, though they are still carrying large supplies. A few fabricating orders for structural material are coming out, the bulk of the business being taken by Eastern interests. Tank plates are moving in a small way, though there is considerable business in prospect. All descriptions of steel pipe are quiet, with little immediate prospect of improvement.

Plates.—The demand for plates has not entirely recovered from the recent depression, though deliveries are now coming forward rapidly on the large orders placed earlier in the season. Small orders for tank plates are fairly numerous, and while the tonnage is not as heavy as was expected, the movement is as large as usual at this season. There has been some delay in the placing of new contracts for fabrication, and the larger work in hand has already been provided for. The outlook is favorable for a large movement during the fall.

Rails.—No heavy tonnage of standard sections has been booked recently, the larger projects in hand being well provided for and very few new inquiries are coming into the market. Supplies of light rails in store are considered ample for all probable needs of the immediate future, as the jobbing demand for the last month has been of little consequence and no unusual activity is anticipated.

Bars.—The larger buyers are still inclined to hold off from the market or to order in a small way for early delivery, and the bulk of the business is of a jobbing nature. Small orders are fairly numerous, but the distributive movement is not sufficient to cause any material reduction of supplies on hand, which are augmented from time to time by arrivals of foreign material. The tonnage in store is not excessive, but is considered ample for current needs and merchants are buying on a very moderate scale. Bars for concrete reinforcing are in good demand, as there is considerable activity in concrete construction work, but this material is purchased in small lots as required. Jobbing prices are firmly held, bars from store, San Francisco, being quoted at 2.50c. for steel and 2.30c. for iron.

Structural Material.—The local situation is very quiet. Few contracts of any importance have been let recently, though figures are being taken on a number of jobs. Several of the smaller fabricators in San Francisco are fairly busy, but the bulk of the work is of a small nature and will soon be completed. A contract is expected shortly for the Realty Syndicate Building in Oakland, and the general contract has been awarded for the H. C. Capwell Building in that city, which will require about 600 tons. Milliken Bros. will fabricate 400 tons for the Oregon Railroad & Navigation Company, Portland, Ore. The American Bridge Company has a contract for a court house at Fairfield, Cal., about 200 tons. The contract is still withheld on the steel for the Bakersfield, Cal., court house. An inquiry has been received for about 300 tons for an art museum at Los Angeles, Cal. Specifications are being prepared for the Oakland City Hall, contracts for which will probably be let within four months. The Folsom Investment Company is planning a building at Sacramento, Cal., which will require about 150 tons. Awards are expected within a few days on a bank in the San Joaquin Valley and on the Masonic Temple at Fresno, Cal. A site has been selected for a national guard armory, for which a considerable tonnage will probably be required, and the Government is negotiating for a site for a $180,000 federal building at Berkeley, Cal. A general contract has been let for a large steel frame theater building at San Diego, Cal. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Merchant Pipe.—The general movement of steel pipe during the month of July has been even smaller than for the previous month, no tonnage of any consequence having been booked by any of the Eastern interests in this market. The movement of small sizes is almost entirely of a jobbing nature and the demand has not increased to any great extent, most orders being for carload lots or less. Some fair inquiries for small pipe, however, are coming from municipal water works projects. Local merchants have held aloof from the market since last November, when a heavy tonnage was ordered in anticipation of an advance, and no general buying movement is expected before the last quarter. A material increase of small business is expected before the end of September, but stocks on hand are considered ample to meet all demands until that time. The market in the oil fields remains extremely dull and the prospect of a revival before the rainy season is very doubtful. Existing wells are producing more oil than can be handled, causing a general suspension of new drilling operations, and plans for new pipe lines are progressing very slowly.

Cast Iron Pipe.—The tonnage booked during the past month is comparatively light, as is to be expected at this time of year. The general buying movement earlier in the season has provided for the principal requirements of the summer season, a fair tonnage having been ordered by most of the water and gas corporations of the coast, and inquiries at present are mostly for municipal water works, most of which are of small importance. Plans are under way, however, on quite a number of water works projects and there is considerable business in prospect. The Crane Company has taken a contract for a considerable tonnage for the town of Lodi, Cal., and there is an inquiry for a lot of 10 and 12 in. pipe for Phœnix, Ariz.

Pig Iron.—Most of the local foundries are operating on a small scale, as structural cast iron is in small demand, and current business in machinery castings occupies only a small proportion of the capacity. Several foundries are working on manhole covers, &c., in connection with street work, but their requirements are not heavy. As none of the local melters is inclined to carry any stock in excess of current needs this market remains in the same dull condition as for several months past, most orders consisting of small lots to be delivered from store. There is somewhat more activity at other coast points, especially in the North, but the principal requirements of that section are provided for by frequent arrivals of Chinese iron. Southern foundry iron is nominally valued at $22.50, and foreign iron in small lots from store is quoted as follows: Chinese, $23; Continental, $23; English, $23 to $23.50; Scotch, $24 to $24.50. Lower prices could probably be obtained on large lots to arrive.

Old Material.—Shipping firms are buying up considerable steel melting scrap for shipment to Atlantic ports, an old steamer containing about 2200 tons being recently sold to be broken up for this purpose. Otherwise the market presents little feature. Accumulations of cast scrap are not excessive, and while there is no demand of any consequence prices are firmly maintained. Other descriptions are quiet. Prices are quoted as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, 10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

Buffalo

BUFFALO, N. Y., August 2, 1910.

Pig Iron.—The market continues dull and the aggregate of sales for the week has been small, neither producers nor purchasers making much effort to do business. The larger proportion of the sales made have been to Eastern and New England points accessible for shipment via the Erie Canal, comprising principally foundry grades, in 100 to 200 ton lots. Sales for July show a total considerably under that for June. Prices are practically unchanged from last week. We quote as follows, per gross ton, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.50
Malleable	15.00 to 15.50
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—The total sales figures for finished products for the month of July, as reported by the principal agencies, are well up with June, making a very good showing for the midsummer month, the slight slacking off being attributable to the inventory period. In structural business there was a marked increase for the month, as compared with June. The market in bar material is quiet, but specifications on contracts continue in good volume and a fair amount of new business for the season is in evidence. In plates and shapes some good inquiries are being received, but purchasers are looking for concessions. The demand for fabricated structural material shows improvement. Bids have gone in this week for the 700 tons of

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material for a highway bridge over the Oswego River at Oswego, and figures will be taken next week for the steel for the new Manru Theatre on Broadway, Buffalo, about 175 tons, and for the Plaza Theatre, Buffalo, for a smaller tonnage. Plans and specifications are being prepared for a 10-story receiving and distributing warehouse for the Larkin Company, soap manufacturer, Buffalo, involving a heavy tonnage. The Buffalo Structural Steel Company was low bidder for the new Sherman House, Jamestown, N. Y., 862 tons; also for the State Normal School at Oswego, N. Y., 400 tons. The contract for steel for the addition to the Snow Building, Syracuse, went to the Syracuse Bridge Company.

Old Material.—There is but little inquiry for material in any line. A few sales have been made at sacrifice prices, but there has been no movement of important tonnage. Most dealers are holding their material rather than dispose of it at prices obtainable and are adding to their stocks such as can be secured at low prices. We quote as follows per gross ton, f.o.b. Buffalo, prices being largely nominal:

Heavy melting steel	$13.25 to $13.50
Low phosphorus steel	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.75 to 14.25
Boiler plate	11.25 to 11.50
Locomotive grate bars	11.00 to 11.50
Pipe	11.00 to 11.50
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 bushelling scrap	11.75 to 12.00

New York

NEW YORK, August 3, 1910.

Pig Iron.—Some sellers appear to be making more effort to get business and prices have yielded further. On Southern iron $11, Birmingham, for No. 2 foundry has been done, and it is reported that one or two Virginia irons have been offered as low as $13 at furnace, though $13.25 and $13.50 are maintained by other sellers. Several orders for fair size have been booked, Southern and Northern irons sharing the business. A Brooklyn buyer took 1000 tons for delivery in the balance of the year, and a transaction of similar size is reported from Connecticut. Business in 200, 300 and 500-ton lots has been done at Hudson River points and at foundry centers in central and eastern New York. This is not so much the result of inquiries on which there has been competitive bidding, for inquiries have grown less, but rather comes from attractive offers made by furnaces. More business has been done in this district by Buffalo furnaces on the basis of $14.50 at furnace for No. 2. We quote Northern foundry iron at tidewater as follows: No. 1, $16.25 to $16.50; No. 2 X, $15.75 to $16; No. 2 plain, $15.50 to $15.75. On Southern iron quotations are $15.75 to $16 for No. 1 and $15.25 to $15.75 for No. 2.

Finished Iron and Steel.—The West shows most activity in new structural work. While a number of contracts have been taken by fabricators in that section, Eastern business has fallen off. The New York Central terminal work in this city has not yet been let. It is understood the competition is quite sharp, in view of the large tonnage involved. The principal new business taken in New York City was the steel for three new school buildings, amounting to 2000 tons. The American Bridge Company will fabricate the steel for a new foundry building for the Dean Steam Pump Company, Holyoke, Mass., 300 tons. A new bakery and garage at 165th street and Park avenue, this city, 350 tons, will be erected by the Hay Foundry & Iron Works. New railroad bridge work is unimportant. In Ohio the King Bridge Company, Cleveland, has taken 350 tons, awarded by the Cincinnati, Hamilton & Dayton. While the large fabricators have business enough to carry them well along in the year they are keeping a close watch on new developments, July showing the smallest total of new tonnage for the year at 100,000 tons, of which the leading interest took about 30,000 tons. While the volume of business in both steel and iron bars is quite satisfactory for the season, competition is keen and prospective buyers are vigorously canvassed for the orders which are now being placed. The plate trade is not active, but there is some prospects for business of fair size in the boat building line. Quotations are as follows: Plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.56c. to 1.61c.; bar iron, 1.45c. to 1.50c., all New York:

Cast Iron Pipe.—The Washington, D. C., contract for 5060 tons, referred to in last week's report, was awarded July 27 to a Virginia foundry, as had been anticipated. The most important letting now coming up in Eastern cities is at Boston. August 9, when bids will be received on 500 tons of 30-in. water pipe. The general market is almost lifeless, inquiries being very light. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Ferroalloys.—There is but little call for ferromanganese. The price is about $39.50, Baltimore, and quotations for next year's delivery are around $40. An error was made in last week's report, the quotation of $39 having been at seaboard. The price for 50 per cent. ferrosilicon is from $57.50 to $58, delivered Pittsburgh, and but little trading is being done.

Old Material.—Business is decidedly quiet, but this condition of the trade is partly due to the refusal of many dealers to sell their holdings at current prices. They say that they are unable to replace their stock from makers of scrap who are unwilling to take the offers now being made. The railroad lists now going out are quite heavy, but it would not be surprising if some companies refused to sell at the bids they will get. All the railroads are complaining of the low prices they are receiving for old material. Wrought pipe is probably most in demand of any class of scrap, which is owing to the fact that the supply is light, while the material is desirable. Foundries are making only limited purchases of cast scrap. Quotations per gross ton, New York and vicinity, are nominal, as given below, but it is likely that buyers in actual need of material may be obliged to pay somewhat higher prices.

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.00 to 11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.00 to 21.00
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.25 to 13.75
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Wrought pipe	11.75 to 12.25
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, August 3, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper			Lead		Spelter	
July	Lake	Electrolytic	Tin	New York.	St. Louis.	New York.	St. Louis.
28	12 62½	12 50	32 25	4 15	4 30	5 20	5 05
29	12 75	12 50	33 00	4 45	4 30	5 20	5 05
30	12 75	12 50	33 00	4 40	4 25	5 20	5 05
August.							
1	12 75	12 50	33 50	4 40	4 25	5 20	5 05
2	12 75	12 50	33 35	4 40	4 25	5 20	5 05
3	12 75	12 50	33 20	4 40	4 25	5 20	5 05

The buying movement in copper continues and some sellers have disposed of all their stocks for immediate delivery. Tin statistics, showing unusually heavy deliveries for June and July, have greatly strengthened that market. Lead is a little easier. Spelter is attracting no attention from buyers, but prices are firm.

Copper.—Some large sales of copper were made during the week, with the result that prices have stiffened and quotations for September deliveries have advanced to 12.62½c. for electrolytic. It is generally believed that most copper producers have of their own accord curtailed their production, and there are enough reports of shutdowns at some of the mines for repairs to indicate that production is being lessened. There has been a very good call for copper for spot delivery, and last Thursday outside sellers who were offering electrolytic at 12.37½c. advanced their price to that established by the United Metals Selling Company, which was 12.50c. To-day copper was even stronger than yesterday and sales of electrolytic were made at 12.62½c., delivered in the Naugatuck Valley, cash in 30 days. It is evident that many consumers of copper have let their stocks run down, as most of the buying that has been done the past week has been for immediate delivery. Lake copper is higher and cannot be had for less than 12.75c. The price for spot electrolytic in New York is 12.50c. and casting copper is firm at 12.37½c. The August statistics on copper, compiled by C. Mayer, secretary of the Metal Exchange, show that the exports during the month were fair, amounting in all to 22,875 tons. The total exports for the seven months of this year show a decrease of 30,427 tons, compared with the same period of last year. In London to-day the market closed with spot copper selling for £55 8s. 9d. and futures for £56 2s. 6d. The sales amounted to 500 tons of spot and 1400 tons of futures. The market was dull.

Waterbury Average.—The Waterbury average for July was 12.75c.

Pig Tin.—The tin statistics for July, compiled by the

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New York Metal Exchange, were astonishing, as the combined deliveries of June and July were more than the deliveries of any two consecutive months in the history of the trade. The deliveries in July alone amounted to 3800 tons, and the total for the seven months of the year shows an increase of 7900 tons, compared with the same period last year. The total visible supply, July 31, was 2811 tons below that of July 31, 1909. It is very certain that a large amount of tin delivered last month did not go into consumption, but, nevertheless, the fact that the market in spot tin is still cornered is taken as an indication that the demand is unusually good. A good business has been done in the New York market since last Friday, and the sales were mostly to consumers. The arrival of the steamer Minnewaska, August 1, with 980 tons of tin, has not given any special relief, as most of the cargo had been taken care of and the tin available for early consumption in New York is still cornered. Since early last week the Minnewaska tin to arrive had been traded in, and the price varied from 10 to 15 points less than the spot price, until August 1, when tin in the warehouse and tin on board the steamer were quoted at 33c. August 1 was a holiday in London and sellers here were in the dark as to how the English traders might take the American statistics. Consequently on the following day, when the London market opened at a much higher price, the price for spot tin in New York was advanced ½c. and yesterday it receded to 33.25c. Spot tin was sold in New York to-day for 33.20c. The London market closed to-day with spot tin selling at £151 and futures at £151 7s. 6d. Sales amounted to 150 tons of spot and 1000 tons of futures. The market was dull.

Tin Plates.—The demand is rather quiet, but it is still somewhat difficult to get early deliveries. The price in New York for 100-lb. coke plates is $3.84. Following a sharp advance in the price of pig tin, quotations on tin plates at Swansea, Wales, were advanced 1½d. to-day, and the price now is 13s. 6d.

Lead.—Lead is somewhat easier. On July 28 and 29 outside sellers advanced their price to 4.50c., and it was strongly rumored that the leading interest was preparing to advance its price five points. As the week went by and no action was taken in this direction the market became easier, and at present outside sellers are getting the price asked by the American Smelting & Refining Company, which is 4.40c., New York. The price in St. Louis is 4.25c., and the market there is reported to be firmer than the New York market.

Spelter.—Spelter for spot delivery is still scarce in New York, but that is affecting only the jobbing trade, as larger buyers have ample assurance that they can get all the metal they need shipped from East St. Louis within a very short time, and they are making their purchases accordingly. Very little interest is being taken in the market by consumers, and the nominal price remains unchanged at 5.25c., New York, and 5.05c., St. Louis.

Antimony.—The antimony situation is uninteresting. Prices are weak and there are reports that the standard brands are being offered at shaded prices. The nominal price for Cookson's is 8.25c. and Hallett's 8c. Lesser known brands of antimony are being sold at all sorts of prices from 7.50c. up.

Old Metals.—Under an improved demand copper and brass prices are higher. Dealers' selling prices are as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.75 to 9.00
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.50 to 9.75
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, August 2.—The discussion of restricting the output of copper has led large consumers to buy heavily the past week, and as a result prices are quoted higher on both casting and lake copper in this market. Spot tin is still quoted at 34c., but for shipment after August 10 this metal is quoted a half cent lower. Lead is stronger, but the leading interest has not changed its price. Spelter is practically unchanged, with very little business being done. We quote Chicago prices as follows: Casting copper, 12⅝c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 34c.; small lots, 35c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 11¾c.; red brass, 11½c.; yellow brass, 8¾c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4⅛c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, August 1.—Lead is quiet at 4.30c. to 4.35c.; spelter is in moderate demand at 5c. to 5.05c., both at East St. Louis. Zinc ore is held at $38 to $39 per ton, Joplin base. Tin is quoted at 33.35c. per pound; antimony, 8.50c.; Lake copper, 13.15c.; electrolytic, 12.97½c., all at St. Louis. The demand for finished metals is slower and rounded up for the past week only a fair average.

Iron and Industrial Stocks

NEW YORK, August 3, 1910.

The lowest prices of the downward movement in the stock market which was in progress at the date of last week's report were reached on Wednesday. A reaction from the decline started on Thursday, which was continued with much strength on Friday, but prices again receded on Saturday, largely influenced by rumors of a reduction in the dividend on an iron stock. This appeared to chill the ardor of those operating for higher prices, and until Tuesday the market was dull, with recessions in some securities, but on that day an upward movement occurred. The range of prices on active iron and industrial stocks from Wednesday last week to Tuesday this week was as follows:

Allis-Chalm., com..	8 - 9	Pressed St., com..	26⅛- 30
Allis-Chalm., pref..	25 - 28	Pressed St., pref..	90 - 94½
Beth. Steel, com...	22 - 24½	Railway Spr., com.	28 - 30¾
Can. com.	71½ - 8⅝	Republic, com.	28 - 31⅝
Can. pref.	63⅛ - 67	Republic, pref.	84 - 90
Car & Fdry. com..	41½ - 46½	Sloss, com.	49 - 57⅞
Car & Fdry. pref..	109 -109½	Pipe, com.	14⅛ - 16⅞
Steel Foundries...	39 - 43¾	Pipe, pref.	53⅜ - 54
Colorado Fuel....	24⅝ - 27⅝	U. S. Steel, com...	63⅜ - 69¼
General Electric...	135¾-141⅛	U. S. Steel, pref...	112¾-116
Gr. N. ore ctf....	49¼ - 54	Westinghouse Elec.	52½ - 56½
Int. Harv., com..	86⅛ - 89½	Am. Ship, com....	79 - 80
Int. Harv., pref..	...118	Am. Ship, pref....	...108
Int. Pump, com...	38¼ - 40½	Cambria Steel....	41¼ - 42
Int. Pump, pref...	78¾ - 79⅝	Lake Sup. Corp...	17¼ - 17⅝
Locomotive, com...	30¼ - 36¾	Warwick	9¾
Locomotive, pref..	103 -105	Crucible St., pref..	72 - 73
Nat. En. & St.,com.	15¼ - 16⅛		

Dividends.—The American Shipbuilding Company has declared a regular annual dividend of 4 per cent. on the common stock and 4 per cent. extra. The dividends will be payable 2 per cent. quarterly, beginning September 1. This distribution is from the earnings of the company in the fiscal year ended June 30, 1910.

The Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred, payable August 24.

The American Radiator Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred and 2 per cent. on the common. The preferred dividend is payable August 15, the common September 30.

The German Iron Market

BERLIN, July 22, 1910.

The event of chief present interest to the iron market is the advance in the price of coke, which was voted by the Coal Syndicate several days ago. The advance had been proposed above a month ago and was much discussed at that time. It was then believed in the iron trade that the syndicate would desist from such action in view of the energetic protests of such furnaces as are operated independently of steel works. Most of these establishments, it is claimed by their owners, are already being operated at a loss, and their contracts for the rest of the year were taken on the basis of coke prices as already existing. Now the syndicate has added 1.50 marks (35.7 cents) per ton on blast furnace coke (1 mark on other qualities), to take effect October 1. The original proposal was to add 2 marks, but the syndicate thought it might take account of the furnacemen's protests by throwing off ½ mark of the intended advance.

The Pig Iron Syndicate

The market has been discussing what effect this action will have on the negotiations now in progress for the reorganization of the pig iron trade. On the stock market it is believed that the rise will cause the isolated furnaces to lend a more willing ear to the proposals of the concerns that are pushing for a combine. Those disconnected furnaces will evidently be harder hit by the increased price of coke than furnaces connected with big steel companies, which all make their own coke and can well be indifferent to the price of that commodity. Indeed, it was asserted in the trade press that these big companies of mixed production were the chief movers for the marking up of the price, since this action would still further aggravate the precarious position of the independents without at the same time doing themselves any harm.

The Machinery Markets

Machine tool builders have recently received an unusual number of cancellations of orders from the automobile manufacturers of the Middle West. As many of the machinery people, whose product is an important factor in that industry, are far behind in their orders, a reasonable percentage of cancellations would not be unacceptable. They would welcome the opportunity to accumulate stocks. The incident is emphasizing the necessity of a noncancellation clause in machinery contracts. The volume of business booked from miscellaneous New England industries is encouraging; the variety of product represented by buyers appears to be on the increase, and their total bookings, apart from the automobile industry, are holding their own. In the New York district many houses did a better business in July than they did in June. Strong expectations are warranted of a good deal of new business coming along in the fall, but from present indications it will be necessary to look in other directions to make up for a falling off in the demand for machinery from the automobile trade. It is reported in the Pittsburgh district that the outlook for the fall trade has seldom been better, and there is already a marked improvement in buying. In that territory some companies are experiencing difficulty in placing bonds in part payment for new equipment. There is enough business in sight in Detroit to warrant the belief that August will be a strong month there, and many new building projects are under way. In Milwaukee a heavy fall trade is expected, and a good business is being done by manufacturers of machine tools and foundry equipment. An indication of the trend in St. Louis is contained in the report that a leading babbitt metal manufacturer there states that his July business shows an increase of 30 per cent. over the corresponding month of 1909. In Chicago some good railroad lists are expected shortly, but the immediate business is rather dull. The machine tool business in Philadelphia is fairly good, but there is not much in sight for the immediate future. In Cincinnati most manufacturers have their plants running on full time, although the machine tool business there is rather easy and a similar condition exists in Cleveland. Trade is very quiet in the South and Southwest. In the Northwest a great deal of development work is going on, and manufacturers of hydroelectric equipment are especially busy. A big business is reported on the North Pacific Coast, and some good trade is coming into that market from Alaska.

New York

NEW YORK, August 3, 1910.

The machinery trade in the Manhattan territory is more quiet, but there is some good business in sight. The business done during the last week was largely in filling small orders for replacements. A number of New York machinery houses find in going over their books that July was one of the best months in the year, and most of the New York representatives of machinery manufacturers did more business in July than they did during the month of June. The New York Central Railroad has been placing a few orders against the list it issued about two weeks ago, but other railroads have been inactive as far as machinery buying is concerned. The list issued by the Delaware, Lackawanna & Western Railroad for its Scranton shops has not been closed yet, and it is understood that the mechanical department at Scranton has not decided on all the machinery that will be required. Manufacturers of small power equipment, including electric generating sets, are doing more business just now than they had been looking for. This is largely due to the fact that the building season this year was rather slow, as a great many construction projects were held in abeyance because of the uncertainty in the real estate market. A great many office buildings and large apartment houses which have been erected in the vicinity of New York during the spring and summer are now being prepared for occupancy, and in many cases the purchasing of small power units has been left until the last moment; consequently a fair amount of unexpected business is coming from that source. Iron and steel foundries which make a specialty of furnishing steel castings for machinery manufacturers are fairly busy in filling orders. It is stated in the trade that there is not as much new business in sight as there was in the spring, but most of them have enough to do to keep their plants filled up with work.

It is expected that within the next month a list of machine tools and other equipment will be prepared for the proposed new Manual Training and Commercial High School to be erected in Newark, N. J. The plans for the structure have been approved and the construction work is under way. It is proposed to equip a foundry and forge room, a machine shop, pattern shop, woodworking shop and sheet metal working department. Mr. Pickwick, who is connected with the manual training department of the Newark schools, with headquarters in the City Hall, has charge of the machinery details.

The W. A. Wood Auto Company, Kingston, N. Y., may shortly be in the market for a line of machine tools for the manufacture of automobile trucks. This company some time ago acquired the plant of the Peckham Mfg. Company at Kingston, and lately it has been disposing of some of the railroad car manufacturing equipment which the former owner used. It is understood that this machinery is to be replaced with machine tools.

The Universal Caster & Foundry Company, 574-600 Ferry street, Newark, N. J., will not be ready to purchase the equipment for its proposed new plant within 30 days or more, according to the engineer in charge. The company proposes to erect a building which will contain approximately 190,000 sq. ft. of floor space, and it is expected that the structure will be completed by next February.

The Compton Shear Company, Newark, N. J., is about to increase its manufacturing facilities by the erection of a three-story factory, plans for which have been prepared by Nathan Myers of Newark. Two years ago this company erected a grind and forge shop for which machinery equipment was purchased in the New York market, and at the time sufficient power was installed to take care of the proposed addition.

J. L. Cohagan, Washington, Pa., and W. W. Smith, Wheeling, W. Va., who are connected with the Railway Brake & Shoe Company, are arranging to establish a plant at Moundsville, W. Va., for the manufacture of brake shoes for steam and electric railroads. The brake shoes are to be made under new patents and are to be composed of malleable iron shells filled with a composition. It is proposed to erect a one and two story brick building, 80 x 100 ft., at a cost of $10,000, and equipment costing about $20,000 will be installed. Mr. Cohagan can be addressed at Washington, Pa.

The Turner Construction Company, New York, has been awarded a contract for erecting a reinforced concrete factory building for the Bush Terminal Company at Brooklyn. It will be an eight-story structure, 230 x 440 ft. The same company will build a reinforced concrete factory at Buffalo, N. Y., for the Alling & Cory Company of Rochester, N. Y. It will be an L-shaped structure, 65 x 153 ft., with a wing 53 x 117 ft. Both buildings are to be six stories in hight.

The Larkin Company, Buffalo, manufacturer of soaps, perfumes and toilet preparations and an extensive line of premiums, will erect a receiving and distributing building, 10 stories and basement, 100 x 600 ft., at Van Rensselaer and Exchange streets and the Erie Railroad, adjoining its present mammoth plant, the largest in Buffalo, at Seneca, Larkin and Van Rennselaer streets. The new building will be of steel frame and brick construction, with concrete floors.

The Industrial Bureau, Niagara Falls, Ont., announces that the Hawes-von Gal Hat Company of Danbury, Conn., has decided to build a manufacturing plant in that city at Clifton avenue and Queen street.

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D. Dick & Sons, Welland, Ont., have secured contract for the building of the extensive Canadian plant of the Oliver Chilled Plow Company at Hamilton, Ont., and construction work will be commenced at once.

The Star Electric Company, Binghamton, N. Y., has been incorporated, with a capital of $300,000, to manufacture electric appliances and electric supplies.

The Federal Motor Company, Buffalo, E. E. Denniston, president, West Mohawk and Staats streets, is having plans prepared for a four-story and basement factory for the manufacture of auto trucks and commercial vehicles.

The Stahlbrodt Company has been incorporated at Rochester, N. Y., with a capital stock of $25,000, to manufacture wind shields and other appliances for automobiles, air craft and other power machines. The incorporators are L. C. Stahlbrodt, A. M. Grewer and R. B. Griffin.

The Stevens Mfg. Company has been incorporated at Rome, N. Y., to manufacture carbureters, motor and automobile supplies. S. B. Stevens and A. L. McAdam, Rome, are among the incorporators. Capital stock, $50,000.

The Northeastern Forestry Company, New Haven, Conn., will add curing and drying buildings to its plant at Wellsboro, N. Y.

The Jacob Dold Packing Company, Buffalo, has let contract to the Turner Construction Company for the erection of a concrete and steel reservoir and tank building at its plant, William and Howard streets and New York Central Railroad.

The Keystone Mfg. Company, Buffalo, manufacturer of wrenches, is building a two-story and basement warehouse and office building at its plant on Chandler street.

Catalogues Wanted

Francis B. Atkinson, 4939 Vincennes avenue, Chicago, would like to receive catalogues of machinery and supplies, as he and associates contemplate the erection of a plant for the manufacture of machinery.

Chicago

CHICAGO, ILL., August 2, 1910.

August promises to be a duller month than July in the Chicago machinery market, but this does not cause any concern to dealers, as they have expected a dull summer season. There are occasional sales of machines to individual buyers and there are also a few inquiries for second-hand machines, but no large transactions are expected until the fall trade picks up. It is believed, however, that the Chicago, Burlington & Quincy Railroad will close in the near future on its list for the Havelock shops, as these shops are now practically completed and ready to install the necessary tools. In other directions railroad buying is very light. There is a difference of opinion whether the policy now followed by the railroads is the result of business necessity which makes them restrict their purchases to the lowest possible limit, or whether they are following a shrewd political policy of doing all that they can to keep the business of the country in a dragging state until they secure approval for a general advance in rates. In any event, the purchasing agents are working under strict orders not to do any buying that can be postponed until November.

The Ross Gear & Tool Company, La Fayette, Ind., has increased its capital stock from $50,000 to $100,000 and is contemplating the erection of a main factory building of sufficient size to handle its increasing volume of business.

The F. A. L. Motor Company, Chicago, has increased its capital stock from $200,000 to $900,000. The company advises that the increase is to be used for extra working capital and that it does not contemplate adding new equipment of any consequence.

P. E. Kroehler, president of the Naperville Lounge Company, Naperville, Ill., advises that he will start a factory at Kankakee, Ill., for the manufacture of davenports, couches, Morris chairs, &c.

The Economy Motor Car Company, Joliet, Ill., which has recently passed under control of new owners, is negotiating with outside interests with a view to expanding its manufacturing facilities.

The plant of the Thomas Brass & Iron Company, Waukegan, Ill., was destroyed by fire on the morning of July 26. The company will hold a meeting of its directors, at which time it will be decided whether the plant is to be rebuilt. The plant of the Durand Steel Locker Company, adjoining the plant of the Thomas Brass & Iron Company, was also destroyed.

Joseph H. Whitehead, 12 North Jefferson street, Chicago, machinists' supplies, has secured the agency in the Chicago territory for the Lutz file handle, manufactured by the Lutz File Company, Cincinnati, Ohio. The company will also act as agents for L. M. Tague, Kokomo, Ind., manufacturer of aluminum solder, in Wisconsin, Illinois and Iowa.

The Excelsior Motor & Mfg. Company, Chicago, has increased its capital stock from $60,000 to $250,000, for the purpose of increasing its working capital.

The Chicago & Alton Railroad Company has awarded a contract to Westinghouse, Church, Kerr & Co. of New York City for the enlargement of its shops at Bloomington, Ill., and the construction of a new depot. Officials of the company recently entered into an agreement with the city to expend $1,000,000 in improvements in consideration of the transfer by the city of Bloomington of land upon which to erect the new buildings and yards valued at $165,000.

The Chicago & Northwestern Railroad has awarded a contract to J. J. Jobst of Peoria, Ill., for the construction in its Fulton terminal yards at Belvidere, Ill., of a power house, 100 x 110 ft., which is to be equipped with a battery of five 150-hp. boilers.

The Ft. Wayne Box Company, Ft. Wayne, Ind., has increased its capital stock from $100,000 to $140,000. W. W. Rockhill is president of the company.

C. S. Workinger, formerly secretary-treasurer of the Sibley Machine Tool Company, South Bend, Ind., has purchased the Edward Kelley foundry at Elkhart, Ind., and with C. G. Kibbe of Elkhart will organize a company with $200,000 capital stock. It is planned to make extensive additions and improvements.

Fire July 26 destroyed the main building of the Monarch Iron Works, Plymouth, Ind., with $10,000 loss. There was $4000 insurance.

The Loshbough & Jordan Tool & Machine Company has been incorporated at Elkhart, Ind., with $5000 capital stock. The directors are J. E. Loshbough, R. M. Loshbough, J. C. Jordan and M. M. Jordan.

The Chicago & Northwestern Railroad Company is erecting at the intersection of its tracks and Fortieth avenue, Chicago, a machine shop 200 x 300 ft., one story. G. A. Johnson & Son, 1335 North Clark street, Chicago, are the general contractors.

The Velie Engineering Company, Moline, Ill., has awarded a contract for the construction of a plant for the manufacture of gasoline engines, 80 x 400 ft., to the Leonard Construction Company, Chicago.

Philadelphia

PHILADELPHIA, PA., August 2, 1910.

With the majority of manufacturers and merchants the month of July was dull. In very few instances has the volume of business transacted been equal to that of June, and with quite a few sales have fallen below the usual average for July. The apathetic condition of the railroads and restricted buying by the large industrial concerns, few of which are operating up to their full productive capacity, have been factors. The usual midsummer inactivity has also had a quieting influence on trade generally. Business during the week has been of the ordinary character, scattered sales of one or more tools, with an occasional larger order, making up the bulk of the business. Merchants report transactions confined principally to the smaller classes of equipment, but the demand on the whole drags. There is no fresh railroad business offered, and pending business for any large proposition in the way of general shop equipment shows little indication of an early development into orders. Machine tool builders are, as a rule, comfortably fixed as far as business on hand, sufficient to keep plants fairly active for the next three to six months, is concerned. They are, however, catching up on some classes of work, and in a number of instances better deliveries than were offered a few months ago are to be had. With deliveries improving prospective buyers show no haste in placing orders. There has been some further locomotive business placed, and the local builder now reports order books in very satisfactory shape.

The demand for second-hand engines, boilers and machine tools generally continues rather inactive. Both iron and steel castings are in better supply, foundries not being so actively engaged.

The outlook for business during August is not particularly good, conflicting conditions influence the trade in many instances, and little active betterment in the situation is looked for before early fall.

The Sharpless Separator Company, West Chester, Pa., confirms the purchase of a site, corner Washington and Jefferson streets, Chicago, on which it will erect a fireproof building during the next 12 months. It is not the intention to do any manufacturing in Chicago: the proposed building will be used as a general Western office and storehouse. Definite plans have not been decided upon, but the building will be eight or ten stories.

The Emporium Water Company, Emporium, Pa., will

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receive bids until August 20 for the construction of a reservoir and the laying of about three miles of 12-in. cast iron water pipe. Plans and specifications may be obtained on payment of a small guarantee for safe return, on application to the company.

The Chadwick Engineering Works, Pottstown, Pa., states that its machine hands walked out July 26. No grievance had been presented on July 30, and it is presumed that the men walked out owing to the installation of a piece-work system.

Appropriations for a large amount of municipal work were authorized by City Councils a few days ago. Among the items were $300,000 for the completion of the Northeast high pressure fire system and $50,000 for bridge repairs. No funds for strictly new work were appropriated.

The Philadelphia & Reading Railroad has had plans prepared for a four-track stone and concrete bridge crossing the Delaware River at Yardley, Pa. This is in connection with the plan to four-track the system from Philadelphia to New York.

Fire partially destroyed the old general storehouse of the Germantown Tool Works in this city July 28. As a large portion of the materials contained therein had been removed to a new building, the inconvenience to the operation of the plant was small, and deliveries on orders will be but slightly interfered with.

The Betts Machine Company, Wilmington, Del., has recently shipped an extra heavy 20-ft. boring and turning mill to the Mesta Machine Works, Pittsburgh, Pa. The machine weighed complete about 370,000 lb. While some irregularity in the volume of new business taken by the Betts Company is reported, a good volume of business is on its books, sufficient to maintain the plant in full operation for the next three months. The outlook for the future is considered problematical, owing to conflicting existing conditions.

A number of contractors are estimating on a group of 21 buildings of various characters, comprising new shops for the Pennsylvania Railroad Company, to be erected in connection with improvement work at Northumberland, Pa.

The Baldwin Locomotive Works denies the current report that its boiler making department would be moved from this city to Burnham. The reported difficulties with molders at its Eddystone plant were of small consequence and easily adjusted. The Baldwin Works is quite busy and has recently booked an order for 35 engines of the consolidation type from the Illinois Central Railroad, for comparatively early delivery.

W. Vernon Phillips and Jacob M. Shenk, receivers of the Iron & Steel Products Company, announce that in connection with the sale of the entire plant, machinery and equipment, on August 16, of the Canton Iron & Steel Company, bankrupt, Baltimore, Md., by order of O. Parker Baker, trustee, they will, as receivers, also dispose of the personal property of the company, comprising bar iron, scrap iron and supplies, at the same time and place.

The American Viscose Company, Marcus Hook, Pa., which will engage in the manufacture of artificial silk, understood to be made from wood pulp, is progressing rapidly with its new plant. It is stated that the buildings, drains, reservoirs, filter beds, &c., will cost about $250,000, while $150,000 will be expended for machinery and equipment, a considerable amount of which will be brought from abroad. The motive power will probably be electricity, although no authoritative information is obtainable.

New England

BOSTON, MASS., August 2, 1910.

Those New England machine tool builders, a large percentage of whose current business is from the automobile manufacturers, are receiving notices to cancel orders running into considerable totals. This movement started some 10 days ago. Manufacturers of automobile parts are not troubled greatly with cancellations, but in the same period they have been asked by some of their important customers in the automobile trade to hold up on deliveries for the present. The matter is not so serious as would appear at first thought. The types of machines affected are practically out of the market because of the enormous bookings by this one industry, which have forced deliveries well into the future. Cancellations mean a relief from a strain of production which is abnormal, and may permit deliveries of such tools as milling machines, grinders, screw machines, the automatics and more or less special types, to return to a position where other classes of buyers will have a fair chance. The demand may be equalized both as to customers and as to machinery.

Another factor is the possibility that high class mechanics who have been attracted to the Middle West by the high wages offered may be induced to return to New England, where they would be quickly absorbed.

Doubt is expressed, however, of the permanency of the movement as indicated by the cancellations. There may have been an overproduction of pleasure cars; report has it that some of the Middle West builders have manufactured more than the market could absorb. Banking interests have become more conservative in accepting the commercial paper of the trade.

The collective statement of an increased production for 1911 is accepted with reserve. Neverthless, the belief exists, with good reason, that the automobile people will be excellent customers during the next 12 months, but with a lesser amount of what may be termed speculative orders. Some of the great establishments have made contracts with such utter disregard of cost as to attract criticizing attention. Machinery manufacturers have declined some of this business, and have taken certain orders only after a clause had been inserted in the contracts providing for a cash penalty for cancellation. The general opinion is that if the elimination process has started in the industry the results will be healthful to business in general.

The experience is an emphatic object lesson in the necessity of a non-cancellation clause in machine tool contracts. A splendid optimism in the automobile business, the outcome of great profits, an enormous demand, and the liberal backing of the banks, have led in some cases to a reckless disregard of the cost of anything which would lead to increased production. To-day some of these orders are being canceled in the face of very decided protests on the part of the manufacturers and dealers. Most of this business must be crossed off the books. The automobile trade will be held more strictly to account in the future.

The miscellaneous demand for machinery is not letting up. Orders received during the fortnight represent a wide variety of buyers' product.

The strike of molders and coremakers at Hartford, Conn., is practically a thing of the past. While technically the strike is still in progress, the places of the strikers have practically all been filled, the estimate being that a total of 20 vacancies only now remains.

The Henry & Wright Mfg. Company, Hartford, Conn., is putting on the market a new sensitive drilling machine known as the wide range type. The No. 1 and No. 6 machines are the beginning of a full line, an important characteristic of which is the ample proportions, which permit of the employment of drills up to 1¼ in. for commercial work. The machines contain a number of improvements over the company's existing types.

As was anticipated, the United Shoe Machinery Company has brought suit against Thomas G. Plant and the Thomas G. Plant Company, Jamaica Plain, Mass., alleging infringement of patents on shoe machinery. The three mechanisms in question are employed in the machines of the Wonder Shoe Machinery Company, recently organized, and which proposes to put on the market a full line of shoe machinery.

The One-Lock Reamer Company, New Haven, Conn., the successor of the Wm. J. Smith Company of that city, is removing its works to the fourth story of the new six-story Smedley Building on Brewery street, where additional floor space will be available as well as improved manufacturing conditions.

The original unit of the new factory of the Bosch Magneto Company, Brightwood, Springfield, Mass., will consist of a four-story reinforced concrete building, 55 x 314 ft., with ells respectively 65 x 70 ft. and 22 x 59 ft. The company is now protesting against the presence in the neighborhood of a rendering plant, contending that a nuisance exists, which must be removed or the work of building will not proceed, but some other site chosen.

The contract has been awarded for the new building of the Hart & Hegeman Mfg. Company, Hartford, Conn., manufacturer of electric specialties. The plans call for a brick and reinforced concrete structure 60 x 200 ft., four stories.

Additions to general manufacturing plants include the following: Fiske Rubber Company, Chicopee Falls, Mass., building 36 x 185 ft., four stories, addition to engine room 18 ft. square and addition to boiler house 12 x 42 ft.; United States Paper Bottle Company, Hartford, Conn., new plant on Windsor street, but no contracts for equipment ready to give out at present; Stony Brook Paper Company, South Hadley, Mass., addition 35 x 90 ft., one story and basement; Wyandotte Worsted Company, Waterville, Maine, one-story addition 56 x 88 ft. and two-story addition 30 x 140 ft.; Morton E. Converse & Son, Winchendon, Mass., toy manufacturers, addition 75 x 150 ft.; Housatonic Power Company, Greenwich, Conn., substation 36 x 100 ft., one and two stories; Crompton & Knowles Loom Works, Providence, R. I., textile machinery, two-story addition to shops; U. S. Gutta Percha Paint Company, Providence, R. I., addition to factory; American Silk Spinning Company, Providence, R. I., large addition to mill.

The Wm. P. Kirk Company, Bridgeport, Conn., manufac-

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turer of metal cornices, skylights, &c., and heating and sanitary engineer, has increased its capital stock from $20,000 to $50,000, to secure additional resources for the business. The company states that it will not be in the market for equipment at this time.

The C. I. Yale Mfg. Company, Yalesville, Conn., manufacturer of carpenters' edge tools, will make large additions to its factory, owing to the inability to fill orders as promptly with present facilities as it would desire. To make possible these extensions of the business the capital stock has been increased from $150,000 to $300,000.

The Eastern Machine Screw Company, New Haven, Conn., has just completed its new and modern factory and is ready for business. The company will manufacture machine screws, machine screw products and hardware specialties, using a new type of screw machine the design of William H. Gates, formerly of Norwich, Conn., employing the milling process. Benjamin P. Greene, the secretary and manager, and Mr. Gates, the vice-president and superintendent, are the active men in the business.

The Specialty Mfg. Company, Melrose, Mass., manufacturer of chair and couch beds, will locate its entire manufacturing business at Mystic, Conn., within the next few months. A factory will be erected 40 x 200 ft., two stories, together with power house and dry kilns. Heating and sprinkler systems will be installed. Eli Gledhill, treasurer and manager of the Mystic Mfg. Company, is the president of the company, and the change in location is due to his influence.

The Naugatuck Mfg. Company, Naugatuck, Conn., manufacturer of seamless copper floats, is erecting an addition to its factory, which will be chiefly for the copper depositing department. Additional manufacturing space has been made necessary by the increased demand for the company's product.

The E. I. Du Pont de Nemours Powder Company states that there is no truth in the report that the branch at Valley Falls, N. Y., will be removed to Hazardville, Conn. On the contrary, the Valley Falls plant is being rebuilt. The company has established a system of bonuses in all of its plants, ranging from 2 per cent. for men who have been employed one year to 20 per cent. for those of 15 years standing or longer, the purpose being to make employment as permanent as possible.

Pittsburgh

PITTSBURGH, PA., August 2, 1910.

Indications of a renewed buying movement, such as have been manifested recently in certain quarters, are becoming more general. Within the past week many of the principal salesmen employed by leading manufacturers of the district have left for various parts of the country to close pending contracts, and, as the vacation season draws to a close, not a few negotiations that have been dragging along, because of the absence of some official connected with the buyer's establishment, will undoubtedly be concluded.

Meanwhile operations at nearly all plants of the metal working industries are still very heavy for this season of the year, and some concerns are not looking for new business beyond what comes to them in the daily mails.

The foundry of the Buckeye Steel Castings Company, Columbus, Ohio, is principally occupied at present with railroad work. The company has been making a specialty for some time past of cast steel coupler yokes, in which the defects inherent in wrought iron yokes are stated to have been overcome.

The Rogers Bros. Bridge Company, Albion, Pa., has been awarded the contract for the large new bridge to be built at Oil City, Pa. Except for reinforcing steel will not enter into the structure, which is to be of concrete.

A new machine shop is being erected in Columbus, Ohio, by W. H. Miller of that place. Further particulars are lacking.

The Erie City Iron Works, Erie, Pa., has been awarded the contract for supplying the battery of boilers to be used in the new municipal water works station, at Clarksburg, W. Va.

The factory of the Anderson Electric Porcelain Company, at East Liverpool, Ohio, which was destroyed by fire last week, will be rebuilt for larger capacity. New kilns, with a gas plant for firing, will be needed.

The Pittsburgh Smelting & Refining Company, whose plant is at Greensburg, Pa., notes much more of a tendency on the part of manufacturers, foundrymen, &c., than in former years, to save and dispose of their metal refuse. The proper utilization of this material frequently represents the difference between a good profit and a very close one, or sometimes between a profit and a loss. As a result of the systematic conservation of such waste, a good many private chemical laboratories have been established in manufacturing plants of this district, which had not hitherto considered them necessary, and tests adequately conducted have shown numerous opportunities for economy, better methods of works practice, &c., which had been unsuspected.

The Jaeger Machine Company, Columbus, Ohio, has just let the contracts for erecting a two-story shop.

All of the railroad companies whose lines center here are finding it difficult to obtain enough skilled operatives for their shops, as industrial plants in the same towns, or at neighboring centers of manufacturing, offer better inducements to the men. Motive power officials are hampered in meeting this competition by the amount of red tape which any change involves.

Cincinnati

CINCINNATI, OHIO, August 2, 1910.

An optimistic feeling is entertained by the local trade. A careful canvass of the manufacturing plants, embracing all lines, shows that practically all of them are running on full time. Machine tool builders are receiving a fair run of orders and some of them report an excellent volume of inquiries. As these come from different sections of the country and from varied industries, it is to be supposed that a more healthy condition generally prevails. Orders received are of a small and medium sized variety, but those booked during July totaled enough to surprise some firms who were looking for the usual midsummer dullness.

Machine tool dealers have not fared as well as the builders on orders booked, but they are encouraged over the fall outlook, judging from the inquiries coming in. Second-hand machinery dealers are enjoying a fairly active business.

Power plant equipment and timber cutting and woodworking machinery are only moderately good sellers.

The Rahn-Carpenter Company, Cincinnati, is now turning out some of its lathes at a subsidiary plant in Knoxville, Tenn., which is run in connection with the Knoxville Foundry & Machine Company. W. H. Carpenter has severed his connection with the company, and the officers now are: John Rahn, Jr., president; Francis B. James, vice-president; Henry G. Frost, secretary, and A. J. Larmon, treasurer. The company reports its domestic business as good, while its export business is steadily increasing.

About November 1 the Baldwin Forging & Tool Company will move its shovel factory from Columbus, Ohio, to Parkersburg, W. Va. The company now employs about 225 people, but will require over 400 to operate the Parkersburg plant, the main building of which will be 150 x 860 ft., one story.

The plant of the Blymyer Iron Works Company, Cincinnati, is busily engaged on a large contract for sugar mill machinery, which was recently received from Spanish-America. The company's bell foundry is also working on full time.

The plant of the Dayton Ice Machine Company, Dayton, Ohio, has been purchased at a receiver's sale by a new company of similar name and will be started up in the manufacture of ice and refrigerating machinery. The new company is capitalized at $50,000. Joseph Meyer is president and treasurer; William C. Hiester, vice-president, and C. N. Lupton, secretary.

The Elmwood Place Auto Top & Supply Company, Cincinnati, is a new partnership formed by Joseph P. Anderson and S. A. Lee. It will occupy a factory building, 25 x 100 ft., two stories, of brick construction, located at Carthage pike and Beech avenue. Practically all the necessary equipment has been purchased.

The Cincinnati Ball Crank Company, whose plant was destroyed by fire last week, has leased quarters at 1249 Plum street, Cincinnati, containing about 12,000 sq. ft. of floor space, and will resume manufacturing operations at an early date.

The Chess & Wymond Company, Louisville, Ky., cooper, has increased its capital stock from $200,000 to $1,000,000. No immediate additions to its plant are planned.

Sealed proposals will be received by the Board of Trustees of the Athens State Hospital, Athens, Ohio, until August 25, for furnishing and erecting one standpipe, two 150-hp. horizontal tubular boilers and a system of steam and water piping for the hospital. Dr. O. O. Fordyce is secretary of the board.

The American Tool Works Company, Cincinnati, reports its business for July as being better than for any month since one in 1907. Orders received are medium sized ones and come from no particular industry or section of the country, but are pretty generally distributed.

In the list of busy Cincinnati industries is the foundry of the J. A. Oberhelman Foundry Company, Harrison avenue and Buck street. Among its orders booked last week was one from a local company for a quantity of machine tool frames.

The Kern Machine Tool Company, 4657-59 Spring Grove

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avenue, Cincinnati, has increased its capital stock from $50,000 to $100,000, for the purpose of adding to its manufacturing facilities. Additional equipment will be installed in its shop and it is quite probable, if the demand for its drilling machinery keeps up, another building will be erected adjoining the present plant.

The Package Machine Company has been organized at Indianapolis, Ind., with $25,000 capital stock, to manufacture veneer products. The incorporators are Charles E. Gregory, Frank B. Davenport and Joseph R. C. Marsh.

The Globe-Bosse-World Furniture Company has been incorporated at Evansville, Ind., with $600,000 capital stock. Benjamin Bosse is president; A. F. Karges, vice-president; C. M. Frisse, secretary, and E. W. Ploeger, treasurer. The company is a consolidation of three large companies in the city, owning four plants.

The Standard Brass Foundry, Indianapolis, Ind., has been incorporated, with $10,000 capital stock, by Herman Lifchitz, Albert Holzworth and Louis Sagalowsky.

The Universal Tire Bridge Company, Indianapolis, has been incorporated, with $25,000 capital stock, to manufacture devices for pneumatic tires. The directors are R. E. Gregg, R. L. McOuat, W. W. Gregg and C. F. Gregg.

The Bromwell Wire Screen Company, Greensburg, Ind., will erect an addition to its plant and install 18 looms. The building will be 60 x 200 ft.

The Huntingburg Electric Light Company, Huntingburg, Ind., has been incorporated, with $15,000 capital stock, to supply municipal and domestic lighting. The directors are Charles and August Miessner and F. G. Katterhenry.

The Dalrymple Contracting Company, Gary, Ind., has been incorporated, with $15,000 capital stock, to do a general contracting business. The directors are P. W. Dalrymple, G. H. Manlove and B. A. Manlove.

C. W. Hooven, receiver for the Union Gas Light & Fuel Company, Anderson, Ind., states that an addition to the plant will be built before fall.

The Brazil, Ind., Factory Promoting Club has signed a contract with the American Sewer Pipe Company for the erection of an addition to the company's plant, for the manufacture of the larger sizes of pipe. The cost will be about $100,000.

The Richmond Chandelier & Art Brass Works has been sold at receiver's sale to Richard Sedgwick for $20,000. He was former president of the company.

Middletown, Ind., by vote, has decided to install a municipal electric light plant.

The Crane Credit Register Company has been organized at Lafayette, Ind., with $10,000 capital stock, to manufacture credit registers. The directors are S. W. Crane, B. F. Hoffman and F. H. Crane.

Detroit

DETROIT, MICH., August 2, 1910.

The volume of business transacted by machinery manufacturers and dealers during July, including purchases made by automobile companies, appears to have been more generally satisfactory than was anticipated at the beginning of the month. For the first two weeks in August prospects are not, at this writing, quite as good as had been expected; but there is enough new business in sight to warrant the belief that the month will close strong, with a heavy run of fall buying immediately following. This might be said even without taking into account the amount of new building which is either in progress or about to be undertaken, as improvements made in existing plants, with ordinary replacements due to wear, offer a very substantial basis for future trade. Hence, all things considered, the outlook is certainly most promising.

A feature of no small importance this season, so far as local industries are concerned, has been the extraordinary growth of the brass, bronze and aluminum foundries, as well as finishing shops and factories, of Detroit and vicinity. The rapid extension of automobile building, both here and elsewhere, is constantly giving impetus to this trade, so that its possibilities seem to be limited only by the provision that can be made for increased plant facilities. For the next few months at least there will be a great deal of buying in behalf of the shops here, and announcements of important additions are likely to be made very shortly.

The very interesting statement is made in relation to a well-known Detroit product that the first distinctively American type of mechanical stoker, as well as the earliest of the side feed pattern of which there is any record, is the one brought out by the Murphy Iron Works of this city in 1878, after a lengthy period of experiments and tests. While subsequent changes and improvements have been made in its details, the essential features of the original design have been retained.

The Ford Motor Company, Detroit, is having plans drawn for a three-story factory building, 60 x 100 ft., at Walkerville, Ont.

The Knickerbocker Company, Jackson, Mich., has installed its dust collector system this year in a large number of foundries, where it can be used for a wide range of service, from tumbling barrels to sand blast.

The Russel Wheel & Foundry Company, Detroit, has been awarded the structural contract for the new eight-story building, 60 x 100 ft., to be used by Dodge Bros. of this city in the manufacture of automobile parts.

The Michigan Bridge & Pipe Company, Lansing, Mich., now numbers among its products corrugated metal culvert pipe of the so-called Watson pattern, which is made of non-corrosive American ingot iron, furnished by the American Rolling Mill Company, Middletown, Ohio. Service tests have shown that the pipe is extremely durable and that it will bear up under a very heavy load.

The Worden-Allen Company, Milwaukee, is securing a large amount of work on the Upper Peninsula, through the district engineering and sales office which it maintains at Houghton, Mich. The latter also represents the Lackawanna Bridge Company, Buffalo, N. Y., the interests composing the two companies being largely the same.

Contracts have been let by the Timken-Detroit Axle Company, Detroit, for the erection of its new one-story forge shop, 70 x 245 ft., which will be completed and fully equipped by early fall.

The Capitol Brass Works, Detroit, are reported to contemplate a material increase in their output, for another season, of the electromagnetic metal separators which they manufacture. These are used in machine shops, brass foundries, &c., where they take up but little space and can be operated on a minimum of power.

The Ellis Engine Company, Detroit, Mich., recently incorporated with a capital stock of $150,000, advises it will occupy leased quarters for the first year and will confine its operations to assembling, but that ultimately it will install a complete equipment for manufacturing engines.

The Phœnix Plating Works, Grand Rapids, Mich., has secured the building adjoining its present works recently vacated by the Michigan Tool & Stamping Works containing 2000 square ft. of floor space, and will install two nickel tanks, four polishing machines, a new motor and a new polishing dynamo.

The plant of the Van Dyke Motor Car Company, Detroit, Mich., now under course of construction, will be 60 x 600 ft., one story. Motive power generated by a 125 hp. Corliss engine will be used for operating purposes. The company will have all of its parts built by outside makers, and will only do assembling. All necessary equipment and machine tools have been contracted for.

The Bissell Carpet Sweeper Company, Grand Rapids, Mich., has under course of construction a warehouse building, 45 x 140 ft., of reinforced concrete construction which will be equipped with an automatic sprinkler system and an electric elevator. The company is also erecting an addition to its main factory, 38 x 42 ft.

Cleveland

CLEVELAND, OHIO, August 2, 1910.

Little inquiry came out for machine tools during the week and sales were confined mostly to single tool orders. During the early part of July dealers did a fair amount of business, but there was some falling off in the last two weeks. The total volume of business for the month, however, was not bad for this season of the year. While the general outlook in other lines is fairly good, present conditions in the automobile trade are not as satisfactory as they were earlier in the season. Some manufacturers appear to have reached the point where they can make cars faster than they can sell them and a reduction of the output has followed. This condition of the industry has resulted in some cancellations of orders placed in the spring for additional machinery equipment for delivery in the fall. In other cases shipments of new tools have been held up. This indicates that some of the leading automobile interests are going to act conservatively in the matter of further extensions. Others feel that there is only a temporary lull and are going ahead with plants for plant enlargements.

In some lines of machinery the demand is holding up very well. A local builder of heavy forging machinery reports a good volume of orders during July, there being considerable improvement over June, which was the only quiet month of the year. Very little of this business is coming from the railroads. In power equipment a good volume of orders has been coming from coal mining companies.

In the lake shipbuilding industry the outlook is not very encouraging. The present tonnage of bulk freighters ex-

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ceeds the demand, even with a heavy freight movement, and it is doubtful if many vessels of that class will be built during the coming season. Orders for two large freight boats for 1911 delivery have been placed, and some contracts are expected for passenger and package freight boats.

In addition to erecting a large plant at Niagara Falls and extensions at Fremont, Ohio, the National Carbon Company, Cleveland, will enlarge its plant at Fostoria, Ohio, by the erection of two buildings, plans for which will be prepared by the Osborn Engineering Company. The general contract for the company's new buildings at Fremont has been awarded to the Hunkin-Conkey Construction Company of Cleveland.

The Bettcher Mfg. Company, Cleveland, has purchased the entire equipment of the Bourne & Knowles Mfg. Company of Cleveland. The latter company will retire from business. The equipment consists of machinery, dies, &c., used in the manufacture of corrugated copper gaskets. The Bettcher Company will make a full line of these gaskets and will carry a complete stock of them on hand at all times.

The Anderson Tool Company, Anderson, Ind., has increased its capital stock from $200,000 to $300,000.

Plans for the new plant to be erected by the Ohio Blower Company, Cleveland, have been prepared by the Cleveland Engineering Company and bids will be received this week. The new plant will be of steel construction, 80 x 130 ft. and two stories.

The Aetna Foundry & Machine Company, Warren, Ohio, is making additions to its plant which will about double its present capacity. The machine shop and foundry are being enlarged and a new cupola will be added to the latter. The pattern building has been reconstructed into a forge shop and a new three-story brick building has been built for a pattern shop. Some new machinery has been added.

The Macomber Bros. Company, Toledo, Ohio, will erect a power building in that city to accommodate small manufacturers. A three-story concrete building, 210 x 230 ft., will be erected, containing a power plant, it being the intention to add additional units to the building later. The building will be located at West Woodruff avenue, North Twelfth street and Woodruff avenue. Work will be started in the fall.

The County Building Commission, Cleveland, has rejected all bids for the erection of a power plant in connection with the Cuyahoga County Court House, claiming that they are too high. A committee of the commission will confer with the engineers in regard to changing the plans somewhat, with the view of reducing the cost of the plant.

The Board of Trustees of the Athens State Hospital, Athens, Ohio, will receive bids August 25 for a standpipe, two 150-hp. horizontal tubular boilers and a system of piping for improving the water supply system at that institution. Plans and specifications are on file at the office of the superintendent of the hospital and at the offices of the engineers, the Osborn Engineering Company, Cleveland, Ohio.

The contract for the new plant to be erected by the Republic Rubber Company, Youngstown, Ohio, has been let to the Forest City Steel & Iron Company, Cleveland. The building will be of steel construction, 80 x 200 ft. and six stories.

The Canton Art Metal Company, Canton, Ohio, has received a contract for over $100,000 worth of metal furniture, which will be used for equipping the California State Hall of Records, Los Angeles, Cal. The contract includes tables, chairs, filing cases, desks, &c.

The property on Columbus street, Cleveland, recently occupied by the McMyler Mfg. Company has been leased by the C. O. Bartlett & Snow Company, maker of elevating and conveying machinery, &c. The plant contains 76,000 sq. ft. of floor space and has complete power equipment.

The Nute Foundry Company, Cuyahoga Falls, Ohio, is enlarging its plant by the erection of a brick addition 20 x 90 ft.

The Hydraulic Pressed Steel Company, Cleveland, has increased its capital stock from $150,000 to $250,000.

The Peerless Brass Mfg. Company, Cleveland, has been incorporated, with a capital stock of $20,000, by John F. Jedticka.

Baltimore

BALTIMORE, MD., August 2, 1910.

Trade generally has been somewhat quieter during the month, although merchants and manufacturers in some lines report a very satisfactory volume of business, made up particularly of small orders and exceeding in the aggregate that taken in June. Machine tool lines continue a trifle quiet, as is customary at this season. A scattered demand is reported from the South, but the railroads continue unimportant buyers. Power equipment has been in somewhat better demand, particularly that class used in connection with heating, ventilating and lighting, for which several very good orders have recently been placed. The demand for small shop supplies is a shade better, but the market is spotty. Contractors' equipment continues to be pretty freely taken. There is still a considerable amount of municipal work before the trade. Bridge work, in connection with general highway improvements, a high pressure pumping station and smaller power house and general equipment is being inquired for. Fabricated steel workers report a fair inquiry for smaller buildings and bridge work. Several of the larger propositions which have been under negotiation recently have been temporarily held up. A considerable amount of work in the nature of subcontracts for various classes of work in connection with the larger building operations is beginning to come out and will probably develop into orders in the near future. The bulk of the new work placed is of the smaller class, but industrial establishments generally have order books pretty well filled, with enough work to keep them quite active during the next few months. No particular betterment in the machine tool lines is anticipated by merchants and manufacturers during the heated term. The general opinion prevails, however, that a decided betterment will be noted during the early fall months.

The Baltimore Copper, Smelting & Rolling Company has plans under consideration for extensions and improvements to its plant, which when completed will increase the capacity about 25 per cent.

The Gwynnbrook Distillery Company, Gwynnbrook, will erect a seven-story bonded warehouse structure, 85 x 130 ft. The building will be of brick construction and fireproof throughout.

The award of contracts for the Hochschield-Kohn and the Brager department store additions have been held up, and it is likely that new bids will be asked for.

The construction of a sugar refinery in the immediate vicinity of Baltimore is again being seriously discussed. The project is being looked after by the executive committee of the Merchants & Travelers' Association.

The Western Maryland Railroad is considering the erection of a new grain elevator at Port Covington, South Baltimore. R. H. Pratt is the company's engineer.

The International Harvester Company proposes to erect a new warehouse on Dickson, near Mosher, street. The building will be 115 x 120 ft. on the ground plan, five stories. W. G. Uffendel is the architect.

The Chesapeake Iron Company has taken an order for building work for the F. S. Royster Chemical Company, Seawall, Md., but the bulk of the business closed recently has been of the smaller class. The plant is extremely busy on work already in hand, and is figuring on a large list of moderate size building work.

Plans are under consideration for the erection of a large power house at Frederick or Hagerstown, Md., to furnish current for the trolley lines of Frederick & Washington counties, Maryland. P. O. Keilholtz, electrical engineer, Baltimore, Md., has been commissioned, it is stated, to prepare plans for such a plant, to operate which a separate company would be formed, which would furnish the power to the several railways interested at an equal cost.

The United States Fidelity & Guaranty Company has received bids for the construction of a brick, stone and terra cotta addition, seven stories, 65 x 78 ft. on the ground plan, to be erected at Calvert & German streets. The Engineering & Contracting Company is the lowest bidder.

The C. M. Kemp Mfg. Company is busier than ever, principally on gas appliances. This concern has recently increased its facilities by the addition of various classes of equipment, and is now operating at full capacity in all departments.

The Dietrich & Harvey Machine Company continues actively engaged, although the usual midsummer season, as well as the vacation period, interfere with the closing of pending business. A waiting market characterizes the general situation. Orders during the month have been somewhat scattered, although a sufficient volume of business is on the books to keep the plant comparatively busy well over the second half of the year.

Announcement of a trustees and receivers' sale of the entire plant of the Canton Iron & Steel Company, bankrupt, together with a large quantity of bar and scrap iron at public auction at the plant in Canton, Baltimore Co., on August 17, at noon, has been made. The concern is an underlying company of the Iron & Steel Products Company of New Jersey, which also recently went into receivers' hands.

Among some of the smaller building propositions being figured on by contractors and makers of fabricated material are the following: New building for the Baltimore School for the Blind; Georgia Life Insurance Company Building, Macon, Ga., and an addition for the C. C. Willard Estate, Washington, D. C. The contract for a new building, requiring several hundred tons of structural work for the Petersburg Benevolent Mechanics' Association, Petersburg, Va., has

been awarded to J. W. Davis, general contractor, Newport News, Va.

The Baltimore Bridge Company has recently booked orders for several large transmission towers to be erected near Baltimore, to be used for carrying the cables of the McCalls Ferry Power Company over the Baltimore & Ohio Railroad. This company has also booked orders for a quantity of sheet steel piling and four cylinders for pier construction on the Barbilla River Bridge, Costa Rica. Work on the Fidelity Building addition, under erection, is now 75 per cent. complete, while a number of smaller propositions have been completed.

The T. C. Basher Company has just closed a contract to install the heating and power system for the Catholic University of America at Washington, D. C. Water tube boilers and a Skinner Automatic high speed engine, direct connected, with a 275-kw. generator, the order for which has not yet been placed, will be installed. Trade generally has been better during July than the previous month. The boiler and tank department has been particularly busy, orders being recently booked for 20 large tanks for customers in different parts of the South.

The Bartlett & Hayward Company is busy in all departments, although usual summer dullness, as far as new business is concerned, is to be noted, and current orders are generally small. Several additions have been recently made to the machine tool equipment of this concern, and inquiries for some further equipment are being tentatively made.

The Crook-Kries Company is now established in its new quarters at Saratoga street and Park avenue. The company has just received the contract for the power plant and heating apparatus for the new building of the Fidelity & Deposit Company of Maryland. Three Edgemoor water tube boilers of 250 hp. each and for 100 hp. Ball engine will be installed. This concern also has the contract for the heating and boiler plant for the Southern Office Building, Washington, D. C., as well as that for a central heating plant for the Hannahmore Academy at Reistertown, Md. A very satisfactory volume of small work has also been recently contracted for.

The Aumen Machinery & Supply Company, 324 N. Holliday street, went into the hands of a receiver on June 26. William J. Obrien, Jr., was appointed receiver by Judge Niles in Circuit Court No. 2. The appointment followed the filing of a bill of complaint by M. L. Coale and W. J. Obrien, Jr., trustees of the estate of Joseph M. Coale, holding a large block of the company's stock. The company made no objection to the receivership, under which it expects to pay its indebtedness in full. It is a Maryland corporation, with a capital of $50,000.

The Board of Awards, Baltimore City, will take bids until August 17 for furnishing materials and erecting complete a power house, also bids for furnishing and installing engines, generators, switchboard and wiring; for boilers and piping in power house and in grounds, and for a water supply, including storage tank and pumps, for the Bayview Asylum, under the direction of the Board of City Charities. Drawings and specifications may be seen at the office of the Inspector of Building, City Hall, after August 2, 1910. The Board of Awards will also receive bids until August 10 for the construction of the sub and superstructure of the Poplar Grove Street Bridge, from specifications on file at the office of the Commissioners for Opening Streets, City Hall. Bids will also be opened on August 17 for the construction of a steel and concrete bridge over Jones Falls, at Pratt street. Plans and specifications may be obtained from O. F. Lackey, harbor engineer, City Hall, Baltimore, Md.

St. Louis

ST. LOUIS, August 1, 1910.

A favorable factor in St. Louis and in the east side cities comprised in this manufacturing district is that skilled mechanics are well employed and at present there is no labor agitation. Except with companies exclusively in heavy and light railroad supplies, new business is being secured each week, and, even in case of this line, most of the local companies are busy on prior contracts. There is a good demand for merchant steel bars, but for only moderate merchant pipe. The leading manufacturer of Babbitt metals states that business for July was 33 per cent. better than the corresponding month of 1909, and for the first half this year a gain of 27 per cent. over the same period last year.

The Kewanee Siphon Pump Company of Kewanee, Ill., has been incorporated. Capital stock $2,500. Incorporators, F. L. Thelen, John L. Skeffington and F. M. Grimes.

The Green's Car Wheel Mfg. Company, which makes a specialty of gray iron machinery castings, states that at present the demand is not as large as it was before the summer season.

The Williams Patent Crusher & Pulverizer Company report a good inquiry for its machine, of which over 1500 are now in use. At present the best call is coming from the manufacturers of alfalfa feed.

The Coyle Mfg. Company, while having some business in millwright work, is quite busy in turning out its ash and coal elevators. Among other recent contracts for the same are the St. Louis Brewing Association's Wainwright branch and two for the Board of Education for public school buildings.

The Westinghouse Air Brake Company finds at present only a moderate demand coming from this district, there being some steam and traction promotion operations which are postponed until fall.

Hall & Brown Woodworking Machine Company states that it finds some improvement in the demand during the past fortnight, particularly for its heavy fast feed Mississippi planers and matchers, new model numbers 66 and 36, orders for seven machines being received during the past week. It regards the outlook for fall business as favorable.

The Adrean Mfg. Company, which makes a specialty of railway supplies, states that owing to the increase in heavy railroad equipment there is an excellent demand for track tie plates and rail joints.

The Brownell Company finds a fair demand in the section handled by its St. Louis office for both engines and boilers starting up after a few weeks which ruled quiet.

The Reliance Machine & Tool Works is finding an excellent demand for its Reliance hoisting machine coming from the Central West and Southwest, together with a fair inquiry for its Hooker patent pump.

The Stupp Brothers Bridge & Iron Company states it is nearly snowed under by virtue of experiencing a continued demand for highway and railroad bridge work on top of contracts already in hand. Among other structural jobs is about 300 tons structural material for the new addition to the Commonwealth Steel Company's plant.

The Otis Elevator Company is full of business for elevators, partly local, for warehouses, mercantile and other buildings, together with contracts at Kansas City for office buildings, &c.

The J. A. Fay & Egan Company, beside partial equipment for planing mills in the Southwest, has just made its fourth sale in St. Louis of its large 60-in. band resaw machine.

The Scott-Madden Iron Works Company finds a fair demand, which, with contracts on its books, is keeping its two factories running full in turning out brick presses, auger machines, mud machines, dry pans, pulverizers, crushers, elevators, &c.

The St. Louis Lightning Rod Company, the largest factory in this line in the country, states that its business is quite subject to weather and crop conditions, as its trade lies largely in agricultural sections. While these factors recently were unfavorable, of late there has been an improvement and orders are correspondingly more plentiful.

The Victor Automobile Mfg. Company, St. Louis, Mo., will commence in the near future the construction of an automobile factory which is to be completed by January 1. The new building will be of fireproof construction and will double the company's present capacity.

Sealed bids will be received at the office of the city clerk, Slater, Mo., until August 9, for furnishing material and labor and extending a system of water works and electric lighting. Separate bids will be received as follows: For furnishing labor and material for extending water works and electric lighting systems; for furnishing material and labor and constructing concrete reservoir; for furnishing switchboard, generators and transformers; for furnishing two high speed engines for 60 and 100 kw. generators; for furnishing boiler and feed pumps; for furnishing material and erecting chimney, all f.o.b. cars, Slater, Mo.

The South

NASHVILLE, TENN., August 1, 1910.

In the more northerly districts of the South there is not much buying of any kind being done at present, whether of machinery, material or supplies. Few salesmen are out, and those that have been trying to drum up trade lately seem to experience considerable difficulty in getting any one even mildly interested. In perhaps the majority of instances the individual responsible for ordering cannot be found, unless the transaction is one that has been left in the hands of a subordinate. Manufacturers have largely gone to the mountains or seashore with their families, to remain until the dog days are over.

At the Chattanooga works of the United States Cast Iron Pipe & Foundry Company preparations are being made for what will probably be the most active fall trade in their history. It is anticipated locally that within the next year

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or two the works will be largely increased to correspond with their growing importance in the company's business. There are few, if any, cities of the country where the operating conditions are better.

The new steel bridge across the Loxahatchee River at Jupiter, Fla., will be built by the Champion Bridge Company, Wilmington, Ohio.

It is reported from Atlanta, Ga., that the Southern Fixture & Cabinet Company, concerning which no further particulars are given, will build a large manufacturing plant there, electrically operated.

The Southern Motor Works, Jackson, Tenn., has completed the removal of its plant to Nashville, where it has been merged in that of the Southern Automobile Company, whose organization was recently reported.

The contract for the new steel standpipe of 500,000-gal. capacity to be erected in connection with the extended water works system at Montgomery, Ala., has been let to the Hartley Boiler Works Company of that city, which is now doing a good deal of work of this kind for municipalities, railroads and industrial plants. Elevated steel tanks are in greater demand this year than they have ever been.

The Tampa Electric Company, Tampa, Fla., which operates an engine driven and steam turbine plant of about 6500 kw., will install some auxiliary equipment, including a motor generator set of 750 to 1000 kw. capacity. The machinery contracts have been practically closed.

The Southern Mfg. Company, Columbus, Miss., is just placing in service the plant formerly occupied by the New South Plow Works, which has been idle for some time past, pending a change in ownership and the effecting of needed improvements, alterations, etc. It is now in good operating condition.

The capital stock of the Wheeling Mold & Foundry Company, Wheeling, W. Va., has been increased from $405,000 to $500,000. No plant additions of any consequence are contemplated at this time.

The Holt Engine Company, Burlington, N. C., is buying a line of machines to include lathes, milling machines, foundry equipment, for the manufacture of rotary engines. The company was recently organized to manufacture a new type of engine, to include the Holt rotary engine and the Holt rotary compound engine, which is automatically changeable to high pressure on both rotors. No boilers or engines will be needed, as all of the equipment will be motor driven. The officers of the company are as follows: John M. Cook, president; Lafayette Holt, first vice-president; George F. Hunt, second vice-president; W. W. Brown, treasurer, and John R. Hoffman, secretary.

Specifications will be ready within the next 30 days for water works system and electric light plant to be built at Dalton, Ga., by the H. S. Jaudon Engineering Company, Savannah, Ga. The water works system will include a pumping plant to produce 4,500,000 gal. daily, and the specifications will call for a steam pump and electric pump, filter tank, &c. The electrical equipment will include compound condensing engines direct connected to generators, and a plant of about 500 hp. will be installed.

The Southwest

KANSAS CITY, MO., August 1, 1910.

Salesmen of machinery houses who have been through different sections of the Southwest recently have very little success to report so far as the closing of contracts is concerned. Trade in most lines is slow everywhere, with practically no indication that it will pick up much before September. Only municipal buying continues active. Contractors, whose machinery requirements extended over a much longer period than usual this season, now appear to have about all the equipment that is needed for the present. Foundries and machine shops are busy both with orders and plans for fall enlargements, but their owners are not ordinarily ready to discuss equipment details, believing that they will have no difficulty in securing deliveries as needed later on. For immediate use second-hand tools sell to rather better advantage than new, particularly inferior stock, which can be offered at very low prices. This, however, is taken principally for repair work in logging districts, construction camps, mining fields, &c. Light apparatus is given preference for this service. Second-hand power machinery, including engines, small dynamos and motors, can also be placed more readily just now than new, except when purchased by cities or electric traction companies, which show an increasing tendency to install only the best modern equipment.

The Freeborn Engineering & Construction Company, Kansas City, has taken the contract for a new cement manufacturing plant to be built near Chamberlain, S. D., by the Dakota Portland Cement Company, whose headquarters are in Sioux Falls, S. D.

An electric power plant will be installed in the basement of the new seven-story factory building to be erected in Kansas City by the National Biscuit Company of New York. Motors will be used throughout.

The J. Faessler Mfg. Company, Moberly, Mo., has built up a large trade in special tools for boiler and tank making. A good many orders within the past few months have come from locomotive works and railroad repair shops.

A new wood working plant will be built in Terrell, Texas, by the O. F. Walton Company.

H. C. Darnell & Co., whose offices are in the new Nelson Building, Kansas City, represent the Insley Mfg. Company, Indianapolis, Ind., in the sale of the latter's automatic roller hoist, steel buckets, &c., which have been very extensively introduced through this section during the present season.

Two motor generator sets of 200 kw. each will be installed by the Arkansas Valley Interurban Railway, Wichita, Kan., in substations to be constructed along its line. The company does not operate an electric generating plant, power being purchased from a local central station.

The electric generating machinery installed in the municipal power and pumping plant at McPherson, Kan., was destroyed by first last week. New equipment is reported to have been already ordered.

The Antlers Light & Power Company, Antlers, Okla., recently incorporated with $10,000 capital stock, advises it will be in the market in the near future for two boilers of 80 or 85 hp. and engines, and later on for a cotton gin and ice plant.

The plant of the Amarillo Ice & Cold Storage Company, Amarillo, Texas, was recently destroyed by fire at a loss of about $100,000. While it has not been definitely decided, the plant will probably be rebuilt.

The United States Iron & Steel Company, Houston, Texas, has been incorporated with capital stock of $150,000 by N. L. Mills, J. W. Barnes and J. B. Hine.

The Otto Weiss Alfalfa Stock Food Company, Wichita, Kan., advises that it will rebuild its plant, which was destroyed by fire last April, but will not be in the market for any equipment, as the power plant was saved, with the main shaft, pulleys and connections. All other necessary machinery has already been purchased.

The city of Foss, Okla., has prepared plans and specifications for a water works system to be constructed at a cost of $25,000.

The Missouri Pacific Railroad Company has taken out a permit in Kansas City, Mo., for the construction of a machine and repair shop to cost $136,000. It will be 153 x 224 ft., and is to be ready for occupancy by May 1, 1911.

Citizens of Yukon, Okla., have voted a $30,000 bond issue to help defray the cost of erecting a water works and sewer system. The water works system will cost about $30,000 and $10,000 is to be spent on the sewerage system.

Milwaukee

MILWAUKEE, WIS., August 1, 1910.

With the beginning of the last month of summer it is clear that conditions not only throughout this country but also in the world at large, as they are to be observed through the eyes of the manufacturers and dealers of Wisconsin, have recently been shaping themselves along the lines of a very heavy fall trade. Inquiries have never been more plentiful, and the extent to which estimates are called for indicate that a multitude of new projects or improvements is being planned. Those who are conversant with the outlook here have exceptional opportunities for judging the situation everywhere. Wisconsin has attained especial prominence in the machinery field as a producer of equipment for the generation and utilization of mechanical, electric and pneumatic power of every description, and as some form of such equipment is included in practically every scheme for industrial growth or betterment, the impending activity can be very accurately gauged from that standpoint alone. Further evidence, however, of the facts above stated is obtainable in the business and information of numerous plants in this State that are engaged in the production of other apparatus which enters into practically every industry. All are preparing for a degree of future activity that will transcend anything heretofore known.

Another feature of much importance is also to be found in a gradual rise of values for standard machinery. The cut-throat competition that was so generally prevalent a year ago has been practically eliminated. In many cases this condition is accompanied by a further increase in the margin of profit, as a result of closer business management, better shop methods and the use of improved machinery, so that the net result is extremely gratifying to the more progressive manufacturers.

Current business in shop and foundry equipment, includ-

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ing machine tools, is good for this time of the year. Manufacturers are not making any very strenuous campaign for orders, having already enough on their books to carry them along for quite a period. Dealers also seem to be more concerned in looking out for the requirements of their regular customers, which are being filled as fast as the necessary shop room is provided, than in going after new trade. With all of the shops recently completed or under construction, as well as changes made in established plants, the quantity of equipment installed by autumn will break any previous records. The season has, in fact, come to be one of superlatives.

Owing to the large demand for its product which has already developed, the Badger Four Wheel Drive Auto Company, Clintonville, Wis., recently decided to begin the manufacture of motor vehicles without waiting for the erection of a new factory, and a local machine shop has been leased for the purpose. Building plans will be carried out later. This company is likely to require considerable equipment as the business grows.

Bids are now being taken on a large steam generating and distributing plant for the new factory of the Racine-Kelley Rubber Company, Racine, Wis., the principal details of which have previously been reported.

Travelers for houses that manufacture agricultural machinery, such as the J. I. Case Company, Belle City Mfg. Company, S. Freeman & Sons Mfg. Company, Racine; La Crosse Plow Company, La Crosse; Anderson Mfg. Company, Eau Claire; Fond du Lac Implement Company, Fond du Lac; J. Thompson & Sons Mfg. Company, Beloit; Janesville Machine Company, Janesville; J. S. Rowell Mfg. Company, Beaver Dam; Baker Mfg. Company, Evansville; Hartford Plow Works, Hartford; Van Brunt Mfg. Company, Horicon; A. B. Stevens Company, Marinette; Fuller & Johnson Mfg. Company, Madison, and other representatives of Wisconsin concerns, who were recently questioned by a dealer having large interests in the southern part of the State, are unanimous in reporting that better care of agricultural equipment of all kinds is being taken than in former years. It is not so generally allowed to stand out exposed to the elements, where it will rust, and when repairs are necessary they are more promptly attended to, so that an actual breakdown less frequently occurs. For this condition, which will affect manufacturers—and through them the machine tool builders—more and more as the years go by, the influence of the agricultural course at the University of Wisconsin, Madison, with its extensive lectures, summer school, &c., appears to be mainly responsible. It is favorable to the better grades of machinery, for the reason that deterioration due to wear alone can be more quickly determined when apparatus is otherwise properly cared for, and will mean the gradual elimination of equipment that is meant to last only for a couple of seasons. Some profitable repair work may also be cut out, but the general effect will be decidedly beneficial to responsible manufacturers of the order of those above mentioned. The university ought also to have its meed of credit.

Plans have been completed for the two-story plant, 40 x 100 ft., to be built by the Racine Tool & Machine Company, Racine, Wis. A gas producer, gas engine, dynamo and motors will be used to furnish power, and all equipment purchased for the shop will be of correspondingly modern design. The construction of the building will include cast iron columns, steel girders and floor beams, brick walls and composition roofing.

The Sheboygan Light, Power & Railway Company has awarded contracts for the improvements recently mentioned as contemplated, including a steam turbine, generating unit and auxiliary machinery. This will be installed in the power house at Sheboygan, Wis.

Construction is about to begin of the new plant of the C. B. Henschel Mfg. Company, Milwaukee, the foundations of which have been completed.

A power house building will be erected shortly in connection with the new manufacturing plant of the Sternberg Mfg. Company, West Allis, Wis. The machinery has been ordered.

So much has been said about the economies in other directions made necessary by the rise of the automobile industry that it is of interest to note what its effect has been upon the carriage and wagon trade of this State. Light driving vehicles used purely for convenience or pleasure have, of course, given way largely to motor cars; but, despite the rapidly increasing use of automobile trucks, the demand for carts and wagons has more than kept pace with it. Every wagon maker in the State, including such representative concerns as the F. Mackinnon Mfg. Company, Grand Rapids; Bain Wagon Company, Kenosha; Fish Brothers Wagon Company, Racine; Mandt Wagon Company, Stoughton; Racine-Sattley Company, Racine; Vaughn Mfg. Company, Jefferson; Randolph Wagon Works, Randolph, and others whose plans for new shop buildings, substitution of electric for belt drive, &c., have been heretofore mentioned, has been increasing its output. Some of these are also going into the motor truck business, but not at the expense of their standard lines, except in an occasional rare instance. Contractors' carts have been in especially heavy demand this season, and the tendency toward steel or semi-steel construction is widening the market for those materials. In farmers' wagons, also, the use of metal parts is gaining.

Allis-Chalmers Company reports the sale of considerable rock crushing machinery in the far West. On the Pacific Coast an order recently taken for the acount of the Acton Rock Company, Los Angeles, Cal., includes one No. 12, two No. 5 and one No. 2 style K Gates breakers, two large revolving screens, conveying apparatus and a line of induction motors varying from 3 hp. to 175 hp. The user of this machinery is preparing to furnish large quantities of commercial stone.

The Bedford Power Company, Bedford, Ind., which is planning a very extensive hydroelectric development on the east branch of the White River at Williams, Ind., has ordered two 750-kw. steam turbine generating units here with which to start its power delivery. After the installation of hydraulic turbines and generators, these machines will serve as steam auxiliaries for emergency use. The manufacturer, Allis-Chalmers Company, has also been awarded the contract for the first of the hydroelectric units. These include two triplex vertical turbines of 1050 hp. each, operating under the low commercial head of 17 ft. They will be direct coupled to 1000 k.v.a. (at 70 per cent. power factor), 2300-volt, 60-cycle, three-phase alternating current generators. Later on three larger units will be put in service.

Installation of machinery is being completed at the plant of the Anson-Gilkey-Hurd Company, Merrill, Wis., which will be one of the largest woodworking factories in the Northwest.

Although no official announcement has been made on the subject, it is generally accepted in machinery circles here as a fact that the works of the Fred Prescott Steam Pump Company have been sold to the International Steam Pump Company, New York, and that Fred Prescott will remain in charge for the present. This is a very desirable property and will be taken over in excellent operating condition. The company began last month with a large amount of work on its books and the shops crowded to capacity.

The Brodesser Motor Truck Company, Milwaukee, Wis., will erect upon a site recently acquired in Janeau, Wis., a factory building, 60 x 200 ft., a power house and a warehouse.

The Northwest

ST. PAUL, MINN., August 1, 1910.

Along the international boundary line, from Grand Marias to Vancouver, B. C., there is now in progress a great deal of development work, including systematic exploitation of mineral and timber resources, water powers, &c., which has gone far toward strengthening the market for machinery and fabricated material of every description. From the western provinces of Canada this market, in common with others of the Northwest, is deriving a larger share of its trade than ever before, and local representatives of Eastern houses are particularly energetic in reaching out for such portions of this business as are not directly covered by Canadian agencies. In doing so they have been assisted not a little by the tremendous volume of travel this summer through St. Paul and Minneapolis of people residing on the other side of the border, among whom are many machinery users. A large number of the latter have stopped here to inspect equipment and leave orders. If it were not for tariff restrictions the amount of business thus transacted would, of course, be much greater.

The contract for an immense concentrating plant to be erected in Arizona by the Chino Copper Company, which has been designed for a capacity of 3000 tons daily, has been let to the Minneapolis Steel & Machinery Company, Minneapolis. It will be built in three sections of 1000 tons capacity each. The machinery will all be operated by means of electric motors. A power plant of 3000 kw. is now in course of construction.

One of the best equipped steam turbine plants in the Northwest has been put in service by the Virginia & Rainy Lake Company, at Virginia, Minn., and its operation is being very closely watched by other industrial companies on the ranges. The main units were built in the West Allis, Wis., shops of Allis-Chalmers Company.

The contract for equipping an electric power plant to be used in municipal service at Aurora, Minn., has been let to the Marshall-Wells Hardware Company, Duluth, Minn., which is making arrangements for the necessary machinery.

The Malleable Casting Mfg. Company, whose foundry is in North St. Paul, has practically had its pick this season of

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business offering, owing to the quantity that can readily be secured by plants whose work is recognized as reliable. An increase in the company's facilities will be gradually brought about without disturbing the operation of the foundry.

Changes are to be made at once in the Grand Forks, N. D., plant of the Red River Power Company, nearly doubling its present capacity.

Machinery is being installed in a new planing mill at St. Joe, Idaho, by the Milwaukee Land Company, which will be in the market later on for some additional equipment.

The city of Biwabik, Minn., on the iron range, will build an electric power and lighting station and purchase machinery by or before fall.

The Peteler Car Company, Minneapolis, which builds steel cars for mines, quarries and industrial operations of various kinds, is using chilled wheels which wear extremely well under the most severe conditions of service. This season the cars are being sold largely to contractors for railroad and other heavy construction work.

It is stated by the representative of a leading machinery building company that the action of the Washburn-Crosby Company, Minneapolis, in installing electric motors for driving machinery in its mills, with use of a steam turbine and alternator for generating the power, will be followed to a large extent in future by other Northwestern plants of a similar character.

The Central States Bridge Company, which has an office in the Northwestern Building, Minneapolis, is getting a very good share of the work in this part of the country, both under public contracts and for mill and factory buildings.

The Northwest Thresher Company, Stillwater, Minn., is increasing its shop force and preparing for a large output for the coming year. Despite unfavorable crop reports from the wheat growing districts of western Minnesota, the Dakotas and Manitoba, every indication now points to a material strengthening of the demand for agricultural machinery for another season, due to the extent of the area now under cultivation. The manufacturing plants of this section are, therefore, about to provide facilities, including shop equipment, sufficient to care for their share of the trade.

The plant of the Black Hills Brick & Mfg. Company, Sturgis, S. D., which burned last week, will probably be rebuilt and furnished with machinery for considerably greater capacity. The company's plans for the future have not yet, however, been fully determined upon.

The Herzog Iron Works, St. Paul, is adding more molders for ornamental metal work used in large buildings, the demand for this material being now very heavy.

The Disc Grader & Plow Company, which removed to Minneapolis from Hunter, N. D., and now has its general offices in the Andrus Building, is manufacturing a combination machine that has sold extensively this season to road contractors. It is probable that by another year the company will be compelled to considerably increase its plant facilities.

It is reported from Wallace, Idaho, that the plant of the Dalmatia Mining Company, which was recently consumed in a local conflagration, will be replaced at once and furnished with the best character of modern equipment. Further details are lacking.

The self-contained hoisting engine units manufactured by J. S. Mundy, Newark, N. J., are meeting with a large sale throughout the Northwestern States. The builder is represented in this territory by G. E. Ingersoll, St. Paul, who has an office in the Pioneer Press Building. He carries a line of this machinery in a local warehouse, ready for immediate shipment.

Extensive municipal improvements, including the probable purchase of more pumping machinery, are under consideration at St. Paul, Minn.

The Elk Mines Corporation, Elk City, Idaho, will install a new boiler and other equipment for its mine and concentrating plant.

Preparations are now in progress for the purchase and installation of an electric power and lighting station of about 150 kw., to be operated by the city of Bridgewater, S. D.

An effort is being made by the Commercial Club, St. Cloud, Minn., to secure new industries for that place. One of the projects now under way is the formation of a company to quarry and finish the granite of the locality, of which there are extensive beds. If this undertaking succeeds it will call for the purchase of considerable machinery.

John Morrell & Co., Sioux Falls, S. D., packers, are having erected a packing plant, consisting of ten buildings, among which will be included a boiler, engine and ice house.

C. Millers & Sons, Clermont, Iowa, have been granted a 25-year franchise by Calman, Mo., for the construction of an electric light plant at that city.

Webster Wheelock, Hackney Building, St. Paul, Minn., is having plans prepared for a power house to be used by a number of manufacturing concerns, 87 x 300 ft., seven stories and basement, to be erected at a cost of $300,000.

The Fort Dodge Iron & Metal Company, Fort Dodge, Iowa, is negotiating for the purchase of a plant in that city which if purchased will be remodeled into a foundry. The company advises that in case it fails in its negotiations it will erect a foundry in the course of the next 60 days.

The Farther Central West

OMAHA, NEB., August 1, 1910.

No general description can be made to characterize conditions in this part of the country at the present time. For most lines of industry there is relatively little buying of new equipment, but the situation differs with the community or district involved, and there are some very good sales being made in places where no particular activity was looked for until after the heated season. In the mountain country the progress now being made in opening up new mines or developing existing ones continues to bring out considerable business, with the assurance of heavier purchases later on. At the larger centers of population through Iowa, Nebraska, Colorado, Wyoming and Utah, there is also evidence of extensive plans for construction work of various kinds which will be completed externally before winter sets in. Comprised in this are some industrial establishments, a good many power and pumping plants and numerous large buildings for which heating apparatus, electric dynamo sets, ventilation fans, sprinkler systems and other mechanical appliances will be required. As a whole the outlook is favorable.

E. A. Bullock, president of the Norfolk Electric Light & Power Company, Norfolk, Neb., contemplates the installation of an electric generating station for power and lighting service at Bonesteel, S. D., where a franchise for the purpose has been applied for.

The Clinton Bridge & Iron Works, Clinton, Iowa, has taken the contract for a steel bridge to be built near Davenport, Iowa.

The Denver, Colo., representatives of the Jeffrey Mfg. Company, Columbus, Ohio, note an increase in the demand for conveying machinery. This is an indication that additions are to be made to many concentrating plants and smelters in the mining districts, as apparatus of that type is usually purchased in connection with other machinery, for which it forms the connecting link.

Funds for the construction of a pumping plant and water distribution system are being provided at Centralia, Iowa, where bids on machinery will be taken in about 60 days.

The Waterloo Cement Machinery Company, Waterloo, Iowa, since establishing a branch office in the Fitzsimmons Building, Pittsburgh, Pa., has been receiving a liberal volume of orders from Eastern territory, where its Polygon mixer, in consequence of the speed with which it can be operated, is being used to excellent advantage on construction contracts that were specified for completion within a limited time. For the coming spring an enlargement of the company's manufacturing plant is said to be contemplated.

The new machine shop for repair work that is to be added to the terminal facilities of the Utah Light & Railway Company, Salt Lake City, Utah, will be put in operation this fall.

The Ottumwa Bridge Company, Ottumwa, Iowa, has prepared plans covering four new steel bridges to be built for the county.

The Zophar Mining & Milling Company, Wallstreet, Colo., will hereafter be in the market at intervals for electrical equipment, having recently substituted motor drive for water power and shafting formerly used.

An air compressor plant will be installed at Central City, Colo., and other machinery provided for driving tunnels on the property of the Arundel Mines. The equipment is to be furnished by the contractor, S. A. Knowles, whose present address is given as Idaho Springs, Idaho. Mr. Knowles was in charge of the work on the famous Newhouse Tunnel.

One or more pumping units of larger capacity than the machinery now operated will be required in the near future at Logan, Iowa, where important improvements are contemplated. The complete plans are being worked out.

The Murray Iron Works Company, Burlington, Iowa, is having a very successful year in the sale of engines for power plant service. For high speeds the company has introduced a number of innovations in Corliss engine practice which enable these units, in the smaller sizes, to compete with four-valve and automatic engines for installation where this has not been practicable heretofore.

A steel viaduct nearly 900 ft. long, with electrically operated bascule bridge, or one equally well adapted to the service, will be built at Ft. Dodge, Iowa, where bids are to be taken by the authorities until the last week in August. Specifications can be obtained from the city clerk.

The Kelly Mfg. Company, Waterloo, Iowa, which is identified with the same interests that compose the Kelly Foundry & Machine Company, Goshen, Ind., has had its

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shop facilities crowded this season to supply the demand for machinery and fabricated material of different kinds used by contractors. It is the expectation locally that the plant will be considerably enlarged.

Work has begun on the new power house for the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, which is to be 132 x 154 ft.

It is reported from Grand Junction, Colo., that a large timber cutting plant and planing mill will be established there by the Rocky Mountain Box & Lumber Company.

The Isabella Company, owner of the Empire State mine at Cripple Creek, Colo., is reported to contemplate the purchase of a new hoist.

It is reported from Sioux City, Iowa, that for the auxiliary pumping station now under consideration a deep well pump operated by a steam turbine or electric motor will be purchased. The plan has not yet, however, received final sanction from the authorities.

The Golden Cycle Mining Company, Colorado City, Colo., is installing a 30-drill air compressor furnished by the Ingersoll Rand Company, New York, and will make other improvements.

The Gunnison Valley Power Company, Gunnison, Utah, has placed an order with Allis-Chalmers Company, Dooley Building, Salt Lake City, for machinery including a 540-hp. single horizontal turbine with cast iron spiral case, operating under a head of 210 ft., direct connected to a 300 kva., 2300 volt, 60-cycle, three-phase alternating current generator, also a 10-kw. exciter and three power transformers of 100 kva. each.

The electric power and pumping plants operated by the city at Alliance, Neb., are to be enlarged and improved. The preparation of plans has been intrusted to Grant & Letton, F. & M. Building, Lincoln, Neb.

The Christie Engine Company, Waterloo, Iowa, has acquired another site of considerable extent and will erect a large new plant for the manufacture of gasoline engines.

In the new power house of the Waterloo, Cedar Falls & Northern Railroad Company, which was mentioned in *The Iron Age* last week, there will be installed four steam turbines and generators having an aggregate capacity of 24,000 kw. For serving the engine room a large traveling crane is to be provided.

Electric motors for driving machinery in its mill have been ordered by the Layton Milling & Electric Company, Layton, Utah.

Work is about to begin on the new plant to be erected in Muscatine, Iowa, by the Ritchie Corrugating Company, Ottumwa, Iowa. The main part will consist of a two-story building, 40 x 100 ft., and a one-story shop, 60 x 100 ft.

Twelve tubular boilers of 525 hp. each, built by the Babcock & Wilcox Company, New York City, are being installed in the new power plant at Omaha, Neb., of the Omaha & Council Bluffs Railway Company.

A. G. Brown, Cedar Rapids, Iowa, has arranged for the construction of a new factory building.

Machinery for the new municipal power and lighting plant at Pocahontas, Iowa, will probably be purchased the latter part of this month.

One 80-ton and five 60-ton steam shovels built by the Marion Steam Shovel Company, Marion, Ohio, are being used in the construction of the great Standley Lake dam, near Denver, Colo., of the Denver Reservoir & Irrigation Company.

The plant of the Beatrice Electric Company, Beatrice, Neb., which is equipped with engines of 450 hp., built by the Murray Iron Works Company, Burlington, Iowa, will be enlarged and improved, having recently passed under the control of new interests.

The Utah Hotel, Salt Lake City, Utah, has awarded a contract to the Trent Engineering & Machinery Company of that city for the construction of an electric plant.

The North Pacific Coast

TACOMA, WASH., July 29, 1910.

Trade with Alaska and the Northwest provinces of Canada is now one of the leading features of the market in machinery and supplies. Heavy shipments to points as far as Nome and Dawson have been started from the principal ports on the sound and river, and as the open season at the north set in very much later than usual this year, the movement will probably continue longer. The success attending dredging operations along the Yukon and its tributaries has led to the formation of quite a number of new companies for the purpose, and some of these have given their orders for machines, which are being hurried forward or have been already installed. Within the next three or four months other contracts will be placed for dredges to be delivered next spring. Each of these machines, of course, includes its own power equipment, and many are now operated by direct motor drive for each of the separate parts, a generator being installed on the dredge to furnish current for that purpose.

As an indication of the character of the machinery now going into Alaska, it will probably surprise some manufacturers in the East to learn that Nome, which is almost within the Arctic Circle, has a steam turbine generating station of 500-kw. capacity, which furnishes electric lighting for the community. This plant, which was built by the Nome Mining Company and has not been long in operation, is already to be enlarged. The boiler capacity is sufficient to permit of installing another turbine unit of the same size.

From Edmonton, Alberta, where a gas engine and generator of American build are in service at the municipal power plant, it is reported that further opportunities for the sale of similar units, to operate on natural gas, will be opened up in the near future by the development of the new fields, of large extent and great pressure, which were discovered north of Calgary not long ago. Gas producer power is also receiving considerable attention on both sides of the border.

The Washington Machinery Company, Tacoma, is representing the Syracuse Smelting Works, Brooklyn, N. Y., in the sale of bearing metals, the demand for which in this part of the country is steadily growing.

The Holmes Machinery & Saw Works, Tacoma, has kept its shop busy all through the first half of the year, with sufficient stock in the warehouse to enable prompt shipments to be made on orders. In addition to other lines it is handling electric motors, both new and second hand.

A company headed by John Bagley, president of the Pacific States Lumber Company, Tacoma, has been organized to take over and operate the shops formerly occupied by the maintenance department of the Tacoma Eastern Railroad at Bismarck, N. D. For the present a specialty will be made of repair work. The company has been incorporated as the Nisqually Iron Works, Tacoma.

Interests identified with the Western Steel Corporation are reliably reported to have purchased a large tract of coal land in British Columbia.

Work is now in progress on the new plant of the Northwestern Wheel & Wagon Works Company, Bellingham, Wash., whose plans have previously been mentioned.

The Western Brass Works, which has been organized at Tacoma by Lewis Bros., will continue the business of the latter on a much larger scale. Plans for a casting and finishing plant are now being worked out. Considerable new equipment will probably be required.

J. L. & S. A. Kendall, who have a hydro-electric plant at Roseberg, Ore., in which an alternating current generator of 200 kw. is driven by a water turbine, have ordered a heavy duty Corliss engine which will be belted to the generator in the season of low water.

The Nay-Aug Idaho Mines Company, which is reported to be now under the management of W. W. Chambreau, Portland, Ore., is building a hydro-electric power plant with which to supply power to its properties in the vicinity of Hailey, Idaho. At what is known as the Nay-Aug mine a hoist, air compressor and other machinery are now being installed.

The Cove Power Company, of which Warren Brown is secretary, has been incorporated at Prineville, Ore., and will build a hydro-electric plant of 6000 kw. or possibly larger capacity.

Bonds have been voted at Ashland, Ore., for an electric plant to be operated by the municipality, and the work of construction and equipment will be undertaken in the near future.

The Perine Machinery Company, Seattle, reports a fairly good demand at present for the better grades of second-hand and rebuilt equipment.

The Armstrong Machinery Company, Spokane, Wash., is making a specialty of refrigeration plants, the machinery for which has been selling to uncommonly good advantage this summer.

The Nickerson-McFarlane Machinery Company, Tacoma, Wash., is erecting a new machine shop, 60 x 140 ft., near its present shops at Fifteenth and Dock streets. The company also has under construction a 100-ft. wharf, which will be served with a 20-ton crane. The company will not purchase any new equipment at present, but would like to secure agencies for machine tools and equipment.

Government Purchases

WASHINGTON, D. C., August 2, 1910.

The Bureau of Supplies and Accounts, Navy Department, will open bids August 16 for one forging press, schedule 2763; two lathes and two gear cutting machines, schedule 2764, and one screw machine, schedule 2765.

William Crozier, chief of ordnance, United States Army, will open bids September 15 for furnishing electrical apparatus for operating two 14-in. gun turrets, model 1909.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Right to Show Guarantee not Expressed in Sale Contract.—A written contract for the sale of a machine being complete upon its face, evidence as to any guarantee not contained in the contract is inadmissible. (New York Supreme Court, Appellate Term, American Multigraph Sales Company *vs.* Fred R. Jones & Co., 119 New York Supplement 1087.)

Rights of Buyer Asserting Breach of Warranty.—Where a buyer of machinery, on being sued for the balance of the price, asserts a breach of warranty and damages therefor, he cannot recover a partial payment made on delivery of the goods. (Texas Court of Civil Appeals, Erie City Iron Works *vs.* Noble, 124 Southwestern Reporter 172.)

Statement by Salesman not Constituting a Warranty.—A salesman's statement that the price charged for goods is cheaper than the buyer could procure elsewhere is only an expression of an opinion, and does not invalidate the contract, though false. (Michigan Supreme Court, Mayo *vs.* Latham, 123 Northwestern Reporter 561.)

Effect of Warranty by Wholesale Dealer.—An agreement for the sale of machinery by a wholesale, to a retail, dealer, which provides that it is subject to the warranties stated in the manufacturer's catalogue, constitutes a warranty by the wholesaler and not by the manufacturer. That a retailer does not inspect machinery promptly on its receipt does not preclude him from either setting up his claim for damages in a suit by the wholesaler brought to recover the purchase price or from bringing an independent suit for such damages, on his discovery after selling the machinery to a customer that it did not comply with the warranty under which it was sold to the retailer. (Iowa Supreme Court, Loxtercamp *vs.* Linininger Implement Company, 125 Northwestern Reporter 830.)

Seller's Remedies on Default by Buyer.—If one who has agreed to buy articles already manufactured refuses to accept them, the seller's remedy is a suit for damages and not for the purchase price, if the particular articles to be delivered have not been identified up to the time of the buyer's refusal. (Wisconsin Supreme Court, Lincoln *vs.* Charles Ashuler Mfg. Company, 125 Northwestern Reporter 908.)

Skill Required of Machinist.—One contracting with a machinist for the installation of an engine in a factory had the right to assume that the work would be done in a reasonably competent and diligent manner. (Michigan Supreme Court, Smith *vs.* Hertz & Hosbach Company, 125 Northwestern Reporter 368.)

Damages for Breaking Contract to Buy Article.—As a rule, the measure of recovery for a buyer's breach of agreement to accept the article sold is the difference between the agreed price and the market value of the article at the time and place of delivery. A buyer can prevent the transfer of title to him by refusing to accept delivery and thus limit the seller's legal rights to recovery of damages for breach of the agreement to buy. (New Jersey Supreme Court, Massman *vs.* Steiger, 75 Atlantic Reporter 746.)

Representations Amounting to Warranty.—A clear and positive representation of the quality of an article sold, when made by the seller as part of the contract of sale and relied upon by the buyer, is a warranty for breach of which suit will lie, as distinguished from a mere expression of opinion. (Minnesota Supreme Court, Siegel *vs.* Barker, 125 Northwestern Reporter 582.)

Warranty of Engines Sold.—Where a manufacturer of an engine sold it with knowledge that it was to be used in the buyer's greenhouses and represented that it would be capable of performing the work for which it was bought, the buyer could recover the amount of damage actually and unavoidably done to flowers in the greenhouses through the engine's failure to work properly. One who buys machinery under a warranty must take reasonable steps to minimize his loss sustained through a breach of the warranty. (New York Supreme Court, Appellate Term, Ralph B. Carter Company *vs.* Fischer, 121 New York Supplement 614.)

Right to Convert Insolvent Buyer's Contract Into Lease.—A contract of sale of property partly executed by a delivery and partial payments made on the price cannot be converted into a lease, after the buyer becomes insolvent, so as to revest title in the seller as against the purchaser's creditors in bankruptcy. (United States District Court, Middle District, Pennsylvania, *in re* Rinker, 174 Federal Reporter 490.)

Rights of Buyer on Seller's Breach of Contract.—By accepting a pump weighing 27,400 lb. a buyer did not waive his claim for any damages sustained through breach of the seller's agreement to deliver one weighing 35,000 lb. One injured through another breaking a contract to manufacture, sell and deliver articles within a specified time can recover his damage, including gains prevented and losses sustained. (Washington Supreme Court, Eichbaum *vs.* Caldwell Brothers Company, 108 Pacific Reporter 434.)

Right to Dispute Authority of Agent.—A seller of machinery who retained title until payment of the price could not dispute the authority of his agent to make an agreement to take the machinery back and cancel the notes given for the purchase price, where the seller received the machinery from the agent and retained possession. (Indiana Appellate Court, Reeves & Co. *vs.* Miller, 91 Northeastern Reporter 812.)

Measure of Damage for Breach of Warranty.—The measure of damage for a breach of warranty of an engine sold is the difference between its value as warranted and its real value, where the buyer used it more than two years. (Pennsylvania Supreme Court, Fowler Waste Mfg. Company *vs.* Otto Gas Engine Works, 76 Atlantic Reporter 20.)

Measure of Damage for Failure to Deliver Scrap.—Where defendant broke an agreement to deliver steel scrap and cast scrap, f.o.b. Bayonne, N. J., to be shipped to an iron company at South Bethlehem, Pa., the company properly reduced its damages by buying in a cheaper market than Bayonne and is entitled to recover only the excess of the price paid over the contract price, the freight from the place of purchase to South Bethlehem being the same as from Bayonne. (New York Supreme Court, Appellate Term, Fechheimer Iron & Steel Company *vs.* Baress, 122 New York Supplement 683.)

Measure of Damage for Breaking Contract to Sell Coal.—The measure of damages for breaking an agreement to deliver coal is the difference between the contract price and the market price when delivery should have been made. (United States Circuit Court, Western District of Pennsylvania, Youghiogheny & Ohio Coal Company *vs.* Verstine, Hibbard & Co., 176 Federal Reporter 972.)

Injunction Against Noisy Operation of Iron Works.—On suit to restrain the noisy operation of an iron works, an important question is whether the noise by any reasonable means can be so moderated as to conform to the degree of quietness plaintiff is entitled to enjoy, and, where it appears that the real annoyance was in the summer, when the windows and doors of the buildings were open, and when the work was done outside and at times in the evenings, a judgment in such general terms that obedience to it would result in the closing of the works should be modified to prohibit the operation of machinery of a noisy character between specified hours, and requiring the work inside the buildings to be done with the doors and windows closed. (Pennsylvania Supreme Court, Collins *vs.* Wayne Iron Works, 76 Atlantic Reporter 24.)

Foundryman as Expert Witness. Acceptance of Machinery Under Contract of Sale.—The mere fact that a witness was a foundryman did not qualify him to testify to the value of a molding machine. The machine was sold under no warranty other than that it had no mechanical defects, and the buyer was required under the contract of sale to test the machine and keep it or not, as he might choose; but if he did not keep it, he was to notify the seller within 30 days after starting it, and failure to so notify the seller was to be regarded as an acceptance. He gave no such notice. Held that he is liable for the price, though unable to make the machine do the work expected of it. (Texas Court of Civil Appeals, Carroll *vs.* Mitchell-Parks Mfg. Company, 128 Southwestern Reporter 446.)

Rights Under Sale of Machinery in Factory.—A sale of machinery in a factory implies a right in the buyer to enter the factory for the purpose of removing the machinery. Unless time for removal is agreed upon, removal must be made within a reasonable time. (Massachusetts Supreme Judicial Court, Barry *vs.* Woodbury, 91 Northeastern Reporter 902.)

Necessity for Reducing Contract to Writing.—In Florida no contract for the sale of personal property is valid unless the buyer accepts at least part of it, or pays something to bind the bargain or on the purchase price, or unless the agreement is evidenced by a writing signed by the parties to be charged by the contract or their agents. An entry in the seller's account book is not sufficient for this purpose. An express company transporting goods, whether under contract with the seller or the buyer, has no implied authority to do the act required to constitute an acceptance of the goods by the buyer, so as to avoid the necessity for a writing under the rule above stated. (Florida Supreme Court, United Hardware-Furniture Company *vs.* Blue, 52 Southern Reporter 364.)

Acceptance of Order by Partial Shipment.—Shipment of part of chains ordered shows acceptance of the order. (Indiana Appellate Court, Haskell & Barker Car Company *vs.* Allegheny Forging Company, 91 Northeastern Reporter 975.)

Statements Not Constituting Warranty of Thing Sold.—Statements which merely constitute praise or commendation or the seller's opinion, belief, judgment or estimate of the quality of an article sold do not amount to a warranty. (Arkansas Supreme Court, Cornish *vs.* Friedman, 126 Southwestern Reporter 1079.)

New Tools and Appliances

A New Model Milwaukee Shaper.—The Lutter & Gibs Company, Milwaukee, Wis., has built an improved model of its Milwaukee shaper in which the aim of the builder was to secure strength and simplicity in all working parts. The base is of the pan type and is strongly ribbed internally to insure stiffness while it also projects well out from the column and affords a rigid foundation. The dimensions of the column are liberal and it is rigidly braced. The slides overhang at both ends, thus giving a long bearing surface to the ram, which has a quick return and is of strong construction. Eight feeds are provided, four by a 4-step cone pulley and the remainder by the back gears. The table is slotted on both the top and the sides and may be revolved to any position that may be required by loosening the bolts fastening it to the apron. T-slots are provided on the end of the apron so that the vise or the work itself can be clamped directly thereto after the table has been removed. The vise has a graduated swivel base and can be clamped to either the side or the top of the table. The tool head is graduated and swivels to any angle. The length of stroke is indicated by a pointer on the side of the machine and can be changed instantly by simply manipulating a large hand wheel located on the working side of the tool. The feeding mechanism is simple in construction and an adjustable table support is provided to eliminate all spring when doing heavy work. The bearings of the apron, ram and slides are provided with tapered gibs to secure the maintenance of the accurate fit originally given and the cross-rail screw has ball thrust bearings and micrometer collar reading to thousandths of an inch. Ball bearings are provided on the elevating screw nut for the saddle to eliminate friction as far as possible.

A New Hob Grinding Machine.—The Carpenter-Kerlin Gear & Machine Company, 77 White street, New York City, has added a new universal tool grinder for grinding hobs as well as other straight and spiral fluted tools to its line of gear cutting machines. This grinder is made in four sizes with and without automatic reversing power traverse to table, ranging in capacity from 25½ in. long by 7⅞ in. in diameter to 31½ and 15¾ in. respectively. These machines are equipped with spiral dividing head for spiral fluted tools, internal grinding attachment, two tailstocks, one headstock with driver attachment for truing up the centers, guiding finger with foot and tension roller, and two hand rests and are arranged for either hand or drive grinding. They can also be furnished for motor drive. It is claimed that these grinding machines are rapid as well as accurate for the grinding of hobs and other straight and spiral fluted tools and are highly efficient in grinding bores and cylindrical work.

The Western Steel Corporation, Seattle, Wash., states that its blast furnace, which has been in operation at Irondale since July 10, has a present output of 90 tons daily. Two open hearth furnaces are in operation, also two rolling mills, one 14-in. and the other 22-in. Pig and scrap are being used in equal proportion in the open hearth furnaces. The entire plant is working successfully.

The Southington Hardware Company, manufacturer of hardware specialties, whose factory is at Southington, Conn., held its annual meeting of stockholders July 26, when the following officers were elected: James H. Pratt, president; J. H. Baldwin, secretary and treasurer. The marketing of the company's product will in the future be done from the factory.

The furnace of the Marting Iron & Steel Company, at Ironton, Ohio, was expected to blow in this week. It has been out since June 26.

The Pennsylvania Steel Company had three of its blast furnaces at Steelton, Pa., in operation August 1. No. 4 was blown out July 19.

Obituary

Joseph Howard, president and treasurer of the De Laney Forge & Iron Company, Buffalo, N. Y., died July 28, aged 82 years. He was born at Bury, Bancanshire, England, and came to this country with his parents when he was 14 years old. The family settled in Fall River, Mass., and it was there, at a blacksmith's forge, that he laid the foundation of his practical knowledge in the working of iron and steel, which made him in after years the foremost smith of his time. This ability on his part was so generally recognized by the forge trade in America that, when an organization of the trade was made which needed as chairman of its Executive Committee a thoroughly practical forgeman, Mr. Howard was unanimously elected to this position, and he directed the practical workings of the organization for years. He went to Buffalo in 1868 to take an interest in the De Laney Forge & Iron Company. Since then he continued actively to direct the practical workings of the company, whose high position in complicated work is a monument to Mr. Howard's ability and teachings. He leaves two sons.

The Vanadium-Alloys Steel Company, Latrobe, Pa., recently appointed W. E. Snow, formerly in the engineering department of the Pittsburgh Gage & Supply Company, as its sales representative in Pittsburgh, to cover western Pennsylvania and southern Ohio. The company is also establishing sales offices in New York City, Philadelphia, Boston, Cleveland and Chicago. It manufactures Red Cut high speed steel, Vanadium steel for all purposes and regular carbon and alloy steels.

The New England Sherardizing Company has been organized at Hartford, Conn., with an authorized capital stock of $30,000, and will establish plants for the Sherardizing process of dry galvanizing at Hartford and New Haven, Conn., and New York. The incorporators are: J. McA. Johnson and John F. Forward, Hartford, and C. L. Ganser, New Haven. The company has also bought from the United States Sherardizing Company, New Castle, Pa., the right to license other manufacturers to use the process.

The Berlin Machine Works, Beloit, Wis., is contemplating erecting in or near Seattle, Wash., a plant for the manufacture of woodworking machinery. The plant which it is proposed to erect will cover several acres and will involve an expenditure of about $600,000, capable of employing at least 400 men. It is understood that the plant to be erected in Seattle will be a duplicate of the one just completed by the company at Hamilton, Ont.

A petition in bankruptcy has been filed in the United States District Court, Pittsburgh, against the Union Sheet & Tin Plate Company by five creditors, whose claims aggregate $1,303.27. The company has a plant in operation at Marietta, Ohio, while a similar plant at Hazleton, Pa., is said to be idle. Arthur O. Fording, Pittsburgh, was appointed receiver, under bond of $5000.

The West Penn Steel Company, Brackenridge, Pa., has placed a contract with the Fort Pitt Bridge Works, Pittsburgh, for an addition, 80 x 150 ft., to its main sheet mill building. The company has also purchased some resquaring shears and leveling machines. These additions to plant and equipment have been made necessary by its rapidly increasing business in high grade steel sheets.

Vanadium in Cast Iron*

Good Results with Locomotive Cylinders

BY GEORGE L. NORRIS.

The entrance of vanadium into commercial metallurgy dates from about 1903 and the discovery of the rich deposits of vanadium ore in the Andes in Peru. Vanadium is probably the most powerful metal for alloying with steel. One or two tenths of 1 per cent. raises the elastic limit of mild carbon steel about 50 per cent., or more in some cases, without impairing the ductility. Vanadium steels have a very high dynamic strength, sustaining repeated vibrations better than any other steels. The greatest application of vanadium will doubtless continue to be in combination with steel, as here all its wonderful effects and qualities can be fully developed.

Cast iron may be regarded as a more or less impure steel, containing, in addition to the usual elements present in steel, a comparatively large quantity of carbon in the form of graphite interspersed throughout its structure in the form of granules, flecks or plates. The graphite destroys the continuity of the metal. In consequence the limit of strength of cast iron is low as compared with steel, and it also follows that any improvement conferred upon cast iron by an alloy must necessarily not be as great as in the case of more homogeneous steel. In cast iron, also, we have a metal that is subjected to no work or heat treatment to develop latent qualities.

Nevertheless the benefits which accrue from the incorporation of small percentages of vanadium with cast iron, especially in chill and cylinder castings, are very great, even if they are not so spectacular in their nature as those obtained in steel. Vanadium not only cleanses the cast iron from oxides and nitrides, but also exercises a very strong fining effect on the grain of the iron, with the result that porosity is eliminated and sound castings are produced. Strength, resistance to wear and rigidity are all increased by the addition of vanadium to gray cast iron, while the vanadium martensites are much tougher than ordinary martensites. In the case of chilled cast iron, vanadium produces a deeper, stronger chill, and one less liable to spall or flake. Chilled iron rolls containing vanadium have shown remarkably increased resistance to wear in service.

Vanadium in Locomotive Cylinders

As a result of two years' test on a pair of cast iron cylinders made of vanadium cast iron, the New York Central Railroad Company specified vanadium cast iron for the cylinders of 183 new locomotives built during the past eight months. The pair of cylinders under test gave upward of 200,000 miles, with only microscopical wear, whereas ordinary locomotive cylinders will show about 1-32 in. wear per 100,000 miles. These locomotives were built by the American Locomotive Company and comparative tests have been made between the iron containing vanadium and that to which no vanadium was added. The averages of 10 consecutive comparative tests are as follows:

	Transverse strength. Pounds.	Tensile strength. Pounds.
Plain cast iron	2,130	24,225
Vanadium cast iron	2,318	28,728

The transverse tests were made on 1-in. square bars, 12 in. between supports; the bars were machined all over and consequently were absolutely comparable, as is not the case with bars tested as they are cast. The tensile tests were also of machined bars. In machining the vanadium cast iron cylinders, the effect of the vanadium was noticed in the machining qualities of the iron; the chips were not so short, were tougher and showed considerable springiness.

Another concern making gas engine cylinders has recently reported comparative tests as follows:

		Transverse strength. Pounds.	Tensile strength. Pounds.
A	Plain iron	2,860	21,000
AV	Vanadium iron	3,500	24,000
B	Plain iron	3,487	25,000
BV	Vanadium iron	3,770	27,650

These transverse tests were made on bars 1 in. square, 12 in. between supports, and we understand they were not machined. The "AV" and "BV" cast iron, containing vanadium, has stood 750 lb. water pressure with ¾-in. thickness of metal.

The use of vanadium in cast iron will doubtless find its greatest field in engine cylinders, both gas and steam, where it will be of great value in increasing the life of the cylinder through its effect on the wearing qualities of the iron.

Tests of vanadium in malleable cast iron have been reported as satisfactory in every way, the fibre of the iron showing much cleaner and the tensile strength being improved about 12 per cent. The castings were also very much stiffer than ordinary malleable castings.

The Method of Adding Vanadium

In applying vanadium to cast iron, it must be remembered that nothing like the heat of molten steel is at hand; consequently one should use a finely crushed or powdered alloy of a low melting point. As the melting point depends directly upon the percentage of vanadium contained in the alloy, a ferrovanadium containing under 35 per cent. vanadium should be used. If the iron to be vanadized is melted in the air furnace, the procedure is a very simple one: After the charge is melted and 15 to 20 minutes before tapping, the ferrovanadium is added and the bath well stirred or rabbled.

Where the iron is melted in the cupola it is necessary to add the vanadium to the ladle, and, as the amount of heat available for dissolving the ferrovanadium is limited, the iron should be tapped out as hot as possible and a ladle used that has just been emptied in order to conserve as much heat as is practicable. After the bottom of the ladle is covered with a few inches of iron, the finely crushed or powdered ferrovanadium is added by sprinkling it on the stream of iron as it flows down the spout to the ladle. In this way advantage is taken of all the available heat, and there is also the mixing effect of the stream as it strikes the iron in the ladle. After the vanadium is added the contents of the ladle should be well rabbled and allowed to stand a few moments before pouring in order to insure thorough incorporation and complete reaction.

In the case of cupola iron, with its limited available heat, it has been found that the addition of 0.10 to 0.12 per cent. vanadium is all that should be attempted ordinarily; while in the case of high grade air furnace iron, with its reserve of available furnace heat, the addition of 0.18 per cent. to 0.20 per cent. is advisable and readily made.

The analyses of a great many tests show that about 70 to 80 per cent. of the vanadium alloys with the iron, the remainder being used up in cleansing the iron from oxides and nitrides. In remelting cast iron which has been vanadized, most of the vanadium is necessarily lost, owing to the very strong oxidizing conditions under which the iron is melted. The effect, however, of the small amount of vanadium remaining in the remelted iron is apparent in the texture of the grain and its consequent freedom from porosity.

Sarah Furnace of the Kelly Nail & Iron Company, Ironton, Ohio, was blown out in July and will be rebuilt.

* From a paper read at the May meeting of the New England Foundrymen's Association, at Hartford, Mass. Mr. Norris represents the Vanadium Sales Company.

The Peat Industry

The American Peat Society's Meeting at Ottawa, Canada, July 25 to 27

Promise of the possibilities in the peat industry of the United States and Canada is offered in the various circumstances in evidence at the Ottawa meeting of the American Peat Society, July 25, 26 and 27. Those in attendance witnessed the operations of producing fuel from the Government peat bog at Alfred, Ont., near Ottawa, and on the following day visited the fuel and fuel testing station where peat is being used in the economical production of power in a gas producer and electric generator. The aid given by the Dominion Government in the development of the peat industry was the subject of much favorable comment by the members. Several important iron and steel and industrial corporations considered the meeting of sufficient importance to have representatives present. The attention that has been given to the development of machinery and processes of handling were discussed at considerable length in the various sessions.

The first session on Monday morning was entirely devoted to business of the society, with the exception of a description of the Government peat plant at Alfred, Ont., given by A. Anrep, Jr., of the Department of Mines.

Visit to Government Peat Bog

In the afternoon a special train carried the delegates to Alfred to inspect the peat plant. The bog area comprises 7000 acres, of which the Canadian Government owns 300 acres. At the time of the visit the peat was being dug by hand from a trench 3 to 12 ft. deep, and placed on a conveyer which elevated it to the pulverizer. From this machine, in which it was macerated by a series of knives, it was discharged into cable operated cars and conveyed a short distance to another spot on the bog—the drying field. From the cars it was spread out in a layer about 6 ft. wide and 5 in. deep, and the field press, a simple arrangement of weighted rollers with a series of knives following, passed over it. Roller knives were drawn laterally over the layer of fresh peat, thus forming blocks about 10 x 5 x 5 in. The peat machine has a capacity of 25 to 30 tons per day. A visit was then made to points on the field where the peat in similar rows had been drying for about three weeks. In that time it had been turned once, and the visitors saw it being picked up and conveyed in cars to the storage sheds. When spread out originally it contained 90 per cent. moisture, and after air drying for three weeks the moisture had been reduced to 25 per cent., a degree of dryness suitable for fuel or use in a gas producer.

About 1600 tons of dried peat has been taken from the bog this season, and is to be sold for fuel.

According to figures supplied by Dr. Eugene Haanel, president of the society, the cost of the peat from the bog, including interest on capital invested, amortization, oil and repairs, is $1.65 per ton loaded on cars.

Analyses of the Alfred peat, absolutely dry, show its composition as follows:

Volatile matter	68.23	Sulphur	0.218
Fixed carbon	26.00	Phosphorus	0.033
Ash	5.77		
Nitrogen	1.76	Calorific value B.t.u.	9.005

The President's Address

In the evening President Haanel gave an address on "The Exploitation of Our Peat Bogs for the Production of Fuel for Domestic and Industrial Purposes." He pointed out that in Canada alone there are 37,000 square miles of peat bogs already known and referred to the investigation conducted by the Dominion Department of Mines, and the report on the manufacture of peat for fuel and other purposes in the peat using countries of Europe. This investigation, he said, has demonstrated that for the economic production of fuel from peat, machinery must be substituted as far as possible for manual labor, and that drying peat by pressure and artificial heat have both failed. He considered that if Canada is to establish a peat industry only such processes and machinery as have proved successful in Europe should be introduced, and the development of new ideas should be left to the future.

Figures quoted by him show that Russia is the largest producer of peat fuel in the world. In 1902 the production was 4,000,000 tons, and since then there has been an annual increase of nearly 200,000 tons. Many private plants exist in Russia in connection with cotton mills for the production for their own use of 200,000 tons of peat annually. Thirteen hundred plants making machine peat are now in operation in Russia.

Adaptability of Peat for Gas Producer Use

Taking up the use of peat in gas producers, Dr. Haanel said:

Air dried peat is not alone an excellent fuel for domestic use, but for the production of power it proves an ideal fuel in the peat gas producer, which is to-day as reliable and efficient in its operation as the coal gas producer. I do not hesitate to say that it is an ideal fuel because the peat from most bogs is free from a clinkering ash and yields, on combustion, a fine white residue, which readily allows of the thorough cleaning of the fire, and the property of not fusing or caking in the producer assures regular operation. Moreover, since gas leaves the producer with a high degree of sensible heat, which must be cooled to the temperature of the atmosphere before being used in the gas engine, it is exceedingly important that as much of this sensible heat as possible be utilized in the producer itself, in order to increase its thermal efficiency. This is accomplished in coal gas producers by the introduction of water vapor, which passes through the incandescent fuel with the air supplied for combustion. This water vapor is decomposed, yielding hydrogen and oxygen. The latter combines with the carbon of the fuel, forming carbon monoxide. This chemical reaction absorbs a large amount of heat and lowers the sensible heat of the gas, but the heat absorbed in liberating the hydrogen is to a large extent restored and utilized when the gas, enriched by hydrogen, is burned in the gas engine or other apparatus. With peat containing from 25 to 30 and more per cent. of moisture, the moisture content is sufficient to accomplish all that is required without the introduction of water in the producer from an outside source.

Hon. Clifford Sifton spoke of the urgent necessity of utilizing the peat bogs of North America, and also on the conservation of our natural resources.

A Traction Trackless Peat Machine

Francis J. Bulask, Toledo, Ohio, read a paper on "The Work of the Peat Engineering Company." He stated that after an investigation of the processes and machinery used in foreign countries his company had designed a traction trackless peat fuel machine. A description of this machine showed it to be designed for the complete handling of the peat, including the digging from the bog, making or cutting it into small pieces, turning it during the drying process, and windrowing or piling it ready to be carted to the sheds.

A paper was also read by Dr. T. Arthur Mighill of Stone & Webster, Boston, Mass., on "Peat Power Generation," referring to some tests that had been

made with peat in the gas producer and relating some of the difficulties that must be overcome in its use.

Officers Elected

On Tuesday morning officers for the ensuing year were elected as follows: President, Dr. Eugene Haanel, Department of Mines, Ottawa; vice-presidents for Eastern States, John N. Hoff, New York City; Great Lakes and Mississippi Valley, Carl Kleinstueck, Kalamazoo, Mich., for Eastern Division, and L. B. Lincoln, Chicago, for Western Division; Southern States, Robert Ranson, St. Augustine, Fla.; Pacific States, C. V. Imeson, Los Angeles, Cal.; Canada, Dr. J. McWilliam, London, Ont.; New York Section, Dr. Charles F. McKenna, New York City; New England Section, O. E. Moulton, Dover, N. H.; Minnesota Section, Max Toltz, St. Paul; secretary-treasurer, Julius Bordollo, Kingsbridge, New York City.

Kalamazoo, Mich., was selected as the 1911 convention city.

Following the report of the editor of the *Journal* of the American Peat Society, it was decided to supply that journal hereafter to 1000 of the more important public libraries of the country. It was also voted to increase the annual dues of the society to $5 per year.

A "History of the Peat Industry of Canada" comprised the subject of a paper by Alexander Dobson, in which a brief account was given of the various attempts to develop the peat bogs of Canada. In this paper it was related that, beginning in 1878, the peat bog near Farnham, Que., supplied for five years an entire division of the Grand Trunk Railroad with peat as fuel.

Results of Tests of Peat for Producing Power

In the afternoon, after an automobile tour of the city, the visitors were taken to the Government fuel and fuel testing station in Ottawa. At that station there has been erected a double fire zone Körting peat gas producer with the necessary cleaning apparatus and a Körting four-cycle single acting gas engine, direct connected to a Westinghouse 50-kw. direct current generators. While no official report is yet ready for publication, it is understood that the engineer in charge has succeeded in showing the development of one brake horsepower hour on 3 lb. of peat. This means that if the plant were situated at the bog a brake horsepower year could be developed at from $7.50 to $8.

President Haanel, in this connection stated that the erection of gas producers designed for the recovery of by-products is not recommended except in localities where such by-products would command a ready and profitable market. He added:

> In Canada it is far more economical to aim at the complete gasification of all the heat elements in the fuel. Peat gas producers for power purposes should, whenever possible, be erected on the bog, and the energy generated in the form of electricity transmitted to neighboring towns and villages for power and lighting purposes as in the case of water power. This is the policy adopted in European countries. Whatever other valuable products may be obtained, such as moss litter, peat mull, alcohol, packing paper, millboards, ammonia and nitrates, the great and important need for us in Canada is the production from the peat deposits of a constant reliable supply of fuel for domestic and industrial purposes.

In the evening a complimentary banquet was tendered the delegates, at which Hon. Sidney Fisher, Member of Agriculture, was the chief speaker.

On Wednesday morning Ernest V. Moore, Peterborough, Ont., gave a description of a new portable peat gas machine, which has been designed to handle peat from the bog, and requires only two men to operate it.

Dr. J. McWilliam, London, Ont., gave some of his experiences in peat briquetting, and told of the difficulties encountered in the wet process, as well as some of the obstacles to be overcome in the dry process.

The Mark process of drying peat was the subject of an interesting talk by C. E. Mark of the Mark Process Company, Chicago. This was followed by a lengthy discussion.

On Wednesday several of the members from Ottawa, prominent in the peat industry, started a movement which has assured the organization of a Canadian peat society.

Personal

E. R. Hibbard, president of the Grip Nut Company, Chicago, started July 28 on a 10 weeks' trip to the Orient.

T. Evans, for many years purchasing agent for the Cananea Copper Company, has been appointed manager of the Mine & Smelter Supply Company's branch office at Denver.

M. H. Godfrey, who has been for some years connected with Hibbing and Chisholm, Minn., iron mines, latterly being in charge of Chisholm district properties of the United States Steel Corporation, is the successor of John C. Greenway as superintendent of the Canisteo district. Mr. Godfrey's successor at Chisholm is Sullivan, formerly in charge of the Gilbert mine, Mesaba range.

H. S. Stebbins of Oglebay, Norton & Co., Cleveland, who received severe injuries in an automobile accident 10 days ago, is making a good recovery.

Wm. Wilkins, heretofore manager at Ashland, Wis., for the Lake Superior Iron & Chemical Company, has been transferred to the main offices of the company at Detroit.

Wm. G. Mathias, superintendent of the structural and blooming mills of the South Works of the Illinois Steel Company, has been appointed assistant general superintendent of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala. His associates, through General Superintendent Wm. A. Field of the South Works, presented him with a set of flat silver, and there was also a presentation from employees in the mills of which he had charge. James Walsh succeeds Mr. Mathias at South Chicago, and John Caldwell has been given charge of the slabbing mill, succeeding Mr. Walsh.

Edwin F. Atkins of Boston was elected president of the Westinghouse Electric & Mfg. Company to succeed George Westinghouse, at the annual meeting July 29. Other officers were re-elected as follows: Robert Mather, chairman; E. M. Herr, L. A. Osborne and Charles A. Terry, vice-presidents; G. W. Hebard and H. D. Shute, acting vice-presidents; W. A. Esselstyn, secretary; T. W. Siemon, treasurer and assistant secretary; H. F. Baetz and E. St. John, assistant treasurers; James C. Bennett, auditor and controller; F. E. Craig and W. B. Coville, assistant auditors. It is stated that Mr. Atkins accepted the election to the presidency with the distinct understanding that his retention of the position is to be temporary and until the board shall select a permanent successor. Mr. Westinghouse remains a director, his time expiring in 1912.

Humphrey Bond of the metal house of Vivian Bond & Co., New York, has returned after a four weeks' absence in Europe.

H. A. Fennerty, purchasing agent of the Carnegie Steel Company, Pittsburgh, who is convalescing from a severe operation, sails for Europe August 4, on a month's absence.

Helen furnace of the Red River Furnace Company, Clarksville, Tenn., was expected to blow out this week.

Rusty Water Due to Poorly Galvanized Pipes

An Investigation at Springfield, Mass.

Numerous residents of Springfield, Mass., having complained to the local Water Board of the rusty condition of the water furnished to their houses, George C. Whipple, a New York engineer, was engaged to make an investigation. His report, which has been published in the Springfield *Republican*, is of much interest to manufacturers of wrought pipe, especially the following extracts taken from it:

The pipes used for the conveyance of the hot water were found to be chiefly of galvanized steel. Possibly in some of the older installations they may have been galvanized iron, but this could not be told from inspection. In one instance brass pipe was found in connection with a steel tank. In some of the private houses examined the hot water piping was of brass and lead and the boilers of copper. The quality of the galvanized pipe used differed considerably in different buildings. In some cases, especially the older installations, the pipe appeared to be of much better character than in the houses more recently built, the amount of zinc on the pipe being greater and the coating smoother. These pipes of better grade were almost invariably found in connection with galvanized tanks or with tanks covered with packing. The poorer qualities of galvanized pipe were usually found associated with the unprotected steel tanks, this being apparently a cheaper installation.

The Uncoated Interior of Galvanized Pipe

When it was found that the rusty water troubles were associated with the steel tanks and galvanized pipes of poor quality, an investigation was made to ascertain the character of the inside of some of the galvanized piping used in Springfield. Samples were obtained from various plumbers and dealers, from the stock of pipe in the water works yard and from pipes used in other cities. These samples were sawn asunder, so as to expose the interior. The results, taken as a whole, showed extremely bad conditions. Scarcely a single specimen of a perfect pipe was obtained. In some cases there were large areas on the interior of the pipe entirely uncoated with zinc, and where the steel was exposed and coated with rust; others were spotted with pieces of mill scale embedded in the zinc coating; others were rough from the presence of dross from the spelter bath; sometimes a line was found along the seam where the coating had not adhered to the pipe, possibly on account of the failure of the acid to remove the mill scale during the process of galvanizing. In several pipes where the coating was good, as far as the eye could see, microscopical and chemical tests showed the presence of pin holes where rusting might occur.

A number of years ago wrought iron pipe was largely used for house services. The zinc coating on such pipe was usually better than that found on modern steel pipe. Whether this is due to the nature of the metal or to differences in the process of galvanizing it is not necessary to discuss here, but that there is on the market to-day a very large amount of poorly galvanized steel pipe seems evident from our observations. It is still possible to obtain galvanized iron pipe, but it costs more than steel and is said to be more troublesome to get, so that practically it is little used.

The Trouble Not Due to the Water, but Unprotected Metal

It seems certain from our observations that the cause of the rusty condition of the hot water is not due to the water itself, but rather to the unprotected metal of the steel tanks and pipes used in distributing the hot water in certain buildings. Apparently both the tanks and pipes contribute to the trouble. In one instance where a steel tank was used in connection with brass piping the trouble existed, though not in as serious form as elsewhere. In this instance it must have been due to the action of the hot water on the metal of the tank. In other instances pieces of galvanized pipe were examined which had been taken from the primary circulating system. These pipes showed evidences of serious pitting and corrosion. There were numerous spots where the metal had been eaten into so as to reduce the thickness of the pipe by 30 to 40 per cent. These pipes were almost completely choked with iron rust. Most of this iron rust came from the pipe itself, for it was present in the form of tubercles, each tubercle covering a pit in the steel.

It hardly seemed credible that so much iron rust could be derived from the pipe itself, but experiments showed that each volume of metallic iron was capable of producing upward of 10 volumes of iron rust in a moist condition, and calculations showed that in order to completely fill a 1½-in. pipe it would be only necessary to have the metal of the steel reduced on an average by less than 1-27 in., in a 1-in. pipe by 1-40 in. in a ¾-in. pipe by 1-52 in. and in a ½-in. pipe by 1-80 in. In some of the specimens examined the loss of metal must have been even greater than this. Calculation has also shown that a corrosion of the inside of the steel tanks amounting to only 1-100 in. would be sufficient to cause a rusty condition of the hot water for an entire year. It is evident, therefore, that it is perfectly possible for the observed conditions to originate within the hot water distribution system of the apartments.

Pipe Deposits Almost Wholly Iron Rust

The accumulated deposit in the pipes consisted almost exclusively of iron rust. The percentage of organic matter was extremely small, very much smaller than would have been the case if the deposits had been caused by mud derived from the mains. Part of the iron rust was in the form of the ordinary red oxide, but part of it was in the form of magnetic oxide. This was especially the case at the bottom of the tubercles, where the supply of oxygen was obviously limited. The black appearance of this magnetic oxide would at first glance give one the impression of being organic matter. The samples of hot water analyzed in the houses where trouble has occurred showed a marked decrease in the amount of dissolved oxygen, indicating that the oxygen had been used up in oxidizing the iron. In some cases also there was a very slight reduction in the amount of dissolved free carbonic acid in the hot water and a slight increase in the alkalinity.

From the coincidence of the rusty water trouble and the presence of steel tanks and galvanized pipe of poor quality; from its absence under other conditions; from the generally bad character of the galvanized steel pipes now in the market; from the pitted condition of galvanized pipes examined; from the analysis of the deposits in the pipes themselves, and from the loss of oxygen in the hot water, it seems reasonable and inevitable to conclude that the rusty water is due, not to the character of the water supplied, but to the use of unprotected steel tanks and imperfectly galvanized steel pipes for distribution of the hot water.

In justice to the plumbers it ought to be stated that the equipment used for distributing hot water in the apartments where trouble has existed is used extensively in other cities with apparent success. In New York City and Brooklyn, for example, it is said to be common. In Boston, however, and in most cities of eastern New England, galvanized piping is almost universally avoided for hot water services. Where the water is hard, or even moderately hard, corrosion does not appear to be a serious matter except where other corrosive salts, such as the chlorides, for example, are present. With the softer waters of New England, however, unprotected or poorly protected steel cannot be used for hot water without trouble.

Trade Publications

Elevating and Conveying Machinery and Industrial Railways.—C. W. Hunt Company, West New Brighton, N. Y. Catalogue No. 102. Briefly describes the various types of machinery built by this company. This includes coal-handling and hoisting machinery, conveyors, industrial railways, electric locomotives, electric and steam hoists and Manila rope. There are numerous illustrations showing installations of the various pieces of apparatus, and in many cases under the engraving there is a brief statement of the principal points of interest about the installation.

Electrical Machinery.—Triumph Electric Company, Cincinnati, Ohio. Two loose leaf circulars. Concerned with induction motors and small generating sets for private lighting, which are a cheap, economical and reliable source of light for small factories, private residences, steamboats, farms, &c.

Special Track Work. Conley Frog & Switch Company, Memphis, Tenn. Catalogue No. 2. Relates to a line of special track work for steam, electric, mining, logging, sawmill, plantation and industrial railroads. This includes a number of types of frogs, switches, turnouts and crossings. A number of switch stands, rail braces, slide plates, tie rods and head chairs are also illustrated.

Portable Sawmill. —American Portable Band Saw Mill Company, Winston-Salem, N. C. Treats of a new type of portable sawmill having a band saw instead of the circular saw ordinarily employed. Some of the advantages claimed for this mill are a saving in the amount of timber, as it is stated that the part now wasted in sawdust by the old type of circular mill is saved because of the narrowness of the cut; fine finish on the product, as the lumber is sawed so smooth that sandpaper rubbed lightly over the surface removes all saw marks and makes it ready for paint, thus eliminating loss in planing, and cheapness of operation, as only three men are required and two of these can be ordinary laborers. The log remains stationary on the truck frame, which rests on the ground, and the saw carriage travels to the log and feeds the saw into it and reciprocates over the log until it is sawed to the proper dimensions.

Gondola Dump Cars.—The Ralston Steel Car Company, Columbus, Ohio. Booklet. Treats of a special type of level floor drop bottom car with which coal, ore, sand, gravel or light material can be dumped either from a trestle or the ordinary track level very quickly and at the same time enables the car to be loaded with lumber, bar iron, sewer pipe, brick and material of this nature that cannot be conveniently loaded in hopper cars. The illustrations show the under frame of the car, a skeleton view, side views with the doors up and down, an end view, the car equipped with a coke rack, interior views with the doors in both positions, a cane car, and a general service box or stock car with drop doors.

Pneumatic Hammers. — Ingersoll-Rand Company, 11 Broadway, New York. Form No. 8003. Devoted to the Imperial type E pneumatic hammers, which are built in a number of different sizes for scaling, chipping and riveting. There is a brief description of the construction of these hammers, supplemented by illustrations of the different types. This description is followed by a set of instructions on the care of the tool and a brief table of specifications and sectional views giving the names and repair numbers of the various parts are appended.

Friction Clutches.—The Hill Clutch Company, Cleveland, Ohio. Catalogue No. 8. Calls attention to the improvements which have been made in the Hill clutch since the original model was placed on the market in 1886. The standard clutch pulleys and cut-off couplings are illustrated and described and a table of dimensions is appended. Space is also given to a list of repair parts and accessories, such as hand levers and fulcrum stands, clutch operators, quills, collar oiling bearings and belt tighteners.

Steel Lockers.—S. Keighley Metal Ceiling & Mfg. Company, 819 Locust street, Pittsburgh, Pa. Circular. Pertains to a line of steel lockers built on the unit system in sections or groups in a single row, double rows with a single back, and in single or double tiers. The material employed is heavy cold rolled steel reinforced at the edges and center with angles and bars. The doors are equipped with a simple three-way locking device which securely fastens the door at the top, center and bottom and is operated by a Yale & Towne or other lock or a keyless or time combination lock. Flat tops are regularly furnished, but if desired a sloping one can be made to order.

Buckets. — Andresen-Evans Company, 1501 Monadnock Building, Chicago, Ill. Folder. Illustrates a type of grab bucket for handling ore, coal, sand, gravel, crushed stone and similar material, which is intended to replace the orange peel bucket formerly used.

Steam Engines.—Providence Engineering Works, Providence, R. I. Bulletin S-75. Relates to the Rice and Sargent Corliss engine. The details of construction are described very thoroughly, especially those features which are said to enable operation at higher speeds than the other types now on the market. Data is given regarding the amount of floor space required, horsepower ratings and the amount of power transmitted by rope drive. The illustrations in the bulletin show some of the different parts of the engines and a number of installations.

Turbine Blowers. L. J. Wing Mfg. Company, 90 West street, New York City. Bulletin No. 7. Illustrations and descriptive matter explain the operation of the Typhoon turbine blower, which is a combination of a propeller type blower and a steam turbine. Some of the advantages claimed where this blower is used for furnishing the draft in a boiler plant are the use of smaller sized and less expensive fuel, the development of additional power by increasing the rate of combustion, which in some cases will enable one or more boilers to be shut down, and the maintenance of an almost constant steam pressure.

Generators and Fixtures for Acetylene Lighting Systems. —Acetylene Apparatus Mfg. Company, 50 Church street, New York City. Two catalogues. The first, No. 11, deals with the Pilot generator for producing acetylene, in which the carbide is fed to the water. The feed in this generator is a forced one, operated by a weight motor, in which the rate of feed is such that the gas is generated faster than the carbide is fed to the water. Three models varying only in size are shown, and the illustrations include exterior and sectional views of the entire generator as well as details of the various parts. The other catalogue, No. 12, is devoted entirely to fixtures and supplies for an acetylene lighting system, and the illustrations are of various types of fixtures, shades, fittings and accessories.

Electric Pyrometers.—The Brown Instrument Company, 311 Walnut street, Philadelphia, Pa. Catalogue No. 3. Pertains to the line of electric pyrometers for indicating or recording all ranges of temperature made by this company. This include two fixed instruments having circular and square scales, one portable model for indicating and a recording pyrometer which traces the temperature record on a circular chart. The thermo-electric couples used with these instruments are shown and space is also given to the Brown radiation pyrometer, which is designed for use above the limit of the electric instrument with platinum thermo-couple inserted directly in the heat. A number of suitable equipments for different industries requiring a pyrometer and a partial list of users are appended.

Packing.—New York Belting & Packing Company, Ltd., 91 Chambers street, New York. Catalogue. Deals with the numerous styles of packing manufactured by this company for practically all the different conditions encountered by an engineer. The various kinds illustrated include oval and spiral piston rod packing, diagonal expansion packing, waterproof hydraulic packing, hot water spiral plunger packing, packing for piston rods and throttles, and a number of combination packings designed for use where the conditions are such that one type of packing alone will not give satisfactory service. In addition to these styles, red, white and black sheet packing, asbestos metallic sheet packing, asbestos and cloth gaskets, pump diaphragms and valves, hard rubber valve disks, gauge glass rings, bib disks and washers, air hose coupling and lubricator glass gaskets, and asbestos wick are also illustrated and described. A partial list of other goods manufactured and a complete index of the goods covered in the catalogue both by style numbers and names are appended.

Metal Working Machinery and Oil Separators.—American Tool & Machine Company, 109 Beech street, Boston, Mass. Describes and illustrates an extensive line of lathes, valve milling machines and oil separators. The lathes include turret models with swings ranging from 26⅜ in. and an 8-ft. bed to 18½ in. and a 6-ft. bed. Other types shown include two square arbor lathes and two models of set over and back motion lathes. Two styles of milling machines for brass valves are shown and a number of accessories are also illustrated. The line of oil separators includes two belt-driven models having capacities of 520 and 2540 cu. in., respectively, and an electrically driven machine having the same capacity as the smaller belt-driven one. In the make-up of the catalogue the illustrations appear on the left-hand page, while the facing pages contain descriptions of the machines illustrated.

Sand and Lime Brick Machinery.—American Sandstone Machinery Company, 321 North Hamilton street, Saginaw, Mich. Catalogue. Illustrates and describes the Komnick system for making bricks from sand and lime, for which the advantages of greater resistance to fire and greater strength are claimed. The process of making the bricks is described briefly, and there are a number of illustrations of the different machines and other accessories used. A number of photographs of structures constructed of sandstone brick complete the catalogue.

Railroad Equipment. — Gould Coupler Company, 341 Fifth avenue, New York City. Loose leaf catalogue. Size 9¼ x 12 in. Illustrates the various specialties manufactured by this company, which include couplers, vestibules for trains, continuous platforms and buffers, friction draft gear, trap door rigging, journal boxes, draft beams and coupling brackets, steel bolsters, axles, end sills and side frames. The illustrations show the different sizes made of each piece of equipment, and include half-tones showing the general style of each piece and its various parts, supplemented by line drawings showing the differences in the dimensions of the various sizes.

The Eastern Pig Iron Association at Port Henry

A Visit to Witherbee, Sherman & Co.'s Properties in the Eastern Adirondack District—Important New Mining and Concentrating Operations

One of the most notable of the many visits of representatives of the iron industry to the Adirondack iron ore district was made last week. Starting with an invitation from Witherbee, Sherman & Co., Inc., to the members of the Eastern Pig Iron Association to hold their July meeting at Port Henry as the guests of the company, the plans for the excursion were widened to include in the party various consuming interests outside the association. A special train of five Pullman cars and two private cars was provided for the trip, leaving the Grand Central Station, New York, Tuesday evening, July 26, at 9.39. At Albany it was transferred to the Delaware & Hudson Railroad, and Port Henry was reached early Wednesday morning. Leaving New York at the close of a day of high temperature and humidity, the travelers found the cool morning air along the Lake Champlain shore entirely agreeable. Their first view of the Adirondacks on the west and of the distant ranges of Vermont across the lake was an introduction to a day whose scenic features were no less noteworthy in their way than the mining operations which were the special object of interest.

A Historic District

The magnetite of the Lake Champlain or Adirondack Mountain region has never held so important a position in the 25 years of the country's marked advance in iron manufacture as it holds to-day. The story of iron mining and iron production in that district is of exceeding interest. The pioneers there, finding deposits of iron ore and available waterfall, secured sufficient financial support to erect forges where the raw mineral was converted into blooms by the use of charcoal made in the adjacent woodlands. Though this history is embraced in but little more than a century, these forges and the blast furnaces subsequently erected have passed away, and in a number of instances their exact locations are in dispute.

That magnetite in quantity exists in the Adirondack region is evidenced by the mining operations which have been or are now carried on in an area extending from the Chateaugay and Arnold Hill mines on the north to Ticonderoga and Fort Ann on the south, and from the Cheever mine on the east to the Benson mines on the west, offering the prospect of large future reserves. Another No. 21 mine, with its vein of rich ore from 300 to 400 ft. thick, may not be encountered, nor may another bunch of phenomenally pure ore be found, such as was developed at Lover's Hole, in Barton Hill, from which over 30,000 tons of 70 per cent. Bessemer ore was taken, and many superb octahedral crystals obtained. Nor may there be as great exposures as those exhibited by the titaniferous ore deposits at Tahawus, 40 miles west of Port Henry, described in *The Iron Age* of October 14, 1909. However, some of the bases of supply for the older forges may be developed into producing mines, for of the territory above generally defined only limited portions can be considered as having been explored.

The Cheever mine was recognized as a source of ore in 1804, from the outcrops of which the neighborhood drew its supply, and later when the Lake Champlain Canal aided transportation such names as Ausable, Essex, New Russia, Schroon, Horicon, Crown Point and Ticonderoga were well known in the iron trade, especially for horseshoe nails and other specialties.

Subsequently the railroad encouraged the construction of blast furnaces to use anthracite coal, and these contributed material from which the earlier steel rails were rolled. The equipment of some of the plants was in advance of the times, the largest, and at that date the most economical, blowing engines being features.

The first installation of firebrick hot blast stoves in America was made at the Cedar Point furnace at Port Henry, the only one of the older plants which has survived, yet it shows its youthfulness by a large output made with phenomenally low fuel consumption—a necessity where distance from coal mines creates high freight charges—and by the turbine driven blast apparatus lately installed. This furnace is demonstrating the possibilities of using a charge of all rich magnetite with excellent results. The only other active blast furnace in the Adirondack region is at Lyon Mountain.

The first use of a closed front by an American blast furnace, the first establishment of a furnace laboratory, and the continuous production of 2300 lb. of pig iron with the consumption of 1600 lb. of charcoal, are credited to the Fletcherville furnace, now only a memory.

A Record of Enterprise

Similar evidences of progressiveness have been constantly shown in mine equipment in the Champlain district, for 30 years ago the hoisting plant at Mineville was a "show" installation which attracted many visitors. Diamond drills, air compressors and electrically operated machinery were adopted early in this district, and nowhere in the United States has magnetic concentration been more thoroughly studied and more practically demonstrated.

History repeats itself in the story of concentration, for 60 years ago the famous No. 21 mine was purchased for a few hundred dollars as a source of phosphorus, and crude magnetic separators were operated to obtain the apatite for shipment abroad, the iron being a by-product. To-day the modern concentrating mills are operated to enrich or purify the ore, and some of the phosphorus tailings are disposed of for fertilizers or sold to blast furnaces whose ore supply contains insufficient phosphorus to produce satisfactory foundry pig iron. Thousands of tons of Harmony mine tailings have been shipped for this purpose to Central Western furnaces, these containing 10 to 12 per cent. iron and 9 to 10 per cent. phosphorus.

The record of iron ore mining in the district shows many failures, and the blast furnace history is mainly one of disasters. But the wonderful development at Mineville and the successful operation of blast furnaces at Port Henry and Lyon Mountain demonstrate that persistence and progressive management, backed by ample capital, may be expected to bring success in other portions of the Adirondack region.

So much has been written of the Witherbee, Sherman & Co. properties, that in what is said below of the trip of last week it is the aim to refer chiefly to the more recent developments.

INSPECTIONS IN AND ABOUT PORT HENRY

The Power House and the Crown Point Park

After Wednesday morning's breakfast, which was served on the special train, the visitors were conducted first to the Port Henry power house of Witherbee, Sherman & Co., located on the lake shore. The building was erected in 1907 of monolithic concrete, 6 parts mine tailings to 1 of cement. The stack is 175 ft. high and 8 ft. inside diameter of reinforced concrete.

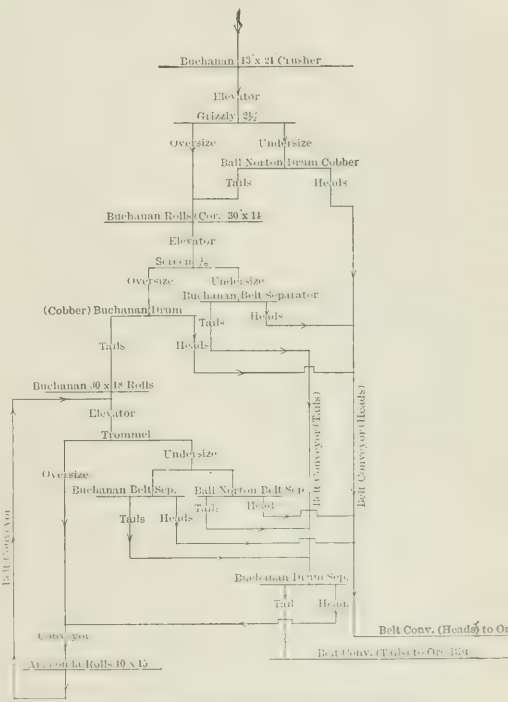
There are 1864 hp. Babcock & Wilcox boilers equipped with superheaters, McClave shaking grates and Wing turbine blowers. The fuel is No. 2 buckwheat anthracite. Two General Electric vertical Curtis turbines generate electric current at 6600 volts, 25 cycles. An 800-kw. generator was installed in 1907 and one of 1500 kw. in 1909. Steam is used at 165 lb. pressure and 100 degrees superheat. Auxiliary equipment includes a Wheeler surface condenser and pumps. The cost of power is stated to be 0.9 cent per killowatt hour when generating 500,000 kw. hour per month. From this power the greater part of the requirements of the mining and concentrating operations at Mineville are supplied.

The party divided after the power house inspection, the majority taking ferry for Crown Point, that historic strip of New York State land, which intrudes upon Lake Champlain just below Port Henry. Witherbee, Sherman & Co. gave the Crown Point Park to the State of New York early in 1910. In it are the ruins of Fort St. Frederic, built by the French in 1731 and the ruins of Fort Amherst, built by the English in 1759, about both of which so much interest gathered at the time of the Champlain tercentenary celebration last year. Several million dollars were spent on these fortifications. On a Government site adjoining the park the monument to Champlain commemorating the three hundredth anniversary of his discovery of 1609 will be erected. The iron nails in some of the woodwork of the fortifications attracted the attention of the visitors for their size and shape as well as their holding properties. Several of them were carried away for chemical analysis.

The Cheever Mine

The alternative morning trip, which a smaller party took by automobile, was to the Cheever iron mine, about two miles north of Port Henry. This property, in which the Bethlehem Steel Company acquired a 51 per cent. interest last year, Witherbee, Sherman & Co. having the remainder, has an ore body entirely distinct from those of the Mineville district. The old Cheever Iron Company dates back to 1820, though ore was taken from the Cheever in Revolutionary War times. From 1853 to 1883 the mine was operated to supply ore to the Bay State Furnace, a charcoal stack at Port Henry, and then for over 20 years it was abandoned, being reopened in 1906. Present operations at the Cheever are in charge of A. E. Hodgkins, general manager, formerly of Witherbee, Sherman & Co. Ore is being raised through both the Weldon and Tunnel shafts, the former overlying the other. The present depth of mining is about 350 ft., measured vertically, or 1400 ft. on the slope. The company will soon operate a third shaft on the south side of the old workings, which will increase the output to nearly 700 tons of crude ore, instead of 400 tons a day. An electric haulage system will also be installed for a portion of the old working, which will be reached by a drift of about 400 ft. from the Weldon shaft. One electric locomotive and a supply of 3-ton cars will be provided. An air hoist will be installed to raise the gate of the underground ore bin. For hoisting from the third shaft, referred to above, the company is putting in a double drum Lambert hoist, operated by a 75-hp. General Electric motor. The present steam hoisting plant at the Weldon and Tunnel shafts is being replaced by a double drum, Wellman-Seaver-Morgan electric hoist, driven by a 225-hp. General Electric motor, the new plant being started this week. In line with the plans of the new owners to substitute electricity for steam a 1400 cu. ft. Ingersoll-Rand compressor, electrically driven, was installed a few months ago and four electrically driven pumps. For auxiliary hoisting underground three single drum, 37-hp. electric hoists were provided. The company derives current from the Port Henry power house of Witherbee, Sherman & Co. at 6600 volts, cutting it down to 440 volts for hoisting and 110 volts for lighting.

The concentrating mill at the Cheever Mine is operated by a 150-hp. General Electric motor, which drives the crusher, cobbing machines and belt and drum separators. From the crusher the ore is passed over a 2½-in. grizzly. All that passes through the latter goes to a cobbing machine of the Ball-Norton drum type, from which the heads are taken by belt conveyor to the shipping bins. The overs from the grizzly and the tails from the cobbing machine pass to a set of Buchanan corrugated rolls, 14 by 30 in. The ensuing repeated operations of screening, magnetic separation of undersized ore, cobbing of over-



Flow Sheet of Magnetic Concentrating Mill, Cheever Iron Ore Company.

size, and the successive magnetic separations are indicated on the accompanying flow sheet for this plant.

About 65 per cent. of the shipping ore from the Cheever is cobbed ore running 58 per cent. in iron, 10 to 12 per cent. silica and 2 per cent. lime. The ore as it passes from the concentrating mill goes to the loading bin, which has 350 tons capacity. Two 4½-ton cars are sent down each trip over two gravity planes, 800 and 1900 ft., respectively, to the loading dock of the Delaware & Hudson Company, where the ore is dumped into a chute and thus loaded into railroad cars. The average of the concentrates is 60 per cent. iron and 0.15 per cent. phosphorus.

The Cedar Point Furnace

In the latter part of the forenoon the Cedar Point furnace of the Northern Iron Company was visited. Built in 1872, this furnace is owned by Witherbee, Sherman & Co., and is operated under lease by the Northern Iron Company (T. I. Crane, president; W. S. Pilling, secretary and treasurer, and F. E. Bachman, general manager). For years this furnace has been a point of interest to engineers who have visited Port Henry, and its management has always been progressive. The present party had looked forward with par-

ticular interest to an inspection of the six-stage centrifugal General Electric Company compressor recently installed to replace the reciprocating blowing engines of this plant. The compressor is driven by a 1500-kw. steam turbine engine, and its normal capacity is 22,000 cu. ft. of air per minute at 15 lb. pressure, with an arrangement for automatically increasing the pressure up to 25 lb. The furnace has lately been operated with a blast pressure of 9 lb., but at the time of the visit this was down to 4 lb. A slip had occurred two or three days previous, following a change from a foundry iron to a basic iron burden. From having every tuyere frozen after the accident the management had succeeded in opening two, and rapid progress toward regular work was made on Wednesday, so that by night seven out of nine tuyeres were open. The visitors, while not able to see the regular operation of the turbo blower, were much interested in an inspection of the machine itself, which is a duplicate of the installation made early this year at the Oxford, N. J., furnace of the Empire Steel & Iron Company. These are the only two furnaces in the country to be so equipped thus far. Since the turbo blower at Port Henry has been installed the furnace has produced foundry iron ranging from 1.5 per cent. to 3 per cent. in silicon; thus exact comparisons cannot be made with the work of the reciprocating blowing engines, which was chiefly on basic iron. However, the claims of smaller steam consumption have been well borne out, as well as those of more regular working, due to the constancy of volume and pressure of the blast. Much reduced expense for lubrication is another advantage. The Cedar Point furnace is 69 ft. 3 in. high, with diameters of 10 ft. 6 in. at hearth, 17 ft. at bosh and 10 ft. 6 in. at stock line. The mixture is all magnetite, principally concentrates.

THE MINEVILLE PROPERTIES

After luncheon, which was served on the train, a start was made early in the afternoon for Mineville, six miles northwest of Port Henry on the Lake Champlain & Moriah Railroad. This road was built in 1868 and is owned chiefly by the Port Henry Iron Ore Company and Witherbee, Sherman & Co.

The usual grade from the lake level at Port Henry to Mineville is about 200 ft. to the mile, or about 4 per cent. Thus the power cost of hauling loaded ore cars to the docks at Port Henry is low. The roadbed is ballasted with ore tailings and laid with 90-lb. rails. The company is substituting 55-ton steel cars for its old equipment. In the first six months of 1910 the ore tonnage over this road was 437,825 tons. On the way to Mineville the train was run out upon the Y switch, over which several years ago a train of seven loaded ore cars made a flying leap of 340 ft., resulting in the complete wrecking of cars and locomotive. Details of this remarkable accident were given in *The Iron Age* of May 4, 1905.

The New No. 3 Concentrating Plant

What particularly impresses itself upon the visitor to Mineville is the amount of new construction and improvement work under way, as well as the thoroughly well kept condition of plant of all descriptions. It is estimated that fully $800,000 has been spent in new construction and machinery for Witherbee, Sherman & Co.'s properties in the past two years. The most important of the surface improvements made in the past year is the new No. 3 concentrating plant built to treat the ore from the Harmony mines. The Harmony ore is siliceous, and as mined runs 40 to 60 per cent. iron. The concentrates are about 63 per cent. in iron and 0.10 to 0.15 per cent. in phosphorus. The new separator was built so that ore could be taken direct from the mines, saving the present switching cost and leaving both Nos. 1 and 2 mills for the Old Bed ore. As the visitors saw the new mill all the machinery was turning, but no ore was being treated, and thus close observation of all machinery was possible without the clouds of dust encountered at the other mills. Some description of the equipment and of the flow of the ore through the mill will be of interest.

An 18 x 30 in. Blake crusher at B shaft and a No. 8 Gates crusher at A shaft take the ore from small bins in the pit head and crush it to 4 in. It is then carried up a 16-degree incline on 20-in. Robins conveyors to a 1500-ton cylindrical concrete bin, 50 ft. high from floor level, 21 ft. in diameter, and located midway between the two shafts. Of this storage 1100 tons will run out by gravity into a shaking feeder at the floor level, which feeds a continuous bucket elevator. From the head of the latter the stream is divided between two rotary screens, having 2-in. round holes. The rejections go to two No. 6K Gates crushers, and then back to the screens. The ore passing through screens goes to the first separator, a drum, Ball-Norton cobbing machine. With the ordinary run of Harmony ore, the first cobbers remove one-third to one-half of the stream as heads. The tails go to 42 x 16 in. special heavy Anaconda rolls, and then are elevated to two screens making ¼-in. ore, which goes to a double deck type Ball & Norton separator, and 1-in. ore, which goes to another pair of drum cobbers.

The rejections from the screens and the tailings from the cobbers go to a pair of 40 x 15-in. Anaconda rolls and are elevated back to screens. The tailings from the belt machine go to a third pair of 40 x 15-in. Anaconda rolls, and thence over another belt machine to make the final cleaning of the tailings, after which the tailings go to the pile or to railroad cars, as desired. The concentrates from all machines go up an elevator into shipping bins over a railroad switch, or may be put into a stock pile, which may be enlarged to hold 100,000 tons. The mill is designed to treat 85 tons of ore per hour, if it is desired to grind it all to ¼ in. or finer. For the ordinary run of ore it is expected the capacity will be 150 tons per hour.

By a special elevator and double bin it has been arranged to take one set of rolls and one belt machine out of the regular train and use them for making high grade concentrates, running 70 to 71 per cent. iron. To do this some of the regular ore is run into one-half of the double bin. This is drawn back into rolls and over the belt separator and up into the other half of the bin. This can then be repeated until the desired purity is attained. The average analysis of the Harmony concentrates is 62 per cent. iron and 0.12 per cent. phosphorus, and the present output is about 900 tons per day, with a capacity for 1500 tons per day.

The new separator building is of concrete blocks (reinforced through the air spaces), with monolithic concrete columns and floors, reinforced with old steel hoisting rope. In all 50,000 ft. of old hoisting rope was used, embedded in concrete. The building is 54 x 150 x 50 ft. high to the under side of the roof truss, with motor room 52 x 26 x 25 ft. and switchboard room 26 x 16½ x 25 ft. It has 30-in. square pilasters, 13-ft. centers, with 10-in. curtain wall between. The concrete floors are designed to carry 500 lb. per square foot. The building contains 600,000 cu. ft. of space, and the cost was about $35,000, or under 5 cents per cubic foot. The retaining walls and foundations cost $5000 additional. The total cost of the whole installation was about $160,000.

The mill is driven by two 200-hp., two-bearing, 440-volt., 3-phase, 25-cycle, 500-rpm., variable speed, induction motors, operated by reversible controllers. As a reserve a 300-hp., 440-volt, 250 to 500-rpm., induction motor was installed, and the shafting was so arranged that this can be substituted for either of the other motors. A 50-kw. motor generator set furnishes direct current for magnetic separators and lights. The set consists of a 125-volt, compound wound, d. c. generator, direct connected to a 440-volt induction motor.

Transformers and switchboards are all in a separate room and the panel controlling the magnetic separators carries an ammeter, fuse switch and regulating rheostat for each separate machine.

At A shaft a 35-hp., 440-volt, variable speed induction motor with reversible controller drives the crusher and a 20-hp., 440-volt, constant speed induction motor drives the conveyor taking ore to the bin, while a duplicate outfit drives the crusher at B shaft and the conveyor to the bin.

Bessemer Ore from Barton Hill

The most important development work now in progress at the Mineville group is at Barton Hill, whose summit is nearly 1800 ft. above the Lake Champlain level. One opening after another has been made in years past on the outcrop of the Barton Hill vein, one of these being the famous Lovers' Hole, from which 30,000 tons of Bessemer ore running 70 per cent. in iron was taken. The tunnel has been driven in a distance of 2300 ft., practically all in ore, and intersects in turn the various openings referred to, none of which have been worked in recent years. The tunnel will make it possible to take out the ore and water at a lower level. While a very considerable body of ore exists in the portion of the vein above the tunnel, diamond drilling has shown that a large portion is below the tunnel. The cores from this drilling show the continuity of the vein and the uniformity of the ore. Some of that thus far taken out through the tunnel is characterized by large crystals. The crude ore runs about 50 per cent. iron and 0.04 to 0.06 phosphorus. Concentration should give 67 per cent. iron and 0.01 per cent. phosphorus. The importance of this new operation, both to Witherbee, Sherman & Co. and to the Lackawanna Steel Company, which has a one-third holding in the former company, is apparent, in view of the lowering iron and rising phosphorus content of the ores now depended upon by the Bessemer steel industry of the country. Electric tramming, hoisting and pumping systems are being installed at the Barton Hill mine, and a separator will be built at the entrance of the tunnel.

Other Mineville Plants

Most of the other features of the afternoon trip at Mineville have been made more or less familiar to our readers by the descriptions which have already appeared in these columns. The open pit of the Port Henry Iron Ore Company, for example, which shows the outcrop of the famous No. 21 mine, was illustrated in *The Iron Age* of February 17, 1910, the same article being accompanied by a view of the No. 1 and No. 2 concentrating mills at Mineville, the electric hoist at Harmony Mines, and the Curtis turbines at Port Henry. A new hoisting and compressor plant at Clonan shaft of the Port Henry Iron Ore Company attracted considerable attention. The shaft is vertical, has three compartments, concrete lined and its foot is 541 ft. below the surface. A steel head frame has a storage capacity for 600 tons of furnace ore, 100 tons of crushed ore, 100 tons of lump ore and 300 tons of rock. The hoisting plant has a capacity for hoisting 2000 tons of ore in 24 hours from a depth of 1000 ft. The hoisting engine is of the duplex, direct acting Corliss type, with 20 x 42-in. cylinders. Two drums 7 ft. in diameter carry 1000 ft. of 1⅛-in. plow steel rope on one wind. The drums are driven by steam operated band friction clutches, and there are steam and hand brakes. Brake is applied automatically in case of overwind, and the throttle is also automatically closed. The rope speed of the hoist is 1500 ft. per min. at 110-lb. pressure. The compressor plant is of the Sullivan type, straight line compound steam and two stage air, 16 x 28 x 24 in. and 14½ x 24 x 24 in. The hoisting plant was furnished by the Sullivan Machinery Company.

A new installation at the central power plant of Witherbee, Sherman & Co. at Mineville is a 750-kw., low pressure turbine. The exhaust steam is taken from the Corliss engine and passes from the turbine to an Alberger surface condenser. This addition will increase the generating capacity of the station about 50 per cent., with about 30 per cent. economy of coal consumption. In case of accident to the Corliss engine the turbine can operate under high pressure steam direct from the boiler.

The Mineville office building of Witherbee, Sherman & Co. was built in 1907, of concrete blocks from separator tailings. Here the party was shown models of the mines, indicating the extent of the underground workings and the shape of the ore body at various depths and distances from working shafts. Among the cabinet specimens at the offices was a famous octohedral iron crystal taken from Lovers' Hole, for which the Smithsonian Institution at one time made an offer of $300, it being the largest iron crystal known.

Features of the various Witherbee, Sherman & Co. properties visited were explained by officers of the company, by S. Norton, the veteran superintendent at Mineville, and by S. Le Fevre, assistant superintendent. At the Port Henry Iron Ore Company's details were given by H. N. Brinsmade.

Wednesday Evening

A climax to the generous entertainment which made the entire trip memorable was a delightful reception given informally at the home of F. S. Witherbee, at Port Henry, Wednesday evening. The guests on this occasion added to their information concerning the turbo blower they had seen at the Cedar Point blast furnace in the forenoon, a number of lantern slides being shown, with sections of the six-stage compressor, by R. H. Rice and F. A. Larkin of the General Electric Company. A number of questions as to economies were asked and answered. H. B. Cox of the Empire Steel & Iron Company was called upon and, without having figures at hand, spoke of the results secured with the installation at the Oxford, N. J., furnace. Among the economies he referred to the fact that considerably less steam was required and a portion of the boiler capacity at Oxford is now out of commission. A very marked reduction was also noticed in the consumption of lubricant. An increased output of iron has been secured at Oxford also, but details were not given as to the extent to which the new blowing equipment is responsible for this.

The return train to New York left Port Henry at 11 o'clock Wednesday night, and with its arrival at the Grand Central Station Thursday morning terminated a highly successful and instructive excursion. To most of the visitors it brought a revelation of the great resources of the Port Henry district, and emphasized the progressive spirit which has marked the working out of its problems.

Members of the Party

H. E. Andrews, Lackawanna Steel Company, New York.
E. S. Atwater, Poughkeepsie Iron Company, Poughkeepsie, N. Y.
F. E. Bachman, Northern Iron Company, Port Henry, N. Y.
John Barkimeyer, Philadelphia.
George W. Blanchard, Boonton Iron & Steel Company, Boonton, N. J.
A. L. Bogle, New Jersey Zinc Company, New York.
R. P. Bowler, Guantanamo Exploration Company, New York.
Horace Boyd, Thomas Iron Company, Easton, Pa.
H. N. Brinsmade, Port Henry Iron Ore Company, New York.
D. F. Bush, Crocker Brothers, New York.
Robert Bull, New York.
S. H. Chauvenet, Berkshire Iron Works, Sheriden, Pa.
E. A. S. Clarke, Lackawanna Steel Company, New York.
H. B. Cox, Empire Steel & Iron Company, Catasauqua, Pa.
H. G. Dalton, Pickands, Mather & Co., Cleveland.
G. C. Davies, Pilling & Crane, Philadelphia.
Warren Delano, Lackawanna Steel Company, New York.
J. F. Dery, Witherbee, Sherman & Co., New York.
J. F. Desmond, B. Nicoll & Co., New York.
William Dette, Crocker Brothers, New York.
A. I. Findley, *The Iron Age*, New York.
Wallace T. Foote, Witherbee, Sherman & Co., Port Henry, N. Y.

L. W. Francis, Witherbee, Sherman & Co., New York.
A. W. Francis, New York.
S. S. Freeman, Carbon Iron & Steel Company, Parryville, Pa.
James Gayley, New York.
H. F. Hallman, Warwick Iron & Steel Company, Pottstown, Pa.
G. F. D. Hallman, Reading Iron Company, Reading, Pa.
W. W. Hearne, Matthew Addy & Co., Philadelphia.
August Heckscher, New Jersey Zinc Company, New York.
R. M. Heckscher, Richard Heckscher & Sons Company, Philadelphia.
Geo. A. Howells, Ingersoll-Rand Company, New York.
E. L. Herndon, Eastern Steel Company, Pottsville, Pa.
F. P. Huntley, Gould Coupler Company, New York.
J. E. Johnson, Jr., Republic Iron & Steel Company, Birmingham, Ala.
J. R. Jones, Alan Wood Iron & Steel Company, Philadelphia.
F. A. Larkin, General Electric Company, New York.
A. H. Lee, Lackawanna Steel Company, Buffalo.
C. H. McCullough, Lackawanna Steel Company, Buffalo.
Alfred Marshall, Juniata Furnace & Foundry Company, Philadelphia.
M. L. Seaman, American Bridge Company, Pencoyd, Pa.
J. B. Moss, American Steel & Wire Company, Worcester, Mass.
W. J. Mullin, Delaware & Hudson Railroad Company, Albany, N. Y.
Augustus Munson, Wharton Steel Company, Wharton, N. J.
A. D. Paine, Jr., New York.
J. Hervey Patton, Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa.
W. C. Pearson, D. G. Gautier & Co., New York.
Leonard Peckitt, Empire Steel & Iron Company, Catasauqua, Pa.
C. P. Perin, New York.
W. B. Perley, United States Steel Corporation, New York.
W. S. Pilling and J. R. Pilling, Pilling & Crane, Philadelphia.
A. W. Powers, Cohoes Rolling Mill Company, Cohoes, N. Y.
Veryl Preston, Eastern Steel Company, New York.
R. H. Rice, General Electric Company, Lynn, Mass.
Thomas Robins, Jr., Robins Conveying Belt Company, New York.
James P. Roe, Glasgow Iron Company, Pottstown, Pa.
C. M. Schwab, Bethlehem Steel Company, New York.
C. S. Sims, Delaware & Hudson Company, Albany, N. Y.
A. P. Smith, Boonton Iron & Steel Company, Boonton, N. J.
H. S. Snyder, Bethlehem Steel Company, New York.
H. B. Spackman, Lukens Iron & Steel Company, Coatesville, Pa.
C. J. Stark, *Iron Trade Review*, New York.
J. S. Stillman, Empire Steel & Iron Company, Catasauqua, Pa.
Noah H. Swayne, Rogers, Brown & Co., Philadelphia.
F. A. Wilmot, American Tube & Stamping Company, Bridgeport, Conn.
W. L. Wolfe, Lackawanna Iron & Steel Company, Lebanon, Pa.
Howard Wood, Alan Wood Iron & Steel Company, Philadelphia.
Dr. J. McG. Woodbury, General Electric Company, New York.
Philip E. Wright, Thomas Iron Company, Philadelphia.
Walter C. Witherbee, Witherbee, Sherman & Co., Port Henry, N. Y.
F. S. Witherbee, Witherbee, Sherman & Co., New York.

Canada's Market for Foundry Iron

TORONTO, July 20, 1910.—An item of the Canadian tariff that is likely to be reduced if the promises of tariff revision and of reciprocity negotiations Sir Wilfrid Laurier is making in the West are fulfilled, is that prescribing the duty on pig iron. Of that material the imports are steadily increasing. In the first two months of the current fiscal year, which opened April 1, the quantity of pig iron imported was 38,953 tons. Of this 21,653 tons came from the United Kingdom, 17,179 tons from the United States and 91 tons from other countries. The two marked features about the pig iron importations are their increasing magnitude and the increasing proportion coming from the United Kingdom. There was a time, not many years ago, when British pig iron sank to a very small place in the country's imports, and when it seemed that Canada would soon be producing all the pig iron required by its consumers. United States iron had displaced British iron, and Canadian iron, made from imported ore, was bidding fair to displace United States iron. But there has been a great change since then. The demand in Canada has swollen into much larger dimensions, the home supply, though also very greatly increased, is for the most part absorbed in steel making, and the British preference together with favorable ocean rates has tilted the advantage to the side of the British maker.

Canada's foundry industry has undergone marked development in recent years. The material required is not to be obtained from domestic makers in anything like adequate supply, and the importation of foundry grades has grown fast. Of the new foundries most are engaged in producing articles for which certain grades of pig iron are needed. That fact may also have something to do in turning the demand to the British market. The trade returns indicate that the British iron brought into the country is cheaper than the American, the 21,653 tons of British iron being entered at $277,697 and the 16,953 tons of American coke iron at $252,199. This makes an average price of a shade under $13 a ton for the British iron and $14.87 a ton for the American. The duty is $1 a ton in favor of the British iron, the general tariff rate—to which the American iron is subject—being $2.50 a ton, and the preferential rate being $1.50 a ton.

Foundry interests, whose protection under the tariff is quite moderate, are not loath to pay duties on their raw material if thereby they conduce to the growth of an adequate home supply of the material. But the home supply of foundry grades of pig iron falls shorter instead of increasing. The foundrymen have to pay the duty on their pig iron without seeing that there is any consequential growth of blast furnace output on foundry account. As it is, the farming portion of the community upon which the foundry interests depend for a market, and as the farmers are calling for the free entry of implements, the foundrymen cannot be blamed if they ask for free pig iron. At present the prospects for a greatly enlarged output of Canadian foundry pig are not encouraging. The furnaces at Sydney are likely to be kept busy supplying pig iron for the steel works there. If the Hamilton Steel & Iron Company builds a new furnace, as is projected, its additional output will probably be required for the production of the steel which the works of the several companies included in the Canadian Steel Company will need. The furnaces of the Algoma Steel Company will have all they can do to keep pace with the company's demand on steel rail account. The duties on the staple articles made of steel being generally sufficient for protection, and the demand for steel in the country steadily expanding, the drain on the furnace for the rail mills, rod mills, plate mills, &c., will be likely to increase. At the same time the demand for castings will go on enlarging and the consumption of the foundries will increase. Importation of foundry grades must therefore also increase or the home manufacture of such grades must become much greater than it is.

C. A. C. J.

The Lake Superior Mining Institute

A more detailed announcement is made by the secretary, A. J. Yungbluth, Ishpeming, Mich., of the fifteenth annual meeting of the Lake Superior Mining Institute, which will be held at Ironwood, Mich., Wednesday, August 24. The day will be spent in visiting various mines on the Gogebic Range and a business session will be held in the evening. At 11 p.m. a special train will be taken for Chicago and Gary, Ind., where the plant of the Indiana Steel Company will be visited. On Thursday there will be a brief inspection of the shops of the Chicago & Northwestern Railroad at Chicago, and later the plant of the Sullivan Machinery Company, 1170 West Lake street, will be visited. A trip will be made by automobile to the warehouse of Joseph T. Ryerson & Son, Sixteenth and Rockwell streets, where luncheon will be served, followed by an inspection of the warehouses and connected shops. Thursday evening a business session will be held at Gary and the visit to the steel works will occur on Friday. On Friday evening a banquet will be held at the Auditorium Annex, Chicago. At Ironwood the headquarters for the meeting will be at the Ironwood Club.

The Allis-Chalmers Gas Engine Blowing Unit

Large Order Recently Shipped to Canada

The accompanying illustrations show the two component parts of the Allis-Chalmers standard gas engine blowing unit. Fig. 1 is a view of the gas engine, and

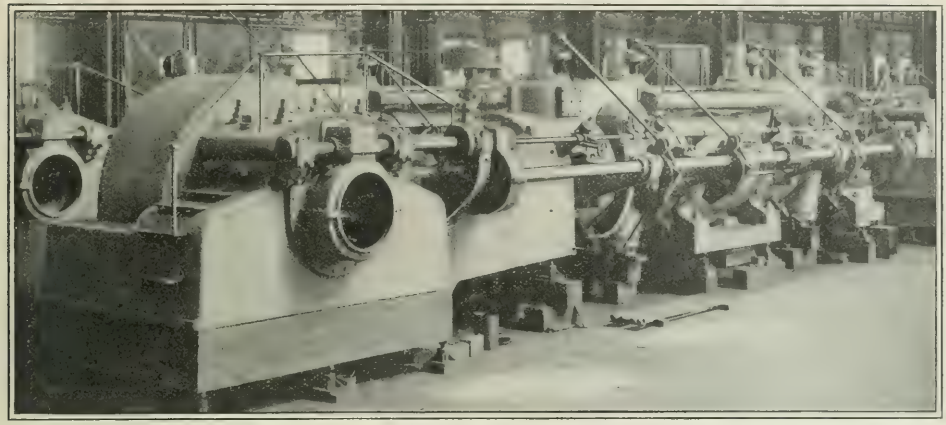


Fig. 1.—The Gas Engine Used in the Gas Engine Blowing Unit, Built by the Allis Chalmers Company, Milwaukee, Wis.

Fig. 2 shows the Slick blowing tub for which the engines furnish power.

During the past few months the Allis-Chalmers Company, Milwaukee, Wis., has shipped two of these units and four gas engine generating sets to the Lake Superior Iron & Steel Corporation at Sault Ste. Marie, Ontario, Canada. In addition to the above equipment, two more blowing units are being constructed and are

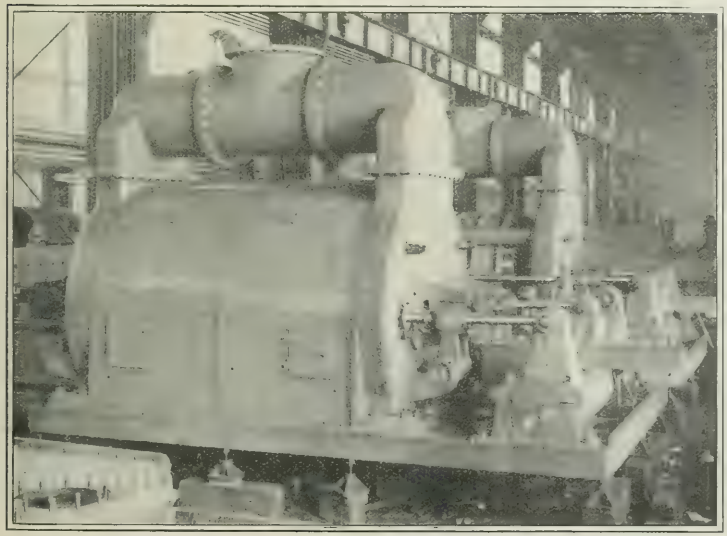


Fig. 2.—The Slick Blowing Tubs Forming a Part of the Units Shipped to Canada.

rapidly nearing completion. The gas engines are all alike, being of the twin tandem four-cycle type, with cylinders 34 x 48 in. and conform to the builder's standard in all respects. Four outfits are direct connected to 1765-kva. 25-cycle three-phase 2300-volt alternators running at a speed of 107 rev. per min. and supplying power for driving the various motors around the plant. The other four engines are to be connected to the new Slick blowing tubs shown in Fig. 2. These tubs are 48 x 64 in. and are arranged for duplex operation on the opposite side of the main shaft from the engine. Each blowing unit has a capacity of 25,000 cu. ft. per minute when running at 72 rev. per min., but can be speeded up to 85 rev. per min. if necessary. The gas for the engines will be supplied from the blast furnaces of the plant. While some idea of the size of these units can be secured from the engravings, perhaps a better idea will be obtained when it is stated that each unit has an approximate weight of 1,000,000 lb., and to transport it from the shop at Milwaukee, where it was built, to its destination 12 large size flat cars were required.

These gas engines are being installed in a large extension of the Lake Superior Iron & Steel Corporation's plant, which when completed will make the works the largest steel producing plant in Canada and also the most modern. The improvements include greatly increasing the capacity of the original rail mill and the erection of new plate and merchant mills, together with the construction of a large coke oven plant. The latter consists of 110 ovens of the Koppers type, arranged in two batteries of 55 each. These ovens are 37 ft. between the doors, 17 in. at the pusher end, 21 in. at the quenching end and 9 ft. 10⅜ in. at the top of the arch. The yield of coke per oven, it is estimated, will be nearly 1200 tons per day and approximately 10,000,000 ft. of surplus gas will be available for the generation of industrial power. A brief description of the coke oven plant was printed in *The Iron Age*, December 9, 1909. It will greatly increase the efficiency of the works.

The Collin Regenerative By-Product Coke Oven

A Successful German Type Recently Introduced in This Country

Germany has perhaps been noted more than any other country for the development of means and ways for utilizing by-products. One of the devices which has reached a high state of development there is the coke oven, and one of the most prominent builders is F. A. Collin of Dortmund. The first Collin oven was built in 1868, and the latest design of oven embodying the regenerative principle was perfected about three years ago and is now being introduced in America by the Coal Distillation Company of America, Singer Building, New York City. The principal features of the construction of this oven are shown in Figs. 1 and 2, which are longitudinal and transverse sections, respectively, while Fig. 3 illustrates the distribution of heat in various types of ovens.

The advantages claimed for the system of heating employed in this oven are as follows: First, the uniform heating of the entire oven wall length is assured because each vertical heating flue is heated continuously by burning live gas with hot air, the quantities of each being under perfect control. Second, the products of combustion do not have to travel along a top horizontal flue connected with all the vertical ones in order to reach that leading to the regenerators. On the contrary, each flue has its own individual flue for the products of combustion immediately adjoining, and the gases have therefore a short, unobstructed passage under equal suction to the chimney. Third, in the Collin oven the coking chamber is alternately heated from the bottom and the top, this method permitting the use of a higher oven chamber with greater coking capacity without the danger of overheating the bottom of the chamber. Fourth, the placing of the regenerators outside the oven battery is advantageous because the temperature of all regenerators is constantly changing, and the consequent movement of the checker work and walls is not transmitted to the ovens themselves.

The oven chambers are formed of special firebrick and are rectangular in general outline, with a small taper toward the discharge end. The coal is introduced through charging holes in the top, and is leveled by a leveling machine, operating through a small door at the top of one oven end. The gases evolved during the coking of the coal leave the oven chamber through a pipe in the middle of the oven top, and are conducted to the by-product plant, whence part of the thoroughly cleaned gas is returned to the ovens for coking fresh charges of coal. A battery of these coke ovens is connected to two sets of regenerators, placed outside the battery itself, and in their turn communicate with a chimney for producing the necessary draft.

The heating of the ovens takes place in two phases or periods. The gas having been returned from the by-product plant through gas mains at either end of the ovens, is in the first period introduced into distributing chambers by six pipes for each oven wall, three at either end, provided with cocks for regulation. In these distributing chambers the gas is not mixed with air and therefore not burnt.

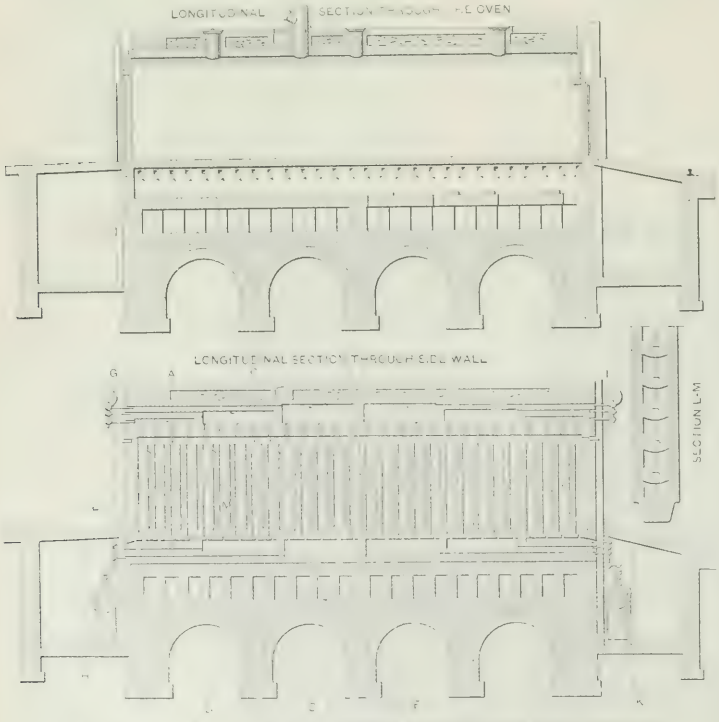


Fig. 1. Sectional Elevation of the Regenerative By-Product Coke Oven, Designed by F. A. Collin, Dortmund, Germany.

From these six distributing chambers the gas ascends through slots into each vertical heating flue as indicated by the arrows, Fig. 1. At the bottom of these heating flues and in a plane with the sole of the oven are ports *p*, through which air is admitted that has been brought to about 1000 degrees C. by first passing through the regenerators outside the oven battery and then through the rectangular firebrick passages *r*, located underneath the entire battery of ovens and running at right angles to the oven chambers. This air, on entering, causes combustion of the live gas in each flue. The amount of air and the draft are regulated by dampers in the flues under the oven soles. The flames pass up the heating flues and descend through the adjoining flues *s*. The products of combustion then pass through the two sole flues of each oven and finally into one-half of the

rectangular passages *r*, where a large portion of the heat is absorbed. These passages lead to the regenerator, where the remainder of the heat is given up. The gases leaving the regenerator retain only sufficient heat to produce the necessary chimney draft.

When this heating has proceeded for a certain period, generally half an hour, the flow of gas and air is reversed. The gas then enters at the top of the

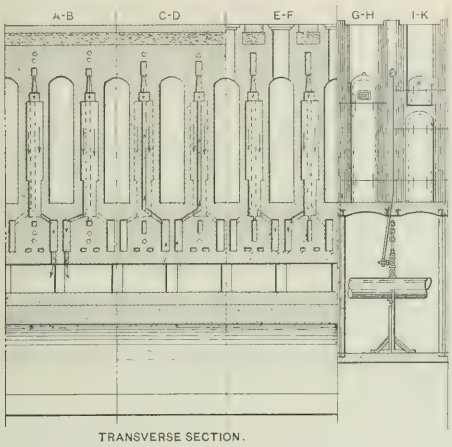


Fig. 2.—Sections at Various Points in Fig. 1.

oven and the gas inlets at the bottom are closed by an automatic reversing arrangement, which also changes the direction of the air by turning a wing valve in the chimney flue. At the upper end of these flues the gas is met by the air which has been heated by passing through the second of the outside regenerators and then through the passages in the ovens. The products of combustion again enter the sole flues and thence pass through the other half of the rectangular passages underneath the sole flues into the first outside regenerator and finally to the chimney.

The principle on which regenerative coke ovens have hitherto been built is that the walls are heated alternately by live gas and waste heat, letting the incandescent products of combustion which come from one set of flues pass through another set and periodically reversing this operation. After having given up part of their heat to the oven walls, these products of combustion, still at a high temperature, enter chambers of checkered firebrick, which they heat to redness and leave at a comparatively low temperature. There are two such regenerators which are alternately heated. The air required for the combustion of the live gas in the oven flues is passed through one or the other of these hot regenerators and enters the flues at a temperature of about 1000 degrees C. In this way much less live gas is required for carbonizing a given charge than in the waste heat oven without regenerators, where the heat of the burnt gases is used for generating steam.

This method of heating the ovens partly by live gas and partly by waste heat and periodically changing these two sources of heat from one part of the oven wall to another, as is done in some types of regenerative coke ovens, is said to possess serious drawbacks. In the first place, the heat of the products of combustion is less than the heat of the flame itself. Hence, it follows that the part of the oven heated by the direct flame will be hotter than that warmed by the waste heat. Aside from affecting the quality of the coke and increasing the time required for the coking process, this constant variation in the heat supplied to the oven walls affects the brickwork, and regenerative ovens of this kind have a shorter life and require more repairs than waste heat ovens which have no regenerators, generally speaking.

A further drawback to some regenerative ovens is the unequal distance the heating gases have to travel in different parts of the oven and the unequal drafts thus caused which produces differences in the heat of the various flues. To illustrate this, the top diagram, Fig. 3, shows the mode of heating an oven wall in two well-known systems of regenerative coke ovens, the shaded portion indicating the part of the oven wall heated directly by gas, the unshaded portion that warmed by the products of combustion. As all gases naturally take the shortest route to the chimney, it is obvious that the flues nearest to either side of the middle division will have the strongest draft and will carry the bulk of the hot gases. A smaller quantity is thus left for the flues nearer the ends of the oven and as a consequence the oven will be hottest in the middle.

Another firm of regenerative oven builders has recognized this defect and tried to remedy it by dividing the oven walls into four parts. The second section of Fig. 3 shows this mode of heating, the shaded portions again indicating the parts of the oven wall heated directly by live gas and the unshaded ones those heated by the products of combustion. Another type of regenerative oven has been constructed in which the principle of subdividing the oven wall into parts heated directly by live gas and by the products of combustion has been still further carried out, as shown in the third section in the diagram. This is an improvement, but it does not eliminate the drawback that the different parts of the oven walls are alternately heated by live gas and the products of combustion.

As will be seen from Figs. 1 and 2, and the foregoing description, this type of oven has a system of flues constantly heated by direct flames, which in one period travel upward from the lower part and downward from the top in the other period, but always heating the same flues in both. The products of combus-

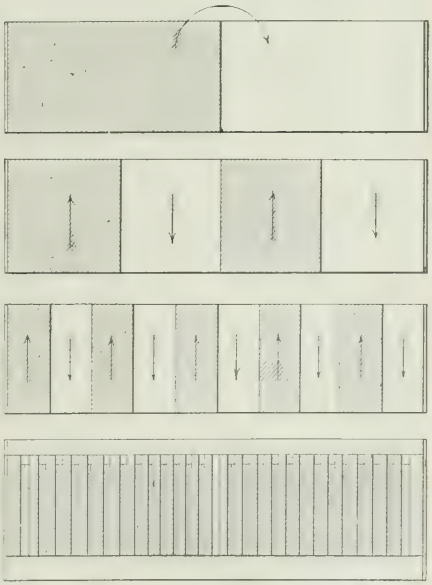


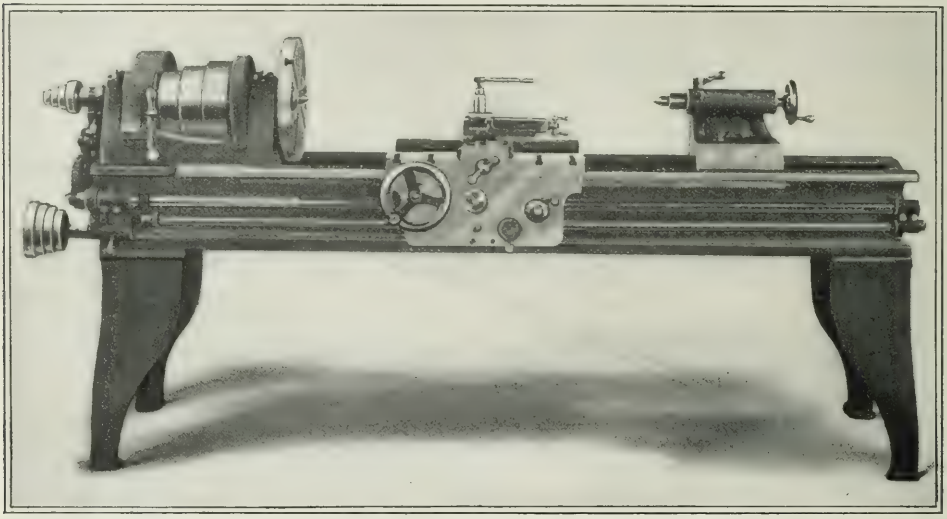
Fig. 3. Diagrams Showing Methods of Heating the Walls of Regenerative Ovens in Common Use.

tion in this oven are drawn off in a set of special flues, one of which immediately adjoins each heating flue. These products of combustion do not, therefore, exclusively heat any large portion of the oven wall, but are so thoroughly subdivided and the flues which carry

them to the regenerators are so intermixed with the heating flues of the oven that the temperature in every part of the oven wall is said to be absolutely uniform, the draft on all the flues is equal and the walls therefore are not subject to expansion and contraction, but remain permanently tight. The result is that the Collin oven produces a coke of more uniform quality, that the coking time is shortened and the life of the oven itself prolonged. This method of heating is diagrammatically indicated by the bottom diagram, where the shaded portions again indicate those parts of the oven wall heated by live gas and the unshaded portion those parts along which the products of combustion travel.

The Miami Valley 16-in. Engine Lathe

A new tool, which has just been brought out by the Miami Valley Machine Tool Company, Dayton, Ohio, is the 16-in. standard engine lathe with double back gears, shown in the accompanying illustration. It is of



The 16-In. Back Geared Engine Lathe, Built by the Miami Valley Machine Tool Company, Dayton, Ohio.

the same general design as the 15-in. single back gear lathe made by this company, which was illustrated and described in *The Iron Age* March 11, 1909. The headstock is massive and has a long bearing to resist chatter or vibration under heavy cuts. It is driven by a wide three-step cone pulley and this, together with the double back gears, makes the lathe a powerful heavy duty machine. The back gears are shifted by the hand lever on the head stock and have ratios of 5.6 and 9.6 to 1 for the single and double gears, respectively. The tail stock is of the off-set design and will permit using the compound rest at right angles or parallel with the bed.

The carriage is of the T-slot design with a bearing 23½ in. long. It is gibbed both front and back and the cross bridge is heavily ribbed. The cross slide and compound rest are of heavy design and are also well gibbed. The slide for the latter has been lengthened to give a 5-in. feed. Five to 40 threads per inch can be cut, including an 11½ to the inch pipe thread, all of which can be cut without stopping or reversing the lathe. The feeds in both the apron and the head are reversible and it is impossible to engage the screw and the feed rod at the same time. This machine can be used with either belt driven or positive feed and the gear on the feed meshes with either a gear on the cone pulley shaft or a gear on the lead screw. The lathe is equipped either with a compound or plain rest and other accessories furnished as a part of the regular equipment include a full set of change gears, large and small face plates, follow and steady rests, a double friction countershaft and wrenches.

Western Shippers to Aid the Commerce Commission

A representative committee of Western shippers will take an active part in the proceedings before the Interstate Commerce Commission to determine whether the railroads are justified in making a general advance in freight rates. The committee will not place itself in active opposition to the railroads, but will merely submit statistical data and other evidence which may be of value to the commission in considering the case. This committee is the outgrowth of a conference or convention of shippers which was held at the Congress Hotel, Chicago, May 17, last. A general committee was appointed at that time for the immediate purpose of securing a postponement of any general advance in rates until the reasonableness of such advance could be considered by the Interstate Commerce Commission.

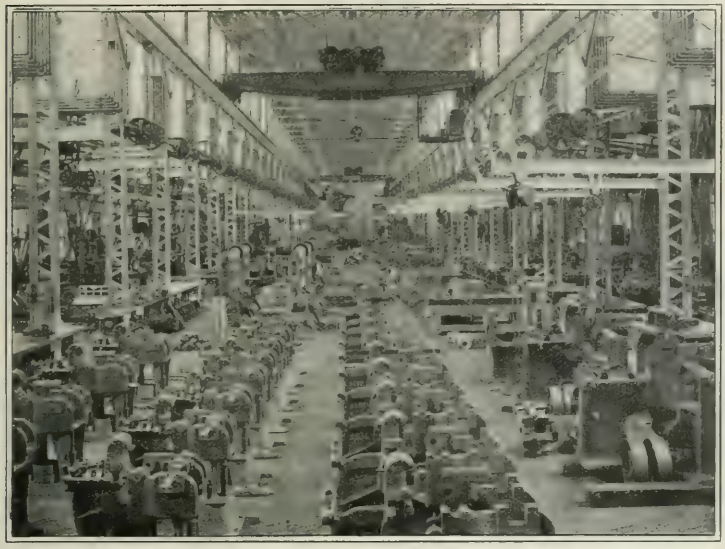
The preparation of data for the commission is now in charge of a subcommittee of which Frank B. Montgomery, traffic manager of the International Harvester Company, Chicago, is chairman, Mr. Montgomery being also chairman of the Traffic Committee of the Illinois Manufacturers' Association. The other members of this committee are E. J. McVann, Omaha, Neb.; H. G. Wilson, Kansas City; J. C. Lincoln, St. Louis; W. P. Trickett, Minneapolis; E. E. Williamson, Cincinnati, and H. C. Barlow, Chicago. All are actively identified with large shipping interests.

The Jackson & Church Company, Saginaw, Mich., has broken ground for a new boiler shop, 95 x 240 ft., to be of brick and concrete construction. As soon as this building is completed the company will take down its present machine shop, which is of steel construction, 50 x 225 ft., and add 125 ft. to its length and 40 ft. to the width, making a machine shop 90 x 350 ft. Both buildings will be equipped with traveling cranes when completed. It is also the intention of the company to remove and consolidate its two foundries, thus enabling it to do light and heavy work under one roof. The company will do its own structural iron work and erecting.

An Exposition of Bolt, Nut and Forging Machinery

The National Machinery Company to Show New Models

Arrangements have been completed by the National Machinery Company, Tiffin, Ohio, for an exposition of modern bolt, nut and forging machinery, to be held at its shops on August 19, 22 and 23. Two years ago this company completely remodeled and greatly enlarged its plant, installed a number of electric traveling cranes and adopted electric power for driving the tools throughout the entire plant. The entire lower end of the main shop will be devoted to the exposition, and the accompanying illustrations are two views of the center bay of the shop.

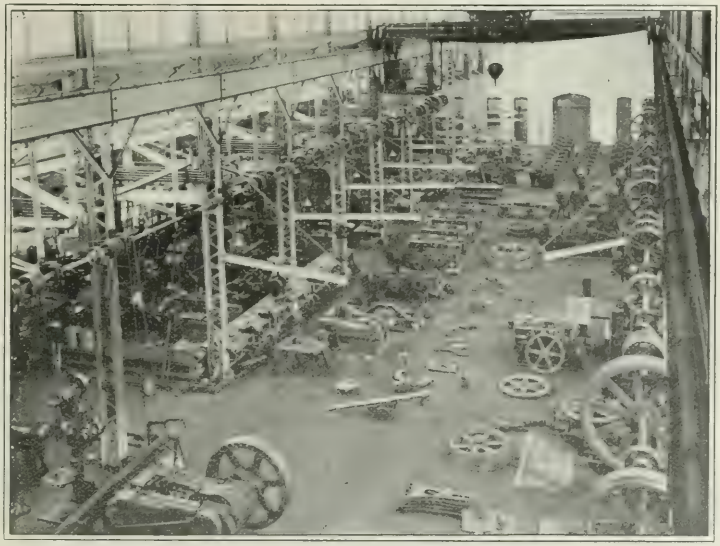


Center Bay in Shop of the National Machinery Company, Tiffin, Ohio, Where Exposition Will Be Held.

The exhibit includes forging machines, bolt headers, continuous and automatic rivet machines, several types of automatic machines for tapping and boring hot pressed nuts, two of which were illustrated and described in *The Iron Age*, February 4, 1909, and April 28, 1910, respectively; vertical roll threaders for handling bolts and long rods, lag screw gimlet pointers, bolt pointers, shears, die sharpeners and bolt cutters. The four-spindle model of the last was illustrated and described in *The Iron Age*, February 3, 1910. Many of the machines will be directly driven by electric motors to show the National method of motor application. In addition to these machines the company has developed and will exhibit for the first time a number of new designs, the object being to familiarize the trade with them by demonstrating their actual service conditions so far as the shop facilities will permit. Altogether over 50 machines will be shown on the exposition floor and most of these will be in operation.

A number of invitations have been extended to firms and individuals interested and the International Railroad Master Blacksmiths' Association, which will be in convention at Detroit, August 18 to 20, will be conveyed to Tiffin on a special train to attend the exposition on Friday, August 19, which has been set apart as Master Blacksmiths' Day. On the other two days of the exposition the bolt and nut manufacturers, the mechanical heads of the railroads and general industrial representatives will be the guests of the company at the exposition, and special provision has been made for the accommodation of all guests.

The mutual benefit to be derived from exhibits of this character cannot be overestimated, for while it furthers the aim of the manufacturer in getting his product before prospective customers, at the same time they keep the user in touch with the very latest designs and methods employed and enable him to improve his equipment by the adoption of those designs and methods. This will doubtless be of interest to other manufacturers whose products can be thus shown.



View of Same Bay, Looking in Opposite Direction

The Motsinger Rotary Engine

A Three-Rotor Model Combining Two Engines in One

The single rotary piston engine has, from the invention of the first steam engine, been the ideal of most inventors and mechanical engineers, and perhaps more money has been spent in research work on this type of engine than all the others combined. The Motsinger double rotary engine, built by the Motsinger Rotary Engine Company, Greensburg, Pa., is said to offer a solution of the problem by eliminating the bad features of the reciprocating and turbine engines and retaining all their good points. Fig. 1 shows the engine driving a centrifugal pump, Fig. 2 is a sectional elevation of the engine, Fig. 3 is a section through the cylinder and Fig. 4 is a section showing the manner of packing which is one of the special features of the engine. These engines can be used for driving all sorts of machinery through a belt connection from the flywheel or by direct connection to the shaft of the driven machine and can operate electric generators of centrifugal pumps.

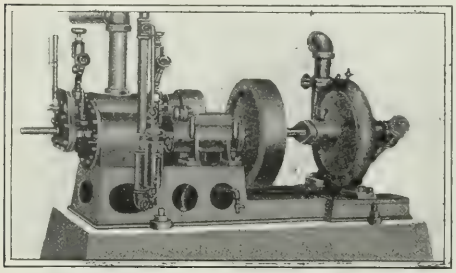


Fig. 1.—The 20 Hp. Rotary Engine, Built by the Motsinger Rotary Engine Company, Greensburg, Pa.

The Cylinder

The engine comprises a cylinder *d* having three bores, whose axes are in the same plane. Three rotors, *e*, *f* and *g* (Fig. 3), are mounted in these bores, the central rotor being formed with a longitudinal groove *h* and the side ones having a longitudinal vane *i*, the radii of the outside bores being greater than the radius of the middle bore by the hight of this vane, and these outside bores cut into the middle one a depth equal to the difference of their radii. A fourth bore is found directly above the center rotor, and a hollow cylindrical reversing valve *a*, is mounted therein and extends at each end into the heads *j* and *k*.

The cylinder also is formed with a steam space *l* (Fig. 2), surrounding the rotors to equalize the heat expansion of the cylinder to the rotors. An inlet *m*, at the bottom of the cylinder admits steam from the boiler to this steam space, and an outlet *n*, at the opposite side of the cylinder leads the live steam into either end of the reversing valve and out at exhaust pipe *o*. The complete cylinder is covered with asbestos and sheet iron jacket to prevent radiation.

Both cylinder heads are exactly alike, being cast from the same pattern. They are of a form corresponding to the cylinder to which they are secured at each end facing each other. Each head is formed with bores for the shafts *p*, *q* and *r*, and a bore to receive the reversing valve. Three ports lead from this last bore to and from the engines—two exhaust ports *b* and *c*, which are alternately closed at either end by the reverse valve in reversing the engine and one common inlet chamber, *s*, in front of the cut-off plates. This port is only open to live steam when the exhaust ports are closed. Around the center shaft the head is counterbored to receive a stationary plate containing two ports, one port communicating with one engine through port *t*, and the other with the other engine through port *u*.

Over these two ports revolves a cut-off plate *n n* secured by a collar to the center shaft. It has but one port, and as it revolves, steam is cut off for each engine as desired, and allowed to expand the rest of the cycle. In the heads are cored two shoe-shaped ports *t* and *u*, which lead directly into the expansion chambers behind the vanes of the outside rotors. They are diametrically opposite to each other, and since the heads are placed facing each other on the cylinder, these ports will always stand diametrically opposite each other but reversed in position. Hence, it is only necessary to reverse the steam from one end of the cylinder to the other, by the reversing valve to reverse the engine.

Over the chamber containing the cut-off plates is fitted an end plate *j* through which the reverse valve is fitted and a portion *v* is flanged and notched to secure the pawl *w* of the valve handle *x*. A similar head plate is formed by the end of the gear case *y* for the opposite head of the engine.

The Reversing Valve

The reversing valve *a* is a hollow cylinder extending from end to end of the engine through the cylinder

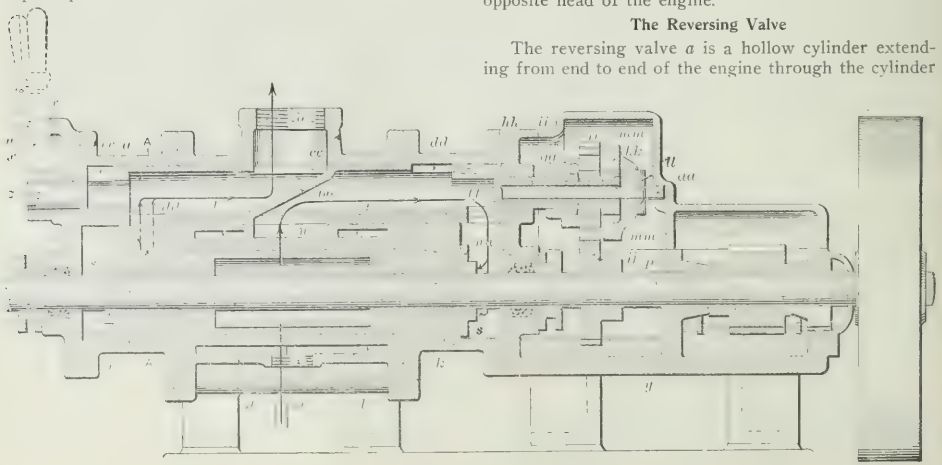


Fig. 2.—Sectional Elevation of the Engine.

and the heads to communicate with the several steam chambers and ports. At the head end it is formed with a journal *z* projecting through the end plate *j*, on which is mounted a lever for turning it, which carries a common form of securing pawl adapted to engage in notches in flange on the face plate to secure the valve in the adjustment desired.

On the opposite end this valve is formed with a shaft, *a a*, extending into a bearing formed in the inner face of top of the gear case *y*. The valve is divided into two chambers by a central diagonal partition, *b b*, being formed with a center port on one side of said partition and another center port, *c c*, on the opposite side, both of which are adapted to communicate with

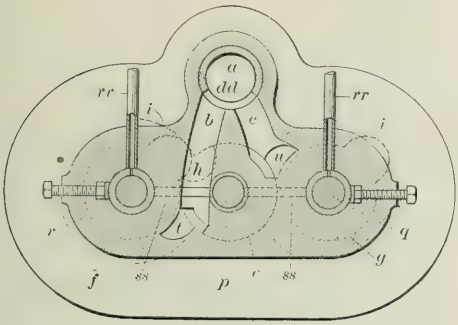


Fig. 3.—Section Through Cylinder Along A A.

the live steam outlet *n*, from the steam space *l*, and with the exhaust outlet *o* in the cylinder *d*, according to the position of the valve. The exhaust pipe of the engine is connected with the exhaust outlet of the cylinder. Near each end but on opposite sides of the valve are formed ports, *d d*, which, when the parts are in the position shown in Fig. 2, one will open the exhaust ports *b* and *c* (Fig. 3) in the head *j* to the air, while similar exhaust ports are closed in the head *k*. On the opposite side and nearer the end of the head *j* it is formed with a port *e e*, adapted to communicate, when in the proper position, directly with the inlet steam chamber *s* in the head. Its extreme end in head *k* is reduced in diameter to receive the governor sleeves, and a port, *f f*, therein communicates with the inlet steam chamber.

The Governor

The governor comprises a sleeve, *g g*, mounted around the end of the reversing valve, and a second sleeve, *h h*, mounted outside the first one. This outer sleeve carries a gear wheel *i i*, which meshes with a second gear wheel, *j j*, on the shaft of the center rotor. The inner sleeve *g g* extends through the outer sleeve *h h* beyond the outer face of the gear wheel mounted thereon and carries a pinion, *k k*. The gear *i i* is provided with stud shafts on two diametrically opposite sides of its axes on each of which is mounted a weighted governor arm *l l*, the hubs of which are formed with teethed segments, *m m*, on their adjacent edges, which are adapted to mesh with pinion *k k*. A coiled spring connects the outer ends of these weighted arms to hold them normally toward each other. A second spring is coiled around the sleeve *g g* in a chamber in the hub of the wheel *i i*. One end of this spring is connected with the pinion *k k* and the other end to a worm wheel mounted on sleeve *g g* and engaging with a worm, by which it may be turned to regulate the tension of the spring as desired.

These springs can be used together or one may act as a substitute for the other. Two ports in both sleeves, *g g* and *h h*, are adapted to register with port *f f* in the reversing valve. Thus the steam is not only cut off as desired by the ports revolving over the port in the reversing valve, but the size of the ports is constantly varied to suit the load by the centrifugal movement of the weighted arms, thus making what is said to be the most perfect of automatic cut-off governors.

The several rotor shafts extend through the gear case and are journaled in bearings provided with bronze bushings and oil rings in its ends and in the partition at the right end (Fig. 2). They are geared together by strong cut steel gears, which are pinned on the respective shafts, and run in oil, and the shaft of the center rotor extends to the outside and is provided with a fly wheel, by which power is transmitted from the engine.

Packing the Engine

Much of the power and economy of any engine using steam expansively depends upon tight fitting and durable packing, which is one of the special features of this engine. The method followed, which is described at length further on, is said to be very efficient, and the longer the surfaces of the rotors roll upon each other the smoother they get, and the tighter the fit. Fig. 4 shows the method of packing the ends of the rotors as well as the tops of the vanes.

Each side rotor is formed with a recess in its ends, in which is mounted a steam packing ring secured on splines, *o o*, and normally held outward against the heads by the coiled springs *p p*. Radial grooves are formed in the rings, in which are mounted packing strips, which are normally held outward by the coil springs *q q*. The vanes *l* are also formed with longitudinal grooves in which longitudinal packing strips are mounted. Both grooves and the packing strips are T-shaped, the wide portion being at the bottom of the groove to hold the strip in place. These strips are planed off to fit the bores they are to travel in, and three or four coiled springs are inserted beneath them which, with the centrifugal force of rotation, hold them steam tight against the wearing surfaces and take up the wear. The middle rotor is packed in the

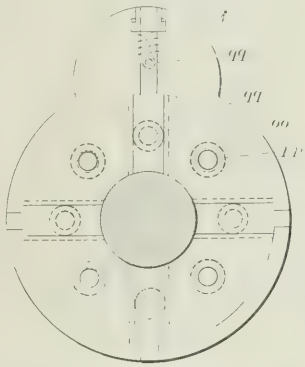


Fig. 4.—Section Showing Method of Packing.

same way by the use of four longitudinal packing strips, one set on each side of the groove, and all four are 90 degrees apart, so that two of them (one above and one below) are doing service all the time in keeping the steam from passing from one engine to the other. But a few thousandths of an inch play is given beneath all these packing strips, and the corners of the cylinder, where the bores cut into each other are rounded so as to allow them to glide smoothly in and out of service in rotation. As soon as they wear to a polished surface they become very hard and cease to wear and scraping the oil before them, make the engine almost as tight as a bottle.

The ends of the middle rotor are packed with four radial packing strips set in a packing ring similar to the ones used in the side rotors.

The shafts of the outside rotors, Fig. 3, are journaled on bearings which are lined with split bushings, which are sawed to form a flexible tongue in the middle about three-fourths of their length. The flexible parts are held by spring gibs, under tension of adjusting screws, against the shafts for the purpose of keeping the side rotors steam tight against the center rotor, and to compensate for any wear that may take place in the bearings. These set screws should not be touched more than once or twice per year, as high-grade phosphor bronze bushings are used on the long bearings and the wear is very little. The center rotor having almost equal lateral steam pressure, and being closely held by the contact of the side rotors, needs no lateral adjustment and will run for years if properly oiled.

The cylinder of the engine is oiled by any good sight or force feed lubricator. All three bearings in each head are well oiled by a single lubricating cup attached to the oil pipes, *r r*, Fig. 3, which lead to each side rotor bearing. From these bearings oil holes, *s s*, lead to the center bearing. These bearings also get some oil from the cylinder lubrication.

It will readily be seen that, although this engine takes steam twice per revolution as a unit, each separate engine takes steam but once per revolution, and exhausts but once, and continued steam pressure is obtained during almost a complete revolution. With cut-offs set at the same point of stroke twice the expansion of the ordinary reciprocating engine or the equal of a compound engine is said to be obtained without the trouble of compounding the cylinders which makes the engine the equal of a quadruple expansion engine.

There are several ways these engines may be compounded. Three of these are:

1. By setting the high pressure cylinder on top of the low pressure cylinder, and gearing the center shafts of the two engines together, which will require a set of gears for each engine and a pair of gears connecting the center shafts; 2, by setting the high and low pressure cylinders tandem—the low pressure cylinder being larger in diameter as well as longer—and directly connecting the center shafts of both engines which will require two sets of gears—one for each engine; 3, by setting the high and low pressure cylinders tandem—both cylinders being of the same diameters, the low pressure being made longer to receive the expanded steam, when only one set of gears are needed, since both the high and the low pressure rotors may be placed on the same shafts, the middle head being split horizontally to permit assembling. Compounded in any of these ways, the engine can be run compound or simple forward, or simple backward. It will occupy as little space as the turbine, and used with a condenser ought to prove most economical, as the steam will be used expansively against close fitting rotors for almost two turns, and is cut-off completely twice. There being no dead points, the power will be steady and the steam exhausted at almost atmospheric pressure.

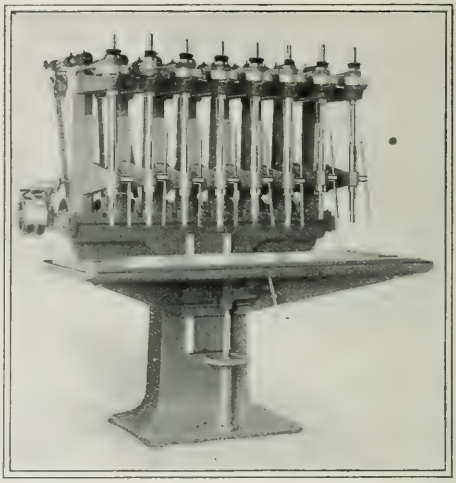
Five sizes of engine, ranging from 5 to 80 hp., are regularly built, but the maker can supply larger sizes of simple engine under special contract or compound engines for large electric light and power purposes. In the engine described the rotors run at the same speed, but the maker has developed a new type in which the ratio between the outside rotors and the middle one is 2 to 1.

The Chicago, Rock Island & Pacific Railway Company has leased the real estate and plant of the Blue Island Rolling Mill & Car Company at Blue Island, Ill., for three months, with the privilege of buying the property prior to October 31. The lease was entered into July 15 and was signed by F. H. Niles, president of the Blue Island Company.

The Henry & Wright Eight-Spindle Drill

A new line of ball-bearing drilling machines has been brought out by the Henry & Wright Mfg. Company, 111 Sheldon street, Hartford, Conn., and is illustrated herewith. The special features of this new model are a wider, heavier and better balanced base, a wider tableway, a much heavier table with oil grooves twice as wide and deep as formerly, a new design of idler pulley and belt guide for adjusting it, a new dust-proof thrust bearing and a new weight chain.

Like the drill which was illustrated and described in *The Iron Age*, July 4, 1907, these machines are built



The Ball-bearing Eight Spindle Sensitive Drill, Made by the Henry & Wright Mfg. Company, Hartford, Conn.

in from one to eight spindle sizes, the latter being the one illustrated, and have the distances from the spindle centers to the face of the column so arranged as to be able to drill to the center of 14, 19, 24 and 30 in. circles, respectively. Another point of difference between the 1910 model and the one previously described is that while in the latter the table was made in two parts, the table with the new model is in one piece and is elevated and lowered in a different way. In the older model telescopic screws operated from a handle at the front of the table were employed. In this model the hand wheel underneath the table controls its vertical motion through a screw and the handle at the right of the screw serves to clamp the table rigidly at the desired hight.

The Power Specialty Company, 111 Broadway, New York, is just completing at its works in Dansville, N. Y., a modern foundry 100 x 140 ft., with electric traveling cranes, industrial railroad, core ovens and core machinery, molding machines, &c.; in fact, a complete equipment, which has been made necessary by the growth of business in Foster superheaters and Heenan refuse destructors. The building is of steel frame structure, brick filled above the line of the window sills, which are of molded concrete extending all round the building. A novel feature is the use of electrical conduit seconds, 13 in. square, for the walls between the concrete foundations and the concrete window sills. This proves a very substantial form of construction and is quickly laid. The company has received orders the past month for superheaters from a large number of localities in nine different States and in Canada, and for a 60-ton refuse destructor from Montgomery, Ala.

The Economy Oil Cup

On September 28, 1909, United States letters patent were granted to Eugene M. Crozier, Augusta, Ga., covering a removable lubricating device having a felt base and described as a bearing lubricator. This invention was the result of two years' diligent experiment by Mr. Crozier to perfect an oiling device for lubricating bearings of street railway cars that would eliminate the old and inefficient system of filling the grease box with waste and permitting the oil to pass through it into the bearing slot. The engravings show the form in which the invention now known as the Economy oil cup has been placed on the market by the Economy Oil Cup Company, Montgomery Building, Augusta, Ga. Fig. 1 shows a bearing equipped with this device, and Fig. 2 illustrates the manner in which the cup is placed in a bushing.

The body of the cup is composed of block tin, shaped to fit the grease box, and made in various sizes to conform to the different styles of motors. The felt base fits the bearing slot and rests upon the shaft to which it conveys the oil direct. The weight of the cup causes it to follow the shaft as the felt wears, assuring a free and uniform feed of oil at all times. The base is composed of one piece of sheet felt that extends up into the body of the cup. All oil passes through this base direct to the shaft, which, it is said, prevents dirt, grit or dust from entering the bearing. There is no drip from the bearing when the cars are standing in barn or stations along the road, as the cup feeds oil only when the shaft is in motion. The oil does not leave the cup until the shaft is reached and cannot leak out around loose bearings, as the cup rides the shaft at all times with felt base below the top of bearing slot. The removable feature of this cup permits inspection of bearing at all times by simply lifting the grease box lid. An oiling of ½ gill per bearing will furnish perfect lubrication for 37 hours' service or from 275 to 300 miles.

In use these cups are said to fulfill all expectations and have greatly reduced the cost of lubrication. During the month of April, 1908, the cost of lubricating the cars on the Aiken division of the Augusta Railway Company, which was in charge of the inventor, was

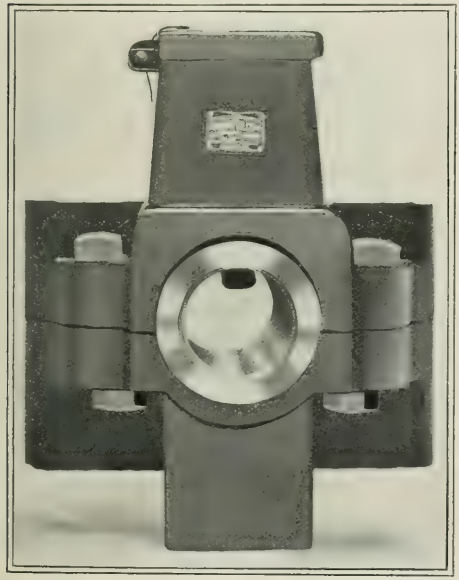


Fig. 1.—Bearing Equipped with the Economy Oil Cup, Made by the Economy Oil Cup Company, Augusta, Ga.

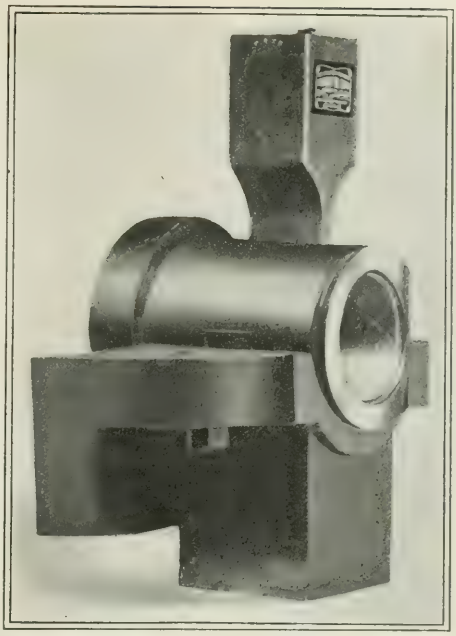


Fig. 2.—The Economy Oil Cup in Place in a Bushing.

$1.14 per 1000 car miles. Sample cups were placed on a number of trial cars the following month, and by the end of June, 1908, the cost of lubricating had been reduced to about 70 cents per 1000 car miles, with less than one-third of the cars in service on this division using the cup. At the present time the entire division is equipped with the Economy oil cup, with the result that the cost of lubrication has been reduced until the net cost now is 18 cents per 1000 car miles, and the condition of the armatures and bearings is said to be the best in the history of the road.

The Columbus Garbage Disposal Plant

The new municipal garbage disposal plant, built by the city of Columbus, Ohio, was started in operation July 21. The plant has a capacity of 80 tons of garbage per day. The entire equipment, including all the machinery, is working without a hitch, and it is generally considered by those who have inspected it that it is the most modern and up to date garbage plant in the world.

The buildings were erected at a cost approximating $100,000. In addition to this the complete equipment approximated $150,000, including elevating and conveying machinery, the latter being designed and built by the Jeffrey Mfg. Company, Columbus. The construction of this equipment will save the city thousands of dollars. The products consisting of fertilizer, oil, &c., will be sold; the proceeds, it is thought, will pay for the cost of operating. Notwithstanding the enormous amount of material to be handled and the extensiveness of the operations of this plant, only 20 men will be required when it is running at its greatest capacity.

The J. F. Lucey Company of Los Angeles, Cal., a large jobber of oil well tools and supplies, having stores and warehouses throughout all the Western oil fields, has opened an office at 960 Monadnock Building, Chicago, for the purpose of purchasing supplies and handling its foreign business.

Modern Gas Producers

Interesting Features of Types Developed by European Engineers

[Chief Engineer J. Hofman of Witkowitz contributed an elaborate paper on gas producers for the recent Duesseldorf International Congress of Metallurgy. Passing over the historical matter contained in the paper, some of the latest achievements in this direction will be of interest.]

A very marked advance was attained by the invention of the Kerpely producer with rotating grate. It was first installed at the Donawitz Works, and since that time some 350 producers of this type have been placed in daily service. It is a very capacious apparatus and turns out large quantities of gas. Fig. 1 shows the construction plainly. The grate is built up on the inner edge of the pan. The lower portion of the shell is arranged for water cooling, and to this is attached a cast iron ring or cylinder, dropping down into the pan and forming the water seal. Air, moistened with steam, is furnished by a fan, and is introduced below the grate

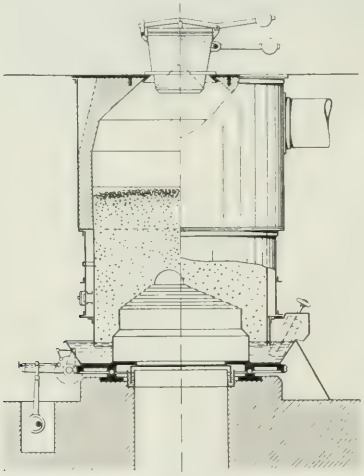


Fig. 1.—Kerpely Gas Producer with Rotating Grate.

which extends upward into the portion of the producer provided with the water cooling. The pan with the grate attached is rotated continuously by means of a motor, and any slag formed gets between the iron ring and the grates, which are placed eccentric with respect to the producer, and thus it is crushed and drops into the pan in small lumps.

The special characteristics of this producer are the water cooled lower shell, the slowly rotating eccentric grate, and the mechanical removal of the ash, no manual labor being necessary for purposes of cleaning. These producers are made with a diameter in the clear of from 7 to 10 ft., and gasify from 10 to 24 tons of anthracite per 24 hours, or from 22 to 33 tons of soft coal for the same time, depending upon the diameter of the apparatus. Even if forced the producer works well, giving a steady supply of gas, while the ash is clean, and as the rate of gasifying is good and a minimum of labor is required, the producer may be considered a good and economical one.

It is only natural that this producer, originally intended for soft coals, should undergo considerable modification, especially in the grates, when handling hard coals. Hence a number of types have been developed from the original Kerpely system. The one best known is by Rehmann, and is shown in Fig. 2. The grate here consists of several sets of perforated superposed cones. In consequence of the several points thus projecting into the incandescent fuel, this will not churn, and the ash has to slide down the conical surfaces. Moreover, the residues are loosened up somewhat, even before reaching the cones, by reason of the revolving points. The air passages being covered are

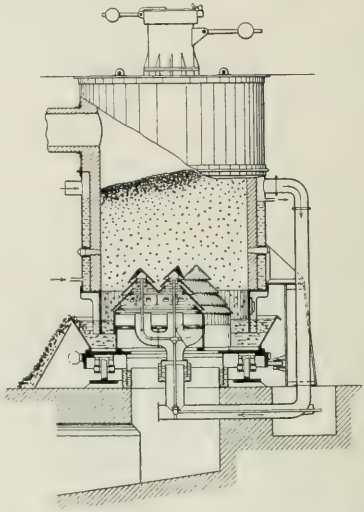


Fig. 2.—Rehmann Gas Producer with Rotating Grate.

not clogged up, and as each set of cones has its own supply of steam laden air, the working of the producer stronger at either sides or center can be readily regulated. The lower portion of the apparatus consists of cast iron segments which may be removed at will, so that it is possible to take out some of the grate bars for replacement without emptying the producer. The pan revolves on wheels and not on balls, as in the case of the Kerpely producer, and this is said to prevent occasional stoppages. The deflector plate taking the ash from the pan automatically may be set high or

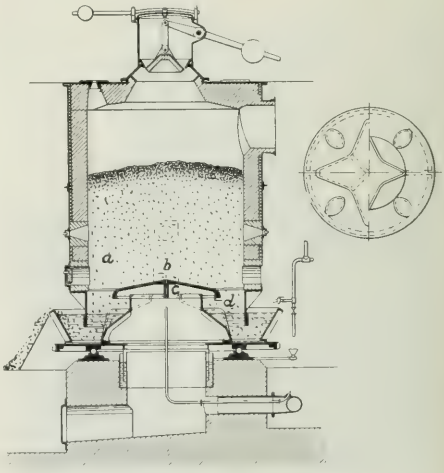


Fig. 3. Hilger Gas Producer with Rotating Grate.

low and thus removes the desired amount. Iron prongs are set behind this plate to catch and remove lumps of slag that may have been formed.

Another interesting modification is the Hilger producer. This is shown in Fig. 3. Here also the grate is the important point, and consists of an underframe cov-

ered by a peculiarly constructed bonnet. Between the two there is left a star-shaped aperture, opening downward, through which the steam and air mixture is let in. The grate is very low, and the projecting points catch the slag and compel the whole material at that point to rotate with the grate. Reinforcements on the grate facilitate this action.

The very latest, however, is the so-called S. F. H. producer, built by Fichet & Heurtey of Paris, in which the slag is tapped out in a molten condition. It is a revival of the Ebmelmen idea of two generations ago; namely, that fuel should be gasified in a regular shaft furnace. After many tests a satisfactory construction was attained in the summer of 1907, since which time this type of producer has proved its value. Fig. 4 shows a section of this producer. It is very similar to a small charcoal furnace, and consists of a continuous shell lined with refractory material. Provision is made for two tap holes to drain the liquid slag from the crucible of the shaft. Three to six water cooled tuyeres are used, and the shaft may have a hearth or not, as desired. A double bell hopper provides for charging and seals the top. A positive blower furnishes the air with pressures up to 10 lb. The proportions of the producer are adapted to the quality of the coal to be gasified. No steam is used.

The operation is as follows: Additions of limestone, sand or granulated blast furnace slag are made to the fuel in order to let the slag come out thinly fluid. The air forced in burns the coal to carbonic acid, which, passing through the heavy bed of fuel above, is almost completely converted to carbonic oxide. Slag is tapped off every hour or two. The temperature at the tuyeres is naturally a very high one. An interesting fact is that with oxide of iron in the ash of a coal or in the additions, this is reduced and runs off as pig iron with the slag, just as in the blast furnace. An analysis of the gas obtained with this type of producer is as follows:

	Soft coal.	Hard coal.	Lignite.
CO	28.3	31.0	29.5
H	7.7	6.0	6.7
CH_4	7.5	6.5	3.2
CO_2	1.4	1.0	2.5
N	55.1	55.0	58.1

The bosh of the furnace is renewed every three months; the lining above lasts several years. At Gironcourt six of these producers have been working for three years using fuel with the ash content 37.44, carbon 44.41 and water 10. The advantages of the S. F. H. system seem to be the small first cost; low maintenance expense, having no complicated grates; the making of dry gas, not requiring steam; the use of high blast pressure, which gasifies dusty and low grade fuels; and finally, low operating cost.

Gas Producer Practice at Witkowitz

Mr. Hofman concludes his interesting paper with a few general remarks on the subject of running gas producers. Ever since 1879 the Witkowitz Works have used limestone additions to the fuel in their gas making practice. It seems that the distribution of this material keeps the coking of the coal in better shape, prevents great clinkers and prevents those which do form from sticking to the walls of the producer. Furthermore, the driving off of the carbonic acid gas from the limestone, with the subsequent change to carbonic oxide, increases the output of gas. In his opinion the formation of the proper slag in the gas producer is just as important as it is in the blast furnace, for there are very few fuels which will run themselves without attention when handled by the rotating grate type of producer, where the slag or clinkers must be friable.

A further important point is the quality of the steam blown into the air. This is seldom as dry as it should be, on account of the distance of the boilers from the gas plant. As a consequence, there is too great a proportion of water introduced with cooling effects in the producer rendering the formation of carbonic oxide incomplete. The presence of 13 grains of water in the cubic foot of producer gas is fatal in the making of quality steel in the open hearth furnace. It is therefore advisable to superheat the steam before allowing it to mingle with the air in the producer as this is blown in. As an example of the value of this practice, it may be stated that of two producers running side by side, of identical make and construction, one using plain steam and the other receiving it superheated, the former always gave the poorer gas as well as gasified less fuel.

The importance of the new development of the producer industry cannot be overestimated in connection with the use of poor grade fuels. With high pressure blast it is possible to use up the immense breeze piles of coke economically; indeed, one large works in Europe is now about doing this. Furthermore, in winning coal, it will not be necessary to reject the poorer grades as absolutely unfit for the market, and hence slaty fuels need not be thrown away where they cannot be washed clean enough ordinarily. The application of

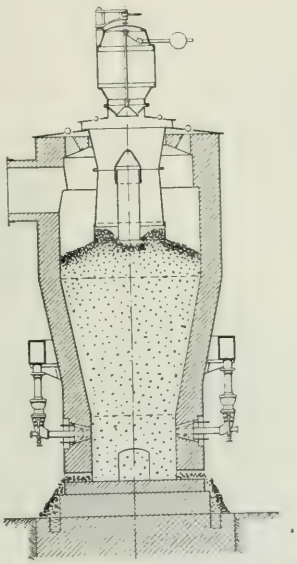


Fig. 4.—S. F. H. Gas Producer of Fichet and Heurtey.

gas thus made under boilers is self-evident, and when it is considered that fuels with 65 per cent. ash, 20 per cent. carbon and 15 per cent. volatile matter are regularly used at the works of Comp. des Mines Blanzy in Montceau des Mines, for all purposes through the gas made from them, the field for utilizing waste material has been widely extended and so far as waste fuels are concerned this problem has been practically solved. Time will show a great development of producers along the shaft furnace type, and the natural outcome will be the erection of central stations for generating current for long distance transmission.

The copper statistics issued by Henry R. Merton & Co., Ltd., London, show that stocks of copper in England and France are continuing the decline which has been in progress since February. In that month the stocks attained the high point, reaching a total of 113,455 gross tons. Each month since then has shown a decline of 1500 to 2000 tons. The stocks July 15 were 102,659 tons. On September 30, 1907, the lowest stocks in years were held, the total then being only 12,138 tons.

A Large Newton Milling Machine

Details of a Heavy Type 50-In. Horizontal Model

The accompanying illustrations show a heavy type 50-in. horizontal milling machine built by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., which, while of massive proportions, maintains the fine details for accuracy, economical operation and convenience, both in operation and adjustment, of the smaller and lighter machines. A number of these machines have been built by the maker and are in satisfactory operation on locomotive rod work.

The design and general construction is shown in the engravings, of which Fig. 1 is a view of the operating side and Fig. 2 shows the driving side. The diameter of the spindle in the parallel bearings is 7 in., and in addition there is a double taper bearing in front of the spindle sleeve, whose largest diameter is 11 in. The spindle sleeve is 13½ in. in diameter and has a 10-in. independent hand adjustment. The maximum distance between spindle saddle and the outboard bearing is 51 in., the minimum distance from the center of the spindle to the top of the work table is 5 in., and the maximum 31 in. The work table is 42 in. wide, 14 ft. long and entirely surrounded by an oil pan. The bed is 21 ft. long and 38 in. over the shears, the spindle saddle having a bearing on the main upright 24 in. wide and 45 in. long.

The spindle is arranged to drive a 4-in. cutter arbor by a broad face key. The spindle is fitted with a No. 7 Morse taper and has a through retaining bolt to hold the arbors in place, thus relieving the outboard bearing of all strain when taking cuts. The spindle is driven by a sleeve worm wheel 35½ in. outside diameter, the drive being transmitted by a double keyway. The worm wheel has a bronze ring with teeth of steep lead and the driving worm is of hardened steel with roller thrust bearings. Both bearings are cast solid with the spindle saddle and in this manner all stresses are contained within the saddle and no vibration is transmitted to the cut. The drive to the spindle is further through bevel and spur gears connecting with a General Electric 62-hp. 220-volt intermittent motor having a speed range of 560 to 1120 rev. per min., which gives the spindle a range of 15.55 to 31.11 rev. per min.

The feed is taken from the vertical driving shaft through the operating side of the machine shown in Fig. 1, where three changes of gear feed, namely, 0.10, 0.15 and 0.20 in. per revolution of spindle are provided. The fast power traverse is reversed by a friction clutch engaging the double train of bevel friction clutch gears provided. The lever A engages the clutch controlling the fast traverse of the table and the direction of movement indicates the direction of travel to the table. The lever B engages the clutch for the transmission of feeds, the trip for which is located at C. The hand wheel D is for the hand movement of the table, and the hand wheel E for the simultaneous adjustment of the spindle saddle and the outboard bearing, which can also be elevated or lowered by the independent General Electric 3-hp. series wound, 220-volt motor having a speed of 1425 rev. per min., which is mounted on top of the machine and moves the saddle at the rate of 6 ft. per minute.

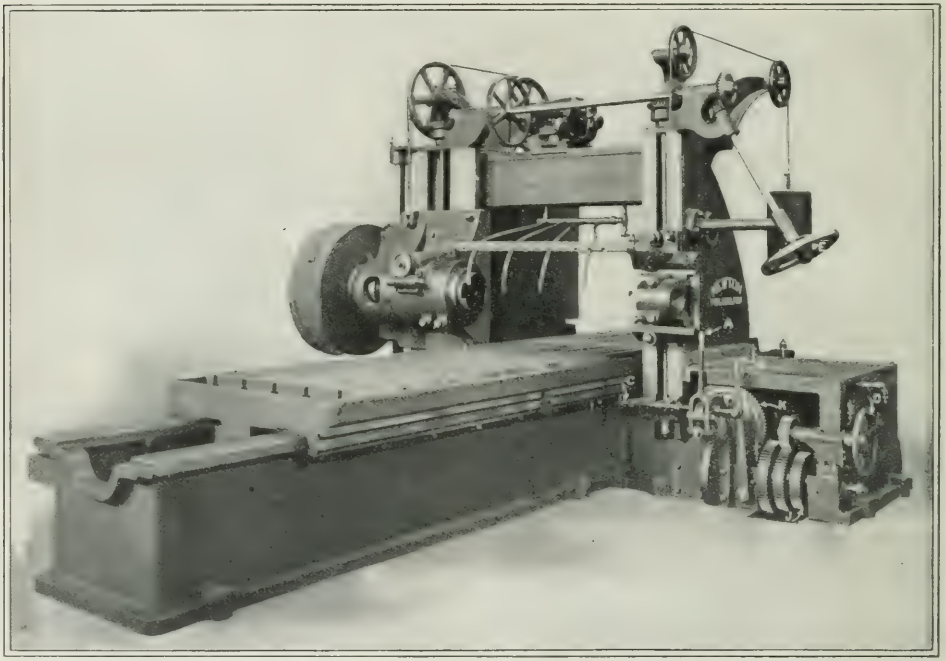


Fig. 1.—Operating Side of a 50-In. Horizontal Miller, Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

The spindle saddle is counterweighted and has square lock gibbed bearings on the upright, adjustments being made by the taper shoes F, Fig. 2, which are arranged to permit of easy detachment of the saddle should any accident occur, and also to have the tension on the solid surface. The elevating screws for both the saddle and outboard bearing have a top and bottom bearing to maintain them in alignment at all times. The adjustment of the spindle sleeve is controlled by the worm and worm wheel at G, which govern the movement of the rack pinion engaging into the spindle sleeve. The outboard bearing has an independent horizontal adjustment in its saddle of 8 in. The work table is of very heavy construction and has spiral gear and rack drive with three changes of feed for each of the spindle speeds. The work table and bed are both fitted

with the customary lubricating system, the drip pan being cast solid with the bed.

This type of machine, the maker states, has been attempted before, but never has a machine of such massive proportions with the details incorporated been built. The vertical driving spline shaft, for instance, at H slides through bushings to which it is keyed, causing their rotation in unison, which lengthens the life of the bearing by preventing the escape of oil that would occur should the spline shaft rotate in the fixed bearings. At I the bevel driving gear on the vertical shaft is placed above the driving bevel gear on the horizontal shaft in order that the thrust on the bottom bearing may be equalized by the pressure on the gear, and thus eliminate excessive wear. On the thrust washers placed at the bottom of the shaft, and in the pull pin feed gears J, bronze centers have been placed to facilitate renewals, if necessary, at a slight cost and to overcome the objection of having a loose steel gear revolving on a steel shaft. The male friction clutch K is equipped with applewood blocks thoroughly fitted and held in place by bolts instead of by glue, which was the former practice.

All the gears on this machine, with the exception of the worm wheel by which the fast traverse is obtained, are of hammered steel with the teeth cut from the solid. This worm wheel is of Tobin bronze.

Data concerning the output of these machines is as yet unavailable, on account of the short time they have been in operation, but it is stated that on the old design of machine of nearly the same proportion and drive, they have been able to mill locomotive rods at a feed of about 8 in. a minute when taking cuts from 3/8 to 1/2 in. deep and from 14 to 18 in. wide, and to channel two rods simultaneously, each channel being 3 1/2 in. wide and 1 3/4 in. deep, the feed in this case being 2 1/2 in. per minute.

It is to be noted that from the two examples given that the rating of the machine by pounds of metal removed for a given time or the number of cubic inches of metal removed might be erroneous and misleading, as the stress under which machines operate when taking very deep cuts is much greater than when taking slabbing cuts, as much more power is consumed. In making recommendations of types and power of milling machines, the builder, therefore, first endeavors to learn the nature of the materials to be cut, and when the metal to be worked is steel, the carbon content and the depth and width of cut. For ordinary slab milling the correct output of machines appears, from the maker's experience, to be about 1 cu. in. of metal per minute per horsepower. In conformity with this policy it is the custom of the builder to recommend the size of motor deemed best suited for particular requirements, and in many cases it is necessary to make special modifications in the motor, as it is frequently found that the motors offered cannot possibly develop the power necessary to take the cuts of which many machines are capable.

The machine described occupies a total floor space of 15 x 21 ft., and weighs about 38,000 lb. net.

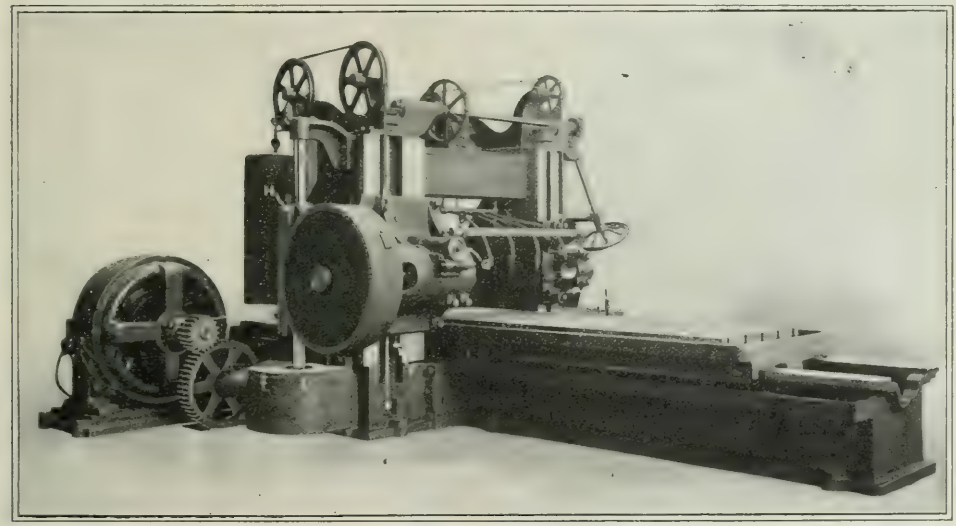


Fig. 2.—Driving Side of the Milling Machine.

Electric Pig Iron Production in California

A party of 20, including representatives of a number of San Francisco iron working industries and of banking interests, visited the plant of the Noble Electric Steel Company at Heroult-on-the-Pitt, Shasta County, California, July 21. The visitors saw two casts of about 5 tons each, the furnace being tapped about noon and again at 6 p.m. Charcoal is used as fuel and ore is obtained in the mountains, close to the furnace site. The charcoal plant consists of light retorts, each producing 1700 lb. in 24 hours, and the by-products are saved. H. H. Noble, president of the company, announced that five additional furnaces would be built similar to the one now in operation. This furnace was started on its present run July 10. Among the members of the party were S. T. Wellman, Cleveland, and the following from San Francisco: Patrick Noble, Pacific Rolling Mills Company; R. S. Moore, Moore & Scott Iron Works; F. E. Neitzel, Union Iron Works; S. P. Mooney, John A. Roebling's Sons Company; Charles M. Gunn, Columbia Steel Company (Portland and San Francisco); Richard B. Carr, Carnegie Steel Company; Edward J. Schneider, American Bridge Company.

The Lebanon Valley Iron & Steel Company, Lebanon, Pa., has added a department for the manufacture of railroad and other spikes. This department has been fully equipped and the machines were started July 27. The daily capacity of the department is about 25 tons of all kinds of spikes. The New York office of the company is at 90 West street.

The Ideal Alternators

Special Features in the Design of a Small Machine

Although probably 90 per cent. of the alternators used in power plants and factories are of less than 200-kw. capacity, it is seldom that sufficient attention is given to the characteristics of small machines by the ordinary purchaser. The larger machines are as a rule usually purchased under rigid guarantees as to regulation, efficiency, wave form, &c., but the small buyer is apt to take the first machine offered, although the wrong type of generator may waste its first cost many times over during a year.

One of the most important things to take into consideration in the purchase of an alternator is the wave form. Practically all engineering calculations and the design of recording instruments, motors, transformers, &c., are based on the assumption that the generator delivers a wave of approximately sine form, and any

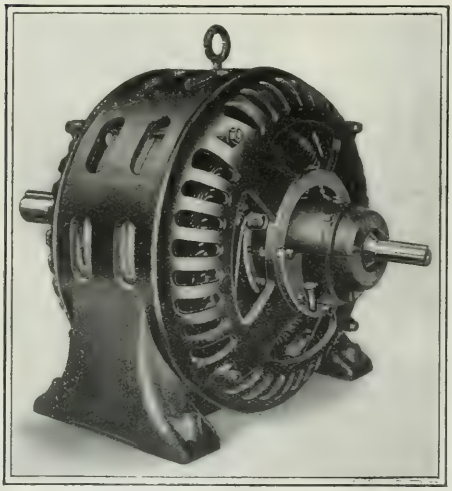


Fig. 1. The Ideal 100-KVA. Revolving Field Alternator, Built by the Ideal Electric & Mfg. Company, Mansfield, Ohio.

variation from this shape is of great importance. Take transformers, for instance, which are computed for sine wave operation and designed to operate on a certain temperature rise for a given load. It may be that, when the transformer is put in operation, it runs hot even at no load and showing excessive iron losses. The trouble may not be due to any defect in the transformer, but may be caused by a flat voltage curve, necessitating a peaked magnetic curve in the transformer and, therefore, a high maximum induction. The transformer manufacturer could not be held legally responsible for the apparent defect, inasmuch as the apparatus was designed for a sine wave.

Another circumstance where the wave form plays an important part is when two or more alternators are run in parallel, or when an alternator supplies power for a synchronous motor. The two machines will not work satisfactorily unless the voltage wave forms of all are very nearly sinusoidal. Distorted wave forms cause large equalizing currents to flow, disturbing the normal operation, causing hunting, and spoiling the regulation, to say nothing of the excessive heating which results.

The wave form depends to a large extent upon the number of coils per phase per pole. In building small machines some manufacturers place only one or two conductors per phase per pole. This arrangement gives a very peaked wave form and also in passing from zero

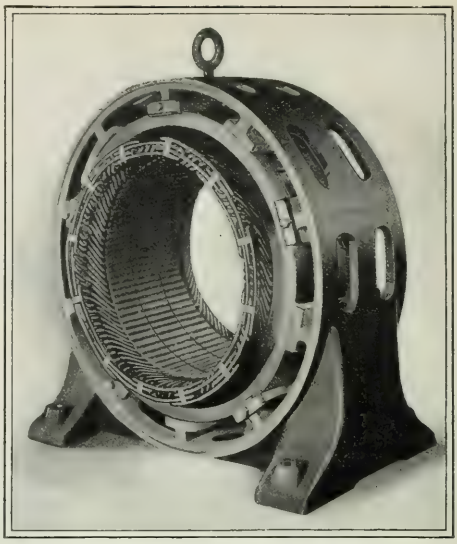


Fig. 2. Stator of the Ideal Alternator.

to the maximum, the electromotive force does not go through uniform changes, but has humps in it.

The Ideal Electric & Mfg. Company, Mansfield, Ohio, has recently placed on the market a line of revolving field alternators built in sizes from 20 to 200 kva., two and three phase for various voltages and frequencies in which special consideration has been given to the production of a uniform sinusoidal wave form. Fig. 1 shows the 100-kva. three-phase 60-cycle 2300-volt model assembled, Figs. 2 and 3 the stator and rotor, respectively, while Fig. 4 shows a series of curves which were obtained from a test of the machine.

In the stator shown in Fig. 2 it will be noticed that there are a comparatively large number of slots. Even in the smaller sizes these generators have at least three slots per phase per pole in three-phase generators, or four slots in two-phase generators, while in the larger sizes the number of slots is greater. Besides giving more conductors per phase per pole, a large number of slots also has the further advantage that it gives a more even distribution of the flux. This is especially important in small alternators having open slots. Open slots are used in the generator shown, thus permitting the coils to be form wound and heavily insulated before insertion in the armature. It also has the advantage that in case of a burn out coils can be easily removed without disturbing the remainder of the winding.

Another cause of poor wave form is the shape of the field pole pieces. The lines of force naturally pass from pole to pole through the path of least reluctance, and as the pole tips present the shortest path, the flux will concentrate here, giving an excessive magnetic

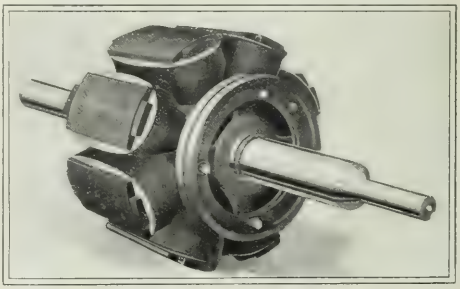


Fig. 3. Rotor of the Ideal Alternator.

density, unless special pains are taken to prevent this by shaping the pole pieces as shown in Fig. 3. This arrangement gives a practically uniform magnetic path and insures an even distribution of the flux in the pole face at all times.

Another important feature in the design of the alternator illustrated is the fact that both bearing boxes are directly bolted to the stator frame. The bearings themselves are of the split, ring oiled, self-aligning type which offers a considerable advantage to the user in case it is necessary to remove the rotor for dismantling or making repairs. The oil is contained in large reservoirs having outside gauges to indicate the amount of oil present.

These alternators are designed for continuous operation at 80 per cent. power factor, but their ratings are given on the kva. basis at 100 per cent. power factor. By the use of carefully annealed and japanned laminations in the armature and by a liberal use of copper this machine has been so improved that it gives high efficiencies over a wide range of load. For instance, Fig. 4. which gives the test curves of a 100-kva. three-phase 60-cycle 2300-volt revolving field alternator shows that the efficiency from 50 to 125 per cent. load is practically flat, giving a maximum efficiency of 95 per cent. at full load. These curves also show the influence

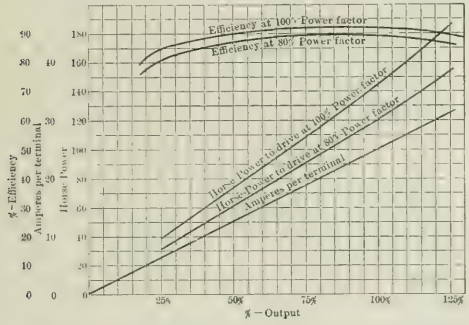


Fig. 4.—Test Curves of an Ideal 100-KVA. Three-Phase 60-Cycle 2300-Volt Alternator.

of power factor on the power necessary to run the generators. These machines run at full rated load and not less than 80 per cent. power factor without showing a temperature rise of more than 40 degrees C.

The Champion Scrap Crucible Charge Packer

For a number of years the Famous Mfg. Company, East Chicago, Ind., has been manufacturing a line of baling presses for handling every kind of balable and packable material. One of this line was a sheet and wrought metal scrap busheling press, used very extensively in stamping works, by manufacturers of household utensils and pressed metals, in rolling mills and scrap yards for packing and busheling scrap. In response to a demand from the users of this busheling press for a hand power machine to press brass and copper scrap into crucible charges instead of pounding the scrap into a half keg or similar shaped receptable, the company has developed and brought out the Champion hand power crucible charge packing press, which is illustrated herewith.

This press is intended for use in connection with brass foundries and junk dealers, and wherever it is desired to put up old brass and copper articles and wire scrap in the proper shape to fit into melting crucibles. The cross section of these crucibles is round, and, in order to secure economical melting, the charges should be in the form of a roll of approximately the same length and diameter as the crucible in which they are placed, and should fit the crucible almost as snugly as a cartridge fits a gun barrel. Although this press is designed primarily for packing sheet and wire brass and copper scrap, at the same time it is said to be capable of turning equally well



The Champion Crucible Charge Packer, Made by the Famous Mfg. Company, East Chicago, Ind.

formed charges of sheet steel and similar scrap, which is much harder to work.

As will be noticed from the engraving, the press is self-contained and may be placed anywhere that the scrap may be. It does not have to be placed on a floor or fastened down, so that it is always ready to work. Levers are provided on both sides, so that it may be operated by either one or two persons.

The press is built entirely of steel to resist the great strains to which it is subjected in forming crucible charges. The power shaft is heavy, and is provided with substantial bearings, which form a part of the main frame of the press. A double toggle cam is located on the shaft between the boxes, which in turn are connected by wrought steel pinions to the gripper working on the square wrought steel rammer bar. Sockets are provided at each end of the shaft outside the main frame boxes for the handles. The gripper is inlaid with square high carbon tool steel to insure the edges standing up and gripping the wrought steel rammer bar.

In operating the packer the top is raised and the rammer drawn back. The pressing trough is then filled with scrap, as in the accompanying illustration. Closing the cover forces the scrap down, so that the top with the roller cam lever can be forced down in place and locked. A few strokes of the lever passes the rammer ahead, condensing and pressing the charge until it assumes the shape of those shown in front of the packer. The top is then raised and the ram drawn back. Applying pressure to the foot lever at the left forces the charge up, so that it is readily removed.

The action of the packer in operation is such that the scrap is held together without any ties, and there is practically no expansion when it is removed from the press. The charge fits the crucible snugly at the bottom, but leaves some space around the top to be filled in with borings, lathe cuttings or scrap of the kind to make the mixture of the desired character. The capacity of the machine varies with the size of the press and also with the material being pressed. If the scrap is such as will readily fill the pressure trough there is a greater tonnage output than when the scrap hangs together, and is such as requires more time in filling the trough. The press does its part of the work, it is said, in a few seconds, so that if the persons operating it work fairly fast the output per day will be from 2 to 4 tons. Two sizes of press are built, one making crucible charges 6 in. in diameter, and the other making them 2 in. larger.

The blast furnace of the Ivanhoe Furnace Company, Ivanhoe, Va., was blown out for relining July 14, after a blast of 27 months.

Drilling Large Holes in Concrete

29-In. Bores Produced with a Chilled-Shot Drill

The core drill and its use in connection with exploratory work in mining is well known in that industry, but among those acquainted with its uses few thus far have given any consideration to it as a device through whose agency present ventilating conditions may be improved and the life of the workers protected. The engravings reproduced herewith show what has been accomplished in the way of drilling holes large enough to admit the passage of a human being through them, and perhaps point the way to what may be a very reasonable method of ventilating coal mines as well as providing additional openings to and from them. Work recently performed by the Engineer Corps of the War Department with a Terry core drill, built by the Terry Core Drill Company, 50 Church street, New York City, has established beyond doubt the practicability of drilling bore holes 30 to 40 in. in diameter vertically or at an angle and to any reasonable depth with drills of the chilled shot type. The drill used was of the maker's class D type equipped with tools for boring a 29-in. hole, and is shown in Fig. 1. A graphical demonstration of the work mentioned is given by the other two illustrations of which Fig. 2 is a view looking down into the hole and Fig. 3 shows the cores removed from it.

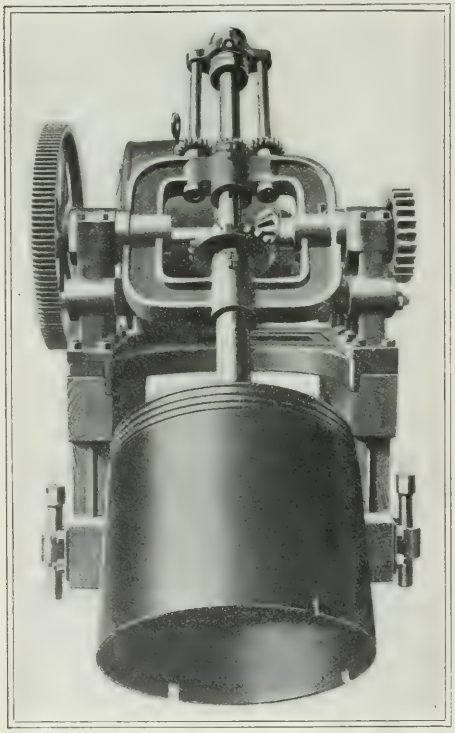


Fig. 1. Class D Core Drill, Built by the Terry Core Drill Company, New York City.

The work was done in New York, and the material bored through was a trap rock concrete embankment. Some of the drilling was done in places where the bore holes penetrated concrete reinforced by steel beams, and elsewhere iron drain pipes and the like intersected the line of the bore hole. In one of these cores there is embedded a section of an 8-in. I-beam and in another an iron pipe 2 in. in diameter. Both the steel beam and iron pipe were severed without any appreciable reduction in the speed of cutting. All of the holes drilled were at an angle of 55 degrees from the vertical and the average cutting rate was 2 ft. per hour. The wear on the bit was ¼ in. per foot, and 10 lb. of shot was used in drilling the same distance. Numerous seams and openings caused by imperfect setting of the cement, as well as severed pipes large enough to drain the water

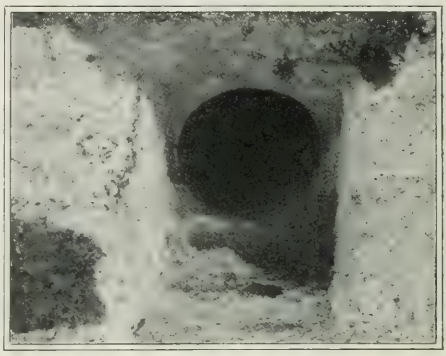


Fig. 2. View Looking Into the 29-In. Hole.

from an ordinary bore hole in a few minutes offered not the slightest hindrance to the work. Irregular and broken formations are of no consequence in drilling large holes, as has been demonstrated in similar operations. The detritus or sludge from the kerf is sufficient to close all save large seams or crevices and through which the heavy tools advance with remarkable rapidity under a high momentum.

The machine used was of the maker's class D type and the drill was rotated by an electric motor at a speed of 125 rev. per min., which gave a peripheral speed to the 28-in. bit of about 1000 ft. per minute. The feed was by hand through two feed screws at the rear of the drill head.

The speed at which the work was done is given in the following table:

Date.	Depth drilled. Inches.	Net drilling time. Hr.	Min.
April 18	37	2	40
April 19	36	1	0
April 20	31	2	0
8-in. steel I-beam cut through.			
April 22	33½	1	15
2-in. wrought iron pipe cut through.			
Totals	137½	6	55

The head room where the drilling was done was an extremely limited, thus restricting the drilling to short cores, which made the work much slower than it would have been otherwise. In the above table only the actual time when the drill was cutting is given, and the total running time on each of the four days listed was much greater, due to many delays for different reasons which continually occurred in the work.

For drilling the holes given in the above table it is estimated that in cutting 14 ft. of hole the wear of the bit was $5.25 and the consumption of oil, waste, grease and shot $2, making the total cost for 14 ft. $7.25. In cutting a similar hole only 6 ft. in length the total cost was estimated at $7 divided between wear on the bit valued at $6, and consumption of shot, oil, waste, &c., at $1. The total cost for drilling 20 ft. of hole is therefore $14.25.

If the production of holes 30 in. in diameter and larger proves as readily feasible in general practice as it was found to be in this case, a large number of uses for this class of drilling holes ought to develop. Shot drilling has been successfully carried out in sinking cylinder holes for plunger elevators where the maximum diameter was approximately 20 in. These are

of course true vertical holes which is a trifle different problem from inclined ones.

In mining operations where the head room will permit, these drills can be profitably employed for sinking winzes or boring holes for use as ore chutes, and such operations are now being conducted with a Terry drill in a large mine in northern New York. For ventilating mines several holes of 30 in. in diameter or larger can be drilled for the cost of sinking a single shaft, and if properly located these would furnish a circulation of air to the workings which is claimed to be much better than that now obtained through the shaft method of ventilation. The size of these holes would be ample for the installation of permanent ladders to serve as exits from the workings in case of accident and be of assistance in rescue work.

There would also be much less difficulty in reaching and extinguishing mine fires which under present conditions are often so located that the affected points are inaccessible and continue unmolested until checked at some place remote from their origin. To be able to reach a fire quickly while it is still in the incipient stage would save the sums hitherto wasted for lack of a vantage point from which to begin the attack. Aside from providing a means of ingress and egress for the miners, these large bore holes would supply a wholesome atmosphere to the workers under more natural conditions than is at present provided. At each opening an electrically driven fan could



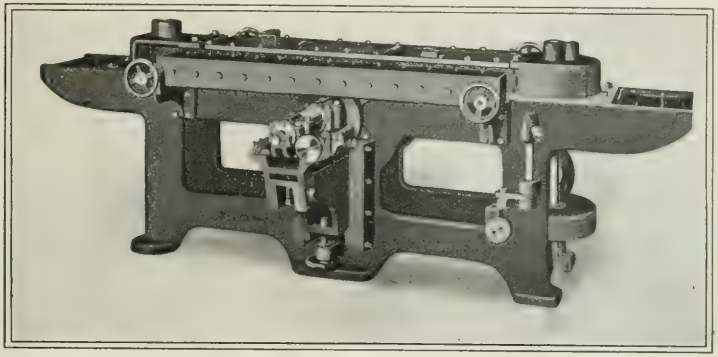
Fig. 3.—Four of the Cores Removed from the Hole.

be installed which would force fresh air into the workings or exhaust the foul air from the mine as occasion arose. Ventilation would not be the only purpose for which these bore holes could be advantageously used, as they could serve as conductors for pipes and cables and would in many cases shorten the distance to which such lines must be carried.

The annual meeting of the sales agents of the Pennsylvania Steel Company and the Maryland Steel Company was held recently in connection with visits to the plants at Steelton, Pa., and Sparrows Point, Md. The meeting was held at the office of the Pennsylvania Steel Company at Steelton, Tuesday and Wednesday, July 19 and 20, and at the office of the Maryland Steel Company at Sparrows Point Thursday, July 21. It was attended by the general manager of sales and by sales managers from the various cities in which the companies have sales offices.

The Fay & Egan Glue Jointer

A continuous feed glue jointer for both inside finish work and furniture is one of the latest machines built by the J. A. Fay & Egan Company, Cincinnati, Ohio. It is claimed to make a glue joint better, faster and more perfectly than has ever been done before on a machine of this style, and is especially recommended by the manufacturer for all work where a perfect joint is desired, such as interior building trim, furniture, cabinet, piano, and other similar lines.



Glue Jointer for Inside Finish and Furniture Work, Built by the J. A. Fay & Egan Company, Cincinnati, Ohio.

The machine, which is illustrated herewith, works material from ¼ to 3 in. thick, from 1 in. wide up to any width, and from 6 in. up to any length desired. The frame is absolutely rigid, and is cast open in one piece. All parts are accessible, and all bearings are oiled from the outside. The cutter heads are located one on either side of the center of the machine and run longitudinally. They are mounted in heavy housings, having vertical, horizontal and angular adjustments. The feed consists of an endless chain driven by a three-step clutch cone, operated by a lever close at hand. The power for feeding the work is transmitted by large bronze worm wheel and a steel worm running in oil, the end thrust of the worm being taken by ball bearings. The chain is of flat links with knurled faces, and all links are interchangeable, as the pins are not riveted and are thus readily removable. The chain runs over two octagonal wheels, one at each end of the machine. It is adjustable for making spring joints—that is, joints slightly hollowed on long material to insure against opening at the ends.

Materials varying ½ in. in thickness may be worked without adjustment of the pressure bars, which are made up of a double series of knurled steel rollers, each mounted in independent housings and backed up by steel springs. Thus pieces of uneven thickness may be fed one after the other. The countershaft has both a tight and loose pulley each 12 x 5½ in.

The floor space required for the regular style of the above machine is 8 ft. 10 in. x 5 ft. 9 in., and with an extended table and adjustable rest it requires 14 ft. x 5 ft. 9 in.

The Galesburg Coulter-Disc Company, Galesburg, Ill., is contemplating the erection of a plant for the manufacture of plow steel in the vicinity of Chicago, and will be in the market for open hearth steel works equipment, rolling mill machinery, engines, boilers, shearing machinery, &c.

Utilizing Waste Heat from Gas Engine Plants*

The Recovery of Thermal Units Now Lost in Jacket Water and Exhaust

JOHN T. FAIG.†

The designer of steam plants finds a wide variety of auxiliaries in the market. Open and closed feed water heaters, surface, jet and barometric condensers, steam heating and drying coils, cooling towers for water and water softening plants of many types are available. From these he may select elements which will give the most desirable combination for the particular problem he has to solve. The use of auxiliary machinery is familiar not only to designers of steam plants and builders of steam machinery, but to many power users and the large body of operating engineers.

In many cases the installation of such auxiliaries makes possible a higher net economy than can be obtained with internal combustion engines without auxiliaries, notwithstanding the higher thermal efficiency of the latter engines. This is particularly true of large office buildings, where the exhaust steam may be used for heating, and factories, where it may be used for heating or industrial purposes requiring low pressure steam or hot water.

Two sources of great heat waste occur in internal combustion engines. This waste is so common that there is danger of losing sight of its importance. The two sources are the jacket water and the exhaust. The amount of heat so lost varies in different engines, but

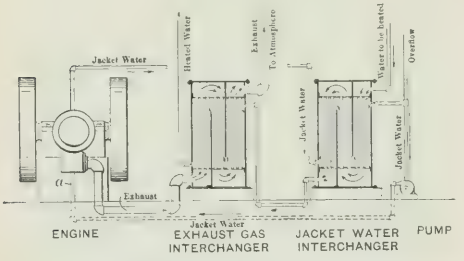


Fig. 1.—Gas Engine With Interchanger Utilizing Jacket Water and Exhaust Gases to Heat Water.

is nearly always three times as great as the amount converted into work in the cylinder.

The following table shows the percentages of heat of the fuel lost in some engines:

Fuel.	Name of engine.	Rated b.h.p.	Heat converted into water in cylinder.—%	Heat lost in jacket water, exhaust and radiation.—%	Reference
Illum. gas.	Gueldner.	20	42.7	57.3	Test by Schroeter Z. d. y. d. I. 1904.
Nat. gas.	Walrath.	75	27.1	72.9	Geer and Venelain. Sib. Coll. Thesis. 1902.
Prod. gas.	R. D. Wood.	300	24.4	75.6	Goldsmith and Hartwig. Sib. Coll. Thesis. 1905.
Kerosene.	Hornsby.	25	21	79	Robinson, 1908. Gas and Pet. Eng., p. 710.
Prod. gas.	Fair. Morse.	25	25.8	74.2	Jahnke. Univ. Cin. Thesis. 1910.

Except for the Gueldner engine, which gave such remarkable economy as to be exceptional, the tests showed that about one-fourth of the heat of the fuel was represented by the indicated horsepower. Practically all the remaining three-fourths of the heat of the fuel was lost in the jacket water and exhaust. As these tests were made on engines in good condition, and were considered good enough to go on record, there can be no doubt that the losses of heat in the jacket water and exhaust for every-day engines will be considerably greater. Besides the losses already mentioned, there may be mentioned the mechanical friction of the engine and the radiation, which are inevitable, and constitute together not more than 5 per cent. of the heat of the fuel. The mechanical friction is, of course, included in the indicated horsepower.

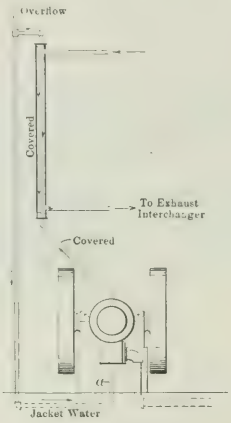


Fig. 2.—Alternative Method of Utilizing Waste Heat.

Not only is the heat of the jacket water lost in most cases, but its removal entails considerable expense; that is, the cost of the jacket water itself. There are, it is true, some few installations where the jacket water is used for heating or industrial purposes, but such installations are merely exceptions to the general run of plants.

The development of auxiliaries that will utilize the heat of the jacket water and exhaust gases must keep pace with the development of internal combustion engines if these engines are to compete with steam engines where the exhaust is used. Where hot water for heating or industrial purposes is required the utilization of most of this waste heat presents no great difficulty. Fig. 1 represents a diagrammatic sketch of an engine with two simple heat interchangers, one using the jacket water and the other the exhaust gases.

The sketch is purely diagrammatic, to show the circulation of the jacket water, exhaust gases and water to be heated through the interchangers. The same idea may be expressed in many different designs. There is no reason why one interchanger should not be placed on top of the other, or the two combined in the same shell. One form of interchanger has recently been put upon the market. Some firms use part of the heat of the exhaust for vaporization of water for the producer. The writer has given some attention to the utilization of waste heat from producer engine plants and prepared sketches for a plant utilizing practically all of the heat in the coal, except the inevitable losses of hot ash, mechanical friction and radiation, all of which may be reduced to very small percentages of the total. These sketches will not be presented at this time, as they would apply only to producer plants, while the sketches shown apply to all plants using internal combustion engines.

The interchangers may be of the simplest construction, since all pressures are small and temperatures comparatively low, the highest being that of the exhaust gases, from 600 to 1000 degrees F. A thermostatic valve could be installed at *a* to automatically admit cold water from the city mains should the temperature at *a* rise too high. This might occur if for any reason the circulation of the water being heated should be stopped. The exhaust gas interchanger should form an excellent muffler. The exhaust pipe between the engine and interchanger should be covered to reduce heat loss, maintain a reasonable temperature near the engine and prevent burnt hands.

Fig. 2 shows an arrangement which does away with the necessity for a circulating pump in the jacket water line. A thermostat controls the admission of

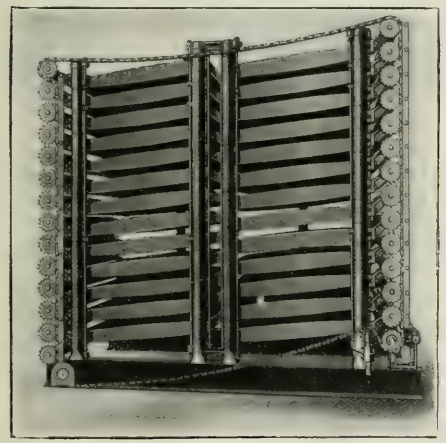
* Paper read before the National Gas and Gasoline Engine Trades Association, Cincinnati, June 15, 1910.

† Professor of Mechanical Engineering, University of Cincinnati, Cincinnati, Ohio.

cold water to the jacket water line and will operate if for any reason the interchanger does not absorb sufficient heat from the jacket water. The jacket water interchanger may be secured against a wall overhead to save space if there is sufficient head room. The hight which will give the proper circulation for a given engine could probably be determined only by trial.

A New Type of Chain Drive

A scheme which has been recently patented for driving a series of parallel shafts or rolls is now being used with considerable success on cell driers for drying textiles, pulp and paper. One of the claims made by the manufacturer for the new drive, which employs a roller chain and sprockets, is that it is much more efficient in transmitting power to many rolls or shafts than the trains of spur gears and the bevel gear drives formerly used. As will be noticed from the illustration, the drive has a set of rolls for each tray, the number varying with the size of drying units from six on the



A Stack of Drying Rolls Driven by Diamond Roller Chain, Made by the Diamond Chain & Mfg. Company, Indianapolis, Ind.

smallest to 40 on the largest machines. A single loop of 1½-in. pitch Diamond roller chain made by the Diamond Chain & Mfg. Company, Indianapolis, Ind., runs around the machine and meshes with a sprocket on each roll.

The sprocket on the lowest roll at the right is the driver on the machine illustrated and turns in a clockwise direction. The chain is kept in contact with the sprockets by two steel guide rails, one on each side of the machine. The width of these rails is slightly less than that of the chain rollers, and consequently the chain is compelled to mesh with the sprockets. The lower strand of the chain runs loose, and at the left of the driving sprocket an idler is provided which is adjustable vertically to take up the slack.

The bevel gears and spur gear trains that formerly drove the rolls consumed considerable power and were noisy at high speeds. The chain is said to be much quieter and absorbs little power in overcoming the friction load. A ½-hp. motor using a 1-in. belt will easily drive an empty machine of the size shown at high speed, and this is the means employed to limber up new machines. Other advantages claimed for the chain drive are a lower initial cost, less expensive maintenance and less wear in use than the gears formerly employed.

Joseph T. Ryerson & Son, Chicago, recently sold to the Indiana Steel Company a large friction saw, to be installed in the merchant mill at Gary. This is the second Ryerson saw of this type to be installed in the Gary Works. The large multiple punch illustrated on page 111 of *The Iron Age* of July 14, which was built by the Cleveland Punch & Shear Works Company, Cleveland, Ohio, was sold to the Pressed Steel Car Company, Pittsburgh, Pa., by Joseph T. Ryerson & Son.

The Movement of Lake Superior Iron Ores in 1909

John Birkinbine, Philadelphia, has prepared for the U. S. Geological Survey a very interesting map, with brief explanatory text in an accompanying pamphlet, showing graphically the movement of Lake Superior ores in 1909. A similar exhibit was prepared in 1903. The scheme of the map is to show by a series of red lines which originate with the various Lake Superior ranges and extend down the lakes in a broad band, from which in turn certain lines separate themselves as the lower lake ports of delivery are reached from these. In the 1902 map each of the main lines represented 1,000,000 tons, but the total shipments that year were 27,500,000 gross tons. For 1909 the total was 42,500,000 tons, and heavy lines were used, each of which represented 5,000,000 tons, while lighter lines represented 1,000,000 tons and a dotted line less than 1,000,000 tons. The pamphlet thus briefly sketches the sources of lake ores and their flow into the districts of consumption:

At the west end of Lake Superior water shipments, amounting to 29,200,000 gross tons, coming from the Mesaba and Vermilion ranges, were made from Two Harbors and Duluth, Minn., and Superior, Wis. These were augmented to 33,000,000 tons by the addition of 3,800,000 tons from the Gogebic range forwarded from Ashland, Wis., and were still further increased to 35,900,000 tons by shipments from the Marquette range, via Marquette, Mich., and by a small quantity from the Michipicoten range in Canada.

With the exception of a comparatively small tonnage required for local blast furnaces, this immense quantity passed through the Sault Ste. Marie canals and moved on to the Straits of Mackinac, where a part of the ore from the Lake Superior ports, together with some ore from the port of Escanaba (the point of shipment both for the Menominee range ores and for part of the Marquette range ores), proceeded down Lake Michigan to various ports, such as Milwaukee, Fruitport, Chicago and Gary. Some of the furnaces at these ports also obtain considerable ore from local mines in Wisconsin. The remainder of the ore from Escanaba passed eastward through the Straits of Mackinac and, with the shipments from Moose Mountain, Ont., joined the main column through Lake Huron, some being disposed of at Midland, Ont., and Detroit, Mich., but the great bulk being distributed to the lower lake receiving docks at Toledo, Sandusky, Huron, Lorain, Cleveland, Fairport, Ashtabula and Conneaut, Ohio; Erie, Pa., and Buffalo and Tonawanda, N. Y.

Most of the iron ore handled at lower lake ports is consumed in eastern Ohio and western Pennsylvania, about 23,000,000 tons being sent in 1909 to the region tributary to Cleveland and Pittsburgh. Ore is also delivered to central Ohio and to points along the Ohio River. At Buffalo and Tonawanda, N. Y., 5,000,000 tons was received, mostly for local use, although some of this was distributed by long rail hauls.

St. Louis, Mo., received a small quantity of Lake Superior ore by all-rail routes; about 80,000 tons went to Virginia; approximately 2,000,000 tons went to western Pennsylvania; and about 800,000 tons were carried to eastern Pennsylvania and New Jersey in competition with local and foreign ores, with which they are mixed. A cargo of lake ore was carried to Cape Breton, and small shipments for special purposes reached New England and the Southern States.

The pamphlet refers in conclusion to the transportation and distribution of the 20 per cent. of the ores of the United States not produced on Lake Superior. It is noted that from Lake Champlain mines about 15,000 tons went to Canada in 1909 and that some limonite from eastern Texas was delivered last year at Alabama blast furnaces. The bulk of the ore supply for the Colorado Fuel & Iron Company's furnaces at Pueblo, Colo., is brought 350 miles from eastern Wyoming, and this is supplemented by ore hauled over 600 miles from northern New Mexico. The foreign ores imported in 1909 aggregated 1,700,000 gross tons.

Autogenous Welding Equipments Compared

A Discussion of the Relative Merits of the High and Low Pressure Systems

BY HENRY CAVE, SPRINGFIELD, MASS.

There are two distinct systems of autogenous welding with the oxy-acetylene torch in use in this country, which are known as the high and the low pressure systems respectively. There is considerable discussion regarding the advantages of the so-called high pressure system among those who are interested in this process, but very few people really know wherein these advantages lay. What is called the high pressure system in this country is really the medium pressure system of France, wherein the different systems were mainly developed, the real high pressure system not having been introduced into this country.

The Low Pressure Torch

The low pressure system is generally considered as embracing those using acetylene at the pressure usually generated by the common acetylene lighting generator in use in this country, which is limited to a maximum pressure of about 10 oz. per square inch, which is only

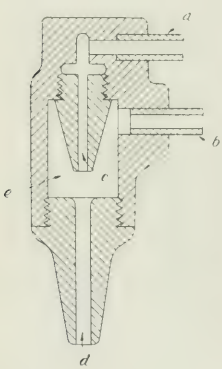


Fig. 1.—Low Pressure Torch.

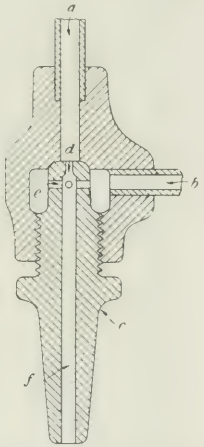


Fig. 2.—High Pressure Torch.

Sections of the Two Types of Torches Employed in Welding.

enough to force the acetylene through the piping to the chamber at the tip or burner of the torch. From this chamber the acetylene is drawn into the oxygen by the vacuum produced by the flow of the latter under a high pressure, or by what is termed injector action, as this is the principle on which boiler feed injectors work. This is shown diagramatically in Fig. 1, in which *a* is the oxygen supply, *b* the acetylene supply, *c* the oxygen nozzle, *d* the mixture nozzle and *e* the acetylene chamber. The action of the gases is illustrated, the full lines representing the path of the oxygen and the dotted ones that of the acetylene.

As there is nothing to restrict the amount of acetylene drawn in, it has to be regulated by the flow of the oxygen, according to the formula for the injector where the amount of acetylene drawn in varies as the square of the velocity of the oxygen. Thus any variation in the pressure of the oxygen has a very pronounced effect on the flame. Such variations might be produced by irregular working of the oxygen reducing valve, by variations in the temperature of the tip expanding the orifice, or by particles of metal adhering to the tip, and where these variations produce an excess of oxygen an oxidizing flame would result.

By examining the representation of the flow of gas in the low pressure torch, shown in Fig. 1, it can readily be seen that the mixture as it issues from the tip to be ignited cannot be homogeneous, as there must be an excess of oxygen in the center, and this defect



Fig. 3.—A Cracked Bulldozer Frame Repaired by Welding.

causes this type of torch to require 1.50 to 1.80 parts of oxygen for every unit of acetylene burned. The surplus oxygen combines with the metal to produce weak, brittle welds, and also prolongs the time to make the weld due to the metal being burnt up by oxidation.

The High Pressure Torch

The high pressure torch will not work with acetylene from a lighting generator, as it requires pressures varying with the size of tip used up to 15 lb. per square inch, but the acetylene may be taken from a special pressure generator or from a cylinder of dissolved acetylene and the pressure adjusted by a reducing valve similar in action to that used on the oxygen cylinder. Fig. 2 shows a section of the tip of a high pressure torch, the oxygen coming in at *a* and the acetylene at *b*. The oxygen passes into the tip *c* through the hole *d* and the acetylene through the holes *e*, the gases then passing together along the passage *f* to the end of the tip where the ignition takes place.

The acetylene coming in at the holes in the side of the tip under a pressure only slightly less than that of oxygen, the two gases meeting at right angles and passing together through the tip produces a very intimate contact of the molecules, with the result that only 1.28 parts of oxygen are used to 1 part of acetylene, which, it is stated, results in welds of maximum strength as there is a minimum of oxidation. These welds are also produced at a minimum cost, because of the reduction not only in the oxygen used, which alone produces an economy of from 25 to 40 per cent., but also in the time required to make the weld, which

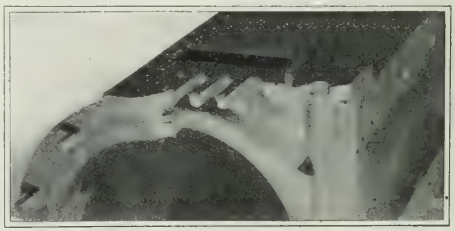


Fig. 4.—The Cracked Cylinder Head of a 200-Hp. Engine.

is considerably shortened owing to the decreased oxidation. This latter saving on exactly the same welds has been as high as 60 per cent. The mixture depends absolutely on the sizes of the holes *d* and *e* and on the pressure under which each gas is fed to the torch. This latter being regulated by reducing valves, it is not subject to variations; the mixture is therefore positive, and as there is very little injector action the proportions are not varied materially by outside conditions.

It can therefore be seen that the advantages the high pressure torch has over the low pressure type is

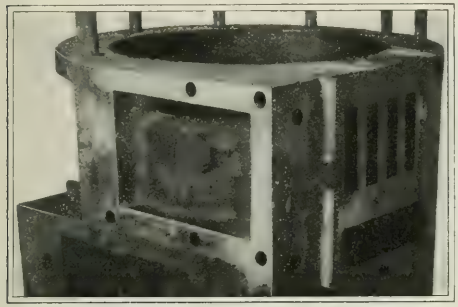


Fig. 5.—Cylinder Head Repaired by Welding in a New Piece.

not so much due to higher pressure of the acetylene, but to the fact that this high pressure enables the amount of the two gases to be regulated accurately by the holes in the tips, and that the mixture thus produced is absolutely homogeneous and results in the maximum molecular contact of the gases. The high pressure is an attendant feature of this type of torch, and the positive mixture thus obtained is the main reason for the economy. Those torches using a higher pressure than that produced by lighting generators, although they are sometimes termed high pressure, do not, without this positive feature, have the advantages of this type, but really work on the injector system with its disadvantages. It would be better to describe these torches as positive mixture and injector mixture types and then there could be no possible confusion between them.

Economic Features to Be Considered

Outside the construction of the torch, the principal economic features which should be considered are the method of producing acetylene from calcium carbide and the oxygen supply. The principal consideration in acetylene generator design is the means used to bring the water and the calcium carbide together. This is an economic consideration, because where the water is fed to the carbide a considerable separation of a part of the carbon from the gas occurs which forms tar and causes trouble by clogging up the pipes and the torches, and also considerably reducing either the calorific value of the gas or the number of cubic feet obtained per pound of carbide. This separation of the carbon is produced by the heat generated due to insufficient water to slack the carbide and produce the gas. This cannot take place in carbide feed generators in which the lumps of carbide are dropped into a tank of water, and it has been said that two cans of carbide in the latter type would go as far as three cans in the water fed model. Professor Pond's pamphlet on Calcium Carbide, which is recognized as containing the best information on this subject, states that the generators of the carbide-to-water type are undoubtedly the best, as with the water kept in excess it is impossible for the temperature to rise above the boiling point of water, and under all conditions this class of generators yields the purest gas, as the acetylene having to bubble through the lime water formed in the generator is washed free from most of its impurities.

With regard to the oxygen, it is desirable not only to consider the price at which it can be produced or bought, but also to consider its purity and what the impurities consist of, as some are far worse than others and produce weak welds. For example, chlorine has a very bad effect on the strength of welds, and this gas generally is present in oxygen produced in small generating plants. It can, of course, be removed by washing, and it has been found that where the oxygen is generated at atmospheric pressure the molecules of the gas passing through the water offer such a large surface that this impurity is removed only by passing through 9 ft. of washing fluid. When, however, the oxygen is produced under pressure ready for use the globules would probably only offer one-tenth of the surface and should therefore pass through 10 times as much washing fluid, or 90 ft., which could be readily accomplished in a stationary generator, but would be practically impossible in a portable one.

Disadvantages of Portable Generators

It is the writer's opinion that it is impossible to produce oxygen satisfactorily in a portable generator, the only feasible way being to use cylinders charged from a stationary plant having a satisfactory washing arrangement. Another reason why portable generation of gases is not desirable is that these generators produce such a small amount of gas that on large work an additional attendant is required. For small work where portability is required, the most suitable equipment consists of dissolved acetylene and oxygen in cylinders, which can be placed on a truck if desired, although in most cases this is not necessary as the units are not heavy.

For large emergency work a small stationary acetylene generator equipment is most suitable, but no

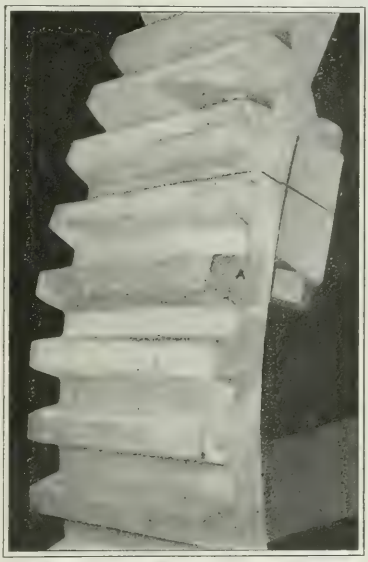


Fig. 6.—Portion of a 22 In. Gear Where Almost an Entire Tooth Was Built Up by Welding.

advantage is gained by mounting it on a truck as it should always be emptied of both water and carbide before moving. Otherwise there would be a chance of the generator being tipped and the water and carbide coming together, with a resulting instant generation of a large amount of gas which would burst the generator or else escape into the air and become ignited.

It is doubtful if any insurance company would sanction using a portable generator equipment mounted on a truck inside buildings, and as it could not be used outside in winter without freezing, there is no legitimate use for equipments of this sort.

In speaking of the high pressure torch I have called attention to the high pressure generator. This generator must not be confused with a type employed for charging dissolved acetylene cylinders such as are used for automobiles, which generates several hundred pounds pressure and was proven very dangerous. The generator used with the high pressure torch only generates pressure up to 15 lb. per square inch, which is perfectly safe, as shown by the fact that generators of this type have been passed by the laboratory engineers of the National Board of Fire Underwriters.

Repairs Made with a Positive-Mixture Torch

The injector mixture torch becomes less economical as its capacity is increased. This is not the case with the positive mixture torch, and some very large work has been carried out with it by the Autogenous Welding Equipment Company, Springfield, Mass., which keeps an equipment crated and ready to ship to any breakdown job at any moment's notice. A number



Fig. 7 Welding the Jars of the Edison Storage Battery, an Application of the Process to Manufacturing.

of repairs made by this company are illustrated herewith. Fig. 3 shows a bulldozer frame weighing 8 or 10 tons, made from cast iron, that was cracked at A through a section 8 in. wide by 5 in. deep. This was repaired by welding an additional inch of metal to increase the strength, making the actual weld 8 x 6 in. This machine could not have been repaired in any other way, and as a new casting could not have been obtained for several months a large financial loss was avoided by the successful welding of the break, the cost of which was small in proportion to that of a new frame.

Fig. 4 shows a break in the cylinder of a 200-hp. engine supplying the power for a factory employing 400 hands, which would have entailed a still greater loss. As there was no pattern of the casting available, making one, pouring the casting and the machining of the new cylinder would have meant a shutdown of a month or more, whereas the factory was running again on the Tuesday following the Thursday night, when the break occurred, the flange being welded back on the cylinder, as can be seen in Fig. 5.

The rim of a 12-ft. cast iron gear weighing 16 tons, whose face was 22 in. wide, broke at the rim. This was repaired by welding, the metal at the weld being 4 in. thick, and three-quarters of the tooth A, which was missing, was replaced, as shown in Fig. 6. In all 120 lb. of cast iron, the metal being added drop by drop, were required to make the weld.

Another considerable saving resulted from the welding of the crank disk of a 150-hp. steam engine which was split by the crank pin being forced too tightly into place. It would have been necessary to remove an 18-in. belt and also the flywheel to get the shaft out, and to do this part of the engine room would have to be torn down. In this case also there was no available pattern for the disk, and the successful completion of the repair in one day saved a shutdown of some weeks and was also cheaper as the repair charges were much less than the cost of a new disk.

The autogenous welding process is coming into extensive use for manufacturing, particularly where the work can be done automatically in a machine, as is the case with a large amount of sheet metal work. A good illustration of its application to this kind of work is given in Fig. 7, which shows the welding of the Edison storage battery jar, made from nickel iron about 1-64 in. thick. The longitudinal seam and one end are welded, the contents are then assembled and the top welded in place, as shown in the engraving, the work being entirely automatic. In this way much better work, as well as cheaper, can be done than by hand.

Sydney's Aid to Shipbuilding

TORONTO, July 30, 1910.—The ratepayers of Sydney, N. S., voted favorably July 20 on the by-law submitted by the City Council providing for the grant of a free site and a bonus of $350,000 for a steel shipbuilding plant. The by-law was submitted after some negotiation with Joseph Constant and associates of London, England, and with Constant & Hawthorne, naval architects, Montreal. The Constant interests propose to erect a steel shipbuilding plant, a repair, wrecking and salvage plant, and a floating dock. The dock will be a sectional steel pontoon, capable of docking a ship of 15,000 tons register, and will be built in the company's English yard. By adding sections the dock may at any time be converted into what is described in the act as a first-class dock. The company intends to build and sell ships. It has been said that it will sell on the installment plan. It is also the intention to prepare to build warships for the Canadian Government. Until the Dominion Steel Corporation's plate mill, now under construction, is completed, plates, angles, &c., will be imported. The company undertakes to keep from 500 to 1000 hands employed.

At the last session of the Nova Scotia Legislature an act was passed to enable the city of Sydney to give a bonus of $50,000 and a free site to a shipbuilding company, and a guarantee of 1½ per cent. per annum on $1,500,000 for 25 years. The company preferred the present arrangement, which is to be carried out by the city giving $350,000 of its 4 per cent. bonds to the company and conveying a free site. The Legislature is expected to validate the altered arrangement.

As the Province has a standing offer of $100,000 as assistance to the first large steel shipbuilding plant in Nova Scotia, and as the Dominion will pay 3½ per cent. per annum on the capital outlay for a dock, the company should be able to make a success of the venture.

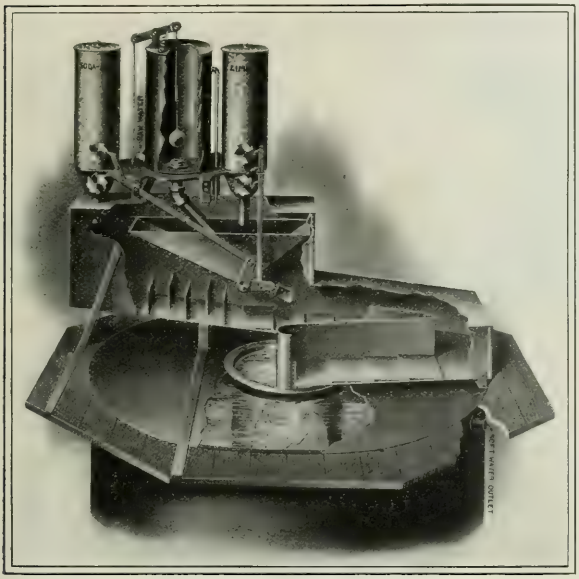
C. A. C. J.

Robert Aitchison, formerly general manager of the Aitchison Perforated Metal Company, has opened an agency office in the Plymouth Building, Chicago. He will represent in the Chicago territory the Nortmann & Duffke Foundry Company, Milwaukee, manufacturer of crucible steel, gray iron castings and pressed steel shapes, and is seeking other agencies in the mining and milling machinery lines.

The United States Radiator Corporation has secured the quarters formerly occupied by the United States Heater Company at 34 Dearborn street and 98 Lake street, where it will maintain its Chicago branch, under the management of E. A. Stark.

The Peerless Automatic Water Softening System

The special features of the Peerless system of water softening, manufactured by the Peerless Water Softener Company, Traction Terminal Building, Indianapolis, Ind., are the use of chemical reagents in a dry state instead of in a liquid solution, and the use of a few automatically operated parts. The first of these probably constitutes the most radical departure from former methods, as it differs markedly from all the known systems. In these systems the chemical reagents employed to remove the mineral impurities from the water are first converted into a liquid solution, but in the Peerless they are employed in a dry state. To deliver the exact amount of liquid reagent in a proper proportion to the flowing water is an extremely delicate task, as it is generally admitted that



The Water Softening Apparatus Built by the Peerless Water Softener Company, Indianapolis, Ind.

water containing 40 grains of impurity to the United States gallon is a bad water, although this proportion of impurity is only about one-fourth of 1 per cent. The purpose of the water softening system is to eliminate by chemical reaction about 90 per cent. of these impurities, leaving in the water about 10 per cent., or about one part in 4000. These figures show the extreme delicacy of the operation, especially when dealing with such an infinitesimal amount. It is claimed that by the Peerless system the use of the reagents in a dry state enables greater exactness to be secured in the operation.

The Peerless system in its essential features consists primarily of five component parts. The first of these, the auxiliary raw water reservoir, consists of a steel tank, into which the raw water flows, equipped with an automatic cut-off operated by a float valve. This cut-off arrests the flow of water while the weighing hopper is discharging its contents. This reservoir is the central one of the three cylindrical tanks shown in the upper part of the engraving. The two outside ones constitute the second part of the system, and are the self-measuring chemical feeders. These are composed of a chemical container equipped with an automatic self-measuring device operated, as is clearly shown, by levers from the weighing hopper, which opens and closes the gates of the feeders. One of the chemicals used in the process is soda ash, which is discharged from the left tank directly into the sluiceway. The other is lime and is discharged into the automatic weighing hopper simultaneously with the raw water.

The automatic weighing hopper consists of a triangular steel mixing chamber, which is so constructed that when full it dumps automatically, this action furnishing the motive power to operate the automatic cut-off in the raw water reservoir and close the gates of the chemical feeders.

From the weighing hopper the water is dumped into the agitating sluiceway or breakers below. This part of the apparatus is constructed of sheet steel, with baffle plates and a series of steps, over which the water flows, thus thoroughly mixing the reagents with the raw water before it is discharged into the precipitating tank. This tank, the upper portion only of which is shown, is constructed of steel boiler plate in the form of a standpipe, with a water-tight inner tube extending from the top to within a few inches of the bottom. The water after flowing out of the sluiceway passes down through this inner tube to the bottom of the tank, and then rises in the space between the inner tube and the outer shell, passing through a filter near the top of this space and finally flowing out through the soft water outlet at the right side of the tank near the top. In this tank, as its name indicates, the impurities are precipitated out by the chemical action of the reagents and the precipitate falls to the bottom of the tank, which is conical in form and provided with a blow-off valve for the removal of this matter. This system is designed primarily for the use of industrial plants to remove the scale forming impurities present in the boiler feed water, although it can be used with equal success for rendering drinking water palatable, and at the present time a municipal design for handling large quantities of water, 6,000,000 gal. and upward every 24 hours is being made. While soda ash and lime are employed in the system described, it is of course possible to substitute any other dry chemical for one or both of these reagents, according to the character of the water to be treated.

The American Gas Machine Company's Enlargement.—The American Gas Machine Company, Albert Lea, Minn., is erecting a new factory building, 65 x 240 ft., five stories. The first floor will be devoted to offices and salesrooms, brass foundry and electric plating department; the second to the sheet metal department, the third to the brass furnishing and assembling department and the fourth and fifth to the shipping and stockrooms. At the present time the company employs 100 people, but as soon as the new plant is completed it will probably require double that number. The new building will be ready for occupancy about January 1. This company recently established an Eastern branch house in New York State for the more efficient handling of its large New England trade.

The Vulcan Steam Shovel Company, Toledo, Ohio, is having plans prepared by Arnold & Co., 181 La Salle street, Chicago, for the buildings of its new plant to be erected at Evansville, Ind. The dimensions of these buildings have not yet been determined.

Efficiency Tests of Centrifugal Pumps

Results Obtained from Two Large American Models

The American Well Works Company, Aurora, Ill., has just made public the report of an efficiency test made on two of its centrifugal pumps. These pumps constituted part of an order for seven, which number will be ultimately increased to 15, the pumps being intended for irrigating 14,000 acres of land in the San Joaquin Valley, California. One of the pumps tested was designated by the manufacturer as a 20-in. and the other as a 15-in. pump, these dimensions being the diameter of the suction connections at the point of inlet into the main casing. In general character the pumps were identical and of the type shown in Fig. 1. The larger pump hereinafter designated as pump No. 1 has an outlet 24 in. in diameter and the double suction were each 15 in. in diameter. The corresponding dimensions of the smaller pump, hereinafter designated as pump No. 2, were 20 and 12 in., respectively. The curves obtained from the tests are shown in Figs. 2 and 3, respectively.

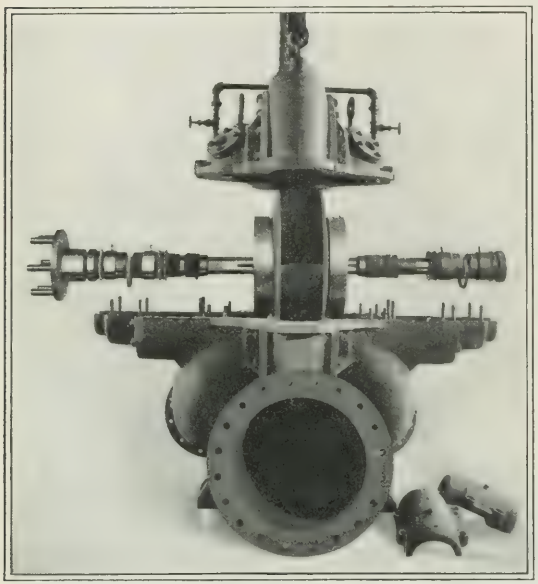


Fig. 1.—A Typical Centrifugal Pump, Built by the American Well Works, Aurora, Ill.

Both pumps were supplied with runners of the inclosed type and were operated during the test by direct connection through a flexible coupling to a jack shaft which in turn was belt driven by a direct current 125-hp. motor.

The dynamic heads were observed by mercury columns. The suction column was connected to both suction pipes on the horizontal axis of the ells, the other end of which connected direct to the pump casing. The connections were at an approximate distance of 3 ft. from the entrance to the pump runner and on the 15-in. pipe in the case of pump No. 1 and the 12-in. one in the case of pump No. 2. The force column was attached to the horizontal axis of the pump outlet immediately inside the flange, the diameters of discharge openings at points of connection being, as previously mentioned, 24 in. in the case of pump No. 1 and 20 in. in the case of pump No. 2. Necessary corrections were made to reduce the observed readings of the force column to an elevation coinciding with the horizontal axis of the pump discharge.

The quantity of water passing through the pumps was measured on a contracted weir 14 ft. long for pump No. 1 and 8 ft. in the case of pump No. 2. After some experimentation, the baffles between the pump discharge and the weir were so arranged as to secure conditions of flow suited to reasonably accurate measurement. The depth of water passing over the weir was measured in a still well by a hook gauge. The still well was connected with the basin by a pipe having three connections to the water at the bottom of the basin above the weir and distributed at substantially equal distances along its length. The zero of the hook gauge was carefully adjusted to the weir crest elevation with a Y level. A sluice gate placed immediately in front of the pump discharge afforded means for regulating the quantity of water flowing through the pump, with corresponding variations in lift.

The amount of current used by the motor was determined by measurement with a direct reading voltmeter and ammeter. The tests were run after the usual manner, commencing with the wide open discharge and working down through various stages of partial gate opening to complete closure. Some leakage in the gate, however, prevented an entire cessation of the discharge. After running a sufficient length of time to secure uniform conditions with each degree of gate opening, the various observations were made and checked.

After completing the test of both pumps in this manner a prony brake was substituted for the pump and a brake test made to determine the relation between the power applied to the pump shaft and the current supplied to the motor, the differences representing the losses in jack-shaft belt and motor.

The higher efficiency given by pump No. 2 is to be accounted for by slight error in the assembling of pump No. 1 not discovered until after the completion of the test of pump No. 2. The brass packing rings at the ends of the runner had been reversed in assembling, resulting in friction between the runner and these rings on both sides of the pump. This friction had been sufficient during the test to leave a very noticeable wear upon the rings, and as this acted as a brake

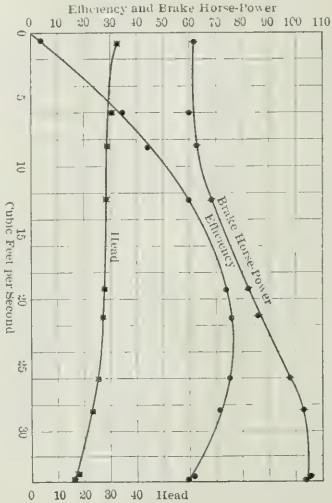


Fig. 2. Test Curves of the 20 In. Pump.

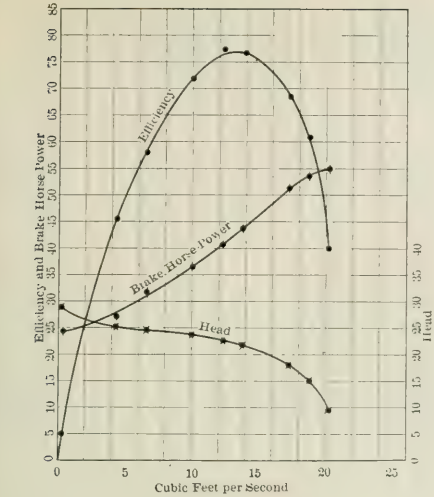
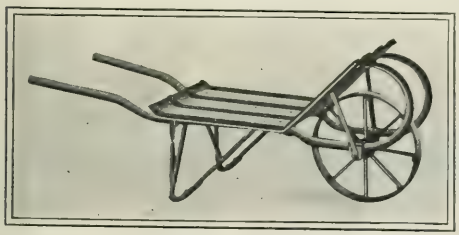


Fig. 3.—Curves Obtained from Test of the 15-In. Pump.

on a circle 20 in. in diameter, there can be little doubt if this error had not been made the pump would have shown, as it should have, as high, or somewhat higher, efficiency than pump No. 2.

The Syracuse Pig Iron Barrow

The No. 62 pig iron barrow built by the Syracuse Chilled Plow Company, Syracuse, N. Y., which is illustrated herewith, is said to possess the advantages of great strength and ease in handling. The most important part of any barrow built for handling pig iron or other heavy material is the forward end, as the load



The No. 62 Pig Iron Barrow, Made by the Syracuse Chilled Plow Company, Syracuse, N. Y.

must be carried well forward in order to bring as much weight on the wheel and as little on the handles as possible.

The wheel of this barrow, which is 17 in. in diameter, is extra heavy and the spokes are cast into the hub, which prevents them from working loose. The tire is shrunk on and the spokes riveted in place, a type of construction which results in a wheel which is said not to have any slack, and the spokes do double duty by suspending as well as supporting the hub. The wheel is set in a tubular iron frame which is a continuation of the handles, and is bent so as to form a support and guard for the wheel and also serve as a brace for the front of the tray. Referring to the engraving of the barrow, it will be noticed that this wheel guard projects slightly beyond the wheel. The operator is thus enabled to dump the barrow forward so that at the end of the operation the barrow rests on the guard with no danger of its falling back. When not in use the barrow can be set on end, resting on this wheel guard and thus saving considerable space in storage.

The handles are offset at the rear of the tray, thus providing a high support, with consequent ease in handling and balancing. The tray is made of No. 8 gauge steel and is 24 in. long, 22 in. wide and 16 in. deep at the forward end. Four straps reinforce it throughout its entire length, thus giving extra stiffness to the tray and relieving it of the wear consequent to the handling of rough, heavy material.

New Publications

Electric Power Plants. By Thomas Edward Murray, second vice-president and general manager, New York Edison Company. Pages, 337; illustrations, 152. Privately printed for distribution gratuitously among the author's friends and others who would appreciate the value of such a book.

The object of this work is to exhibit the engineering details of certain modern electric lighting and power plants which represent the most advanced design and construction. The list of plants is a fairly representative one, and includes the largest stations of the New York Edison Company in the Borough of Manhattan, the power stations of the Brooklyn Rapid Transit Company and the Gold street station of the Kings County Electric Light & Power Company, Brooklyn, N. Y.; two stations in smaller cities, one industrial power plant and one hydroelectric plant.

The two Waterside stations of the New York Edison Company exhibit not alone the installation and operation of units of exceptional size and large output, but also the many expedients required to insure continuous service throughout a large city area and the consequent meeting of every conceivable emergency. One power station of the Rapid Transit Company represents a system of high tension distribution with rotary converter substations, and is a radical departure from the earlier system of operating trolley lines by primary generation of direct current with reliance upon boosters for long distance transmission. This single large central station delivers current to any part of the system, which comprises over 300 miles of track, without excessive loss, and underground high tension feeders replace the heavy overhead cables, resulting in great flexibility and ample provision for future growth wherever this may become necessary. The other railroad station is of especial interest, as it shows the application of horizontal steam turbines as prime movers. The station of the Kings County Electric Light & Power Company is an example of the earlier engine driven station rebuilt as a turbine driven station. The other two central stations are typical installations for light and power in small cities, and the power plant of the Helderberg Cement Company illustrates an industrial plant wherein exceptional local conditions had to be met. The hydroelectric plant is that of the Chattanooga & Tennessee River Power Company, which is representative of the recent application of water power to the production of electric energy.

With a view to making the book of practical utility to the electrical engineer and power station builder, the author, who is also the designer of the plants described and supervised their construction, has confined himself to the exposition of facts and data valuable for purposes of comparison. He has therefore omitted all theoretical discussions, since the book is presented chiefly as a guide or collection of precedents likely to be of service to others having similar problems to solve. The illustrations include views of the stations, exterior and interior, the latter showing the apparatus installed; floor plans and sections of the various structures and diagrams of piping systems and electrical transmission lines, &c. The index is divided into sections, each of which is devoted to one of the stations, and these are also subdivided to make the locating of any particular part of one of the stations a comparatively easy matter.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅞ in. round and square	₩ lb 1.90¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 2.10¢
1½ to 4 in. x 1/16 to 5/16	
Rods—⅜ and 11-16 round and square	₩ lb 2.10¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 3/16 in. and ⅛ in.	2.35¢
1½ to 2½ in. x ⅜ in.	2.20¢
1½ to 2½ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.20¢
1 to 1¼ x ⅜ in.	2.30¢
⅞ x ⅛ in.	2.40¢
¾ x ⅛ in.	2.50¢
⅝ x ⅛ in.	3.55¢
½ x 8-32 in.	4.35¢

Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

per lb.

Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ lb 2.90¢	3.00¢
Nos. 18 to 21	₩ lb 2.95¢	3.10¢
Nos. 22 and 24	₩ lb 3.00¢	3.20¢
No. 26	₩ lb 3.10¢	3.30¢
No. 28	₩ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₩ lb 3.20¢
Nos. 22 to 24	₩ lb 3.55¢
No. 26	₩ lb 3.75¢
No. 28	₩ lb 4.10¢

No. 20 and lighter 86 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $4.85	4.80
No. 26	₩ 100 sq. ft. 3.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

A. Charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.60
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 .....107 lb.	$4.30
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 19¾¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14¼¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14¼¢ ₩ lb

Brass Wire—

List August 1, 1908. 14¼¢ ₩ lb

Copper Wire—

Base Price, Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot

Planished Copper, 1¢ ₩ square foot more than Polished

METALS—

Tin—

Straits Pig ₩ lb 35 @35¾¢

Copper—

Lake Ingot	₩ lb 14¾@15 ¢
Electrolytic	₩ lb 14¼@14¾¢
Casting	₩ lb 14¼@14½¢

Spelter—

Western ₩ lb 6¼@6½¢

Zinc.

No 9, base, casks ₩ lb 8 ¢ | Open ₩ lb 8¼¢

Lead.

American Pig	₩ lb 5 @5¼¢
Bar	₩ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed	₩ lb 22 @22½¢
No. 1	₩ lb 19 @19¾¢
Refined	₩ lb 17½@17¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb @10¢
Hallett's	@10¢
Other Brands	@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 34¢

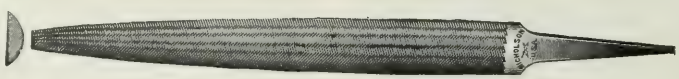
Rods & Wire	Base Price 34¢
Sheets	Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents		
Copper, Heavy cut and crucible	₩	lb	10.25@10.50
Copper, Heavy and Wire	₩	lb	10.00@10.25
Copper, Light and Bottoms	₩	lb	9.00@9.25
Brass, Heavy	₩	lb	6.75@7.00
Brass, Light	₩	lb	5.50@5.75
Heavy Mechine Composition	₩	lb	9.25@9.50
Clean Brass Turnings	₩	lb	6.75@7.00
Composition Turnings	₩	lb	8.00@8.25
Lead, Heavy	₩	lb	@3.50
Lead, Tea	₩	lb	@3.25
Zinc Scrap	₩	lb	@3.75

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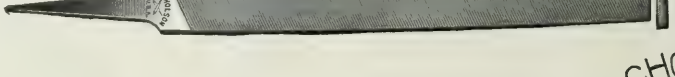


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Established 1855 — New York, August 11, 1910 — Vol. 86: No. 6

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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A Quiet Iron Market

No Cut in the Price of Standard Rails

The Steel Corporation's Statement of Unfilled Orders July 30

Iron and steel markets have probably not been quieter this year than in the past week. Crop news has been favorable on the whole and has helped sentiment, but it is evident that something more stirring in outside developments will be required to quicken the iron trade into real activity.

The statement of unfilled orders on the books of the United States Steel Corporation subsidiaries, given out as this is written, shows a total of 3,970,931 tons July 30, against 4,257,794 tons June 30, a falling off in the month of 286,863 tons. The falling off in the second quarter, as reported in July, was 1,144,720 tons, or an average of 381,570 tons a month. It is to be considered that production has been reduced in July, and therefore the July 30 statement of unfilled orders does not permit any exact deduction as to the inflow of new business last month, as compared with the three preceding months. It is well known, however, as was indicated a week ago, that July showed some decrease both in new orders and in shipments from the average for June.

The policy of the railroads, as to a large extent it is that of all consumers, is to buy for early needs. A few conspicuous exceptions come up, including the definite inquiry for 3000 cars for the Chicago & Alton and the statement that the New York Central Lines will place orders for 265 locomotives.

Much has been published in the past week of an alleged cut of $1.50 in the price of steel rails. It can be said on authority that no reduction from the $28 basis for standard rails has been made, nor is any change contemplated. Some statements have intimated that the cut was made on Mexican business. It is a fact that a large Mexican order is pending and it is also well known that the $28 price has not been maintained on export trade.

Structural works find that while large projects which require special financing are dormant there is a good aggregate, particularly in the West, of steel construction involving moderate tonnages. A dozen railroads are asking for bridge steel in small lots ranging up to 500 tons, indicating that nothing is being placed that can be postponed.

Steel car works are supplied with orders that will carry them into October, so that plate shipments for that trade have not shrunk greatly.

The vote of the Amalgamated Association on the proposal to call off the strike in American Sheet & Tin Plate Company mills showed 63.2 per cent. adverse. Had the strike been ended the Martins Ferry and La

Belle tin plate plants would have started and the Aetna Standard sheet mill. On tin plates the company is sold into February at its present rate of output and is three months behind in deliveries.

In cast iron water pipe the most important contract is for 3400 tons for Cheyenne, Wyo., taken by the largest producer. The low price of $21.89 on 500 tons let at Boston indicates an unusual anxiety for business. A gas pipe contract soon to come up is for a line 80 miles long, from Fayette, Miss., to Birmingham, Ala.

All pig iron markets are dull. The feeling is spreading that prices recently named are calculated to attract buyers. The level for which certain pipe foundries have been waiting has now been reached and some business has resulted.

Northern Ohio has finished the only round transaction in steel making iron. Of 10,000 tons of basic inquired for, 5000 tons was bought for fourth quarter delivery, the price netting the furnace about $14.

The July movement of Lake Superior ore by water was 6,945,000 tons, or 371,000 tons less than in June. Shippers are already counting on an early closing of the season, owing to the now certain shrinkage of requirements.

There has been sufficient buying of copper this week, in conjunction with the evidences of curtailment, to establish the price of electrolytic at 12.62½c., while Lake has advanced to 13c. After the wearying succession of disappointments in the industry, a more hopeful view of the outlook is finding less resistance.

Pig Iron Stock Statistics and Their Value

Where the iron trade is most concerned about knowing at what rate iron and steel are being consumed by the country the difficulties of finding out are usually greatest. The present is one of the times of special interest and difficulty. Since the publication of the blast furnace statistics last week, the statement has been made in several pig iron market reviews that the reduction of output in July has evidently established a close relation between supply and demand, and that the further reduction promised should bring improvement to the pig iron market. At the same time regret has been expressed that the statistics of pig iron stocks in the hands of producers are no longer published, the idea being, no doubt, that such publication would furnish the key to the situation. In the financial column of a recent issue of the New York *Evening Post* this appeared:

> We are told that, on the basis of the July output, the country's rate of annual production is 20 per cent. less than what it was at the maximum of the present year. But this is in some ways an extremely misleading comparison. There was no one at all in touch with conditions in the iron trade who was not aware last February that overproduction on a formidable scale was under way. To rectify this unwholesome position in the iron trade was as necessary as to rectify the position on the Stock Exchange, and that work has been largely accomplished. It would greatly reassure the trade if it could be known how far the huge accumulations of unsold iron have been reduced since February. But the iron trade refused, shortly after the large combinations in the industry, to give out those figures any longer. It did not like to have all the world know when supply and demand were out of touch. But, of course, the penalty comes when the trade would have good news to give out in the same direction, but cannot do it.

What was said in these columns last week of the difference between the present rate of pig iron production and the maximum rate of 1910 only becomes misleading when used as if it had to do with consumption. It is common to see the pig iron production statistics headlined as favorable when they show a large output and unfavorable when output declines. But it would be hard for any one who had followed the course of the iron trade this year to make a wrong deduction from the figures of August 1. The trade had been calling for curtailment, and plainly curtailment was under way at last to an extent that meant a shorter cut to equilibrium than the figures of June 1, two months previous, which showed but 10 per cent. reduction from the high rate of February.

A word as to the main matter with which this extract deals—the statistics of stocks of pig iron in makers' hands: They are not so valuable as they are made to appear. When these statistics were first gathered, merchant pig iron was much more than half the country's output. Steel companies were regular buyers of pig iron. To-day the steel companies produce more than twice as much pig iron as the merchant furnaces and only buy from the latter on booms. Figures of stocks in merchant makers' hands are now of less significance, as bearing on the general iron and steel situation, than the figures of stocks at steel works furnaces, which were never collected even in the days of publicity.

The stock statistics published regularly up to the fall of 1905 related chiefly to foundry iron and to the smaller amount of steel making iron produced by merchant furnaces. They were discontinued because some of the furnace companies considered that the holding off by foundry buyers in the first six or eight months of 1905 was due to the monthly announcement of an increase in furnace stocks. The theory of the refusing companies was that secrecy about stocks would result in the buyer coming into the market from time to time and possibly prevent the weakening of prices, which had accompanied the general knowledge of large accumulations of iron.

The suppression of data on stocks has had very little, if any, effect on the pig iron trade. Since 1905 the steel companies have had less and less to do with the pig iron market. The furnaces producing foundry iron have also learned that stocks in their customers' hands may at times signify much more than stocks on furnace banks. These foundry stocks led to an exaggerated notion of the rate of consumption in the fall of 1909. All the iron bought on the revival of demand last August was taken into foundry yards, for on a rising market full contract deliveries are wanted whether the iron is needed or not. The same was true of steel products. All over the country, following two years of hand-to-mouth buying and cleaning up of stocks, the second half of 1909 brought a general restocking movement. Just what the actual consumption of iron and steel products was then would be as hard to determine as it is to-day. Then iron and steel were accumulating in consumers' hands and consumption was less than it seemed to be. In recent months, as users of iron and steel have worked off their high priced stocks, consumption has probably been underestimated.

It is hard to say how the publication of pig iron stocks, month by month since the opening of this year, would have changed the attitude of foundry iron buyers. So many signals have been flying that the consumer has not been left in doubt, even though a greater

factor than furnace stocks—the total of pig iron stocks at foundries—has been, as always, a matter of conjecture. The steadily lowering prices quoted by individual sellers, who presumably found stocks growing on their hands, have told their own story. Having bought freely in the upward movement of 1909 without any information from stock statistics, the discerning foundryman has apparently picked his way along the declivity of 1910 without their help.

In times when the adjustments of supply and demand are more delicate than they have been in the movement of 1909 and its counterpart of 1910, pig iron stock statistics have a certain value. But for the reasons given, and with the great swing of the industry toward steel produced by strong, self-contained companies, that value is much less than it has ever been.

Contraction in Lake Ore Shipments

The July movement of Lake Superior iron ore, amounting to 6,945,000 tons, against 7,316,000 tons in June, marks the beginning of curtailment there, following six months of declining pig iron production. Before they had unloaded in their storage yards the first trainload of 1910 ore some of the Central Western blast furnace companies saw that their purchases for the year ending April 30, 1911, would be far in excess of their needs. Moreover, the argument commonly put forth early in the year that as ore cost had advanced the pig iron market would have just that much less room in which to fall has been swept away by events. The suggestion of a readjustment of ore prices did not appeal to the ore producers, who saw in such a procedure the possibilities of fresh demoralization in pig iron. As the shipping season advanced, rail freights from lower lake docks on ore that must stay on furnace yard stockpile many months before it could be worked up became more of a burden. There would be some relief if it could be held on dock at Lake Erie, even though the rebate for direct shipment were sacrificed. Ordinarily the consumer's request to have ore docked would be granted, within limits. But as ore shipments per year have been passing the 40,000-000-ton mark dock space has not grown greatly, furnace storage being depended on to care for the increase. Thus with crowded docks and the desire of furnaces to have ore held back the question comes up of the extent to which shipping programmes can be revised and the ore held at the mine.

Reselling part of his ore at a sacrifice will not appeal to the average furnaceman. To the 50 cents concession, which is the basis named in a recent offer, there is the offset of a saving in interest—about half as much on $5 ore—and the possibility of loss on pig iron should present tendencies continue. But the chief reason for expecting few resales is that there are practically no buyers—nearly all have enough and more.

With 21,863,000 tons of ore moved up to August 1, or nearly 6,500,000 tons more than to the corresponding date in 1909, it is plain that there can be even a further laying off of ore freighters and have enough ore down by December 1 to last into the summer of 1911. While it has been evident for months that the 50,000,000-ton movement talked of at the beginning of the year was improbable, there are still indications that the record shipments of 42,500,000 tons in 1909 will be exceeded.

The Revision of Iron and Steel Duties

Iron and steel manufacturers feel that the criticisms of the revision of the tariff effected by the Payne act of 1909 are ill founded as far as the metal schedule is concerned. Those who claim that there was no revision downward, and that in this respect the campaign promises of the dominant political party in 1908 were not fulfilled, should take a little time to make a comparison of the duties imposed by the metal schedule of the Dingley act with those fixed by the act now in force.

If such an examination were to be made, it would be found that the duty on steel rails was reduced from $7.84 to $3.92 per ton, or 50 per cent.; the duty on wrought pipes or tubes was reduced from 2 cents to 1 cent per pound, or 50 per cent.; the duty on bar iron was reduced from 6-10 to 3-10 cent. per pound, or 50 per cent.; the duty on structural shapes was reduced from 5-10 to 3-10 cent per pound, or 40 per cent.; the duty on pig iron was reduced from $4 to $2.50 per ton, or 37½ per cent.; the duty on anchors was reduced from 1½ cents to 1 cent per pound, or 33 1-3 per cent.; the duty on hoops and bands was reduced from 5-10 to 3-10 cent per pound, or 40 per cent.; the duty on planished sheets was reduced from 2 to 1½ cents per pound, or 25 per cent.; the duty on black sheets, from Nos. 25 to 32, was reduced from 1 1-10 cents to 8-10 cent per pound, or 27 3-10 per cent.; the duty on galvanized sheets, from Nos. 25 to 32, was reduced from 1 3-10 cents to 1 cent per pound, or 23 1-13 per cent.; the duty on tin plates was reduced from 1½ to 1 1-5 cents per pound, or 20 per cent.; the duty on steel plates, valued from 1 cent to 2 cents per pound, was reduced from 6-10 to 5-10 cent per pound, or 16 2-3 per cent. The duties on a great variety of other iron and steel articles were reduced from 25 to 33 1-3 per cent. The duty on scrap iron was reduced from $4 to $1 per ton, or 75 per cent. The duty on iron ore was reduced from 40 to 15 cents per ton, or 62½ per cent.

It will be well to keep these reductions in duty in mind in the heated discussion which is now being conducted in some quarters relative to the necessity for another tariff revision. It is possible that in some schedules the reductions made were not such as to accomplish much saving in the duties imposed, but this has clearly not been the case with the metal schedule.

A Suggestive Noncancellation Clause

The Brown & Sharpe Mfg. Company, Providence, R. I., has placed at the foot of its quotation sheet to customers the paragraph: "Cancellation of orders once placed with and accepted by us can be made only with our consent." The clause is suggestive to those who are studying the details of a new practice—for the machine tool trade—of noncancellation of contracts. It does not voice a hard and fast rule, but places the manufacturer in a position from which he can dictate terms when the occasion shall arise. At present the customer is the dictator. At times of business crises the machine builder is protected by such a clause. He can deal individually with his customers. The optimistic buyer, who orders too heavily on the principle that when business is rushing he can have none too great a producing power, is made to realize that he and not the manufacturer of machinery must bear the burden of a slump.

The Machinists' Strike on the Pacific Coast

Reports from members of the United Metal Trades Association of the Pacific Coast indicate that in the last week in July greater gains were made in their working forces than in any week since the machinists' strike was declared. In Seattle more machinists were at work than on June 1. Business is reported better than at the time the strike was called, and while some of the shops need more men none is seriously handicapped. It is stated that if only the same amount of work required to be done that was going through the shops two months ago, all would have full forces. At Spokane conditions are gradually becoming normal, and all shops are running with good forces. At a meeting of the employers a formal declaration for the open shop was adopted. Portland shops report that pickets are becoming less numerous. At Tacoma some further additions have been made to the working forces. Retail merchants at Portland have gone on record for the open shop. The labor unions there are threatening to call a general strike to force the draymen to yield to the teamsters. At Los Angeles the City Council passed an ordinance which prohibits the carrying of boycotting banners and the use of other methods, such as public outcry, to prevent persons from entering places of business or factories. A similar ordinance was passed at Portland.

An interesting development is the friction between labor union leaders that has resulted from the failure of the molders and patternmakers to go out in support of the machinists' strike. A letter from President O'Connell of the International Association of Machinists to President Valentine of the Iron Molders' Union, says that he feels very keenly the failure of the iron molders to co-operate. "I find myself," he says, "in a most awkward position trying to explain to our people why it is that only the machinists on the Puget Sound are now struggling to extend the eight-hour day, and that the molders and patternmakers are taking no part with us." He adds that if the machinists are left alone to fight it out, the contest will be long drawn out and expensive, with the outcome very doubtful.

Foundry Machinery and Supply Firms Incorporated

At a meeting of the Executive Committee of the Foundry and Manufacturers' Supply Association, held at the Hollenden Hotel, Cleveland, August 8, the committee appointed to investigate the feasibility of incorporating the organization in accordance with the resolution passed at the annual meeting held in Detroit, presented the following report:

Since the convention in Detroit, we find that the molding machine manufacturers and others, representing one-third of the space at the exhibit held in Detroit, have incorporated under the laws of the State of Pennsylvania as the Foundry and Machine Exhibition Company, with a capital of $25,000. After investigation, we find the purposes and intentions of this incorporation are identical with the object of the organization which your association proposed. Therefore, if after full and complete information concerning this corporation is submitted to the members, and if the same be found satisfactory to them, we recommend that the members of the Foundry and Manufacturers' Supply Association join the new corporation.

The committee appointed to investigate the incorporation of this society appointed by George R. Rayner, president-elect, consists of S. T. Johnston, S. Obermayer Company, Chicago; Frederick B. Stevens, Detroit, and F. N. Perkins, Arcade Mfg. Company, Freeport, Ill. Secretary C. E. Hoyt was instructed to advise the members of the association immediately of the committee's report, and a more complete statement will be issued by the Executive Committee in the near future. The report was presented by the committee to President-elect Rayner, by whom it was referred to the Executive Committee and was favorably acted upon.

The Eastern Scrap Situation

A communication has been addressed to railroad companies by a large scrap dealer on the subject of the concentration of purchases of scrap through one agency by a number of eastern Pennsylvania steel manufacturers and bar iron rolling mill companies. It presents the views of the dealers, who have found their business seriously disorganized by this method of syndicate buying, which they believe works an injustice to the railroads, who furnish the principal supply of scrap, as well as to themselves. The communication is as follows:

A combination in restraint of trade is one which makes it possible for that combination to sell its product to the consumer at a higher price than the members could otherwise get if not in combination, or else makes it possible for that combination to buy material which its members use at a lower price than they could otherwise buy the material if not in combination.

The associated mills of the East are buying all their scrap iron through one broker. The railroads could break this up and get a higher price for their scrap if they would refuse to sell to his broker, or refuse to sell material to those mills through this broker. The railroads should agree to foster competition in the scrap iron trade, not destroy it.

Without the scrap man, who is the middleman and the balance wheel, as it were, in the business, the railroads would be getting less money all the time for their scrap material, and in the end all competition would be destroyed and they would be at the mercy of the mills, who would buy the scrap at less than it is worth.

Scrap iron and steel have always sold at a higher price in eastern Pennsylvania, by $1 to $2 per ton, than in western Pennsylvania. To-day, through the efforts of the brokers working for the combination, prices are $1 to $2 per ton lower in eastern Pennsylvania than in western Pennsylvania.

The scrap dealer who writes the communication says he is ready to retire from the business if he is not assured of the co-operation of the railroads in developing competition among the dealers instead of eliminating such competition.

A. M. Byers Company Improvements.—This company is now going ahead with the improvements at its South Side Pittsburgh plant, the cost of which will aggregate $225,000. The Riter-Conley Mfg. Company, Pittsburgh, has contracts for the steel buildings, which include pipe mills, gas producer, conveyor building, warehouses and covered crane runways for storage purposes, besides a brick boiler house. These improvements, which will be completed early next year, will give the A. M. Byers Company an increased capacity in its pipe department. The construction of the 46 puddling furnaces at the Girard, Ohio, plant is progressing favorably and it is expected that they will be ready for operation in the latter part of October.

The Colonial Steel Company, Pittsburgh, with plant at Colona, Pa., will shortly erect a new steel and brick warehouse, 72 x 117 ft., equipped with a 5-ton electric traveling crane and having a runway extension 200 ft. long with 63-ft. span, on which a somewhat larger crane will be operated for yard storage. S. Diescher & Sons, engineers, Farmers Bank Building, Pittsburgh, are taking bids for the building and equipment.

The Sharon Foundry Company, Sharon, Pa., with plant at Wheatland, nearby, manufacturer of steel castings, has let a contract to Wallis & Carley for the erection of an addition to its pattern storage house which will be 50 x 60 ft., of iron and wood construction, with slate roof. No additional equipment will be required.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug.10, 1910.	Aug. 3, 1910.	July 13, 1910.	Aug. 11, 1909.
PIG IRON, Per Gross Ton:				
Foundry No 2, standard, Philadelphia	*$16.00*	$16.00	$16.25	$17.00
Foundry No. 2, Southern, Cincinnati	*14.25*	14.50	14.75	16.25
Foundry No. 2, local, Chicago..	16.50	16.50	16.50	17.00
Basic, delivered, eastern Pa....	*15.25*	15.25	15.75	17.00
Basic, Valley furnace	*14.25*	14.25	14.50	15.25
Bessemer, Pittsburgh	*16.15*	16.15	16.40	16.90
Gray forge, Pittsburgh	14.40	14.40	14.40	15.15
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh....	*24.50*	24.50	25.00	24.00
Forging billets, Pittsburgh.....	30.00	30.00	30.00	28.00
Open hearth billets, Philadelphia	*27.50*	27.50	28.50	27.00
Wire rods, Pittsburgh	*28.00*	28.50	29.00	31.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago....	**13.50**	13.50	13.00	16.00
Steel rails, melting, Philadelphia	*13.75*	13.75	14.25	17.00
Iron rails, Chicago	*16.50*	16.50	16.75	18.50
Iron rails, Philadelphia	*18.00*	18.00	19.00	19.75
Car wheels, Chicago	*14.50*	14.50	14.75	16.00
Car wheels, Philadelphia	*14.00*	14.00	14.50	15 50
Heavy steel scrap, Pittsburgh...	*14.25*	14.50	14.50	16.00
Heavy steel scrap, Chicago.....	12.25	12.25	12.25	14.75
Heavy steel scrap, Philadelphia.	*13.75*	13.75	14.25	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.	*1.42½*	1.42½	1.47½	1.45
Common iron bars, Chicago....	1.40	1.40	1.40	1.37½
Common iron bars, Pittsburgh..	*1.45*	1.45	1.50	1.45
Steel bars, tidewater, New York	*1.56*	1.56	1.61	1.46
Steel bars, Pittsburgh	*1.40*	1.40	1.45	1.30
Tank plates, tidewater, New York.	1.56	1.56	1.56	1.56
Tank plates, Pittsburgh	1.40	1.40	1.40	1.40
Beams, tidewater, New York....	1.56	1.56	1.56	1.56
Beams, Pittsburgh	1.40	1.40	1.40	1.40
Angles, tidewater, New York...	1.56	1.56	1.56	1.56
Angles, Pittsburgh	1.40	1.40	1.40	1.40
Skelp, grooved steel, Pittsburgh.	1.50	1.50	1.50	1.35
Skelp, sheared steel, Pittsburgh.	1.60	1.60	1.60	1.45
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents	Cents.
Sheets, black, No. 28, Pittsburgh	*2.20*	2.25	2.30	2.20
Wire nails, Pittsburgh*.....	*1.70*	1.70	1.80	1.80
Cut nails, Pittsburgh	*1.65*	1.65	1.70	1.75
Barb wire, galv., Pittsburgh*...	*2.00*	2.00	2.10	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents
Lake copper, New York.....	**13.00**	12.75	12.62½	13.62½
Electrolytic copper, New York..	**12.62½**	12.50	12.37½	13.25
Spelter, New York	5.20	5.20	5.20	5.75
Spelter, St. Louis	5.05	5.05	5.05	5.60
Lead, New York	4.40	4.40	4.40	4.30
Lead, St. Louis	**4.30**	4.25	4.25	4.15
Tin, New York	**33.37**	33.20	32.65	29.85
Antimony, Hallett, New York...	*8.00*	8.00	8.12½	8.12½
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York...	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c. plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.15c. to 2.20c.; No. 28, 2.20c. to 2.25c.; No. 29, 2.25c. to 2.30c.; No. 30, 2.35c. to 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c.; No. 29, 3.45c. to 3.50c.; No. 30, 3.65c. to 3.70c. Painted roofing sheets, No. 28, $1.65 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	55	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

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Pittsburgh

PARK BUILDING, August 10, 1910.—(*By Telegraph.*)

Pig Iron. Some odd lots of pig iron in middle hands have been disposed of, while there has been a slight improvement in the inquiry, so that on the whole the market has not lost any ground the past week. A sale of 1000 tons of prompt Bessemer has been made at $15.25, Valley furnace, to a Bessemer steel interest. A steel company at Canton, Ohio, bought 5000 tons of fourth quarter basic on its inquiry for 10,000 to 12,000 tons, and will defer the purchase of the remainder for some time. It is understood that $14.50, delivered at Canton, was paid for the iron bought, netting $14 at furnace. Sales have been made of about 2000 tons of off basic at under $14, Valley furnace. There are inquiries for 800 tons of Bessemer for a steel casting interest, fourth quarter, and 500 tons of basic or early delivery to another interest. We note sales of one carload of prompt foundry iron at $14.25, Valley furnace, and 200 tons of fourth quarter at $14.40. We quote the market at Valley furnaces, 90c. higher delivered Pittsburgh, as follows: Bessemer, $15.25; basic, $14.25 to $14.50; No. 2 foundry, $14.25; gray forge, $13.50; malleable Bessemer, $14.50 to $14.75, the higher price, when there is a range, being for later delivery.

Steel.—The tone of the billet and sheet bar market is somewhat easier, as there is considerable surplus capacity, but prices are not quotably lower, and we quote Bessemer billets, 4 x 4 in., $24.50 to $25; Bessemer sheet bars, $25.50 to $26; 4 x 4 in. open hearth billets, $26; open hearth sheet and tin bars, $26.50 to $27; open hearth small billets, $27; forging billets, $30 to $31, all f.o.b. Pittsburgh, Wheeling or Youngstown district, with freight to point of delivery added. The quotation of $26 to $26.50 on Bessemer sheet bars in the issue of July 28 should have been $26 flat.

(*By Mail.*)

The finished steel market has become still quieter, new buying being extremely light. Shipments, however, are fairly well maintained, specifications being good considering the amount of buying that has been done lately. In some lines a slight increase in specifications is noted, as compared with July. The railroads are conspicuous by their absence as buyers. A feature of the market is the steadiness with which bars, plates and shapes are being held at a minimum of 1.40c., Pittsburgh, by leading interests. The price was done two months or more ago on plates and shapes, but no important transactions below this level are believed to have been made, while it has only been lately that the price was done on steel bars, and even now it is made only on the most attractive business. The result of the Amalgamated Association's per capita vote on the strike matter was announced late this afternoon, 63.2 per cent. being in favor of continuing the strike against the open shop of the American Sheet & Tin Plate Company and 36.8 per cent. in favor of calling it off. The strike will therefore be continued, but no new plans for prosecuting it vigorously have been announced.

Ferromanganese.—The inquiry is light and only for odd lots for early shipment. We continue to quote, f.o.b. Baltimore, $39 to $39.50 for prompt delivery.

Ferrosilicon.—A leading manufacturer of blast furnace ferrosilicon states that there has been more inquiry the past week than at any time for a year. Prices are unchanged. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh. Blast furnace ferrosilicon is quotable at $23 for 10 per cent.; $24 for 11 per cent., and $25 for 12 per cent., f.o.b. Jisco and Ashland furnaces.

Rods.—The Jones & Laughlin Steel Company is this week putting its rod mill at Aliquippa in operation, on billets shipped from the Pittsburgh plant. The output will be relatively light for a month, or until the first of the Talbot steel furnaces at Aliquippa is put in operation. The market has been quiet, but prices are a shade easier, rods being sold in some exceptional cases at $28. We quote the market at $28 to $28.50 for Bessemer and at $28.50 to $29 for open hearth, Pittsburgh.

Skelp.—Specifications are fairly good for sheared skelp, as the pipe mills are doing well on large sizes, and there is a moderate amount of new business, on which regular prices are occasionally cut. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—Some stir has been caused by the report that the Illinois Steel Company, in competition with Belgian manufacturers, has sold 20,000 tons of standard rails to a Western railroad at $1.50 less than the recognized price, which has been adhered to since the advance from $26 to $28 in February, 1901.* A specific denial that any such transaction occurred is made by the local rail interests, and it is suggested that there is more disposition on the part of rail makers to advance than reduce prices, on account of the increase in cost of manufacture in the past nine years by reason of the ores used being leaner and wages and supplies having gone up, besides which the greatly increased stringency of specifications and inspection in the past two or three years has added materially to the production cost. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50., at mill.

Structural Material.—The fabricating shops are fairly busy, and will be for two or three months with the work now on books, but new business is light. Fabricating prices are very low, compared with costs of plain shapes. We quote beams and channels, 15-in. and under, at 1.40c. to 1.45c., Pittsburgh.

Plates.—The steel car shops find new orders falling far short of equaling those that are being filled, but they are still busy and taking a round tonnage of plates. The railroads are expected to buy cars more freely late in the year. Mills making a full range of sizes are firm at a minimum of 1.40c., Pittsburgh, on plates, and obtain 1.45c. on less desirable business, but a few small mills making only a limited range sell at 50c. to $1 a ton under this minimum on such orders as they can pick up.

Sheets.—The vote of the Amalgamated Association to continue the strike against the open shop of the American Sheet & Tin Plate Company will not affect the sheet situation, as this interest had succeeded in operating all its sheet mills except the Ætna-Standard, at Bridgeport, Ohio, but has lately been operating somewhat intermittently at its Kiskiminetas Valley plants outside of Vandergrift. New demand is extremely light for sheets, and this is attributed to its being the vacation season. Specifications and deliveries are quite heavy. We quote one-pass box annealed sheets at 2.20c. to 2.25c., depending on delivery, and galvanized at 3.30c. to 3.35c., both for No. 28 gauge.

Tin Plate.—The vote of the Amalgamated Association to continue the strike averts the possibility of a material increase in tin plate production, as in the event of the strike being called off the leading interest was expected to start the Martins Ferry and La Belle plants, in the Wheeling district, besides recruiting its forces at some plants now in operation, where, on account of the weather, extra men can be used to increase output. Tin plate continues scarce and is being shipped as fast as produced, but buying for far forward delivery is relatively light. The leading interest is said to be sold into February at its present rate of output and to be three months behind in deliveries, while independents are sold into November. We quote the market very firm at $3.60, Pittsburgh, for 100-lb. cokes. Occasionally premiums up to 15c. per box are paid for prompt delivery of small lots.

Bars.—The steel bar market is at an absolute minimum of 1.40c., Pittsburgh, while on odd lots 1.45c. is usually obtained. Specifications on steel bar contracts are heavy, but new business is relatively light. Iron bars continue in light demand, remaining quotable at 1.45c. to 1.50c., Pittsburgh.

Spelter.—There is a moderate demand for spelter for early shipment, but no forward buying. Prices are stationary and we continue to quote prime Western grades at 5c. to 5.05c., East St. Louis, or 5.12½c. to 5.17½c., delivered, Pittsburgh.

Hoops and Bands.—Specifications continue fairly good, but new buying is light. We quote steel hoops at 1.50c. to 1.55c. and bands at 1.45c. to 1.50c., the latter with extras on the steel band card.

Spikes.—The demand for spikes is light, and there is not a great deal of contract business on books. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade, but some of the producers refuse to go below 1.55c. on any business. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, far carload and larger lots.

Rivets.—New business continues light, while specifications are fairly satisfactory. Official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but these prices are shaded on desirable orders.

Shafting.—New demand for shafting is light, particularly from the automobile trade, but there is a good line of business on the books of producers. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of an extra 5 per cent.

Wire Products.—There has been fairly good buying of

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wire products since the recent reduction, but the buying is confined to deliveries in the next 30 to 60 days, buyers not taking hold very freely for the regular fall trade. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65 to $1.70, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination added.

Merchant Pipe.—The Philadelphia Company has placed with a contractor 18 miles of 16-in. line pipe, and the order for the pipe is expected to go to the leading pipe producer. It has placed an order for 5 miles of 12-in. with an independent, and the Arkansas Natural Gas Company has also placed with an independent an order for 7 miles of 10-in. Official discounts are reported as being absolutely maintained on steel pipe and fairly well on iron pipe.

Boiler Tubes.—There is a moderate demand for boiler tubes, and specifications are fairly satisfactory. Regular discounts continue to be shaded.

Coke.—The Standard Sanitary Mfg. Company has placed two contracts for standard 72-hour Connellsville foundry coke, aggregating 10 to 15 cars weekly, one for 11 months, to July 1 next, and the other for 12 months, to August 1, prices being just a shade under $2.25 per net ton, at oven. Furnace coke is in very light demand. Prices are well maintained, as production seems to be closely regulated to demand. We quote standard coke, per net ton, at oven, as follows: Prompt furnace coke, $1.65; prompt foundry coke, $2.15 to $2.25; contract foundry coke, $2.25 to $2.50.

Iron and Steel Scrap.—The market for heavy melting steel is quieter since the sudden buying reported last week and prices are hardly as firm on this grade. We quote as follows for delivery at Pittsburgh or elsewhere, as stated:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.75 to 10.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.75 to 14.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	21.00 to 21.50
Steel car axles	19.00 to 19.50
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.50
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.50 to 7.75
Machine shop turnings	9.25 to 9.50

Chicago

FISHER BUILDING, August 10, 1910.—(*By Telegraph.*)

Current business and small operations are apparently going forward at a normal rate. The fabricating shops in the West are filled up with small jobs, this class of business in structural shapes having grown to larger proportions than ever known before. The scarcity and high price of timber suitable for bridges and warehouse beams have made steel cheaper than wood, and this is having a considerable effect on the demand for small lots of structural shapes. Building codes in the cities are also becoming more rigid, and altogether the fabricating interests are so well supplied with work that they are not much affected by financial conditions which are holding back contracts for large jobs. In other directions the same indications are found of growth in the general consumption of steel. Shipments of merchant steel into this territory the past month broke all records for July in the value of shipments and were second only to July last year in the tonnage. The demand for open hearth sheets is better than the local mills had any reason to expect in August. There is a steady run of current business in bars, principally for concrete work. Orders for wire products are coming in at a good rate, without any of the speculative demand which was apparent last year, when higher prices were expected. The weak spots in the market are those affected by the purchasing power of the railroads. The lack of railroad orders is felt most seriously by the bar iron mills, but it also affects the plate and structural mills on material for car building. There has been good consumptive buying of copper for deliveries extending into October, but the demand for spelter and other metals is light. Old material is weak and lower.

Pig Iron.—The pig iron market here is going through the dullest period of the year, and men who have been actively interested in this trade for years say they have never known the demand to be so light in normal times. The foundries are all doing a fair amount of business and their melt has not fallen off to any great extent, but they are generally covered several months ahead. Even the malleable foundries are fairly busy, as the growth in their demand from other sources has offset to a considerable extent the lack of railroad orders. The furnace interests are disappointed to find a growing tendency among buyers to wait until they can purchase for next year. Very little business has been done thus far for the first quarter or first half of 1911, and only under special conditions. In some cases buyers can make contracts for Southern iron for the first half of 1911 at $11.50, Birmingham, purchasing from merchant interests buying spot iron at $11 and carrying it on warrants until time for shipment. A stove interest in western Michigan has purchased 1000 tons of Southern high silicon for delivery this year and is in the market for another 1000 tons of high silicon for first half, as well as 2000 tons each of Northern and Southern foundry, but it is understood that the 1911 business has not been placed. Small lots of Southern foundry are being sold at $11.50 for current shipment or last half, and this appears to be the minimum on small lots of standard brands. The $11 price is only available on larger transactions for prompt or last half delivery. Northern iron is selling at $16 to $16.50, at furnace, for early deliveries, with switching charges added to make the price quoted for Chicago delivery. Many buyers express a willingness to cover round lots for the first half, but the furnace interests are determined to wait as long as they can before opening their books for next year's business. The following quotations are for August and September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.00 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.00 to 15.50
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.50 to 15.00
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.90 to 18.40
Jackson Co. and Kentucky silvery, 6	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10	21.40 to 21.90

(*By Mail.*)

Billets.—Occasional sales are made to consumers in this district at $29 to $30, base, Chicago, for open hearth billets, making Chicago an independent market for this material. No regular Chicago price can be quoted on Bessemer billets, as the price that would be done would depend upon the quality and other considerations.

Rails and Track Supplies.—New business in standard rails is very light, but there is no effort on the part of the railroads to hold back deliveries on the tonnage bought for this year, and in some cases important roads have requested earlier deliveries than they had specified in their contract. The demand for track supplies, however, is not so urgent as it was during the spring. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $27; 30 to 35 lb., $27.50; 16, 20 and 25 lb., $28; 12 lb., $29, Chicago.

Structural Material.—The demand for small lots of structural material throughout the West is very heavy, and fabricators generally have about all the business of this kind that they can handle. One large fabricating shop which is oversold has endeavored recently to place several hundred tons of plate girder bridges with some other plant for shipment within 60 days, but has found it difficult to get the desired delivery. Many large projects, however, are held back by financial considerations, owing to the critical attitude adopted by the banking and insurance interests which underwrite mortgages or bonds on large buildings, and only a few jobs of moderate size were reported closed last week. The Oregon Railway & Navigation Company let to Milliken Brothers a contract for a freight house at Seattle, Wash., which will require 600 tons. Buildings for the Utah Copper Company near Salt Lake which call for 450 tons will be fabricated and erected by the Minneapolis Steel & Machinery Company. There are rumors of concessions in price on large lots of plain material from mill, but on ordinary business the market is firm at 1.40c., Pittsburgh. We quote plain-material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The mills still have a fair amount of business on their books growing out of car contracts that were placed last spring. No new car inquiries are reported, however, although the Alton, which inquired some time ago, is still figuring on a good lot of cars. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—There is a good run of new business in open hearth sheets, the tonnage sold being better than any one had reason to expect at this season of the year, and in view of quiet conditions in other lines. Prices, however, are somewhat irregular, depending largely on the quantity on which

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the buyer seeks quotations. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.48c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—Some of the local mills are meeting the 1.40c. price quoted in Pittsburgh on soft steel bars, but only on attractive specifications. An order for a good lot on one or two standard sizes is generally given the preference by the mills, but where many sizes are specified in one order, making a small quantity of each size or section, higher prices are asked. Hard steel bars are going at a differential of about $2 per ton under soft steel, and the local mills are quoting about $1 lower than the price they have maintained thus far. The market for bar iron is very dull, as there is not much business going except from wagon and implement manufacturers. The railroad purchasing departments are working under orders to restrict their purchases to the minimum, and the bar iron mills feel the force of this restriction more than any other branch of the iron and steel business, as the railroad demand represents 75 per cent. of the normal consumption of bar iron in this territory. While 1.40c., Chicago, can be shaded on a good order for iron bars for prompt shipment, this price continues to represent the minimum on current business. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—There is a fair run of new business from the jobbing trade, and manufacturers are also furnishing good specifications on industrial grades of wire. There is no speculative buying this fall, in anticipation of profits such as jobbers made by stocking up last year, but the demand is believed to represent a good normal rate of consumption. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—A leading manufacturer advises that its shipments into this territory in the month of July were the largest in the history of the business in the value of the product, and in tonnage second only to July, 1909. This business consists chiefly of agricultural steel and goes to show that manufacturers who depend upon the agricultural trade are doing a very satisfactory business.

Old Material.—As usual, the scrap market reflects the undertone of weakness in the iron and steel industry. The lack of buying orders from railroads has made the business of the bar iron mills as dull recently as it was during a few months following the panic of 1907, and while the mills like to accumulate scrap when it is cheap there is little encouragement to buy when they cannot sell the product. This is also the case with malleable foundries. The rerolling mills are able to get all the old rails they can use at $15.50, delivered to Chicago mills. Steel axle turnings and machine shop turnings are quoted lower. While there is not much change in other prices, the market is weak and dealers are proceeding cautiously in their trades. The prices quoted below are for material delivered to buyers' works, all switching charges paid. Manufacturers in this district who sell scrap usually receive 50c. to $1 less. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.50 to $17.00
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.25 to 10.75
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Cast Iron Pipe.—The leading pipe interest has booked 3400 tons of water pipe at Cheyenne, Wyo. No other important lettings are reported for the past week, but there is a fair amount of routine business. Owing to the decline in pig iron, cast iron pipe is now quoted 50c. lower in this market. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27.50; 6 to 12 in., $26.50; 16-in. and up, $25.50, with $1 extra for gas pipe.

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

Philadelphia

PHILADELPHIA, PA., August 9, 1910.

Consumers still show little disposition to enter the market for requirements beyond immediate needs, although in some instances a cautious feeling around for more extended delivery is noted. Prices for the most part are firm at the recently established levels, although concessions could be had in some classes of finished materials if desirable specifications were offered. On the whole, transactions in pig iron as well as in rolled products have been on a narrow basis, and sellers are not disposed to force business, anticipating a better buying movement in the near future. The demand for plates and shapes has been less active; that for iron bars, however, shows a slight betterment.

Pig Iron.—Transactions have been comparatively light, neither buyer nor seller showing any particular interest in the market. Sales for the most part have been in the foundry grades, with consumers taking small lots sufficient for near future needs. There is a feeling among the trade, however, that the time is not far distant when more aggressive buying will be necessary, as the majority of the melters have been out of the market so long that, it is thought, stocks on hand must have become pretty low. At the present range of prices producers contend that actual bottom has been reached, and state that at present cost of production they can go no lower without incurring a considerable loss. Sales have been principally in small lots, with an occasional order for a few hundred tons, at $16 to $16.50 for No. 2 X foundry, delivered in this vicinity, although the greater proportion of the sales are made close to $16.25, delivered. Virginia foundry iron for August-September delivery can be had at $13.25, furnace, for No. 2 X. The majority of the sellers hold around $13.50. In one instance $13.50, furnace, has been named for No. 2 plain, and $13.75 for No. 2 X for last quarter shipment. Transactions have been small, however, and at prices representing about $16 to $16.50 for No. 2 X, delivered in this vicinity. At the lower ranges the same price is quoted for either No. 2 X or No. 2 plain grades. Cast iron pipe foundries have taken some low grade iron and are still considering further purchases, but no important sales have been recently announced. The demand for forge iron for rolling mill purposes has been unimportant; several small sales have been made, but the business has been scarcely sufficient to establish a market, which is still nominally quoted at $15 to $15.25, delivered. No movement in basic iron is reported. Buyers are pretty well covered for near future needs and sellers await further developments. It is believed that $15, delivered, could be done if any tonnage in this grade was offered. Low phosphorus iron of standard grade has been sold in lots of a few hundred tons at unchanged prices. The following range about represents the market for moderate lots for early delivery in buyers' yards, eastern Pennsylvania and nearby points:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.50
Eastern Pennsylvania, No. 2 plain	15.75 to 16.25
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	15.00 to 15.25
Basic	15.25
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—Very little demand is reported. Eastern consumers show no interest in the market, although some small business continues to be done in the West. Prices are unchanged, $39 to $40, Baltimore, about representing the range of quotations for 80 per cent., dependent on tonnage and delivery.

Billets.—Business has been confined to small lots for prompt shipment. Larger consumers show little disposition to enter the market, and the general situation is easy. For small lots Eastern mills quote $27.50 to $28 for ordinary rolling billets, delivered in this vicinity, with forging billets at $29.50 to $30, at Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—The majority of the Eastern mills report a fair run of miscellaneous orders, smaller in the aggregate in some instances than that of the previous week, but sufficient to keep plants fairly well occupied. There is still an absence of inquiries for large lots, although some consumers would contract for the last half, if mills would accept the business. Prices show no change, being held for the time at 1.55c. to 1.60c., delivered in this territory, for the general run of business, although some makers are still able to get 1.65c., delivered, for small orders.

Structural Material.—The market shows more irregu-

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larity, and some makers report a decline in both inquiries and orders. The bulk of the business recently placed has been of a rather miscellaneous character, although some good tonnages are in sight. Additional work on abolishing grade crossings by the Philadelphia & Reading Railroad is nearly ready for estimate, but details are not yet available. Prices are unchanged, 1.55c. to 1.60c., delivered in this vicinity, about representing the market for plain shapes.

Sheets.—The demand continues of a spotty character, consumers placing, as a rule, orders for immediate needs only. Very little forward business is offered and mills' order books are not in very satisfactory shape. Concessions for large lots are still available. For small spot lots the following range of quotations represents prices of Eastern manufacturers: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

Bars.—More inquiry for refined iron bars has developed during the week, and mills have been making better sales. A few fair sized lots are before the trade and the situation is a trifle more encouraging. Prices, however, are not particularly strong. On large lots, carrying desirable specifications, 1.40c., delivered in this territory, might be done, although for the general run of business 1.42½c. to 1.50c., delivered, about represents the market. Steel bars are quoted at 1.55c. to 1.60c., delivered in this vicinity.

Coke.—The market has been quiet. Occasional sales of foundry coke for prompt and last half delivery are reported at unchanged prices. Furnace coke continues dull. The market drags, although prices remain comparatively firm, the following range representing quotations per net ton, delivered in buyers' yards in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Monessen furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.25

Old Material.—Transactions have been light. Mills show but little interest in the situation, being pretty well supplied with the various grades, buying only when material is offered at a low price. Cancellations of orders have weakened the market in some directions, resulting in sales at lower prices. The leading buyer has reduced offering prices for certain grades, and transactions have in the majority of cases been insufficient to establish quotations. Bids and offers for delivery in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia of 45 cents to $1.30, range as follows, per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.50 to 15.00
Railroad malleable	14.00 to 14.50
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

St. Louis

ST. LOUIS, MO., August 8, 1910.

An increase of almost $22,000,000 in the bank clearings for July, with an increase of $239,510,000 for the first seven months of 1910 over the corresponding period of 1909, is regarded as a very satisfactory showing for this city. It is confidently expected that the clearings at the close of the year will reach the $4,000,000,000 mark for the first time in the history of St. Louis. Collections are reported as good with most interests and in pig iron shipments on prior contracts are for the most part being made according to contract specifications. A 14-story addition to the *Times* Building, costing $250,000, is to be erected; also a 17-story office building at Seventh and Chestnut streets, to be called the Leathe Building, costing upward of $600,000.

Coke.—A quiet market is reported, with the exception of one office, where in the aggregate contracts covering upward of 3000 tons were booked. Merchant sellers are still effecting sales of small lots, mostly to out of town buyers. The business referred to aboye was in Virginia foundry coke, while there are moderate transactions in Connellsville foundry. Prices in the Connellsville district are hardening, and we quote for shipment over a year 72-hour foundry at $2.40 per net ton f.o.b. oven for standard brands. Virginia coke is held at $2.25. On jobbing trade prices are 25c. per ton higher.

Pig Iron.—In attempting to account for the unsatisfactory situation in pig iron, one of the older representatives of furnace interests is inclined to attribute it to some extent to heavy speculative buying last fall. Too many furnacemen counted this iron as disposed of, while it was still on the market, and continued producing rather heavily. It not only had not gone into consumption to any extent, but became a competitor and generally led in the decline. The feature of the market is the wide range in price, especially in Southern iron, it being $1 per ton. In view of the fact that some of the leading sellers are holding for the outside price, they have in consequence no business to report. The representative of a leading house secured a contract for 2000 tons and another for 500 tons No. 2 Southern foundry for shipment over the remainder of the year, and another office, in the aggregate, booked orders for 950 tons. A leading broker reports an inquiry for 2500 tons Lake Superior charcoal iron for shipment over the remainder of the year; also an inquiry for 1000 tons foundry iron for shipment over the first quarter of 1911. As far as can be learned there are no prices out for 1911 iron. Business, so far as any has been transacted, is the result of the acceptance of firm offers. We quote No. 2 Southern foundry for shipment over the remainder of the year at $11, with some houses asking $11.50 and others $12 f.o.b. Birmingham. Southern Ohio is nominally $15 f.o.b. furnace.

Finished Iron and Steel.—The leading interest reports a quiet market on standard rails, with a fair inquiry for light rails, coming principally from coal interests. In structural material the volume of new business is moderate. In bars there is a seasonable inquiry with urgent requests for filling back orders. The demand for track material is running lighter.

Old Material.—The offerings by the local railroads during the past week were quite large, the lists being as follows: Missouri Pacific, 2000 tons; Wabash, 1500 tons; St. Louis & San Francisco, 1000 tons. Though the demand from consumers is still light, there is more trading among dealers, locally and for shipment. With regard to prices, the figures quoted on some items in the absence of business represent asking prices. The tone of the market is weaker, in sympathy with pig iron. Relaying rails continue scarce and are urgently wanted. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.00 to 12.50
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.50 to 6.00
No. 1 busheling	10.50 to 11.00
No. 1 bolted, cut to sheet and pipe	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

The Missouri Iron Ore Company, St. Louis, has been incorporated; capital stock, $300,000. The principal stockholder is Aaron B. Donaldson, vice-president of the St. Louis Tie Company. The company will be interested in iron ore lands in Missouri.

D. C. Nevin, president of the St. Louis-Kansas City Electric Railway Company, has returned from Paris, where he placed a $15,000,000 bond issue for the building of the road. Construction is expected to begin this fall.

Cincinnati

CINCINNATI, OHIO, August 10, 1910. (*By Telegraph.*)

Pig Iron.—The past week has brought out no important developments. There is little trading, with not very many inquiries. Next year's business is not being sought by the furnace interests and requests for prices for this delivery are generally answered with a figure that is now considered prohibitive. However, there is a better feeling all round, and even the foundry people appear to share in the belief that there will be a betterment in prices at no distant day. Their melt for the past eight months is stated to be larger than for any previous corresponding period, and while it has recently fallen off somewhat, stocks on hand are constantly being depleted. The stove foundries seem to hold

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a prominent place among the large consumers. Later, when crop reports are more certain, a quicker change may take place than has been anticipated. For Southern No. 2 foundry we quote $11 to $11.50, Birmingham district, and for Northern No. 2 $14.50 to $15, Ironton. The Red River Company's Helen Furnace goes out of blast this week. For immediate delivery and through the last half, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*Big Mail.*)

Coke.—Shipments on contracts are good, but new business is of a small character. It is understood that the foundries have pretty generally contracted for future requirements and the furnaces are light purchasers. The stiff price of coal, caused by the good demand for it, has had some effect in keeping prices firm on coke. Connellsville furnace coke remains at $1.70 to $1.85, per net ton, at oven, and Pocahontas furnace grades around $1.85. Foundry coke in the Connellsville, Pocahontas and Wise County districts is selling from $2.10 to $2.25 at shipping point, and it is understood that a few ovens would accept business at $2, though quite a large number of operators have sold up to the limit of output.

Finished Iron and Steel.—Every line is quiet. Local dealers report a fair demand for structural material from stock, with prices for beams and channels around 1.90c. to 2c. Steel bars can be obtained from stock at 1.80c.

Old Material.—Offerings are light and sales are on the same level. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Bar iron scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel axles, gross ton	14.50 to 15.00
Railroad malleable, gross ton	12.50 to 13.50
Old car wheels, gross ton	12.00 to 14.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Buffalo

BUFFALO, N. Y., August 9, 1910.

Pig Iron.—Considerable activity in inquiry has developed during the week, principally for foundry grades, but including some requests on malleable from New York State, Connecticut and eastern New England points. Only a small proportion of the inquiries, however, materialize into orders of a size worth mentioning. A valve concern in Connecticut had inquiries out for a tonnage of some importance, two-thirds of which was for foundry iron and one-third for malleable. Another inquiry was for 1000 tons of No. 2 X foundry; also one for 2000 tons of malleable, on which the business is reported to have been placed at the minimum price of the current schedule and one for high silicon iron for fourth quarter and first quarter deliveries. The indications are that most purchasers are pursuing a hand to mouth policy, splitting known requirements into separate and frequently placed orders instead of ordering as ordinarily in larger quantities, thus being enabled to take advantage of any lowering of current quotations or to jump in with larger orders in case of manifestation of a stiffening tendency in prices. Many small foundries are now very busy on old orders, but the general situation appears to be one of slowing down in consumption. Prices are not materially changed from last week. We quote as follows, f.o.b. Buffalo, for delivery through last half:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—Most agencies report the demand for steel bars fully up to expectations, with fairly good bookings for the midsummer season. The principal interest and some others state that prices are held at 1.45c., Pittsburgh; other interests admit having made some concessions from this figure "to meet competition," consequently on material not required for immediate use some consumers are holding off with the expectation of buying lower. Recent reductions in wire products have started a good buying movement and large tonnages are being placed. The market for shapes is fair, with 1.45c., Pittsburgh, for the general run of orders, but on large orders for long lengths 1.40c. has been taken. The demand for black and galvanized sheets has been fairly good, but prices are somewhat softer. In structural material the demand continues good, but prices as a rule are a little easier. Bids will soon be called for on the steel for the three buildings of the Buffalo Tuberculosis Hospital at Perrysburg, N. Y., and a number of other local structures will soon be ready for figures. The Lackawanna Bridge Company has received contract for the engineering and machine shop buildings to be erected at Ashtabula, Ohio, by the Great Lakes Engineering Works of Detroit, the contract calling for about 1000 tons. The Buffalo Structural Steel Company has been awarded contract for the fabrication and erection of the steel for the new Sherman House, Jamestown, nearly 900 tons, and the George Kellogg Structural Company has received contract for the steel for the Washington B. French apartment house, Buffalo, 100 tons. Contract for the steel for the Bevier Memorial Art Building to be erected by the Mechanics' Institute at Rochester, about 250 tons, has been awarded to F. L. Heughes & Co., Rochester. The steel contract for the seven-story office and theater building to be erected by Walter Snowden Smith, Syracuse, was taken by the Syracuse Bridge Company.

Old Material.—The market is very dull, both dealers and consumers maintaining a waiting attitude. The new business being transacted is insufficient to establish definite price values, and only a small quantity of material is going forward on old contracts. We quote dealers' nominal prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$13.25 to $13.50
Low phosphorus steel	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.75 to 14.25
Boiler plate	11.25 to 11.50
Locomotive grate bars	11.00 to 11.50
Pipe	11.00 to 11.50
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

Birmingham

BIRMINGHAM, ALA., August 8, 1910.

Pig Iron.—Some few sales for prompt shipment were made the past week, but the aggregate of tonnage involved is not important. The trade as a whole is apparently no more interested in future deliveries than at the time of last report and the volume of business transacted the present week will no doubt be light. It is now pretty well understood that some of the producing interests would not refuse $11, Birmingham basis, for a round tonnage to be delivered within a comparatively short time, and reports have been made of even small lots being sold at a concession from $11.50, Birmingham, yet no specific information in either regard is obtainable and the market is quoted at $11.50 for prompt deliveries or shipments to cover the remainder of this year. Shipments from furnace yards have so far, since August 1, about kept up at the rate recorded during July and very little additional iron has been put on furnace yards. The actual melt, however, has been reduced and founders' stocks are more in evidence than for some weeks. It is believed that additional furnaces will be blown out this month, although such action will no doubt be governed largely by the results of efforts to deliver tonnage now on order books that was engaged for delivery prior to this time. It will be noticed that requests that shipment against contracts now in force be held up are more frequent, and that of the iron sold early in this year at figures considerably higher than those now ruling a significant proportion still remains on furnace yards or is being held in warrant. Such conditions are believed to be fully accounted for by the condition of the foundry trade generally, and from the best authorities the condition of that trade is not expected to improve at an early date. There has been a fair demand for charcoal iron within the past 10 days, and producers of such iron have succeeded in maintaining a basis of $22.50, at furnace, for chilling grades.

Cast Iron Pipe.—A contract for 500 tons of water pipe was placed by the city of Gadsden, Ala., the past week, but it has not yet been definitely determined what producer will furnish the material. With this exception, the tonnage entered since last report is represented by a number of small lots for maintenance work which is fairly attractive in the aggregate. Among the contracts now in sight probably the one of most interest to Southern producers will cover approximately 80 miles of gas pipe soon to be placed for the construction of a line from Fayette, Miss., to this city. The specifications for this tonnage are now under consideration.

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but no announcement has so far been made as to the date of award. Indications for new business along the Pacific Coast and in the Middle West are still encouraging, and ample tonnage for the fall and winter months' operations is expected by all interests. No change has been made in quotations since last report and we quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., average $20.50, with $1 per ton extra for gas pipe.

Old Material.—Local dealers have been able to dispose of their stock at about the same rate at which shipments are received, but the margin in prices is very narrow and the market as a whole in a very unsatisfactory condition. There are no indications at this time for an increase in the consumption, with the supply already on hand comparatively large. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$16.50 to $17.00
Old iron rails	12.50 to 13.00
Old steel axles	16.00 to 16.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	9.00 to 9.50
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light cast and stove plate	7.00 to 7.50

Cleveland

CLEVELAND, OHIO, August 9, 1910.

Iron Ore.—Ore shipments down the lakes during July were 6,945,289 tons, which is a falling off of only 371,303 tons as compared with the heavy movement during June. Although many furnace interests are not ready to take their ore, mining companies will not delay in moving the tonnage that has been sold down the lakes. It is expected, however, that there will be an early closing of shipments in the fall. In view of the market conditions, further sales are not looked for. We quote ore prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The Canton, Ohio, consumer that had an inquiry out last week for 10,000 tons of basic for the last quarter is understood to have bought 5000 tons from a Valley interest at about $14.25, Valley furnace. The sale of some small lots of foundry iron is reported, but buyers, who have been feeling the market for lots of 500 tons and over, are still holding off. There is almost a total absence of local inquiries, the few sales reported being for outside shipment. Local prices are somewhat softer, and the $14 quotation in the Valley for No. 2 appears to have become more general. There is a feeling that prices will go no lower, but buyers think they can do as well by waiting, and those not in need of iron are in no hurry to buy. Reports indicate that most foundries have small stocks in their yards. For prompt shipment and the last half we quote, delivered, Cleveland, as follows:

Bessemer	$16.15 to $16.40
Northern foundry, No. 1	15.25 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.25 to 14.75
Gray forge	14.15 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—Buying by the foundry trade for its requirements for the last half and in many cases for the first half of next year, which has been quite active for several weeks, has dropped almost entirely off and it is believed that nearly all of the foundrymen are now under contract. There is no demand for furnace grades. We quote standard Connellsville furnace coke at $1.60 to $1.65 per net ton, at oven, for spot shipment, and $1.80 to $1.85 for the last half. Connellsville 72-hour foundry coke is held at $2.15 per net ton, at oven, for spot shipment, and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—While no large orders are coming out, the demand for small lots is quite active. Some of the mill agencies report an improvement in this respect. Consumers' stocks are reported to be generally low and early shipment is wanted on nearly all orders. Lower price quotations on steel bars have been quite generally met by all the mills, so that the ruling quotation now is 1.40c., Pittsburgh, for carload lots and over. The bolt and nut trade is somewhat quiet at present, but consumption by other manufacturers appears to be well maintained. In some cases shipments have been held up, but these are mostly from the automobile trade. The demand for iron bars is only fair and prices are not firm. The usual quotation of 1.40c., at mill, can be shaded on desirable orders. The demand for plates and structural material in small lots is good. Boiler and tank shops in this territory are quite busy, and local fabricating shops are well filled with work. Among new structural inquiries is one from the Detroit, Toledo & Ironton Railroad for 1400 tons for bridge work, and a round tonnage for a new building to be erected by the Dime Savings Bank in Detroit, for which Bethlehem sections will probably be used. Plates and structural material are firm at 1.40c., Pittsburgh. While there is a fair demand for sheets some of the mills are eager for orders, and the usual quotation on No. 28 of 2.20c. for black and 3.30c. for galvanized can probably be shaded on desirable business. The demand for twisted bars for concrete reinforcement is quite heavy, and is expected to continue good during the remainder of the building season. While warehouse business has fallen off somewhat, jobbers are still getting a fair volume of orders.

Old Material.—Local mills are buying only in small lots for immediate needs, purchases being mostly what is offered them at bargain prices. There are good sized stocks in some of the yards, which are being held for firmer prices. There is no demand from foundries. Owing to the absence of transactions some quotations are merely nominal. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.75 to 7.25
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

New York

NEW YORK, August 10, 1910.

Pig Iron.—A number of inquiries have been before local sales offices in the past week, and business has been closed in lots running up to 500 tons in foundry iron, with several transactions involving 1000 tons or more each still pending. The chief inquiry of the past fortnight has come from a railroad equipment interest having a number of foundries, and a total of several thousand tons is involved, deliveries for both the last quarter of 1910 and the first quarter of 1911 being asked. It is understood some of the iron for this year has been placed. In New England some business has been done with malleable and gray iron foundries, particularly in Connecticut. Considerable activity is reported in iron from the Buffalo district, Eastern buyers so located as to be reached by water taking advantage of shipment by the Erie Canal, $15.75 and as low as $15.50, at points on the Hudson and on Long Island Sound being possible on deliveries before the close of navigation. In the close competition over some recent business low figures are heard. Pipe foundries continue to make offers for Northern irons, representing some of the lowest quotations for Southern irons plus freight, but Pennsylvania and New Jersey furnaces are not yet down to such a level apparently. Some water pipe and soil pipe foundry buying is reported, including one fair sized lot for Brooklyn delivery. We quote Northern foundry iron at tidewater as follows: No. 1, $16. to $16.25; No. 2 X, $15.75 to $16; No. 2 plain, $15.25 to $15.50. On Southern iron quotations are $15.75 to $16 for No. 1 and $15.25 to $15.75 for No. 2.

Finished Iron and Steel.—The falling off in building operations in the East is rather more pronounced, and little important new inquiry has come to the fabricating companies in the past week. The 10,000 tons for the New York Central terminal work is not formally awarded, but it is expected the announcement will be made within the week. Railroad inquiry is coming in for such a variety of small lots as to indicate that absolutely nothing is being placed that can be dispensed with, the inquiries ranging from 10 tons upward. The largest is for 500 tons of track elevation work for the Pennsylvania lines West. The pending estimates in this connection are for the Chesapeake & Ohio, Baltimore & Ohio, Central of New Jersey, Reading, Boston & Albany, Boston & Maine, Pennsylvania Railroad, New York Central, St. Paul and Missouri Pacific. The principal inquiry from the Pacific Coast is for the Corlett Building at Seattle—1900 tons. The American Bridge Company has received the contract for mill buildings for the Michigan Alkali Company, Wyandotte, Mich., requiring about 1000 tons of steel. The Kern county court house, California, 500 tons, was taken by L. Shreiber & Sons, Cincinnati. The new First National Bank at Lincoln, Neb., 600 tons, will be fabricated by the Noelke-Richards Company, Indianapolis.

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Excellent specifications are being received for steel bars and new orders for bar iron are more numerous. The leading bar iron mills have booked some good orders from railroad companies for delivery over the remainder of the year, understood to be at a slight concession from recent prices. It is reported that the bar iron trade is being canvassed with a view to endeavoring to reorganize the old Bar Iron Association. Quotations are as follows: Plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.56c. to 1.61c.; bar iron, 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—Sharp competition developed in the placing of the Boston contract for 500 tons of water pipe on Tuesday. The lowest bidder named $21.89 per net ton, delivered. The next lowest bidder was $1.50 above this price. General business continues exceedingly dull. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Steel Rails.—Very few sales have been made. The Carnegie Steel Company has booked 500 tons for the Philadelphia & Reading Coal & Iron Company and 500 tons for the La Belle Iron Works. The Illinois Steel Company has sold 500 tons to a terminal railroad company.

Old Material.—A very decided lack of interest is shown by consumers and this, together with the numerous and heavy railroad list coming out, is tending to depress the market still further. Steel scrap in eastern Pennsylvania is now so low that the price offered there is about $1 per ton less than is now prevailing in the Pittsburgh district. This condition of affairs has largely been brought about by the buying through one agency for most of the steel works and the principal iron rolling mills. While present conditions are discouraging, dealers are inclined to believe that something of a buying movement must shortly develop, as general business conditions are by no means unfavorable, and if any trade is to be done this fall it cannot long be postponed. While buyers in actual need of material may be obliged to pay somewhat higher prices, the market per gross ton, New York and vicinity, appears to be as follows:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	11.00 to 11.25
Heavy melting steel scrap	11.00 to 11.25
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	12.75 to 13.25
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	7.00 to 7.50
Wrought turnings	7.50 to 8.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

The German Iron Market

BERLIN, July 29, 1910.

The theory that the isolated furnaces would be frightened into making terms with the new syndicate builders seems to have some substance to it. At any rate, it is now announced that the furnaces of the great Rhenish-Westphalian district, with the exception of a few unimportant concerns, have reached a basis of agreement for a new organization.

On the Duesseldorf Exchange recently the trading in iron products brought out a somewhat lower price for one grade of pig, as well as a drop of several marks on plates of the thinner numbers. The market for tubing has been badly shaken up by the dissolution of the trade combinations at the beginning of this month; prices are considerably lower. There appear to be marked differences of opinion as to the further development of prices in general. It is asserted in some of the trade reports that manufacturers are disinclined to take orders at existing prices, but the same reports point out that dealers and consumers are holding back orders with the expectation of forcing price concessions later. It is a remarkable fact that prices have kept up much better in Germany than in the United States, England and Belgium. Trade reports emphasize the fact that Germany is the only country that still has higher iron and steel prices than at the beginning of the year.

The Steel Syndicate held its regular monthly meeting July 21 and gave out a rather cheerful report. It says in respect to semi-manufactured products that there has been no marked change of conditions since last month, and that specifications on orders already sent in are arriving at a satisfactory rate; the foreign trade continues quiet. As to steel rails, it is mentioned that the Prussian railroads have now given their last orders for this year, and these fall more than 40,000 tons short of even the reduced quantity ordered last year. Better prospects are reported for grooved rails, as numerous municipal and other building projects are in view; some big foreign orders have also recently come in. Rails for mines are in good demand, particularly for the foreign market, but Belgian competition in this specialty is sharp and disturbing. The settlement of the lockout in the building trades has given a good impetus to the demand for structural shapes, and the foreign market has continued satisfactory.

Metal Market

NEW YORK, August 10, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.		Lead.		Spelter.	
August.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
4	12.75	12.50	33.12½	4.40	4.25	5.20	5.05
5	12.75	12.50	33.25	4.40	4.30	5.20	5.05
6	12.75	12.50	33.25	4.40	4.30	5.20	5.05
8	12.75	12.50	33.20	4.40	4.30	5.20	5.05
9	12.75	12.50	33.25	4.40	4.30	5.20	5.05
10	13.00	12.62½	33.37	4.40	4.30	5.20	5.05

Copper advanced this morning, the market having greatly strengthened. The tin market is strong, and it is thought that there will be a shortage of stocks during the present month. Lead is firmer and outside sellers are asking better prices. The price of spelter is being firmly held, but consumers are taking little interest in the market.

Copper.—Since the publication of the producers' statistics for July, which showed the consumption to be larger than generally expected, the London market has advanced more than £5. There have been sales in this country of some good round lots of copper for export during the week, and although up to noon to-day an important sales agency was offering electrolytic at 12.50c., the market in other quarters had advanced to 12.62½c. As it is a question whether the seller referred to would accept any great amount of business at 12.50c., the market should be quoted at the higher price, 12.62½c. The price of lake copper began to advance yesterday afternoon, and this morning most of those who had any to offer were naming 13c. All things considered, the producers' statistics, published elsewhere, were very favorably received in the trade, and the copper market has an undertone of confidence that is encouraging to the sellers. Outside of the sales for export, consumers have not actively taken hold as yet, but, as many of them have been placing orders for smaller lots than they ordinarily buy, it is thought that a consuming demand is developing fast. In London to-day the market closed with spot copper selling at £56 2s. 6d. and futures for £56 18s 9d. The sales amounted to 800 tons of spot and 3100 tons of futures. The market was firm.

Pig Tin.—The pig tin market was not very active the past week until yesterday, when a good demand developed and about 200 tons changed hands. It is apparent that there will be a shortage before the month is out, although it is not thought that the stocks will be so tightly cornered as during the latter part of last month. On August 1 the stocks on hand were shown to be 693 tons, and so far this month the arrivals have been 2053 tons, while of the 2330 tons afloat it is expected that at least 1325 tons will arrive. This would indicate that there will be during the month about 4071 tons in sight, which, at the present rate of consumption, will only about suffice for the current demand, as consumers have bought very sparingly of late because of the corner. Some large buyers have covered themselves by placing orders in advance and this will prevent available stocks from being so closely concentrated. Tin sold in New York to-day for 33.37c. The London market closed with spot tin selling at £152 10s. and futures for £152 7s 6d. The sales amounted to 220 tons of spot and 370 tons of futures. The market was steady.

Tin Plates.—While the demand for tin plates is rather quiet, the mills are still behind in their deliveries. The price in New York for 100-lb. coke plates is $3.84. The recent advance of 1½d. in the price of Swansea plates is still maintained.

Lead.—The lead market has strengthened and in St. Louis the metal is costing five points more. The American Smelting & Refining Company is offering it in the New York market at 4.40c., but outside sellers are asking from 4.45c. to 4.50c. In St. Louis this company, which usually quotes the market 15 points under the New York price, has advanced its quotations to 4.30c., and other sellers are naming the same figure. In other parts of the country it is asking relatively more for lead than in New York. For instance, in New England, where the freight rates would make the price two points higher than at New York, the price named is four to six points above the New York price. It is thought in many quarters that there will shortly be an advance all along the line.

Spelter.—Buyers are taking little or no interest in the spelter market. There have been reports of some shading of

THE IRON AND METAL MARKETS

prices, but careful investigation fails to disclose anything to warrant the rumor. As a matter of fact, very little spelter is being taken. We quote 5.20c., New York.

Antimony. Prices continue weak and few sales are being made. The nominal price for Cookson's is 8.25c. Hallett's is selling at 8c. Other brands can be had around 7.50c.

Old Metals.—The market is quiet. Dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.75 to 9.00
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.50 to 9.75
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, August 9.—There has been good consumptive buying of copper in this market for deliveries running through September and in some cases into October. Casting copper is a shade stronger, but the quotation of lake in the Chicago jobbing trade remains unchanged. Not much demand is reported for spelter, on which the price remains practically the same, some sales of single carloads running as high as 5.25c. Lead is unchanged. Tin is still quoted at 34c. for spot delivery, and the concession for shipment during the latter half of August is narrowed to about ¼c. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 34c.; small lots, 35c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 11¾c.; red brass, 11½c.; yellow brass, 8¾c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4⅜c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, August 8.—Lead is quiet, at 4.30c.; spelter is steady, at 5c. to 5.05c., East St. Louis. Zinc ore is held at $38 to $40 per ton. Joplin base. Tin is quoted at 33.85c. per pound; antimony, 8.50c.; lake copper, 13.15c.; electrolytic, 12.95c., all at St. Louis. There was a fair demand for finished metals the past week and the outlook is favorable for business for the month.

Iron and Industrial Stocks

NEW YORK, August 10, 1910.

The stock market has been fairly well sustained since last week's report by the rather cheerful news coming from the Western agricultural districts. Quite a confident feeling now prevails that the staple crops of the country will not fall much below the average. With fears of an actual crop failure allayed, one feature of possible business disturbance has been removed, and this in itself is of much importance. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows, the highest prices of this period having usually been reached on Tuesday:

Allis-Chalm., com..	8½ - 8¾	Pressed St., pref...	94 - 94½
Allis-Chalm., pref..	27 - 28	Railway Spr., com.	30 - 32
Can. com.	7¾ - 8½	Republic, com.	28½ - 30
Can. pref.	65½ - 68	Republic, pref.	89⅞ - 91
Car & Fdry, com..	44⅜ - 46¾	Sloss, com.	56 - 61
Car & Fdry, pref..	109 - 109½	Sloss, pref.	111 - 116¼
Steel Foundries....	42½ - 44¼	Pipe, pref.	55
Colorado Fuel	26⅝ - 29¾	U. S. Steel, com...	67 - 70
General Electric...	139¾ - 143¼	U. S. Steel, pref...	114½ - 116
Gr. N. ore cert....	51 - 53¾	Westinghouse Elec.	55 - 62
Int. Harv., com...	87⅛ - 90⅞	Am. Ship, com....	79¼ - 80
Int. Harv., pref...	117½ - 119¼	Am. Ship, pref.	107
Int. Pump, com...	38¾ - 40½	Chi. Pneu. Tool...	32 - 35
Int. Pump, pref...	79¾ - 81	Cambria Steel.....	41 - 42½
Locomotive, com...	24 - 27½	Lake Sup. Corp...	18½ - 19⅝
Locomotive, pref...	102½ - 103	Crucible St., com..	10 - 11¾
Nat. En. & St., com.	15⅛ - 15½	Crucible St., pref..	72¾ - 74¼
Pressed St., com...	30½ - 34¼	Harb.-W. Ref., pref.	92½

Dividends.—The Niles-Bement-Pond Company has declared the regular quarterly dividends of 1½ per cent. on the common and preferred. The preferred dividend is payable August 15. The common dividend is payable September 20.

The Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15.

The Sloss-Sheffield Steel & Iron Company has declared the usual quarterly dividend of 1¼ per cent. on the common stock.

Canadian Machine Makers Combine.—Concerning the merger comprising practically all the companies in Canada that manufacture the lighter grades of woodworking machinery and tools, Consul James M. Shepard quotes the official announcement: "The new company will be known as the Canada Machinery Corporation, Ltd., and with its headquarters at Galt, Ont., will comprise MacGregor, Gourlay & Co., Ltd., Galt, Ont.; John Ballantine & Co., Ltd., Preston, Ont.; Hespeler Machinery Company, Ltd., Hespeler, Ont., and the woodworking machinery departments of Goldie & McCulloch Company, Ltd., Galt, Ont., and the Sussex Mfg. Company, Ltd., Sussex, N. B. The capitalization of the new company will be as follows:

	Authorized.	Now issued.
First mortgage, 6 per cent. bonds	$1,000,000	*$400,000
Preferred stock, 7 per cent. cumulative	1,500,000	850,000
Common stock	1,500,000	625,000

Russia's scourge, the cholera, continues to spread with most alarming rapidity, particularly in the southern mining districts and in St. Petersburg, where the epidemic is fast approaching the proportions of the great epidemic of 1908. A report from the United Mine Owners' Association, covering 48 mines and 4 foundries, gives 2970 cases and 1250 deaths. The extent of the panic among the miners is shown by figures furnished from 18 mines, from which 18,000 of the 46,000 employees have fled. The panic threatens to stop the production of coal and iron in South Russia.

A special convention of the United Mine Workers of America has been called to meet at Indianapolis, Ind., beginning Thursday, August 11. The conditions that have brought about the necessity for the special meeting have arisen chiefly in Illinois by a conflict between International President Thomas L. Lewis and Illinois District President John H. Walker, who, it is alleged, has refused to abide by the decision of the International Executive Board in dealing with the Illinois situation. On the other hand, several Illinois local unions have passed resolutions that President Lewis has "wilfully and maliciously prolonged the miners' strike in Illinois." Danger to the organization has also arisen, Mr. Lewis says, in several districts of the Southwest, where mines are preparing to continue work under the "open shop" rule and this "serious situation" must be dealt with by the convention.

The Canadian Trade Commissioner at Leeds, England, has forwarded to the Department of Trade and Commerce at Ottawa certain facts that will be of interest to Canadian and American rail manufacturers. Upon the desire of the India Council, the British Government, which insisted on the use of a higher grade of railroad material upon its lines, obtained quantities of rails from Canada and the United States for purposes of testing. So far, it is stated, the tests have been in favor of the Canadian rails.

Hall Furnace of the Republic Iron & Steel Company, Sharon, Pa., was blown in last Monday. During the six weeks' shutdown the furnace was thoroughly relined, and is in condition for a long and steady run.

The No. 6 furnace of the Thomas Iron Company, Hokendauqua, Pa., was blown out July 17. On August 1 the company had five furnaces in blast at its Hokendauqua, Island Park, Lock Ridge and Hellertown plants.

The Machinery Markets

The machinery trade is generally quiet, but there is so much good business in sight in most of the machinery centers that the market has a cheerful tone. Cancellations on the part of automobile supply manufacturers, which are somewhat prevalent just now, have done little else than reduce the delivery terms on some machine tools which have been so greatly in demand that the makers were from four to six months behind in their orders. From all reports, it is apparent that there are no large lists before the trade throughout the country, but a satisfactory business is being done in the way of single orders and orders for small lots. In the East there are a number of large projects in formulation that will call for heavy machinery expenditures in the fall. Reports from Chicago indicate that the trade is very quiet there, but several large railroad shops in that vicinity are in course of construction and later will have to be equipped. In Milwaukee a slight improvement is felt in the machinery market, and there is some good business in sight. In Pittsburgh inquiries are much more liberal than they were a month ago, and an excellent export trade has been done there. Boiler and locomotive shops are also making good purchases in that market. The outlook is good on the North Pacific Coast and in the Southwest, but business at present in those territories is rather quiet. In the Northwest there is a good demand for quarrying equipment and concrete machinery, as there is a great deal of construction work going on in that territory. The market in the farther Central West has not developed much activity of late, but a good fall trade is expected. Business has picked up slightly in Detroit during the last week, and a good month is expected in that market. Lack of demand from the railroads has contributed toward making the Philadelphia market rather dull during the last week.

New York

NEW YORK, August 10, 1910.

The machinery trade in the Manhattan territory is more quiet than it has been in the last four weeks, and with the exception of some fair sized orders which were placed by the New York Central Railroad during the week no business of any size was done by New York machinery houses. Most of the orders that came to the trade in this territory were for replacements, but there are a number of inquiries in the market which indicate that they will result in liberal buying. A large magneto manufacturing concern with German connections is arranging to build a plant in New England which will be one of the largest factories of its kind in the country, and it is understood that a list of machinery equipment for the enterprise is now in preparation. Nothing has been heard in the trade of the list which was issued by the Delaware, Lackawanna & Western Railroad several weeks ago, but it is understood that the machinery requirements have been listed and placed in the hands of those in charge of the railroad company's purchasing affairs. Notwithstanding the fact that there have been numerous cancellations of orders in the machine tool lines, it is stated by dealers that most manufacturers of milling machines, planers and lathes are still behind in their delivery. The demand for second-hand machinery is somewhat better than the call for new equipment, and good prices are being obtained for used machines, although they are somewhat lower than they were three months ago. Machinery manufacturers find it somewhat easier to place orders for machinery castings, but nevertheless most of the foundries are filled up with work.

The Ottoman-American Development Company has been organized under the laws of New Jersey with a nominal capital of $500,000 to develop a number of railroad projects in Asiatic Turkey, and it is understood that the company will spend at least $60,000,000 in a number of enterprises for which it has obtained concessions from the Turkish government. It is understood that the company, in which a number of men well known in the machinery trade in this country are interested, will, in addition to constructing railroads, develop rich mineral and oil fields in the Kurdistan and other sections in the Ottoman empire. Prominent in the affairs of the new company are Charles A. Moore, president of Manning, Maxwell & Moore, Inc.; Arthur F. MacArthur, president of MacArthur Bros. Company; C. M. Chester, Jr., treasurer of Manning, Maxwell & Moore, and E. C. Converse, president of the Bankers' Trust Company, who is also a director in the United States Steel Corporation. It is understood that the company proposes to build several railway systems, which are to be constructed and outfitted with American equipment, and in addition it has a number of mining concessions, some sections of which have heretofore been worked with crude equipment, but which have, however, been bringing good returns. At present plans are being prepared for the first section of the proposed railroad system, which will extend from Sivas, in the province of that name, to the Mediterranean, tapping a number of well populated centers and extending through some of the country where the company holds mining concessions.

Westinghouse, Church, Kerr & Co., 10 Bridge street, New York, have been awarded the contract for the construction of an addition to the plant of the American Brake Company at St. Louis, Mo. The addition will include a three-story general factory building 80 x 134 ft., which will cost about $100,000; a power plant 36 x 60 ft., and an addition to the smith shop which will be 100 x 110 ft. and one story. It is understood that Westinghouse, Church, Kerr & Co. have the general contract for erecting and equipping the structure.

The Climax Lock & Ventilator Company, Buffalo, is arranging to increase its capital stock from $150,000 to $250,000, for the purpose of enlarging its plant and manufacturing facilities. Phillip C. Witte is president, 656 Michigan street.

The International Auto League Tire & Rubber Company, recently incorporated at Buffalo with a capital stock of $1,000,000, to manufacture automobile and automobile tires, appliances and fittings, has broken ground for its factory building at Akron, Ohio. The directors are Alfred C. Bidwell, Wm. Preiss and Chas. H. Bowe, 72 Pearl street, Buffalo, at which location the Buffalo branch office and salesroom will be maintained.

The F. J. Lederer Company has been incorporated at Buffalo, with a capital stock of $30,000, to manufacture air brushes, spindles, &c. The directors are Frederick J. Lederer, Frank F. Blessing and Henry G. Bentz.

The Rensselaer Mfg. Company, Cohoes, N. Y., has work under way on its new factory building and will soon let contracts for the interior work and equipment.

Bids are being received by supervising architect Henry L. Spann, 38 Pascal street, Buffalo, N. Y., for power plant with equipment, to be added to the Mother House of the Sisters of Mercy, now being erected at Abbott road and Red Jacket parkway at a cost of $350,000.

The U. S. Hoffman Company, Rochester, N. Y., has commenced work on the three-story and basement factory, 50 x 150 ft., it is to erect on Temple street, for the manufacture of clothes pressing machinery.

The Rochester Trolley Guard & Fender Company has been incorporated at Rochester, N. Y., with a capital stock of $50,000, to engage in the manufacture of appliances for trolley cars. The incorporators are W. F. Reichenbach, A. A. Prebler and C. W. Henning.

The Bayonne Casting Company, Bayonne, N. J., distributer of monel metal rods, is now running on full time making monel metal castings at its new plant, which was recently equipped for manufacturing special castings in monel metal. Among recent contracts taken by the company is one for two 8000-lb. propellors for the United States battleship Florida, and 12 propellers weighing 16,000 lb. each for the Argentine Republic warships, now in course of construction in this country. This is the largest contract ever taken for monel metal castings.

Port Arthur, Canada, will increase its pumping capacity by a motor driven centrifugal pump, which is necessitated by the rapidly increasing population and the decision of the Domonion Government to locate a large fish hatchery there and take its water from the city's water supply.

The Coldwell Lawn Mower Company of Newburgh, N.

THE MACHINERY MARKETS

Y., has begun work on an additional warehouse at Newburgh, which will be a three-story structure, 100 ft. square.

The Stahlbrodt Company, which was recently incorporated at Rochester, N. Y., was not organized to manufacture wind shields, as was at first announced, but was formed to protect in this country patents covering the manufacture of the zigzag shield, which is now made in Great Britain.

Chicago

CHICAGO, ILL., August 9, 1910.

The machinery trade remains very quiet, with scarcely enough business going to pay running expenses. The factories are more fortunately situated than the dealers during a dull summer market like the present season, as the majority of the manufacturers booked enough business during the spring to run them through the summer, while the dealers have to wait patiently when they encounter a streak of lean in the market. Many important factors have contributed to disturb the buying of machine tools. The financial and banking situation this summer has discouraged extensions and new enterprises. There has been enough speculative news on the crops to promote doubt, especially regarding the corn crop, and the railroads have persisted in their policy of doing no buying that could be postponed until the rate question is settled. All these conditions have had a tendency to check the buying of new tools and shop equipment. The dealers, however, report a slight improvement this week in the amount of business done and when the pendulum swings back again they are confident of having quite a rush of new business. During the past two years the trade has been coming up slowly in alternate periods of activity and dullness. Each active period has developed a larger amount of business than the one that preceded it, and if this condition holds true when business picks up this fall a dull summer will soon be forgotten. Several large railroad shops that are under course of construction in the West will require large lists of tools to equip them and there will undoubtedly be a rush of scattering orders from the railroads as soon as the embargo on their purchasing departments is raised.

The Root & Van Dervoort Engineering Company, East Moline, Ill., has increased its capital stock from $250,000 to $1,000,000 and increased its number of directors from four to five.

The Loshbough & Jordan Tool & Machine Company, Elkhart, Ind., has been incorporated with a capital stock of $5000. The incorporators are J. E. Loshbough, J. C. Jordan, R. M. Loshbough and M. M. Jordan.

The National Mfg. & Lock Company, Chicago, has increased its capital stock from $100,000 to $131,000.

The Clark-Smith Hardware Company, Peoria, Ill., has been incorporated with a capital stock of $160,000 to do a general manufacturing and merchandise business. The incorporators are Frank E. Smith, Amanda A. Foster and George T. Pace.

The Barnes Drill Company, Rockford, Ill., is transferring its equipment to the new plant recently completed, where it will be able to handle a larger volume of business. Electric power for the operation of the new plant will be secured from outside sources, but the company is figuring on installing a boiler to be used for heating purposes and of sufficient size to produce from 75 to 100 hp. All new tools and machinery required have been purchased.

The C. E. Bonner Mfg. Company, Chrisman, Ill., will remove its plant and business to Champaign, Ill., where it is having a new factory building erected.

The Ingersoll Milling Machine Company, Rockford, Ill., is contemplating improvements to its Rockford plant, details of which have not been worked out.

Thomas & Clarke, Peoria, Ill., are having plans prepared for a new cracker factory to be erected at a cost of about $125,000. The plant is to be completed by January 1 and will be operated by electric power secured from the local electric company.

The Rayfield Motor Company, Springfield, Ill., has increased its capital stock from $74,000 to $150,000 and will make extensive improvements.

The Union Drop Forge Company, Chicago, has awarded to the Kenwood Bridge Company, Chicago, the general contract for the construction of a drop forge plant which includes hammer shop, 71 x 400 ft.; machine shop, 52 x 380 ft.; board drop, 75 x 400 ft.; cutting and storage shop, 48 x 96 ft.; shipping building, 48 x 96 ft., and an engine and boiler room, 49 x 82 ft.

The Streeter-Amet Weighing & Recording Company, Chicago, has plans prepared for a manufacturing building, 165 x 310 ft., to be erected at the northeast corner of Ravenswood Park and Belleplaine avenue.

Bids will be received until August 15 by the city of Chicago Heights, Ill., for new equipment to be installed in the pumping station. W. E. Lennertz is city clerk.

The Union Pacific Railroad Company has awarded a contract to the George B. Swift Company, general contractors, Chicago, for the construction at Omaha, Neb., of a planing mill building, 90 x 302 ft. The building will be of steel frame construction, with brick walls.

Philadelphia

PHILADELPHIA, PA., August 9, 1910.

The local market has been quite dull, transactions during the week being small and, as a rule, unimportant, while inquiries have shown a decrease. The effect of the usual vacation period has been pronounced, and the trade generally finds it difficult to close up pending business. The railroad demand is still quiet, no new inquiries being reported by local merchants. There is a considerable quantity of prospective business in sight, and, while the trade scarcely expects any important developments during the current month, more active conditions are anticipated during September and October.

Manufacturers of tools and machinery generally continue operating their plants to comparatively full capacity. In many cases orders on hand are reported sufficient to keep them so engaged from three to six months ahead, but new business is reported as being very light. In a number of cases the month of July was said to have been fairly good in point of orders, but sales have been largely to consumers at distant points, rather than in this vicinity, and confined particularly to special equipment and machinery, rather than the usual line of machine tools. Some little business in the way of equipment for export is heard of, but the demand is irregular and by no means large.

In the second-hand machinery market business drags, reflecting the general condition of the trade. A pretty good demand for machinery castings is reported, both in iron and steel, but there is little large business being placed and foundries as a rule have less forward business on their books. While the demand for boilers, engines and general power equipment has not been large, there is a fair volume of business pending, mostly, however, in the small and medium horsepowers.

The A. P. Witteman Company is making considerable improvement to its forge shop at Chester, Pa., a structural steel extension, 60 x 100 ft., being added, giving a total length of 140 ft. As soon as the new portion is completed the old shop will be torn down and the structural steel extension continued, replacing the old shop. The equipment for the addition is, we are informed, practically all purchased, the better part of that recently acquired by the purchase of the entire equipment of the Portsmouth Forge Company, Portsmouth, N. H., will be used in the new addition.

Ballinger & Perrot, architects and engineers, have completed plans and specifications and awarded a contract to Appleton & Burrell, for a fireproof addition to the machine shop of Hugo Bilgram, Spring Garden street, below Thirteenth street. The new addition will have a frontage of 40 ft., and 78 ft. deep, with an L 21 x 30 ft. It will be two stories, of fireproof construction, and conform in design to the present building. This contract is in addition to that for a power house for the same concern, contract for which was recently awarded. Ballinger & Perrot have also completed plans for the erection of a new fireproof manufacturing building, which will replace that of the Ehret Magnesia Covering Mfg. Company at Port Kennedy, Pa., which was recently destroyed by fire. The building will be three stories and 67 x 256 ft. on the ground plan. The contract for the building has been let and work will be started at the earliest convenience.

The Premier Metals Company, Camden, N. J., has been incorporated under the Jersey laws with a capital of $50,000, for the purpose of dealing in metals. William T. Wycoff, R. M. Hilands, L. H. Schmidt and A. L. Whealtors are named as the incorporators.

The Engineering & Contracting Company, Baltimore, Md., has been awarded the contract for a five-story addition, 45 x 92 ft., to the department store of A. A. Brager, 225 and 227 Eutaw street, in that city. The building will be of fireproof construction.

Preliminary estimates on the buildings and piers to be erected in connection with the new emigrant station for the Port of Philadelphia, at Gloucester, N. J., will, it is stated, be shortly ready for submission to the Department of Commerce and Labor. Plans call for a 250-ft. pier and a main building, 100 x 230 ft., in addition to which there will be separate buildings and a power house.

The contract for the power house to be erected for the Stephen Girard Estate at Twentieth and Oregon streets has been awarded the Pomeroy Construction Company. It

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will be 37 x 87 ft., of brick and reinforced concrete, from designs by J. R. Windrim. The Girard Estate already has one such plant in operation, and the second one will be used for the same purpose, that of supplying heat, light and power to groups of residences erected in the vicinity.

Sealed proposals will be received until August 15 by A. F. Hammond, superintendent of supplies, Board of Education, First School District of Pennsylvania, for a quantity of supplies, among which are included electric lamps, scientific department materials, engineers' transit, patternmakers' face lathe, drilling and grinding machine, dies and taps, speed lathe, electric fans and other materials and equipment. Specifications, samples and full list of articles can be seen and further information obtained by applying to room 392, City Hall.

Plans completed by Zatzinger, Borie & Medary, associated architects, and accepted for the group of house buildings for the Grand Lodge of Free and Accepted Masons of Pennsylvania, to be erected at Elizabethtown, Pa., include a mechanical plant, consisting of one or more buildings, to provide heat and light for the entire group and power for the laundry and the ventilating systems. It will also include refrigerating machinery, repair shops for engineer, carpenter, electrician and blacksmith, incinerating ovens and cold storage facilities. Boiler house, engine and dynamo room, pumping station and a water tower are provided for.

Dodge & Day, engineers, are taking bids for buildings for an addition to the plant of the Watson Wagon Company, Canastota, N. Y. Those for the buildings, which include a three-story paint shop and manufacturing building, dry kilns and a wheel stock storehouse, will be opened August 15, at Canastota, N. Y. Some small power equipment, including a 75-kw. generator set and additional woodworking machinery, will be taken up at a later date. This firm of engineers is engaged on plans for several other large plants, details of which are not yet ready for announcement.

Manufacturers here are reported to be figuring on equipment for a generating station to be erected by the Jenkins Electric Company, recently organized by J. H. Glennon and others of West Pittston, in Pittston, Pa.

The Chester Shipping Company, Chester, Pa., has, it is stated, awarded a contract to John J. Williams & Co. of that city for the erection of an extensive concrete pier at the foot of Market street. It is proposed to erect a steel frame warehouse, two stories, 200 ft. long, on the new pier.

Henry Disston & Sons, Tacony, have awarded the contract for a new cold rolling mill, previous mention of which has been made in these columns, to the Charles McCaul Company. The building is to be of brick and measure 51 x 288 ft. on the ground plan.

Plans are prepared and have been practically approved by city engineers for the elevation of tracks of the Philadelphia & Reading Railway, from Somerset street to the Port Richmond coal wharves. This will abolish a number of grade crossings and, according to agreement, the expense, which is estimated to be about $4,000,000, will be divided between the city and the railroad company. It is believed that bids for the work will be advertised in the next week or so.

Pittsburgh

PITTSBURGH, PA., August 9, 1910.

Although irregularity still characterizes the market, the balance of trade in machinery, as compared with other industrial sections of the country, appears to be strongly in favor of the manufacturers and dealers of this district. Inquiries are much more liberal than they were a month ago, and the aggregate of actual bookings must be large for this time of the year. Export trade, which has gradually been gaining, helps the present situation materially, but the heaviest percentage of increase is in domestic business. Orders from the Central West appear to predominate in number, but in point of value Eastern trade shows up very well. Buying for the account of boiler and locomotive shops, tank works, structural iron and steel fabricating plants, sheet metal factories, &c., is again quite a feature of the local market, and letters received by manufacturers from representatives in the West, both north and south of the Iowa-Missouri line, indicate that this will be considerably strengthened by the demand from that section as soon as the crop movement is further along.

One of the surprises of the season is the continued purchasing of machinery for coal mining and handling, as it was thought that the heavy buying, which began early in the spring, would not last very long. The Westinghouse Electric & Mfg. Company, with its affiliated interests, has probably benefited by this trade to a greater extent than any other single interest, for the reason that there has been a notable movement toward the complete electrification of many important properties; but it has been shared by numerous other manufacturers and supply houses in Pittsburgh, Connellsville and neighboring cities. This is so far recognized that several new companies are forming to engage principally in the colliery trade, while others, that have not paid much attention to it heretofore, are arranging for representation in the leading centers of distribution of the coal mining districts.

The market for machine tools and shop equipment in general does not show as much life as other lines that are closely related. In fact, its continued sluggishness is distinctly disappointing. With reference to fall prospects, however, a hopeful feeling prevails, and, with better deliveries than last year, dealers feel that they can do enough business between September 1 and the holidays to foot up a large total for the current season.

Work is just starting on a steel tipple and power house for the Purseglove Coal Company of St. Clairsville, Ohio, at Steubenville, Ohio. It is stated that an expenditure of $250,000 for machinery and buildings will be made.

The Bethlehem Steel Company, South Bethlehem, Pa., has been taking bids on a new shop building, 22 x 80 ft. The contract for constructing the gas engine power plant has been let to the McClintic-Marshall Construction Company, Pittsburgh. The size and equipment have been previously mentioned.

The plant of the Union Spring & Mfg. Company at New Kensington, Pa., is largely occupied at present with orders from electric traction companies, truck builders, &c. One of its specialties is a pressed steel lid used for journal boxes, which is produced in accordance with specifications of the Master Car Builders' Association.

The Wheeling Traction Company, Wheeling, W. Va., has been authorized by the City Council to build a pumping station on the South Side, the purpose of which is not stated.

The municipal power and pumping plant proposed for Etna, Pa., a suburb of Pittsburgh, will not be constructed this year, as a bond issue for the purpose has been defeated.

The Anderson Automobile Company, organized here by John C. Anderson, Harold Allen and R. H. Frank, will make application for a State charter to engage in the manufacture of motor vehicles.

It is announced from Greenville, Pa., that work has been ordered to be started on a new roundhouse, machine shop and air brake shop, steam heating plant, &c., for the Bessemer & Lake Erie Railroad. An expenditure of $100,000 or more is involved.

The J. S. McCormick Company, Pittsburgh, is finding a large sale among foundries in this district and elsewhere for the Deane pneumatic sand sifter, which it handles. The outlook for fall trade is good.

The Riddle Construction Company, which was recently organized at Johnstown, Pa., by Henry Riddle and others, is preparing to enter the coal mine equipment field and will also engage in various forms of engineering construction work. Plans for a manufacturing plant have not yet, however, been matured.

Manufacturers of this district have been asked for preliminary estimates, it is said, on equipment for the new crucible foundry of the Taylor Steel Company, but it does not appear that any definite lists have been given out, the plans of the company in this particular being still incomplete.

The Quemahoning Coal Company, whose headquarters are at Somerset, Pa., is increasing the capacity of its steam power and compresosr plant, the equipment for which has been largely purchased. Additional development work to be undertaken, however, will require some further apparatus later on.

Quite a number of plate punchers, riveters, &c., have been drawn from here lately for work in Eastern shipbuilding plants. From the north Pacific coast there is also a call for this class of labor.

The Pittsburgh Construction Company, Pittsburgh, has the contract for erecting new factory buildings, tanks, &c., for the United States Glass Company, Glassport, Pa.

Among the sales in this district of the Brown Hoisting Machinery Company, whose Pittsburgh offices are in the Frick Building, locomotive cranes for industrial plants, contractors' service, &c., have been more prominent than usual, with promise of an abundance of similar business during the remainder of the year.

The Wright Wrench & Forgings Company has put in operation its new plant at South Canton, Ohio, where its line of products will be considerably enlarged. Forgings for machinery manufacturers, automobile builders, &c., will be a feature of future trade.

Dealers here will be figuring almost continuously for some months on equipment for the new plant of the General Electric Company, at Erie, Pa., which is to be purchased on small lists issued at intervals as construction contracts are let.

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The Pressed Prism Plate Glass Company, Morgantown, W. Va., whose plant is electrically operated, will add somewhat to its machinery during the fall.

As an index of present operations in plants of all kinds where metals are melted or heated for working, it is interesting to note that the present demand for pyrometers is uncommonly heavy.

Larkin & Co., Butler, Pa., machinists and manufacturers of oil well tools, &c., have purchased a strip of land adjoining their plant, on which a new boiler house is to be erected, to contain an 80-hp. Titusville boiler. The present equipment in the machine shop is also to be rearranged, but no new machinery will be purchased at present.

Cincinnati

CINCINNATI, OHIO, August 9, 1910.

As far as machine tool builders are concerned, indications are that the first two weeks of August will be about the same as the corresponding period of July. Enough scattered orders are coming in from the trade generally to keep the machine tool people in an optimistic humor. Recent crop reports appear to have helped along this feeling, and the inquiry is better than had been anticipated. The railroads have done some quiet purchasing lately, and business from the automobile industry has by no means been entirely cut off. While the smaller type of lathes, shapers, milling machines, &c., have been mostly in demand, some recent orders have been booked for the larger sizes of shop tools, which are understood to have been placed by the railroads. As evidence of the fact that machinery manufacturers are busy it is stated, and on good authority, that the consumption of pig iron for the past six months has been greater than ever known for a like period.

Dealers in machine tools and the second-hand machinery people both report business only fair, but state that enough inquiries are coming in to encourage them as to the fall outlook.

A few local foundries and patternmakers could probably take care of more work, but as a general rule they are operating on full time.

The American Valve & Meter Company, whose Cincinnati factory is now located on Gest street, has commenced work on a plant at 2833-49 Spring Grove avenue. The main building will be 62 x 173 ft., with an L 62 x 82 ft., all two stories, and of reinforced concrete construction. The company makes a specialty of switch stands and water columns for railroads, as well as water meters, and its production in the new quarters will be greatly increased. The equipment now in the Gest street plant will be moved, but some additional machinery will have to be provided.

The additions planned to be made to the plant of the Hooven, Owens, Rentschler Company, Hamilton, Ohio, manufacturer of Corliss engines, include two stories to its present pattern shop and also a new building, 69 x 116 ft., four stories, of reinforced concrete construction. A pattern storage warehouse, 50 x 182 ft., one story, is also being constructed. On the completion of these proposed improvements the company will be able to make prompt deliveries on contracts for its well-known engines.

About October 1 the Hisey & Wolf Machine Tool Company expects to occupy its new factory at Colerain avenue and Township street, Cincinnati. Among its recent orders was one from Japan for some of its breast drills.

The Norwood Ice Company of Norwood, a Cincinnati suburb, has been incorporated with $35,000 capital stock. H. C. Wood, president of the company, is also president of the H. C. Wood Ice Company of Cincinnati. The other incorporators are H. W. Zeigler, C. C. Carpenter, J. T. Maltby and J. S. Gibson. The company will erect a 50-ton ice plant. None of the equipment has been purchased.

John C. Rogers, Provident Bank Building, Cincinnati, is the principal incorporator of the American Railroad Tie Company, and plans are under way for the erection of a plant at a nearby point for the manufacture of a reinforced concrete crosstie.

The Black & Clawson Company, Hamilton, Ohio, is very busy working on orders for heavy paper machinery. Business recently booked included a large mill from each of the following: The Bryant Paper Company, Kalamazoo, Mich.; River Raisin Paper Company, Monroe, Mich., and the John F. Boyle Company, Jersey City, N. J.

In spite of the fact that the railroads have been slow buyers, the Niles Tool Works Company, at Hamilton, Ohio, is working a full force and plans to keep thus employed the balance of the summer.

A 35-ft. extension was recently completed to the shop of the Long & Allstatter Company, Hamilton, Ohio. The company's records show that orders recently received have come from varied industries all over the country, as well as some for export. A large, heavy, double punching machine has just been completed for the Norfolk & Western Railroad.

The Globe Steel Company, Mansfield, Ohio, has increased its capital stock from $5000 to $30,000.

The H. F. M. Mfg. Company, Akron, Ohio, has now been incorporated and has recently made contract with two outside companies to take its entire output of sheet metal specialties. No additions to its plant are planned.

Littleford Bros., Cincinnati, boilermakers and general sheet iron workers, have recently purchased a lot behind their shop, at 453-57 Pearl street, which will enable them to extend it through to Second street. Building plans have not yet been decided on.

The Foos Gas Engine Company, Springfield, Ohio, has operated night and day without a skip for 10 months except for enforced shutdowns for repairs and holidays. In spite of this the company is still as far behind orders as it was a year ago and reports 1910 the most successful year in its history. It will probably begin soon the erection of a big addition, which will increase its erecting and testing floors to the point where it can take care of its big business without straining its organization on large orders for 25 to 50 of its horizontal engines, besides a large number of its multiple vertical type, in units from 20 to 500 hp.

Sealed proposals will be received by the city of Connersville, Ind., until September 1, 1910, for the furnishing of all material and constructing complete pumping station and other buildings, reservoir, removal of old machinery, laying of water pipes and specials, drilling wells, the furnishing of vertical motors, electrical centrifugal unit, turbine generator unit with surface condenser, &c., and tubular boiler for municipal water works improvements. Bids are to be separate and in full on each class of work as classified in specifications, and bids on a single class or combination of classes may be accepted.

The Ansted Spring & Axle Company, Connersville, Ind., whose plant was destroyed by fire, is erecting a new plant of fireproof construction, which will contain about twice as much floor space as the old plant.

The Brazil Fence Company, Brazil, Ind., has purchased the factory of the Withington Machine & Fence Company, Adrian, Mich., and has moved the equipment to Brazil, where it will be utilized for the manufacture of fence machines.

The Chicago, Burlington & Quincy Railroad Company is considering the construction at Paducah, Ky., of the shops of the Herrin Southern branch of the Burlington System, but we are officially advised that no definite decision has been reached.

The Ayer, McCarel, Regan Clay Company, Brazil, Ind., capital stock $100,000, has taken over the plant and business of the Indiana Fire Proofing Company at Carbon, Ind., and expects to have it in operation in about 30 days. The plant is fully equipped for the manufacture of fireproofing and drain tile and was built at a cost of $40,000. The officers of the company are: D. E. Regan, president; J. V. Ayer, secretary and treasurer; W. L. McCarel, vice-president and general manager.

The Maxwell-Briscoe Motor Company, New Castle, Ind., is considering plans for the extension of its plant.

The Bayonet Trolley Harp Company, Springfield, Ohio, at the present rate of demand from electric railway lines, will be obliged to provide for enlarged manufacturing facilities.

F. E. Myers & Bro., Ashland, Ohio, are contemplating extensive improvements, among which will be a new foundry, 140 x 250 ft., for making light gray iron castings. The company expects to let the contract for this building early in the fall.

The Jenne Acetylene Gas Machine Company, Indianapolis, Ind., has accepted a bonus of $17,000 and will remove its plant to Homer, Ill.

The Noblesville Water & Light Company, Noblesville, Ind., has been sold for $55,000 to L. N. Joseph and associates. A. D. Booth is president and James Thom secretary of the company.

The Miller Shoe Company of Cincinnati has purchased a building in Muncie, Ind., in which it will install a branch factory.

The Wayne Oil Tank Company, Ft. Wayne, Ind., which recently increased its capital stock from $50,000 to $100,000, has purchased a 4-acre site on which it will erect two factory buildings. Henry C. Berghoff is president of the company.

The court has dissolved the injunction against the city of Peru, Ind., asked by a gas engine company to prevent the city from making improvements to its water works plant before paying amounts alleged to be due on engines now in it.

S. F. Bowser & Co., Ft. Wayne, large manufacturers of oil tanks and measuring apparatus, has decided to issue $800,000 of preferred stock.

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The Ft. Wayne Automobile Mfg. Company has been incorporated at Ft. Wayne, Ind., with $20,000 capital stock, to manufacture automobiles. The directors are George P. Dudenhoefer, George T. Fox, H. E. Boeker, Wm. H. Rohan, C. J. Romary, L. J. Wilbrath and A. C. Harger.

The Chapin Mfg. Company, Indianapolis, Ind., has been incorporated with $20,000 capital stock to manufacture carburettors and automobile parts. The directors are George F. Quick, William S. Polling, D. Rosenbaum, William Y. Chapin and Frank A. Chapin.

The Town Trustees of Normal City, a suburb of Muncie, Ind., have decided to install a gravity water works system.

The Midland steel works of the American Sheet Steel Company, at Muncie, Ind., after a month's shutdown, accompanied with rumors of removal of the plant to Gary, has resumed operations with 500 employees. Joseph T. Dougherty has been appointed manager to succeed Mark M. McDonough, who died a few weeks ago in Carnegie, Pa.

Stock has been subscribed for by citizens of Hope, Ind., in the Bell Smokeless Powder Company of St. Paul, Ind., and the plant will be removed to Hope and will be enlarged.

The Redkey Electric Light Company has been organized at Redkey, Ind., to supply light and power. The stockholders are R. E. Breed, H. L. Finley, F. B. Ball and others of Muncie, Ind.

The Sanitary Pottery Company, Evansville, Ind., is planning the erection of an addition to its plant to cost $200,000.

The Terre Haute Post Company, Terre Haute, Ind., has increased its capital stock from $20,000 to $40,000. W. C. Mayborn is president of the company.

The Mais Motor Truck Company, manufacturer of motor vehicles, has been incorporated at Indianapolis, Ind., with $500,000 capital stock. The directors are A. W. Markham, E. W. Spencer and Charles Fisher. The company's plant at Peru, Ind., will be moved to Indianapolis.

The Showalter Brothers Company, Bloomington, Ind., is completing the building at Bloomington of what is said to be the largest factory in the world making bedroom furniture. It will have 6¾ acres of floor space. The buildings have some new features. The construction of the skylights is such that it permits alignment of the glass by taking up any shrinkage. The radiating coils are overhead near the roof and will keep it free from snow and ice. The skylight contains 128,000 sq. ft. of ribbed glass.

W. H. Isgrigg & Son, Greensburg, have secured the contract for the erection of a one-story brick addition to the plant of the Bromwell Wire Works of that city. The building will be 60 x 200 ft. and will be used for manufacturing purposes.

Fire destroyed the plant of the Anderson Knife & Bar Company, Anderson, Ind., August 6. Loss estimated at $30,000; insurance, $20,000. W. R. Carr is manager.

The Rumely Mfg. Company, maker of agricultural machinery, Laporte, Ind., has let the contract to E. E. Burner & Co., South Bend, Ind., for a new pattern building to cost $20,000. It will be 60 x 160 ft., of steel and reinforced concrete.

In the additions to the plant of the Portsmouth Machine & Casting Company, Portsmouth, Ohio, are an electric traveling crane, a new compressed air system and cupola. The foundry has just been remodeled and is now able to handle almost any size of gray iron castings.

New England

BOSTON, MASS., August 9, 1910.

A better feeling pervades trade in New England, based not upon changes in actual conditions but upon a more intelligent understanding of the business situation. Production, taking all lines of trade as a whole, has not increased. On the contrary, it has probably fallen off. The textile industry is dull, though improving slightly, and the textile machinery builders are not as busy as they have been during the last 12 months. There are other instances where conditions, seasonable and otherwise, have resulted in a certain amount of curtailment, but probably this is no more than normal for midsummer.

Men who come in daily contact with the manufacturers are convinced that the basis of business in New England is a very substantial one, more so than in 1906-07. Average resources are greater in their ratio to producing capacity. These observers, who include most successful and experienced salesmen, assert that in practically every case where a manufacturer has expressed doubt regarding the outlook his own works are busy. In a large proportion of instances in the metal lines the factories are running at full capacity. To put it plainly, men are worrying over what others may not be doing. They are not making their estimates of the general situation upon the figures on their own order books or on the inquiries which they are receiving.

The cancellations of orders for machine tools received from automobile manufacturers are not assuming serious proportions. They are confined to some of the very large works. It is doubtful if any New England manufacturer of motor cars or automobile accessories or parts has canceled any of his own orders. The total of parts and accessories the manufacture of which has been held up at the request of the automobile people is large, but these cases also are confined to a comparatively few buyers. While there are exceptions to the rule, the automobile companies who are compelled to go slowly at this time appear to be those who have been increasing their facilities with tremendous strides. Their orders have been on a very lavish scale. Their buying has not been carefully considered and has lacked balance. It is not difficult to appreciate the feverish rush to meet a market which was believed to be far beyond the country's producing capacity. The growth has been so rapid as to disturb organization in some of the great works, which may account for what has been deemed unscientific selection of machinery in its relation to the equipment of which it was intended to be a part. Cancellations are confined almost entirely to those classes of machinery which are practically out of the market. As was stated last week, buyers of machinery in general will be glad of a movement which will place deliveries on somewhere near an easy basis.

The hardware manufacturers are doing a very good business, to quote again the men who are visiting the offices of such concerns. Each reports a satisfactory condition of its own order books. Demand for builders' hardware is not so brisk as it was, and some other rather slight changes are reported. Trade is normal in the Naugatuck Valley. The manufacturers of goods from brass are enjoying an active demand, and the brass mills themselves are said to be booking a satisfactory volume of business.

The strike of the Boston machinists is practically a dead letter. The manufacturers have won their fight for an open shop and most of the works affected by the strike are now running with practically a full force of men. In two instances manufacturers have procured injunctions against the strikers restraining them from interfering with workmen. As the situation looks to-day the strike may continue technically, but its effects will soon cease to be felt even in a slight degree.

The Wonder Worker Shoe Machinery Company, of which Thomas G. Plant, Jamaica Plain, Mass., is the controlling factor, has purchased the large works at Lawrence, Mass., of the Stanley Company, manufacturer of combustion engines and machine parts. The plant is a large one, capable of housing a force of more than 600 men. It was formerly occupied by the Gordon-McKay Company and absorbed in the United Shoe Machinery Company, Beverly, Mass. The shops contain a machine equipment suitable for the needs of the new owner, and this is being supplemented by some new tools. Since the purchase, however, the Wonder Worker Company, or interests closely allied with it, have had out a very long list of machinery, but orders have not been placed, nor is it expected that they will be for the present. Some further development of the situation is looked for before these larger wants will be cared for. The Plant people have been constant buyers of high grade tools for several years, and the routine purchases are expected to continue.

The Rockwood Sprinkler Company, Worcester, Mass., has purchased the property recently occupied by the James H. Whittle Company in that city and will remove its business to the much larger quarters from 2 Arch street. The company manufactures automatic sprinkler systems. The Whittle plant consists of 34,000 sq. ft. of land, on which are a three-story brick shop building, 56 x 233 ft.; a one-story shop, 22 x 30 ft.; a foundry, 60 x 80 ft.; pattern shop, 18 x 190 ft.; blacksmith shop, power plant and office building. A large amount of new machinery will be installed, the works renovated throughout, and a spur track put in.

The Merrifield Building Trust, Worcester, Mass., will erect an additional building for rental for manufacturing purposes, 50 x 60 ft., four stories.

The Mianus Motor Company, Stamford, Conn., manufacturer of gasoline engines, will build a one-story addition, 60 x 150 ft. The company has recently purchased a tract of land containing 5½ acres, which will permit of future expansion.

Estimates are being received on new plans for the Mason Laboratory of Mechanical Engineering, which will be built at New Haven, Conn., for Yale University.

A hydro-electric plant will be established at Franklin, N. H., the power from which will be carried on high tension lines to Concord, N. H., for the shops and yards of the Boston & Maine Railroad. Stone & Webster, Boston, are the contractors.

Work will begin immediately on the new power plant of the Worcester Electric Light Company, Worcester, Mass.,

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which will be 80 x 148 ft., two stories. The Westinghouse, Church, Kerr Company, New York, are the engineers.

The Liberty Cartridge Company, Mt. Carmel, Conn., is engaged in building special machinery for the manufacture of its product, and does not expect to begin production for the market before the first of next year.

The New Departure Mfg. Company, Bristol, Conn., is installing a 500 hp. Snow gas engine, two double end mufflers, two carbonizing furnaces and an annealing furnace. The ball bearing and coaster brake departments are running night and day.

Additions to general manufacturing industry include the following: Stevens Linen Works, Dudley, Mass., tentative plans for enlargements to increase capacity 50 per cent.; East Brook Company, Gardner, Mass., mill to manufacture a cotton substitute; Eastern Chemical Works, Hartford, Conn., plant at 32 Morgan street, to manufacture photographic chemicals; Slater Cotton Company, Pawtucket, R. I., additions to cost $30,000.

J. M. Brady, 847 Main street, Hartford, Conn., is organizing a corporation to be known as the Rex Motor Company of America, which will control the manufacture of a new gasoline engine, the invention of Prof. J. J. Hogan of Yale University. The company will maintain control of the patents and will organize local companies in various sections of the country for the manufacture of the engines. A Hartford company will establish works under the patents, and others are projected for the immediate future. The motor is spoken of in high terms by those familiar with it. It is designed primarily for use in automobiles and aeroplanes.

The reorganization of the Oakley Steel Foundry Company, Millbury, Mass., has been completed and the name of the corporation changed to the Millbury Steel Foundry Company. F. W. Moore, Millbury, is the president; Henry T. Maxwell, Millbury, treasurer and general manager, and W. B. Nourse, Worcester, superintendent. The directors are Messrs. Moore and Maxwell and William A. Pentacost, H. H. Merriam and William L. Neilson, Worcester. The company makes a specialty of crucible steel castings.

Cleveland

CLEVELAND, OHIO, August 9, 1910.

While the local machinery market is quiet, the volume of business that is coming out is about normal for this time of the year. Business with the machine tool dealers during some of the machine tool manufacturers report an improvethe week was confined mostly to single tool orders. Several good inquiries that have come out during the past month are still pending. These purchases have not been held up. The machinery in most cases is needed for plant additions and is not needed immediately. The demand for second-hand machinery continues good. While cancellation and the holding up of orders by some of the automobile trade, mostly by makers of low priced cars, has had an unfavorable effect, a falling off in the demand from this source had been anticipated by machine tool builders and dealers for some time. They felt that the rapid growth that industry had experienced during the past two years or more must soon reach a limit and for some time they had been looking for a falling off in the demand from this source for new machinery equipment. In lines not associated with the automobile trade a fair amount of business is coming out, and ment over July during the first week of August. The trade generally takes an optimistic view of the situation and is looking for a good volume of business in the fall. Very little business has come from the railroads for the past year or more and the feeling prevails that some of the roads will be unable to delay purchases of needed equipment much longer.

The general manufacturing situation outside of plants making automobile parts continues satisfactory, new orders being fairly plentiful. Excepting those plants that make automobile castings, business in the foundry trade is holding up well.

The Damascus Brake Beam Company, maker of brake beams for railroad cars, has purchased the plant in Cleveland formerly owned by the Cowing Engineering Company, which has been idle since the latter company failed about two years ago. The Damascus Company, whose headquarters are in this city, has been operating a plant in Sharon, Pa., which was badly damaged by fire a few weeks ago. It has not yet been decided whether the Sharon plant will be abandoned. The Cowing plant is practically a new one, having been built as a structural steel fabrication shop. The plant includes one building 100 x 450 ft. and several smaller structures. It is located on a 11-acre site on the Nickel Plate Railroad. The plant was sold for about $150,000. The Damascus Company expects to fit it up for its purposes very shortly, and considerable new machinery will be installed. This plant will give the company a large increase over the capacity of its Sharon plant.

The National Acme Mfg. Company, Cleveland, maker of automatic screw machines and screw machine products, has commenced the erection of a four-story addition to its plant, of brick construction, 40 x 185 ft. This will be used for a stockroom, case hardening department and other purposes. The extension will provide the company with more room in its manufacturing departments, where the machinery has become somewhat crowded. The company is running its plant at full capacity and reports that new orders are up to normal for this time of the year.

The Crucible Steel Castings Company, which established a plant at 800 Canal road, Cleveland, several months ago, has taken out incorporation papers with a capital stock of $25,000. The company is planning a number of improvements to its plant and will install a machine shop, the equipment for which it will probably be in the market for shortly. Officers have been elected as follows: William Schmehl, president; Charles Kaufman, vice-president; A. H. Kaufman, secretary and treasurer; H. L. Aiken, general manager. The company reports a very satisfactory volume of orders and a steady growth in its business.

The Marion Shovel & Dredge Company, Marion, Ohio, has been incorporated with a capital stock of $400,000 for the manufacture of steam shovels, dredges and similar equipment. An option on a 125-acre tract lying between the Hocking Valley and Pennsylvania railroads has been secured for a site. It is expected that sufficient stock subscriptions will be secured to start the erection of the plant in a short time. The incorporators are John D. Owens, Arthur E. Cheney, David W. Evans, Clifford A. Owens, Harry J. Barnhart, George D. Copeland and George B. Christian, Jr.

The W. H. Mullins Company, Salem, Ohio, maker of various sheet metal products, reports that the volume of its orders is holding up in a very satisfactory manner. The company's entire plant is well filled with work, with some departments running double turn and others overtime.

The Kanneberg Roofing & Ceiling Company, Canton, Ohio, has acquired a site adjoining its plant and expects shortly to enlarge its present capacity by the erection of an extension to its main building, 200 ft. long by about 60 ft. wide. Additional stamping presses will be installed.

The Carey Company, Cleveland, has been incorporated with a capital stock of $150,000. This company is to be operated as a selling organization in connection with the Carey-Philip Mfg. Company, manufacturer of magnesia and asbestos pipe and boiler covering and roofing, located on West Ninth street.

The Canton Electric Company, Canton, Ohio, is building a new boiler house and will install three 500-hp. boilers with automatic stokers and an electric crane. The Canton Boiler & Engineering Company is erecting a 250-ft. smokestack for the new plant.

The Willis-Overland Company, Toledo, Ohio, maker of automobiles, has increased its capital stock from $2,000,000 to $6,000,000.

Sealed proposals will be received by the Board of Trustees of the Athens State Hospital, Athens, Ohio, August 25, 1910, for the erection of a standpipe, two 150-hp. horizontal tubular boilers and a system of steam and water piping to be installed at the State Hospital in Athens.

Detroit

DETROIT, MICH., August 9, 1910.

While there has recently been some complaint here that trade had fallen flat, any statement to that effect is disputed by the activity of various local machinery houses, including manufacturers, who feel well satisfied with the record made during July, right up to the close of the month. For the first few days in August there appeared to be a pronounced lull in buying, but this can be largely ascribed to the fact that consideration of inventories and financial statements was very general just then on the part of officials of many large companies, with consequent delay in making new contracts for either equipment or material. The present week is opening comparatively strong. Not only has there been an influx of inquiries and orders here, but machinery builders out in the State and to the southward in Ohio and Indiana write very cheerfully to local representatives and others concerning the situation. The unparalleled amount of construction work now under way all through this territory is forcing purchases of tools, power apparatus, &c., where they have not already been made, and numerous lists are still awaiting approval or known to be in preparation.

Aside from the between season shutdown of automobile plants, the leading manufacturing establishments are run-

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ning practically to capacity, except where scarcity of skilled labor renders it impracticable to do so, and the output for the current month will be about the same as in July, which was uncommonly heavy for midsummer. At all of the brass and aluminum foundries new men are being taken on as obtainable. From the automobile companies the demand for fall deliveries from these foundries is heavy, their policy, as announced by an official of the Packard Motor Car Company, speaking in behalf of his own company, being to keep their output this autumn up to the top notch. As far as possible, however, they will make use of machinery already installed, the rush to provide additional facilities having abated somewhat. This is due partly to delays in construction plans and to difficulty in getting men to operate additional machines. It has also been ascribed in some quarters to a disposition on the part of the motor car builders to slow down a bit with respect to enlargements, and there has been talk of cancellation of orders for tools, but the latter will probably be found to take the form mainly of substitutions of certain lists for others, due to alterations in plans, which have not yet been fully decided upon. There is not likely to be any serious retrogression from the scheme of expansion mapped out by the leading interests.

The Anderson Carriage Company, Detroit, is having work started on a three-story factory building, 80 x 300 ft. Most of the machinery required has been already provided for.

The present active interest of electric traction lines in all improved appliances has created an excellent demand for the products of the Hensley Trolley & Mfg. Company, Detroit. It is making a specialty of a trolley wheel of very simple construction which is lubricated by the use of a spindle and hollow hub, graphite bushings being done away with.

Interests identified with the Hercules Hoop Company, Durand, Mich., are reported to contemplate the erection of a factory in Cadillac, Mich.

The Ohio Brass Company, Mansfield, Ohio, offers for use in the bearings of engines, generators, motors, &c., a metal which is stated to be made after Isaac Babbitt's original formula.

The M. Lamont Company, Bay City, Mich., is planning the construction of a large woodworking plant, including planing mill and box factory. The details of equipment and date of erection have not yet, however, been fully decided upon.

A hoisting plant built in the shops of the Wellman-Seaver-Morgan Company, Cleveland, has been installed by Pickands, Mather & Co. of that city, at the Hemlock Mine, Amasa, Mich., where a new shaft house was recently completed.

It is anticipated by dealers here that equipment will be needed shortly for an addition to the plant of the Huntingburg Wagon Works, Huntingburg, Ind. Contracts for the construction work have already been let. The plans are said to include electric drive.

It is reported that W. A. Story, manager here for the Erie City Iron Works, Erie, Pa., has been elected vice-president of the S. B. Martin Company, recently incorporated for $225,000, which will operate a stone quarry at Fiborn, Mich., on the upper peninsula.

The Springfield Metallic Casket Company, Springfield, Ohio, is putting on more hands for brass work.

A report just made by the Buick Motor Company, Flint, Mich., shows that during the second quarter of this year 8697 cars were built in its shops. In view of the present statements concerning overproduction of automobiles, it is interesting to note that on July 27 the company had a total of 3461 machines on hand, nearly one-third of which were unfinished. This number also included delivery trucks.

Contracts for the erection of a manufacturing plant, 60 x 130 ft., four stories, are about to be let by the Detroit Show Case Company of this city. All of the mechanical equipment needed will be electrically operated and controlled.

The Huebner Mfg. Company, Detroit, is reported to contemplate some enlargement of its woodworking plant. With the existing facilities, however, more skilled men could be employed than are at present available.

Purchases have recently been made here of equipment for the new factory of the Taylor-May Machine Company, Rochester, N. Y., which will be largely devoted to the manufacture of automobile parts and accessories. Some further apparatus will be required as the plant nears completion. It is understood that induction motors for alternating current will be used for operating the machinery on power supplied by the Rochester Railway & Light Company.

Wickes Bros., Saginaw, Mich., have sent out their monthly stock list of second-hand machinery, which includes machine tools and general machinery, engines, boilers, pumps, dynamos, motors, &c. The classification is in very convenient form for reference.

Machinery is now being provided for the new building to be erected here by the Michigan Pressed Steel Company, Detroit, the plans for which were recently mentioned in *The Iron Age*. The shop, which will be 60 x 200 ft., is one of a number of similar units to be constructed for the various purposes of the business as the need develops.

At a recent meeting here of automobile engineers, it was decided to recommend a material reduction in the number of standard parts for which stock ordinarily has to be carried.

F. G. Hood, Pentoga, Mich., recently organized the Lignum Chemical Company, which will erect a manufacturing plant at Marinette, Wis., for the production of various acids. A site has been secured and plans for the buildings are under way. The apparatus required has not yet been fully decided upon.

The Riverside Machinery Depot, Detroit, is offering to the trade a very full list of used and rebuilt machinery for iron, brass and woodworking, power equipment, &c. Considering the time of year, trade at present is quite satisfactory.

Eastern shipyards are making a vigorous campaign here for the employment of skilled shop operatives, riveters, &c., for work on steel vessels and their machinery.

In an interview recently granted by one of the officials of the Packard Motor Car Company the fact was brought out that the output of the company was increased from 200 cars in 1904 to 3270 in the present year. The number of employees engaged in manufacturing is 7211. A new building to increase the output of the motor-truck department has been started, and plans calling for the gradual erection of a number of other shops have already been determined upon.

The Union Clay Mfg. Company, Empire, Ohio, is preparing to install some power equipment, the principal details of which have already been contracted for.

A machine shop to take care of the repairs on automobiles owned by the city is being erected on Belle Isle at a cost of approximately $20,000.

Manufacturers of this vicinity who make a specialty of tools and other equipment for motor car plants expect to figure on apparatus for a factory which it is said will be erected at some point in Missouri by the Banner Automobile Company, composed of interests largely identical with those of the Banner Buggy Company, St. Louis, Mo.

It is reported from Saginaw, Mich., although without direct confirmation, that the Lufkin Rule Company of that place has decided upon a large increase in its output for the coming year, made necessary by the growth of trade, with consequent extension of its factory.

A number of firms here who expected to supply some of the equipment for the Jewell Steel & Malleable Company's new works at Buffalo, N. Y., appear to have been forestalled by early purchases, but it is likely that some additional machinery and tools will be required before the plant is operated to its capacity.

The Pontiac Foundry Company, at Pontiac, Mich., will commence construction at once on a brick factory building, 170 x 270 ft., with an L addition, 32 x 60 ft. The company proposes to conduct a general jobbing foundry and will make castings of all kinds to order.

The Jackson & Church Company, 300 Cleveland street, Saginaw, Mich., expects to purchase two traveling cranes, rolls and some boiler shop equipment, which is to be installed in a new plant the company will shortly construct.

John B. Corliss, Jr., 34 Canfield avenue, Detroit, Mich., has had plans prepared for a machine shop, 100 x 100 ft., by George D. Mason, 80 Griswold street, who is now letting contracts.

Milwaukee

MILWAUKEE, WIS., August 8, 1910.

Trade thus far this month has been very much better than for the similar period in July, and with few exceptions manufacturers seem to be satisfied. No contracts of any considerable size are reported, but there is a steady run of the orders upon which most dependence is placed and the shops are kept operating practically to capacity. A good deal of repair work has been coming in lately, and some plants have also taken advantage of the summer quiet to accumulate stocks of parts which are furnished on annual contracts. The foundries are not as much rushed as they were, but have enough business booked to carry them well into the fall.

One line of production which shows great activity is that of compressors and air brakes for electric traction and street railroad service. Milwaukee is now the leading center for the manufacture of such equipments, and contracts have been closed with companies in many of the principal cities to keep them continuously supplied for long periods of time with everything of the kind that is needed for operating their systems.

The subject of gas power continues to occupy the attention of some of the larger machinery builders, and it is

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anticipated, with good reason, that the production of machinery for the purpose will increase at least 50 per cent. during the next 12 months. Some very powerful and economical gasoline motors are also being developed. A notable example of this is to be found in the locomotive for mining, industrial railroads and contractors' service being built by the Milwaukee Locomotive Mfg. Company, which utilizes gasoline as its driving power. The machine has proven very efficient and is attracting a great deal of attention. Other Wisconsin concerns are experimenting with something similar or have already put a machine on the market, as in the case of the Termaat & Monahan Company, Oskosh, whose apparatus is, however, designed for lighter service.

Boiler and tank building has been revived to a degree which not long ago was thought impracticable, in view of the hold which these industries have obtained in other parts of the country. Probably a majority of the apparatus for high pressure service sold in this State for some months past has represented Wisconsin labor, and the principal shops in which it is built have apparently all they can do to keep up with orders. A leading manufacturer of engines and other power machinery is also preparing to put on the market a new type of boiler which is said to equal any of the most advanced design, but the formal announcement of that fact is withheld for the present.

The Cutler-Hammer Mfg. Company of this city has met with a degree of success in the introduction of its improved type of lifting magnet which is beyond the expectations originally entertained. It is now being used not only for unloading and handling material at foundries, steel mills, &c., but also for a great variety of service that experience has developed. Figures are in the possession of the manufacturer which show the actual economies effected, so that the salesmen who go out in answer to inquiries can deal in concrete facts rather than theory or argument. The future of this industry is very bright.

The McDonough Mfg. Company, Eau Claire, Wis., has found this one of the best seasons in its history, taking the first seven months of the year as a whole. A feature of its trade which has been very successful is the sale of the heavy resawing machinery, which it was a pioneer in developing. It is now certain that during the coming fall the demand for this will be very strong.

The C. Colnik Mfg. Company, Milwaukee, has the contract for a steel frame addition to be made to the plant of the Lytle-Stoppenbach Company, Jefferson Junction, Wis.

Electric power will be used in new buildings, 30 x 40 and 20 x 96 ft., to be erected by the Milwaukee Elevator Company, Milwaukee, at Walworth, Wis.

The Valley Iron Works Company, Appleton, Wis., has kept its foundry and machine shops principally occupied this season with work for the pulp and paper mills, of which it makes a specialty. The woodworking shop connected with the plant has also been busy on tanks for this trade, which have to be made of acid resisting material.

The new factory to be built by the Chippawa Falls Chair Company, Chippawa Falls, Wis., will be three stories, 80 x 100 ft. Electric power is to be used, but whether it will be generated on the premises or purchased from the local central station has not yet been decided.

The Termaat & Monahan Company, Oshkosh, Wis., notes an increasing interest in small gasoline and oil locomotives, of which it manufactures a very compact, serviceable type.

It is reported from Chippawa Falls, Wis., that the gasoline engine factory of P. J. Holm & Sons will be enlarged and steps taken to make this one of the leading industries in that part of the State.

An electric motor of about 500 hp. and other equipment for driving a wood pulp grinder is required in connection with the Forest Products Laboratory at the University of Wisconsin. Bids are to be taken until August 12.

The La Crosse Steel & Bridge Company, La Crosse, Wis., has been awarded the contract for constructing a steel bridge at Union Mills, Wis.

The Northwestern Steel & Iron Works, Eau Claire, Wis., is commencing work on the foundations of the new foundry, 100 x 200 ft., and also has a pattern storage building in process of construction.

The Commercial Club at Onalaska, Wis., has a committee on new industries, which is out after factories for that place, and it is stated that announcement of the location of a plant there will be made shortly.

The Superior Iron Works Company, Superior, Wis., has in operation at various plants a new type of shaking and dump grate for power plant furnaces which possesses some unique features, its principal advantage being in the large air surface arising from the construction used.

It is reported from Wabeno, Wis., that A. E. Ruche & Co. of that place will erect a factory for the production of woodenware. It will be operated by water power.

The municipal light and water plant at Evansville, Wis., which is equipped with two engine driven generators of 150 kw. for alternating current, furnished by the Westinghouse Electric & Mfg. Company, will have its capacity increased by machinery now being installed. Beginning this fall a commercial day load is to be carried, and further extensions may be looked for.

The Standard Oil Company has acquired a site at Green Bay, Wis., on which to erect a boiler house, warehouse and storage tanks for a capacity of 4,000,000 gal. Brick, steel and concrete construction will be used.

The Power & Mining Machinery Company, Milwaukee, is preparing to introduce more extensively its gas producer system, which has been put in very successful operation at some of the leading gas power plants of the country. A station in this vicinity, where the producers are installed, is that of the Milwaukee Northern Railway, at Port Washington, Wis. Tests made of the plant have been very favorable and it has made an excellent showing in regular service, supplying two gas engines of 1500 hp. each.

The Ashland Light, Power & Street Railway Company, Ashland, Wis., has been granted a permit to establish a substation at Ironwood, Mich., and it is reported that with the increased service now contracted for it will build another hydroelectric plant at Copper Falls.

The Northern Reduction Company, Milwaukee, has been incorporated for $50,000 by H. C. Carr, F. C. Gross and C. P. Hobson to establish a fertilizer factory.

The Jacob J. Vollrath Mfg. Company, Sheboygan, Wis., has filed with the Secretary of State at Madison, Wis., an amendment to its charter increasing the capital stock to $500,000 and the number of its directors from three to five.

The Rock River Machine Company, Janesville, Wis., is erecting a machine shop, 90 x 108 ft., which will have three aisles 30 ft. wide with a 15-ton crane running through the center aisle. A vacuum heating system will be installed for which the contract has been placed. The company is not in the market for any new machine tools or equipment at the present time, but probably will purchase a little later several lathes, grinders, boring mill, key seater and shaper. The lathes to be installed will be of 18, 32 and 34 in., and the boring mill about 54-in. swing. The installation of tool room grinder for reamers, &c., is also being considered.

The Koehring Machine Company, Milwaukee, Wis., has increased its capital stock from $50,000 to $100,000, but advises it is not contemplating any additional improvements or the purchase of any new machine tools or equipment.

The Wausau Sulphate Fibre Company, Wausau, Wis., has under construction a new plant which will consist of three buildings, the largest of which will be 70 x 525 ft., two stories. The plant will be operated by electricity, a large dam supplying the water power.

Sealed bids for installing an electric light plant for the village of Browntown, Wis., will be received by the village clerk until August 17. Bids will be received as follows: For furnishing and installing a 25-hp. gasoline engine, belt connected to an 18-kw. generator, and furnishing and erecting a pole line.

St. Louis

ST. LOUIS, MO., August 8, 1910.

A feature with some of the leading merchant metal working machinery houses is numerous inquiries, the head of one of them stating that not in 30 years has the number been so great in the summer. The percentage of which is resulting in business is not so large as might reasonably be expected. A canvass covering quite a number of local, together with representatives of outside companies, with but few exceptions shows manufacturers of iron and steel and allied products seasonably active, with good prospects for an increased demand in the fall.

The Koken Iron Works has a good run of business. Among its recent contracts are the following: Steel work for a public schoolhouse at Denver, Colo.; a bridge for the War Department at Cache Creek, near Fort Sill, Okla.; a highway county span, Lemhi County, Idaho; steel work for United States Post Office, Lander, Wyo.; frames and waste gates, Marble Falls, Texas; head frames, Pachuca, Mexico; science building, University of Colorado, Boulder, Colo., and has just completed a steel job for Japan.

Early in the year the Brown Machinery Company removed to 515-517 Main street. The quarters it now occupies are so spacious that its stock can be displayed to best advantage. It states that there is this summer a very good demand for engines, boilers, saw mill and woodworking machinery.

The W. C. Johnson & Sons Machinery Company reports being in receipt of a remarkable number of inquiries, mostly for heavy machinery; also for boilers, engines and pumps; but only a fair percentage result in business. Mr. Johnson states that the company is to-day shipping two cars of engines and boilers to a customer in Oklahoma.

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J. W. Wright & Co. finds a normal demand for this season of the year prevails. For the most part the call is for the heaviest tools. Second-hand machinery is not wanted to much extent. There is some demand for electrically driven tools. For automobile stuff it is more quiet than in the spring.

The W. R. Colcord Machinery Company states that the company finds the best demand is for light machine tools. The Rogers Automobile Company has an order in for tools. In the main there is good inquiry, coming principally from outside St. Louis.

The Broderick & Bascom Rope Company, C. E. Bascom says, is fairly well satisfied with conditions in its line, since there is a steady demand for its specialty, Yellow Strand wire rope. This is in use by the Government at Panama, which order was filled with the size taking a breaking strain of 100 tons. The logging, quarrying and mining interests are being heard from right along.

The A. Leschen & Sons Rope Company is running night and day shifts at its wire rope plant. This does not indicate an unusual demand, as it is merely its normal position, this having been its custom for some years past and was only temporarily cut down to a day shift for a while following the depression of the early part of 1908.

The N. O. Nelson Mfg. Company is enjoying a good business not only from its branch houses in the West and on the Pacific Coast, but also from Texas. Its local trade is good and many orders are coming from Kansas City. Business for the first half of 1909 exceeded that of the same period in 1908. Its shops at Leclair, Ill., are running on full time.

The St. Louis Rail & Equipment Company states there has been considerable call for rails, weights 56, 60 and 70 lb. There is a fair demand for light equipment from steam and electric roads; rather the best from the latter interest. It has recently had calls for narrow gauge engines from Cuba and Mexico. The railroads seem to have cleaned up their engines, and second-hand stock is pretty much in the hands of dealers. Relaying rails are in small supply.

The Wesca Supply Company finds a fair demand for electrical supplies and electrical machinery, though this is the quiet season in its line. Inquiries for future wants are coming in quite freely. New electric railway lines are being projected and the outlook for fall business is good.

The Wagner Electric Mfg. Company has secured the contract for two 200-kw., 23, 100-volt, 25-cycle transformers for use in connection with the Salt River irrigation project, Arizona, at a price not to exceed $1515 each.

Geo. B. Ogan, Western manager for the Hess Spring & Axle Company, reports that the Banner Buggy Company has placed with his company an order for vehicle axles, the specifications for which call for 25,000 sets, and 30 freight cars will be required to transport them.

The Lindell Motor & Auto Parts Mfg. Company has been incorporated. Capital stock, one-half paid, $6000. Incorporators: Edward B. Campbell, Alfred A. Wagner and George S. Brunks. To manufacture and deal in motor vehicles and accessories.

The H. G. Turley Machine Company reports business good for its specialty of cut machine gears of all kinds. The business was recently incorporated with a capital stock of $25,000.

The Standard Adding Machine Company regards the demand for its machines as satisfactory for this season of the year.

The Champion Shoe Machinery Company, maker of shoe sewing and polishing machines for the use of shoe repairers, states it is doing well for the season.

The Cotton Belt Railroad has its new shops at Tyler, Texas, under way, and the machinery is beginning to arrive. The entire equipment, including cranes, was furnished by one of the Eastern houses, the order having been placed some time ago.

The Monarch Metal Weather Strip Company, maker of rubberless weather strips, is having an active demand for its specialty.

The Hannibal Tool Company, a new concern just starting in Hannibal, Mo., is in the market for an equipment of lathes, milling machines, drop hammers, &c.

The Harrisonville Foundry & Machine Company of Harrisonville, Mo., recently purchased an equipment for its plant, of St. Louis houses.

The Medart Patent Pulley Company finds business thoroughly satisfactory for midsummer on its line of pulleys, shafting and transmission machinery.

The Whitman Agricultural Company, maker of high grade hay presses, reports a satisfactory seasonable demand. This company has just completed a three-story warehouse addition.

The F. E. Schonberg Mfg. Company, manufacturer of window and door screens, has well under way a new three-story addition to its plant.

The Miller Elevator Company is quite busy on orders for freight and passenger elevators.

St. Louis Iron Machine Works has been well occupied on Corliss engine work and also has several orders in hand for ice plant equipment.

The Woodstock Safety Chuck Company, Woodstock, Ill., certifies to an increase in capital stock from $20,000 to $25,000.

The Springfield Traction Company, Springfield, Mo., has purchased additional ground for the enlargement of its car barns and machine shops, for which definite plans have not been decided upon.

The Citizens' Electric Light & Power Company, the Southwestern Light & Power Company and the East St. Louis Light & Power Company, all of East St. Louis, Ill., have been consolidated under the title of the last mentioned company with a capital stock of $1,000,000. The officers of the consolidated company are: L. C. Haynes, president; H. D. Sexton, first vice-president; M. S. Hipkins, second vice-president; G. L. Estabrook, secretary and treasurer; T. L. Gregory, assistant secretary and treasurer.

The National Clock & Electric Mfg. Company, St. Louis, Mo., is considering the erection of a new factory. Plans for the building have not been prepared, as the company has not yet secured a site, although it has several under consideration.

The Kansas City Pressed Metal Radiator Company, Kansas City, Mo., recently organized with a capital stock of $75,000, is negotiating with several cities for a suitable location for the erection of a factory. Machinery to be installed in the factory has all been contracted for and is now under construction. The officers of the company are: James Muir, president; Thomas H. Walker, vice-president and general manager; W. Z. Flanery, secretary; Paul F. Covington, treasurer.

The South

BIRMINGHAM, ALA., August 8, 1910.

Considerable interest has recently been aroused in the possibilities of the Ensley district, near Birmingham, as the center for a grouping of related industries similar to that now in progress at Gary, Ind. Several large manufacturing companies dependent on the steel mills and coke ovens for their raw material, fuel, &c., are known to have been investigating conditions in that vicinity, and some important developments of interest to machinery supply houses may be looked for shortly. One of the things which is said to have had most consideration is the matter of securing and retaining skilled labor. In this housing conditions, local transportation, public utilities, &c., are controlling factors; consequently the unfolding of plans for the new industrial city of Corey will have more than a little influence on the situation.

It has been decided at Opelika, Ala., to proceed with the construction of an electric plant to be used in municipal service, and funds for that purpose to the amount of $85,000 are now being provided.

Two steel and brick warehouses, 122 x 148 and 125 x 157 ft., will be added to the plant of the C. C. Mengel & Bro. Company, Louisville, Ky.

The Eastern Tennessee Power Company has been organized at Chattanooga, Tenn., to build a large hydro-electric plant on the Ocoee River and construct an interurban railroad.

The Lubin Mfg. Company, N. D. Lubin, manager, has been organized and will establish a plant at Anniston, Ala.

A new plant has been completed at Anniston, Ala., by the Hale Buggy Company.

The Bering Mfg. Company, Houston, Texas, is making purchases of machinery for a large new timber-cutting plant at Pawnee, La.

If satisfactory arrangements are not made to take over the plant of the Ocala Water Company, Ocala, Fla., the city will build its own power and pumping station, equipped with modern, high duty machinery.

An engineering firm is about to be selected by the city of Charleston, S. C., to prepare plans and specifications for the proposed municipal electric plant to be used in power and lighting service.

It is reported from Columbus, Miss., that the Southern Mfg. Company of that place, which recently opened its plant there, has been chartered to manufacture vehicles as well as agricultural implements and machinery, and that an additional factory for that purpose may be erected. One of the organizers of the new concern already operates a vehicle plant in the North.

Construction was recently commenced of a large stave factory at Colfax, La., for the Colfax Hardwood Lumber Company, which will probably be electrically operated.

A district engineering and sales office has been established in the Woodward Building, Birmingham, Ala., by the

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Wagner Electric Mfg. Company, St. Louis, whose trade through this section is now very large.

Considerable new machinery has just been installed in the plant of the Memphis Saw Mill Company, Memphis, Tenn.

The Richmond Electric Company, Richmond, Va., is putting on the market a variable speed alternating current motor of the induction type, which shows uncommonly high efficiency for a machine of that class.

Some additional pumping machinery will probably be required this year at Morgan, La., where an extension of the water system is being planned.

An elevated steel tank or water tower will be required for erection at Montezuma, Ga., where an appropriation has been made to cover the expense.

B. J. Robinson, Vicksburg, Miss., is having plans drawn by Wm. A. Stanton of that place, whose office is above the First National Bank, for a machine shop, 75 x 100 ft., two stories, to be used for general contract and repair work.

The Vicksburg Traction Company, Vicksburg, Miss., is planning to install a modern coal handling system in connection with its power plant. A machine and forge shop for repair work will also be built.

Contract has been awarded the Johnson Iron Works, Ltd., New Orleans, La., for constructing a steel vessel to be used by the Federal Government in river work.

Sealed bids will be received by the city of Ophelika, Ala., until August 31 for furnishing all material and labor and constructing a water works and electric lighting systems. L. F. Dickson, Mayor.

The Southwest

KANSAS CITY, MO., August 8, 1910.

Sales of both high and low pressure boilers, heaters, pumps, regulators, &c., have been the principal feature of recent trade, with steam, gas, gasoline and oil engines probably next in importance. In the line of equipment for metal working plants there has not been much doing, although some inquiries are out that will develop into orders before a great while. The same is true, but in greater measure, of woodworking shops, planing mills, stave factories, &c., for which considerable machinery will be needed by or before October 1. In the mining districts around Joplin and elsewhere considerable activity is impending, and some purchases of equipment will take place soon after the beginning of fall. A little later the sawmill trade of Arkansas, Texas and Oklahoma will cut quite a figure, and the tendency during the coming season will be to install heavier apparatus than in former years. Quality is also coming to be more considered. In the construction of mill buildings structural steel will be more and more used in future. Recently this was an absolute innovation, but its advantages are coming to be recognized, and anything of this kind which tends toward permanency of plants cannot fail to have a large influence upon the character of their equipment. The systematic development of the country in connection with logging is, moreover, leading to plans for industrial railroads which can be converted into feeders or connections for trunk lines. With these come the establishment of machine shops for repair work, and in pending projects are comprised a number of such plants that will compare favorably with those of Eastern companies. Taking into consideration merely the factors above stated the outlook for future business in the Southwest is excellent, and with its many other resources a favorable market during autumn and winter is practically certain.

An addition is to be made to the car shops of the Springfield Traction Company, Springfield, Mo.

The Smith Automobile Company, Topeka, Kan., is increasing its force of machinists, assemblers, testers, &c., and will operate to its fullest possible capacity between now and spring. Men skilled in this work have to be obtained largely in the East.

The Heaton Wagon Company, which is headed by Walter Heaton, Neosho, Mo., is planning the erection of a factory in which motor drive for machinery will probably be used.

The Craig Machinery & Wood Feather Mfg. Company, Kansas City, has had plans drawn for a new manufacturing plant, the initial unit of which will be 70 x 140 ft. A material used in packing fragile ware will be the product of the plant.

The foundation for the new pumping engines at the Quindaro water works station, Kansas City, has been ordered from the Midland Bridge Company of this city.

New machinery, including a large motor driven pump, is being installed at the shaft of the Jerome Verde Mining Company, Jerome, Ariz. Considerable additional equipment will be required later on, when the property is kept free from water.

A large incineration plant, the waste heat from which may be used under boilers in a steam power station, will be built for municipal use at Kansas City.

A large building for the assembling and storage of agricultural machinery is about to be erected in Kansas City by the John Deere Company, Moline, Ill.

The construction of a substation, equipped with transformers and a rotary converter of 500 to 600 kw., has been decided upon by the Southwest Missouri Electric Railroad Company, Webb City, Mo. A switchboard and protective apparatus will also be needed.

The Frisco Mines & Power Company, Kingman, Ariz., has purchased two grinding mills from the Harding Conical Mill Company, New York City, for installation at one of its properties.

Machinery will be provided shortly for a new plant which the Creamery Package Company is starting to erect at Blytheville, Ark. It will probably be motor driven.

It is reported from Oklahoma City, Okla., that the Farmers' Motor Wagon & Plow Company has been formed there with a capital of $100,000, and will erect a manufacturing plant. Further details are lacking.

The city of Provo, Utah, has sold bonds in the sum of $90,000, the proceeds to be used for the construction of a water works system.

Thomas J. Freeman, receiver and general manager of the International & Great Northern Railway Company, has issued an order for the erection at Taylor, Texas, of three additional buildings which will be used for a power house, sand drying house and bathrooms, closets and lockers. Other improvements under course of construction at Taylor consist of a lake and dam for a water reservoir, coal chutes, water pumping station, tank and turntable.

It is understood that the Hydro Carbon Company, Wichita, Kan., which recently made extensive improvements to its plant, is in the market for a 60-hp. gas engine.

The Tulsa Boiler, Bridge & Mfg. Company has been organized at Tulsa, Okla., to manufacture all kinds of boilers, tanks and bridges and to do general machine work. The plant will be in operation within three months and will employ several hundred men.

The Northwest

MINNEAPOLIS, MINN., August 8, 1910.

Among the more important contracts recently taken by local supply houses are orders for equipment used in quarrying, rock crushing, road making, ballasting and concrete construction. The last named has been a very remunerative source of business for some months past, and it is now reinforced by the other lines mentioned, which have become active in consequence of the great amount of improvement work that will be carried on during the remainder of the open season. Not only are the railroads and traction companies putting vast quantities of ballast into their roadbeds, but the bonds voted by counties and municipalities at the late spring and early summer elections are now available for highway betterments, concrete bridges, culverts, revetments, dams, &c., and contractors in these several lines are crowded with work. This spurt of buying will, however, not last very much longer. Users of such machinery have demanded and been accorded almost immediate delivery, as the condition which has lately existed was foreseen by manufacturers and very well provided for.

Pumps continue to find a good market in all sections of the Northwest. Gasoline engines are largely wanted; mixers sell readily; hoists have been in fair demand, but will not be much longer; excavators required for this season have mostly been supplied; electrical machinery is still called for with great regularity; steam generating equipment can be placed at many points, and for the ordinary run of equipment of all kinds conditions are fairly good for August. July business was surprisingly good in the aggregate, as there has not been much surface indication of the amount of trade actually in progress, and the showing made this month ought to be better.

The South St. Paul Light, Heat & Power Company, South St. Paul, Minn., which is operating two Fort Wayne generators of 175 kw., alternating current, driven by Murray Corliss engines, has under consideration improvements in its electric system.

It is reported from Peach, N. D., that a machine shop, 100 x 100 ft., equipped partly for automobile work, will be erected there by A. E. Kastien.

New boilers may be added to the municipal light and water plant at Hibbing, Minn., for the purpose of establishing a central heating system.

The Diamond Iron Works, Minneapolis, furnished six 16 x 70 high pressure boilers for the plant that is now being put in operation at Ione, Idaho, by the Panhandle Lumber Company, Spirit Lake, Idaho, which is regarded as the most modern of its kind in the country.

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A party of State officials, headed by Governor Eberhardt, will leave St. Paul on August 14 for a trip to the iron ranges, where the mining properties owned by the State of Minnesota will be inspected. Hibbing and Chisholm will be among the towns visited. This visit may have an important influence upon the future development of mineral lands in that section and consequently upon the market for mining machinery.

The Minneapolis Steel & Machinery Company, Minneapolis, as a result of the large contracts now in hand, is putting on all of the men that it can obtain for structural shop and erection work, including assemblers, fitters, markers and riveters. Skilled men in these lines are not easy to find and it has been found necessary lately to train a good deal of inexperienced labor. The company makes a standing offer to do this in the case of men willing to take an intelligent interest in the work.

The Pelican Rapids, Minn., municipal power plant, which is equipped with a Chandler & Taylor engine of 150 hp., driving a Triumph generator, will be enlarged. The entire contract, including machinery, has been placed with J. W. Shuman, Minneapolis.

The planing mill and woodworking plant of the Park Rapids Lumber Company, Park Rapids, Minn., which recently burned, will probably be rebuilt for considerably greater output and equipped with motor driven machinery.

The county authorities at Great Falls, Mont., have awarded a contract for the construction of 18 steel bridges in that vicinity to the Midland Bridge Company, Kansas City, Mo.

The plant of the Union Light, Heat & Power Company, Fargo, N. D., will be remodeled and its capacity enlarged. The present equipment, which will be added to and partially replaced, consists of direct current generators of 1000 kw. and alternating current generators of 650 kw., all driven by Corliss engines. Steam is furnished by boilers from the shops of the Heine Safety Boiler Company, St. Louis, Mo.

A steel frame mill, with concrete base, which will cost about $250,000, including machinery, is now being erected at St. Maries, Idaho, by the Milwaukee Lumber Company. It will be the only plant of this most modern type of construction in the Northwest and is to have the best equipment that can be furnished. Electric drive will be used throughout.

It is reported from Winona, Minn., that a manufacturing plant to cost $600,000 will be built there by the Oxford Linen Mattress Company, whose main office is temporarily located at North Brookfield, Mass. Contracts for the first of the structures to be erected will be let at once.

Extensive improvements are to be made by the Consumers' Power Company to its plant in Faribault, Minn. The system will be changed from water gas to coal gas and three large benches installed.

An electric power and lighting plant is now being installed at Blunt, S. D.

The increasing opportunities for the sale of coal mining and handling machinery in the Northwest are shown by a map just prepared in the office of the State Engineer at Bismarck, N. D., giving the locations of 104 commercial mines in North Dakota alone.

The Business League of St. Paul, 224 Endicott Building, St. Paul, Minn., is having plans prepared for a power plant to be erected in that city.

The Boise Iron Works Company, Boise, Idaho, has been organized and is having a plant erected which will be ready for occupancy by August 25. All necessary equipment has been purchased. The officers of the company are: W. J. Briggs, president and general manager; R. Richardson, vice-president; D. D. Long, secretary and treasurer.

The Farther Central West

OMAHA, NEB., August 8, 1910.

While some dealers report an improvement in trade for the first week of August, as compared with the average of July, the market does not seem to have as yet developed very much activity. Power and pumping machinery unquestionably leads all else, due to buying on the part of municipalities, traction lines and public service companies, but representatives of leading manufacturers, who have called on the responsible officials with the object of closing contracts, complain that it is slow work. Advices from Colorado, Wyoming and Utah are more generally favorable, as considerable ordering is being done for the account of mines, smelters, collieries, hydraulic power plants, irrigation projects, tunnel work, &c. In the Black Hills the renewed activity is also becoming more pronounced, and it looks as though that district would presently assume the relative importance for this market that it had a decade ago.

A motor driven centrifugal pump of 1,500,000 gal. daily capacity will be installed at the Greenville station of the Sioux City water works, and another similar unit at the Morningside station.

The Sioux City Foundry & Mfg. Company, Sioux City, Iowa, is finding this a particularly good season for boiler and sheet metal work of every description.

It is reported from Lexington, Neb., that the power plant of the Lexington Mill & Electric Company, which furnishes the town with electric lighting, has been destroyed by fire.

The Omaha Motor Car Company, Omaha, has been incorporated here for $200,000.

Plans are being prepared by the Falkenau Electrical Construction Company, Chicago, for a hydroelectric plant to be operated in connection with an irrigation system known as the Davis and Weber Counties Canals in Utah. The first of the three units proposed will consist of hydraulic turbines operating under a 220-ft. head, driving alternating current generators of 4000 kw.

The Utah Electric Supply Company, Salt Lake City, Utah, which recently came under a new management, has been designated as sales agent for the Ft. Wayne Electric Works, Ft. Wayne, Ind., and is handling a full line of equipment, including generators, motors, transformers, switchboard, &c. Contracts for complete steam and hydroelectric plants are also taken.

The city officials at Strawberry Point, Iowa, have awarded contract for electric generators and other apparatus to the Ft. Wayne Electric Works, Ft. Wayne, Ind. The new power plant building will be constructed and a producer gas engine set furnished by the Minneapolis Steel & Machinery Company, Minneapolis, Minn.

A heating and ventilating plant of considerable size will be needed for the new high school building to be erected in Des Moines, Iowa.

It has been decided by the authorities at Ellsworth, Iowa, to install a pumping plant and water works system there.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, is low bidder for the construction of a pumping plant and water works system at Donnelly, Minn.

The Broken Bow Electric Light Company, Broken Bow, Neb., is proceeding with plans for the erection of a power station.

The power plant of the Griswold Milling & Light Company, Griswold, Iowa, owned by J. W. Daly, which is equipped with direct current Westinghouse generators, will be remodeled to supply alternating current, new machinery being installed for the purpose.

The Adams Company, Dubuque, Iowa, which manufactures several different types of molding machines, is putting on the market a bracket squeezer, built in 24, 30, 34 and 38 in. sizes, which is designed to be attached to the wall, making it possible, where floor space is crowded, to put up one or more additional rows of molds. It is not, however, intended to take the place of stationary or portable squeezers of the standard types which the company also offers.

The Silver Bros. Iron Works Company, Salt Lake City, which has the largest machinery building plant in that section, will build a dredge for municipal service, the contract having been recently awarded.

The construction of a municipal pumping plant is proposed at North Platte, Neb.

The Utah Light & Railway Company, Salt Lake City, Utah, is arranging for the erection of another power station of 8000 kw.

The Salt Lake City, Utah, office of Fairbanks, Morse & Co. is introducing extensively in the West the new Duff-Bethlehem hydraulic jack, brought out by the Duff Mfg. Company, Pittsburgh, which is stated to be forged entirely out of steel. It is designed for heavy service.

The capacity of the Manchester Light, Heat & Power Company's plant at Manchester, Iowa, which is now about 200 hp., will be enlarged. Apparatus already ordered includes a 150 hp. boiler.

The H. S. Brammer Mfg. Company, Davenport, Iowa, whose plant was recently destroyed by fire, has awarded a contract for the construction of a reinforced concrete fireproof factory building, 80 x 250 ft., three stories, a boiler house, 33 x 56 ft., and a dry kiln, 24 x 100 ft., to the William Allen Son & Company, Peoria, Ill. The company manufactures washing machines, boxes and shipping cases.

The Waterloo, Cedar Falls & Northern Railway Company, Waterloo, Iowa, has begun the construction of a power house to be erected and equipped at a cost of $500,000. The plant will be equipped with 1500-kw. turbo-generators with necessary accessories, contracts for which have been placed.

The Voss Brothers Mfg. Company, Des Moines, Iowa, manufacturer of washing machines, has awarded a contract for a main factory building, 75 x 200 ft., two stories and basement, a dry kiln and a power house. Upon completion the building will be occupied by the company, which is now located in another part of the city.

The Davenport Ladder Company, Davenport, Iowa, has

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awarded a contract for the construction of a two-story brick factory building, 100 x 140 ft. The building will be steam heated and will be operated by electric power. There will be installed an electric elevator of special design. Machinery to double the output of the present plant of the company will be installed, and has already been purchased.

The North Pacific Coast

SEATTLE, WASH., August 5, 1910.

Manufacturers and dealers in machinery, metal goods, &c., in this territory are fairly well satisfied, both with the present business outlook and the past month's record. Indeed, considering all of the conditions, they feel that they have come through the summer thus far very well. For all lines of industry the output of local plants has been large for this time of the year, and in some cases production has even been forced beyond what the existing facilities would ordinarily provide. Marine work has helped out a great deal, and steam and electric roads, particularly the former, have turned to local manufacturers considerable business necessitated by the improvements in their shops, terminals and permanent plants or structures of different sorts.

In an address recently delivered by Geo. M. Cornwall, Portland, Ore., before the Pacific Coast Logging Congress, which was held in that city, the very interesting fact was brought out that the appliction of electric power for logging purposes is likely to be very largely extended in the near future. Two of the largest manufacturers of electrical appartus, he stated, are experimenting with an electric donkey engine, and in British Columbia a leading company is using an electric road engine with very satisfactory results.

The new shop of the Union Machinery & Supply Company, Seattle, has been furnished with a very complete equipment and will be an important factor in the work of this section.

A new plant 100 x 120 ft. is to be built in Tacoma, Wash., by the Atlas Foundry & Machine Company. Brick and concrete construction is to be principally used.

It is stated here that the Oregon Railroad & Navigation Company has decided upon the construction of a machine shop 130 x 130 ft., with steel frame and brick walls, at La Grande, Ore. Equipment details are not mentioned.

Among foreign orders recently received by the Washington Iron Works Company, Seattle, is one from the colonial government of Java for an engine and other equipment to be used in logging service. This is the second contract of the kind that has been taken from the same authorities.

The power plant of the Grays Harbor Railway & Light Company, Aberdeen, Wash., which is equipped with Allis-Chalmers engines driving Westinghouse and Stanley G. E. generators of 800 kw., will be enlarged and improved. A steam turbine unit may be installed.

It is reported from Dalles, Ore., that the Columbia River Light & Power Company, Portland, will enlarge the capacity of the hydroelectric plant at White River Falls and make other improvements.

The Willipa Harbor Iron Works, South Bend, Wash., is very busy for this season of the year and a good deal of repair work is in hand at the present time.

It is proposed to install at Port Gray, B. C., one of the largest pumping plants in the Pacific Northwest for municipal water service. The cost of the entire system is estimated at $500,000.

Plans are reported to have been made by Wm. Meyer, Chewelah, Wash., for rebuilding the foundry owned by him, which recently suffered from fire.

The United States Blower Company, Seattle, Wash., is installing a large number of its motor driven exhaust fans for removal of refuse at planing mills in various parts of this section. Direct connected units are the most favored.

The Walther Lumber Company, Spokane, is planning the construction of a large electrically operated timber cutting plant at Ellensburg, Wash.

Fairbanks, Morse & Co., from their headquarters at 315 Occidental avenue, Seattle, are sending out considerable mining machinery. Among recent installations is one of six Nissen stamps and other equipment for an ore reduction plant which Falkenburg & Laucks, Seattle, designed for the Wenatchee mine, near Wenatchee, Wash. In the line of machinery of general utility the company's gasoline engines are selling to excellent advantage, with every indication of a heavy fall trade.

The Industrial Bureau of the Chamber of Commerce, Seattle, will be glad to answer the inquiries of any manufacturer who contemplates building a plant on the coast.

Specifications have been completed for the large addition to the plant of the Fisher Flouring Mills Company, Seattle, and the work of construction and equipment will begin at once. Every mill on the Pacific slope is now rushed with orders, some large contracts from the Orient having recently been taken.

The Nisqually Iron Works, Tacoma, Wash., incorporated at $25,000, has acquired the car shop buildings formerly occupied by the Tacoma Eastern Railroad and will act as repair headquarters for a number of logging roads, saw mills and mining companies operating in western Washington. In addition to the machinery with which the shops are now equipped, the company will install a complete boiler shop equipment, including heavy rolls for 1-in. plate, heavy punches and shears and one 48-in. engine lathe.

The Santa Fe Railroad has been granted a permit by San Bernardino, Cal., for the construction of a machine shop to cost $130,000. The work of construction is now well under way, a permit having been granted for the pits and foundations of the building some time ago. It is estimated that the total cost of the building and equipment will be approximately $350,000.

San Francisco

SAN FRANCISCO, August 3, 1910.

A barely perceptible improvement is noted in the California market, the various departments occupying about the same relative position in regard to prominence as for some time past. The outlook, as judged by the financial condition of California, is good, and leading bankers express the belief that a great improvement in the industrial and commercial situation will take place within the next 90 days. Considerable buying is being done at present for public works and large projects of a semi-public nature, and conditions favor an increasing demand from mining and lumbering interests, as well as manufacturers in general.

Inquiry for metal working tools continues rather light, though small purchases are becoming more frequent. Business in San Francisco is extremely quiet, and will remain so as long as local manufacturers are under the present labor handicap, but small orders for tools of various descriptions are being placed by several shops in neighboring towns. No large tools have been sold recently, though a few purchases of this character are likely to be made before long by the Government and railroad interests. The volume of country business in small tools is increasing, with prospects of considerable activity in that line, and several large shops in the interior are buying on a moderate scale for immediate requirements.

The most encouraging feature is the continued strong demand for all descriptions of agricultural machinery and implements. Many traction engines, especially of the gasoline type, have been sold recently, for use in lumbering and mining as well as agricultural work. New equipment is being installed in fruit packing establishments all over the State. The development of irrigation in California is responsible for a heavy volume of business. Many large tracts in the Sacramento and San Joaquin valleys are being placed under irrigation and subdivided, giving rise to a demand for all types and sizes of pumps, the manufacture of which is one of the most prosperous industries on the coast. At present many dairies, &c., in these districts are in the market for machinery, alfalfa meal mills are being established and several large packing plants are projected. There are at present a number of inquiries for grape crushers and winery equipment, which is usually in demand at this season.

C. B. Morgan, secretary of the Noble Electric Steel Company, announces that the electric furnace at Heroult, Cal., has passed beyond the experimental stage, and that work has been started on the construction of four additional furnaces, which will give the plant a commercial output of about 100 tons of pig iron per day.

It is announced that the American Can Company will erect a new factory in the Hawaiian Islands, installing machinery of an improved type.

Government Purchases

WASHINGTON, D. C., August 9, 1910.

The Bureau of Supplies and Accounts, Navy Department, will open bids August 23, under schedule 2787, for six propelling machines and one Allen dense air ice machine, and on August 30, under schedule 2791, for furnishing and erecting steam locomotive crane.

The Bureau of Supplies and Accounts, Navy Department, opened bids August 2 as follows:

Class 61. Nine transformers. Bidder 83, General Electric Company, Schenectady, N. Y., $737.35; 129, Maloney Electrical Company, St. Louis, Mo., $760.82; 146, National Electrical Supply Company, Washington, D. C., $840; 211, Westinghouse Electric & Mfg. Company, Baltimore, Md., $669.

Class 86. Twenty-eight differential pulley blocks. Bidder 21, Boston & Lockport Block Company, Boston, Mass., $328.86; 127, Manning, Maxwell & Moore, New York City, $650.12.

The Iron Ore Resources of the World

The Available Supply Reckoned Sufficient for 200 Years at the Present Rate of Consumption, While the Potential Supply is Practically Unlimited

Reference has been made in these columns to the ambitious undertaking by the Executive Committee of the Eleventh International Geological Congress, soon to be held at Stockholm, Sweden. This was the preparation of a summary of the iron ore resources of the world. The task which the geologists of Sweden set for themselves was prodigious. In the first place, with the small number of persons available in Sweden, in comparison with the forces enlisted in preparing for the congress in the stronger nations which have entertained it in other years, the Stockholm meeting itself involved a heavy responsibility. Then came the proposition to make this congress memorable by a permanent contribution to the literature of the iron ore supplies of the world. The project was particularly attractive to Swedish mining geologists and mine owners, in view of the prominence their own country has had in recent years as a source of high grade iron ores. The Executive Committee of the congress sent out circulars announcing its purpose in January, 1908. The co-operation of iron ore authorities throughout the world was solicited, official geological surveys being addressed, and in addition many experts in mining geology. The response has been surprising, and the two stout volumes of text and the accompanying atlas, which have recently come from the press, are proofs of the prodigious labors of the Executive Committee and its collaborators. Volume one contains 550 pages, 8⅜ x 11 in., in addition to 79 pages of introduction and summary, the latter, which is an admirable résumé of the two volumes, being prepared by Hj. Sjoegren. Volume two contains 518 pages. The entire work is edited by J. G. Anderson, general secretary of the congress. In addition to the 42 maps in the atlas, which is 13½ x 19½ in., the two volumes contain 28 plates, chiefly maps and views of mines, and 137 illustrations in the text. The publisher is Generalstabens Litografiska Anstalt, Stockholm, and the price of the work is £3.

The chapter covering the iron ores of the United States is prepared by Prof. J. F. Kemp, Columbia University, New York, who has also contributed the information concerning the iron ores of South America (apart from Brazil), Central America, the West Indies and the Philippines. The reader will think it strange that the iron ores of the United States are given but 25 pages, while Canada covers 27 pages, Japan 44 pages, Switzerland 36 pages, France 39 pages and Hungary spreads out over 121 pages. It may be that the caution of the editors in their original circular that no writer should exceed 32 quarto pages, had something to do with the lack of perspective in the treatment of different countries. Professor Kemp seems to have kept within the limits, while the writers for other countries whose iron ore resources, rated by their extent, deserve only a fraction of the space devoted to the United States have rambled on *ad libitum*.

United States

Professor Kemp divides the iron ores of the United States territorially into four groups: A, the Eastern region, which comprises several different geological types of ores; B, the Lake Superior region, which alone holds greater reserves of ores than all the other districts put together; C, the Mississippi Valley, with ore of various kinds; D, the Cordilleran region, which chiefly contains magnetites and hematites. The estimates given are, for the most part, based on the reports on iron ores prepared for the Commission of Conservation by Dr. C. W. Hayes of the United States Geological Survey. Two classes of ore are included in the estimates: first, actual reserves; second, potential. The former include ores which are considered workable by present methods and which conform generally to present standards as to iron content. In the second class are grouped ores not now available, but that are regarded as a potential supply.

To the Eastern region are assigned Archæan magnetites, Adirondack red hematites, Pennsylvania soft magnetites, brown hematites of mesozoic, tertiary and Cambro-Ordovician deposits, Alabama gray and red hematites, the Clinton red hematites and carbonate ores. The Archæan magnetites which occur in the Adirondack district, are estimated to amount to 20,000,000 tons actual reserve and 30,000,000 tons potential, the latter being ores present in such relation as to be mined in the long run. Of the titaniferous ores in the Adirondacks 90,000,000 tons is put down as available, with a further 100,000,000 tons not available. Of soft magnetites in Pennsylvania, chiefly Cornwall ores, the reserves are put at 40,000,000 tons.

The Mississippi Valley and Cordilleran ores are of relatively small extent. Concerning the Cordilleran region, the following is condensed from Professor Kemp's comment as indicating the basis of the steel industry in Colorado and the possibilities for other Western steel works:

Wyoming possesses the largest and at present the most productive mines in the West. The reserves are estimated at 3,000,000 tons actual and 1,000,000 tons potential. Of the Colorado deposits several which were first worked and were most productive are already exhausted. In the remainder it is estimated there is 4,000,000 tons of potential reserve. In New Mexico the most productive district in the southwestern part of the State is almost exhausted. Utah possesses a large and well opened up deposit in the Iron Spring district containing about 40,000,000 tons, but communications are lacking and therefore his must be regarded as potential. In Nevada are several deposits not so well known and at least one in the Humboldt Mountains where the reserves are estimated at 4,800,000 tons. In California a number of deposits are known of which that of the Iron Mountain is estimated at 11,000,000 tons. For all of California the estimate is 65,000,000 tons, of which 15,000,000 tons is available.

In the estimate of Clinton red hematites 355,000,000 tons of available ore is assigned to Alabama, with 150,000,000 tons more as probable, while in New York State 30,000,000 tons is classed as available and 570,000,000 tons as probable.

The estimate for the Lake Superior region, according to ranges, is as follows, only deposits with a percentage of iron upward of 50 being taken into account:

Summary for the Lake Superior Region. Metric Tons.

	Available.	Potential.
Michigan:		
Marquette	110,000,000	15,900,000,000
Menominee	80,000,000	7,360,000,000
Gogebic	95,000,000	3,900,000,000
Wisconsin:		
Menominee and Gogebic	40,000,000	4,525,000,000
Minnesota:		
Vermillion	60,000,000	1,005,000,000
Mesaba	3,100,000,000	39,000,000,000
Cuyuna and others	15,000,000	310,000,000
Totals	3,500,000,000	72,000,000,000

The estimated total for the United States is 4,257,820,000 tons actual and 75,105,300,000 tons potential. The following general observation is made concerning the United States: "As regards the future, it may be said that ores of 60 per cent. and above, except as concentrates, are a rapidly vanishing reserve, but that of ores at 50 per cent. there is a supply for many years,

and that at 40 per cent. the reserves are practically inexhaustible."

It may be recalled that Professor Törnebohm's peculiar estimate made for the Swedish Government in 1905, which was widely criticised, credited the United States with but 1,060,000,000 tons of iron ore, only the Lake Superior district and the brown hematites of the Southern States being considered.

Canada and Newfoundland

Dr. Haanel's report on Canada does not deal with figures. He gives a description of the various iron ore districts in Canada with particular reference to the largest ore reserves, which are in the Province of Ontario to the north of Lake Superior.

An interesting report is made by James P. Howley on the ore reserve on Belle Island in Concepcion Bay, near St. Johns, Newfoundland. Up to the end of 1908 some 7,000,000 tons had been taken from these mines. On Belle Island alone the author estimates there are reserves of at least 25,000,000, while in the submarine area of which the Nova Scotia Steel & Iron Company owns 33 square miles and the Dominion Iron & Steel Company 5½ miles, there are enormously greater deposits. Taking all beds over 1 ft. in thickness and assuming that the bands of ore maintain their thickness and stratified character, it is estimated that all the ore still remaining on Great Belle Island amounts to 113,000,000 tons, while in the submarine areas there is 3,522,000,000 tons.

Cuba

Referring to the specular ores in Cuba, those which have been mined on the southeast coast of the island, Professor Kemp estimates about 3,000,000 tons available, with an additional 3,000,000 tons as probable and 4,000,000 tons as possible reserve. Of the brown hematites, he credits 1,600,000,000 tons to the Mayari and Moa districts and 300,000,000 to Baracoa on the east, making 1,900,000,000 of available ore, with a possible addition of 1,000,000,000 tons. The brown hematites contain a large percentage of water and from 40 to 50 per cent. iron, while the percentage of phosphorus is low.

South America

Orville A. Derby, reporting for Brazil, says that the ore bearing formation consists of quartziferous rocks resembling the banded Jasper which in North America has such large iron ore reserve. The survey made by the State of Minas Geraes shows an iron bearing formation which in the district survey occupies about 5700 sq. km., which is only one-half to two-thirds its whole extent. Three classes of ore are referred to: Quarry ore, which is the finest, containing 50 to 70 per cent. iron, with low phosphorus, is estimated at 2,000,000,000 potential reserve. Rubble ores, which are of lower value, are estimated at 2,000,000,000 tons, and Canga ore, still lower, though containing about 50 per cent. iron, is put at 1,710,000,000 tons.

The data concerning Venezuela are furnished in part by Frank L. Nason, mining geologist, who has examined the only developed area. He says:

> In the delta region of the Orinoco River and from the Indian village of Piacoa on the south bank opposite the larger settlement of Barrancas the low range of the Imataca Mountains runs closely parallel to the river running in the Rio Grande. The mountains are from 15 to 30 km. from the water. The intervening space consists of low swampy land and jungle. The range extends for 100 km. and then dips under the delta. Along it indications of iron ore are reported, but the remoteness from navigable waters has militated against any serious exploration. At Mano, near the junction of the two forks of the Rio Grande, known as Cano Imitaca and Cano Corosima, a spur of the range comes within a kilometer of the Cano Corosima. At this point the ore has been explored and the fundamental foundation is decomposed gneiss. On this rests a bed of quartzite about 13 m. thick which contains the ore, a magnetite, or perhaps at times martite, varying from a maximum of 4 m. to a minimum of less than 0.6 m.

Mr. Nason's estimate of the total available iron ore is not over 2,600,000 tons.

The iron ores of Peru and Chile are referred to briefly. In the former the deposits at Cambro Grande are referred to as quite extensive. The ore is red hematite and the estimate is 1,179,675 metric tons. Reference is made to other small deposits, and Peru is credited with a total of 1,600,000 tons of available ores.

Concerning Chilean ores, the information is given by a French engineer, Ch. Vattier, who says iron ore exists in almost all parts of Chile, but for immediate development and for quantity and quality the most important bodies are those named Juan Soldado, Tofo and Huatchalaluma, all in Coquimbo, tributary to its seaboard. The ores are of high grade, running up to 68 per cent. iron, and it is estimated there are some millions of tons.

General Summary

While it is dignifying them far beyond what they deserve, to consider some of the estimates in the volume statistically, it will at least be of interest to reproduce the "World's Summary," as shown by these reports. In the first and third columns below are given the figures for iron ore in million tons; in the second and fourth columns are given the pig iron equivalent, based on the average percentage of iron in the ore:

Summary of Iron Ore Resources of the World.

	Actual reserves.		Potential reserves.		
	Ore. MT.	Iron. MT.	Ore. MT.	Iron. MT.	
Europe	12,032	4,733	41,029	12,085	+ considerable.
America	9,855	5,154	81,822	40,731	+ enormous.
Australia	136	74	69	37	+ considerable.
Asia	260	156	457	283	+ enormous.
Africa	125	75	Many thousands	Many thousands	+ enormous.
Totals	22,408	10,192	123,377*	53,136	+ enormous.

* Plus many thousands of millions.

The compilers venture the following definite statement in summation of the estimates of their various contributors: "Out of these figures we wish for the moment to direct our attention to those representing the world's total actual known and recorded iron [not ore] reserves, which, according to the table, amount in round figures to about 10,000 MT. As the production of pig iron at present can be put down at about 60 MT, yearly, the supply hitherto known of actual resources would not be sufficient for 200 years on the supposition that the production of pig iron remained stationary."

July Copper Production and Stocks

The Copper Producers' Association has issued the following statement for July:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States July 1	168,386,017
Production of marketable copper in the United States from all domestic and foreign sources during July	118,370,003
Deliveries of marketable copper during July:	
For domestic consumption	56,708,175
For export	59,407,167
Total	116,115,342
Stock of marketable copper of all kinds on hand at all points in the United States August 1	170,640,678

This statement shows an increase of 2,254,661 lb. in the stocks on hand August 1, as compared with July 1, but a decrease in production in July of 8,849,185 lb., as compared with June.

L. Vogelstein & Co., 42 Broadway, New York, have issued a statistical statement giving the apparent consumption of copper in this country and Europe in the first seven months of 1907 and 1910, which shows that while American production increased in the first seven months of this year 35,966,341 lb., the apparent American and European consumption increased 83,972,715 lb.

The No. 1 furnace of the Carnegie Steel Company at Columbus, Ohio, was blown out July 29 and the No. 2 furnace July 31.

June Exports and Imports of Iron and Steel

The June report of the Bureau of Statistics of the Department of Commerce and Labor shows a decrease in both exports and imports of iron and steel as compared with May. The value of the exports of iron and steel and manufactures thereof, not including iron ore, was $16,503,204 in June, against $17,658,042 in May, while the value of similar imports was $3,068,184 in June, against $3,486,336 in May.

The exports of commodities for which quantities are given totaled 120,596 gross tons in June, against 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for June and for the entire fiscal year ending with June are as follows, compared with the corresponding periods of the previous year:

Exports of Iron and Steel.

	June,		12 mos. ending June,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	8,854	7,846	79,771	50,178
Scrap	3,940	7,837	18,448	29,029
Bar iron	1,396	1,089	16,050	11,625
Wire rods	2,498	1,519	24,941	12,715
Steel bars	9,444	7,207	90,507	52,668
Billets, blooms, &c.	2,241	10,574	51,554	109,331
Hoops, bands, &c.	579	234	5,238	3,448
Steel rails	25,392	20,813	369,578	234,128
Iron sheets and plates	7,728	7,630	95,621	58,658
Steel sheets and plates	10,505	8,471	139,429	79,230
Tin and terne plates	764	629	11,682	5,094
Structural iron and steel	15,756	8,999	120,228	101,653
Barb wire	7,167	7,136	75,020	67,299
Wire	7,964	9,608	80,977	73,269
Cut nails	367	979	8,906	8,013
Wire nails	2,304	2,433	36,398	26,783
All other nails, including tacks	699	582	8,365	6,670
Pipe and fittings	12,998	11,131	163,776	129,443
Totals	120,596	114,717	1,396,489	1,059,234

The imports of commodities for which quantities are given totaled 31,010 gross tons in June, as compared with 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of such imports for June and for the entire fiscal year ending with June, as compared with the corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.

	June,		12 mos. ending June,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	13,988	10,623	237,594	104,655
Scrap	2,240	50	118,610	5,182
Bar iron	4,109	818	34,071	14,869
Rails	186	....	7,030	1,292
Billets, bars and steel forms n.e.s.	2,429	1,103	37,227	12,627
Sheets and plates	428	199	6,852	3,167
Tin and terne plates	5,450	5,647	69,003	52,376
Wire rods	1,678	838	15,718	11,358
Structural iron and steel	502	90	10,659	5,475
Totals	31,010	19,368	536,764	211,001

The imports of iron ore in June were 193,415 gross tons, against 240,833 tons in May, 206,135 tons in April and 124,714 tons in the month of June, 1909. The total importations of iron ore for the fiscal year ending with June were 2,381,676 gross tons, against 1,015,647 tons in the previous fiscal year and 958,378 tons in the fiscal year 1908. Of the June imports of iron ore 118,850 tons came from Cuba, 48,413 tons from Europe and 26,152 tons from British North America.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the fiscal year ending with June was $179,133,186, against $144,951,357 in the fiscal year 1909 and $183,982,182 in the fiscal year 1908.

The total value of the imports of iron and steel and manufactures thereof, not including ore, for the fiscal year ending with June was $38,502,457, against $22,439,787 in the fiscal year 1909 and $27,607,909 in the fiscal year 1908.

Pig Iron Production by Grades in 1909

The annual report of the American Iron and Steel Association for 1909, published in the past week, gives statistics of output of various descriptions of pig iron, semi-finished steel and finished iron and steel last year. These for the most part have been printed in *The Iron Age* in the following issues: Pig Iron, February 3, 1910, page 276; Steel Rails, March 3, 1910, page 523; Bessemer Steel Ingots, May 5, 1910, page 1039; Open Hearth Steel Ingots, May 26, 1910, page 1246; Structural Steel, June 30, 1910, page 1574. The separation of the pig iron statistics according to grades, however, is now printed for the first time, and with it are given below similar statistics for the three preceding years:

Grades.—Gross tons.	1906.	1907.	1908.	1909.
Bessemer and low phosphorus	13,840,518	13,221,620	7,216,976	10,557,370
Basic (mineral fuel)	5,018,674	5,375,219	4,010,144	8,250,225
Ferge pig iron	597,420	683,167	457,164	725,624
Foundry and ferro-silicon	4,773,011	5,151,209	3,637,622	5,322,415
Malleable Bessemer	699,701	920,290	414,957	658,048
Spiegeleisen	244,980	283,430	111,376	142,831
Ferromanganese	55,520	55,918	40,642	82,209
White, mottled, direct castings, &c.	77,367	80,508	47,137	56,749
Totals	25,307,191	25,781,361	15,936,018	25,795,471

The record production of foundry iron last year is noteworthy. Of interest also is the figure representing the output of malleable Bessemer iron, particularly in its relation to the very large production of that grade in 1907. In the malleable castings industry, if production of malleable Bessemer iron be taken as a criterion, 1907 was far the greatest year, while 1906 was second.

Rails and structural steel are the only finished products of which complete statistics of output in 1909 have been collected. The report, however, gives full statistics concerning finished products for 1908, which were not available when the 1908 report was published last year. They were given in the *Bulletin* later and were reprinted in *The Iron Age* of May 27, 1909, page 1702. The difficulties attending the collection of so large a body of statistics have apparently increased. Yet the United States is still far in the lead among iron and steel producing countries, in the completeness and accuracy of its statistics of the industry and in the promptness with which the figures are printed.

The remaining data concerning the production of rolled products in 1909 will no doubt appear in the *Bulletin* of the American Iron and Steel Association in the near future.

Lake Ore Shipments to August 1

The movement of Lake Superior ore from upper lake docks in July was 6,945,289 gross tons, a falling off of 371,303 tons from the record of June, but an increase of 252,264 tons over the shipments for July, 1909. The total shipments to August 1 this year were 21,863,549 tons, against 15,395,350 tons to August 1, 1909, a gain of 6,468,199 tons. In the following table the shipments are given by ports for the two years:

	July, 1910.	July, 1909.	To Aug. 1, 1910.	To Aug. 1, 1909
Escanaba	725,123	884,271	2,464,859	2,016,505
Marquette	573,632	450,736	1,723,877	870,961
Ashland	718,309	449,163	2,233,864	1,061,187
Superior	1,262,468	1,111,533	3,895,303	2,576,110
Duluth	2,344,226	2,249,410	7,441,488	5,434,135
Two Harbors	1,321,531	1,547,912	4,104,158	3,436,452
Totals	6,945,289	6,693,025	21,863,549	15,395,350
Increase, 1910		252,264		6,468,199

Ashland is shipping a larger percentage of the total this year than last—10.21 per cent. against 6.89. The percentages of this year's movement credited to the three ports at the head of the lakes—Superior, Duluth and Two Harbors—are 17.82, 34.04 and 18.77, as against 16.73, 35.30 and 22.32, respectively, in 1909.

Cuban Mining Development.—The Committee on Agriculture, Industry and Commerce of the Cuban House of Representatives has reported favorably a bill exempting mining claims and properties, under exploitation or not, from all national provincial and municipal taxes for a period of 10 years, and extending this exemption for a full 10 years to all mining claims and properties put in operation at any time within the original 10-year period. During a period of 30 years all vessels entering Cuban ports in ballast, coming from any foreign or Cuban port, and which clear with cargo of minerals or other products of national mines, are to be entitled to the remission of one-half of the port and tonnage dues paid on entry, and during a similar period minerals and mineral products are to be exempt from payment of export duties. During a period of 10 years, machinery, apparatus and railroad material imported into Cuba for use in mining and metallurgical industries are to pay no more than the minimum duty prescribed for similar articles when imported for use in the most favored Cuban industry.

The World's Production of Calcium Carbide.—Consul-General Richard Guenther of Frankfort reports the world's production of calcium carbide in 1908 as amounting to 200,000 tons, one-fifth of which was produced in the United States and Canada. The production in the other countries was as follows, in tons: Italy, 32,002; France, 27,000; Norway, 25,000; Switzerland and Austria-Hungary, 20,000 each; Sweden, 12,000; Germany, 9000; England, 800. There were 70 factories employed in the manufacture of the article. The production has increased very much in recent years.

Steel Rail Contracts in Sweden.—Consul-General E. D. Winslow sends the information from Stockholm that the Swedish State railroads have closed a contract with the Steel Syndicate of Germany for the delivery of 22,800 tons of rails during 1910 at certain seaport towns at $29.48 per ton. They have also closed another contract for the delivery of the same quantity for the year 1911 at $32.16 per ton, delivery to be made at certain seaports in the kingdom.

The American Spiral Spring & Mfg. Company, Fifty-fifth and Butler streets, Pittsburgh, has recently erected a brick building, about 50 x 100 ft., in which it will concentrate its wire spring department. The machinery in the older building will be rearranged for a heavier line of work. Contracts for all new machinery have been placed, and will be installed within the next month or so. The company manufactures springs of all kinds and will shortly establish a sales agency in Chicago to handle its Western business. It is operating its plant to practically full capacity.

We are in receipt of a copy of the programme of the outing of the employees of the Dodge Mfg. Company, Mishawaka, Ind., which was held at Winona Lake July 30. This outing is an annual event with the employees of the Dodge Company, whose management was among the first to arrange for an affair of this kind, in which the families of officers and employees enjoy together a day of festivity. The programme comprised 20 contests of a varied character for which prizes were awarded.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, reports the following structural steel contracts recently taken: Ordnance storehouse, Mare Island, Cal., 140 tons; Des Moines Electric Company, 160 tons; steel stack, Kansas Gas & Electric Company, Wichita, Kan., 110 tons; Cathedral of the Immaculate Conception, Wichita, Kan., 100 tons; High School building, Wichita, Kan., 175 tons; Utah Light & Railway Company, Salt Lake City, Utah, 150 tons; Y. M. C. A. Building, Des Moines, 210 tons.

The Beaver Bridge.—The McClintic-Marshall Construction Company, Park Building, Pittsburgh, Pa., has recently issued a brochure descriptive of the new cantilever bridge over the Ohio River, at Beaver, Pa., for the Pittsburgh & Lake Erie Railroad, for which it furnished and erected the steel superstructure. This bridge was built to care for the increased traffic and loadings of the road, and replaced the old single track structure built about 20 years ago. The first two of the 40 pages contain a brief description of the bridge and its method of erection. The remaining pages of the brochure are given up to illustrations showing the progress of the work and some of the members entering into the construction of the bridge. The two central pages contain a double page view of the completed structure and a two-page folding insert gives the principal dimensions of the bridge.

The battleship cruiser Lion launched August 6 at Devonport, England, exceeds all battleships in size, speed and armament. She has a displacement of 26,000 tons and is 700 ft. long and 88-ft. beam. The horsepower will be 70,000, developing 30 knots. She will be fitted with the Parsons turbines, and will have 42 water tube boilers, situated amidships. The Lion is the fifteenth British Dreadnought to be launched. She was constructed in eight months and cost $10,875,000.

The Mesta Machine Company, Pittsburgh, has recently shipped the following from its plant at West Homestead, Pa.: A Mesta pickling machine to the Hydraulic Pressed Steel Company, Cleveland; one stand, 28-in. sheet roughing mill to the De Forest Sheet & Tin Plate Company, Niles, Ohio; one 32 x 56 x 60 in. tandem compound Corliss engine to the La Belle Iron Works, Steubenville, Ohio, and a large number of miscellaneous steel castings and gears.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa., has been awarded a contract for nine 58-in. balanced valves for use in regulating the discharge of water in the reservoirs for irrigation in South Dakota and Wyoming. The valves are of cast iron and bronze construction, specially designed by the Reclamation Bureau. The contract price is $35,010, and the valves are to be completed and shipped by February 1, 1911.

President A. C. Rosencranz of the Vulcan Plow Company, Evansville, Ind., recently made a bonus distribution of $8500 to 103 of the 124 employees. The bonus plan has been in force four years. The first year the distribution was $2500; the second year, $3500, and the third, $5000. It is a good conduct bonus, depending on the general deportment and interest of the workmen, number of days missed from work, &c.

The largest single contract for steel cable ever placed in Vancouver, B. C., is about to be awarded by the Western Canada Power Company, Ltd. The order will call for 40 miles of ⅜-in., for early delivery. The cable will be used for the ground and guy wires of the transmission line, which the company now has under construction, from Stave River Falls to Vancouver.

At the annual meeting of the Pittsburgh Forge & Iron Company, held in Pittsburgh August 2, the retiring Board of Directors was re-elected. F. E. Richardson is president and treasurer, and W. I. Miller is secretary.

The third annual picnic of the Mesta Machine Company was scheduled for Wednesday of this week at Homestead Park, Pa. The programme included athletic events, ball game, dancing, music, &c.

Technical Education in Canada

TORONTO, August 6, 1910.—The Canadian Royal Commission on Industrial and Technical Education, appointed at the beginning of the summer, has been investigating conditions in Nova Scotia. It will complete its tour of the Maritime Provinces before taking up its work in the other provinces of the Dominion. Its inquiries so far have had to do with the steel and coal industries in Cape Breton and in the Pictou district. The steel works at Sydney were inspected, and afterward hearings were had of the steel and coal men there and at New Glasgow. Sydney mines were also visited. Many practical coal and steel men gave evidence at the hearings. All expressed the opinion that technical training is absolutely necessary for the proper progress of the industries with which they are connected.

The commission is to make a very thorough study of the needs of industry and commerce in Canada in the matter of technical education. It is then to look into the systems in vogue in other countries, especially those in which the progress of manufacturing has been most marked in recent times. The United States, Germany, the United Kingdom and other countries will be visited. The commission is composed of representatives of Canada's education, labor, agriculture, mining and manufacturing interests.

The idea of appointing the commission was strongly advocated on both sides of the House of Commons last session, and it is expected that the report, when made, will be followed by the Government making very generous provision for technical education. C. A. C. J.

Riter-Conley Contracts.—The Riter-Conley Mfg. Company, Pittsburgh, Pa., has recently taken some large contracts, among which are the following: Rebuilding the blast furnace of the Emporium Iron Company, Emporium, Pa.; rebuilding No. 2 Isabella stack of the Carnegie Steel Company, Sharpsburg, Pa.; three large oil tanks for the Atlantic Refining Company, Pittsburgh, Pa.; gas holder with a capacity of 3,000,000 cu. ft. for the St. Paul Gas Light Company, St. Paul, Minn.; 1000 towers for carrying high tension transmission wires for companies in the West and Canada; 400-ton metal mixer for the Republic Iron & Steel Company, Youngstown, Ohio; 300-ton metal mixer for the Alan Wood Iron & Steel Company, Conshohocken, Pa.; about 15,000 ft. of riveted pipe for a water main in New York City. With numerous smaller orders on its books the company is operating its plants in Pittsburgh and at Leetsdale, Pa., to full capacity.

A Wellman-Seaver-Morgan Booklet.—The Wellman-Seaver-Morgan Company, Cleveland, devotes a 48-page booklet, 6 x 9 in., to hoisting machinery, steam and electric. Illustrations and descriptions are given of a number of types of hoist used in deep mines in the West, and an installation made by this company for the Hecla mine at Burke, Idaho, is described with special detail. In this case a double reel hoist is used directly connected to a 550-hp., 600-volt. d. c. motor operating at a normal speed of 60 rev. per min. The current for this motor is furnished through a motor generator flywheel set. The maximum hoisting speed is 2400 ft. per minute. Each of the reels is fitted with a Webster-Camp-Lane band friction clutch and a post brake. This installation was inspected with particular interest by the members of the American Institute of Mining Engineers on their 1909 tour.

The Canadian Shipbuilding Proposals.—To the Canadian Government's inquiries of shipbuilders as to the probability of their competing for the contracts to be given out for the construction of the naval vessels, provided for in the last session of Parliament, several replies have been received. Three Canadian and two British firms have indicated their desire to tender, and intimations have been given as to the possibility of an amalgamation of two or more of the interests heard from. The Government itself might favor a joining of forces for the purpose of building the ships, believing that in that way the work can be done more economically and with a minimum of publicity as to the plans of the vessels.

Southern Iron & Steel Company Changes

Announcement is made of the resignation of W. H. Hassinger as president of the Southern Iron & Steel Company, Birmingham, Ala., effective in September. W. W. Miller, vice-president and general counsel of the company, has resigned as vice-president and will be succeeded by James Bowron, who becomes vice-president and treasurer, while A. R. Forsyth will be secretary. Mr. Bowron was in charge of the finances of the Tennessee Coal, Iron & Railroad Company during the presidency of N. Baxter, Jr. It is stated that C. A. Grenfell, who has been at Birmingham for some time and is a member of the Board of Directors, representing English security holders, will sail for Europe shortly to report to the foreign interests.

A statement has been issued in New York by the Southern Iron & Steel Company referring to Mr. Hassinger's retirement and to the present status of the company's operations. It says that Mr. Hassinger, having completed all the work of construction and improvement contemplated under the reorganization of the company, and having gathered together a competent organization under Vice-President F. B. Keiser and having actually started the wire mills of the company, is relieved from his responsibilities at his own request. It is added that though he ceases to be an officer, Mr. Hassinger will continue to give advice and to aid in promoting the success of the company. The expenditures of the past year in new construction and betterment have been above $2,500,000. Sales of wire fence, barb wire and nails are reported up to expectation, but collections are slow. The company reports free net cash and quick assets of $1,866,020 on July 1, against which there is $947,151 of unsecured current liabilities.

The directorate of the Southern Iron & Steel Company includes Cornelius Vanderbilt and R. T. Wilson. The firm of Kean, Van Cortlandt & Co., New York, which was largely interested in the original Southern Steel Company and its reorganization, was dissolved a few months ago, it is stated, Mr. Van Cortlandt retiring to take a long vacation in Europe. D. G. and G. L. Boissevain, the former of whom was also active in the Southern Steel Company, withdrew at the same time. Hamilton F. Kean and Moses Taylor, neither of whom is a director in the Southern Iron & Steel Company, joined with J. R. Swan in forming the Stock Exchange firm of Kean, Taylor & Co.

The Illinois Nail Company, Chicago, Ill., has purchased the property at the southeast corner of Grand and North Forty-sixth avenues, 188 x 494 ft., upon which it will build a new plant, including a one-story factory and a three-story warehouse at a cost of about $50,000. The new plant will not affect the operations of the company's existing plants, one of which is located at the Stock Yards, and the other at Dick street and Chicago avenue.

The Lackawanna Iron & Steel Company blew out its No. 1 Bird Coleman Furnace, at Cornwall, Pa., August 1. It now has but two of its furnaces in the Lebanon Valley in blast, these being the Colebrook stacks at Lebanon.

Personal

Rudolph Erickson, formerly chief engineer for the Jones & Laughlin interests on the Michigan iron ranges, has been appointed superintendent of the Davidson Ore Mining Company, a New York State Steel Company mining corporation, which is operating the Gleason mine at Iron River, Mich.

D. R. Day has resigned his position as secretary and general manager of the Union Malleable Iron Company, Moline, Ill., to assume the management of the Oliver Mfg. Company, Chicago. He will take up his new duties about August 15.

Montgomery Hallowell has been appointed general advertising manager of the United States Motor Company, 505 Fifth avenue, New York City. He will assume his duties August 15, and will have supervision of the advertising and publicity of the parent company and the following concerns affiliated with the organization: Maxwell-Briscoe Motor Company, Columbia Motor Car Company, Brush Runabout Company, Alden Sampson Mfg. Company, Dayton Motor Car Company, Courier Car Company, Briscoe Mfg. Company, Gray Motor Company and Providence Engineering Works.

L. R. Tustin has been appointed assistant superintendent of the armor plate department of the Homestead Works of the Carnegie Steel Company, Homestead, Pa., to succeed L. H. Bowman, who recently resigned.

James W. Davis has been appointed manager of the New York branch of L. & I. J. White Company, Buffalo, manufacturer of edged tools and machine knives, succeeding the late J. H. Dillon. The New York branch is at 45 Centre street. Mr. Davis has been for the past eight years general export buyer for W. R. Grace & Co., New York, making hardware lines his specialty.

Frank F. Amsden, for several years superintendent of Paxton furnaces of the Central Iron & Steel Company, Harrisburg, Pa., has been appointed superintendent of the Federal Furnace Company, whose two blast furnaces are at South Chicago, Ill.

J. O. Henshaw, New York resident partner of Hickman, Williams & Co., has returned from a trip to Europe.

The Pan-American Congress in session at Buenos Aires, Argentina, on August 4 voted a gold medal to Andrew Carnegie for his services to the cause of humanity. It will be the joint gift of all the American republics.

Otto Hahn, London, England, representing European interests connected with coke oven by-product manufacture, is making a tour of the iron and steel districts of this country.

Prof. Henry M. Howe is in Europe, and will return about the middle of September.

H. A. Croxton has resigned as president of the Massillon Iron & Steel Company, Massillon, Ohio. He is succeeded by C. M. Russell.

James A. Campbell, president; Geo. E. Day, secretary, and Richard Garlick, treasurer, of the Youngstown Sheet & Tube Company, acted as hosts at an informal luncheon given to the steel fence sales agents of that company in the Youngstown Club, Youngstown, Ohio, last Thursday. Matters of special interest to this department were discussed.

The New York sailing time of the excursion in connection with the Canal Zone meeting of the American Institute of Mining Engineers has been changed from October 29 to Friday, October 21, 1910. Returning the party will arrive at New York about November 15. Nearly 100 members and guests have already secured accommodations for the trip.

Chateaugay Pig Iron

Some years ago the Chateaugay Ore & Iron Company produced at Standish, N. Y., charcoal pig iron running low in phosphorus. The operation was a small one, and the furnace was remodeled and enlarged about four years ago and leased to the Northern Iron Company, which has since been operating it with coke as fuel. The ores used are exclusively concentrates, produced from the Chateaugay mines at Lyon Mountain, N. Y.

To use these ores more effectively, an extensive nodulizing plant was erected at the furnace. After screening the finer concentrates are nodulized, and at present the mixture is composed of these nodules and raw concentrates. The capacity of the furnace—in fact, the average product—is now 160 tons per day. By judicious selection of raw materials and careful furnace management, the phosphorus in the iron has been gradually reduced, and has been brought to an usually low point. The following table shows the actual results obtained during the latter half of July:

Date.	Phosphorus.	Silicon.	Sulphur.
July 16	0.021	2.15	0.012
July 17	0.025	2.10	0.0165
July 18	0.024	3.00	0.0115
July 19	0.025	2.20	0.013
July 20	0.025	2.08	0.0205
July 21	0.024	1.10	0.017
July 22	0.027	2.67	0.012
July 23	0.025	2.05	0.0165
July 24	0.020	1.90	0.017
July 25	0.021	1.85	0.017
July 26	0.021	1.65	0.0165
July 27	0.022	2.00	0.0175
July 28	0.021	2.30	0.0145
July 29	0.023	1.30	0.020
July 30	0.022	2.15	0.0155
July 31	0.020	1.48	0.012

During the present month the phosphorus has been still further reduced, many of the casts showing this element to run under 0.020 per cent., and the average sulphur is quite considerably under this figure.

It is stated that this iron is lower in phosphorus than any which has ever been produced in the United States or Great Britain, and approaches very closely some of the famous brands of low phosphorus Swedish charcoal irons.

The American Society of Engineer Draftsmen.—On June 18 steps were taken to form a permanent organization to be known as the American Society of Engineer Draftsmen, embracing every branch of the profession, including mechanical, electrical, civil, architectural, marine, sanitary, automobile and aeronautical draftsmen. The first meeting of the society was held July 27. The formation of this organization, which was conceived by E. Farrington Chandler, a well-known designer and inventor, marks the first effort to form a national society among draftsmen, who have long felt the need of an organization, both from an engineering and a fraternal standpoint, which would be the means to establish a higher professional standing and place them on a recognized professional plane in the field of engineering. A feature of the society is the opportunity offered juniors, affording means by which they may become familiar with the demands of practice in the drafting room while students or employees in other branches of industrial work, as is also an employment bureau co-operating with employers. E. Farrington Chandler is president, Wm. B. Harsel is vice-president and Henry L. Sloan is secretary and treasurer, with headquarters at 116 Nassau street, New York.

The Southern Iron & Steel Company now has one blast furnace in operation—that at Trussville, Ala.—the Chattanooga furnace having blown out at the end of June and the Alabama City furnace early in July.

Obituary

WALLACE A. STEWART

Wallace A. Stewart, vice-president of the Stewart Iron Works Company, Covington, Ky., and president of the Union Iron Works Company, Cincinnati, Ohio, died, after a lingering illness, at his residence in Covington, August 3, aged 52 years. He was born in Cleveland, Ohio, and when three years old the family removed to Cincinnati. He went into business, as an iron manufacturer, about 25 years ago, and with his brother, Richard C. Stewart, established a plant at Wichita, Kan.; five years later they moved back to Cincinnati and founded the Stewart Iron Works Company and its subsidiary companies, the Stewart Jail Works Company and Stewart Iron Fence Company, whose joint factory is in Covington. Afterward they organized the Union Iron Works, whose plant is located in the manufacturing district of Cincinnati. Mr. Stewart was a member of the leading clubs of Cincinnati and



WALLACE A. STEWART

was considered one of the ablest and most progressive men in his line in the Middle West. In practically all his business ventures he was very successful. He leaves a widow, a son and a daughter.

JAMES RILEY, for many years a prominent figure in the iron industry of Great Britain, died at Harrogate, Yorkshire, England, July 15. In 1887 he received the Bessemer medal of the Iron and Steel Institute "for his valuable services to the open hearth industry, especially in developing the manufacture of mild steel of high quality." He was for a number of years manager of the works of the Steel Company of Scotland and secured a wider use of its mild steel for boiler making, bridge building and other purposes. In the 1890's he began to manufacture iron and steel on his own account, at the Richmond Works, Stockton-on-Tees. He was first president of the West of Scotland Iron and Steel Institute and a member of the council of the Iron and Steel Institute. Having risen from the ranks, he took an active interest in the welfare of labor and was a member of various boards of conciliation.

AARON WHITE COOK WILLIAMS, Hartford, Conn., founder and for years treasurer and general manager of the Capewell Horse Nail Company, died August 4, aged 76 years. He was born in Manchester, Conn. His early life was associated with the silk business of his native town, chiefly in the mills of Cheney Bros. In the early sixties he founded, with several others, the Williams Silk Mfg. Company, Bridgeport, Conn., which prospered under his management. In 1869 he retired from the business and went abroad, being engaged in mercantile and manufacturing pursuits in France and England. Twenty years later he returned to this country and located in Hartford, intending to devote the remainder of his life to leisure. But he soon became interested in the establishment of the Capewell Company, and was made its treasurer and general manager, offices which he held until his death. He was a director of the First National Bank. He leaves a widow.

CHARLES H. KIMBALL of the Kimball & Chappell Company, Chicago, manufacturer of metal beds, died July 30.

FREDERICK B. BLINN died at Summit, N. J., August 7, of tuberculosis, aged 40 years. At the formation of the United States Steel Corporation in 1901 he was made assistant secretary and stock transfer agent, and continued in that position several years. In the past two or three years he had not been active owing to failing health.

JAMES LATHWOOD died August 1, at his home in Pittsburgh, aged 70 years. He had long been identified with the Central Foundry Company, Pittsburgh.

Western River Transportation Reviving

There are indications of a revival of interest in river transportation throughout the West. The shops which build steel boats and barges for traffic on the Ohio and Mississippi rivers have contracts on their books which will engage their capacity all the way from eight months to two years.

A packet company operating on the Mississippi River is in the market for a steel passenger boat with decks 60 x 250 ft., on which immediate construction is sought, but has been unsuccessful in placing the contract. This particular boat is wanted for excursion traffic, with clear decks for dancing and only a small amount of stateroom construction. The demand is equally urgent, however, for freight barges and tow boats, and owing to the scarcity of timber of the quality desired for this work steel construction is universally preferred.

In the Pittsburgh district large industries have found large steel barges very economical for handling bulk freight on the rivers, while in the Mississippi Valley the agitation in recent years for a deep water way from the lakes to the gulf has turned the attention of merchants and shippers to the advantages of the river barge. A local company has been operating barges successfully for two years between Kansas City and St. Louis, and a larger corporation was recently organized to operate on the Mississippi River. At Lockport, Ill., a connecting link has been completed between the new Drainage Canal and the old Illinois and Michigan Canal, so that small barges and boats drawing not over 4½ ft. can pass from Chicago to the Illinois River, and thence to the Mississippi. It is expected that this route will be utilized commercially in the near future.

Building operations in July as indicated by returns to *Bradstreet's* from 68 cities show a falling off of 24.3 per cent. from June of this year and 22.2 per cent. from July, 1909. The total expenditures were $47,924,665, against $63,343,600 in June and $31,627,568 in July, 1909. The falling off in building operations in New York is responsible for $13,160,000 of the loss as compared with July of last year, the total being $12,573,620, against $25,733,373 in July, 1909, and $17,040,505 in June, 1910.

A Self-Propelled Machine Shop

The North Coast Railroad, which is steadily pushing its line west from Spokane through central and western Washington to the Cascade range to meet the increasing demands of the great Northwest, is in itself a very interesting engineering operation. All the latest appliances which will assist in the construction of the road are employed, and probably one of the most interesting is the self-propelled machine shop, whose

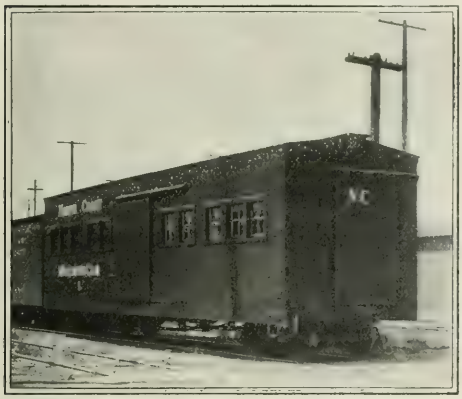


Fig. 1.—Self-Propelled Machine Shop Driven by a 12-Hp. Gasoline Engine, Built by Fairbanks, Morse & Co., Chicago, Ill.

exterior is shown in Fig. 1. Fig. 2 is an interior view, and gives some idea of the manner in which the equipment is arranged.

As it would be some time before a permanent shop for repairing locomotives and other equipment could be located and erected, recourse was had in the interval to some other way, and a combination motor and machine car was decided upon as being best suited to perform this work. The motive power is supplied by 12-hp. Fairbanks-Morse vertical gasoline engine, built by Fairbanks, Morse & Co., Wabash avenue and Eldredge place, Chicago, Ill. This engine which is shown at the left of Fig. 2 is oil cooled, and is connected through a friction clutch to a line shaft for driving the various tools. Power is transmitted to the wheels of the car



Fig. 2.—Interior of the Self-Propelled Machine Shop of the North Coast Railroad.

from the shaft by a chain and sprocket. This enables the operator to do switching with the car and also to move from one station to another without the assistance of a locomotive at a speed of from 8 to 10 miles per hour.

The tools in the car are those ordinarily employed in making emergency repairs to railroad equipment, and include one 23-in. engine lathe, one 16-in. shaper, a 1½-in. bolt cutter, a 6-in. pipe threading machine, an emery wheel and a 22-in. vertical drill press. In operation the car has proved very economical. During one day when the engine was running 12¾ hours, the amount of fuel consumed was only 4 gal. of gasoline, and during this time the two men connected with the car were running the different tools to handle the repair work as it came in. During the nine months that the engine has been running, it is said that not one cent has been expended for repairs. Beside this motor driven machine shop, the equipment of the road includes two gasoline motor passenger cars for handling the local business.

Hooven, Owens, Rentschler Engine News

The Hooven, Owens, Rentschler Company, Hamilton, Ohio, has nearly ready to ship to the water works plant of the borough of Brooklyn, N. Y., a solid trainload of power plant equipment, consisting of four heavy duty vertical triple expansion engines. The high pressure cylinders are 28 in. in diameter, the intermediate 50 in. and the low pressure 80 in., all with a common piston stroke of 60 in. The cylinders are of the built-up type and are thoroughly steam jacketed. The high pressure steam and exhaust, the intermediate steam and exhaust and the low pressure steam valves are of the multiported Hamilton-Corliss type, while the exhaust valves of the low pressure cylinder are of the poppet type, having special quick opening valve mechanism. The total weight of these engines figures up over 640,000 lb. each.

The company is also just finishing up what is probably the largest steam cylinder of its kind ever cast in that part of the country. It is a low pressure cylinder 86 in. in diameter by 60 in. long, for a cross compound, heavy duty Hamilton-Corliss engine, and is to be shipped to the San Francisco, Oakland & San Jose Consolidated Railway Company, Oakland, Cal. It took 42 tons of a semi-steel special mixture to pour this casting and it came out without a flaw. One special feature is that the steam inlet and exhaust port are on one side of the cylinder, thus necessitating a belt of metal extending from top to bottom of the cylinder. This makes the cylinder self-contained and does away with the independent piping commonly used in large work of this kind. The casting mixture used for the cylinder developed a tensile strength of over 36,000 lb. This engine will be direct connected with a 2700-kw. generator and has a rated horsepower of 4000 at economical point of cut-off, and is designed to take care of an overload up to 9000 hp.

The power equipment of the company's plant is being increased by the addition of a 250-hp. boiler recently purchased.

National Roll & Foundry Contracts

The National Roll & Foundry Company, Pittsburgh, Pa., reports that during July its plant at Avonmore, Pa., produced nearly 400 tons of rolls for various purposes. It is now building a lever shear intended for motor drive, to cut up to 4 in. square, for the Grand Rapids & Indiana Railway Company, Grand Rapids, Mich. It also has an important contract for eight stands of 20-in. mills, with four stands of 20-in. pinions, for shipment to the new Milwaukee plant of the Globe Seamless Steel Tube Company, Chicago, delivery to be made about October 1. It is also building a complete combination grinding and polishing machine for the Pressed Prism Plate Glass Company, Morgantown, W. Va., the deck of which will be 26 ft. 6 in. in diameter and will weigh 70,000 lb., while the total weight of the machine will be approximately 300,000 lb.; the bridge is of special design and the machine will be operated by electric motors. This equipment will also be delivered about October 1. The company is operating its plant to capacity.

Steel Balls

Methods Employed by the Standard Roller Bearing Company in Their Manufacture

BY J. F. SPRINGER, NEW YORK.

The great bicycle craze at the close of the last century created a tremendous demand for steel balls. At practically every point in a bicycle where one piece of metal turned upon another a ball bearing was inserted in order to eliminate to the utmost the possibilities of friction, and the great degree of perfection which the bicycle rapidly attained was in large part due to anti-

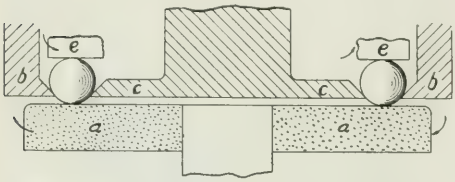


Fig. 1.—Sketch Showing First Stage in Grinding Balls.

friction bearings. A great deal of trouble was experienced with the failure of balls, but this never assumed very serious proportions, as the loads and speeds at the bearing points of a bicycle were very moderate. With the automobile a different problem has arisen. Here high speeds and heavy loads are the order of the day, but these conditions alone would not be excessive. It is the shocks and jars and fluctuations of the load which go to make the service in the hub of an automobile wheel one of the most exacting to which a ball bearing is put. While the ball bearing had succeeded wonderfully well with the bicycle, many disappointments were experienced in automobile use.

It is very desirable to introduce antifriction bearings in machinery in general. At first their success was very doubtful and ball bearings came into some degree of disfavor for serious machinery uses. Their obvious advantages has led to continued study and experiment to ascertain and correct the defects in the design and manufacture of ball bearings. As a result of this investigation it has become very evident that toughness, hardness and accuracy are the controlling

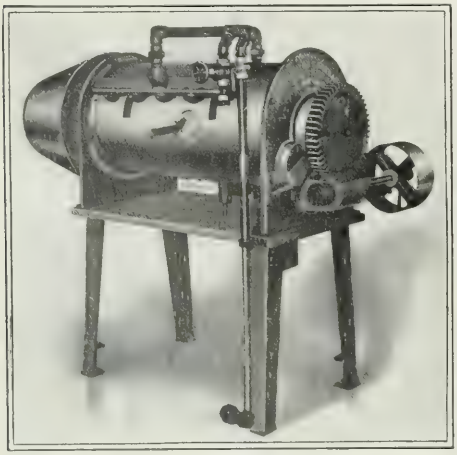


Fig. 2.—Gas Ball Hardening Furnace, Made by the American Gas Furnace Company, New York City.

factors in the manufacture of the balls. A ball is subjected not merely to a steady load, but often to severe shocks and strains. Various endeavors have been made to meet this requirement, and the difficulty is increased because hardness must not be sacrificed. With the recent developments in alloying tool steel very tough balls are now made. The Standard Roller Bearing Company, Philadelphia, Pa., whose methods of ball manufacture it is proposed to describe, has produced an alloy of tool steel and chrome which enables it to make a ball capable of withstanding a load very greatly increased over that possible with the ordinary pure tool steel ball and permits glass hardness to be attained if desired. The service to which a ball is to be put imposes the conditions as to its hardness and toughness, so that balls are made to suit the service. As to accuracy, it is now possible to produce balls whose variation from the standard is within the limit of 0.0001 in., which is no more than is demanded by the more exacting applications.

There are three general classes of materials which are employed in the manufacture of steel balls—machine steel, tool steel, and tool steel alloy. The first of these is not used by this company. It is important that

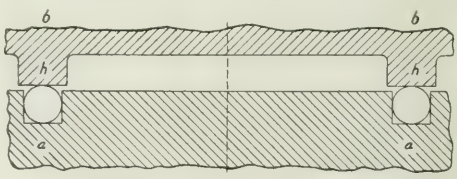


Fig. 3.—Second Stage in Grinding Steel Balls.

the material shall be even grained and without defects. Pure tool steel makes an excellent ball capable of withstanding rough service and possessing a high degree of hardness, but it is liable to fracture under the most severe stress and so is surpassed by the more modern product, alloyed tool steel. This is the result of considerable experiment and increases to a very marked degree the efficiency in point of load sustaining capacity. That is to say, balls of this material may be extremely hard and extremely tough at the same time. It is easy to see why balls should have toughness, but perhaps it is not quite apparent why hardness is necessary. It is an indispensable requisite, as without it a ball would soon lose its sphericity and introduce complications. Even if sphericity be maintained, any wear at all becomes a detriment, especially in nonadjustable bearings.

Forming the Balls

In giving form to a ball there are four initial processes—hot rolling, pressing, forging, and turning. This company utilizes the cold pressing process in giving shape to balls of from ⅛ to ⅜ in. in diameter. Tool steel in the form of wire is passed into a machine which straightens it and cuts it up into small lengths, whose diameter is considerably less than that of the balls to be formed while the length is greater. These short lengths of wire are now fed to an ingenious machine, which seizes one of the bits of steel by a horizontally oscillating finger and carries it vertically to a position between the two parts of a forming die. These are cup shaped and press the piece of wire into a rounded bit of steel in about a second.

By another method certain balls of ½-in. diameter

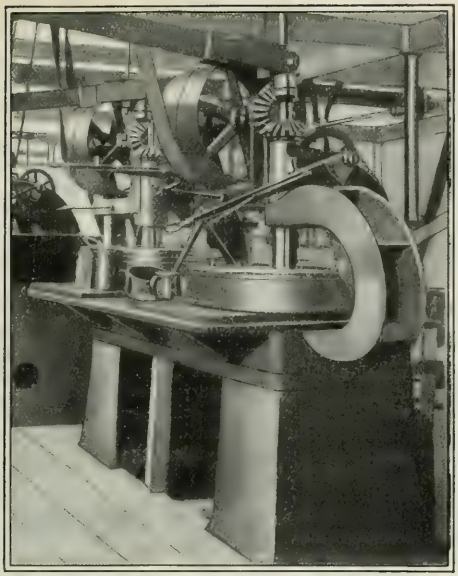


Fig. 4.—Wet Ball Grinding Machines.

and under are turned in an automatic lathe. It is said that it is possible to form 30,000 balls in one day with a single machine. It would seem that a turned ball would be better than a cold pressed one, as the process does not affect the grain in different parts of the ball unequally to a considerable extent, while cold forging would appear to produce a ball markedly different in its various parts.

The last process is hot forging, which is employed with the larger sizes of plain tool steel and all sizes of the alloy balls. A round bar of steel is passed while red hot between two dies which are each in the form of a string of cups. A number of blows is struck, the workman turning the bar on its axis between them. In this way a series of knobs attached to each other and to the remainder of the bar is formed in a short time. This is then placed in position between two dies in a second machine, whose upper die has a string of cups corresponding to the knobs, while the lower die has circular perforations also corresponding to the knobs. When the upper die is forced down the knobs are discharged through the perforations as balls by the shearing action of the dies. This method apparently affords an opportunity for the grain of the metal to recover from the disturbances set up by the blows of the forging die.

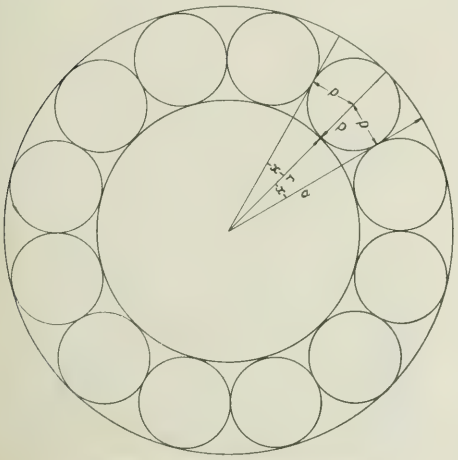


Fig. 5.—Diagram of Ball Bearing.

Grinding the Balls

Whatever the method employed to shape them, the balls are only at the beginning of their career. They are now roughly spherical and in order to bring them closer to the finished form and size they are treated to a grinding process. The balls are ground, a lot at a time. For example, about 135 ¼-in. balls are ground dry by a single machine having one emery wheel simultaneously.

By referring to Fig. 1 the operation of this machine may be readily understood. The emery wheel *a*, carried on a vertical spindle, rotates in the direction of the arrows. A groove open at the bottom is formed by *b* and *c*, and *e* is a rotatable ring which completes a kind of raceway in which the balls are confined. When the balls are placed in the raceways and the machine set in motion, they are ground from below by the rapidly revolving emery wheel through the opening in the bottom of the groove. In a few moments the lot of balls has been sufficiently ground. The machine is stopped and the emery wheel lowered. The parts *b* and *c* can be moved independently of *a* or of each other. The balls are discharged by widening the groove sufficiently into a pan which has been previously placed between *b*, *c* and *a*. The pan is then swung clear and may be discharged by displacing a removable bottom.



Fig. 6.—Ball Gauging Machines.

Hardening and Annealing

This grinding is not the finishing process, as the balls are still soft. The work accomplished is a machine operation, and leaves the balls very fair spheres, but by no means in that perfect condition in which they are used. The balls have now to be hardened and annealed. For hardening different processes are used, dependent upon conditions, water being used in some cases, while for others oil is employed. For some balls the heating is accomplished in oil heated ovens, while for others specially designed machines are used. The former process is by hand, and the proper heat is determined by the color. The red hot balls are placed in open trays, and the whole then transferred to the interior of an open oven. Upon removal the balls are dumped into the cooling liquid. The process of machine hardening is accomplished by gas heated furnaces. These machines are practically automatic and permit very exact regulations of temperature which is an important point. Fig. 2 shows one of these built by

the American Gas Furnace Company, 24 John street, New York City. In drawing the temper, the special use to which the balls are to be put as well as the material of which they are made control the treatment, some balls being left glass hard, while others are given less hardness.

Wet Grinding

The next operation is the final one, and is performed by the wet grinding machines shown in Fig. 4. These consist essentially of two parts. The lower contains a square-bottomed or U-shaped annular groove. The balls to be finished are placed in this groove with a supply of emery powder mixed with oil. Above the

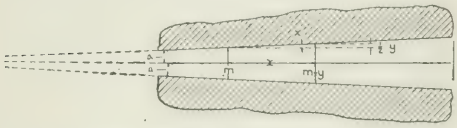


Fig. 7. Slit Used in Gauging Balls

U-shaped groove is fitted a disk having a circular ridge fitting over the groove. In operation the lower part remains fixed, while the upper disk is rapidly revolved.

The essential parts of this machine are shown in Fig. 3. Here *a a* is the lower portion containing a groove. Above this fits the upper portion *b b*, having the projection *h h*. This operation is not expert work contrary to what might be supposed. In fact, a very low class of labor is employed in carrying it out. The brains are in the mechanical arrangements and in the supervision. That this method accomplished good results may be judged by the product. The balls ground do not come out absolutely standard size, nor is this necessary as will be seen from considerations to be pointed out now.

Ordinarily it is a matter of indifference whether

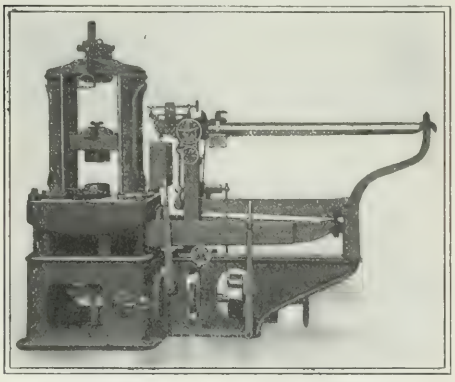


Fig. 8. Ball Testing Machine, Used by the Standard Roller Bearing Company, Philadelphia, Pa.

the balls in any given ball bearing are 0.001 in. above or below standard, or some intermediate dimension if all the balls in one circuit are alike. In constructing ball bearing where there are two points of contact located in a perpendicular to the axis of the shaft, it will be seen from Fig. 5 that $\frac{f}{f' \cdot r} = \text{Sin } x$, which is half the angle subtended by each ball. If 12 balls are to be used and no allowance for any play in circuit made $2x = 30$ degrees, and consequently Sin x = Sin 15 degrees = 0.2588. If the balls are ½ in. in diameter, p = 0.25 in., and r has the value 0.716. The value of a is given by the equation $a = r + 2p$, and in the present case $a = 1.216$. From these results it can be readily seen that for a given bearing, in which there is absolutely no allowance for radial or circumferential play, there is no permissible variation in any of the quantities a, r and p. For such bearings it is important that all the balls shall be perfect spheres of the same size. Even if an allowance is made for circumferential play, the equation $a = r + 2p$ still holds, and this demands the same accuracy as to sphericity and matching of the balls. Lastly, if radial play be allowed, the same demands are still to be made, as otherwise there will be great inequalities in the loads delivered to the balls actually carrying the stress at any one instant. Thus balls that are practically perfect in sphericity and uniform as to size are real and tangible necessities in a bearing designed for exacting service.

Gauging the Balls

The balls are not considered perfect when taken from the grinding machines even though they have been measured by micrometers there. They are next put through a process termed gauging, which divides balls that have come from the grinding machines of the same rated size into lots that differ from each other by 0.0005 in. or 0.00025 in. or less. The machine employed is illustrated in Fig. 6.

The balls are placed in a reservoir at the top from which they roll down a number of inclines. These inclines are formed by bringing into close proximity two straight edges which are not parallel but diverge slightly. Beneath the slit are arranged a number of receptacles corresponding to various slight deviations in size of the slit, so that a ball rolling down will drop into the compartment corresponding to its actual size. This is a simple and effective means of gauging. Fig. 7 shows one of these slits where the angle of divergence is represented by $2a$, m is any selected diameter and y the variation in size, according to which it is desired to sort the balls. From the diagram $y = 2x \tan a$, which holds for any value of x. If $x = 1$ in. and the allowable deviation is 0.00025 in., 0.00025 $= 2 \tan a$, and a may be obtained from a table of natural tangents. It is simpler to control the slit by micrometer screws set perpendicular to the line bisecting the angle $2a$. If these screws are 10 in. apart, and it is desired to gauge the balls to 0.00025 in. at every inch of the slit, these screws are adjusted so that the one separates the straight edges 0.0025 in. further than the other. The simplest way of accomplishing a suitable arrangement of the micrometer screws is to have them threaded to the right at one end and to the left at the other, which has the effect of displacing both straight edges simultaneously.

Even after balls have been gauged inaccuracies persist, as at the moment a ball dropped through the slit into the compartment below it was but a single diameter which decided the question as to whether the ball should drop or roll on. Among all the diameters presented to the edges of the slit preceding the moment of the drop none was as small as the slit at the instant it rolled by. Consequently, it is not possible to determine the question of sphericity, which is a matter of great importance.

To test for this the Standard Roller Bearing Company employs a plate of glass suitably framed and of a size convenient for a girl to handle. Beneath this glass is a sheet of green material to reduce the eye strain. The balls to be tested are placed upon the plate, and the girl tips it back and forth causing the balls to roll about on the plane surface of the glass. A ball which is "out-of-round" will sooner or later disclose itself by irregularities in its rolling, and a girl trained and adapted to this work will readily discover its presence and remove it by a small rod of magnetized metal.

This is not the only process through which the finished and gauged ball has to pass. It may be imperfect because of uneven hardening or pitted places. A sharp-eyed girl, trained to the variations in color shown by an unevenly hardened ball and to other im-

perfections visible to the eye, is able to accomplish good results in a moderate time. To do this it is necessary to see all sides of the ball under favorable conditions of convenience and light. This is accomplished by placing the balls upon a second glass plate similar to the first, but they are kept comparatively quiescent. A piece of stiff material is inserted underneath the balls from the front, the girl and the whole arrangement facing the light. Moving this sheet back and forth turns the balls about without necessarily displacing them. This is necessary as in the case of a ball rolling about the plate of glass, it would be difficult to compare different parts of its surface.

Tests for Strength

An important matter connected with balls and ball bearings is the question of the duty which a ball of given size may be reasonably expected to perform. This is a most complicated matter, as in journal bearings where the load comes upon but one part of the circuit of balls at a given instant, the operation of the bearing is accomplished by having the races out of center with each other and the load falls upon but few balls at any one instant. This question has already been discussed in two articles published in *The Iron Age*, October 17 and 24, 1907. The one or two balls nearest the line joining the centers of the load and the bearing are subjected to an excessively disproportionate share, and it would almost appear necessary to use balls of a size and strength, such that a single ball is capable of withstanding the entire strain. In the case of balls used where the service is not very exacting, this matter may be largely neglected, but when the question concerns a bearing subjected to heavy loads, shocks and jars and high speeds, the ability of the ball is a matter of great importance and one which must secure at least an approximate solution.

This company makes use of the testing machine shown in Fig. 8. The ball to be tested is placed between two plates, the lower of which rests on a carriage connected with the heavy lower beam. The upper plate is controlled by two screws, one of which may be seen in the engraving. These screws are operated by power and draw the upper plate down. The ball is tested until it fails.

As an example of the loads necessary to crush good balls, certain results with ¾ in. and ½ in. balls may be cited. With the ¾-in. ordinary tool steel ball, the limit is about 58,000 or 59,000 lb., but with Standard alloy the limit of resistance increases to 96,000 lb. In the case of a ½-in. ball made of high carbon steel, but not an alloy, 25,000 lb. has been found sufficient to crush it. If, the special alloy, it is necessary to use 50,000 to 60,000 lb. pressure.

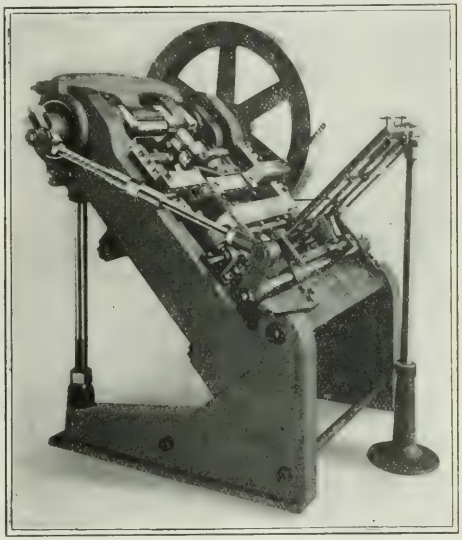
Aside from the material of which they are composed, balls are graded in quality. These grades are the results of the tests for sphericity and for uneven hardness, pitting and the like.

Railroad Equipment Orders.—The St. Louis & San Francisco has ordered from the American Car & Foundry Company 500 box cars, in addition to 500 stock cars and 250 tank cars recently placed. The report that the Chicago & Alton is in the market for 3000 cars is merely the revival of a portion of the Hawley lines inquiry reported some weeks ago. The Maine Central has been considering the purchase of 1500 cars. The American Locomotive Company has booked 10 engines for the Maine Central, 5 for the Chicago Southern, 10 for the Terminal Railroad Association of St. Louis and 5 Mallet locomotives for the Baltimore & Ohio, which has 25 more under inquiry. The Illinois Central order for 35 consolidation locomotives was placed with the Baldwin Locomotive Works. The Canadian Pacific will built 5 Mallet locomotives. The Michigan Central has ordered 21 locomotives from the Montreal Locomotive Works.

The Walsh Double Crank Power Press

The Walsh Press & Die Company, 4709 West Kinzie street, Chicago, Ill., has recently designed and brought out a special double crank power press fitted with gang dies and automatic feed for the production of drawn shells similar in size to the cover of an 8-oz. baking powder can. The approximate dimensions of these shells are 2⅛ in. in diameter, with a drawn edge of ⅜ in. The gang of dies, which numbers eight, cuts 80 of these blanks from a standard sheet of tin 20 x 28 in., draws them and embosses or letters the covers in one operation.

The press proper is swung by trunnions from its legs and is supported in the rear by heavy vertical jackscrews, which can be adjusted to incline the press to the most convenient angle to suit the requirements of the work to be done. The front feeding mechanism is arranged so that it places the sheet automatically in the feed proper. All that the operator has to do is to put



Double Crank Power Press for Rapid Production of Drawn Shells, Built by the Walsh Press & Die Company, Chicago, Ill.

the sheet in place, and while this mechanism is automatically placing it in the feed, ample time is given for adjusting another sheet in place, thus making the production of these shells a continuous operation.

The press is run at a speed of 90 strokes per minute, and as the dies produce eight covers at each stroke, the theoretical output for a 10-hour day of continuous running is 432,000 finished shells or covers. Allowing for reasonable stoppages, the builder claims that from 250,000 to 300,000 covers can be made in this time or an equal number of shells of similar character can be produced.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., at a meeting of stockholders held July 27, increased its capital stock from $405,000 to $500,000, for the purpose of more easily handling some large contracts recently taken. It is to furnish the steel, iron and bronze castings and machine work on them, amounting to about $900,000, for the Panama Canal, for which the McClintic-Marshall Construction Company, Pittsburgh, took the general contract for lock gates, &c. This work, with other orders on hand, will enable the Wheeling Mold & Foundry Company to operate its plant to capacity for a considerable period.

A Notable Motor-Driven Plant

Thorough Wiring Construction and Extensive Use of Chain Drive Are Special Features

The maximum of cleanliness and the economy of space which the electric motor drive affords is perhaps nowhere more apparent than in the plant of the Improved Seamless Wire Company, Providence, R. I. Adopting an effective combination of the group and the individual drive in the layout of the motors has resulted in extreme economy both as regards initial cost and operating expense. Figs. 1 and 2 show the motors driving reducing rolls through chains, and Fig. 3 illustrates the use of a back geared motor for driving a rotary shear.

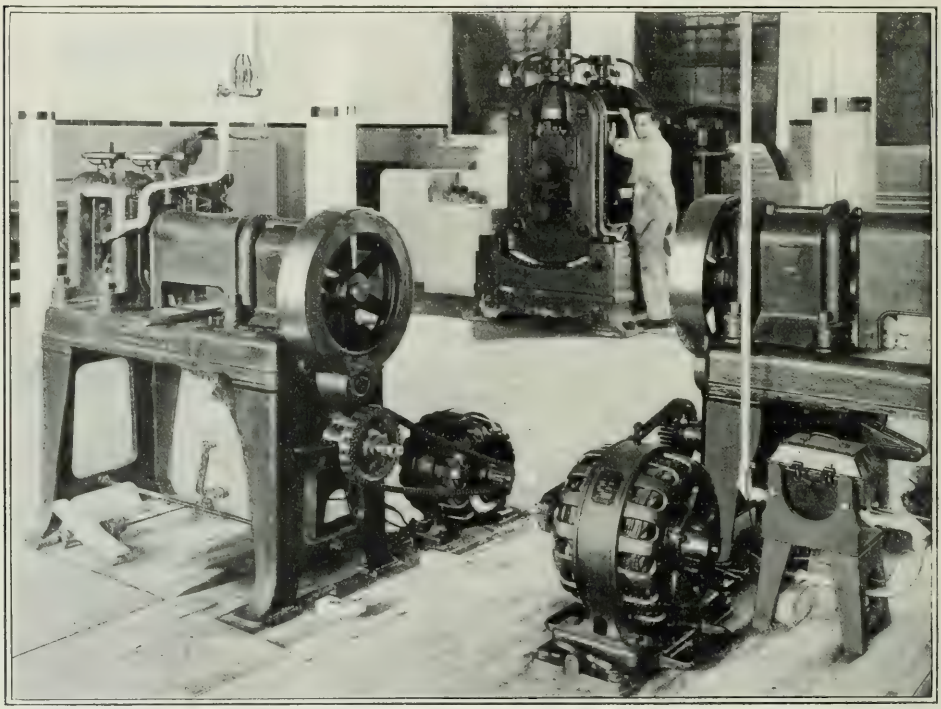


Fig. 1.—Motor Drive in the Improved Seamless Wire Company's Plant, Providence, R. I. Motors Driving Reducing Rolls Through Chains and Controlled by Auto Starters Operated by Foot Treadles.

One of the features of the installation is the thoroughness with which the wiring was done and the illustrations are all typical views of the work. All of the wiring was run in conduit, and the fittings corresponding to it were used wherever a change in the direction was made. Auto starters have been used throughout the plant, and are mounted in the most convenient locations. Fig. 1 shows an interesting application of the starter where a foot treadle is used to operate it. As will be noticed the machine at the left shows very clearly the way in which the treadle operates the starter by turning the rod and the crank attached to the rear end thereof when the treadle is depressed. The motion of the crank is transmitted to the auto starter through a rod, the connection to the crank being shown in the machine at the left, and that to the auto starter by the machine at the right. In this way it is a very easy matter for the operator to start and stop the machine without any effort other than simply shifting the position of the treadle, so that one end is alternately raised and depressed. In Fig. 2 the auto starter is shown mounted on the frame of the roll, and is almost as readily operated as by the foot treadle. The use of the Morse silent chain in connection with the individual drive of the rolls is another feature worthy of mention. The use of the chains makes it possible to transmit power with a positive speed ratio between the shafts located very close together with practically noiseless operation and an efficiency of about 99 per cent.

The output of this plant is seamless gold wire and tubing, such as is used extensively in the manufacture of the cheaper grades of jewelry. Essentially the process consists of pressing a slab of gold upon a slab of copper, and reducing the plated metal thus formed to the proper thickness. This is then cut and drawn into wire or tubing. After the slab is made it is taken to the rolling department where it is passed through the rolls shown in Figs. 1 and 2 and reduced to the proper thickness. From the reducing rolls the metal is taken to the rotary shear shown in Fig. 3, where it is cut into small squares. These small square sheets of metal next go to the press room where they are shaped into the form of a cup. These cups are elongated by different sets of dies until they resemble a very short section of heavy copper tubing.

Further procedure depends entirely what use is to be made of the material. If tubing is to be made the cups are taken to the swedging machines where they are still further reduced and are finally turned into the form of seamless gold plated tubing on the draw benches. If, on the other hand, it is desired to make wire the material is taken first to smaller swedging machines, then to a set of reducing rolls, and finally to the coiling machines when it is ready for shipment.

The electrical equipment of the plant includes 20 type CCL motors, built by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. These vary in capacity from ½ to 30 hp., and the total horsepower is

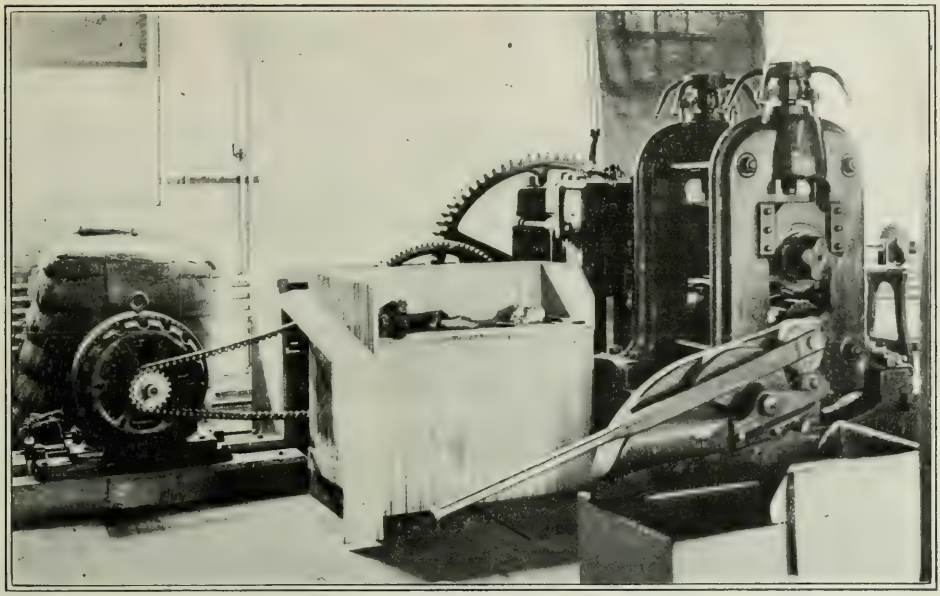


Fig. 2.—15-Hp. Westinghouse Motor Driving Reducing Rolls.

113. These motors operate on a 550-volt, three-phase, 60-cycle circuit, the current being supplied by the local electric light company.

A Novel Sheet Metal Exhibit

A notable exhibit at the sixth annual convention of the Master Sheet Metal Workers' Association, now being held in Philadelphia, is that of the Stark Rolling Mill Company, Canton, Ohio, manufacturer of the well-known Toncan metal roofing, siding, troughing, &c. For some years, prior to the introduction of its Toncan metal, the Stark company labored hard on the problem of producing a moderate priced sheet metal that, while possessing the best points of high grade charcoal iron, should resist corrosion to a much greater degree, and consequently prove more durable. That their labor was not in vain is fully realized by all metal workers familiar with the merits of Toncan metal, while to those who are not so familiar the display at the Philadelphia convention is submitted as proof.

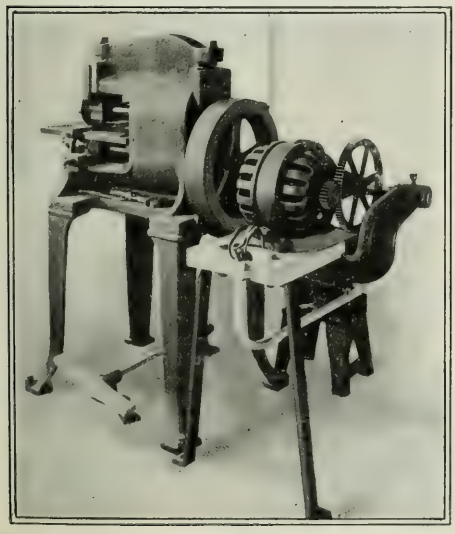


Fig. 3.—Back Geared Motor Driving Rotary Shear.

In striking contrast to the brilliance with which it is surrounded, the glint and glitter of countless electric lights reflected from myriads of polished surfaces, the Stark company's exhibit stands dark and mournful—melancholy testimony to the insufficiency for its purpose of the material from which it is constructed. For it is, in fact, nothing less than a section of ordinary metal sheeting removed bodily from a building that for years has been exposed to the onslaughts of the elements, but which it has unsuccessfully endeavored to resist. The section removed consists of siding, roofing and eaves trough literally eaten away by rust, caused by the action of the moisture laden atmosphere. Above the entrance to this relic of a once perfect building swings the double diamond design—the sign of Toncan metal and an invitation to enter. Within all is brightness—another strong contrast to the dull exterior, but a suitable setting for the display of Toncan metal to be seen there. Prominent in this display is a demonstration of the behavior of Toncan under severe acid tests, representing as nearly as possible the conditions with which sheet metal work has to contend during years of exposure to the elements. The unique menu to be used at the banquet given by the Stark company will be printed upon real sheets of Toncan metal. The exhibit is in charge of Mr. Remsen and other representatives of the Stark Rolling Mill Company.

The Westinghouse Electric & Mfg. Company secured last week from other Westinghouse companies their share in the stock of the Interworks Railroad, which connects the East Pittsburgh shops with the Trafford City plants of those interests. The road is 7 miles long, and not only can steam power be used on it to advantage, and is used to some extent, but it also can be operated by the third-rail, the single phase, the alternating current and the direct current trolley systems. The main purpose of the line is to enable the Westinghouse companies, which include the Electric, Machine, Air Brake and Foundry, to transfer materials from one plant to another.

Crating a Large Machine for Export

Constructional Details and Method of Packing a Newton Portable Boring, Drilling and Milling Machine

A new design of the No. 1 portable boring, drilling and milling machine built by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., for which there is a large demand from electrical manufacturing plants, is illustrated herewith. The use of this machine curtails the continuous use of the heavy cranes required to handle the massive castings of generator frames, and on smaller

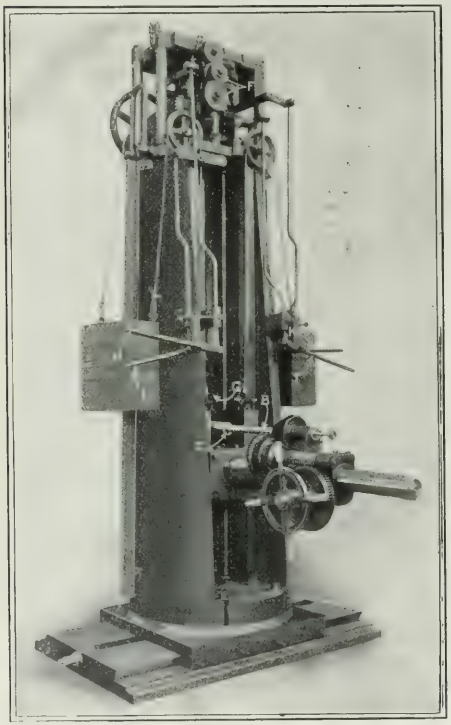


Fig. 1.—Operating Side.

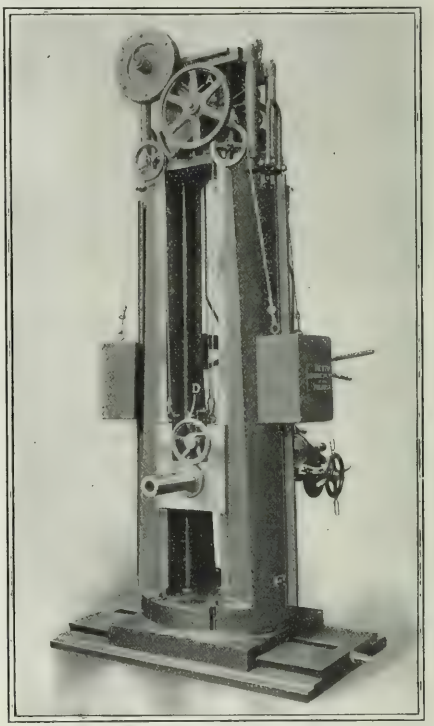


Fig. 2. Working Side.

Two Views of the No. 1 Portable Boring, Drilling and Milling Machine, Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

work economy is also secured through its use, as numerous operations, such as slotting, milling, drilling, tapping, boring and keyseating can be performed with one setting of the work, which effects a saving in the time of production. Figs. 1 and 2 show the operating and driving sides of the tool, and Fig. 3 illustrates the construction of the case in which one of them was recently shipped abroad. The particular advantages of this type of machine are the great rigidity due to mounting the spindle saddle between the uprights and the convenient arrangement for detaching the base plate, which measures 74 x 42 in., to permit of lowering the machine through small diameter frames, a necessity which the machine is particularly designed to meet.

Motion is transmitted from a 5-hp. motor operating at speeds ranging from 300 to 1400 rev. per min. through rawhide pinions to the horizontal driving shaft A, on which the double train of bevel driving gears giving reverse to the drive is mounted, and, further, through the vertical driving worm spline shaft, which has a top and bottom bearing. This vertical driving shaft also carries a separate worm to transmit feed.

The spindle, which is 4¼ in. in diameter, is mounted in a sleeve having double keys, and the sleeve is driven by a worm and worm wheel. The latter has a bronze ring and the worm is of hardened steel. Motion for the 30-in. continuous power geared feed is carried by the shaft B, which is coupled at C to permit of engaging short or long spindles and necessarily long or short horns and driving shafts to meet the requirements of the particular diameters operated on. The hand wheel D controls the engagement of the spindle feeds, of which there are three, and the wheel E controls the fast traverse of the spindle. The maximum and minimum distances between the spindle center and the floor plate are 22 and 82 in. respectively.

The spindle saddle has square lock gibbed bearings to the upright and adjustments are made by taper shoes. The saddle is counterweighted and has reversing vertical traverse and two changes of feed for each of the change gear combination which are attached at F. The studs holding these gears are fitted with hairpin washers and small nuts to allow easy removal of the gears without taking off the nuts.

Motion for the feed is taken from the driving shaft at G for the fast vertical traverse and feeds, the difference in rate being obtained by single and triple lead worm wheels. The lever H operates the clutch controlling the direction of spindle rotation, and the lever I actuates the clutch on the vertical driving shaft which governs the elevating or the lowering of the saddle without rotating the spindle. The clutch for the fast traverse is operated by the lever J, and the lever K controls the engagement of the two-to-one feed gears

with which the machine is fitted. The upright has a hand adjustment of 30 in. on the base.

Fig. 3 is a reproduction of a photograph of one of these machines boxed for shipment to Sweden. All

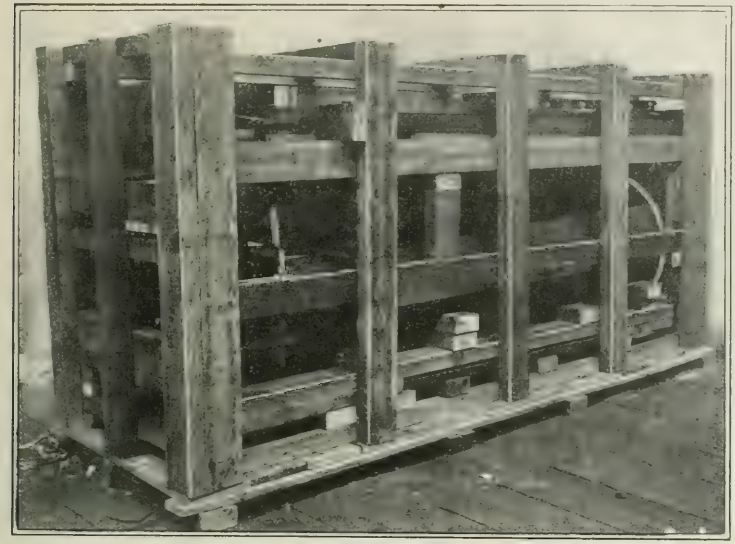


Fig. 3.—Framework of the Case in Which the Machine Was Shipped Abroad.

small and overhanging parts are first removed and those requiring extra protection from corrosion are packed in a small sealed box, which is then placed within the larger one to limit the number of packages and also the liability of delay through misplacement.

As shown, a cradle is constructed in which the machine is placed and a protecting frame of 3 x 6 in. timbers afterward built around. Particular attention is paid to protecting the corners and having continuous well protected longitudinal and lateral braces placed exactly in the respective centers of gravity. The base plate, it will be noted, has been removed and placed above the machine. This method gives a very substantial package with all possible crevices utilized. After completion any side could be used for the bottom of the box were it not for the fact of placing skids under all for convenience should conditions require their use. This framework is faced afterward with finished boards to permit of clear markings.

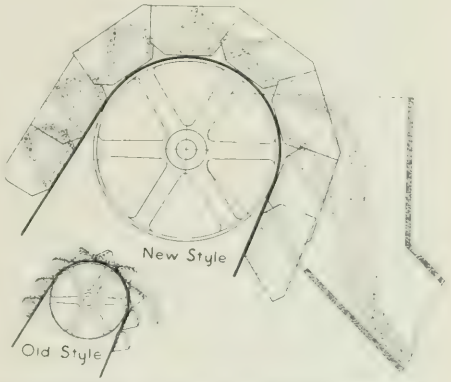
The timber used in this particular crate weighs 2500 lb., and the crate is 12 ft. long by 6 ft. high by 4 ft. 5 in. wide. The total weight of the crate and machine is 16,500 lb., and the tool alone weighs 14,000 lb. The cubic contents of the case is 225 cu. ft.

A New Bucket Elevator

Continuous bucket elevators are those where the buckets are placed as close together as possible. This arrangement possesses the following advantages: The material may be fed directly into the buckets without striking the belt and wearing it out, the elevator requires no boot and a greatly increased capacity is secured.

The buckets on any belt elevator are necessarily fastened to the belt on a line running across it, so that when passing over the head pulley the belt does not tear away from them. The bottom of the buckets then in passing over the pulley becomes tangent to it at the point of fastening, and this leaves a space between the ends of the buckets and the belt. Heretofore the great trouble with continuous elevators, it is claimed, has been that some of the material from each bucket when discharging would fall into this vacant space under the buckets in front of it. When the buckets and belt came together again after leaving the pulley, the result was that the bolts would pull out of the belt and in short time the elevator was ruined. Another trouble was that some of the material would spill sideways from the buckets as they passed over the head pulley. This is clearly shown in the engraving, and not only makes it dangerous for persons to pass under the elevator while it is running, but also makes a pile of material which is hard to recover.

The Stephens-Adamson Mfg. Company, Aurora, Ill., has developed a bucket, which, it is stated, overcomes these troubles, and also adds to the capacity of the elevator. From the illustration it will be seen that the sides of the new style buckets overlap at all times and prevent the material from spilling sideways when discharging. The lip at the front also renders it impossible for them to discharge until they are far enough over the head pulley to prevent the contents from falling into the vacant space under the preceding bucket, and at the same time increases the capacity because of the elimination of the objectionable features of the older type of convevor.



S.-A. Continuous Side Lapping Bucket, Made by the Stephens-Adamson Mfg. Company, Aurora, Ill.

The Eagle Brass Works, Chattanooga, Tenn., has been sold by Mrs. Marcia E. Moffett, administratrix for the estate of William Moffett, to H. L. Hiebeck and C. L. Martin, who will operate the plant under the firm name of Hiebeck & Martin. The Eagle Brass Works is one of the substantial interests of Chattanooga, having been established a quarter of a century ago by Mr. Moffett. The new owners have for a number of years been associated with the Walsh & Weidner Boiler Works of the same city.

F

Condensers for Small Central Stations*

The Effect of Vacuum on Steam Consumption and Recent Efforts Made to Increase It

BY CHAS. S. LEWIS.†

It is the purpose of this paper to set forth the effect of vacuum on the steam consumption of various types of prime movers, to discuss briefly the elementary facts of condensation and to describe some recent improvements in condensing apparatus and their effect in securing higher vacuums at less cost.

Fuel Saving

The maximum efficiency possible for any heat engine is determined by dividing the difference between the absolute temperature at which working fluid is received and the temperature of rejection by the first, from which it is evident that any lowering of the second greatly improves the efficiency of the heat motor. The curves of Fig. 1 show graphically the theoretical increase in efficiency due to such reduction. It is seen that the higher the vacuum, the greater is the increase in the efficiency of an ideal engine for each inch increase of vacuum. Thus, while at 20-in. vacuum an increase to 21 in. adds only 3 per cent. to the efficiency, the increase resulting from increasing the vacuum from 28 to 29 in. is 15 per cent. A glance at a steam table

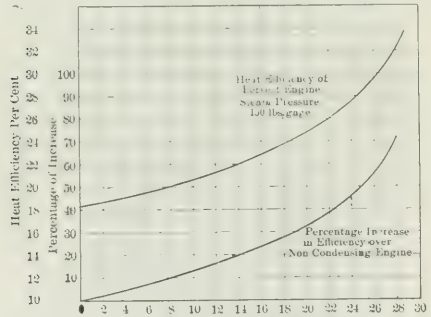


Fig. 1.—Efficiency Curve of the Perfect Engine.

will at once explain this, for while the drop in temperature of saturated steam from 20 to 21 in. vacuum is only 5 degrees F., the drop from 28 to 29 in. is 22 degrees F.; from another point of view, the pressure multiplied by the increase in volume of a pound of steam from 20 to 21 in. is 286 ft.-lb., while from 28 to 29 in. it is 1137 ft.-lb. In the above, and throughout this paper, unless otherwise stated, reference is made to a 30-in. barometer; that is, a 28-in. vacuum means an absolute vapor pressure of 2 in. of mercury.

Certain types of prime movers are more capable of utilizing low back pressures than others. All heat engines using steam can be divided into reciprocating engines and steam turbines, the former in turn being subdivided according to the speed, the number and type of valves and the number of cylinders. The economy to be derived from running any of these various engines condensing will in general depend upon the steam saving in each case, the value of the steam and the cost of the vacuum. The simple slide valve engine, subject to great losses due to wire drawing in the valve, large clearance spaces and considerable cylinder condensation, usually consumes from 30 to 50 lb. steam per brake horsepower when running noncondensing, depending upon the type of governor and the load. Even this engine, ill adapted as it is to derive benefits from reduced back pressure, shows considerable improvement. Fig. 2, taken from a test made by Prof. R. C. Carpenter on a small slide valve engine, shows how the use of

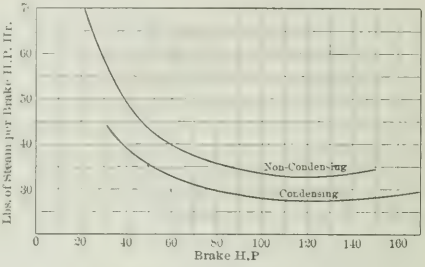


Fig. 2.—Effect of Vacuum on the Steam Consumption of a Simple Slide Valve Engine.

vacuum increases the steam economy of such an engine.

The single expansion, slow speed, four-valve engine is more efficient and, roughly speaking, the steam consumption is reduced 25 per cent. by the condenser. The compound engine with Corliss valves is of more general importance, and the economy of using condensers is considerably greater. This is because the exhaust valves open more widely, there is less range of temperature and hence less condensation in each cylinder, and also because the ratio of expansion can be made greater. The steam per horsepower decreases with the increasing size of engine. Likewise, the economy derived from condensing apparatus increases as the engine size increases.

Owing to the greater ratio of expansion and the fact that there is no alternate heating and cooling of metal surfaces to cause condensation within the turbine, this type of heat motor derives the greatest benefit from condensing apparatus. In the turbine the steam is allowed to expand completely to condenser pressure while doing work. The increase in economy of a 300-kw. Parsons turbine with increase in vacuum is shown by Fig. 3. The total per cent. increase in economy amounts to 40 per cent., corresponding to a reduction in steam consumption from 34.1 to 21.1 lb. per kilowatt hour. Fig. 4 shows the effect of vacuum upon the steam consumption of a De Laval turbine of 300-kw. capacity operating at full load with saturated steam at 150-lb. gauge.

The lessened steam consumption due to operating under reduced back pressure is not the only important

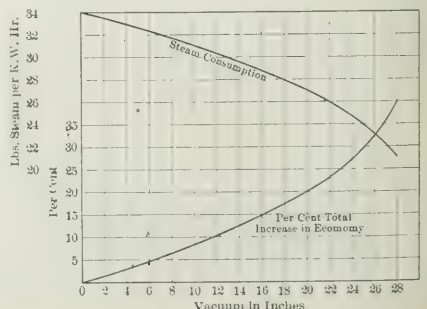


Fig. 3.—Effect of Vacuum on the Steam Consumption of a 300-Kw. Parsons Turbine.

* Presented at the annual convention of the Missouri Electric, Gas, Street Railway and Waterworks Association, Jefferson City, Mo., April 16, 1910.

† Wheeler Condenser & Engineering Company, Carteret, N. J.

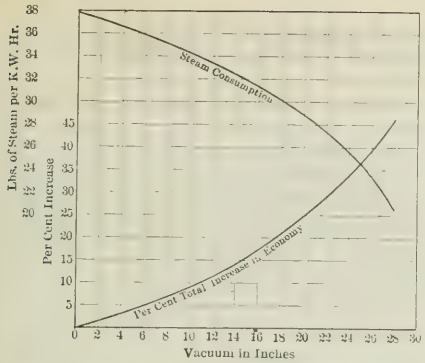


Fig. 4.—Effect of Vacuum on the Steam Consumption of a 300-Kw. De Laval Turbine.

advantage to be derived from running condensing. With the same boiler equipment more power per pound of steam can be obtained when running condensing than when running noncondensing.

Principles of Condensation

A pound of steam at a pressure of 1½ in. absolute, corresponding practically to 3 in. of mercury or 27 in. vacuum, referred to a 30-in. barometer, will occupy a volume of 231.8 cu. ft., and have a temperature of 115 degrees F. If the steam is saturated the temperature will remain the same so long as the pressure remains unchanged. If this pressure is maintained within a condenser that is receiving steam constantly a volume of steam must be condensed during each minute equal to the rate of inflow. Otherwise the pressure and temperature of the steam within the condenser will be raised by compression.

The temperature at which cooling or circulating water is received is usually fixed by the conditions and surroundings of the power plant. The temperature to which the water can be raised is limited by the temperature of the steam, and a perfect condenser would heat the circulating water to this temperature, and would require the theoretically minimum amount. Practically, however, there must be some difference in temperature between the steam and the water in order that the heat may flow from the steam to the water, as through the metal tubes of a surface condenser. In a jet condenser, where the steam comes into immediate actual contact with the water, conditions are different, and if thorough intermixture is secured the temperature of the water may be brought very close indeed to that of the steam. Under the simple conditions above assumed, and assuming a perfect condenser, the vacuum is determined solely by the temperature and amount of cooling water available. A condenser based on these facts would consist then only of means of

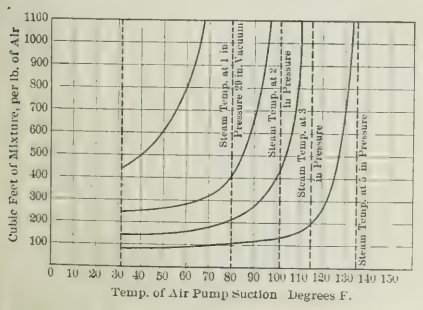


Fig. 5.—Volume of Mixture Per Pound of Air at Various Suction Temperatures and Total Condenser Pressures.

circulating the cooling water, of bringing the steam and water together and of removing the water resulting from the condensation of the steam. In practice, however, the problem is much complicated by the entrance of another element—namely, air.

At the inlet opening there is a constant inflow of practically pure water vapor with only an almost negligible percentage of air. This vapor, upon striking the cold circulating water rapidly condenses, becoming richer in air until at the extreme farthest part of the condenser air constitutes an important part of the mixture. The water vapor and air in a cubic foot of the mixture at this point can be determined if the total pressure in the condenser and the temperature at this point is known. The relations between these quantities are shown graphically in Fig. 5. As will be seen, a high vacuum is impossible without a cold air pump suction and a hot air pump necessarily implies a low vacuum. The bearing of these facts upon condenser design will be brought out more fully later on.

Jet Condensers

Heretofore the great trouble with jet condensers has been that the steam was not brought into thorough intermixture with the water, and that efficient means

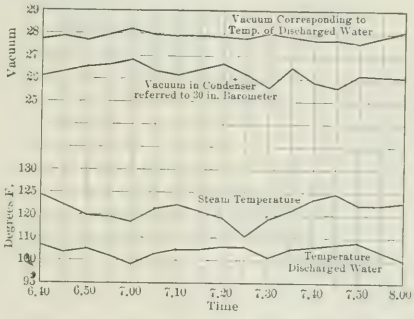


Fig. 6.—Temperature-Vacuum Curves of Ordinary Jet Condenser.

were not provided for cooling the air. In this connection it should be noted that the amount of air to be handled in the case of a jet condenser is greater than with a surface condenser, due to the air introduced in solution in the circulating water. This supplies an added incentive for keeping down the volume of the latter as much as possible. Fig. 6 is a graphical log of a test carried out recently in a railroad and lighting central station where a steam turbine exhausted into an old style jet condenser.

Turning now to a test carried on simultaneously in the same plant with another turbine exhausting into a Wheeler rectangular jet condenser which was illustrated and described in *The Iron Age* November 4, 1909, it will be seen that the vacuum is not only considerably higher, but that the temperature of the exhaust steam and of the discharged cooling water are almost identical. The results of this test are shown graphically in Fig. 7. The cooling capacity of the water has been used to the utmost extent, the very highest vacuum being obtained for the amount and temperature of the water available. The higher vacuum means a saving of about 5 per cent. in the steam consumption of the main turbine, and is obtained with less work on the part of the circulating pump.

A closer inspection of the diagram will show a rather startling condition. For instance, at the time 6.50, it is noticed that the temperature of the steam is about 2 degrees less than the temperature of the water, which is cooling it which is undoubtedly due to the lag of the thermometer. It is to be noticed, too, that the load on the machine was varying quite rapidly with sudden peaks. Nevertheless, soon after the load had

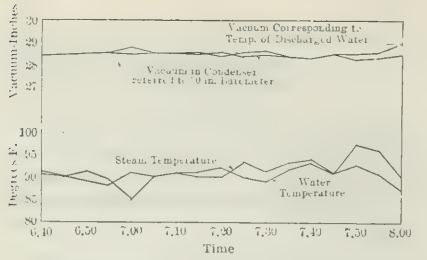


Fig. 7.—Temperature-Vacuum Curves of Wheeler Rectangular Jet Condenser.

increased the condenser was able to give a high vacuum regardless of the variation in load.

The curve of recorded vacuum and that corresponding to the temperature of the cooling water are practically identical, showing that for the water conditions the greatest possible vacuum is obtained.

The air pump used with the Wheeler rectangular jet condenser during this test is of the rotative dry vacuum type. As shown in the cross section in Fig. 8 this pump is a single stage machine, but in addition to the ordinary poppet outlet valves is fitted with a positively moved, semi-rotative valve more or less similar to a Corliss valve and having a peculiar function. In the illustration the piston is shown at the end of its stroke. It will be seen that the rotative valve is in such a position that the two ends of the cylinder are momentarily in communication. By this means the pressure in the clearance, which just a moment before was somewhat greater than 14.7 lb., is immediately reduced to the pressure on the vacuum side of the piston, so that when the piston starts on its outward stroke it at once draws in air from the condenser. The efficiency of this device is most clearly shown by the indicator card in Fig. 9. Instead of an adiabatic expansion of gases within the clearance space there is a straight drop in pressure, and as the stroke begins air is immediately drawn into the cylinder.

Surface Condensers

Improvements have been made in the surface condenser which are equally valuable in increasing the economy of the prime mover without adding greatly to the expense of auxiliary apparatus. While here no trouble is created by the introduction of large quantities of air with the injection water, there are other difficulties due to the fact that heat must be transmitted through metallic tubes. Investigations have shown that transmission of heat through condenser tube surface is affected by factors, among which the two most important are the conditions existing with regard to air and water. The presence of air in a condenser shell is inevitable and has a great effect upon the vacuum obtained. The lower portion of a surface condenser will contain the mixture richest in air, due both to the fact that the mixture is heavier than pure water vapor at the same temperature and to the effect of the incoming steam in driving the mixture down ahead of it. The air pump suction should, therefore, be placed in the lower part of the condenser shell. Air has a very low thermal. conductivity. Hence, if the tubes of a condenser are surrounded by air they will not be as effectual in abstracting heat from the steam as they would if less air were present, and the air pump capacity should be sufficient to prevent "air drowning" of the tubes.

It has been found by experiment that the greater part of the steam entering an ordinary surface condenser is condensed by the upper rows of tubes, and that the condensate falls down over the lower tubes in a veritable flood. This is highly detrimental as it blankets the tubes, preventing steam from coming into contact with them and also because heat is uselessly abstracted from the condensed steam by the cooling water. Thus the cooling capacity of the circulating water is uselessly wasted. A condenser so constructed as to obviate these troubles of tube flooding is shown in Fig. 10. This condenser was supplied by the Wheeler Condenser & Engineering Company, Cartaret, N. J., to the Bronx Gas & Electric Company, Westchester, N. Y. A noticeable point about this condenser is the small amount of tube surface required. It was originally designed to condense 15,000 lb. of steam with circulating water at 70 degrees F. and to give a vacuum of 28 in. referred to 30-in. barometer with 2305 sq. ft. of cooling surface. By rearranging the unit on the dry tube system it was possible to omit 305 tubes, leaving only 1101 tubes in the condenser, a reduction in surface of almost one-fourth without giving in any way poorer vacuums. An illustrated description of the Wheeler dry tube condenser was printed in *The Iron Age* October 7, 1909.

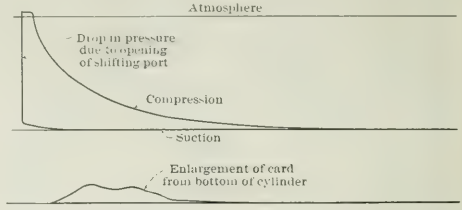


Fig. 9.—Indicator Card from Wheeler Rotative Dry Vacuum Pump.

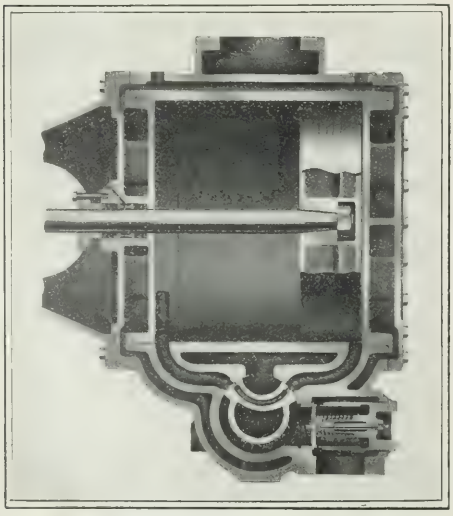


Fig. 8.—Cross Section of Cylinder of Air Pump Used With Wheeler Rectangular Jet Condenser.

The air pump used with this condenser, which can be seen at the right of the engraving, is of the Edwards type, where both air and water of condensation are handled by one cylinder.

A cross section of the pump is shown in Fig. 11. It is noticeable that there is only one set of valves in this pump, namely, the discharge valves. Water enters the cylinder of the pump by gravity from the hot well of the condenser, and on the down-stroke of the cone shaped piston is splashed through the ports in the cylinder wall up into the top of the cylinder. This process partially compresses the air already above the cylinder and also draws more air by inspiration from the condenser shell. The up-stroke of the piston immediately closes the ports in the cylinder wall and compresses the water vapor and air within the cylinder until the discharge valves are opened and the gases and water dis-

charged. An indicator card taken from this type of air pump is shown in Fig. 12. This is a combined card taken from the upper and the lower sides of the piston. The card from the upper side consists of a long expansion and long compression stroke. The card from the lower side of the piston is barely noticeable and has, therefore, been enlarged as shown in the lower part of the drawing. On the down-stroke of the piston, while rarification is occurring above, the water below the piston is displaced and forced through the apertures in the cylinder wall and thrown above the piston. The small amount of pressure exerted is shown by the little rise in the curve. During the up-stroke of the piston, water flows by gravity into the cylinder and there is no change in pressure, as indicated by the straight line in the card.

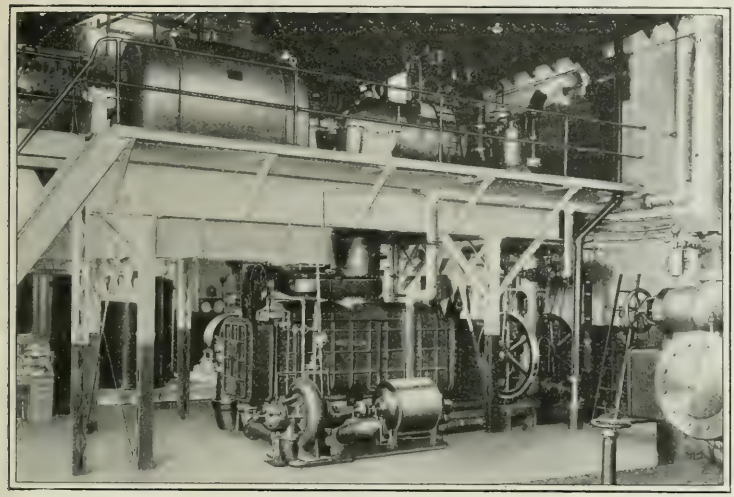


Fig. 10.—Installation in the Plant of the Bronx Gas & Electric Company of Wheeler Condensers, Built by the Wheeler Condenser & Engineering Company, Cartaret, N. J.

Temperatures of the Electric Steel Furnace

In a communication to *Metallurgical and Chemical Engineering* for August, Prof. Bernhard Neumann, Institute of Technology, Darmstadt, Germany, discusses the claims of high temperatures for steel refining in the electric furnace. He refers at the outset to some temperature measurements made at the Heroult furnace of the Illinois Steel Company at South Chicago, Ill., by Prof. Joseph W. Richards. These were so low as to indicate that the electric steel on the average was not hotter than the steel in a Bessemer converter. He finds the reason for this in the fact that at the South Works Bessemer steel is refined for but one or two hours in the electric furnace, only 200 kw.-hours per ton of steel being supplied, so that the steel is only of good average quality—0.4 C., 0.4 Mn., 0.03 S. and 0.03 P. Prof. Neumann gives details of temperature measurements he made in the case of a Nathusius furnace of 5½ tons capacity at Friedenshütte in Upper Silesia, which were of about the same range as those noted at South Chicago. His statement and comment are as follows:

Converter steel was charged into the electric furnace and refined to a very soft steel containing 0.5 to 0.6 C and very small amounts of sulphur and phosphorus (0.003 to 0.02 S and 0.004 to 0.017 P). The treatment lasted for 3½ to 4½ hours and the energy consumption per ton of steel was 300 to 400 kw.-hours.

The converter metal when poured into the smaller ladle had still a temperature of 1450 to 1470 degrees C. When poured from the ladle into the electric furnace the temperature was 1435 to 1450 degrees C. The interior of the furnace (immediately after the pouring of the finished steel) had a temperature of 1535 to 1560 degrees C., the points of the electrodes, when being withdrawn, being at 1300 to 1350 degrees C. The temperature of the electric steel when poured was 1500 to 1520 degrees C. for a soft charge and 1558 degrees C. for a high silicon charge. In the latter case the temperature when pouring into the ingot was still 1500 degrees C.

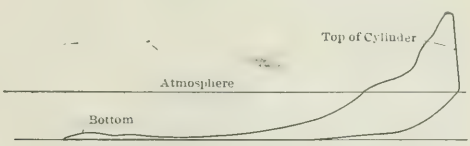


Fig. 12.—Indicator Card from Wheeler-Edwards Air Pump.

Since the electric furnace had always to wait a certain time for a charge of fresh Bessemer metal, the interior of the furnace cooled to about 1000 degrees C. After the metal had been charged into the furnace and the reaction was completed, the temperature of the slag layer was measured and was found to be after an hour, 1550 degrees C., and after an hour and a half, 1600 to 1650 degrees C. It remained at 1600 to 1650 degrees C. until the slag was removed, when its temperature was found to be between 1600 to 1560 degrees C. The removal of this first slag and the introduction of the dephosphorizing slag caused the bath to cool off somewhat to about 1550 degrees C., and the temperature remained in the second period of the treatment a little less than in the first period.

Concerning the Roechling-Rodenhauser induction furnace I have no numerical data of the temperature, but skilled open hearth furnace engineers estimate the average temperature not to be much higher than in the open hearth furnace.

VERY HIGH TEMPERATURE NOT NECESSARY.

What do these figures prove? They show evidently that an abnormally high temperature is not necessary for the refining process. As a matter of fact, even the heat of the

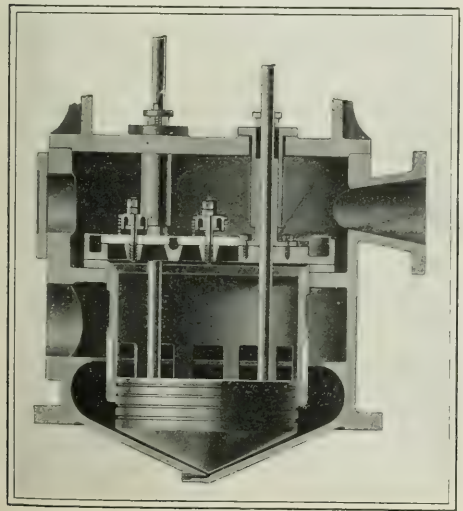


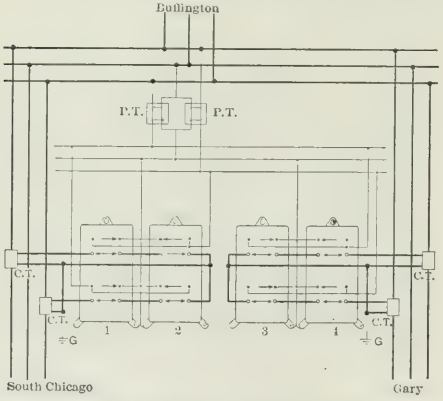
Fig. 11.—Cross Section of Cylinder of Edwards Wet Pump.

arc for the local heating of the slag is not absolutely necessary, since it is generally known that the Roechling-Rodenhauser furnace permits the same far-reaching refining reactions to be carried out down to traces of sulphur and phosphorus without any arc. The refining possibilities of the electric steel furnace are, therefore, certainly due to a larger extent to the non-oxidizing atmosphere than to a very high temperature. There is no doubt that the possibility of producing a higher temperature in the electric furnace helps the refining process considerably, since the higher basic slag can be easily kept fluid, but, as mentioned above, the arc furnace is not absolutely necessary for this purpose.

On the other hand, it is quite self-evident that at the places right below the electrodes the temperatures are much higher than the above average temperatures. The proof of this is the formation of calcium carbide, which has often been observed in the arc furnace and which, according to the latest investigations, begins only at about 1820 degrees C., and which does not occur in the induction furnace. Further, the electric steel furnace offers the possibility of heating the metallic bath for special purposes to a much higher temperature than is possible in other furnaces. I have seen steel tapped at temperatures above 1650 degrees C., but on the average the mean temperature required for the almost complete removal of phosphorus and sulphur is not much higher than in other metallurgical furnaces.

The Metering of Electric Current at Gary and South Chicago

B. E. Semple contributes to the *General Electric Review* the following description of the interesting meter installation devised in view of the relation of the



Arrangement of Electric Meters for Gary and South Chicago Works.

electric power plants at the South Chicago Works of the Illinois Steel Company and the Gary Works of the Indiana Steel Company:

The Illinois Steel Company, South Chicago, Ill., generates its power at 2200 volts, three-phase, 25 cycles. The Indiana Steel Company, Gary, Ind., generates its power at 6600 volts, three-phase, 25 cycles. These two plants are about 16 miles apart and operate in parallel with each other through a 22,000-volt line, suitable step-up transformers being in use at each station.

The plant of the Universal Portland Company is located at Buffington, Ind., about 5 miles from Gary and 11 miles from South Chicago, and receives its power from the 22,000-volt line connecting South Chicago with Gary. At times Gary furnishes power to South Chicago and also to Buffington, and at other times to South Chicago alone or to Buffington alone. Likewise South Chicago at times furnishes power to Gary and Buffington, or to either separately.

This state of affairs demanded a system of metering whereby the proper billing amounts could be arrived at, and it was found that by using four three-phase, three-wire meters at the Buffington substation, connected as shown in the accompanying diagram, the correct amount of energy consumed by the Buffington plant, coming either from South Chicago or Gary, could be recorded, as well as the amounts of energy passing from one generating station to the other. All four meters are equipped with ratchet devices so arranged as to move the recording hands only when the rotating elements are revolving in the proper direction, the meters being free to rotate in either direction, depending on the direction in which the current is flowing.

When South Chicago is feeding Gary and no energy is being used at Buffington, meters No. 1 and No. 3 are registering, since they are connected in series. When Gary is feeding South Chicago and no energy is being used at Buffington, meters No. 2 and No. 4 are registering, since they also are connected in series. When South Chicago is feeding Buffington alone, no energy being sent to Gary, meter No. 1 registers. When Gary is feeding Buffington alone, no energy being sent to South Chicago, meter No. 4 registers.

In billing, therefore, the amount shown by meter No. 1, less the amount shown by meter No. 3, is charged to Buffington, and credited to South Chicago; the amount shown by meter No. 2 is charged to South Chicago and credited to Gary; the amount shown by meter No. 3 is charged to Gary and credited to South Chicago; and the amount shown by meter No. 4, less the amount shown by meter No. 2, is charged to Buffington and credited to Gary.

The American Association of Commerce and Trade, Berlin, Germany

The above named organization, an American Chamber of Commerce founded seven years ago by Americans, is run by Americans on American lines for the purpose of promoting American trade with Germany and German trade with the United States. Its specialty is assisting American business firms to start branches in Germany. The organization has the largest and most complete reading room in the empire, receiving 30 daily American papers and 150 trade publications, all United States Government reports and statistics, all the directories of the leading American and German cities and the principal telegraph codes, all of which it places at the disposal of American business men and American travelers visiting Berlin. This association appeals to American business men intending to do business in Germany, whether temporary or permanent, as it can help them as no other institution or commercial agency can. Information is given regarding business conditions in Germany, agents are found, and inquiries answered thoroughly and satisfactorily. Its offices are in the Equitable Building, Friedrichstrasse 59-60, Berlin.

The Treadwell Construction Company, Midland, Pa., is building oil storage tanks for the Miami Copper Company, Miami, Ariz., one being 25 x 60 ft., and another 15 x 50 ft., and a flue for the Copper Queen Consolidated Mining Company, Douglass, Ariz., which is 13 ft. in diameter by 450 ft. long, the material being 5-16 in. thick and set on supports, with a total weight of 175 tons. It is installing a new 126-in. Hanna pneumatic gap riveter, having a capacity up to 1¼ in. Contracts on hand will enable the company to operate its plant to capacity for the next three months.

Ph. Bonvillain & E. Ronceray, 9 and 11 Rue des Envierges, Paris, who exhibited French molding machines in this country, having repurchased from the E. H. Mumford Company the patent rights for the Universal molding machines and pattern system, are now in a position to make arrangements with some American firm to handle this line of foundry equipment.

The Wilmette Pumping Station Equipment

Allis-Chalmers Pumps Furnished for Chicago Sanitary Works

The drainage canal for the sanitary district of Chicago and other incidental work performed in connection with it has attracted the attention of engineers for several years. The method employed to secure a pure water supply for a city of this size has been of chief importance. Prior to the beginning of this work the entire city discharged its sewage into the harbor directly or through the Chicago and Calumet rivers. This condition of sewage pollution resulted in severe epidemics of typhoid fever and Chicago had an unenviable reputation for this disease. Long and serious study of the existing conditions by both engineers and sanitarians led to the determination of the system finally adopted for remedying the trouble. This consisted in the construction of a canal about 28 miles long, connecting the Chicago with the Desplaines River at a point near Lockport, Ill. By this means the direction of the flow of the Chicago River was reversed, and the waters of Lake Michigan were used to dilute the sewage, which eventually finds its way to the Mississippi River.

Upon the completion of the canal, the work of providing other proper safeguards was carried forward. This included first the building of an intercepting sewer along the lake shore on the south side of the city, extending as far south as Eighty-seventh street and covering all that section included up to the Chicago River. At Thirty-ninth street a pumping station was built, which not only handled the sewage collected by the intercepting sewer but also took large quantities of water from Lake Michigan and discharged it with the sewage into the south branch of the river, thus tending to maintain a current which would keep it free from any dangerous or disagreeable condition.

This station contains four centrifugal pumps for handling the sewage and two screw pumps for taking the water from the lake, all of which were built by the Allis-Chalmers Company, Milwaukee, Wis. The plant has a total capacity of 2,100,000,000 gal. per 24-hour day, which is said to be the largest output of any single pumping station in the world. After this building was finished work was begun on the Lawrence avenue station, which handles the sewage from the intercepting sewer along the north shore of the city and also takes water from Lake Michigan and discharges it into the north branch of the Chicago River.

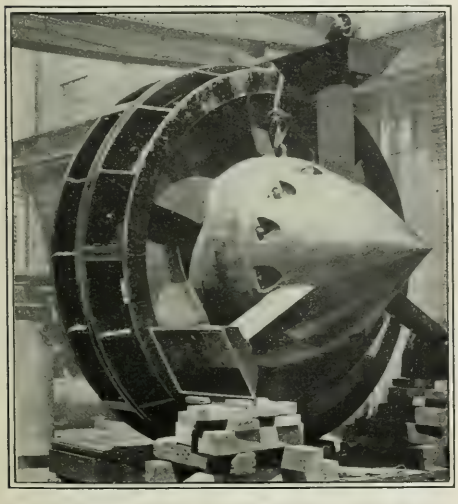


Fig. 1.—Suction Side of a Large Screw Pump, Built for the Chicago Sanitary District Pumping Station by the Allis-Chalmers Company, Milwaukee, Wis.

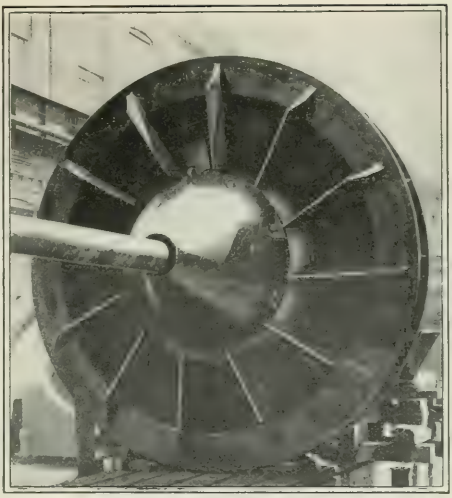


Fig. 2.—Discharge Side of One of Four Large Allis-Chalmers Screw Pumps.

Besides these projects which have already been completed, the district now has under construction a channel along the north shore on which will be located the Wilmette pumping station. A plan for the reversal of the flow in the Calumet River at the south side of the city is also in contemplation, and when this is completed, together with certain sewage pumping stations which the city itself maintains, the entire shore front of Chicago and its immediate vicinity will be well protected.

At the present time the construction of the north shore channel is progressing very rapidly and will probably be completed and in operation before the end of the present year. This channel takes water from Lake Michigan near Wilmette and discharges it into the north branch of the Chicago River. From the lake front to Sheridan road, a distance of about 400 ft., the water will flow by gravity. Here a viaduct carries this road across the canal channel, and built as a part of the viaduct itself and beneath it is the pumping station and a lock. This lock will be used for allowing the barges and tugs employed in keeping the channel free to go into the lake for discharging their loads. The bridge proper will consist of a steel framework, faced with Bedford limestone, thus giving the structure the appearance of a stone bridge. It will have a paved roadway 46 ft. wide and two sidewalks, each 8 ft. wide, with ornamental stone railings.

Beneath the center span of the bridge will be located the pumping station, containing motor and transformer rooms, each measuring 29 x 45 ft. Four horizontal screw pumps, with an individual capacity of 15,000 cu. ft. per minute against a head of 3 ft. when running at a speed of 75 rev. per min., will be installed. Fig. 1 shows the suction side of one of these large pumping units, while Fig. 2 illustrates the discharge side as the pump appeared in the builder's shop. Each of these pumps will be driven by a 150-hp. three-phase 60-cycle 2300-volt induction motor. The runners will be located on the easterly side of the buildings, with the shafts extending horizontally into the motor room. These pumps are similar in construction to others of the same character installed by the Allis-Chalmers Company in the other two stations of the district.

The Taylor Fixed Focus Pyrometer

A New Instrument for Long Distance Work

The power of heat to produce destruction or change in the nature of materials has been recognized for a long time, and in these later days it has been increasingly used as a stage in innumerable processes. In the consideration of the measurement and control of the heat to be applied to any process this activity becomes a source of trouble. Heat is applied to produce change in the product under treatment and yet the device which is to measure that heat must be proof against its ill effects, otherwise the measurements will be unreliable. These facts have presented serious obstacles to the application of pyrometers to processes where the temperatures are very high, and the chemical activity of the furnace gases or of the materials under treatment as well as inaccessibility have also increased the limitations. This has made necessary the designing of a pyrometer that will be able to work at a distance with many obvious advantages. The Taylor Instrument Companies, Rochester, N. Y., have developed a fixed focus pyrometer for quickly reading high temperatures at a distance without focusing. Fig. 1 shows the standard portable outfit, Fig. 2 shows the instrument in use and Fig. 3 is a diagram of the receiving tube.

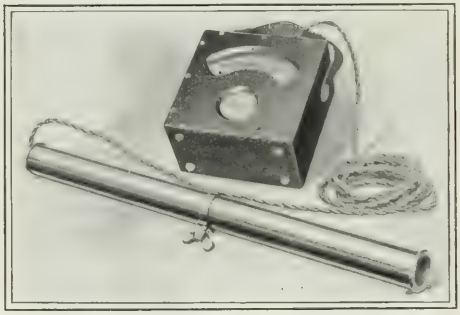


Fig. 1.—Standard Portable Fixed Focus Pyrometer, Made by the Taylor Instrument Companies, Rochester, N. Y.

If the heat given out by any hot body is concentrated on any device that is sensitive to heat there will be an indication by that device of the temperature of the hot body under examination. The most convenient one for this purpose is a thermo-couple, because it can be made very small to get a concentration of the heat and also because it can be connected to an indicator at a distance. The thermo-couple is composed of two very small wires of different alloys joined together at one end, the free ends being connected to a suitable electrical circuit including a flexible cable and an indicating milli-voltmeter. The radiant heat is concentrated upon the common junction of the two alloys and heats this point above the temperature of the junctions of these two alloys to the rest of the circuit, with the result that an electromotive force is set up which is proportional to the temperature of the body radiating the heat. This sensitive thermo-couple is entirely contained within the tube of the pyrometer, and the indications of the instrument are independent of the general air temperature or that of the tube itself.

In Fig. 3, which is a diagrammatic section of the receiving tube *e f* is a diaphragm, while *c*, at the opposite end, is a concave mirror. The heat radiated from any hot body, such as *a b*, enters the opening in the diaphragm and a fixed proportion of it strikes the mirror. This is reflected by the mirror and collected at a focus, *d*, where the thermo-couple junction is located. The amount of heat radiated to the mirror is entirely independent of the size of the body, as will be apparent

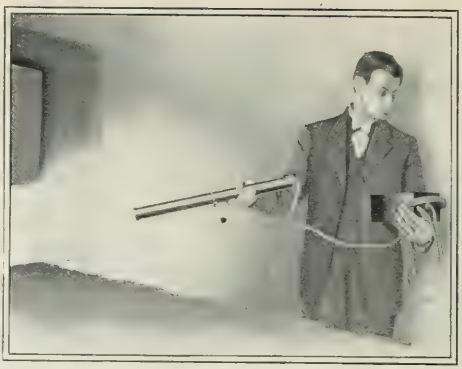


Fig. 2.—The Fixed Focus Pyrometer in Use.

by an inspection of Fig. 3. Any extension of the hot body beyond the limit indicated by the dotted lines passing through the points *e f* would only be able to radiate heat on the walls of the tube, and these are made nonreflecting. The waves of heat passing through these points at the edges of the diaphragm define a cone whose apex is at *g*. For any given hot body the maximum working distance will be a fixed multiple of the diameter or other smaller dimension of the body. Any working distance less than this maximum will result in the outer edges of the body being out of measurement, and in all cases the action will be just the same as if the hot body were actually at the diaphragm. The instrument is designed so that the mirror throws on the thermo-couple junction at *d* a focused image of the aperture *e f*. This fact also supplies the reason for the name, fixed focus. The position of the apex is shown on the outside of the tube by a metal ring, shown in both Figs. 1 and 2, which carries the fixing stud and nut. For the sake of convenience the proportions of the hot body to the working distance are not drawn to scale in the diagram, but in the standard tube the actual proportion is 10 to 1.

In use the indicator is laid on the ground or any convenient support, and the tube is pointed centrally at the peep-hole or door of the furnace whose temperature it is desired to measure and the result read on the indicator dial. The central ring on the tube must not be farther away from the opening of the furnace than 10 times the smallest measurement of the actual opening. That is, if the opening is a furnace door, whose diameter or smallest measurement is 12 in., the center ring of the tube must be within 120 in. of the inside edge of the door. Likewise, if the opening is a peep-hole 3 in. in diameter the working distance from its inside edge to the center ring on the tube must not exceed 30 in. It is not necessary to make accurate measurements of the working distance, as any distance less than the above limit will give correct indications. With this pyrometer the temperatures of a whole battery of furnaces can be rapidly checked, or, on the other hand, the instrument may be permanently fixed to give continuous indications from any one furnace. In the latter case the receiving tube will be mounted on a bracket and pointed into the furnace, while the indicator may be conveniently placed on a shelf or table where the operator can read the temperature from time to time.

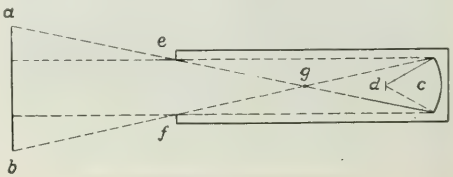


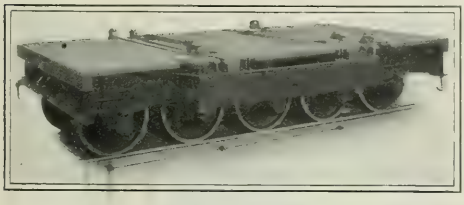
Fig. 3. Diagram of Receiving Tube.

The temperature of that part of the furnace at which the tube is pointed will be automatically shown, so that it can be used to explore a furnace or any hot body in order to find out the variation in temperature. If for any reason it is inadvisable to have a permanent opening in the furnace, a fire clay tube closed at its inner end can be inserted and the receiving tube pointed into this. For the quickest measurements V-brackets may be placed in front of the openings to each furnace and a tube placed in these brackets, while the indicator is held on the arm. A portable collapsible tripod is applied when desired, which is arranged with an angle plate. The stud and wing nut fitted to the tube provide a means of fixing the tube to the tripod and allow of placing it at desired angle.

The indicator scale is divided boldly so that it can be read in a poor light, and is so graduated that at the points where the instruments are customarily used reading can be easily made to 5 degrees, or within one-quarter of 1 per cent., where the temperature is 2000 degrees. The moving parts are of robust construction to withstand the rough usage met with in industrial work, and the instrument does not need to be accurately leveled in use or clamped when carrying.

The Koppel Steel Transformer Car

It is frequently necessary to move large transformers from one part of the power station to another or from the transformer room to the repair shop, so that the workman can do the necessary work without coming in contact with live wires carrying high potential currents. Where this work has to be done without the aid of a crane, it is a somewhat difficult operation. For doing this work satisfactorily in the power house of the Rand diamond mines in South Africa, the Orenstein-Arthur Koppel Company, Pittsburgh, Pa., has designed and built a special type of steel platform car which is shown in the accompanying illustration. Several large three-phase 5000-kw. transformers weighing 88 tons each, and also a number of smaller ones whose weight varies from 13 to 50 tons, are installed in this power house, and the work for which these cars were built was to handle them when it is necessary to remove them from the transformer house to a repair shop located some distance away for occasional repairs.



A Steel Platform Car for Transporting Transformers, Built by the Orenstein-Arthur Koppel Company, Pittsburgh, Pa.

Steel is employed throughout in the construction of these cars except for the wooden platform on top. As will be noticed from the illustration, there are five axles, and the wheels on the three inner ones are without flanges, so that the car may be made to run easily around the curves in the track, which have a radius of about 600 ft. and a gauge of 3 ft. 6 in. All five axles are equipped with roller bearings. The frame of the car consists of steel I-beams. Each car has a capacity of 90 tons and weighs 7½ tons.

In the transformer house the transformers are mounted on low trucks, so that when it is necessary to move them they are disconnected from the line. The platform of the car is provided with tracks of three different gauges to suit the different sizes of transformers, and when one has been disconnected it is simply pushed on the platform. The tracks for the heaviest transformers consist of ordinary rails bolted to the steel car frame, while those for the lightest are of steel channel irons covered with plates, as the wheels of the smaller trucks are without flanges. The loading of the transformers on the car from the side naturally has a tendency to tip the car, but this is checked by adjustable screw supports which are lowered and raised by worm gears operated from the end of the car. This type of construction is necessary because of the great amount of force required to release the supports after the transformer is placed on the car. During the loading process, these supports are lowered and rest on brickwork pillars in the floor of the transformer building.

While the transformers are being transported they are secured in position by special catches which lock the wheels on the transformer trucks to the rails of the car. Hooks in the end frames of the car are connected to links set in the brickwork of the building and hold the car stationary while it is being loaded. The use of this car, when desired for purposes other than that for which it was designed, is made easy by the wooden platform. Great strength with comparatively light weight is secured by the type of construction employed, and the roller bearings with which the axles are provided enable it to be propelled with a minimum expenditure of power.

A New Kansas Iron Store

The Massey Iron Company has completed its large warehouse at Wichita, Kan., and is now ready for business. A circular issued by the company presents a view of this warehouse, which shows that the building is handsome and substantial. It occupies an extensive plot of ground and is three stories high. The company announces that it will do a jobbing business in iron, steel, heavy hardware, blacksmiths' and carriage makers' supplies, mill supplies and implement specialties. The claim is made that the warehouse is one of the best arranged and most thoroughly equipped in this class of trade. A complete stock has been installed and four salesmen will at present represent the company, traveling over the territory lying mostly south and west of Wichita. John Massey, who has engaged in this branch of business for twenty years, is president and manager; Harry D. Howard, for several years buyer and stockkeeper for a heavy hardware house, is vice-president; Ambrose Bowdish, an experienced bookkeeper, is secretary, having charge of the books, credits and collections; G. L. Moore is treasurer. In addition to the jobbing business the company will manufacture buggy and carriage tops, automobile tops and trimmings, cushion work, poles, shafts, &c. Manufacturers' catalogues are desired.

An Extensive Scale Factory.—The Angldile Computing Scale Company, Elkhart, Ind., has plans prepared for a new factory, 120 x 509 ft., with wings of 50 ft., with a space of 20 ft. between them for light and ventilation. An important feature of these buildings will be the heating and ventilating systems. Hot air will be supplied from an indirect system, by which the air, brought from outside, will first be washed and then carried through a coil of steam pipes. A forcing system will send the warmed air the length of the wings, through a large pipe carried beneath the roof. From this main pipe laterals will be carried to the sides of the room at short intervals, and from them the air will be discharged in such volume as the workmen may desire. It is possible with this system to change the air in the entire shop every 10 minutes. During the summer season this same system will be converted into a refrigerating plant; thus a temperature several degrees below that to be found outside will be maintained. Details of the equipment to be installed have not yet been decided upon.

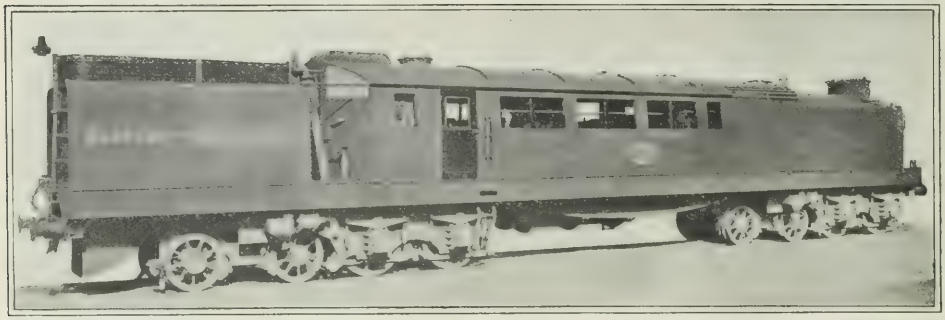
The Reid-Ramsey Electric Locomotive

A Combination of the Steam Turbine with the Electric Motor

In *The Iron Age* of December 30, 1909, preliminary announcement was made of the construction of a steam turbine electric locomotive at the works of the North British Locomotive Company, Glasgow, Scotland. This locomotive has been completed and made its preliminary trial on the main lines of the Caledonian and the North British Railways. The illustrations, which are reproduced through the courtesy of the *Railway Age Gazette,* New York City, give a good idea of the locomotive and its construction. Fig. 1 is a view of the locomotive, while Figs. 2 and 3 illustrate the front and rear ends, respectively.

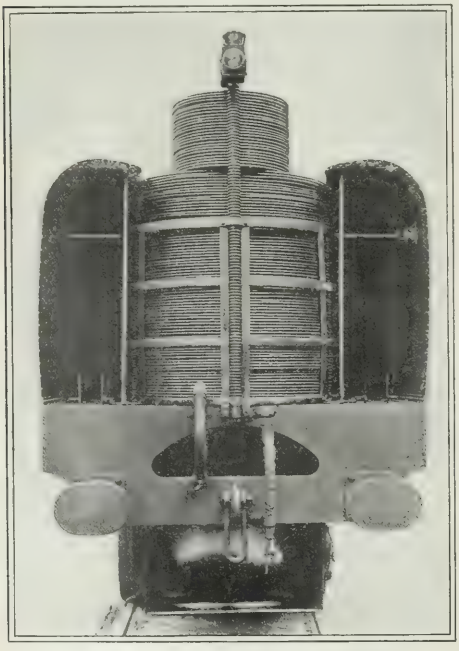
This new engine is a development of the idea embodied in the construction of the Heilmann steam electric locomotive built in 1894, whose trial trip was described in *The Iron Age* June 7 of that year. Up to the present time that locomotive represented the most notable attempt made to introduce independent self-generating electric units for operation over existing steam railroad lines without requiring any installation of electric equipment on the right of way itself.

A boiler of the ordinary locomotive type fitted with a superheater is employed to generate steam, the supplies of coal and water being carried in bunkers and tanks located on either side of the boiler. After being generated in the boiler the steam passes to an impulse type of turbine operating at a speed of 3000 rev. per min. A direct current variable voltage dynamo, which is directly connected to the turbine supplies energy at a potential varying from 200 to 600 volts to four series-wound railway motors whose armatures are built on the four driving axles of the locomotive. The exhaust from the turbines passes into an injector condenser and in company with the circulating water of the condens-



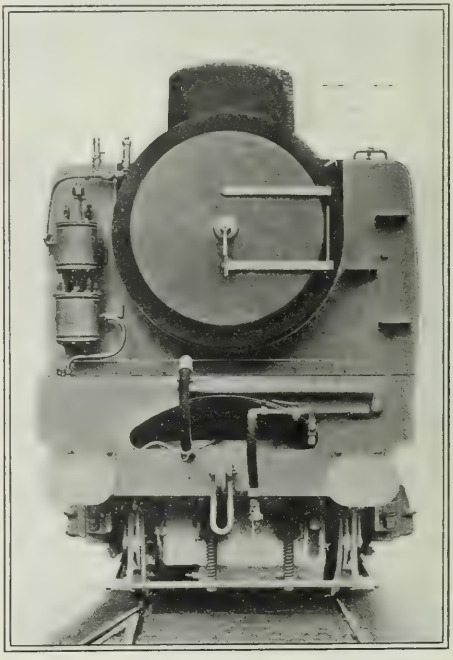
Courtesy *Railway Age Gazette,* New York.

Fig. 1.—The Reid Ramsay Steam Turbine Electric Locomotive, Built by the North British Locomotive Company, Ltd., Glasgow, Scotland.



Courtesy *Railway Age Gazette,* New York.

Fig. 2.—The Front End of the Locomotive.



Courtesy *Railway Age Gazette,* New York.

Fig. 3.—The Rear End of the Locomotive.

ing system is eventually delivered to the hot well. Unlike the reciprocating engines the turbine requires no internal lubrication, which keeps the water of condensation free from oil and permits it to be returned to the boiler directly from the hot well by a feed pump. The water employed in the production of steam is, therefore, returned to the boiler over and over again, and the supply of water carried in the water tanks is available for use as circulating water for condensing purposes. Small centrifugal pumps driven by auxiliary steam turbines placed alongside the main turbine and dynamo circulate this condensing water in a practically closed cycle, which is from the tanks through the first pump where it is pumped into the condenser and becomes heated by the operation of condensing the exhaust. From the condenser it passes to the hot well, from which it is pumped by a second pump to the cooler on the front end of the locomotive. This cooler, which is shown in Fig. 2, is of the same general type as that employed in automobile construction or for cooling the jacket water of gas engines. By locating the cooler in this position the blast of air caused by the movement of the locomotive is fully utilized for cooling the hot circulating water, and this air blast is supplemented by that produced by a fan. After the water has become sufficiently cooled by the influence of the air it is returned to the supply tanks, thus completing the cycle.

Condensing the exhaust steam obviously deprives the boiler of the usual exhaust blast which induces the draft through the fire box and boiler tubes. A small turbine driven fan producing forced draft supplies the deficiency. This fan is the one mentioned in the previous paragraph, and is placed within the cooler so that it will deliver heated air to the boiler fire box, and at the same time assist the current of air through the cooler. The electrical equipment which includes a small switchboard with recording and indicating instruments, the controller for grouping the motors in the various combinations of series parallel and parallel operation for different draw bar pulls, and the voltage regulator for controlling the speed of the train by varying the voltage impressed upon the motor terminals are all located within easy reach of the engineer.

This comprises the main and auxiliary machinery of this locomotive, all of which is mounted on a strong underframe. Two eight-wheel articulated trucks that will easily negotiate curves support the underframe, and the driving axles are the pair at the right of each truck in Fig. 1. Although the results of the tests have not been made public, it is expected that a basis for comparison with the performances of reciprocating engines for express passenger service will be secured.

New Tools and Appliances

Machine for Drilling and Facing Connecting Rods.—One of the costly operations in manufacturing automobile engines is making the connecting rods, as accuracy and perfect alignment are required both in drilling the holes and facing the ends. With a view to reducing the cost of this operation the Hoefer Mfg. Company, 118 Jackson street, Freeport, Ill., has designed and built a special machine which drills the holes and faces both ends accurately without changing the rod in the jig or the drill or tools. The principal part of the machine is two adjustable heads gibbed to a solid bed. One of these carries the drilling spindles and the other has the spindles in which the facing tools for the ends of the rods are placed. The pieces are placed in a jig that is clamped firmly during the operation of drilling and facing, and after the rod has been set an eccentric lever on two projecting arms is locked, thus giving additional support to the rod for high speed drilling. The small end of the connecting rod is drilled first, and while this is being done the sides of the large end are faced concentric with the holes. When these operations are completed the lever is opened and the jig swung through an arc of 180 degrees against an adjustable stop. The ends of the rod are again clamped by the eccentric lever and the large end is drilled while the operator faces the small end. All the spindles are in perfect alignment with the jig carrying the connecting rod, and thus absolute accuracy is assured. An adjustable positive stop of hardened steel is placed in each end of the trunnion jig for the facing tools, and each end of the rod as it is swung from one position to another carries with it its own stops, so that all dimensions are duplicated when once the proper setting is made. As only a slight variation exists in the holes of ordinary connecting rods, the machine is provided with only one speed.

Oil Tube Drill.—A new oil tube drill, differing from those of this type formerly manufactured in having steel tubes for conveying the lubricant to the drill point instead of brass ones, has been recently placed on the market by the Standard Tool Company, Cleveland, Ohio. The increased speed of high-speed steel drills and the heavy cuts taken in refractory metals proved too severe for the brass tubes as they were readily cut and pulled out of place. The steel tubes, however, showed a marked improvement and after a thorough and exhaustive test under the most severe conditions the oil tube drill equipped with them has proved thoroughly efficient and reliable. These tubes are fitted to connect with the oil supply by a hole bored through the shank of the drill and the oil is forced through this hole and flows through the steel tubes, thus giving a constant supply to the cutting edges, which keeps them cool and forces out the chips. It is stated that the use of this type of drill will be found very satisfactory where deep holes are to be bored in steel or wrought iron and they can also be used to advantage in screw machines or in any tool fitted with means for supplying the lubricant. The hole in the shank can be threaded for a pipe connection if desired.

Motor Driven Screw Machines.—Garvin Machine Company, New York City, is equipping its standard No. 1 screw machine with a motor drive, the motor being mounted on a bracket at the rear so as to form an integral part of the machine. This use of the regular pattern of machine is advantageous in two ways, as orders can be executed more promptly and a motor-driven portable machine which can be set anywhere in the factory to suit conditions can be obtained at a moderate cost. The upper and lower cone pulleys are connected by an endless belt whose tension is regulated by the eccentric adjustment on the upper cone which runs loose on a shaft. As it is quickly operated this adjustment may be used for slackening the belt prior to shifting it to obtain changes in the speed. The upper cone pulley and the motor armature are connected by straight and crossed belts controlled by a shipper handle projecting from the front of the machine which makes the control very convenient for the operator. A ½-hp. motor running 1600 rev. per min. is used to drive the machine, which has a capacity for stock ⅝ in. in diameter, and is equipped with an automatic wire feed for feeding the stock through the spindle.

Tumbling Barrel.—The Abbott Ball Company, Hartford, Conn., is building a tumbling barrel for burnishing small metal goods by the use of steel balls. These machines are built in three sizes with any number of compartments from one to four, inclusive; the inside measurements of the different sizes of the compartments being 18 in. in diameter, with a 5-in. face, 24 in. in diameter and 7-in. face and 30 in. in diameter and 8 in. wide. The smallest size is designed more especially for manufacturing jewelers' use and the largest for manufacturers having quantities of such articles, such as saddlery hardware, buckles, hose supporters and cabinet hardware to burnish. The idea of the manufacturer in making the compartment narrow with a large diameter is that when the barrel is loaded with work and the burnishing balls, considerable pressure is exerted upon everything at the bottom of the load which increases the friction and gives a more rapid burnishing effect, as there is a long sliding space for the balls to slide over and under in and out of the work and at the same time any impact which tends to dent the work rather than burnish it is said to be avoided.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1 1/2 in. round and square ..... ₤ ₸ 1.90¢
1 1/2 to 4 in. X 1/2 to 1 in. ..... ₤ ₸ 2.10¢
1 1/2 to 4 in. X 1/4 to 5/8 ..... ₤ ₸ 2.10¢
Rods—5/8 and 11-16 round and square ..... ₤ ₸ 2.10¢

Angles:

3 in. X 3 in. and larger ..... 2.00¢
3 in. X 2 1/2 in. and 2 in. ..... 2.05¢
1 1/2 to 2 in. X 1/4 in. ..... 2.15¢
1 1/2 to 2 1/2 in. X 5/16 in. and thicker ..... 2.10¢
1 to 2 1/2 in. X 3/16 in. ..... 2.25¢
1 to 2 1/2 in. X 1/8 in. ..... 2.30¢
3 1/2 X 3/8 in. ..... 2.10¢
3 X 3/8 in. ..... 2.20¢
3 X 5/16 in. ..... 2.35¢
3 X 1/4 in. ..... 2.55¢

Tees:

1 in. ..... 2.05¢
1 1/4 in. ..... 2.15¢
1 1/2 to 2 1/2 x 1/4 in. ..... 2.15¢
3 1/2 to 2 1/2 X 3/16 in. ..... 2.35¢
3 in. and larger ..... 2.15¢

Beams ..... 2.10¢
Channels, 3 in. and larger ..... 2.40¢
Bands—1 to 6 x 3/16 to No. 8 ..... 2.20¢
"Burden's Best" Iron, base price ..... 2.15¢
"Burden's H. B. & S." Iron, base price ..... 2.95¢
Norway Bars ..... 3.60¢

Merchant Steel from Store—

per ₤

Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.50@2.60¢
Best Cast Steel, base price in small lots ..... 7¢

Sheets from Store—

Black

	One Pass, C R Soft Steel	R. G. Cleaned.
No. 8	₤ ₸ 2.90	3.00¢
Nos. 10 to 14	₤ ₸ 2.95	3.10¢
Nos. 16 to 18	₤ ₸ 3.05	3.20¢
Nos. 20 and 21	₤ ₸ 3.15	3.30¢
No. 26	₤ ₸ 3.25	3.40¢
No. 28	₤ ₸ 3.30	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₤ ₸ 12 @14½¢ net.
Patent Planished, "W" Drawers Wood ..... ₤ ₸ A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16 ..... ₤ ₸ 3.20¢
Nos. 22 to 24 ..... ₤ ₸ 3.55¢
No. 26 ..... ₤ ₸ 3.75¢
No. 28 ..... ₤ ₸ 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

	Per ₤
Nos. 22 and 24	5.50¢
No. 26	6.25¢
No. 28	7.50¢

Corrugated Roofing—

	Galvanized.	Painted	Gross Ton
2½ in. corrugated.			
No. 24	₤ 1.85 sq. ft.	$3.85	4.80
No. 26	₤ 1.60 sq. ft.	2.95	4.30
No. 28	₤ 1.40 sq. ft.	2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20 ..... $4.25
IX, 14 x 20 ..... 7.00
A, Charcoal:
IC, 14 x 20 ..... $5.00
IX, 14 x 20 ..... 6.5

American Coke Plates—Bessemer—

IC, 14 x 20 ..... $4.25
IX, 14 x 20 ..... 5.00

American Terne Plates—

IC, 20 x 28 with an extra coating $8.50
IX, 20 x 28 with an extra coating 10.50

Seamless Brass Tubes—

Last November 13, 1908 ..... Base price 18¢

Brass Tubes, Iron Pipe Sizes—

Last November 13, 1908 ..... Base price 18¢

Copper Tubes—

Last November 13, 1908 ..... Base price 32¢

Brazed Brass Tubes—

Last August —, 1908 ..... 19¾¢ ₤ ₸

High Brass Rods—

Last August 1, 1908 ..... 14½¢ ₤ ₸

Roll and Sheet Brass—

Last August 1, 1908 ..... 14¼¢ ₤ ₸

Brass Wire—

List August 1, 1908 ..... 14¼¢ ₤ ₸

Copper Wire—

Base Price, ... carload lots net 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity ..... 18¢ ₤ ₸
Sheet Copper Cold Rolled, 1¢ ₤ ₸ advance over Hot Rolled
Sheet Copper Polished 2 in. wide and under, 2¢ ₤ ₸ square foot
Sheet Copper Polished over 24 in. wide, 2½¢ square foot
Planished Copper, 1½¢ square foot more than Polished

METALS

Tin—

Straits Pig ..... ₤ ₸ 35 @35¾¢

Copper—

Lake Ingot ..... ₤ ₸ 14¾@15 ¢
Electrolytic ..... ₤ ₸ 14½@14¾¢
Casting ..... ₤ ₸ 14¼@14½¢

Spelter—

Western ..... ₤ ₸ 6¼@6½¢

Zinc.

No. 9, base, casks ..... ₤ ₸ Open ..... ₤ ₸ 5½¢

Lead.

American Pig ..... ₤ ₸ 5 @5¼¢
Bar ..... ₤ ₸ 6¾@6¾¢

Solder.

½ x ½, guaranteed ..... ₤ ₸ 22 @22½¢
No. 1 ..... ₤ ₸ 19 @19½¢
Refined ..... ₤ ₸ 17¼@17½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₤ ₸ 10¢
Hallett ..... 10¢
Other Brands ..... 9@9½¢

Bismuth—

Per ₤ ..... $2.00@$2.25

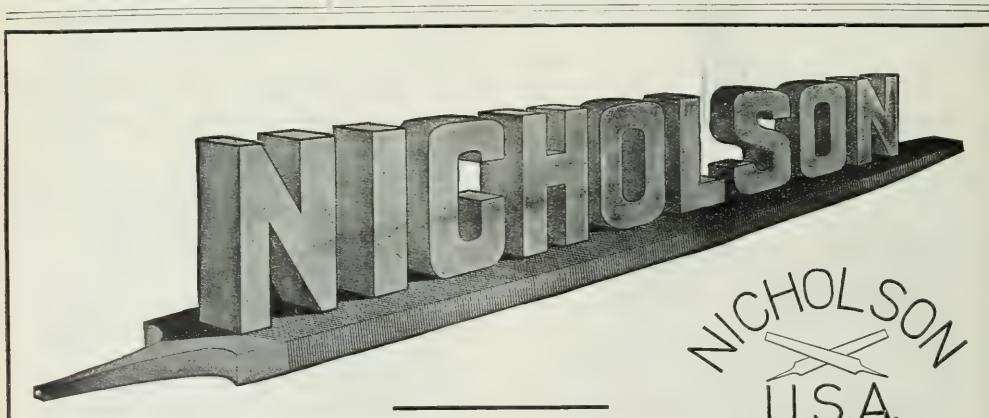
Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₤ ₸ lb 10.75@11.00
Copper, Heavy and Wire	₤ ₸ lb 10.50@10.75
Copper, Light and Bottoms	₤ ₸ lb 9.50@ 9.75
Brass, Heavy	₤ ₸ lb 7.25@ 7.50
Brass, Light	₤ ₸ lb 5.75@ 6.00
Heavy Machine Composition	₤ ₸ lb 9.00@ 9.25
Clean Brass Turnings	₤ ₸ lb 7.00@ 7.25
Composition Turnings	₤ ₸ lb 8.25@ 8.50
Lead, Heavy	₤ ₸ lb @ 3.50
Lead, Tea	₤ ₸ lb @ 3.25
Zinc Scrap	₤ ₸ lb @ 3.75



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THE IRON AGE

Established 1855 | New York, August 18, 1910 | Vol. 86: No. 7

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.00 per Annum, to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

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Consumption Still Large

Underestimated Because of the Shrinkage in New Orders

The stagnation in iron and steel markets continues to contrast sharply with the large tonnage that is moving from blast furnaces and rolling mills to distributers and consumers. New orders are as deceptive as a measure of consumption, now that buying is for immediate needs, as they were in the fall of 1909, when on a rising market contracts were made running months ahead.

That prices have not yielded under continued dullness is due to the months of profitable business the mills have had, and to the fact that as a rule buyers are still taking full shipments under their contracts. There is no indication of any survival-of-the-fittest campaign for orders at cut prices.

The closing down of the steel plant and wire mills of the Pittsburgh Steel Company at Monessen until September 1 has been given undue importance as an index of conditions, in some comments of the week. On the other hand, one large steel interest at Pittsburgh reports that its specifications and new orders thus far in August have been more than in the corresponding part of July.

The gradual adjustment of production to consumption is indicated in the case of the United States Steel Corporation by the fact that 41 of its blast furnaces are now idle, against 39 August 1, 35 July 1 and 31 June 1. The two furnaces blown out this month are at McKeesport, Pa., and Lorain, Ohio. Meantime the various steel companies are eating into their stocks of pig iron.

The principal rail order reported is for 10,000 tons for the National Railways of Mexico taken by the Lackawanna Steel Company in close competition. These lines are expected to make further purchases this year. The Illinois Steel Company has taken a domestic order for 9000 tons of Bessemer rails.

After many months the water supply line for the Portland, Maine, district is up, and alternative bids will be opened September 12 for cast iron and steel pipe. In cast iron 42-in. pipe is called for, the total being 21,500 tons. If riveted steel pipe is decided on, about 16,000 tons of plates will be required.

In steel bars while 1.40c. is the market on large contracts, the mills have closed considerable business at 1.45. Concrete reinforcing bars have been rather active in several markets. Bar iron is weaker. An effort to revive an organization of Eastern iron rolling mills on the lines of the old Eastern Bar Iron Association has been unsuccessful.

Pig iron buying has become even more contracted. A few large melters have made offers under the lowest prices actually done, but furnaces have promptly refused them. That the furnaces have accepted a cer-

tain amount of business at the low prices of recent weeks does not mean that they can come out whole at this level. Thus far the shipments made on higher priced orders have compensated in part. But as old contracts run out there is no such equalizer, and a situation is created that will bear close watching. If it should force further cutting down of production the withdrawal of present prices might be rather abrupt.

In response to inquiries from a large pig iron selling firm 159 foundries report that they are melting as much iron as in 1907, while 202 report a larger and 174 a smaller melt. The net increase for those reporting is put at 1.2 per cent.

"Scientific" and Practical Tariff Making

Impatience has been expressed in some quarters at the arrangements for extending over a period of two years the work of the tariff experts provided for by the last Congress. We are told that the burdens the people are bearing as a result of the failure to make a "scientific" revision of the tariff last year should not be so long continued and that the only real relief is quick relief. In reply, those who have made such large promises for the perfectly adjusted tariff which the President's investigators will be able to suggest say that two years is not too long to wait. In fact, a recent newspaper article, purporting to represent the views of the President, definitely stated that the tariff experts would submit within two years recommendations for the revision of certain schedules.

The importance of tariff legislation as a factor in the raising or lowering of prices of many American products has been exaggerated. Not only so, but there is just now an amazing amount of credulity as to what can be done by a cost finding investigation of home and foreign industries. The doctrine has been laid down that a protective duty should represent the difference between the home and foreign cost of manufacture plus a "reasonable profit." What home cost is to be taken, in the case of steel billets, for example? The cost at Pittsburgh, Philadelphia, Birmingham, Pueblo or at the new steel plant at Irondale, Wash.? Shall it be the cost to a self-contained steel company, owning ore, coal, railroads and vessels; or to one having none of these, though operating its own blast furnaces; or, again, to one that must buy its pig iron in the market? And when it comes to foreign works, will the comparison be with British, German, Belgian or French works? With those best located for low assembling costs, or those located at or near shipping ports, though remote from fuel or ore? Since costs also depend upon trade conditions, will those for the United States be the costs of 1898, of 1906 and 1907, or the average for, say, a 10-year period? And which 10-year period? And will freights to the districts of largest consumption figure in the computation or will they be ruled out as having no relation to works costs? And how will the new tariff experts come any nearer to the foreign steel makers' costs than were the figures secured abroad by Chairman Payne's special agents?

As to the question of a "reasonable profit," there is about the same fitness in a tariff expert settling it as in a government "economist" making a physical valuation of a railroad as a basis for determining the reasonableness of a freight rate.

But assuming that the Tariff Board has made its recommendations, and assuming, as we must, that it has analyzed with fine discrimination the yields of various industries and determined their reasonableness, the work of the real tariff makers has then only begun. We have seen no plan put forth as yet for the passing of expert judgment on the "reasonableness" of the various State and district demands for protection which in the final trying out give many tariff schedules the form in which they go on the statute books. In the past where "scientific," which is to say theoretical, tariff rates have come in conflict with practical schedules—those which have grown out of experience or that are advocated by States or districts whose representatives regardless of party lines are willing to co-operate with those of other States and districts—usually the scientific schedules have been voted down. In so far as the tariff is a local question, to that extent will the programmes of party platforms and the recommendations of experts always be subject to modification. Those who have been so free with promises of scientifically graded reduction will find that the tariff is still a first-class problem in practical politics.

Overbuilding of Vessels and Steel Works

A text is made by the *Marine Review* of the fact that in this season of the largest iron ore movement on the Great Lakes, nearly 6,500,000 tons more being brought down up to August 1 than in the same period of the record year 1909, 20 per cent. of the fleet has been out of commission. With the same percentage remaining idle, it would still be possible to move 50,000,000 tons of ore this year, though, as we have already indicated, owing to the state of the iron trade no such total is probable. The plain conclusion is that with a capacity for carrying more than 60,000,000 tons of ore there are too many boats. This is a condition to which the lake trade is no stranger. The last year in which it was brought home forcibly to the vessel owning interests was 1904. Since that year the building of bulk freighters has gone on at an astonishing pace. We are told that

> The readiness with which they all found profitable employment naturally attracted the promoter who was always anxious to help a good thing along. Ships were built that probably would not have been built normally. It has required such a season as this, when the volume of trade moved is the heaviest on record, to emphasize the fact beyond all argument that shipbuilding has been overdone. There will be no more ships built by the promoter for the present. Any one that goes about with a prospectus showing glittering profits will pour his tales into deaf ears. Shipbuilding for some time to come will be confined to the iron ore producing steel making companies which can use them in their own business.

While no parallel is found in the steel industry to this stimulation of lake vessel building by promoters' methods, there is a parallel situation in the production in the past 12 months of a record tonnage of iron and steel with capacity existing at the same time for a still larger output. Usually, when excessive capacity is complained of, production is on a scale considerably less than the record. It is the concurrence of the greatest production the industry has known with a capacity, represented by modern and highly efficient plant, much beyond the consumptive demand, that has made 1910 so unique in its disappointments. In the last period of prosperity in the iron trade profits were accumulated, permitting large expenditures by the leading com-

panies in building new and adding to old works. At the same time there has been improvement in practice, always a factor in this country, and which every year makes an addition to output equal to the producing capacity of a certain percentage of new plant. On the lakes this is represented by the increased rapidity of loading and unloading ore vessels, the latter due to better equipment at receiving docks, and the former to the special construction of vessel hatches. It has made a measurable addition to the number of trips a vessel can make in a season, and has had the same effect on the freight situation as the building of a certain number of new boats.

What must take place in the steel industry as in the lake trade is a growing up of demand to capacity, and a necessary element in such growing up is time. Meanwhile the building of new steel works as well as the building of new ore carrying vessels will wait on the process of absorption.

The Automobile and the Farmer

One of the significant incidents of the year has been the enormous number of automobiles purchased by farmers. To the average man in the city the automobile is merely a luxury, and a very expensive one. What he is obliged to pay simply for storage is a formidable item. Accidents on crowded streets are frequent and costly. Repair men are quick to take advantage of a customer who is unfamiliar with machinery. It is probably not unfair to say that there are now in use in the large cities more automobiles than there are people who can really afford the outlay for a mere luxury.

In the country, however, the city man's toy becomes an economic investment, which brings satisfactory returns on its cost. The farmer's time is valuable. Nature allows him only a few days in which to harvest any particular crop, and his season is correspondingly short in planting and seeding. In a critical period, when conditions are most favorable for planting or harvesting, the time that the automobile saves in necessary errands makes it an economic agency of production. The mere saving of time, however, is only a small part of the usefulness of the automobile in the country. A few years ago there was much pessimistic talk about the tendency of farmers to "retire" and live in small towns on the rent received from their land. The automobile is now keeping the owner on his land. His family, which wanted to live in town for social advantages, has discovered that it is more satisfactory to enjoy the full income of the farm and own an automobile which can run to the city in the time that would be spent in walking a few blocks than to pay rent and other expenses of living in town. The rural mail delivery, the telephone and the automobile give to the family in the country, owning a good farm, the command of social advantages that are enjoyed by only a few of the people who live in cities. The field of trade that has thus been opened to the automobile manufacturer is almost unlimited.

The remarkable success of the automobile makers in selling their product to the farmers may suggest an opportunity to manufacturers in many other lines who have overlooked the possibilities of agricultural trade. The American farmer of to-day is not the man of even 25 years ago. In the period that followed the Civil War, until about 1890, the area under cultivation increased more rapidly than population in the United States. Overproduction during this period caused a disastrous decline in prices, which was accelerated by a large expansion of wheat growing in Russia, Argentina and India. Since 1890 population in the United States has increased faster than the area under the plow, and during the past 15 years the farmer has profited by an almost continuous advance in the average of agricultural prices. The demand for farm products is increasing more rapidly than the supply, and the farmer will profit more and more from this condition in years to come. Farmers who have paid cash for automobiles this year may have needed credit on a $15 road cart 20 years ago, and they will be equally liberal in the future in patronizing manufacturers or merchants who can offer them substantial value for their money.

Centralizing the German Pig Iron Trade

As is indicated in our German market letter the movement to organize the pig iron producers of Germany and Luxemburg into a syndicate has fallen through, though for some weeks the trade had been hopeful of its success. The question of allotments was the rock on which the whole scheme split, as it will be the most threatening of all the questions the steel works syndicate must face when its renewal comes up two years hence. However, a pig iron selling agency covering the product of certain districts has been arranged, and its first move was expected to be an advance in the price of pig iron for 1911, seeing that the Coal Syndicate has decided to advance coke 1.50 marks. The ability of the new selling organization to control the pig iron situation even in the districts to which it will confine itself is doubted. One feature, which will be watched for its bearing on the market in the United States, is that this pig iron agency will represent a large part of the German production of ferromanganese and ferrosilicon. This fact has already resulted in a firmer market for those products, and in the case of ferrosilicon it has been agreed to book no orders for 1912 before October 1.

The Brussels Exposition Fire

The long expected has happened. A great universal exposition has been ravaged by fire. But this first experience, instead of taking place in the United States, occurred in Europe, whence originated the savage attacks on our inflammable construction whenever a world's fair has been held here, from the Centennial Exposition at Philadelphia, 34 years ago, down to the last effort of this kind. The fire at the Brussels Exposition, which occurred August 14, was a calamity which will be universally deplored. The financial loss is not so great as was at first feared, but it will be heavy enough, probably approximating $20,000,000, but many articles of historic interest were burned which can never be replaced. The world has thus suffered irreparable loss, not only in the destruction actually wrought at Brussels, but in the probable refusal hereafter by owners of rare and curious objects of ancient and modern art to permit them to be placed on view at expositions, for the edification of the masses. It would, of course, be possible to insure safety from fire by the

erection of fireproof buildings, but this would require such a heavy outlay that the cost would be prohibitive.

Drilling Machine Nomenclature

Some of the manufacturers of drilling machines are making the effort to eliminate the word "drill," as applied to a machine. Custom has established the word in the vernacular of the trade. But a drill is a small tool. The machine in which it is employed might as correctly be called a "driller" as a milling machine a miller. No one has ever called a milling machine a "mill." Drill press is an entirely proper expression for vertical machines, even to those of the larger sizes, though, as a general rule, the name is given to the smaller and medium types. It is seldom if ever used in connection with a horizontal machine. "Drilling machine" is applicable to all types, and probably would be accepted as the best usage. Vertical drilling machines and horizontal drilling machines make the necessary distinction. In referring to the sensitive types, the expression "sensitive drill press" may be preferred by many. No one will dispute the contention that the word "drill" should be wiped out of trade parlance as applied to machinery.

The Foundry Pig Iron Trade

Result of the Canvass Made by Hickman, Williams & Co.

Hickman, Williams & Co. recently addressed a letter of inquiry from their Cincinnati office to a large number of foundrymen on the condition of the foundry trade. The purpose of the inquiry was to draw out the views of those addressed on the cause of the present depression and their suggestions as to a remedy for it, and to get a comparison of existing conditions with those in the active period of 1907. The firm has favored us with a copy of its digest of the replies, from which the following extracts are taken:

To the circular sent out by us on August 2 we have received something over 700 replies. In some cases answers were made to all the questions asked and in others to but one or more. We have classified these answers as best we could and trust the results will prove as interesting to our correspondents as they have to us.

The reasons given in answer to Question No. 1, "To what do you attribute the present depression in the iron market?" are:

174. Say no opinion to express.
185. Overproduction of iron.
32. General business depression.
5. Lack of confidence.
17. Lack of confidence in business outlook.
25. Too much politics and political agitation.
20. Legislation adverse to railroads and large corporations.
20. Uncertainty of crops and poor crop failure.
7. General speculation in Wall Street.
37. Prices too high.
4. Overpurchases last fall.
26. Large force of jobbers last fall, bringing about an ill-advised boom.
8. Lack of broad buying.
28. Inability of railroads to raise money on securities.
45. Combinations formed out of the market to influence legislation.
16. Anti-trust laws.
2. Concerted attack on motor industry.
2. Monopoly and special privileges.
4. Lack of confidence in Washington.
2. General dissatisfaction with new tariff law.
42. High wages and high cost of living.
7. Labor unions and unsettled labor conditions.
5. Short age of skilled labor.
2. Strikes.
2. Personal matters.
4. Present small stocks in users' hands.
2. Competition from people that don't know their true costs.
8. Unsettled financial conditions.
Poor local market.
4. Uneasiness among Eastern bankers.
3. Shortage of money and tight money markets.
4. Speculation in iron by dealers and users.
8. Manner in which iron is sold.
2. Lack of competition in iron ore.

The replies to Question No. 2, "What remedy do you suggest?" were not as numerous and are shown under the following heads:

18. Good crops.
170. Cut down production.
24. Less political agitation against railroads.
12. Keep politics out of business.
8. Less interference with business by the Government.
5. Revise tariff downward.
8. Cut out speculative purchases.
4. Change system of selling iron.
3. Sell iron for nearby delivery only.
2. Sell iron for a season ahead.
5. Less trade unionism.
2. Open shops.
2. Cut out Wall Street influence.
2. Send business men, not politicians, to Washington.
3. Readjustment of cost of labor, material, food and clothing.
2. More trust busting.
4. Less trust busting.
2. General economy.
3. Stay on the job.
109. Wait.
40. Time and patience.

Tabulating replies to Question No. 3, "Is your general business as good as it was at this time in 1907?" and Question No. 4, "Are you melting as much iron as you were then?" we find:

159. Business the same.
202. Business better.
174. Business worse.

We find the average increase reported, 27.5 per cent.; average decrease reported, 29.2 per cent. As there are a greater number showing increases than decreases, we find that the total net increase is 1.2 per cent.

We have also classified the replies according to the several lines represented and give below summary of reports:

	Same.	More.	Less.	Total.
Machinery and specialties	40	45	41	127
Engines and boilers, pumps, &c	11	16	15	42
Stoves, ranges and hollow ware	17	29	19	65
Agricultural implements, plows, &c	19	31	13	63
Cast iron, water and gas pipes	3	3	0	6
Railroad equipment	7	0	3	10
Soil pipe, sanitary ware and building material	13	12	6	31
Steel castings	3	5	3	11
Jobbing and general foundries	39	51	56	137
Steel works, rolling mills, &c	11	4	8	23
Malleable iron castings	5	8	7	20
Totals	159	202	174	535

Pig Iron Stocks at Steel Works

In the editorial in *The Iron Age* of August 11, page 298, on "Pig Iron Stock Statistics and Their Value," the statement was made that "the figures of stocks at steel works furnaces were never collected even in the days of publicity." What was in mind was that the monthly statistics of pig iron stocks published by *The Iron Age* up to the fall of 1905 did not take account of steel works stocks. It should be said, however, that the pig iron stock statistics collected by the American Iron and Steel Association for 30 years preceding 1905 did take account of certain stocks at steel works furnaces. These statistics, which were published annually and for most of the time semiannually, included such stocks of pig iron in the hands of steel companies as were not intended for their own consumption—that is, stocks which these companies expected to sell in the market. In more recent years, as is well known, the steel companies have had very little iron to sell, and the foundry iron produced at Bay View, Wis., at a few furnaces owned by Central Pennsylvania companies, and at the Bessemer, Ala., furnaces of the Tennessee Coal, Iron & Railroad Company has been an insignificant percentage of the total product of the companies in question. The important points in the matter are that the steel companies' stocks of steel making iron for their own use have never been published, and that in recent years the steel making pig iron production of these companies has grown to be more than two-thirds the country's pig iron total.

The business and manufacturing property of the late Henry E. Pridmore, manufacturer of molding machines, Chicago, has been disposed of in court by the trustees of the estate. Mrs. Emily M. Pridmore, widow of the deceased, and her son, Henry A., are the purchasers. Mrs. Pridmore has assumed active charge of the company. This transaction affects the disposition of that portion of the Pridmore estate which was involved in the conduct of the business by the trustees.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Aug.17, 1910.	Aug.10, 1910.	July20, 1910.	Aug.18, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.00*	$16.00	$16.25	$17.25
Foundry No. 2, Southern, Cincinnati	*14.25*	14.25	14.75	16.25
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.00
Basic, delivered, eastern Pa.	*15.00*	15.25	15.75	17.25
Basic, Valley furnace	*14.00*	14.25	14.50	15.25
Bessemer, Pittsburgh	*16.15*	16.15	16.40	16.90
Gray forge, Pittsburgh	*14.25*	14.40	14.40	15.15
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*24.50*	24.50	25.00	24.00
Forging billets, Pittsburgh	30.00	30.00	30.00	28.00
Open hearth billets, Philadelphia	*27.50*	27.50	28.50	27.00
Wire rods, Pittsburgh	*28.00*	28.00	29.00	31.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**13.50**	13.50	13.00	16.00
Steel rails, melting, Philadelphia	*13.75*	13.75	14.00	17.00
Iron rails, Chicago	*16.00*	16.50	16.75	18.50
Iron rails, Philadelphia	*18.00*	18.00	18.50	19.75
Car wheels, Chicago	*14.50*	14.50	14.75	16.00
Car wheels, Philadelphia	14.00	14.00	14.00	16.00
Heavy steel scrap, Pittsburgh	*14.25*	14.25	14.50	16.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	15.00
Heavy steel scrap, Philadelphia	*13.75*	13.75	14.00	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents	Cents.
Refined iron bars, Philadelphia	*1.42½*	1.42½	1.45	1.45
Common iron bars, Chicago	1.40	1.40	1.40	1.40
Common iron bars, Pittsburgh	*1.45*	1.45	1.50	1.50
Steel bars, tidewater, New York	*1.56*	1.56	1.61	1.51
Steel bars, Pittsburgh	*1.40*	1.40	1.45	1.35
Tank plates, tidewater, New York	1.56	1.56	1.56	1.56
Tank plates, Pittsburgh	1.40	1.40	1.40	1.40
Beams, tidewater, New York	1.56	1.56	1.56	1.56
Beams, Pittsburgh	1.40	1.40	1.40	1.40
Angles, tidewater, New York	1.56	1.56	1.56	1.56
Angles, Pittsburgh	1.40	1.40	1.40	1.40
Skelp, grooved steel, Pittsburgh	1.50	1.50	1.50	1.35
Skelp, sheared steel, Pittsburgh	1.60	1.60	1.60	1.45
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.20*	2.20	2.30	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	13.00	12.62½	13.62½
Electrolytic copper, New York	**12.62½**	12.62½	12.25	13.25
Spelter, New York	5.20	5.20	5.20	5.75
Spelter, St. Louis	5.05	5.05	5.05	5.60
Lead, New York	4.40	4.40	4.40	4.37½
Lead, St. Louis	**4.30**	4.30	4.25	4.25
Tin, New York	**33.85**	33.37	33.25	30.02½
Antimony, Hallett, New York	7.95	8.00	8.00	8.12
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c. plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 5 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.15c. to 2.20c.; No. 28, 2.20c. to 2.25c.; No. 29, 2.25c. to 2.30c.; No. 30, 2.35c. to 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c.; No. 29, 3.45c. to 3.50c.; No. 30, 3.65c. to 3.70c. Painted roofing sheets, No. 28, $1.65 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	50
⅜ in.	71	57	67	56
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	70	56	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	65	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	-	-
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1½ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c., base; cone head boiler rivets, ¾-in. and larger, 2.25c., base; ⅞-in. and 11-16-in. take an advance of 15c., and 1-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, August 17, 1910.—(*By Telegraph.*)

Pig Iron.—No important transactions in Bessemer are reported, and the market remains quotable at $15.25, Valley furnace. A sale was made of 1000 tons with a particular analysis, for which a premium of 25c. was paid, making the price $15.50. Another sale of 800 tons, September to December, inclusive, was made to a steel casting company under special conditions. A sale of 1000 tons of basic was made to a consumer for early delivery at $14, Valley furnace. Several sales of forge have been made at prices under those lately quoted, the most important being 5000 tons to a Pittsburgh consumer for delivery over the remainder of the year at $13.35, Valley furnace, or $14.25, Pittsburgh. One of the two Hubbard furnaces will blow out this month for relining, the other remaining in blast indefinitely. We quote at Valley furnaces, 90c. higher delivered Pittsburgh: Bessemer, $15.25; basic, $14; gray forge, $13.35 to $13.50; No. 2 foundry, $14.25; malleable, Bessemer, $14.50.

Steel.—Makers report a slightly better inquiry for billets and steel bars, but actual sales have been light and minimum prices are not quotably changed. We quote, f.o.b. maker's mill Pittsburg, Wheeling or Youngstown districts: Bessemer billets, $24.50; Bessemer sheet bars, $25.50; open hearth sheet bars, $26.50 to $27; forging billets, $30.

Wrought Pipe.—No important line pipe business has been placed, but a large aggregate of small inquiries is being figured on. Because of the continued idleness of a majority of the puddling furnaces iron pipe has become relatively scarce. Prices are absolutely maintained. One producing interest has practically withdrawn its quotation, while another producer has been inquiring for muck bar in the open market.

(*By Mail.*)

On the whole the iron and steel market is still phenomenally dull, but slight evidences of improvement are noted here and there. Thus a large steel interest finds its specifications and new orders so far this month make a slightly larger total than in the same portion of July. The tone of the market appears slightly better, prices not yielding to the dullness as might be expected. The most striking feature of the situation is obviously the large tonnage of material which is moving from furnace and mill to consumer, despite the market stagnation; while production has shown a slight further decrease since the beginning of the month, for months past the trade has been surprised at the way in which the tonnage keeps up. Buying, of course, is only from hand to mouth, and even in wire products, where the tonnage on books had dropped to a minimum, there is scarcely any buying for the fall trade, although buying for current requirements makes a fair total weekly. Some hopes are expressed that the progress being made in rate adjustments, whereby the railroads will be allowed to make some advances, will result in heavier orders in the near future, but these hopes are not general, the usual opinion being that little buying can be expected from the railroads until after the elections. In cars the railroads are still due to absorb a large tonnage of steel this year, as the two leading car builders are understood each to have about 10,000 cars on their books, sufficient to maintain full operations at 100 cars each daily until the end of the year. The Pittsburgh Steel Company on Saturday closed its steel and wire plant at Monessen for repairs, to open September 1. The plant was closed June 30 with the expectation of being down during July, but started after a few days. The wage matter between the independent puddling interests and the United Sons of Vulcan has not been settled. The Amalgamated Association has not adopted any fresh policies following the per capita vote to continue the strike against the leading sheet and tin plate interest, and this situation presents no new features nor any that are of interest to the market.

Ferromanganese.—Inquiry continues light and prices are maintained at the previous level, $39 to $39.50, Baltimore, for prompt delivery.

Ferrosilicon.—While the inquiry continues fairly good, transactions are not heavy. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh, and blast furnace ferrosilicon as follows: $23 for 10 per cent., $24 for 11 per cent. and $25 for 12 per cent., f.o.b. Jisco and Ashland furnaces.

Rods.—With little inquiry, prices are unchanged, at $28 to $28.50 for Bessemer and $28.50 to $29 for open hearth, Pittsburgh.

Skelp.—New buying in skelp is limited, and quoted prices are not severely tested. Specifications are fairly good and a large tonnage is moving on old contracts. We quote for ordinary widths and gauges: Grooved steel skelp, 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c.; sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—Buying is restricted and the rail market presents no interesting features. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c. and splice bars at 1.50c., at mill.

Structural Material.—New business continues of small volume and prices on fabricated material hardly let the fabricator out, when paying 1.40c. for plain shapes. The shops are fairly busy with work which will keep them two or three months. We quote beams and channels, 15-in. and under, at 1.40c. to 1.45c., Pittsburgh.

Plates.—As noted above, the two largest steel car builders are practically filled with work to the end of the year, while the smaller interests have a fair amount of business on books, so that plate deliveries to this class of consumers promise to be well maintained. As much cannot be said of the lake shipbuilding trade, prospects in which are poor because with the largest freight movement on record many boats are tied up. Mills making a full range of sizes maintain 1.40c. as a minimum quotation, and occasionally obtain 1.45c. on less desirable business, while occasionally small mills making only a limited range of sizes cut the 1.40c. price by 50c. or $1 a ton.

Sheets.—The shading on galvanized sheets has increased slightly in the past week or 10 days, and in most cases reaches $5 a ton, making galvanized sheets 3.25c., while black sheets are quotable regularly at 2.25c., or $3 a ton off the nominal price, although 2.20c. is occasionally done. Corresponding shading is done on corrugated material, nominal prices for which are $1.70 a square on painted and $3 a square on galvanized, 28 gauge.

Tin Plate.—While the general per capita vote of the Amalgamated Association, announced last week, was in favor of continuing the strike against the leading sheet and tin plate interest, the vote at the La Belle tin plate plant at Wheeling was in favor of calling it off, the Aetna-Standard sheet plant and the Martins Ferry tin plate plant, the other two of the three Wheeling district plants which are idle, being in favor of continuing it. Mills continue behind in tin plate deliveries, although there is relatively little new business, and the present production rate promises to continue indefinitely, as all producers are booked far ahead. The market is absolutely firm at the regular price of $3.60, Pittsburgh, for 100-lb. cokes, premiums up to 15c. per box being sometimes paid for small lots for quick shipment.

Bars.—New business in both steel and iron bars is extremely light, but specifications continued good on steel bar contracts. The mills continue to maintain 1.40c. as the absolute minimum on steel bars, and on less desirable business frequently obtain 1.45c., while one important producer just east of Pittsburgh is maintaining 1.45c. as a minimum. We continue to quote iron bars at 1.45c. to 1.50c., Pittsburgh. There is practically no puddling being done in the Pittsburgh district on account of the scale disagreement with the Sons of Vulcan, but some finishing departments in the mills are running. The valley and other iron mills of the Republic Iron & Steel Company are running, but not at full capacity.

Spelter.—The market has stiffened by producers marking up prices, although demand has been relatively light. We quote 5.12½c., East St. Louis, or 5.25c., delivered, Pittsburgh.

Hoops and Bands.—The leading interest is operating practically all its hoop mills, chiefly on old business, new buying being comparatively light. We quote hoops at 1.50c. to 1.55c., and bands at 1.45c. to 1.50c., the latter with extras on the steel bar card.

Spikes.—The new demand for spikes is light, and, while old contracts have been well specified against right along, there is not a great deal of this business left. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. Some producers refuse to go below 1.55c. on any business, but on really attractive business it is not certain that even 1.50c. would not be shaded by some producers. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, for carload and larger lots.

Rivets.—Very little new business is being placed. Official prices, which are sometimes shaded on desirable business, remain at 2.15c. for structural rivets and 2.25c. for boiler rivets, f.o.b. Pittsburgh.

Shafting.—Specifications on old contracts for shafting continue good, except from the automobile trade, while new business is light. Regular discounts on shafting are 55 per cent. off list in carload and larger lots and 50 per cent. off

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in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded by an additional 5 per cent.

Wire Products.—Buying of plain and barb wire and nails is fairly good, but represents only the meeting of immediate requirements, there being very little ordering for the regular fall trade. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65 to $1.70, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—Since the large orders for line pipe, recently placed, little has been done in this grade, and merchant pipe is also slow, as some of the jobbers still have considerable stocks. The mills are holding prices very firm on merchant steel pipe, while wrought iron pipe discounts are fairly well maintained.

Boiler Tubes.—The demand for boiler tubes has shown a slight decrease in the past week or two, and regular discounts continue to be shaded.

Coke.—The new demand for coke has been light. Contracting for foundry coke has fallen off, and there is no interest in furnace coke contracts. Small prompt lots continue to command full prices, there being little coke pressing on the market. Production and consumption appear to be well balanced. The Connellsville *Courier* reports the weekly production at 406,505 tons, a decrease of 3000 tons from the previous week. The average since May 1 has been about 400,000 tons weekly. We quote standard grades of Connellsville coke at $1.65 to $1.70 per net ton, at oven, for prompt furnace, $1.75 to $1.85 for contract furnace, $2.15 to $2.25 for prompt foundry and $2.25 to $2.50 for contract foundry.

Iron and Steel Scrap.—It is understood that very little heavy melting steel was due at Monessen when the largest plant at that point shut down last Saturday, and its closing until September 1 will hardly bear the market. Very little is being done in the scrap market, and we quote prices substantially unchanged, as follows, per gross ton, Pittsburgh:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.75 to 10.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.75 to 14.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	21.00 to 21.50
Steel car axles	19.00 to 19.50
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.50
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.50 to 7.75
Machine shop turnings	9.25 to 9.50

The Whitney-Kemmerer Company, Oliver Building, Pittsburgh, has been appointed sales agent for Pittsburgh and vicinity by the Dunlap-Connellsville Coke Company, Connellsville, Pa.

Chicago

FISHER BUILDING, August 17, 1910.—(*By Telegraph.*)

There is little improvement in the tone of the Chicago market this week. While there is not much increase in the volume of business, there is a general feeling that conditions have improved somewhat. Unfavorable crop reports have ceased and recent rains throughout the West have improved the prospects for corn and pasture. The railroads are buying more material and supplies. Their orders generally specify small lots, but purchasing agents are unusually urgent in requesting immediate deliveries. As the mills cannot always give immediate shipment, an unusual amount of railroad material is being purchased from store. While the business of this character does not reach any large figures in quantity, the character of the buying is taken as an indication that railroad storekeepers' stocks are very low and that the railroads will be compelled to buy more liberally in the near future. An unusual run of specifications for plate girder bridges is helping out the plate mills, and the tone of the market in structural shapes is a little better. Some of the mills continue to get business at 1.45c., Pittsburgh, for soft steel bars, and it is understood in this market that the 1.40c. price is only done on very desirable business. The demand for concrete bars is becoming a still more important factor in the bar trade, and the bar iron mills are profiting by an increased demand from the railroads. New business in wire products is apparently coming in at a normal rate for the season. Shipments of merchant steel into this territory from the East continue heavy and are very near record figures. Sales from store last week showed a satisfactory average, the business being well distributed in all lines of material thus carried. One of the favorable indications in the market is that dealers in old material are beginning to express the opinion that prices have reached the bottom. This opinion is encouraged by the fact that several railroads which usually sell their scrap each month are now holding it for higher prices. There is a fair demand for copper and other metals.

Pig Iron.—The market continues very quiet. Actual sales are rare in both Northern and Southern grades, and requests to hold back shipments are becoming more troublesome to the furnaces. Buyers generally insist that they are covered for the remainder of the year and will not be in the market until they can buy for the first half of 1911. The local furnaces are holding for $16, at furnace, as their minimum price, equal to $16.50 for the average Chicago delivery, with switching charges paid. Stocks, however, are accumulating at the furnaces and there have been sales of off-grade iron from stock on which special prices have been allowed, giving rise to a great deal of talk that lower prices are being made than regular quotations. One sale of 2000 tons of malleable Bessemer is noted to a local malleable foundry for delivery during the remainder of the year, and a sale of 1500 tons of Northern foundry has also been made for early delivery. A Chicago buyer is in the market for a bargain in a round lot of silvery iron, the amount to be taken depending upon the price that can be done. Current quotations are maintained on small lots of high silicon iron, but it is understood that special prices are made on any inquiry for a round lot. The recent reduction in the recognized price of Southern iron has had no effect on buyers, who are showing no interest in the market except to make tentative inquiries for next year's delivery. A leading interest identified chiefly with Southern iron has made a careful canvass recently among foundry buyers to obtain their opinions of the market and data regarding any increase or decrease in the melt. More than half the replies in this territory show that the foundries are doing a larger business than at this time in 1907, while less than one-fourth report an actual decrease in their melt. Overproduction of foundry iron is considered by the majority as the reason for the depressed state of the market. The following quotations are for August and September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.65 to 18.15
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The market is relatively quiet at $29 to $30, base, Chicago, for open hearth forging billets.

Rails and Track Supplies.—No new business in standard rails is reported, but the railroads are taking full deliveries on their contracts for 1910. Spikes and track supplies are still in fair demand, but Western roads have generally covered their requirements for this summer. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—Evidence of returning confidence in business conditions is found in the fact that Mandel Brothers of this city have decided to go forward promptly with plans for erecting their new department store building. The contract for this building, amounting to about 10,000 tons, was let last winter, but detailed specifications have been held back until recently. The Atchison, Topeka & Santa Fe Railroad has given the American Bridge Company a contract for 1350 tons of bridges. Additional smelter construction for the Utah Copper Company, amounting to 460 tons, which was reported last week, has been relet to the Kansas Structural Steel Company. The fabricating interests have a large run of business in small highway bridges. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The plate mills in this district had a good run of specifications last week, principally from fabricating interests for material going into plate girders. No new car orders or inquiries are reported, and there is some doubt whether the Chicago & Alton will close promptly on inquiries which have been pending with the car builders for

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some time. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—There is a fair run of new business in open hearth sheets, with prices varying according to the tonnage purchased. The Inland Steel Company tried out one of its new open hearth furnaces last week, and will have the second ready for operation within a few days, thus assuring a larger supply of steel to operate its mills. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.48c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Cast Iron Pipe.—There is a very brisk demand from municipalities for small lots of water pipe for delivery this fall. The season is growing short in the northern half of the country for pipe to be laid this year, and this has apparently stimulated the current demand. The foundry interests are now looking forward to lettings of larger lots for shipment during the winter, but no important business of this character has been closed as yet. It is believed that a turn in the iron market would have considerable influence in hastening purchases for next year's delivery. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27.50; 6 to 12 in., $26.50; 16-in. and up, $25.50, with $1 extra for gas pipe.

Merchant Steel.—Manufacturers who use merchant steel are generally specifying at a normal rate, and shipments into this territory are running heavy. It is understood that in some cases automobile manufacturers are contracting for less material than they bought last year, the curtailment in a few cases amounting to 50 per cent., but, on the other hand, many of them are specifying for just as much material as they took last year at this season. The demand from store for all merchant steel products continues good. The railroads are buying a considerable amount of merchant mill products from store, in small orders for immediate delivery.

Old Material.—The market continues very quiet, with no change noted in prices this week except that old iron rails are quoted 50c. lower. There is a little better feeling among dealers, however, and they are very reluctant to sell short at the present level of prices. The principal lines of scrap are quoted lower now than at any time in several years, except the first half of 1908 and a short period in the spring of 1909. Last year at this time the railroads were very active in buying equipment and supplies, but their purchases have been light for the past two months, and the rolling mills and foundry buyers of scrap have been correspondingly reluctant to stock up with old material. Dealers also are carrying very light stocks at present in the Chicago district, so that any increase in the demand would be quickly felt in establishing higher prices. Several railroads which usually issue monthly lists are holding back their material in the expectation of obtaining higher prices in the near future. While there is a slight improvement in the feeling in the market, this is not reflected in current prices. One lot of rerolling rails was sold last week at $15, delivered at buyer's mill, the lowest price noted in this market since a year ago in May. This, however, was a distress sale, and the average going price is a little higher. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Factories which sell scrap usually receive 50c. to $1 less. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.25 to 10.75
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Rods and Wire.—The mill interests feel assured that stocks in the hands of jobbers and dealers were fully liquidated before the readjustment in prices last month. Buying is now on a consumptive basis, both in the manufacturing and jobbing trades. This season is expected to show the usual increase in the demand for fabricated fence. The barb wire business has been practically stationary for several years, and the annual increase in the product of the wire mills goes principally into field fence. New orders and specifications for August make a very satisfactory showing. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Bars.—There is quite a run of new business in bars, especially for concrete work. The Great Northern Railway has an inquiry out for 1500 tons of bars for concrete tunnel work in the Cascade Mountains, and there have been several inquiries lately for lots of 500 to 1000 tons of concrete bars. The wagon and agricultural implement manufacturers have been specifying liberally for their fall trade, which is apparently very satisfactory. The railroads have been buying a little more bar iron lately, and their purchasing agents are very urgent in getting immediate delivery of the small lots which they specify, indicating that stocks are running low in their car shops and stores. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

The business of the Gordon Iron Company, Chicago Heights, Ill., dealers in scrap iron and metals, has been incorporated with a capital stock of $10,000. The company has recently purchased a new yard with a trackage capacity of 20 cars, which it has equipped to handle everything in scrap iron and metals. It will also continue the operation of its old yards.

Philadelphia

PHILADELPHIA, PA., August 16, 1910.

A somewhat better feeling is observed in the various branches of the iron and steel trades. This is not due to any increased activity in buying, as transactions during the week have been extremely light, but rather to increasing interest on the part of consumers, who are beginning to feel round more actively for requirements during the remainder of the year and in some cases for early 1911 delivery. This is particularly the case with pig iron, prices for which are believed to be touching bottom. In finished materials the market drifts along without much change. Orders are still confined principally to small lots, with a fair volume of larger business still unplaced, consumers hoping for further concessions. In the majority of instances, however, makers are inclined to hold the present price level more firmly, although on sharp competition for desirable orders slight shading is reported. The old material market continues dull and there has been little movement in coke.

Pig Iron.—As far as actual sales are concerned, business shows no improvement. There is, however, a decidedly more hopeful feeling, and sellers anticipate a more active movement in the near future. Some consumers have come into the market for fair sized lots for early as well as forward delivery, but sellers are not particularly anxious to load up their books with low priced business and show a disposition to hold quotations more firmly. The cast iron pipe makers in this territory would place orders for probably 30,000 tons of low grade iron if their ideas of prices, ranging from 25c. to 50c. below the market, would be met; but producers have shown no inclination to meet their views. Inquiries for lots of several thousand tons of the higher grades of foundry iron have been reported, while the usual small lot demand continues about the average. That consumption is well maintained is being evidenced, sellers contend, by the fact that melters are taking deliveries freely, particularly in the foundry grades. Transactions in the standard eastern Pennsylvania brands of foundry iron have been confined to small lots, at prices ranging from $16 to $16.25, delivered, for No. 2 X foundry, with an occasional sale at $16.50. A sale of a moderate lot of soil pipe iron at $15, delivered in this district, is reported. Some sales of Virginia foundry iron at $13.25 to $13.50, furnace, for No. 2 X, are reported, this price being equivalent to $16 to $16.50, delivered in this district, dependent on delivery point. A sale of 2000 tons of off Virginia basic to a cast iron pipe works in that territory is reported. A minimum differential of 25c. a ton is maintained by producers of Northern irons, between No. 2 X and No. 2 plain grades, although some Virginia sellers make no differential between those grades at the lower price level. There has been some movement in forge iron. Several sales of 500-ton lots, for comparatively early delivery, have been made to rolling mills in this territory at $15, delivered. A small lot of Virginia forge was also sold to a buyer in eastern Pennsylvania at the same figure. Steel making grades show absolutely no movement. Basic iron is practically uncalled for and is nominally quoted

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at $15.25, delivered, although $15 could be done. One small consumer has been feeling the market, offering to purchase a small lot at 50c. under the market, but the inquiry is not being taken seriously. No sales of standard low phosphorus iron are reported. The following range about represents the market for standard brands, in moderate lots, for early delivery in buyers' yards, eastern Pennsylvania and nearby points:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.75 to 16.00
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	15.00 to 15.25
Basic	15.00 to 15.25
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—The market is extremely quiet, no demand being reported from consumers either in this territory or in the West. Prices are entirely nominal, but sellers' ideas range from $39, Baltimore, for prompt, to $40 for extended delivery. A number of sellers hold at still higher figures.

Billets.—Business during the week has been largely of a day to day character, confined to small lots for early delivery, consumers as a rule not being inclined to buy ahead. For miscellaneous business $27.50 to $28, delivered in this territory, about represents the market for ordinary open hearth rolling billets, although a concession of 50c. a ton could be had for moderate lots. Forging billets are being more freely inquired for and prices are firm at $29.50 to $30, Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—A fairly even demand for small lots is reported, and while incoming orders and specifications are sufficient in some cases to enable mills to maintain an even productive basis, other mills are understood to be in need of tonnage. Large inquiries are scarce, although there is some fair business in tank and structural plates still under negotiation. For the general run of miscellaneous business 1.55c., delivered in this territory, represents the minimum quotation, although 1.60c., delivered, is in instances obtained.

Structural Material.—While the bulk of the business has been confined to small lots, several building propositions requiring from 500 to 1200 tons of fabricated material are being figured upon. The additions to the Union League, St. James Hotel and the St. Charles Hotel at Atlantic City, with aggregate requirements close to 3000 tons, are expected to be closed at an early date. Several other good propositons are in sight, but develop slowly. Current orders have been small, at prices ranging from 1.55c. to 1.60c. for plain shapes, delivered in this territory.

Sheets.—The demand is somewhat irregular. Some producers are receiving day to day orders for small quantities, which in the aggregate enable mills to operate at practically full capacity, but other makers are not so well fixed, and in all cases the amount of forward business on the books is small. For ordinary business for prompt delivery prices are unchanged, although concessions of $1 a ton could be had for tonnage. Quotations of Eastern manufacturers range as follows: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

Bars.—While there is still some demand for refined iron bars, it is not as active as it was last week. A few orders have been placed, but the demand does not seem as urgent. Prices are not strong, and while 1.42½c. to 1.52½c. about represents the market for refined iron bars delivered in this territory, the inside figure might be shaded for desirable specifications. Efforts have been made to interest Eastern mills in an association formed on the lines of the old Eastern Bar Iron Association, but as far as can be learned they have been unsuccessful. Steel bars are being firmly held at 1.55c. to 1.60c., delivered in this vicinity.

Coke.—Business transacted has not been very heavy. A few moderate contracts for foundry coke for remainder of the year delivery, as well as for early shipment, at $2.25 to $2.50 per net ton, at oven, have been reported, and the market is firm at those figures. Furnace coke continues inactive at $1.65 to $1.85, at oven. A number of the producers are now pretty well sold up and forced sales are less frequent. The following range about represents the quotations per net ton, delivered in buyers' yards in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—Neither consumers nor dealers show any special interest in the market. Sellers show no disposition to force sales, to do which would mean lower prices, while consumers take occasional cheap lots, but being well supplied make no efforts to purchase any considerable quantities. The buyer for the associated steel mills and rolling mills in this territory is not taking on any very heavy tonnages. No. 1 railroad wrought and machinery cast are a shade lower. The following range about represents the market for delivery in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia of 45c. to $1.30 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	14.00 to 14.50
No. 1 railroad wrought	15.00 to 15.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

The Richard Heckscher & Sons Company, the Swede furnace department of the Alan Wood Iron & Steel Company, will remove its offices September 5 from the Manhattan Building, Fourth and Walnut streets, to the new quarters of the Alan Wood Iron & Steel Company, on the fifteenth floor of the Morris Building.

Cincinnati

CINCINNATI, OHIO, August 17, 1910.—(*By Telegraph.*)

Pig Iron.—A number of inquiries are now coming in for deliveries the remainder of this year and the first quarter of next, but actual business is very slow in developing. A local firm is understood to have closed for several hundred tons of Southern iron, based on a price of $11.50, Birmingham, for shipment the first half of next year, but this does not represent the market price for that delivery, as practically all the furnace interests are holding out strong for something better. For delivery through the remainder of this year $11.50 is quoted, but for prompt shipment it is understood that $11 can be done with some Tennessee furnaces. It is the general opinion that the market is about at the turning point and that better figures should soon prevail. For speculative purposes an Ohio firm is reported to have made an offer to take about 4000 tons of Southern iron at $10.75, but it has not yet been able to place the order at that figure. Northern irons are still dull and $14.50 to $15, Ironton, for last half shipment are average quotations. Malleable is around $14.75, with very little moving. The Belfont Furnace in the Ironton district goes out of blast this week for repairs. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.25 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—A contract was closed last week by a local firm covering a 12 months' supply of Wise County furnace coke, which is understood will be shipped to a Western concern. The tonnage involved makes this one of the best orders booked lately in this section, and it is stated that the regular market price was maintained. Two inquiries were received from Eastern companies for a year's supply of furnace coke, calling for 7000 and 10,000 tons per month, respectively, and these also helped to enliven the market a little. Contract foundry coke continues to move freely, and there are a considerable number of small purchases being made to fill immediate requirements. Prices are unchanged, but appear to be even firmer than for last week. For Connellsville furnace coke we quote $1.70 to $1.85 per net ton, at oven, and for Pocahontas, furnace grades, $1.75 to $1.85. Connellsville, Pocahontas and Wise County foundry coke is quoted all the way from $2 to $2.25, but $2.10 would be about the figure at which business is being transacted.

Finished Iron and Steel.—About the only activity to be noted is in structural material from stock. The warehouse price of beams and channels remains at 1.90c. to 2c., and dealers are in position to make prompt shipment on almost any standard specifications. While the Pittsburgh mill price on steel bars is now conceded to be 1.40c., the warehouse figure is still 1.80c.

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Old Material.—The market continues very dull, both buyers and sellers waiting for something to happen to stimulate business in this line. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, August 16, 1910.

Iron Ore.—Shipments have fallen off considerably. Ore firms are anxious to get down all they have sold as early as possible, but a check in the movement in the past two weeks has resulted from the action of a number of furnace interests in refusing to take any more for the present. Docks are so crowded that boats are being delayed in disposing of cargoes not intended for direct shipment. Ore firms are not showing much interest in the offering of some odd lots of resale ore at price concessions, as these offerings will have no effect on regular prices. One Ohio furnace interest is reported to have an inquiry out for some Bessemer ore. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The leading pipe interest is figuring on the purchase of a large tonnage of Nos. 3 and 4 foundry iron for the remainder of the year delivery. With this exception the market continues very dull. Few inquiries have come out and these are for small tonnages. Some consumers who have asked for prices in the past few weeks have decided not to buy for the present, and others have not yet placed their orders. We note the sale of 500 tons of No. 2 foundry to a northern Ohio furnace for the remainder of the year delivery at $14, Valley furnace, and a 100-ton lot at the same price. Few of the furnace interests care to meet the present low prices, and unless a change in conditions comes shortly two additional northern Ohio furnaces will probably be blown out. While the local market is as dead at present as it has been at any time in the past few months, a better feeling is expressed in some quarters, and an improvement is looked for next month. No. 2 foundry is quoted at $14, Valley furnace, but most producers are adhering to $14.25. For prompt shipment and for the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$16.15
Northern foundry, No. 1	$15.25 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.15 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—While some small contracts for foundry grades are reported, the market is generally quiet. The only activity in furnace grades is an occasional sale of a small lot for prompt shipment. Prices on foundry grades are fairly firm. We quote standard Connellsville furnace coke at $1.55 to $1.65 per net ton, at oven, for prompt shipment, and $1.75 to $1.85 for the last half. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 per net ton, at oven, for prompt shipment, and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—Most mill agencies report some improvement in the volume of orders as compared with July, and the favorable crop reports have produced a better feeling among both producers and consumers. While a decided change is not expected this month, considerable improvement in orders is looked for in September. Present orders are pretty evenly divided between specifications on contracts and current orders, nearly all being for small tonnages for immediate requirements. Prices generally are firm. Steel bars are being maintained at a minimum of 1.40c., Pittsburgh, for carload lots, but no quotations under 1.45c. are reported for less than carload lots. The demand for steel reinforcing bars continues quite active. There is a fair demand for small lots of plates, and although there are rumors of lower quotations the 1.40c. price appears to be quite firmly maintained in this market. The demand for structural material in small lots is fairly good and 1.40c. is being firmly maintained. No new work requiring large tonnages is coming out, but local fabricators are getting a good volume of small orders and their shops are still well filled with work. The demand for sheets continues quiet and prices show no improvement. We quote No. 28 sheets at 2.20c. for black and 3.25c. to 3.30c. for galvanized. The demand for iron bars continues only moderate. The usual quotation of 1.40c., at mill, can be shaded on a desirable order. The demand for shafting is holding up well. Very little business in any line is coming from the railroads. Warehouse business with the jobbers has improved somewhat during the past week.

Old Material.—The condition of the market shows practically no change. Buying by the mills is in only small lots for immediate needs. There is little demand from foundries. Prices are at about the same level that they were three weeks ago, when some activity caused a slight temporary advance. The Norfolk & Western Railroad will close August 18 on about its usual list. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.75 to 7.25
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, MO., August 15, 1910.

While with some brokers there is but little doing in pig iron other offices report considerable activity, with prices holding steady to firmer. Increased interest is manifest in iron for first half 1911 delivery. There is some inclination to regard the situation as improving, with a good prospect for market activity after September 1. Larger railroad purchases for iron and iron products are looked for in the early fall, based on a big freight tonnage.

Coke.—It is believed that many of the large consumers have placed their contracts for a year's supply of coke, though some are still buying in a hand-to-mouth way, apparently looking for lower prices in the face of the stiffening of values in the Pennsylvania field. A moderate volume of buying is also in evidence on the part of small consumers. None of the leading brokers reports either inquiries or sales of importance for the past week. Prices are steady at $2.40 to $2.50 for contract standard brands of Connellsville 72-hour foundry, per net ton, but for prompt shipment the price is shaded to $2.25, with Virginia offered at $2.25 to $2.50, f.o.b. oven; jobbing lots 25c. per ton higher.

Pig Iron.—In case of one office the statement was made that for the past week the business booked for pig iron exceeded the transactions for the entire month of July. These sales were mostly in lots of 500 tons, principally foundry iron. No contracts were booked at less than $11.50, Birmingham, for No. 2 Southern foundry. Among the inquiries reported by this office were 500 tons and 300 tons No. 2 Southern foundry. All the above were for shipment over the remainder of the year. Another broker reports a sale of 800 tons No. 2 Southern foundry, same shipment. A third sales agency booked orders aggregating 450 tons Northern and Southern foundry, delivery over the last quarter 1910 and first quarter 1911, also for 300 tons Southern foundry, shipment over the remainder of the year. The inquiry for 2500 tons Lake Superior charcoal, reported last week, is still pending. Conditions as to prices remain practically unchanged. While there is some business being worked for No. 2 Southern foundry for the remainder of the year at $11, Birmingham, considerable of the best brands of No. 2 Southern foundry has been placed at $11.50 with desirable buyers. With respect to some of the trade it may be stated that sellers and buyers are still apart in their views and each interest is standing pat, awaiting developments. A part of the buying is in a measure pushed by commitments for finished stock, and in some cases buyers have made additions to recent purchases. But for the fact that there are many furnaces carrying large stocks in their yards, buyers would show more disposition to add to their holdings. Quite a large percentage of inquiries now being received deal with 1911 iron. It is stated that No. 2 Southern foundry or shipment over the first half 1911 is offered at $12. Southern Ohio No. 2 foundry is quoted at $15, f.o.b. furnace.

Old Material.—Though the demand from consumers does not improve, and but little business is passing as far as dealers are concerned, the outlook is regarded as more favorable and leading dealers seem disposed to maintain the present level of prices for this reason and also to encourage the offerings of the railroads. The only list on the market last week was that of the Missouri, Kansas & Texas Railroad, 2000 tons miscellaneous scrap. Relaying rails con-

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tinue scarce and wanted. Old car wheels are in better demand than other material. We quote dealers' prices as follows, per ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	15.00 to 15.50
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	12.00 to 12.50
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.50 to 6.00
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

Advance information on the annual report for the fiscal year 1909-1910 of the Missouri Pacific Railroad shows that the company earned $5,000,000 more gross than in any previous year in the history of the company, without including the gains made since the establishment of the through route to the Pacific Coast.

The St. Louis Car Company will build 54 new cars for the Salt Lake City street railroads, to be 50 ft. in length and of the best type. Steel underbodies will be used and the interior finish will be mahogany, thus constituting them the finest cars in the far West.

The Eagle Packet Company will at once begin the construction of a new large double wheeled packet steamer, to be run between St. Louis and Alton, Ill. It will be one of the largest on the river. It will probably be built by the Howards of Jeffersonville, Ind. The same company will also build a boat to take the place of the wrecked steamer Cape Girardeau in the St. Louis and Cape Girardeau trade.

The Streckfus Steamboat Line Company of Rock Island, Ill., has been incorporated; capital stock, $250,000; incorporators, John Streckfus, Joe Streckfus and Roy Streckfus.

Buffalo

BUFFALO, N. Y., August 16, 1910.

Pig Iron.—Shipments are going forward in good volume on contracts, Erie Canal shipments being especially heavy, but very little new business is being placed. Transactions closed are principally for small lots, the largest inquiry reported being for 1000 tons of foundry iron, mostly No. 2 X, for New England, for delivery over the remainder of the year. Such orders as were placed were largely for rush delivery, indicating that quite a number of foundries have exhausted their present stocks. It is understood that considerable resale iron, most of which was off grade, was disposed of during the week at low figures, the owners having evidently determined to let it go at a sacrifice and pocket the loss rather than carry it longer. On regular grades prices are stationary and appear to be practically down to hard pan. We quote as follows for delivery over the remainder of the year, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—A little better feeling is noticeable as compared with a week ago, and improvement is shown in the inquiry for steel bars, plates, shapes and power transmission material, including cold rolled shafting, but orders placed are, as a rule, for small quantities only. Prices for steel bars remain about the same as a week ago, 1.40c., Pittsburgh, being named for large and desirable orders, but it is claimed by most agencies that the general run of small orders is taken at 1.45c. Many purchasers, however, are holding off on the placement of orders of any size, anticipating that they will be able to obtain lower quotations. Plates and shapes are running at about 1.40c., Pittsburgh, for large tonnage, and 1.45c. for small lots. In fabriciated structural material the demand has lessened temporarily, although there is a good volume of fall business in sight. Plans for the Utica Hotel, Utica, N. Y., which have been held back for two or three weeks, are to come up for bids this week; about 1200 tons will be required. The specifications for the steel for the State Normal School at Oswego, which originally called for 400 tons of steel, have been revised and are now being refigured. Figures are soon to be taken on a crane runway 527 ft. in length for the malleable building of the Gould Coupler Company, Depew, N. Y., requiring a considerable tonnage. The contract for the Central avenue bridge, Rochester, calling for 400 tons of structural material and bars, has been let to Whitmore, Rauber & Vicinus, Rochester. The contract for steel for the Marine Bank Building, Erie, Pa., involving a little over 800 tons, was taken by Kratzer & Co., Pittsburgh.

Old Material.—The market still remains very quiet, but a little more activity is manifested, as compared with the stagnant condition of the past few weeks. The few sales made have been on a lowered price basis, and the general tendency is still downward. Deliveries on old contracts placed at higher figures than recent schedules are dragging, but the majority of such contracts have been closed up. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	21.50 to 22.25
Old car wheels	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

The German Iron Market

BERLIN, August 4, 1910.

The movement to organize the pig iron trade of the country into a single big syndicate, which had held the attention of the market for several weeks, finally resulted last week in a failure to reach an agreement and the negotiations were definitively broken off. The negotiations had reached a very promising stage about the end of July, and persons of an optimistic nature began to predict that the great syndicate would be perfected within a few days. Even the stock markets, although otherwise little inclined to optimism just now, began to count upon the new syndicate as a coming event that would surely arrive, and iron shares assumed accordingly a rising tendency.

A week ago, however, the negotiations ran against a brick wall. It was found impossible to arrange allotments satisfactory to all interests. The Siegerland group of furnaces, which run chiefly on high grades of pig, including spiegeleisen, rejected the proposed allotment of 500,000 tons assigned to them, and the two new furnace companies at Bremen and Emden could not be induced to join. They evidently were disposed to use their location on tidewater as a ground for insisting upon big allotments. The old antagonism between the unattached furnaces and those operated in connection with steel companies also came into play and helped to frustrate the plans of the syndicate makers. Some of the furnaces, too, were held back by the fear lest if they should join a pig iron syndicate at this stage they would find their hands tied two years hence, when the question of renewing the great Steel Syndicate comes up. They did not want to commit themselves in advance on that momentous matter.

A Pig Iron Selling Agency Organized

The big pig iron syndicate is therefore a dead issue for the present. However, an organization of a looser kind and more limited extent was agreed upon several days ago. It embraces most of the big steel works of the west, and even includes the Niederrheinische Hütte, the company which had hitherto been the most troublesome factor in the pig iron trade of that part of the country. The big furnace company of Lübeck and the Krafft concern at Stettin are also in, and an arrangement as to prices has been effected with the Silesian group of furnaces. The new organization takes the form of a common selling agency with fixed prices and allotments. It is holding a meeting to-day for the purpose of fixing the scale of prices for 1911 contracts, and an advance is looked for, in view of the recent decision of the Coal Syndicate to raise the prices of coke. It may be said here parenthetically that many of the furnaces have just made a concerted effort to induce the Coal Syndicate to make the rise in coke only 1 mark, instead of 1.50 marks, per ton, and to postpone the time of its taking effect to January 1, but this petition was rejected.

As to the prospects of the new organization, the market does not rate these very high. The combination cannot fully control the situation, there being some important companies in the West which have not joined, besides the Siegerland group and the Bremen and Emden furnaces. Moreover, there

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is a movement on foot just now to establish a big independent furnace company on the lower Rhine, for the purpose of turning out high grades of pig and ferro compounds. A location has already been chosen with a view to obtaining foreign coke and ore by water, and, in particular, the concern is to be made independent of the Coal Syndicate as to coal and coke. All the smaller consumers of iron in the lower Rhine region are to be asked to take stock in the new venture.

It remains to be mentioned that the new trade combination has an annex covering ferromanganese and ferrosilicon. As to the latter product the details have not yet been completed, but it has been agreed to take no orders for 1912 delivery before October 1, by which time it is hoped that all points of difference will be settled.

The heavy plate convention was renewed yesterday and the price of plates advanced by 2 marks a ton. The sales of ship plates in July were much heavier than a year ago.

The General Trade Situation Uncertain

The trade situation remains irregular and involved in doubt. It is admitted that conditions in America are exerting a restraining influence on our market. The prices of pig have further weakened. At the fortnightly trading on the Duesseldorf Exchange last week several numbers of German pig scored lower prices, as well as English No. 3 foundry. On the other hand, the price cutting in merchant pipe and boiler tubes has about ceased, and most of the works are now demanding higher prices. It is also mentioned that the demand for these products continues extremely active. As for the rest, a rather quiet tone prevails in the market. Consumers continue to buy only for immediate requirements. One of the best features of the situation is that the stocks of dealers, particularly in bars and plates, are running low, and they will soon cease perforce to disturb trade by underbidding manufacturers' prices.

From the Belgian trade the latest reports are somewhat more reassuring. The downward course of prices at least seems to have been checked, and the home trade has improved somewhat. Rail mills are very busy, and they continue to make heavy export shipments. In the pig iron trade conditions remain unsatisfactory, the sharp competition of French and Luxemburg iron exerting pressure on prices.

The stock markets and the iron trade are this week considerably excited over a project of the Deutsch-Luxemburgische Bergwerks und Hütten Gesellschaft to absorb the old Dortmunder Union, which will make it one of the biggest iron and coal companies in Germany. The Deutsch-Luxemburg company was organized in its present form only five years ago out of existing companies at Bochum and in Luxemburg with a capital of $6,000,000, but this has been increased by successive steps to $15,000,000 for the purpose of renovating and enlarging its plants and absorbing several coal mines. It is assumed that it will raise its capital to at least $20,000,000 in absorbing the Union, which would give it the fourth rank among the huge iron companies—only Krupp, Gelsengirchen and Phoenix having bigger capitals. Its allotments for rails, structural forms and semimanufactured steel in the Steel Syndicate will be 478,800 tons, or second in size only to Krupp's. It will be a new mammoth in the German iron industry.

San Francisco

SAN FRANCISCO, August 10, 1910.

The Pacific Coast iron and steel market is still without animation, local business in particular being very quiet in all departments. The tonnage in every line ordered for use in San Francisco has been less than normal for the last two months, and there is very little indication of improvement. Comparatively little building work is in prospect, and the uneasiness of industrial conditions in the iron and steel manufacturing trades is likely to prevent any large buying by those interests for some time to come. Orders booked by mill representatives are very small, though the distributive trade in the interior of the State is normal for the summer season, and the outlook is still good for an active demand from that quarter during the fall.

Bars.—Purchases of soft steel bars by manufacturing interests and the general consuming trade are still largely from hand to mouth, the aggregate being only moderate, though a fair demand is expected within the next two months. With an abundance of material in store local merchants are taking most of these small orders, and have not found it necessary to buy any considerable quantity for stock. Bars for concrete reinforcement are the leading feature in this department at present, and while few orders are individually important the movement is fairly active. A fair tonnage is required at present for sewer, water works and harbor improvements at San Francisco and other coast cities, and for general improvements, dams, culverts, reservoirs, &c., in the interior. A number of large concrete buildings to be erected during the fall will add considerably to the movement of the next few months. A large building of this type is projected for the Deere Implement Company at San Francisco, and another for the Silica Brick Company at Sacramento, Cal. The Union Oil Company is building several reinforced concrete oil reservoirs, capacity 1,000,000 barrels each, near San Luis Obispo, Cal., for which considerable steel is required. Bars from store, San Francisco, are quoted at 2.50c. for steel and 2.30c. for iron.

Structural Material.—With the exception of January, July was the dullest month so far this year in San Francisco building operations, and one of the dullest since 1906. The total valuation of building permits was $1,452,741, compared with $2,216,631 for June, and $2,154,999 for July of last year. The decrease was partially due to a strike of hod carriers, which has also caused some delay in the letting of contracts. Considerable improvement, but no very heavy volume of business, is expected in the fall. A number of contracts are coming out in the interior, and the American Bridge Company has taken a very fair tonnage in various parts of the State. The larger local shops have little work on hand, some having laid off about half of their men. Dyer Bros. have taken a small job on a bank at Newman, Cal. Bids taken for the construction of a post office at Santa Cruz, Cal., have been rejected. The Ralston Iron Works has a small job in the Wright Building, San Francisco, and steel work on bulkhead No. 10, San Francisco Harbor, was awarded to Milliken Bros., Inc. The Realty Syndicate Building in Oakland, Cal., will require about 600 tons. Plans have been completed for a new agricultural building for the University of California, Berkeley, Cal., requiring about 450 tons, for which bids will be taken August 16. Figures are being taken on a large structure for the Order of Eagles in San Francisco, amounting to 300 tons. It is announced that the Western Pacific Railroad will build a steel bridge about 640 ft. long over the American River near Sacramento, Cal., and arrangements have been made for the erection of a steel drawbridge over the Sacramento River, in which Yolo and Sacramento counties will co-operate with interurban railroad companies. Plans are being drawn by San Francisco architects for a 12-story building at Portland, Ore. Beams and channels, from store, San Francisco, are quoted at 2.70c.

Rails.—The present movement is comparatively quiet, consisting mostly of small orders for construction now in progress. There is considerable business in prospect. It is announced that additional contracts are to be let for the Northwestern Pacific for fall construction, and additional extensions are contemplated by interurban companies in the interior of the State. It is reported that there is some prospect of an electric line from Porterville, Cal., through Coalinga to tidewater, but no immediate business is expected from this project.

Plates.—The movement of tank plates is about normal for this time of year, though not as heavy as the activity of tank and riveted pipe fabricators would seem to indicate. Current business is confined to small orders, many of which are taken by local jobbers, and purchases for the oil fields are not of great importance. The Standard Oil Company is planning to build storage tanks at several points in California, but little has recently been heard from other oil storage projects.

Merchant Pipe.—The tonnage booked by mill interests is slightly larger than at this time last month, though the volume is still unsatisfactory. Oil pipe is extremely dull. The production of oil has been increased in the last few weeks by the opening of several more gushing wells and the heavy accumulation discourages new drilling. Most of the existing companies are apparently not in a financial position to carry out projected storage and transportation projects this year, as they have been unable to market a large proportion of their output and have been under heavy expense in handling it. A pipe line may be constructed, however, by the Oil Consumers' Association, recently organized at Los Angeles. The distributive movement of small pipe is on about the same small scale as for some time past and no general demand is anticipated before September, though a few orders for water works supplies are now coming in. The situation offers little encouragement to mill interests. Some time will be required to bring any material reduction of the tonnage in store, and by adopting clearing house methods the jobbers will be able to hold off from the market for several months. Prices on small lots of merchant pipe are firmly maintained.

Cast Iron Pipe.—The coast market is still rather dull, few orders of any consequence having been placed for several weeks. The largest recent order was that of San Bernardino, Cal., for 167 lengths of 4-in., 385 of 6-in. and 13 of 12-in. pipe, placed August 8 with C. Frolich. The Water Commissioners of Los Angeles, Cal., will receive bids August 15 for about 603 tons. Numerous small orders for fire

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hydrants, &c., are being placed. A number of good inquiries are coming into the market and a fairly active movement is expected by the end of the month. Contracts are now being let for laying the San Francisco auxiliary system.

Pig Iron.—There is very little feature to the local market, conditions remaining about as previously described. Small machinery castings are in fair demand and melters are getting some work for public improvements, but the requirements are not increasing. Importers still find difficulty in placing pig iron for future delivery, most of the foundries buying in small quantities according to current needs. Prices remain about as before, Chinese being quoted at $23; Continental, $23; English, $23 to $23.50; Scoth, $24 to $24.50.

Old Material.—There is considerable movement of steel melting scrap for shipment to Atlantic ports. The local shipping firm of Bates & Chesebrough, which handles the bulk of this business, has purchased the wreck of a steamer on Santa Marguerita Island, from which a large amount of scrap will be taken, and a number of smaller wrecking operations are in progress. Cast scrap is quiet, and there is no unusual activity in railroad wrought. Prices are quoted as follows: Cast scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

New York

NEW YORK, August 17, 1910.

Pig Iron.—Inquiry has dropped down to very small proportions; in fact, is less than at any time this year. As noted a week ago, Buffalo furnaces have taken the greater part of the recent business in this territory, freight by canal of from $1 to $1.25 making $14.50 iron, at furnace, attractive to melters at a number of Eastern points reached directly by water. A Connecticut foundry added nearly 1000 tons in the past week to the purchases recently reported. Foundries in general are melting iron at about the rate of July, but most of them appear to be covered for the third quarter. Thus far all the furnaces have had the benefit of business closed at higher prices, but it will not be long until they will be down to the low level on all the iron going out; when that time comes more furnaces will drop out of the race unless signs of better things appear. We quote Northern foundry iron at tidewater as follows: No. 1, $16 to $16.25; No. 2 X, $15.50 to $16; No. 2 plain, $15.25 to $15.50. On Southern iron quotations are $15.75 to $16 for No. 1 and $15.25 to $15.75 for No. 2.

Steel Rails.—The National Railways of Mexico placed an order for 10,000 tons in the past week with the Lackawanna Steel Company. Sharp competition among various domestic mills is reported on this business. Bookings by the Illinois Steel Company in the week are reported at 10,500 tons, including one contract for 9000 tons of Bessemer rails. The Tennessee Coal, Iron & Railroad Company took 1870 tons of new rail business.

Finished Iron and Steel.—All lines continue comparatively dull, but in spots there has recently been some slight improvement. It is probable that August will not be any better than July, and a material increase in business is not looked for until September and possibly not until October. Orders are coming in steadily in small lots, indicating that buying is mainly for pressing needs, and although prices are not strong, the total volume of business is sufficient to occasion no further reduction in producing capacity. Orders now on the books will easily care for the next six or eight weeks at least, in nearly all active plants. Structural material and plates are in the least active demand in the East. If the large water pipe contract for Portland, Maine, on which bids are to be opened September 12, should be decided in favor of steel pipe, about 16,000 tons of plates will be required. Steel bars are better, judging from the deliveries, as 12 weeks is still named for the smaller sizes, but there has been a little improvement in making shipments. Generally, bar iron is quiet, but there are exceptions, one mill reporting a better volume of orders in the past week than for some time, and another that August will show considerable improvement over July. Prices, however, are weak in all finished iron products, such as bolts, spikes, &c., but some of the railroads have been specifying for track supplies quite liberally recently. There are a few definite projects worthy of mention in the structural field. The bids are in on the Saybrook bridge, over the Connecticut River, 2000 tons, and the Pennsylvania Steel Company was the lowest of these seven bidders. The same company secured the new Pennsylvania Railroad bridge over the Schuylkill River, 1400 tons. The Jones & Laughlin Steel Company was awarded 1500 tons of fabricated steel for an addition to the plant of M. H. Treadwell, at Easton, Pa. The viaduct for the Republic Iron & Steel Company, at Youngstown, 2000 tons, has been given to the American Bridge Company. Other smaller awards for bridge work were 160 tons for the Seaboard Railroad, which went to the Phœnix Bridge Company, and 300 tons for the Chicago, Milwaukee & St. Paul, to the Pennsylvania Steel Company. Among the more important building contracts were 1600 tons for a building for the Amicable Insurance Company, at Waco, Texas, taken by the Noelke-Richards Company; a loft on East Fortieth street, New York, 800 tons, taken by the Hinkle Iron Works, and the Marine Bank, at Erie, Pa., 600 tons, taken by the King Bridge Company. The New York Central terminal work has not yet been let, nor the 1400 tons of bridge material for the Detroit, Toledo & Ironton Railroad. The Pennsylvania Lines West are in the market for about 1600 tons, and the Lake Shore for about 900 tons. Bids are being asked for a pier at 131st street, New York, on the North River, requiring about 2000 tons, and an inquiry is also out for nearly 3000 tons for a building on Fifth avenue for W. & J. Sloane. Quotations for plain structural material, plates and steel bars are now on a common level—1.56c. to 1.61c., New York—and bar iron delivered at the same point is quoted at 1.45c. to 1.50c.

Cast Iron Pipe.—Much interest has been aroused by the appearance of the long expected specifications of the Portland Water District of Portland, Maine. Bids are to be opened September 12 for the delivery on cars at Westbrook, Me., of 42-in. pipe for a long supply line. Bids will be received for both cast iron and steel pipe. The specifications for cast iron pipe call for four different weights and figure a total of 21,543 net tons. There will also be required 300 tons of specials. The Municipal Board of Canajoharie, N. Y., will receive bids until August 25 for the construction of water works, including the furnishing of 365 tons of cast iron pipe of various sizes and 8 tons of cast iron specials, also the laying of 1½ miles of 12-in. cast iron pipe. General business is quiet, although inquiries show a trifle more possibility of buying by consumers. Carload lots of 6-in. are quoted at $23.50 to $24, per net ton, tidewater.

Old Material.—Heavy steel melting scrap is neglected, but this is due to some extent to the unwillingness of dealers to part with their holdings at present offers. There is some expectation of a better demand in the near future, as it is understood that some important works in eastern Pennsylvania are now running with very low stocks. Rolling mills are buying but little from dealers, as they have been able for some time to secure what they need from railroads at lower prices than dealers ask. Several of the railroad companies having scrap lists out on which bids were received last week refused to accept the prices named and will carry over much material for another month. A little more interest is springing up in old car wheels, as several inquiries have made their appearance. Cast borings are in strong demand, but not at any better price than has recently been current. It is a curious feature of present conditions that wrought turnings are so neglected that they can be had at practically the same price as borings. Cast scrap is much more active, inquiries being numerous, but buyers are not disposed to pay better prices, although the quantity available at current rates appears to be small. Wrought pipe is in considerable demand and is quite scarce. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	11.00 to 11.25
Heavy melting steel scrap	11.00 to 11.25
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.00 to 5.50
Cast borings	7.00 to 7.50
Wrought turnings	7.00 to 7.50
Wrought pipe	11.50 to 12.00
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., August 17, 1910.—(*By Telegraph.*)

The Birmingham iron market is unchanged as far as sales are concerned, but a much better tone exists as to price. Furnace interests are strictly adhering to the $11.50 basis, and offers of round lots fail to bring forth concessions. Furnace stocks are decreasing to a certain extent and other furnace stacks contemplate going out soon. Considerable interest is manifested in the water pipe market and a fair business is in sight. The old material market continues dull.

THE IRON AND METAL MARKETS

Metal Market

NEW YORK, August 17, 1910.

THE WEEK'S PRICES

Cents Per Pound

	Copper.			Lead.		Spelter.	
August.	Lake.	Electro lytic.	Tin.	New York.	St Louis.	New York.	St. Louis.
11	13.00	12.62½	33.45	4.40	4.30	5.20	5.05
12	13.00	12.62½	33.75	4.40	4.30	5.20	5.05
13	13.00	12.62½	.....	4.40	4.30	5.20	5.05
15	13.00	12.62½	33.55	4.40	4.30	5.20	5.05
16	13.00	12.62½	33.80	4.40	4.30	5.20	5.05
17	13.00	12.62½	33.85	4.40	4.30	5.20	5.05

There has been good, steady trading in copper, and the advanced prices of last week have been maintained. Tin has been steadily advancing all the week. Lead shows a strengthening tendency. The spelter market is very dull.

Copper.—Until yesterday there was a good buying movement in copper, and the market steadily strengthened in tone. Yesterday's trade was light and inquiries fell off somewhat, but this did not affect quotations. It is generally believed that the production of copper is being curtailed, and it is freely predicted that the August report of the copper producers will show a marked shrinkage in stocks. Lake copper is generally quoted at 13c., and electrolytic cannot be had for less than 12.62½c., while some large selling interests are asking as high as 12.75c. In London to-day spot copper was sold for £56 7s. 6d. and futures for £57 2s. 6d. The sales amounted to 400 tons of spot and 1300 tons of futures.

Pig Tin.—Pig tin has been steadily advancing all the week, although there has not been much trading. A great many buyers who anticipated a shortage this month covered their needs during July, and while it is apparent that there is none too much tin on hand, it is generally estimated that the supply will be about equal to the month's consumption. There have been sharp advances in the London market, which is largely due to manipulations by the syndicate. Buyers here seem to be awaiting further developments. Pig tin was sold in New York to-day for 33.80c. to 33.85c. At the close of the London market to-day spot tin was sold for £154 10s.

Tin Plate.—The demand for tin plate in the New York market is slightly better than it was a week ago, which is largely due to increased activity in the building trades. The price in New York for 100-lb. coke plates is maintained at $3.84.

Lead.—There is a good demand for lead and the wants of buyers are largely being filled by the leading interest, which continues to control the situation by offering lead at lower prices than those made by the outside sellers. The price for lead in New York at the present time is 4.40c., and it is being offered in St. Louis at 4.30c.

Spelter.—The spelter market is almost stagnant. There are reports of some shading in prices by sellers who are anxious to dispose of their stock, but consumers are taking very little interest in the situation, and consequently the nominal price has not been affected. The metal is being offered in New York at 5.20c.

Antimony.—Antimony is dull and prices are slightly easier. Cookson's is now being offered at 8.15c. and Hallett's can be had for 7.95c.

Old Metals.—The market is firm. Dealers' selling prices are continued from last week, as follows:

	Cents
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.75 to 9.00
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.50 to 9.75
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, August 15.—Many consumers of copper have been watching the market closely, and are prepared to buy when they feel assured against weakness in the price. Considerable copper has been sold to consumers recently and the tone of the market is firmer, without any change in price for Chicago delivery. Spelter, however, is a little higher in price on large purchases, as well as carload orders, and tin is ½c. higher on carload lots. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 34½c.; small lots, 36c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2¼c. per 100 lb. higher; spelter, 5.20c. to 5.25c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 11¾c.; red brass, 11½c.; yellow brass, 8⅞c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, August 15.—Lead is quiet and steady at 4.25c. to 4.30c.; spelter is fairly firm at 5.05c. to 5.10c., East St. Louis. Zinc ore is quoted steady at $38 to $40 per ton, Joplin base. Tin is quoted at 34.10c. per pound; antimony, 8.50c.; lake copper, 13.20c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals is a good average for the season, with an increased call for railroad brasses.

Iron and Industrial Stocks

NEW YORK, August 17, 1910.

The stock market has been steadily increasing in strength since last report, owing to the better conditions prevailing in the agricultural sections of the country. Business interests are feeling more confidence in the immediate future. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week is as follows:

Allis-Chalm., com..	8⅝ - 9¾	Pressed St., com...	34¾ - 37⅝
Allis-Chalm., pref..	28 - 32	Pressed St., pref....	95
Beth. Steel, com...	26 - 27¼	Railway Spr., com.	31⅜ - 34¼
Beth. Steel, pref...	49 - 58	Republic, com.....	29½ - 32½
Can. com.	8⅛ - 8¾	Republic, pref.....	90½ - 93
Can, pref.....	66¾ - 69	Sloss, com.....	59 - 62½
Car & Fdry, com..	46¾ - 49½	Pipe, com.....	14 - 14⅝
Car & Fdry, pref...	111¼ - 112	Pipe, pref.....	55
Steel Foundries...	44 - 45	U. S. Steel, com...	69 - 72¾
Colorado Fuel.....	28⅜ - 32	U. S. Steel, pref...	115⅜-117
General Electric..	143¼-145	Westinghouse Elec.	59 - 61
Gr. N. ore cert....	53½ - 56½	Am. Ship, com....	80 - 82
Int. Harv., com.	96⅝ - 97¼	Chi. Pneu. Tool...	35 - 36½
Int. Harv., pref...	117 -118	Cambria Steel.....	41½ - 43½
Int. Pump, com...	39¼ - 40¾	Lake Sup. Corp....	19½ - 22½
Int. Pump, pref...	81 - 81½	Warwick	9¾
Locomotive, com..	36 - 39	Crucible St., com..	117⅛ - 124½
Locomotive, pref...	103½	Crucible St., pref..	74½ - 76¼
Nat. En. & St.,com.	15¾ - 16½		

The Montreal Steel Works, Ltd., Montreal, Canada, it is stated, intends to issue $1,000,000 30-year 6 per cent. bonds to provide for extensions to the plant now under way, only $750,000 of which will be issued immediately.

The stockholders of James B. Clow & Sons, Chicago, on August 8 increased the capital stock from $1,000,000 to $1,500,000 by the creation of $500,000 additional 7 per cent. cumulative preferred stock making the total issue of preferred $750,000. This action was taken on account of increase in the business due to the completion of manufacturing plants built and equipped from earnings during the last few years. The new issue will be offered for subscription at $100 a share, with interest from August 1, payable 25 per cent. with subscription and 25 per cent. September 1, October 1 and November 1; 7 per cent. will be allowed on partial payments.

The Cleveland Furnace Company, Cleveland, Ohio, has increased its capital from $1,000,000 to $2,000,000 to provide additional working capital. The new stock will be offered at par. The surplus and undivided profits on March 31 amounted to $1,098,712.

Dividends.—The General Electric Company has declared the regular quarterly dividend of 2 per cent., payable October 1.

The National Enameling & Stamping Company has declared the regular dividend of 7 per cent. on its preferred stock, payable in four quarterly instalments of 1¾ per cent. each on the last day of each quarter—September 30, December 31, March 31 and June 30.

The Heywood Bros. & Wakefield Company has declared the regular semiannual dividend of 3 per cent. on the preferred stock, payable September 1.

The United States Cast Iron Pipe & Foundry Company has declared a dividend of 1¼ per cent. on the preferred stock, payable September 1. The dividend for the past two quarters has been at the rate of 7 per cent. per annum. The dividend on the preferred stock is noncumulative. The officers of the company state that the earnings for the first quarter of the present fiscal year are in excess of the amount required to pay the dividend just declared, but believe that a conservative policy should be pursued, owing to the present condition of general business.

The output of finished iron and steel in Russia in 1909 is put at 2,572,000 tons, as compared with 2,335,000 tons in 1908. The distribution of these respective totals is as follows: Merchant iron, 851,900 tons and 893,300 tons; rails, 467,400 tons and 325,400 tons; thick plates and sheets, 249,300 tons and 265,100 tons; thin plates and sheets, 332,700 tons and 288,400 tons; joists, 147,500 tons and 128,500 tons.

The Machinery Markets

With the exception of New York City territory, where business is exceptionally good for this time of the year, the machinery trade throughout the country is experiencing the expected dull summer period, and attention is largely being given to looking up prospective orders. Optimistic reports as to the outlook come from all quarters, numerous indications pointing to a good fall trade. In the machine tool centers, it is stated that manufacturers have been unable to stock up to any extent, and if business should prove unusually good there may be a shortage in some classes of machinery equipment. There is an excellent supply of second-hand machinery, however, and that stock would help materially toward relieving any scarcity. In New York the trade is bidding against inquiries issued by the New York Central and the Pennsylvania railroads. The latter company is equipping a new shop at Cape Charles, Va. In Chicago the trade is looking for the Trans-Continental Railway of Canada to close orders against a large list issued last spring. A continued improvement in most directions is noted in Milwaukee, and many new enterprises are in formulation in that vicinity. In St. Louis and in Detroit a great deal of estimating on future requirements is being done, but immediate trade is dull. A decided improvement is shown in business in Pittsburgh, where hydro-electric enterprises are calling for heavy machinery expenditures. In Cincinnati many houses report their August business to be as good as that done in July, which was considered an especially heavy month. In other parts of the country trade is rather quiet.

New York

NEW YORK, August 17, 1910.

Machinery business in the metropolitan territory seems to be somewhat better than in the rest of the country. Manufacturers in general are good customers in the market just now and some good sized orders are being placed against the extensive inquiries which were sent out in June and in the early part of July.

The New York Central Railroad has issued inquiries supplementing a list sent out several weeks ago, and it is estimated that the railroad is at present asking for bids on equipment which will entail expenditures amounting to fully $50,000. The New York Central lines have been buying quite steadily during the last three weeks, and most of the orders placed were for machines for replacements. It is not known what disposition the company proposes to make of the equipment it is now inquiring for.

The Pennsylvania Railroad is buying against a small list of requirements, to be installed in new shops recently built at Cape Charles, Va. It is said that the list in question was not generally circulated, but that the company sent inquiries to manufacturers and dealers covering only one or two machines at a time.

New inquiries are not as plentiful just now as they were a month ago, but a number of projects are talked of that will result in some good business in the very near future. A good indication of the trend of trade is contained in the fact that two of the largest manufacturers of electric elevators in the country have their plants ordered up to full capacity for the next eight weeks at least. Manufacturers of small gas engines and electric power units are unusually busy, considering the season.

The demand for heavy power equipment has fallen off somewhat, as most of the inquiries cover requirements for extensions rather than for new factory projects.

Another plant is to be added to the colony of automobile manufacturing works at Long Island City, which promises to become an important center in that industry. The manufacturers of the Mercedes car, which is now made in Germany, have secured a preliminary permit from the municipal authorities for the erection of a plant at Thompson avenue and Lincoln street, which it is estimated will cost $25,000. The Mercedes Company has offices in the Times Building, New York, and also conducts the Mercedes Repair Company at 159-161 East Sixty-fourth street.

The Otis Elevator Company, 17 Battery place, New York City, is preparing to build an addition to its plant at Harrison, N. J., at a cost of about $50,000. The addition will be used as a foundry and it will be a one-story building, brick and steel construction, 60 x 200 ft. Most of the machinery equipment required will be moved to the shop from their plants. George K. Hooper, who has offices at 165 Broadway, is the engineer in charge.

The Central Railroad of New Jersey and the Philadelphia & Reading Railway are jointly constructing a wood creosote plant at Port Reading, N. J., which will be one of the largest plants of its kind in the country. The construction work will include the erection of two docks, each 900 ft. long, and the equipment to be installed will consist largely of special machinery for manufacture of the creosote and lumber handling machinery.

Plans have been prepared by D. C. Newman Collins, 29 Broadway, New York City, for two new factory buildings to be erected at Hudson, N. Y., for the Gifford-Wood Company, manufacturer of ice tools. One building will be 84 x 468 ft. and the other will be 70 x 370 ft. Both will be two-story structures and the equipment will include an automatic sprinkling system. The general contract for the erection of the building has been awarded to the Torrington Building Company.

The Roessler & Hasslacher Chemical Company, 100 William street, New York, has completed the purchase of 5 acres of water font property at Perth Amboy, N. J., where it expects to erect a large drug and chemical plant that will cost about $400,000. Arrangements for the construction of the plant were made several weeks ago, but because of legal technicalities it was found necessary to get the permission of the municipal authorities before the property transfer could be made.

The Fulton Machine & Vise Company, Lowville, N. Y., has increased its capital stock from $50,000 to $300,000, for the purpose of providing increased manufacturing facilities necessitated by the growth of its business. A new foundry will be built, of steel and concrete blocks, with a fireproof storeroom. Considerable additional modern equipment will be installed, including a crude oil brazing furnace. The company will add a full line of power pumps to its present line of iron and brass centrifugal pumps, belt and motor driven, and a number of improved styles of vises will also be added to its product.

The Latty Mfg. Company, which has recently erected a factory at Ellicottville, N. Y., for the manufacture of small nails, tacks and other wire products, is now in full operation. G. Frank Latty is general manager.

The city of Ogdensburg, N. Y., has plans in progress for the installation of a filtration plant, and the Board of Aldermen has passed a resolution providing for the issue of $175,000 in bonds for the purpose.

The Genesee Valley Power Company, Fillmore, N. Y., E. E. Peake, secretary, contemplates installing an additional water wheel and duplicating its A. C. generator equipment, providing new switchboard, &c., in preparation for the extension of its transmission system to neighboring villages in the near future.

Chicago

CHICAGO, ILL., August 16, 1910.

August continues very quiet in the Chicago machinery market. There are scattering inquiries from individual buyers and a little business is being done, but this is really the vacation period in the machinery trade of the West and dealers do not expect much activity for a few weeks. Last year at this time the automobile manufacturers were very heavy buyers of tools, but only a few of the concerns in this industry are going forward with plans for expansion for the coming year, and a great many orders that were placed during the spring for delivery this fall have been canceled or suspended. Dealers as a rule would not be anxious to take much automobile business at present, even if it were offered them. The fact is recognized, however, that there is an almost unlimited market in the United States for automobile

THE MACHINERY MARKETS

manufacturers who sell their machines to the farmers, and it is believed that the present check in the business is merely a matter of resurveying the field in the automobile trade and eliminating unnecessary charges which have added to the cost of manufacturing and distributing the product.

Dealers report that no important business has been closed as yet on the large railroad lists that have been pending for several months. It is understood, however, that the commissioners of the Transcontinental Railway of Canada are about to close on tools for their extensive shops at Winnipeg, a list of which was published in *The Iron Age* last spring. The dealers here still have a great deal of business on their books, sold last spring, on which the factories are behind with deliveries, and it is generally expected that there will be another buying movement which will fill up the books before the business now in hand is cleared up.

The Gary district promises to be a very important market for machine tools during the next year or two. Several large subsidiary plants are now under construction to convert the semifinished steel into finished products, and many of these industries will be large buyers of tools. The American Bridge Company has ordered a large installation for its plant, and other finishing plants will be in the market from time to time.

The Marshall & Huschart Machinery Company, Chicago, has completed its removal into its new building on Jefferson street, Chicago. The new building is one of the handsomest and best arranged houses in the country for the display of machine tools. The interior fittings and the equipment for the demonstration shop have not yet been completed, but are now in progress, the removal of the company to its new building having been hastened somewhat by the necessity for vacating the quarters occupied for many years on Canal street.

The Lennox Machine Company, Marshalltown, Iowa, is running its plant with a full complement of hands on an open shop basis.

Williams, White & Co., Moline, Ill., are very busy on their regular standard lines of machines and that business in general is very good.

The Root-Van Dervoort Engineering Company, East Moline, Ill., which recently increased its capital stock from $250,000 to $1,000,000, has closed a deal for the purchase of an entire block of land lying immediately north of its foundry and machine shops, which makes its total holdings approximately 17 acres. While the purchase of this land was made to safeguard any future developments the company may undertake, it is understood that plans are under way for the construction of a large warehouse.

The Chicago Bridge & Iron Company, Chicago, has purchased 25 acres of land at Greenville, Pa., upon which it will erect a plant at an initial cost of about $100,000.

A committee has been appointed by the City Council of Paris, Ill., to investigate the cost of installing a filter plant.

The roundhouse and machine shops of the Chicago & Northwestern Railroad Company at Chadron, Neb., which were recently destroyed by fire, are being rebuilt and orders have been placed for such tools as were destroyed.

The city of Vandalia, Ill., is in the market for one 125-kw. alternator, one 250-hp. engine and one 50-hp. motor. Geo. L. Whiteman, city clerk.

Philadelphia

PHILADELPHIA, PA., August 16, 1910.

The majority of sellers find no betterment in the demand, although here and there a trifle more buying, due to closing up of pending propositions is reported. The bulk of the business has been of the single tool character, and while confined usually to tools of the smaller class, a few sales of heavier tools have been made. Inquiries for the most part are light and confined to near future requirements. No fresh propositions covering any extensive shop equipments have come out during the week. Railroad business as far as machine tools are concerned shows no movement, although some scattered orders for both motive power and rolling stock are reported. A canvass of manufacturers of both machine tools and general machinery shows the trade to be actively engaged on work on hand. In a large proportion of instances builders have a good supply of orders on their books, enough to keep them actively engaged for some time ahead. Some report new business comparatively light, while in certain special lines a good average business was transacted in July and has been well maintained so far during the present month. The demand for cranes and hoists as well as the general line of heavy presses appears to be particularly well maintained.

Steel casting plants report a trifle better demand, not so much, however, from builders of machine tools, the bulk of work coming from locomotive builders. Makers of crucible steel castings, particularly for automobile work, report a continued good demand. Gray iron foundries show no particular increase in business, but maintain about an even productive basis.

The second-hand tool and machinery merchants report no marked increase in the demand, the usual midsummer dullness characterizing the trade.

The order for the machine shop equipment for the battleship Wyoming, building at the yards of the Wm. Cramps Ship & Engine Building Company, this city, for the Government, has been awarded to Manning, Maxwell & Moore. The usual equipment, covering lathes, drill presses, shaper, milling machine, &c., was included.

The Reading Iron Company, Reading, Pa., is about to erect an overhead crane runway from its Scott Foundry across Cedar street to its boiler shop yard, and to give proper clearance it is necessary to reconstruct the boiler house on the west side of the street. Its own departments will furnish the necessary power equipment for the change.

The Ferracute Machine Company, Bridgeton, Pa., finds orders during July up to the usual average for that month. It is well fixed as far as orders are concerned and is running its plant at full capacity, including several nights a week. Inquiries are reported promising and a full quota of orders is anticipated during the current month.

Revised plans have been prepared by Joseph E. Sperry, architect, Baltimore, Md., for the eight-story department store addition to that of Hochschild, Kohn & Co., Howard and Lexington streets, in that city. Henry Adams is the engineer and new bids will be asked.

Ira J. Williams, Morris Building, this city, represents a prospective renter or purchaser for a factory building with foundry attached, containing 75,000 to 85,000 sq. ft., in or about Philadelphia. Railroad facilities desired but not essential. At this time the purpose for which the plant is desired or the names of the principals interested is withheld.

The Stoever Foundry & Machine Company, Myerstown, Pa., advises that it is particularly busy in its foundry department, and has several very satisfactory orders on its books for pipe threading and pipe bending machines. No improvements will be made at its present plant, as it will be removed to Easton, Pa., under the plan of consolidating this plant with those of the Lebanon Steel Casting Company and Treadwell & Co., now located at Lebanon, Pa.

The Lehigh Valley Railroad has, it is stated, let a contract for lowering the grade of its main line over a stretch of 13 miles, the work beginning at Hayes Creek. The contract, it is said, has been awarded to Hyde, McFarland & Burke of New York and will aggregate an expenditure of over $1,000,000. Further extensive work, including a classification yard at Hazelton, Pa., is also contemplated.

The Board of Awards, Baltimore, Md., has awarded the contract for a bridge over the Western Maryland Railroad tracks at Seventh street to the Raymond Concrete Pile Company, whose bid was $33,000. A contract for a steel and concrete bridge over Stony Run was awarded to C. B. Clarke & Co. of Asheville, N. C., who bid $47,720 for the work.

The Standard Pressed Steel Company is now installing the new machinery for the addition to its plant previously referred to. For some of its products this firm reports a decreased volume of business; in others, however, it is fully maintained. Pressed steel shaft hangers have recently been shipped for export to Sydney, Australia; Holland, Belgium and Germany, while a very good domestic demand from New England and the Middle West is noted. The plant continues in operation at full capacity.

The Royersford Foundry & Machine Company, Royersford, Pa., states that its power transmission business for July was the best that it has ever had, and that during the present month it has been just as satisfactory. The demand for heavy punches and shears has been quiet. A 3a punch and shear has been sold a customer in Brooklyn, N. Y., and a better volume of business is anticipated in the near future. This company is now arranging for the erection of an additional story to its warehouse, which will materially increase its storage facilities.

Proposals will be received until September 6 by the Constructing Quartermaster, Fort Du Pont, Delaware City, Del., for constructing a brick quartermaster's shop and moving and enlarging the ordnance shop at Fort Du Pont, Del., where plans can be seen; these may also be had at the office of the Chief Quartermaster, Governor's Island, N. Y.

The Pennsylvania Shafting Company, Spring City, Pa., has experienced no decrease in its volume of business. Plant No. 2 has just been completed by this concern, which will add about 50 per cent. to its productive capacity. Power will be turned into the new plant some time this month. Orders recently have been fully up to the average, while shipments of finished products have been large.

A first mortgage has been filed in this city for $4,000,000 by the Philadelphia & Western Railway. A portion of the proceeds from the sale of the bonds against this mortgage

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will be used for an extension of the electric line from Strafford to Norristown, Pa. From the latter city a branch line to Lansdale or North Wales is proposed, so as to connect with the line of the Lehigh Valley Transit Company, which will give it a direct line from a number of towns in eastern Pennsylvania.

New England

BOSTON, MASS., August 16, 1910.

The predominating feature of the machine tool market is an assurance, daily becoming more pronounced, that the fall trade will be a good one. The buying of raw materials affords an excellent index of what is to be expected. For example, consumers of wire, who use it in a large way for manufacturing, are placing orders which indicate preparations for a full, normal business. Steel salesmen make a similar report. The machine tool people are adjusting themselves to the somewhat altered conditions resulting from cancellations of orders by some of the important automobile builders of the Middle West. Manufacturers of automobile parts and accessories who have received advices holding up deliveries are watching the situation keenly, with the expectation that a certain percentage of cancellations will follow. The effect of this movement will not be serious, probably. Most of the manufacturers affected have been compelled to refuse orders, and doubtless the market will continue to absorb their product.

The cotton manufacturing industry, the chief bugbear of the New England croakers, is on the mend. The curtailment which was the natural outcome of the exceedingly high prices of raw cotton has resulted in depleted stocks everywhere, which makes it imperitive that manufacturing shall resume on a much larger scale. Conditions in the mills are improving already and they should be running full within the next three months. This should bring a quick return of the textile machinery business to full capacity. Many doubting opinions of the business outlook have been based upon the cotton industry and applied to business as a whole. As a matter of fact, the unusual conditions prevailing in this raw material market has caused the trouble and not a lack of demand. Had cotton been at an average price production would have been consistently active. In the metal industries the vacation season is now on, with the usual shutdowns during which repairing and rearranging are in process. Idleness of producing forces is not great. To quote a veteran observer, a very successful business man who is in close touch with many branches of the trade, New England is producing this year as great a total volume of metal goods as in any other similar period of the past. Capacity being much greater, room for improvement exists, and prices are lower than they have been, which brings the value of current production somewhat lower than the extreme record.

The Boston Fire Department lost its repair shop by fire August 10. A large amount of machine tool equipment will have to be replaced in the near future. Another fire which interests the trade was that of the Maxwell Building on Massachusetts avenue, occupied as a garage.

Shippers are interested in the probable action of the Interstate Commerce Commission in regulating the demurrage rules in New England, so that they will conform to the practice of the rest of the couutry, of 48 hours' exemption from demurrage charges, in place of the present more extended time, in Vermont and Connecticut, of 96 hours. Recent extension of the power of the commission is held to give them authority to enforce the 48-hour rule, even in the face of State statutes. Hitherto the commission has been limited in its action to a recommendation to the railroads of the country. It is held that the difference in rules as between States militates against a harmonious, universal practice.

The Bay State Brass Company, Haydenville, Mass., has been petitioned into bankruptcy by creditors. An effort has begun to reorganize and continue the business. The company was formed in 1906, when the factory was established.

The Pope Mfg. Company, Hartford, Conn., is rapidly utilizing the large buildings recently purchased, formerly occupied by the tube company which went out of existence some years ago. The commercial and public service vehicle departments are being concentrated there, including the manufacture of motor fire wagons, ambulances and police wagons, as well as commercial trucks, which constitute the latest addition. Harold L. Pope has been made manager of the West Works, as they are now called.

The Cooper Oven Thermometer Company, Terryville, Conn., is relieving the congestion of its factory by the erection of a warehouse 20 x 40 ft., which will release space in the main building for manufacturing purposes. Since the addition of the Whittier thermometer the business has increased rapidly and the works are very busy.

The Union Twist Drill Company, Athol, Mass., manufacturer of twist drills, gear and milling cutters, is erecting an addition to its No. 3 building, 62 x 141 ft., four stories, which will be devoted to an extension of the drill business. An addition to the hardening room is also being built, 32 x 51 ft., one story.

The American Rotary Machine Company, Hartford, Conn., has been incorporated under Connecticut laws to take over all American patent rights of the Von Pittler system of rotary engines. A. K. Baylor, New York, is the president and treasurer; E. M. Sawtelle, Englewood, N. J., vice-president and assistant treasurer, and W. Baylor, New York, secretary. The directors are A. K. Baylor, A. F. Rockwell, president of the New Departure Mfg. Company, Bristol, Conn.; G. A. Unger, Marine and Field Club, Gravesend Bay; Frank Shearman, Cardiff, England, representing British shareholders, and Herr Fleischhauer, Berlin, Germany, and William Von Pittler, London England, representing the Germany company. The company acquires the patent rights on a hydraulic transmission equipment for motor cars and a similar equipment for stationary work, two house service water pump sets, two water pumps for general work, a boiler feed pump, vacuum cleaner, water meter and an air compressor and vacuum pump. Contracts have already been made for the manufacture of some of this equipment. A sub-company, to be known as the Rotary House Pump Company, will manufacture the house pumps. Another sub-company will be organized to manufacture boiler feed pumps. After such applications of the principle as have been developed and standardized by the German and Austrian companies have been put on a commercial footing, the American company will devote itself to the creation of other equipment under the patents, and will establish an experimental department in shops already secured in Hoboken, N. J. The executive offices of the company are at 103 Park avenue, New York.

The Holmes & Edwards Silver Company branch of the International Silver Company will build an addition to its works at Bridgeport, Conn., and states that the necessary machinery has been contracted for.

The Atwater Mfg. Company, Plantsville, Conn., manufacturer of hardware, has reorganized its Board of Officers by the election of Norman H. Barnes president and Alfred M. Smith secretary and treasurer.

The New Bedford & Edison Light Company, New Bedford, Mass., has received authority from the Massachusetts Gas and Electric Light Commission to increase its capital stock to the amount of $215,000, a part of the proceeds to be devoted to additions to the plant.

Cincinnati

CINCINNATI, OHIO, August 16, 1910.

While the inquiry for machine tools is good, some builders claim that buyers are slow sending in orders; others seem to be receiving a fair amount of business from the general trade all over the country. A prominent machine tool manufacturer, who reports July as being a satisfactory month, predicts that August will show up equally as well, and probably better, and that any temporary let up in buying is not to be considered at all discouraging. One interesting feature of the present situation is that not many tools, even of the standard sizes, are being stocked up, and should a sudden heavy buying movement commence deliveries will prove a serious problem. The suggestion for inserting a noncancellation clause in all machine tool contracts is a very interesting question with many local firms, and it is believed that a little concerted action would bring about this reform.

The smaller sizes of steam engines and boilers are poor sellers in this territory, but there is a good business in internal combustion motors using natural gas. It is stated, however, that there are a number of prospects in sight where large steam units will be required.

Both new and second-hand machinery dealers did a fair business the past week, and prospects are good for a busy fall season.

The additions to the Cincinnati plant of the Laidlaw-Dunn-Gordon Company at Elmwood place will be completed within a month. The improvements will double the capacity of the foundry and very much increase that of the machine shop.

The Executive Committee of the Cincinnati Branch, National Metal Trades Association, held its regular monthly meeting August 11. General business conditions were discussed and every one reported business in a good healthy condition. Figuring the record breaking year of 1907 at 100 per cent., the reports showed that the metal working factories of the Cincinnati district are now employing 92

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per cent. of the number of men employed then. The National Lead Company's application for membership was passed on favorably.

The United States Electrical Tool Company, whose present factory is at 1938 West Eighth street, Cincinnati, has started work on a new plant at Sixth street and Mount Hope road. The new building will be 67 x 200 ft., two stories, and of brick construction. In addition to the company's present equipment, which will be removed to the new location, considerable more will have to be provided.

The capital stock of the B. F. Goodrich Company, Akron, Ohio, has been increased to $20,000,000, and it is stated that several new buildings will be erected and the capacity of its rubber tire plant greatly increased.

The plant of the Cincinnati Electrical Tool Company, at 650-52 Evans street, Cincinnati, is being increased by the building of a two-story brick addition, which will nearly double its capacity.

Sealed proposals will be received until September 7 by the Board of Trustees of the Ohio University, Athens, Ohio, for additions to the power plant, including the mechanical equipment and the heating apparatus for two halls.

On August 11 fire completely destroyed the large agricultural implement manufacturing plant of the H. P. Deuscher Company, Hamilton, Ohio. The estimated loss is $100,000, with $60,000 insurance. Plans are already under way for rebuilding the factory on a much larger scale.

It is stated that the Mead Engine Company, Dayton, Ohio, has completed plans for a large factory to be constructed on Mound street, in that city.

Among recent contracts closed by the Cincinnati office of the Buffalo Forge Company is one for the heating apparatus for a large warehouse of the Old Crow Distillery, in Franklin County, Ky. This makes the sixth warehouse in which the distillery company has installed the mechanical air blast system of heating.

The Cleveland Motor Truck Mfg. Company, Cleveland, Ohio, recently incorporated with a capital stock of $250,000, has leased a factory building which it will use for manufacturing purposes. The company advises, however, that it is its intention to erect within the next year or two a new plant. In the quarters now occupied the company will use electric power and heat secured from an adjoining factory. Orders for additional machine tools and equipment will be placed in about 30 days.

The Knoblock-Heidman Mfg. Company, South Bend, Ind., manufacturer of the quick action line of ignition apparatus, is now occupying its new factory building, 80 x 130 ft.

The Bromwell Brush & Wire Goods Company, Greenburg, Ind., has awarded a contract for the erection of an addition to its plant, 62 x 202 ft., to be completed in 60 days.

The Bauer Machine Company, Jeffersonville, Ind., has increased its capital stock by an issue of $30,000 of preferred. George H. Holzbog is president of the company.

The DeTamble Motor Company, Anderson, Ind., has practically completed negotiations for the sale of its plant to a New York automobile syndicate. Edward S. DeTamble, president, and Fred DeTamble, sales manager, will move to California.

The Great American Automobile Company, with headquarters at Indianapolis, Ind., has secured a charter from the State of Delaware. The incorporators are Samuel Quinn, Jr., Charles N. Lee and L. H. Van Briggle of Indianapolis, with H. Davis, resident director at Wilmington, Del. The capital stock is $1,500,000. The company has an option on 80 acres near the Indianapolis motor speedway, on which it is proposed to erect the factories, plans for which are now being made. The company is authorized to manufacture anything propelled by a motor, including aeroplanes.

Harry Wainwright of the Wainwright Engine Works, Connersville, Ind., has designed a six-cylinder gasoline motor, the distinctive feature of which is the arrangement of valves in the cylinder head. Instead of being placed in a straight line across the head they are in two shorter lines, permitting the use of larger valves and making more economical use of the surface. The McFarlan Automobile Company of Connersville will use the new motor in its cars.

The Attica Industrial Company has been incorporated at Attica, Ind., to promote the city's industrial welfare by endeavoring to secure factories to locate there. The directors are A. S. Peacock, E. D. Robison, C. L. Green and others.

The Otis Elevator Company will build a large addition to its plant at Peru, Ind., the city having raised $8000 to extend the water mains so that the company's property will have fire protection. The addition, which will be of brick, will give employment to 300 men.

The John H. McGowan Company, Cincinnati, has recently booked an order from the municipality of Chillicothe, Ohio, for one of its triple expansion engine pumping outfits having a capacity of 2,000,000 gal. It is also getting ready for shipment a similar outfit of 3,500,000 gal. capacity for the Madison, Ind., water works.

Pittsburgh

PITTSBURGH, PA., August 16, 1910.

The situation in this district continues to show improvement. Buying for the account of industrial establishments in general, as distinguished from the distinctively metal working plants mentioned last week in this report, is on the increase. Many special interests, such as large hydroelectric power companies, are again coming into the market for machinery. There is even promise of considerably greater activity on the part of the railroads, as foreshadowed by items printed in recent issues of *The Iron Age*, but in this respect the trade has been disappointed so often that it is inclined to be skeptical. Some buying of small lots of tools for new or extended repair shops, and apparatus of various sorts used at terminals, make-up points, roundhouses, coal handling plants, signal stations, &c., has, however, developed in such a way as to give more color to that expectation. This is because many of the expenditures represent actual improvements and are not chargeable strictly to maintenance, indicating a more liberal policy in the operation of the roads affected. It is also evident that an era of renewed railroad building, as strikingly exemplified in the action of the Western Maryland Railroad Company, is about to be entered upon in different sections of the country, including the Southwest and Pacific Northwest, which will lead, in due course, to extensive purchases of equipment and supplies.

Reports received here by one of the leading manufacturers of equipment for electric traction systems indicate an amazing amount of new work in every State of the Union, with actual or prospective investment of many millions in track and line material, power house machinery, car motors, controllers, compressors, brakes, &c. Existing systems are also being remodeled and improved, heavier rails laid, larger cars and motors provided, additional generating units purchased, transformer and converter substations built, and substantial encouragement given to the location of factories along their rights of way. In this situation alone there is large promise for the future.

The National Roll & Foundry Company, Avonmore, Pa., which has some large contracts in hand, is increasing the output of its planer department, as well as other sections of the works, but has been able to do so without adding any machinery.

L. P. Schaefer, 1558 East street, Pittsburgh, has been negotiating with an automobile company for the occupancy of a manufacturing plant which he controls.

The West Virginia Pulp & Paper Company is making installations of power and operating machinery in its plants at Piedmont, W. Va., and Tyrone, Pa. Later in the year some additional apparatus, including electric motors and controllers, is likely to be required.

Vanadium steel springs are now among the specialties of the Fort Pitt Spring & Mfg. Company, McKees Rocks, Pa., whose sales offices are in Pittsburgh.

The Westinghouse Electric & Mfg. Company, Pittsburgh, which has made Houston, Texas, its principal distributing point for the Southwest, is preparing to build a large warehouse there for the storage of machinery and electrical apparatus of various kinds. The trade of the company throughout that section has been notably good this year, and at the present rate of increase it will be much larger by spring.

From inquiries received by the Pittsburgh office of the Cutler-Hammer Mfg. Company, Milwaukee, it is evident that the use of lifting magnets for handling iron and steel is receiving much more attention than in any previous period. The operation of those in service at the various steel mills, foundries, &c., of the district has been quite closely watched by the superintendents of neighboring plants, with the result that many are being included in plans for projected improvements.

The McConway & Torley Company, Pittsburgh, is putting on the market a coupler for interurban railway cars which can also be used with steam railroad equipment, making it particularly convenient for roads that interchange freight, as some are now doing.

The Erie Light & Power Company has been organized at Erie, Pa., to establish a public service plant. An application has been made for a State charter.

The Kroenert Smelting & Refining Company, Pittsburgh, the completion of whose new plant was noted some weeks ago, is doing a large business, among its best customers being foundries that are making a specialty of aluminum castings for the automobile trade.

The Consumers' Electric Company, Wheeling, W. Va., is proceeding with plans for the erection of a power plant for public service. The equipment details have not yet been fully worked out.

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The Pittsburgh Track Specialty Company, Pittsburgh, is finding a market in various parts of the country for cast steel poles, which can be furnished either solid or cored and are practically indestructible. They are intended for electric railway service.

The Riter-Conley Mfg. Company, Pittsburgh, has been awarded the contract for erecting a steel gas tank and holder for the St. Paul Gas Light Company, St. Paul, Minn. The contract amounts to $130,000.

The Johnson Mfg. Company, Urbana, Ohio, has made arrangements for the building of a new factory structure, 90 x 180 ft., ground for which was broken some weeks ago.

The herringbone iron lath, which has been a standard product of the General Fireproofing Company, Youngstown, Ohio, is now being manufactured from American ingot iron from the mills at Middletown, Ohio.

The A. M. Byers Company, Pittsburgh, is arranging for the installation of a new engine driven electric power unit of 500 kw.

Manufacturers in this district have been figuring on some equipment for the new plant of the Ft. Wayne Electric Works, Ft. Wayne, Ind., but the bulk of the business appears to have gone to New York and Philadelphia.

Progress is being made with the plans of the Gaeth Automobile Company, now of Cleveland, Ohio, for a large new manufacturing plant in Pittsburgh, and it is reported that a list of the additional machinery required will be given to the trade shortly.

Western railroads are making a vigorous effort to obtain men here for work in locomotive repair and car building shops, but without much apparent success.

The Wehrle Company, Newark, Ohio, which uses molding machines in its foundry, is adding to the present capacity. Some difficulty has been experienced lately in securing skilled operatives for the work. Floor molders are also scarce.

It is reported from Norwalk, Ohio, that the Huron Works there, which are under a new ownership, will be improved and operated to their full capacity.

The Ellwood City Forge Company, Ellwood City, Pa., has filed application for a charter, with a capital of $25,000. It will erect a plant to be equipped with hammers and other machinery to manufacture engine and machine forgings. The contract for the hammers and some other equipment has been placed, but a 100-hp. boiler will be required which has not been ordered yet. D. A. Evans is secretary and treasurer.

The Ellwood City Iron Works Company, Ellwood City, Pa., is now operating its plant on a line of fire escapes and light structural steel work and has contracts on its books which will insure steady operations for several months. The company has already outgrown its present quarters and is planning to make additions to its plant this fall. A line of machinery will be required later, a list of which is not as yet available.

Detroit

DETROIT, MICH., August 16, 1910.

Without regard to the automobile trade, in reference to which there are conflicting reports, it is becoming more apparent daily that the broadening in the general market for machinery which has taken place within the past year will insure for manufacturers and dealers here an excellent fall trade. A great deal of estimating on future requirements of industrial plants is now being done, and architects, mill engineers, and others are busy with plans for new factories or additions. During the remainder of the open season construction work will be pushed so as to insure at least the completion of the exteriors of buildings before snow flies. It is felt by many that winter will set in early this year, and they are making their preparations accordingly. So far as actual bookings are concerned, the situation is generally satisfactory to dealers, as well as manufacturers, and inquiries are sufficiently liberal to justify expectation of a good record for the month.

A large new factory building is being added to the plant of the Big Four Hardwood Company, Toledo, Ohio, which will engage in the manufacture of a number of specialties besides its standard line of products.

A test was recently made of the Curtis steam turbine, heretofore mentioned, which has been installed by the Quincy Mining Company, Houghton, Mich., to operate on the exhaust steam from one of its hoists, and, as a result, the use of a second machine in another location is being considered. It is stated that the saving of fuel amounts to nearly or quite ½c. per pound in the recovery of the copper which the company is mining. The turbine was built by the General Electric Company, Schenectady, N. Y.

From Mansfield, Ohio, it is reported that the Forth Motor Car Company has been incorporated there with a capital of $200,000.

The Fennia Mfg. Company, Hancock, Mich., has been organized to manufacture dials, levels, &c. A factory will be built as soon as the necessary arrangements can be made. Temporary headquarters have been established at 1008 Minnesota street.

The plant of the Alma Mfg. Company, Alma, Mich., is crowded with work, and more men for molding gas engine castings are being taken on.

Foundry supply houses here have been getting out some rush orders for the addition to the plant of the Sterling Foundry Company, Sterling Ill., which is nearing completion.

Among the manufacturers of brass goods whose plant has been busy all through the summer is the American Brass & Iron Company, Detroit, which has a very dependable sort of trade. By another year additional facilities will be necessary.

Purchases will be completed by early fall of tools for the new shops of the Grand Rapids Railway Company, Grand Rapids, Mich.

The Huron Mfg. Company, Ann Arbor, Mich., has had plans prepared by George Scott of that city for a one-story factory, 50 x 250 ft., bids on the construction and equipment of which will be taken shortly.

The Rose Stephens Mfg. Company, whose plant in West Detroit was destroyed by fire early in the summer, will have a fine new factory in operation for the fall trade.

A plant here to which considerable attention has been directed by motor manufacturers is that of the Murphy Chair Company, which is among the best equipped of any in this section for electric drive.

Included in the apparatus which the American Blower Company, Detroit, is offering for use in metallurgical plants are volume blowers for supplying draft to steam boilers, forges, &c., cast iron exhausters for gritty dust of any kind, pressure blowers for furnishing draft to cupolas and forges, disk fans for cooling, removal of fumes, &c. In all of these lines the demand for the first half of the year was extremely good, and prospects for the fall and early winter could hardly be improved upon.

It is reported from Saginaw, Mich., that as a result of the rapidly growing need of the better grades of foundry facings the United States Graphite Company contemplates providing equipment for a larger output.

The purchase of one or more pumping units of moderate capacity is under consideration by the authorities at Coldwater, Mich.

Plans are now in course of preparation for a three-story manufacturing plant of considerable size to be erected by the Howse Commercial Car Company, recently organized here by Chas. F. Howse and others.

Prof. Gardiner S. Williams of the University of Michigan, Ann Arbor, Mich., has been engaged to prepare plans and specifications of the new sewage pumping station at Grand Rapids, Mich.

For pumping engines to be installed at Wyandotte, Mich., the bidders included Keating Bros., Detroit; the Wisconsin Engine Company, Corliss, Wis.; the Laidlaw-Dunn-Gordon Company, Cincinnati, Ohio; the Allis-Chalmers Company, Milwaukee, Wis.; the Snow Steam Pump Company, Buffalo, N. Y., and the Platt Iron Works, Dayton, Ohio.

The Rapid Motor Vehicle Company, Pontiac, Mich., is adding to the force in its experimental department.

Foundations have been completed for the new water works station of this city in which pumping engines having a daily capacity of 145,000,000 gal. will be installed.

The McRace & Roberts Company, Detroit, Mich., manufacturer of steam and brass goods, has increased its capital stock from $195,000 to $395,000, and will soon commence the erection of a new factory which will practically double its present floor space. The factory will be of brick construction, 60 x 320 ft.; a large portion of it is to be three stories. A foundry will occupy the one-story portion of the building, steel trusses being used to support the roof. There will also be a new boiler house in connection with the plant. The company also advises that it may erect another addition in the near future and increase its capital stock to $500,000.

The Ashland Power Company, Ashland, Wis., has secured at Ironwood, Mich., a 10-year street lighting contract and a 30-year franchise for an electric light plant and an interurban street railway to connect the towns of Ironwood, Bessemer and Wakefield. Plans are not yet perfected, but the company expects soon to be in the market for the necessary material for the construction of a 35-mile three-phase transmission line to connect its water power at Brownstone Falls, which it is about to develop, with the three towns mentioned, together with necessary hydroelectric equipment, water wheels, transformers, &c., for the water power development.

The Universal Motor Truck Company, 362 Grand River avenue, Detroit, Mich., has plans prepared for a factory building, 61 x 252 ft., four stories, and a boiler house, 20 x 60 ft., which will be equipped with two boilers and a steam

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vacuum heating system. A 10,000-lb. capacity elevator, 12 x 22 ft., will be installed in the main building.

The Carpenter, Kendall & Naylor Company, Detroit, Mich., has filed articles of incorporation with an authorized capital stock of $10,000. The company will locate at 60-62 Gratiot avenue and will handle factory supplies and machinery on commission.

The Voelkner & Harry Mfg. Company, Detroit, Mich., manufacturer of hardware specialties, dies, tools, metal stampings and plumbing and brass goods specialties, is erecting a new factory, 100 x 120 ft., two stories and basement of reinforced concrete construction. The basement will contain the boiler room and will be used for storing stock. On the first floor will be the offices, metal stamping department, the plating, polishing and buffing rooms, while the second floor will be used for the machine shop, in which will be installed a number of screw machines, lathes, planers, &c.

Milwaukee

MILWAUKEE, WIS., August 15, 1910.

With continued improvement in most directions since last week's report was written, business is rather above normal for the middle of August, and fall trade will unquestionably open strong. Inquiries now in the hands of Wisconsin manufacturers and dealers foreshadow the closing of a liberal number of contracts during the next two or three months, with the probability that a fair percentage of new business will come out in the meanwhile. Indeed, there are some lines in which orders threaten to overrun production. Among the negotiations upon which manufacturers have recently entered are some that involve very large expenditures, and the most encouraging feature of them lies in the fact that they show a complete restoration of confidence on the part of important financial interests in the essential stability of the present industrial situation. There is, in fact, a noteworthy tendency to proceed with large undertakings which, for a number of years at least, will be earning little or nothing and can only be regarded in the light of investments. For these much machinery and other equipment will be required, including usually electrical apparatus so that the advantage to manufacturers here will be very appreciable.

The local market for machine tools is quiet and likely to remain so for an indefinite period. A good deal of purchasing for the new plants now under construction or finished was done during the first six weeks of summer, so that the requirements of the present situation have been pretty fully met. Some buying, however, is being done at this time, and quite a number of orders have recently originated at other industrial centers of the State, notably Racine, Beloit and Janesville. Tool builders here are still occupied with increasing their facilities and have no occasion to worry about new business, which is coming along as fast as required.

Vigorous steps are about to be taken by the local authorities for the abatement of the smoke nuisance. None of the machinery building plants is a serious offender in this respect, but some of the other industries located in the Menominee Valley and along the lake shore, including the Chicago, Milwaukee & St. Paul Railroad shops, have exhausted the patience of the entire city. It needs a campaign of education to show these people the money they are actually wasting in misuse of fuel, and Milwaukee ought to be a good field for missionary effort on the part of manufacturers of smokeless furnaces and smoke eliminating devices.

The S. Freeman & Sons Mfg. Company, Racine, Wis., in addition to a large trade in boilers, which it sells through its own representatives in various parts of the country, is taking numerous orders this year for self-supporting steel stacks, tanks, standpipes, rivetted steel pipe, &c. This has grown to be one of the leading industries of the State, and there is talk in Racine that a large new plant will be built before a great while, as the present shops are crowded to capacity.

The engine department of the Filer & Stowell Company, Milwaukee, is busy on orders from all parts of the country, trade in the Southwest during the first half of the year having been found particularly good. The outlook for fall business is also favorable.

The Allis-Chalmers Company has just won, in litigation with the General Electric Company, an important patent suit, which establishes its right to the manufacture of certain types of electric railroad apparatus, the company having become, within the past six years, an important factor in the field of traction line equipment.

Schmidt Bros. & Hill, Superior, Wis., have been awarded a contract by the Standard Oil Company for the construction of a power plant and repair shop to be used for maintenance of tank cars. The latter will be 50 x 250 ft., with brick walls.

The Dornfeld-Kunert Company, Watertown, Wis., will supply a gas producer and gas engine, the Holt Electric Company, Milwaukee, a dynamo and the Vilter Mfg. Company, Milwaukee, a compressor for the new power plant of Wm. Franzen & Sons of this city.

The Beaver Dam Construction Company, Beaver Dam, Wis., has the contract for erecting the new manufacturing plant at Juneau, Wis., which will be occupied by the Brodesser Motor Truck Company. The operating equipment has been mainly provided for, but some power machinery remains to be purchased.

An additional factory will probably be erected this fall at Gray's Lake, Ill., by the Wisconsin Condensed Milk Company, Burlington, Wis. The equipment is to include boilers and vacuum pans, pumps, &c.

As a result of the activity in mill outfitting the Avery Scale Company, North Milwaukee, Wis., has had an excellent trade this summer all through the West in automatic weighing apparatus, which it furnishes for a variety of service. The demand from other sources is also fair.

The Burdick Electric Company, Milwaukee, has the contract for a generator to be installed in the Kempsmith Mfg. Company's new plant at West Allis, Wis.

W. E. Reynolds, Green Bay, Wis., will erect a large factory for the production of grass mattings. It is to be occupied by the Willow Grass Rug Company.

A two-story factory building, 50 x 90 ft., will be built here by the Leather Company of America. E. Riemenschneider, Milwaukee, is in charge of the plans and specifications.

The Badger Brass Mfg. Company, Kenosha, Wis., has experienced a slight lull in the demand for lamps and other automobile accessories, buf trade during the coming fall will undoubtedly be very heavy.

The O. O. Storle Valve Company, Green Bay, Wis., is starting work on a three-story factory building. W. J. Hess is manager. The machinery needed has been provided for.

C. F. Dallman, Antigo, Wis., is building a very compact, portable hoist for the use of contractors and others, which can be operated by a gasoline engine, electric motor, automatic steam engine or belted from any existing source of power.

The Clifton Light & Power Company has been incorporated at Clifton, Wis., to establish a hydroelectric plant, and is now figuring on the construction of a power dam on the Kinnikinic River in St. Croix County.

The Wausau Boiler Works has been awarded the contract for installing boilers and erecting a stack at the municipal pumping plant in Wausau, Wis. The boilers will be furnished by the Murray Mfg. Company.

The Wrought Washer Mfg. Company, Milwaukee, has kept its plant busy thus far this season on orders for wrought and steel plate washers, felloe plates, rivet burs, &c., some good sized orders having been received from leading Western railroads.

The Agato Company, Milwaukee, Wis., has been incorporated with a capital stock of $125,000. The company will manufacture a material which has the appearance of porcelain for interior finish, fountains, &c., and will erect a factory. Temporary officers of the company are: A. Loehndorf, president; Dr. L. W. Booth of Milwaukee, secretary.

The South

NASHVILLE, TENN., August 15, 1910.

In all of Eastern Tennessee and the districts of surrounding States that are immediately contiguous there are noteworthy preparations now in progress for development work of various kinds, comprising coal and iron mining, timber cutting, quarrying, clay working and the exploitation of rare minerals, which is likely to be carried on on a larger scale than in any previous season, beginning about the middle of autumn and extending through the winter and spring. For this purpose many new companies have been formed, and others that were organized earlier are about ready to begin operations. Their machinery requirements will, of course, be very considerable. Local representatives of Northern manufacturers or supply houses are taking great pains to cultivate this trade, which is more desirable than ever before for the reason that it includes higher grade equipment than was formerly considered necessary. The economy of using electric power has been so well demonstrated at plants now existing in this section that nearly all contracts for new equipment embody some type of machinery for that purpose. Recent orders from companies such as those mentioned have been placed more largely in Pittsburgh, Cincinnati, New York and other Northern cities than with local agencies, but the business was worked up almost entirely by salesmen located in the South and is credited to them.

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Apart from the buying above referred to, trade remains rather quiet, being mostly of a purely jobbing character. There are, however, indications that it will pick up quite sharply before many weeks have passed, and an excellent fall season is generally anticipated.

James R. Hall, Columbus, Ga., is preparing plans and specifications for an electric generating plant to be built by the Abbe Light & Power Company, at Abbeville, Ala., of about 300 kw. The type of equipment to be used is still to be decided upon.

Electric motors have been installed in the woodworking plant of the Paxton Lumber Company, Bristol, Tenn., and it is stated that other local industries are preparing to follow this example as soon as the new hydroelectric plant now under construction on the Watauga River is completed. Rates for current are then expected to be largely reduced.

Plans for the installation of a pumping plant and water works system are under consideration by the authorities at Meigs, Ga., and a bond issue is proposed to cover the expense.

It is expected that contracts will be let this fall by the Thornton Light & Power Company, Hickory, N. C., for the construction of the proposed hydroelectric plant of 6500 to 7000 kw. Machinery requirements will not be determined upon until some months later.

A manufacturing plant equipped with the most modern machinery will be built at Yazoo City, Miss., by the Delta Table & Chair Company.

A great deal of interest is being taken by auto-vehicle manufacturers and others of this section in an auto logging wagon which is now under construction in the machine shops of the Grant Land & Lumber Company, Selma, La. It is built almost entirely of iron and steel and was designed by the manager of the company, E. E. Fitzgerald. It will be driven by a 40-hp. gasoline motor.

J. B. McCrary & Co., Atlanta, Ga., have been given the complete contract for installing an electric power and pumping plant at Lafayette, Ga., and construction work will begin at once.

The authorities at Waynesboro, Va., have placed an order with the Kennicott Company, Chicago Heights, Ill., for furnishing and erecting a 300,000-gal. steel standpipe. It will be 25 ft. in diameter and 80 ft. high.

The new steel plant of the Allen Engineering Company, Memphis, Tenn., has been completed and is now under operation. The company will manufacture mill supplies and engineering outfits.

St. Louis

ST. LOUIS, August 15, 1910.

Business though rather quiet early in the past week is picking up and shows as good volume as usual at this season. Inquiries are coming in from the South and Southwest quite freely, and considerable business is being figured on, especially in heavy machines. Numerous new concerns are being organized and additions and new plants are being planned by old companies. The leading metal company reports more inquiry for railroad brasses.

The Mississippi Valley Trust Company, St. Louis, Mo., is having plans prepared for a garage 126 x 200 ft., with a machine shop L, 30 x 139 ft., giving an aggregate floor space of about 30,000 sq. ft. The building will be of brick and steel construction, and will be equipped with a steam heating plant and electric connections. A portion of the building has been leased to the Columbia Taxicab Company, St. Louis.

The Board of Public Improvements will receive sealed proposals for furnishing all materials, tools and labor necessary for new toilets to be located in the basement of the Library Building at the St. Louis Industrial School.

Hemp & Co., since 1862 manufacturers of sheet metal goods, air tight stoves and stove pipes, will locate at Vandeventer avenue, on the Oak Hill branch of the Iron Mountain Railroad. The new plant will consist of three large brick, two and three story buildings, will have 125,000 sq. ft. and will cost in the neighborhood of $100,000. About 300 factory hands will be employed.

The American Concrete & Street Railroad Tie Company will erect a plant to cover 5 acres at a cost of $150,000, and employ 500 workmen. B. M. Bullard is president and W. R. Powell, secretary, with offices in the Central National Bank Building. The product of the new concern is a patented tie, made in two parts and connected by a steel binder.

The American Diesel Engine Company, 2925 South Broadway, is planning to erect a $3,000,000 manufacturing plant in this city. Adolphus Busch is largely interested in this company, which controls the American rights to the Diesel oil engine. It is expected to revolutionize many power plants, as the engine uses petroleum residue. James R. Harris is the manager of the company.

The Gardner Machine Company, South Beloit, Ill., has been incorporated, capital stock $100,000; incorporators—F. N. Gardner, F. E. Gardner and L. Waldo Thompson.

The Williams All-Service Car-Door Company, Clinton, Ill., has been incorporated, capital stock $600,000; incorporators—Walter Scott Williams, Charles R. Westcott and William H. H. Hastings.

The Andrews Wire & Iron Works, Rockford, Ill., has filed notice of an increase in capital stock from $20,000 to $140,000.

The United States Mail Chute Equipment Company, St. Louis, certifies to an increase in capital stock from $50,000 to $75,000.

The Illinois Glass Company, Alton, Ill., has completed installing the first automatic glass blowing machine ever used. It is expected the automatic machines will be in operation within two weeks. Blowers are dispensed with in the use of the new machines.

An explosion of starch by spontaneous combustion at the glucose plant at Granite City, Ill., occasioned a loss of $55,000. The three top stories of the six-story building were completely wrecked. One man was killed and several men injured.

The factory of the St. Louis Axle Company was destroyed by fire August 9. The loss on the building was placed at $10,000, and $20,000 to the machinery of the plant. The company makes steel vehicle axles.

The Board of Public Improvements awarded a contract for erecting a second tier of steel cells at the workhouse to the Pauly Jailbuilding Company at a cost of $8300.

The Johnson Wireless, Holding & Mfg. Company, St. Louis, has been incorporated, capital stock $100,000; incorporators—Charles P. Johnson, Ralph Jones, Alexander Young and others. To manufacture and deal in devices for wireless telephones, &c.

The Warlic Heater Mfg. Company, St. Louis, has been incorporated; capital stock, fully paid, $100,000; incorporators—Walter J. Warner, Daniel A. Lichty, J. C. Taylor and James L. Hopkins; to manufacture and deal in heat producing appliances.

The Ferd Bauer Engineering & Contracting Company, St. Louis, has been incorporated; capital stock, fully paid, $50,000; incorporators—Gustav L. Mattern of Chicago, Ferdinand Bauer, Martha Bauer and Margaret Lawless; to manufacture and deal in refrigerating machinery, &c.

The Peerless Folding Bucket & Mfg. Company, St. Louis, has been incorporated; capital stock $25,000, fully paid; incorporators—S. R. Corbett and L. D. Murrill of Memphis, Tenn.; R. C. Powell of Kirkwood, Mo., and A. W. Slayback of St. Louis; to manufacture and deal in buckets.

The Witthcefft-Krusz Concrete Forms & Construction Company, St. Louis, has been incorporated; capital stock $100,000; incorporators—Philip Kruez, Otto Schultes and Wm. Grond; to manufacture and deal in concrete forms.

The Missouri Briquette Machine Company, St. Louis, has been incorporated; capital stock $50,000; incorporators—Frederick R. Cornwall, David R. Francis, John Scullin and others; to do a general manufacturing business, particularly briquette machines.

The St. Louis Cash Register Company is the business name of a new concern which is starting up in a small way, with equipment recently installed.

The Lead Products Company, recently removed here from Kansas City, Mo., manufacturer of red lead, litharge, &c., has its plant in running order again after it recent fire, and has been adding some new machinery.

The W. R. Knight Machinery Company, manufacturer of vertical milling machines, finds business very satisfactory for this season, and notices, particularly, a decided improvement in the demand from Europe.

The Wrought Iron Range Company, manufacturer of kitchen and hotel ranges, furnaces, &c., is getting ready to build a large new plant, as at its present location other lines of business are encroaching and thus prevent an extension.

The Southwest

KANSAS CITY, MO., August 15, 1910.

With the approach of autumn business in the leading trade centers of the Southwest shows a marked tendency to develop along the lines recently indicated in this report. Orders for machinery are still backward, but a good deal of correspondence is now in progress between prospective buyers and sellers, and estimates on the cost of equipping or remodeling power plants, mills, shops and factories have been called for recently to a greater extent than at any time since the close of spring purchasing. Jobbing houses and Eastern manufacturers having warehouses in this territory are also accumulating stocks of machinery and supplies in preparation for prompt deliveries when the regular fall movement sets in. Salesmen for supply houses who call

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frequently at the various local plants report that most of these are very busy, and confirmation of this comes from a number of different sources. Sheet metal and repair work is a feature of the present situation, many shops having enough of the latter to compel considerable overtime labor.

In view of the assertions frequently made, of late, that the automobile industry is prospering at the expense of other lines of trade, the following statement attributed to J. W. Perry, president of the National Bank of Commerce, Kansas City, is interesting: I do not know of one instance, he says, where a man has mortgaged his home to buy a motor car. There is a lot of buncombe about the idea that our financial condition is threatened by motor car extravagance. It is now an economic proposition. We move merchandise in motor cars and motor trucks and save money by it. I believe the motor car is to become a great factor in commerce.

The contract for installing an electric power plant has just been let by the Snyder Ice, Light & Power Company, Synder, Texas.

An elevated steel tank to hold 165,000 gal. will be erected by the Chicago, Rock Island & Pacific Railway at Little Rock, Ark., in connection with a projected roundhouse. A coal handling plant, with track scale, cinder pit, &c., is also to be installed.

An electric generating set will be purchased in the near future by the city of De Soto, Mo., for installation in connection with the pumping plant.

A crushing plant equipped with five stamps has been erected by the Big Butte Mining Company, Prescott, Ariz., and other machinery will be required as the property is developed. Shaft sinking is now in progress.

The Continental Power Development Company, organized by W. E. Bradford. Versailles, Mo., who is secretary, will have plans prepared for a large hydroelectric plant.

The construction of an electric power and pumping station, equipped with the best modern machinery, is under consideration by the municipal authorities at Bryan, Texas.

The Campbell Heating Company, through its Kansas City sales offices, is putting on the market here a line of apparatus which has a number of unique features, and has been very extensively placed this season all through the Southwest, being one of the most active lines in this territory at the present time.

The American Light & Water Company, Kansas City, has been awarded the contract for constructing a pumping plant and distributing system at Vale, Ore. A gas engine driven pump will be used as the initial unit, and this will serve as an auxiliary later on when the proposed gravity system is completed.

It is reported from McCrery, Ark., that the A. Langton Mfg. Company, Terre Haute, Ind., has put in operation a new timber cutting plant.

The Ober-Nester Glass Company, Kansas City, is arranging for the erection of a new factory building.

The Tucson Gas, Electric Light & Power Company, Tucson, Ariz., which has generating units with a capacity of 400 kw., has engaged an Eastern engineering firm to plan extensive improvements in its system, involving the purchase of some new machinery.

A new woodworking plant has been completed and put in operation by the Southwestern Veneer Company at Cotton Plant, Ark.

J. E. Knotts, Guanacevi, Mexico, is contemplating the installation of a 50 or 75 kw. three-phase 2200-volt 60-cycle generator connected to engine in his mill for furnishing electric current for light and power throughout the city. About three miles of transmission line will be erected and street lighting system installed.

San Francisco

SAN FRANCISCO, August 10, 1910.

Road machinery continues active, new types especially being in strong demand, and no curtailment is anticipated before the beginning of the rainy season. Considerable equipment is also required for railroad construction in various parts of the State. Mining machinery has been rather quiet during the summer, but the movement is beginning to increase to some extent. The foreign business in this line continues to be a prominent feature, frequent shipments being made to points in Mexico and South America. Several dredgers, both for mining and reclamation purposes, are being constructed, and it is expected that a local firm will get a contract for a ladder dredge for the Isthmian Canal Commission.

The Empire Investment Company is preparing to install a large pumping plant to irrigate a tract of land near Lemoore, Cal.

The town of Santa Barbara, Cal., is in the market for pumping equipment for use in connection with the sewer system.

The Crown City Flour Milling Company is having plans drawn for a milling plant at Pasadena, Cal.

The town of Lodi, Cal., is planning to replace its water works pumping plant with an entire new outfit, including two 100-hp. gasoline engines, electric generator, &c.

An order from the Government is expected about the end of the month for a steam hammer, water tube boilers, and other equipment for the use of the Mare Island, Cal., navy yard.

The Aiken Company, operating a rock quarry near Bakersfield, Cal., will install a large crusher, revolving screens, &c., in the near future.

The Hanford Foundry, Coalings, Cal., was damaged by fire to the extent of about $1500 on July 29.

The Silica Brick Company, Sacramento, Cal., has placed contracts for new machinery amounting to about $22,000.

The Marysville Gold Dredging Company is preparing to build a new mining dredge on its property at Marigold, Cal.

S. H. Hatcher is planning to install an ice manufacturing plant of about 100 tons daily capacity at Sacramento, Cal.

The Pittsburg Foundry Company has filed articles of incorporation at Los Angeles, Cal., with a capital stock of $25,000. The incorporators are F. E. Burger, H. P. Burger, W. Burger and H. E. Colby.

The Hamilton Motor Company has been incorporated at Pasadena, Cal., with a capital stock of $50,000 by E. J. Pyle, A. A. Genereaux, E. W. Leslie, N. W. and A. G. Hamilton.

O. F. Metz, formerly connected with the Pacific Gas & Electric Company, has joined the staff of W. S. Heger, Pacific Coast manager for the Allis-Chalmers Company.

The Los Angeles Brick Company has plans under way for an addition to its plant at Richmond, Cal., the machinery for which will cost about $50,000, and will include several classes of modern brick making equipment.

The Northern Electric Railway Company, San Francisco, Cal., is contemplating the erection of new shops and new terminals at West Sacramento, Cal., but plans are not sufficiently developed to give detailed information.

The Grandiean Gas Machine Company, San Diego, Cal., is seeking a factory site for the construction of a plant to manufacture a recently perfected gas machine. At present the company is having its products manufactured under contracts.

The Farther Central West

OMAHA, NEB., August 15, 1910.

There are indications all through this Western country that fall trade will be very brisk, as decisions in relation to new equipment have been delayed during the summer, and they will have to be made very shortly if important work is not to be held up. The hot, dry weather caused business of all kinds to drag, and there has been considerable worry over the crops; but it is now apparent that there will be plenty of money in circulation after the early movement of grain takes place, and local industries are likely to flourish. For the next few weeks, however, the only buying of importance will be of machinery of general utility, including power and pumping units, accompanied by the usual miscellaneous demand. It is essentially a jobbers' and dealers' market, with business transacted more by mail than through visits of salesmen to customers.

The Standard Bridge Company, Omaha, has taken an important contract for the erection and maintenance of bridges in the vicinity of Fairfax, S. D.

The Superior Electric Light & Power Company, Superior, Neb., is planning to enlarge its plant and extend the distribution system. Equipment now in service comprises three alternating current generators of 150 kw., driven from hydraulic turbines built by J. Leffel & Co., Springfield, Ohio.

A plant for concentrating tungsten ore will be built in the vicinity of Boulder, Colo., by Smith & Ardouvel, who are operating a mine there. The plans include use of electric motors for driving the machinery.

A new boiler is being ordered for the municipal plant at Wymore, Neb., and some additional apparatus may be purchased.

The Davenport Locomotive Works, Davenport, Iowa, is largely extending its business in the industrial districts of the Ohio River valley and contiguous territory. For that section of the country the Pittsburgh Machinery & Equipment Company, Pittsburgh, was recently appointed sales agent.

The municipal power plant at West Liberty, Iowa, is to be enlarged and a new Corliss engine unit of 150 kw. installed. The present equipment is driven from an engine furnished by the Murray Iron Works Company, Burlington, Iowa.

An electric plant at Van Horne, Iowa, will be taken

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over and improved by the Van Horne Electric Light & Power Company, recently organized there for the purpose.

A motor driven pump of 2,000,000 gal. daily capacity is to be installed at Lincoln, Neb.

The Monarch Engineering Company, Falls City, Neb., has taken the contract for constructing a bridge across the Salinas River in the vicinity of Metz, Cal.

Before the advent of another season the output of the Plymouth Clay Products Company, Ft. Dodge, Iowa, which has recently been inadequate to the demand, will be enlarged by the installation of additional machinery.

The Interstate Electric & Mfg. Company, Sioux City, Iowa, has entered the field as a combination of the Inter-State Electric Mfg. Company and the Interstate Supply Company, whose business it will continue.

Equipment recently installed by the Sliver Bros. Iron Works Company, Salt Lake City, includes a high speed steel saw for cutting beams, channels, angles, &c., which was furnished by Jos. T. Ryerson & Son, Chicago. It is driven by a direct current electric motor of 20 hp.

One of the heaviest dealers in iron and other metal scrap in the mountain States is the Utah Junk Company, Salt Lake City, Utah, which has recently been making extensive shipments to the nearest furnaces.

Business in low pressure boilers for heating systems has been found very good all through the summer by the McDonnell Boiler & Iron Works, Des Moines, Iowa. Prospects for fall trade are excellent.

The Bridgeport Electric & Power Company, Bridgeport, Neb., organized with a capital stock of $25,000, will install in the near future an electric light and power plant, and possibly a water works system.

The Northwest

ST. PAUL, MINN., August 15, 1910.

A fair amount of business continues to be done by manufacturers and dealers in this part of the country, and a number of projects for new factory buildings, including two motor vehicle plants, are now maturing, with a view to starting construction work by or before the middle of the fall season. Contractors' equipment is still being ordered to an appreciable extent, notwithstanding the lateness of the season. Railroads with terminals on the Pacific Coast have taken some machinery lately, together with large quantities of miscellaneous supplies, and there has also been a limited amount of purchasing by the lines that traverse the Northwestern grain fields. Among industrial establishments, the best demand for mechanical equipment comes from manufacturers of flour, cereals, household necessities, small patented specialties, &c., with every prospect that this will be well sustained for some weeks to come.

Webster Wheelock, whose office is in the Hackney Building, St. Paul, has ordered plans prepared for a central power plant, located in one of the manufacturing districts, which will furnish electric current for operating the machinery in a number of industrial plants of the vicinity. The details of equipment will be taken up after building contracts have been let.

A hydroelectric plant to furnish power for operating motors at the mine and concentrating mill is being constructed by the Mines Company, Ltd., Wallace, Idaho.

Contracts for the installation of a municipal electric station for power and lighting at Britton, S. D., were recently let.

The Olson-Boettger Electric Mfg. Company, St. Paul, is having a good trade this summer in small motors and detail apparatus of various kinds.

The Minneapolis Electric & Construction Company, Minneapolis, is putting on the market a wire measuring machine, which performs reeling and measuring in one operation.

Machinery including a hoist, compressor and pumping unit will be installed in the near future on the property of the Big Baldy Mining Company, Wallace, Idaho.

The Oliver Iron Mining Company is putting in a water supply system at Gilbert, Minn. A public service franchise will probably be granted by the local authorities to a corporation formed for the purpose of installing an electric power plant.

The capital stock of the Northwestern Electric Equipment Company, St. Paul, has been increased to $600,000.

It is reported from Hill City, S. D., that E. O. Johnson, who is working the Gertie mine at that place, has had built after his own design an ore crusher which resembles the tube mill in form but uses iron rollers in place of flint pebbles. It was built in the machine shops of the Homestake Mining Company at Lead, S. D.

A car replacer which has come into service in the Northwest is manufactured by the Washburn Steel Castings & Coupler Company, Minneapolis. It is cast in steel, with a clip which hooks over the ball of the rail, holding the device in position and preventing the wheel of a car or locomotive from crowding it away. The outside replacer is also provided with grooves to direct the flange of the wheel over the top of the rail and bring the flange to its position on the inside of the track. This mechanism is also being extensively introduced in other parts of the country.

Plans for hydroelectric developments on tributaries of the St. Louis River that aggregate 75,000 hp. are gradually being matured by the Minnesota Canal & Power Company, Duluth, Minn., which has just been granted permission by the State to use public lands for the sites of storage reservoirs. The company will enter into competition with the Great Northern Power Company, which has a plant of 40,000 hp. on the St. Louis River at Thomson, Minn., its headquarters being also in Duluth.

A new manufacturing plant, 50 x 140 ft., will be built in St. Paul for the O'Donnell Shoe Company, now located at Sixth and Wacouta streets. It is to be completed by November 1.

G. W. Mitchell, Winner, N. D., has organized a company to build a pumping plant for public service.

The Linder Mfg. Company, Minneapolis, has built up a large trade, at numerous points in the Northwest, in structural and ornamental iron, the demand for which this season has kept its fabricating plant running to full capacity.

The town of West Liberty, Iowa, has recently let contracts for new equipment for a lighting plant, and is considering the purchase of a deep well pump.

The Eureka Stone & Ore Crusher Company, Cedar Rapids, Iowa, manufacturer of the Mitchell improved crushers, is considering the erection of an addition to its plant, approximating 60 x 140 ft., two stories, of brick and steel construction. Details of equipment to be installed have not been worked out.

The Standard Mfg. Company, Cedar Falls, Iowa, recently incorporated will manufacture farm and railroad gates and other farm labor saving devices. The company has its plant fully equipped, but will erect an addition within the next year and purchase additional machinery. Electric power with individual motors is now being used. The company is now operating sensitive drill presses, power punches and presses, and special machinery for working tubing into various shapes.

Sealed bids will be received until August 25 by the city of New Ulm, Minn., for furnishing all material and labor for laying water mains, placing gates and hydrants and making connections, also furnishing and installing a pneumatic water tank with a pump, motor and automatic starting device for the Dr. Martin Luther College.

The Grant & Wood Ball Department.—The Grant & Wood Mfg. Company, Chelsea, Mich., is erecting a building which will be used exclusively for oil and dry grinding of steel balls. The building will be 50 x 200 ft., one story, saw tooth roof construction, and will be equipped with sprinkler and hot water heating systems. The grinders to be installed were especially designed by John J. Grant, the company's consulting engineer, who has been identified with the ball industry both in America and abroad since the business was first started. Mr. Grant has also perfected a process whereby the company expects to greatly improve the quality of steel balls as compared with those heretofore manufactured. The new building, together with others already erected, will give the company capacity for a large output of this product, besides all grades of special alloy steel, brass and other composition balls.

The Hawley Down Draft Furnace Company is now moving into its new factory, located at Monroe and Des Plaines streets, Chicago. The entire machine shop contract was let to the Niles-Bement-Pond Company, the lathes being of Pratt & Whitney make. The forge department is being fitted out by the E. W. Bliss Company. The new plant will be modern in every respect and will be operated by electricity, the motors being furnished by the General Electric Company.

The Globe Seamless Steel Tubes Company, Milwaukee, has appointed the Kirby Equipment Company, 652 Railway Exchange Building, Chicago, its sales representative for the West.

Personal

Charles Whiting Baker, editor of the *Engineering News*, New York, was taken ill with fever while at Birmingham, England, in July, attending the congress of the Mechanical Engineers. His return to the United States will probably be delayed several weeks.

Joseph Riter, vice-president of the Riter-Conley Mfg. Company, Pittsburgh, has been very ill at Amsterdam, Holland, where he underwent an operation for appendicitis. He is reported to be recovering. Gilbert Fletcher, president of the company, has gone to Amsterdam to remain with Mr. Riter during his illness.

George R. Bennett, formerly associated with McDowell, Stocker & Co., Chicago, machinery merchants, has resigned from that connection and is now identified with Edgar Allen & Co., Ltd., manufacturers of tool steels, &c., with his headquarters in their Chicago office.

Isaac L. Ellwood, who for years was a very prominent figure in the barb wire trade, is seriously ill at his country home in De Kalb, Ill.

W. C. Royce, formerly with the Firth-Sterling Steel Company, has been appointed general sales agent for the Vanadium-Alloys Steel Company, with offices in Cleveland, Ohio.

E. L. Ryerson, president of Joseph T. Ryerson & Son, Chicago, recently sailed for Europe, to be absent several months.

R. L. Parrish, Covington, Va., president of the Oriskany Ore & Iron Corporation, has returned from a trip to Europe.

F. S. Witherbee, president of Witherbee, Sherman & Co., Inc., New York, sails for Europe early in September.

Charles W. Mouch, president of the Indiana Rolling Mill Company, Newcastle, Ind., has been elected president of the Farmers' National Bank of that city.

H. S. Stebbins of Oglebay, Norton & Co., Cleveland, who was recently severely injured in an automobile accident, is recovering slowly at his country home in Willoughby, Ohio. It will be several weeks until he will be able to take up his duties.

G. H. Jones, vice-president of the Inland Steel Company, Chicago, sailed for Europe August 13, from New York. He will visit his mother in England and will make a brief tour of the Continent, expecting to return to Chicago in about six weeks.

D. C. Snow and E. A. Pridmore, well known to the foundry trade from their connection with the firm of Henry E. Pridmore, Chicago, manufacturer of molding machines, are, on account of change in ownership, no longer connected with the business.

The Jones & Laughlin Steel Company, Pittsburgh, Pa., early last week placed in operation its new rod mill at Aliquippa, Pa.; being a new mill the output at first will be light, but it will be gradually increased until its full capacity is reached. The tin plate mills of this company at the Aliquippa Works, which have been operated now for some time, are to be gaited to full capacity, having business booked that will insure operation for several months. The fourth new blast furnace at Aliquippa is nearing completion and is expected to be blown in within the next three or four weeks.

The Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, has received an order for 500 gondola cars for use by the Illinois Tunnel Company, Chicago. They are small double truck cars, each having a capacity of 15,000 lb. They are to be of all steel construction, equipped with Andrews small size side frames and bolsters, and will be used for conveying freight. They are to be drawn by electric locomotives.

Obituary

WILLIAM H. SILVERTHORNE, New York, president of the Railway Steel Spring Company, died at his summer home near Mentor, Ohio, August 13, aged 60 years. He had been ill for some months. His boyhood and most of his business life were passed at Cleveland. He went to work in the Lake Shore Railroad shops after taking part of the public school course and later was a clerk in the office of the Amherst Stove Company. Then he became a salesman for the Winslow Roofing Company, which was formed to manufacture steel roofs for cars, and from that became connected with the Paige Car Wheel Company of Cleveland, which successfully developed a steel tired car wheel. In 1902 this company was taken over by the Railway Steel Spring Company, the capital of which was finally increased to $40,000,000. For some years Mr. Silverthorne had been a resident of New York. He had some interest in the Safety Car Heating & Lighting Company.

CHARLES RIDGELY, who was president of the Springfield Iron Company until its merger in the Republic Iron & Steel Company, died at Springfield, Ill., August 11, aged 74 years. He was born in Springfield and was active all his life in banking and industrial affairs. He was a director of the Wabash Railroad from 1875 to 1885, and for many years was president of the Consolidated Coal Company, which he organized for Jay Gould. His father, Nicholas H. Ridgely, was the first banker in Springfield, and Charles Ridgely at his death was vice-president of the Ridgely National Bank. In 1886 he declined the position of Comptroller of the Currency, which was offered him by President Cleveland. He was the father of William Barret Ridgely, who recently held this position at Washington.

ALBERT SPIES, who for many years was editor of *Cassier's Magazine*, and recently proprietor and editor of the *Foundry News*, died of apoplexy at his home in Jersey City, N. J., August 16. He was a graduate of Stevens Institute and a member of the American Society of Mechanical Engineers. His introduction into journalism began shortly after his graduation, when he joined the editorial staff of *The Iron Age*, serving in this capacity for several years. He leaves a widow and one son.

CHARLES P. CARTER, an inventor, known especially for his invention of the apple parer, died suddenly in his shop in Kingston, N. Y., August 13, while working on a new device for safes. He was 75 years old.

The Stiles Mfg. Company, Parkersburg, W. Va., has taken over an old plant located there, which includes a foundry for making brass, iron and aluminum castings and a completely equipped machine shop for the manufacture of large and small cut gears and special machine work. It has received important contracts for the manufacture of belt sanding machines for the Oakley & Jansen Machinery Company, and wood steaming retorts for the Perfection Wood Steaming Retort Company, both of Parkersburg. Stock facilities enable the carrying of a full line of mill supplies for prompt shipment. Robert G. Stiles is president; W. H. Westerman, vice-president and manager; Albert M. Stiles, secretary, and Samuel B. Stiles, treasurer.

Correction.—In the article entitled "Condensers for Small Central Stations," printed in *The Iron Age*, August 11, 1910, the lower part of Fig 9 shown on page 340 was misplaced. It should have formed the lower portion of Fig. 12, page 341, as it was an enlargement of the loop marked "bottom" at the left end of the indicator diagram.

The Expense of Nonproducers

Some Contrasts Between Office and Shop Standards of Efficiency

BY F. W. BRADY.

The most modern industrial conditions have apparently established the utility and ultimate economy of the most elaborate and detailed methods of determining the cost of production in manufacturing enterprises, although there is some extra expense involved. Many still object to the salaries paid in the cost department, believing that the information secured and tabulated—with the possible exception of jobs for which the customer is to be charged by the hour—forms no part of direct business operations and results in little but added cares and perplexities.

Ignoring the business procedure of the day, there are many manufacturers who would prefer to determine the progress of a year's business by deducting their gross disbursements from the total receipts; and, were it not for open accounts, payable and receivable, and could a combination of absolute honesty and infallibility be embodied in employees, all accounting expense could be eliminated and wealth and prosperity determined on a sheet from a pad.

However, the cost system as applied to production is coming into its own, although the possible future converts are large in number and strong in prejudice. None can dispute the fact that a cost system properly designed for its especial purpose, intelligently installed and maintained by competent directors is a positive means of eliminating a vast amount of guesswork in fixing selling prices, anticipating future conditions and meeting competition.

With all the attention concentrated on production, its cost, quantity and quality—a never ending search for a saving of a half-minute of time or the smallest fraction of a cent, by either labor saving tools or arrangements for handling material in the shop—it is not surprising that many other items of expense in manufacturing receive but cursory and intermittent investigation. Among these may be mentioned cost of the commercial administration and the clerical force therefor; expense of procuring new business in the various sections which the concern invades; interest and discount; salaries paid for no actual service received.

Opposition to the Expense of New Methods

There still exists a type of manufacturer who has an inborn revulsion against the expense which comes hand-in-hand with modern fixtures and changed methods. Increase in efficiency in any department, if not overburdened with systems, is a latent asset even though it cannot be posted in the books with a definite cash value. Sentiment also plays an important part in some cases, and such an argument as the following is not unusual: A prosperous manufacturer whose attention was called to the great contrast between his plant and the balance of his establishment made the statement that he had allowed very modern young men to sweep him out of his shop, but he positively would not change all his office methods, which had made him money all these years, and part with the only link connecting him with the past. He didn't propose to ask permission of his manager to have his desk stay in its old place.

In the nonproductive branches the majority of employees are salaried and their expense is fixed irrespective of the amount of labor they perform. Their output cannot be weighed in avoirdupois and is not susceptible to the radical betterments we find possible in the shop. Therefore, in studying the office situation, the problem to be met is to secure the maximum efficiency with the smallest consistent payroll.

Office Conditions Less Sharply Scrutinized

Another plausible excuse for the neglect of this phase of an enterprise is the customary small ratio of nonproducers to the total working force, even though the number of the former may be out of all proportion to actual necessities. Every eye is turned toward the shop, and in many instances no attention paid to the commercial help as to punctuality in reporting for the morning's duties; to the listless start of operations at that time; to the early preparations for the dinner hour; overstaying the allotted time for the mid-day meal; the many excuses for absence and days off, with pay; vacations in the summer season; interest in ball games, horse racing, &c.; pools and betting on uncertain future events; the everlasting "joshing" and prank playing during hours on the least provocation. These are a few of the sundry irregularities which would not be tolerated in the shop by either the superintendent or the proprietor himself, who has these conditions under his personal observation. The employees are not to be held guilty of improper service if their duties are not so regulated that they are constantly engaged.

It is not uncommon to find in a large industry, in which the shops are being crowded to the limit of capacity, without a space for a breath between operations, more or less of the office force killing time in consequence of a poor subdivision of the work in hand, or a slip in the layout of the day's duties which the executive of the department has not anticipated and met.

No Parallel to Shop Efficiency

Again, the "atmosphere" of the shop and that of the office are quite different. In the former every man has been trained from the first to be actually, or appear to be, engaged during every minute of the working day. The nonproducer is inclined to view his service otherwise, and without any particular force or inducement to push his work through, plods along at about 50 per cent. efficiency much of the time, or with pulsations of great vigor during a "rush," with periods of idleness intervening.

When the employees are not fully engaged, there are three faults to be studied: the whole force collectively or some of its parts may be too large for the enterprise; the work is not apportioned and distributed with a uniform thickness; the executive's attention is diverted from the details of his department to such an extent that their close study is prevented. In the last case, it is economy to provide for extra supervision, even though expenses may be increased.

How frequently we find the stockroom of the shop in the care of competent clerks; complete records of every ounce of material incoming and outgoing, with proper debits and credits on orders or jobs; an attempt at a perpetual inventory, &c. In the office the customary stockroom is a closet or receptacle in charge of the office boy, whose recollection of material passed out is the sole record; or, worse still, is the case where material is accessible to every employee at will. While the cash in the office is carefully guarded, postage stamps are often indiscriminately handled without any check on the number or weight of pieces mailed. The purpose of shop systems is not primarily to check dishonesty, but to prevent wastes and increase efficiency. Therefore, we would expect the same arguments to apply in the case of the commercial divisions.

Improvements in organizations always involve some cost in addition to a close study of every phase of the situation. The workings of the forces should be under observation for a considerable period, and careful records made of any irregularities in the rou-

tine, just as we watch an engine performance or the output from a group of tools. All mechanical combinations operate at maximum efficiency when under a uniform load approximating that for which they are designed; especially does this apply to those which consume fuel or utilize energy from such combustion. Why is not the human structure similarly regarded, and the same principles applied throughout? Employees under a reasonable stress are ultimately more competent, happier and more ambitious if there are not periods of hysterical rush, nor those given over to watching the clock. Business life indoors should not be influenced by the conditions of temperature without, humidity, depth of snow, protracted wet or dry spells, approaching holidays, or other causes which seem, in many instances, to be the pacemakers for daily activities. In the summer we find a high temperature an excuse for postponing all matters of importance, yet the one who suffers least from heat is he that is too busy to note it. A sharp thunderstorm in the average office will reduce efficiency to about 20 per cent. as a result of the customary methods therein, while during the same outburst the shop production maintains its average.

Office Reforms Take Time and Study

Like other ailments, the deformity of the average office administration is not susceptible to quick cure, nor will one remedy apply to all cases. The keen executive and close observer can go into the shops and absorb some of the spirit therein and transfer some of the fundamental principles he finds, to his dominion, with good results. His output will be increased and his costs reduced, and with due regard to the class of help under his care, his organization will be better pleased with itself and more pleasing to the proprietors. The adoption of labor-saving devices will not in itself bring about the proper results or economies.

The application of stringent measures to the commercial departments to bring about a radical change means the elimination of female employees—a procedure which, in the writer's opinion, cannot be put in force too soon.

The Lozier Motor Company's Plants.—It has been reported that the works of the Lozier Motor Company at Plattsburg, N. Y., would be abandoned, but this is an error. Two large additions to this plant have been built within the past year; 80 per cent. of the machinery is less than three years old; it has a capacity of over 600 complete Lozier cars per year, and it will be operated as heretofore to the fullest extent. On October 1, however, the new Detroit plant will be in operation and complete Lozier cars will only be turned out there; but at that time the Plattsburg plant will specialize in building various parts for the Lozier car which will be supplied to the Detroit plant. These parts will consist of castings, the major portion of the transmission and a greater part of the machine screw work. In this way both the Detroit and Plattsburg factories will work to the fullest extent in conjunction.

The Iron City Coal & Coke Company's Enlarged Sales Office.—G. W. Wilson, vice-president of the Iron City Coal & Coke Company, Pittsburgh, Pa., has purchased the Herriott Coal Company property at New House, Ohio, on the Pittsburgh, Lisbon & Western Railroad, and has incorporated a company under the laws of the State of Ohio known as the Wilson Coal Company. The officers are G. W. Wilson, president; S. V. D. Huntington, secretary; H. H. Hodge, treasurer. The property consists of 250 acres, with a modern electrical equipment. The mine has a capacity of 300 tons per day. The output will be handled by the Iron City Coal & Coke Company, which latter company contemplates opening a branch office in Cleveland, Ohio. This company recently opened branch offices at Philadelphia, Pa., and Toronto, Ont. W. W. Peabody is Eastern sales agent and W. F. Marshall Canadian sales agent. H. H. Hodge is sales agent, main office Pittsburgh, Pa.

The Mattagami River Iron Ore Field

TORONTO, August 15, 1910.—Professor Baker, who was sent to the Mattagami River region by the Government to examine the lignite and iron ore deposits, has returned after spending several weeks there. Nothing official has yet been given out as to his opinion of the ore field. It is said, however, that the exposed iron is of the limonite variety, and this is taken to mean that, below the surface, the ore is hematite. One body is said to be 1800 ft. long and of a known depth of 35 ft. This body is described as quite as promising a property as the Helen mine in the Michipicote district. There are several other properties of which glowing accounts are given by persons who may be interested. Several syndicates reported to be financially strong have taken up iron lands there and have sent up parties to explore them. Claims covering an area of as much as 700 acres have been acquired by a single syndicate in a number of cases. A very large party left toward the end of last month to look over certain of the properties. As has been mentioned in former letters, the field is not far from the lines of railroad that have been pushed across the hight of land and into the Hudson Bay slope of the continent. It is about 75 miles from Cochrane, the present northern terminal point on the Temiskaming & Northern Ontario Railway, a road built, owned and operated by the government of the province. The National Transcontinental Railway, which is being built by the Dominion Government, but which is to be operated by the Grand Trunk Pacific, also passes through Cochrane. There are believed to be great quantities of iron located in deposits scattered over the country about Hudson Bay, and the prediction has been made that that region will be the source of the raw material for a great Canadian iron and steel industry. C. A. C. J.

Modern Ore and Coal Handling Machinery.—Under the above title the Brown Hoisting Machinery Company, Cleveland, has issued an unusually elaborate pamphlet, 8 x 11 in. It consists largely of full page illustrations of installations of Brownhoist machinery that have gone into service since the issuance of the company's last catalogue. No attempt is made to give a detailed description of the machinery, the amount of material each unit will handle or records that have been made. A few introductory pages illustrate the development of ore and coal handling machinery. The first view is a scene at lower lake docks in the old days, when the ore was shoveled out of the hold of the vessel and wheeled on to the dock in barrows. This is followed by a view of three bridge tramways built for the New York, Lake Erie & Western Railroad Company's dock at Cleveland in 1883. In succession are shown a furnace hoist built in 1885, the first bridge tramways with cantilevers, built in 1886 at Ashtabula, and the first "fast plant" built for M. A. Hanna & Co., Cleveland, in 1890.

The Stark Rolling Mill Company, Canton, Ohio, furnished the novel *menu* cards at the annual banquet of the Master Sheet Metal Workers' Association, held at the Hotel Walton, Philadelphia, Pa., on the evening of August 11. The cards were galvanized sheets of the company's rust-resisting Toncan metal, on which the *menu* was printed in three colors. The courses had trade designations of an entertaining character. The entire conception was ingenious and exceedingly clever.

By-Product Ovens in America and Europe

Practice at Plants Operated in Connection with Iron and Steel Works

BY F. E. LUCAS*

So much has been written about the waste of natural resources in America that it seems almost useless to add to it. But the fact remains that due to this waste we have to face problems and conditions to-day that did not seem to have occurred to our forefathers. Dealing with coal alone, from the standpoint of iron and steel manufacture, we find that in the last few decades, while such giant strides have been made in America in building up a magnificent steel industry, millions of dollars have been lost by making coke in beehive ovens—lost through the lower yield of coke obtained in comparison with by-product ovens, and lost in the gas that has been allowed to escape into the air, most of it without even raising the steam necessary to run the plant.

To-day steel makers are facing the problem of making pig iron and steel at a cost that will give a reasonable profit without raising the price too high and so killing the market. The day of 60 per cent. ore is about passed, and consequently the quantity of coke used per ton of iron made is higher. The ore from most mines costs more per ton delivered at the furnace than it did a few years ago. The demand for open hearth steel is daily increasing and that costs more than Bessemer steel. Labor costs are also higher. Lavor saving devices are being added and as labor becomes dearer and scarcer the need for them is more apparent every day.

The size of blast furnaces seems to have reached its maximum. Other causes might be mentioned to show why it costs more to-day to make iron than it did some years ago, but I simply state these to show that while small savings may yet be made in the matters of organization, labor saving devices, &c., there does not seem to be any immediate hope of a very great saving in the furnace and steel departments themselves.

The point where the saving can be made is in the coke, and this is just beginning to be recognized in America now. In Europe, where their raw materials began to get scarce years ago, they have recognized it for some time, necessity driving them to taking advantage of every economy that was possible, particularly in the saving of by-products. We find this in all departments—brick, cement, slag, wool, &c., from blast furnace slag; fertilizer from basic steel slag; ammonia, tar and benzol from coke oven gas, while the gas is used for firing boilers or in gas engines, and the tar, particularly in Germany, is turned into numerous other by-products.

The Questions of First Cost and of By-Product Markets

A few years ago the chief reasons given for building beehive ovens instead of by-product ovens were the lack of a market for the by-products and the fact that the beehive ovens were lower in first cost. An actual comparison of the cost of a beehive oven and by-product oven, taking into consideration the large difference in yield of coke in favor of the by-product oven and the larger output of coke per day, shows that the difference in cost of plant per ton of output is not so great after all. Add to this the value of the ammonia and tar and the value of the surplus gas as fuel around a steel plant, the scale swings very far in favor of the by-product oven.

The market for by-products is at the worst good enough to make it pay well to recover them in connection with the manufacture of coke, and it is growing every year. The demand for sulphate of ammonia is increasing and is bound to increase each year as the population of the country grows. The average yield of crops per acre in the United States has been decreasing, and as a result we have seen many in the past few years packing up and going over to the Canadian West, where the virgin soil promises larger returns. But every one cannot do this, and yet the land must be made to produce. Sulphate of ammonia is what is going to do it and is doing it. The agricultural scientists have proved that, and are doing the advertising for us. At present the production of sulphate in the United States is not sufficient for the demand and thousands of tons are imported annually, besides all the nitrate of soda and other fertilizers.

The market for tar is also growing. Needless to say anything about the depletion of the forests and the necessity for caring for what timber we get and making it last as long as possible. The demand for creosote oil, one of the chief products from the tar, is increasing, and I believe it will not be long before all railroad ties, pit timbers, bridge timbers, &c., will be creosoted. The naphtha, benzol and finer oils find a ready market now, and as the use of internal combustion engines becomes greater so the value of some of the tar products will be greater.

The pitch market has fluctuated greatly, but even at its lowest price it cannot be proved that by-product ovens do not pay. Pitch is coming into greater use for road paving, and I believe that the next few years will see a considerable development of the briquetting industry, which will create a further market for it.

Recent tests made by the United States Government have shown that for fuel purposes it pays to burn briquettes rather than loose coal. In France, Belgium and Germany I found that practically all the railroad locomotives are fired with briquettes.

American and European Practice

I have just recently had the opportunity of visiting the principal iron and coal centers of England and Europe, mainly with the object of looking into the various types of ovens and by-product recovery systems and briquetting plants. Last year I visited most of the oven plants in the United States.

It is very hard to draw comparisons between the general practice in this country and that of England and Europe, for there is such a great difference in the conditions under which they are working. In general, labor saving machinery has not been adopted to such a large extent on the other side as in America. The reasons given for this are that labor is cheaper and the extra fixed charges and cost of maintenance involved in the machinery just about equal the extra labor necessary to do the same work. Then when business is slack the men can be laid off, but with the machinery the charges go on just the same.

Although there are some very excellent types of ovens in operation in England and on the Continent, Europeans do not run them to such high efficiency, so far as the production of coke is concerned, as is done at some of the plants on this side. Twenty-four hours is about the limit for the coking time, though there are ovens that could do better if it was desired to force them. In both coke ovens and blast furnace practice the idea seems to be that it is more economical not to force matters, as is the general practice on this side. Foreign engineers claim that they get longer life in their ovens and furnaces and also have less trouble in operating.

If we in America were suddenly confronted with some of the problems with which many of the plants on the other side are daily contending, it would mean a sad upsetting of business until we got ourselves adjusted to the new conditions. But they came to them gradually, and one cannot help but admire the way in

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which they adapted themselves to the changed conditions, overcoming difficulties which at first would seem almost insurmountable. In many places in England, Belgium and Germany the best coking coals have become exhausted and in nearly every case it is necessary to wash the coal. In most cases, except at some few places in Wales and England, and at some of the plants in Westphalia, it is necessary to stamp the coal before charging it in order to get a coke at all fit for metallurgical use. Added to this, many of the furnaces are working ores running as low as 25 per cent. iron, and have to calcine them before charging into the furnace, the product from the calcining plant running from 30 to 35 per cent. iron. Other furnace plants are working almost entirely on imported ores. There are, of course, a few plants, more favorably situated than others, that still have good ore supplies.

The most striking difference between America and the older countries is in the saving of by-products, and in this we are far behind. Germany particularly has a long lead, both in the quantity of by-products recovered and also in the simplicity of the apparatus used. I do not say that this is due to their superior inventive genius, but the two chief reasons for it are these: First, the necessity for saving everything possible in order to make finished material at a price which would allow them to compete for the world's trade; second, the fact that the laws will not permit them to pollute the air and streams with gases and sewage as we do in this country, and since they had to dispose of them by other means they made the work pay for itself by the recovery of further by-products.

One of the chief reasons why Germany has such a lead over all other countries is due, I think, to their system of education and the facilities that are given to any young chemist of promise for research work. The chemist knows that if he discovers a new by-product that can be made a commercial success, or if he can discover a method for synthetically manufacturing some product more cheaply than the natural product can be obtained, his future is assured.

There are many things on the other side which I believe if adopted in the United States and Canada would mean a great saving; and there are also things on this side which could well be adopted in Europe. But the difficulties which European engineers have met and overcome will just as surely one day confront us, and with the knowledge of their failures and successes the solution of these problems should be much easier for us.

The Trade Outlook in Canada

TORONTO, August 13, 1910.—The trade prospects of this country for the next twelvemonth are much brighter than they appear to interested observers who are looking on from a distance, and are likely to pay undue attention to the reports of crop shortage in the West. It is now clear that the seriousness of the shortage was much exaggerated in these reports, and that even the facts therein were overemphasized. Dr. Saunders, Director of the Dominion Government Experimental Farms, completed a tour of the western fields just before the beginning of harvest, and estimates that they will yield 100,000,000 bushels of wheat. Very great changes for the better took place in certain areas of the crop in the latest stage of growth, and much improved the outlook that led some statisticians to put the yield down as low as 75,000,000 bushels. But even if the wheat crop had not exceeded this low estimate, there would have been no ground for taking a pessimistic view of trade. The West has other agricultural products than wheat, and it has reason to look for fair returns from these. Its oats crop will run into a large value. Its flax is alone a very important item in this year's production. Its dairy industry goes on expanding, and its live stock interests are likely to do very well this year. It would not be surprising if the total agricultural production of the West this year were to prove nearly equal in buying power to that of last year, when wheat loomed so much larger in the output.

It seems quite safe to say that the agricultural production of all Canada will this year equal in value the total agricultural production of all Canada in 1909. It seems necessary to remind outsiders that it is not only in the West that Canada has grain fields, pasture lands and other food yielding tracts. Ontario still holds the primacy in agriculture. The farm wealth produced by the three prairie provinces—Manitoba, Saskatchewan and Alberta—will not exceed, if it equals, the farm wealth produced in this oldest, most populous and richest of the provinces. From its meadows alone Ontario takes an annual return of scores of millions of dollars, computing the value of the hay sold and that fed to live stock, and the produce of the pasture in the farms of milk, butter, cheese and meat. The pasture has been exceptionally good from early spring up to the present, and the dairy output is expected to be one of the largest the province ever had. Then, too, the grain yield of Ontario is exceptionally large. The wheat crop may total 22,000,000 bushels. It is expected that the proceeds of the fruit crop will be unusually large, for besides a large yield there is now a good system of distribution, giving the Ontario fruit access to the Western market.

In Quebec and the Maritime Provinces conditions are likewise very favorable for the tillers of the soil.

A factor that becomes more important every year is the mineral output. British Columbia, Ontario and Nova Scotia are the provinces in which this is of greatest magnitude. According to the preliminary report of the Mines Branch of the Dominion Department of Mines, the value of the metallic, nonmetallic, structural materials and clay products obtained from the deposits of Canada in the calendar year 1909 was $90,415,763, as compared with $85,927,802 in 1908. Ten years ago the value was $49,234,005. No matter how harvests fluctuate, the mines are likely to go on increasing in productiveness.

If there were likely to be any falling off in the country's buying power in the next twelvemonth the banks would have made adjustments accordingly. In former years of crop shortage they had begun to contract their accommodation before this season. This year they show no lack of confidence. They dispense credit now on much the same scale as they did a year ago. The banks can be trusted to gauge the situation with approximate accuracy, for there is no other business intelligence service in the country to be compared with that of the chartered banks. Through their 2000 odd branches scattered over the productive area of the Dominion they keep informed as to conditions in all departments, the local managers being keen observers and collectors of facts bearing on economic conditions in their territory. There seems every reason to believe that Canada's market will be as roomy as it was in the last year.

C. A. C. J.

Panama Scrap to Go to the Pacific Coast.—It is stated that 500 tons of miscellaneous scrap iron and steel, mostly old French material, will be sent from Panama to San Francisco or Seattle for sale in order that a comparison may be made between the prices obtainable at Atlantic and Pacific Coast ports. All the scrap shipped up to this time has been sent to New York in the Panama Railroad steamships. The trial shipment to the Pacific Coast will be made on the Wotan, a German steamer chartered by W. R. Grace & Co., and although the distance to San Francisco is much greater than to New York the rate per ton for carrying the material will be the same.

Texas Ore Fields to Have Railroad Outlets

AUSTIN, TEXAS, August 12, 1910.—Engineers are now at work running lines for the new railroad that is to be constructed from Longview to the iron ore fields in Cass County, Texas, a distance of about 40 miles. This proposed road will be built by Lewis P. Featherstone of Galveston and associates. It is understood that it will be taken over by the Santa Fe upon its completion and operated as a part of that system. It will connect with the Santa Fe at Longview. Mr. Featherstone and associates are also having a survey made for a line of railroad which they will construct to connect the iron ore fields with the Missouri, Kansas & Texas. This latter line will be about 20 miles long.

It is announced that, as soon as the ore beds are given a railroad outlet, mining operations will be started on an extensive scale and the ore shipped to blast furnaces in Pennsylvania via Port Bolivar, Texas, the Santa Fe's deep water terminus, opposite Galveston. The work of exploring the iron ore field in Cass County has been going on for several months, and an enormous tonnage of ore is said to have been developed. Charles M. Schwab and associates, who acquired the ore beds several months ago, will shortly put a large force of men to work getting out the ore. It is asserted that they plan to establish blast furnaces at Port Bolivar, where the ore will be converted into pig iron and then shipped in that form to the steel works in Pennsylvania. H.

The Youngstown Sheet & Tube Company's Bonus.—On August 5 and 6 the Youngstown Sheet & Tube Company, Youngstown, Ohio, began paying the 5 per cent. bonus earned by its employees under the profit sharing plan adopted about a year ago. The extra pay amounted to about $200,000 and was based upon the earnings of the company for the past fiscal year, ending June 30. All the employees of the company participated in this profit sharing plan except union labor and the officials of the company. The union labor at this plant is confined to the puddle and muck bar departments. At the recent annual meeting of the stockholders of the company, it was voted to continue the profit sharing plan for another year. During the first year employees engaged in construction work participated in the bonus payment, but it has been decided that during the second year only those engaged in actual production, except as noted above, will be entitled to a bonus.

International railroad traffic between the United States and Canada promises to be subjected to joint regulation by the two countries. A conference was held last week on this subject between Chairman Martin A. Knapp of the Interstate Commerce Commission and Chief Commissioner Mabee of the Railway Commission of Canada. It is understood that these representatives of the railroad commissions of the two countries have found common ground and will go into a second conference in the early fall with every prospect of making rapid progress. Both of them are requested to investigate the situation for their governments and to make a recommendation for legislation or a treaty. Chairman Knapp states that the growth of through freight and passenger traffic has been exceedingly rapid in the last five years, making joint regulation almost imperative.

The Iron & Steel Products Company.—A committee consisting of Elverton R. Chapman, 80 Broadway, New York; Gustave Benjamin, and Jacob M. Shenk, has submitted a plan of reorganization to the creditors. All the plants of the company are now closed. The following sales were made by Adrian H. Muller & Son, New York, on August 10; Iron & Steel Products Company, $73,000 guaranteed 6 per cent. mortgage gold notes for $200 and $350,000 of the same company's first mortgage 5s for $960; $15,000 notes of West End Iron Company for $150; $10,000 notes of Lebanon Chain Works for $100, and $30,000 notes of Canton Iron & Steel Company for $1160, in each case for the lot.

Marchant's Unbreakable Rivet Sets

Since the invention of the pneumatic hammer, the users of such tools have experienced much trouble, expense and annoyance from the crystallization and consequent breakage of the rivet sets. This breakage invariably occurs in the neck of the tool, and it is not unusual in driving large rivets for a riveting gang to break two or three sets a day. Since the introduction of the use of alloys, however, steel makers have made great strides in the manufacture of steel that would resist the tendency to crystallize under the repeated blows of the hammer, but it has been difficult to make these alloy steels with any degree of uniformity. One lot of steel would give excellent results, but another might fail.

During the past year Geo. F. Marchant, manufacturer of rivet sets, Elizabeth and Lake streets, Chicago, has succeeded in obtaining a vanadium alloy steel that is not only uniform in quality, but has shown remarkable results when made into rivet sets and properly heat treated. To cite an instance of the durability of the vanadium sets, two of them were put to work in February by the Strobel Steel Construction Company on the new Northwestern Station, Chicago. They have been in constant use since that time, and it is estimated have driven more than 25,000 7/8-in. rivets, and are apparently in as good condition now as when new. It is claimed that rivet sets made from high grade carbon tool steel would seldom last, especially during the cold weather, more than two or three days, and would often break during the first hour of use.

Chief Engineer James A. Aupperle of the Metallurgical Research Department of the American Rolling Mill Company, Middletown, Ohio, read an interesting paper on the properties of American ingot iron August 10 at the convention of the National Association of Sheet Metal Workers, Philadelphia. The address has been printed in pamphlet form for distribution. American ingot iron is the special product of this company, and has been shown by severe tests to resist corrosion effectively. It is largely used in the manufacture of sheets.

The American Sandless Casting Company, Philadelphia, Pa., has been incorporated with a capital stock of $5,000,000. Frank M. Riter and W. Northrope Cowles of that city and S. D. Townsend, Jr., Wilmington, Del., are the incorporators. The company has been formed for the purpose of acquiring the patent rights that have been or may be obtained by Edgar A. Custer, now with the Tacony Iron Company, Philadelphia, for casting iron in permanent metal molds. Those interested state that the plans of the new concern have not been fully decided upon.

The Youngstown Furnace Company, which was recently incorporated at Youngstown, Ohio, has taken over the business of the Youngstown Furnace & Supply Company, with office at 13 East Commerce street. A. K. Kimmel is president and general manager, C. F. Landolt is vice-president and H. E. Owen is secretary and treasurer. The company will continue to manufacture Lyon, Apex and Bessemer warm air house heating furnaces, which have been on the market for a considerable length of time.

Titanium in Steel and Iron Castings

A Review of Tests Made at a German Foundry

A very elaborate paper on the action of titanium when added to iron and steel castings appears in *Stahl und Eisen* of July 13. It is the result of a long series of observations made by Leonhard Treuheit, a foundry superintendent at Elberfeld, Germany. The conclusions derived are at variance with those of other investigators, and hence a somewhat critical review would seem in order considering the large amount of space given the matter in the important journal in question.

Mr. Treuheit made his tests with 25 per cent. titanium thermit and with 10 to 15 per cent. ferrotitanium. He was desirous of noting whether the temperature of the bath in either steel or gray iron work was raised any as the result of the titanium addition, and further whether the physical condition of the castings was enhanced. In the first series of tests about 1500 lb. of molten gray iron was tapped from the cupola into a previously heated ladle, the temperature of the metal in the spout being 2475 degrees F. After tapping this became 2340 degrees in the ladle. The temperatures were measured with the Wanner pyrometer. About 440 lb. of metal was poured into a smaller ladle and from there cast into test bars. The temperature in the smaller ladle was now 2240 degrees F., a drop of 235 degrees. The balance in the big ladle received a can of 1.43-lb. titanium thermit (25 per cent. titanium, which figures out 0.0324 per cent. titanium actually added). Mr. Treuheit reports that the ebullition was very slight, lasting only 1½ min. During this reaction temperatures were 2250 degrees F. before the reaction and 2215 degrees after. Repouring into a smaller ladle for test bar purposes brought the temperature down to 2160 degrees.

Evidently Mr. Treuheit was not quite satisfied with this test, and made another in which the drop in temperatures was not quite so marked; indeed, the end temperature given above is so near the melting point of that class of cast iron that if correct it is a wonder that the molds could be poured. This second test also involved the use of 0.04 per cent. titanium, or slightly more than the first.

A Question as to Temperature Records

Criticism of the results given so far would lie in the direction of evident inaccuracy of the temperature readings either on the part of the operator, or more likely in the instrument. A difference of 235 degrees in pouring to the final ladle, even if this is cold, is so far off that results based thereon are at least questionable. Further, the addition of only between 0.03 and 0.04 per cent. of titanium to molten metal is so small a quantity that it could hardly affect results. At least 0.1 per cent. is the proper dose. Hence the elaborate tables given would prove little. These figures may be summarized as follows: Of a dozen tensile tests, the average before using was 28,870 lb. per sq. in., and afterward it dropped down to 28,160 lb., indicating that instead of purifying the bath the titanium thermit did the other thing, probably due to the method of handling, as the temperature was reduced at the same time. Transverse tests with bars 1.2 in. square on supports 30 in. apart gave a breaking load of 980 lb. with 0.35 in. deflection before treatment, and 1200 lb. with 0.36 in. deflection after treating, each figure being the average of a dozen tests. Here again we note the variation from the modern testing conditions, which for Germany require a round bar of 1¼ in. diameter, and supports much closer than 30 in. apart. The results of the repeat test give higher values in favor of the titanium, of which more was used, the tensile strength increasing to the extent of 4.6 per cent. For the transverse tests, however, round bars were weaker, but square bars were stronger.

The iron used ran 1.77 per cent. silicon, 0.57 manganese, 0.490 phosphorus, and sulphur close to 0.090, Mr. Treuheit accounting for a reduction in sulphur of "0.0046 per cent." by reason of the titanium addition. Titanium could not be traced in the metal chemically.

The third series of tests was made by remelting the remains of the treated material of the second test in the crucible and hence will not interest us specially. Some excellent fracture photographs accompany the paper, but, as indicated, these show nothing special as the result of the titanium thermit addition, which seems perfectly natural in the light of the data given.

Unsatisfactory Results with Steel Castings

Mr. Treuheit then conducted a similar set of tests with steel. Here the initial temperature as the metal came from the furnace was 2950 degrees F.; in the ladle it dropped to 2725 degrees, and when repoured for making test pieces ran 2650 degrees, a drop of 300 degrees from the initial. Plates were cast from which the several test pieces were cut out. Mild steel without titanium had an elastic limit of 36,550 lb. per square inch, an ultimate of 55,900 lb., elongation of 33.5 per cent., and reduction of area of 58.7 per cent. After addition of the small amount of 0.04 per cent. titanium it showed 35,130 lb. per square inch elastic limit, with an ultimate of 55,330 lb., an elongation of 32.4 per cent., and a reduction of area of 60.9 per cent. These figures again indicate something wrong with the method of conducting the test, as well as the making of deductions from insufficient titanium additions. The steel in question was quite soft, running 0.09 in carbon.

A further series of tests was made with a steel running 66,280 lb. per square inch, and here also the strengths dropped, while the elongation and reduction in area went up a little.

Larger Additions to Gray Iron and Steel

The next set of tests was made with ferrotitanium additions to gray iron. The alloy contained 14.52 per cent. titanium and 0.458 per cent. manganese. In the tests 0.09 per cent. titanium was added, which should be about the right amount. Titanium up to 15 per cent., however, is pretty hard to melt in cast iron, even if pre-heated to redness, and hence may not have fully dissolved before pouring. The temperatures before and after tapping into the ladle and adding the titanium alloy were close to 2400 degrees F. The composition of the cast iron was about 1.30 silicon, 0.60 manganese, 0.70 phosphorus and 0.09 sulphur. Almost 0.02 sulphur was taken out by the addition. The tensile strength before adding was 28,580 lb. per square inch, and 22,470 lb. after, showing a serious loss. On the transverse tests we have breaking weights of 1120 lb. and 1070 lb. before and after, with deflections of 0.27 in. and 0.24 in., respectively.

The next series of tests was with the same ferrotitanium added to steel. About 0.14 per cent. titanium was added to some 200 lb. of 18 carbon steel, and this poured into plates from which the samples were cut. The results show very little improvement in any direction except in reduction of area, which is more pronounced. The final series of tests with 28 carbon steel under the same conditions showed a small reduction in everything except the elastic limit, this going up a very little.

After reading the 12 pages of this paper in *Stahl und Eisen*, one is a little at sea as to where the sore spot of the problem lies. The results are so much at variance with the facts as gathered by other experimenters that apart from the evident use of too little titanium in nearly all the series and probable ineffectiveness of portions of it where enough was added, owing to the refractory nature of high titanium alloys, there can only remain the suspicion that the experi-

menters in question were not fully familiar with the conducting of scientific tests. There are some earmarks of this, for in giving temperatures these are as close as one degree, an impossible matter in these high ranges. In the analyses the third decimal place is quoted, and so on.

Only one other thing might have been the case, though this would have been one chance in a million, and that is that with the very highest purity in the materials used, titanium has no effect, as it is, after all, only a purifier of oxidized metal, as well as a scavenger for gases. This supposition can be dismissed as remote. Manufacturers of steel as well as foundrymen will be interested in seeing what further developments may take place in regard to the use of titanium in Germany, as it is the home of titanium thermit and also a large consumer of ferrotitanium made in this country.

R. M.

The Bollinger-Andrews Construction Company, Pittsburgh, with plant at Verona, Pa., has contracted with the Nagle Engine & Boiler Works, Erie, Pa., for four 72-in. by 18-ft. boilers, to be installed in its power house. The first named company is also erecting an extension to the green sand department of its foundry, approximately 150 x 160 ft. It is busy in the structural department, turning out steel structures and mill buildings for various concerns, and is also operating its ingot mold and gray iron foundries to good capacity.

An exposition of the industries of New England, promising to be the most elaborate of any of its kind, will be held in Mechanics' Building, Boston, during the four weeks of October, 1911. The project is in the hands of prominent members of the Boston Chamber of Commerce and has received the indorsement of the Boston Merchants' Association. Chester I. Campbell, who has had much experience in this field of activity, is manager of the exposition, aided by an Executive Committee of prominent business men.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, resumed operations in its hot mill department Monday of last week. This department was closed for about four weeks for the purpose of making necessary repairs. The company's three new sheet mills and two special mills under construction are expected to be ready for operation in about five weeks, when the force of workmen will be considerably increased to take care of the greater production.

The Sauer Power Generating Company, 5115-5119 Rosetta street, E. E., Pittsburgh, Pa., has completed an addition to its plant, about 25 x 30 ft., in which it has installed a boiler and other power machinery. The company, which was recently incorporated, will manufacture a line of patented specialties, including the Sauer adjustable shaft bearing, small turbines for a variety of purposes, gas burners, &c. It will require a medium-sized milling machine for its machine shop.

The Independent Bridge Company, Pittsburgh, Pa., has received a contract from the Government for the construction of rolling gates for the locks at dams Nos. 8 and 11, Ohio River, which will take about 600 tons of fabricated steel. The company has also secured the contract for the steel required for an extension to the Harbison-Walker Refractories Company's plant at East Chicago, Ill.

Two British manufacturing concerns have apparently decided to locate branch factories in Montreal. The George Anderson Company, which makes cranes and stove machinery, is to build a large factory there in time to have it in operation by next May. The Cleveland Bridge & Engineering Company, Darlington, England, is the oether company. That concern has tendered for the construction of the Quebec Bridge.

The British Foundrymen's Association

The seventh annual convention of the British Foundrymen's Association was held at Manchester, England, August 2 to 4 and brought out the largest attendance in the history of the association. The annual report showed a membership of 571, as compared with 448 a year previous. Percy Longmuir, well known in the United States for his contributions to the literature of cast iron, was elected president for the coming year. In an address he said that the selling price of castings in recent years had not been as high in proportion to that of pig iron as in earlier periods. This condition and the fact that specifications for special castings are being successfully met indicate, in the speaker's opinion, that the standard of practice in British foundries is advancing. The list of papers read at the meeting included the following: "The Cupola," by R. Mason; "Cupola Slags," by T. Swinden; "Properties of Coke," by F. K. Knowles; "Hardness Testing of Cast Iron," by R. Mather; "Malleable Cast Iron and How It Is Produced in Sweden," by G. A. Blume; "Theory Underlying Malleableizing," by W. H. Hatfield; "The Electric Furnace," by W. S. Gifford; "Brass Alloys," by O. F. Hudson.

Concerning the monumental volumes on "The Iron Ore Resources of the World," to which reference was made at length in *The Iron Age* of August 11, it should be said that three languages are represented in the text —English, German and French—but no portion is in more than one language. The chapters devoted to Germany, Luxemburg, Switzerland, Austria-Hungary, Russia and Norway are in German; those describing the ores of France, Italy and Spain are in French, while practically all the remainder, and the larger part of the work, is in English.

German shipbuilders are encountering serious labor troubles. On August 6 a strike occurred at Hamburg in consequence of the employers refusing a demand for higher wages and shorter hours. It was then decided by the shipbuilders of the empire that they would lock out 60 per cent. of their workmen in consequence of this strike. On August 11 shipyards at Kiel, Stettin, Bremen, Lubeck, Danzig and Flensburg were involved. It is expected that 50,000 men will shortly be idle.

The statistics of bank clearings in the country's trade centers for the week ending August 13, partly estimated, show a total of $2,581,879,470, a decline from the preceding week of 7 per cent. and from the corresponding week of 1909 of 16 per cent. The total last week is smaller than for any other week of 1910. In comparison with the corresponding week of 1909 the shrinkage at New York City was 24 per cent., at Boston 12 per cent. and at Chicago 6½ per cent.

The Harlan & Hollingsworth Corporation, Wilmington, Del., has received an order for 30 vestibule passenger coaches, five vestibule combination cars and five baggage cars from the Philadelphia & Reading Railway Company. All will have steel underframes and wood bodies.

Bradley Stoughton, consulting engineer, announces that as the work at his New York office, 165 Broadway, and his Philadelphia office, 1007 Betz Building, has made larger demands upon his time, his Pittsburgh office will no longer be maintained.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Scope of Antitrust Law.—The Sherman antitrust law is not violated by the seller of a manufacturing plant who sells its products and the products of other plants in sections of two or three States, agreeing not to engage in the same kind of business in that territory for a specified period. That law is inapplicable to a legitimate business transaction, where the restraint of trade complained of is merely incidental or collateral, and is also inapplicable to contracts having a remote and indirect bearing upon interstate commerce. (Pennsylvania Supreme Court, Harbison-Walker Refractories Company *vs.* Stanton, 75 Atlantic Reporter 988.)

Remedy of Buyer on Seller's Breach of Contract.—If a seller of goods refuses to deliver them, the buyer is entitled to buy similar articles on the market and recover from the seller the difference between the price paid and the contract price. If the buyer has other articles of the same kind on hand, bought at a lower price, he has the right to substitute them for those contracted for delivery and charge the seller with the difference between their cost and the contract price. (Pennsylvania Supreme Court, E. P. Burton & Co. *vs.* Miller, 75 Atlantic Reporter 1035.)

Validity of Agreement Not to Engage in Business.—A contract not to engage in a competitive business, although a contract in restraint of trade, is not opposed to public policy, but is valid and enforceable, when the restraint contracted for is partial, and is reasonably required for the protection of the opposite party in the use and enjoyment of the particular business contracted not to be carried on. A contract founded upon adequate consideration, not to engage in the manufacture or sale of white porcelain doorknobs, unlimited as to space, but limited as to time to a period of approximately five years, is reasonable, and will be inforced by injunction. (New Jersey Court of Chancery, Artistic Porcelain Company *vs.* Boch, 74 Atlantic Reporter 680.)

Rights Under Sale Contracts.—Under a contract of sale providing that if "after a thorough trial" the articles sold are not found to work "satisfactorily" the buyer may rescind the order, the test of the buyer's right to rescind is whether the article should be satisfactory to a reasonable man. (Massachusetts Supreme Judicial Court, Fechteler *vs.* Whittemore, 91 Northwestern Reporter 155.)

Rescission of Conditional Sales.—Where one sells articles on condition that title is to remain in him until payment of the purchase price, no express rescission of the agreement is essential to entitle him to retake the property on the buyer's default. In such case the seller may resell the property either before or after resuming possession. (Massachusetts Supreme Judicial Court, Hoe *vs.* Rex Mfg. Company, 91 Northeastern Reporter 154.)

Right to Materialman's Lien.—Mere delivery of material to a contractor at his place of business is not a "furnishing" of material for an improvement, within the meaning of the Wisconsin statute, which gives a subcontractor a lien for materials so furnished, where the material is never incorporated in the improvement nor delivered into the possession or control of the owner. (Wisconsin Supreme Court, Francis & Nygren Foundry Company *vs.* King Knob Coal Company, 126 Northwestern Reporter 39.)

The Bureau of Manufactures, Department of Commerce and Labor, is preparing a pamphlet on packing for export, being largely the result of inquiries made by American consuls. Illustrations of good packing will be given and some examples will be shown pictorially of the results of careless or insufficient packing. The practice of leading exporters in all countries will be drawn upon for examples of the most effective packing.

The July figures of our foreign trade show larger totals of both imports and exports than in July of any earlier year except 1907, in which year both imports and exports exceeded those of the present year. The total imports of July, 1910, were valued at $117,312,105. The exports were $114,493,222. The excess of imports was $2,818,883 against an excess of imports of $3,151,402 in July, 1909.

The Cincinnati pig iron market report of Matthew Addy & Co., for the week ending August 13, says: "As a matetr of historical fact, Southern pig iron prices to-day are lower than they have been, with one brief exception, since the dull period of 1903-4, and before that time of depression to-day's low prices were never paralleled, except in 1898."

The Goshen Iron Company, whose main office is at Wilmington, Del., has purchased Victoria Furnace, at Goshen, Va., which it has been operating under lease since January 2, 1907, from the Chapman Iron, Coal & Coke Company. The property thus acquired includes Virginia iron ore and coal lands and some West Virginia coal properties. The company has been operating 60 coke ovens at Elverton, W. Va. The president of the Goshen Iron Company is A. J. Moxham; vice-president, P. P. Huston, Jr.; secretary, Isaac Fogg; treasurer, F. E. Fenton; manager, O. M. Stull, at Goshen.

The Superior Mfg. Company, N. S., Pittsburgh, Pa., manufacturer of gas stoves, furnaces, gas logs, &c., recently completed the addition of a 40 x 80 ft., four-story brick and steel building, set on concrete piers. A 50-hp. Du Bois gas engine, direct connected to a generator, and other machinery, are being installed. This enlargement greatly increases the company's manufacturing and warehouse facilities, and will enable it to handle its growing business to better advantage.

The National Enameling & Stamping Company's results for the fiscal year ending June 30, 1910, have been published in the daily papers, comparing as follows with the previous year:

Fiscal year.	Gross profits.	Net profits.	Interest on bonds.	7% on pref. stock.	Balance, surplus.
1909-10.....	$1,695,168	$1,062,345	$200,451	$598,262	$263,632
1908-09.....	1,359,191	807,407	39,583	598,262	169,562

Casualties from the great floods, which last week inundated many districts in Japan and on Friday and Saturday submerged two of the principal wards of Tokio almost entirely, were given out August 15, after official investigation, as 1112 dead and missing. Thousands of persons are homeless and dependent on public relief.

Arrangements for the general meeting of the American Iron and Steel Institute, to be held in New York about the middle of October, have been practically completed, and an announcement of the details of the programme will soon be made. The attendance of representatives of British and Continental iron and steel industries is expected.

A party of 4 professors and 28 students of the University of Cologne, Germany, who are making a tour of industrial plants in the United States, visited the mills of the Indiana Steel Company at Gary, August 13. The party included Count Von Griebel, an official representative of the German Emperor.

The statement of output of the Nova Scotia Steel & Coal Company in July shows 70,000 tons of coal raised and 90,000 tons shipped, 7600 tons of pig iron made, 8690 tons of steel, 2833 tons of ingots bloomed, 3500 tons of steel finished, 1103 tons of axles shipped and 7060 tons of coke made.

The deputy collector of the port of Gary, Ind., reports 331,115 tons of iron ore received at the Gary harbor in the month of July; 80,000 tons more than in June. The total for the season to date is 819,163 tons, an average of 8359 tons a day.

Kitselman Brothers, Inc., Muncie, Ind., have established a power plant of their own to furnish current for their wire fence factory, and for the Indiana Steel & Wire Company's plant, also controlled by them.

The Gary Car Axle Mill

The Indiana Steel Company's Great Axle Plant

The manufacture of steel axles for railroad cars is a comparatively new industry. Until a few years ago the railroads used wrought iron exclusively for the axles of freight and passenger cars, as it was believed that wrought iron axles were more reliable than steel. Acid open hearth steel had been used quite extensively for locomotive axles, but was not adopted for cars on account of its higher cost. The chief danger to be guarded against in car axles is crystallization. A steel rail receives only the occasional stress of a passing train, but a car axle is subjected to the constant pounding stress of the rail joints, and Bessemer steel of the quality that gives good service in rails does not answer the requirements of an axle. A broken axle may cause a wreck with enormous property loss, and human life is also involved. Wrought iron has, therefore, been preferred for axles because it has been considered less liable to crystallize, or to break from other causes.

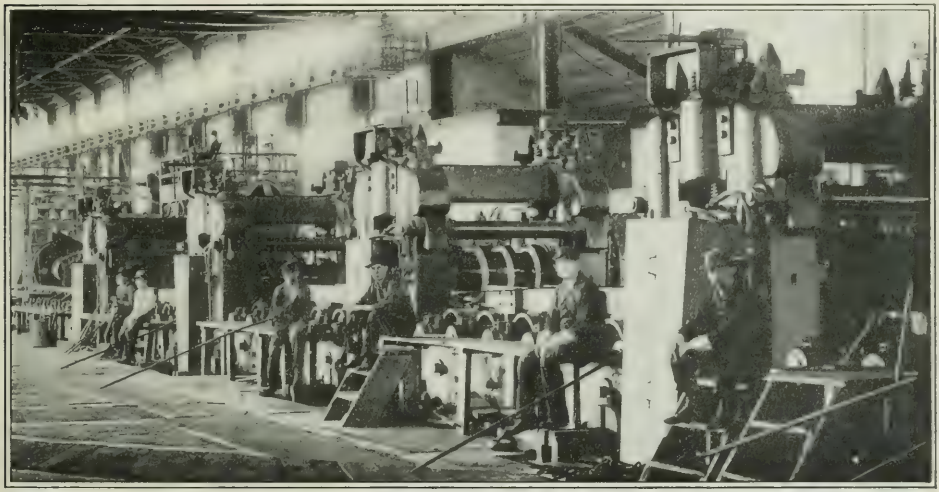


Fig. 1.—View of the Gary Axle Rolling Mill.

When open hearth basic steel became available in large quantities, the attention of the railroads was soon attracted to the qualities which made it available for the manufacture of axles, and during the past 10 years steel has been rapidly superseding iron both in freight and passenger car axles. As the axle industry has grown to large proportions and requires a considerable tonnage of basic open hearth steel, it was natural that an axle mill should be one of the first of the great works erected at Gary, Ind., to convert into finished product the output of the greatest steel plant in the world. More than half of the axles required in the United States are used on railroads which center at Gary and Chicago, so that a mill at Gary has an important geographical advantage in supplying the market at the lowest cost for production and delivery. Gary also promises to be the center of the steel car-building industry west of Pittsburgh, and the Gary axle mill will be an important unit in supplying rolling stock to the railroads, a business which has grown to far larger proportions than the manufacture of steel rails.

The Layout of the Axle Plant

The axle mill at Gary occupies one large building, located southwest of the rail and billet mills. The entire plant is under one roof, 220 x 984 ft., affording over 3 acres of floor space. The operations are all conducted in a direct line from east to west, the billets entering at the east end and the finished axles being stored for shipment at the west end of the plant. As in all the operations at Gary, the plant has been designed to utilize machinery and reduce labor cost, thus affording employment to a higher class of men or paying better wages to men who develop the necessary ability.

The billets which supply the axle mill are brought in standard freight cars from the billet mill to the northeast corner of the axle plant. Electric cranes with magnets unload the billets from the cars, and place them on the pusher skids on which they enter the heating furnace. There are two 12-ft. furnaces of the standard continuous type, heated with producer gas, the producers being located alongside the furnaces. The hot billets drop from the other side of the furnace on a table or conveyor which carries them to the rolls.

There are four trains of rolls, Fig. 1, driven by one 500-hp. General Electric induction motor, the last train being chilled rolls which finish the largest diameter of the axle. This is an innovation in axle mill practice. Heretofore it has only been considered necessary to roll down the corners of axle billets, leaving all the work of shaping to be done with the steam hammer. In designing the Gary mill, however, it was figured that if four stands of rolls were used, with finishing rolls for the last pass, it would be possible to roll the wheel seats and thus save time and cost in the hammer shop. This plan has worked successfully in practice, and it is seldom found necessary to use a hammer on that portion of the axle which is to form the wheel seat. Another striking feature of the train of rolls is that the rolls are turned with four grooves or passes, so that any one of the four standard sizes of axles can be rolled at the pleasure of the operator in the pulpit who directs the movement of the billet by electrically controlled switches.

The billets contain enough material for two axles of whatever size is being rolled. The runout table carries the finished billet or axle blank from the rolls to a

54-in. hot saw, Fig. 2, directly opposite the pulpit occupied by the operator who controls the saw. The runout table continues the full length of the hammer shop with the hammers set on each side of it, and a switch on the table opposite each hammer. The furnaces, rolling mill and hammer shop are covered by Alliance electric cranes, which are available for moving machinery or parts and for any emergency that may arise in handling the material.

The axle mill is the only plant at Gary where steam power is used for the regular operation of some machinery. Electric power generated from blast furnace gas is used wherever possible throughout the entire group of industries at Gary. No means has yet been found, however, to replace steam in the operation of large hammers of the capacity required for forging axles.

Six steam hammers are now in operation, Fig. 3, but room is provided in the hammer shop for six more. The hammers were built and installed by the Morgan Engineering Company. The 7500-lb. hammers have a full stroke of 36 in., the actual working stroke being regulated according to the force desired for each blow. The dies used have three steps, one to swage the middle portion of the axle, one to rough the journal and one to finish the journals. In operation the man in the pulpit who controls the saw and the runout table switches a hot axle billet in front of the hammer which is to be served. The workmen who operate the hammer have a heavy pair of tongs suspended from a jib crane. Grasping the hot billet or axle blank at one end with the tongs they swing it around into the hammer, Fig. 4, passing it back and forth and turning it until the forging operation is completed on one end of the axle. They then swing the tongs around with the crane to the other side, and hold the axle by the finished end, continuing the operation until the complete axle is forged. The rough axles are then passed along to the west for the next operation.

The Straightening Press

The general practice in axle mills is to straighten the axles under the steam hammer after they have cooled. This operation, however, is a severe one on the hammer and soon wears out the dies, besides being very expensive in time, in labor and the use of the equipment. An ingenious and powerful press is used for this work in the Gary mill. The principle employed is that of a powerful gag press, Fig. 5, which exerts sufficient force to straighten the largest sizes of car axles.

The press is operated by a 15-hp. electric motor, with a heavy flywheel and a train of gears. The plunger, or ram, which moves horizontally against the axle, has a stroke of about ½ in., obtained from an eccentric journal. The operator, by the use of a hand lever, is able to shorten or lengthen the plunger stroke by turning an ingenious eccentric drum, which is set in the ram. The eccentric design of this drum or cylindrical block of steel permits a variation of 1½ in. in the "reach" of the ram. While this drum is one solid steel casting, its form is the same as though it had been sawed in two, and the two halves moved so that their centers were 1½ in. apart; or it may be described as a double wedge, coiled in circular form. The workman who directs the straightening operation is able, by turning this eccentric block, to regulate the stroke within perhaps a hundredth part of an inch, so that the exact force required can be brought against the axle to straighten a bend or kink.

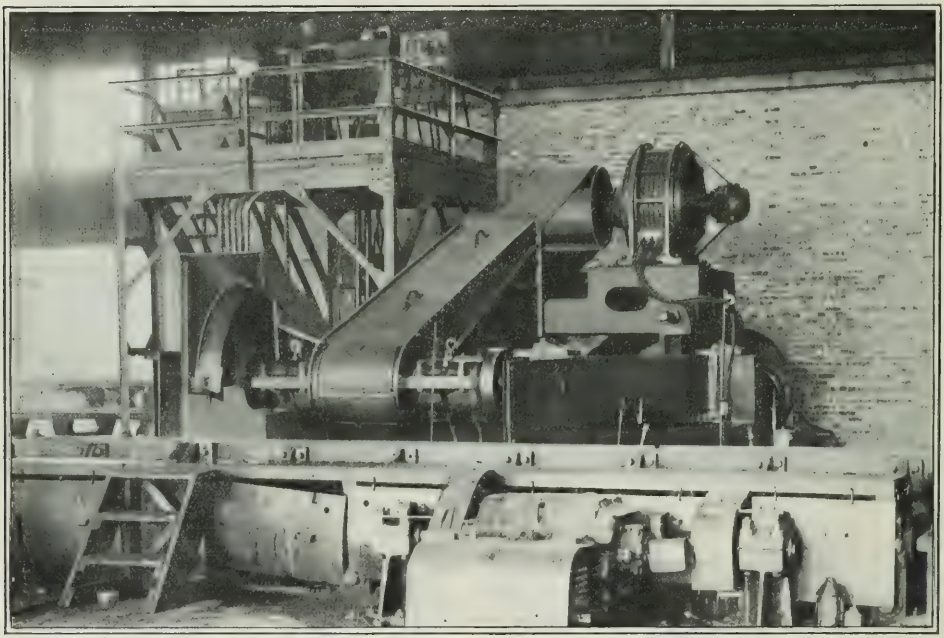


Fig. 2.—The 54-In. Hot Saw.

The axle is rolled on the press by hand over a "drawbridge," which the workmen can raise after they have placed an axle in position. The axle rests against a block, and is supported by rollers which enable the workmen to run it back and forth so the pressure can be applied at any point that may be necessary. The press is so efficient in its operation that a single stroke of the ram is usually sufficient to straighten any bend, kink or "hook" that may be encountered, and the straightening effect is obtained without any destructive strain that might impair the strength of the finished axle.

Cutting Off and Finishing

The cutting off machines, Fig. 6, of which there are 15 now installed in the Gary mill, were built by the

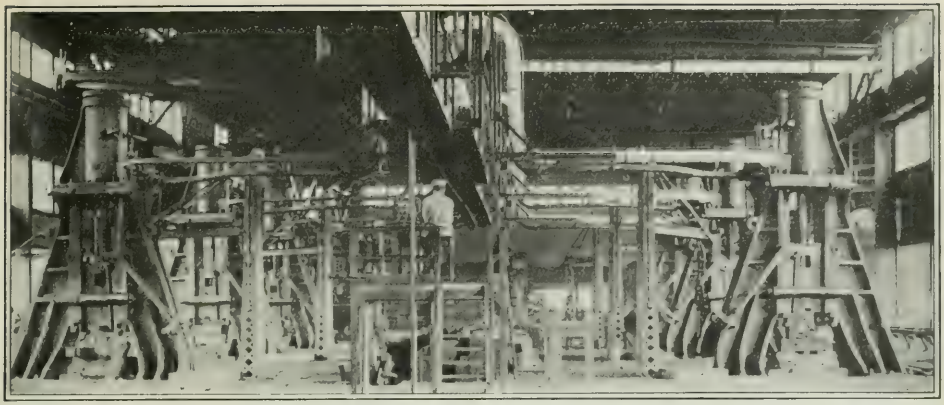


Fig. 3. View of the Six Hammers, with the Rolling Mill in the Background.

Fawcus Machine Company, Pittsburgh. They are driven by individual motors, with an auxiliary drive and a two-speed geared clutch. From the clutch the power is transmitted by silent chains to a pinion on the countershaft of the machine. The axle is held in two chucks, which leaves the ends free. Each chuck has two powerful jaws, which are drawn together at each end by male and female screws. These screws are about 2 in. in diameter, and are controlled by a train of gears. The center pinion in this train of gears has a bolt head on it, and the workman by turning this pinion with a wrench brings the axle to a center. The cutting off tools are then set at each end, and the axle is left with the exact length desired and a smooth lathe finish on each end. When the ends have been faced off a hole is drilled in each end of the axle as centers for the finishing lathes. The centering tool is driven by a separate motor, and is mounted so that it is swung out of the way while the end is being cut off, and is swung back to a center concentric with the chucks when in operation.

From the cutting off machines the axles are carried to the finishing lathes, Fig. 7, of which there are 10 now installed. These are regular axle lathes built by the Niles-Bement-Pond Company. The only notable new feature in their construction is that they have four tool rests, so that the operator is able to keep four tools going at the same time. Some of the railroads are specifying that the body of the axles shall be turned, and the engineers in charge of the axle mill figure that a workman can set two of the tools which will finish the middle of the axle while he is giving his attention to the tools which finish the journals.

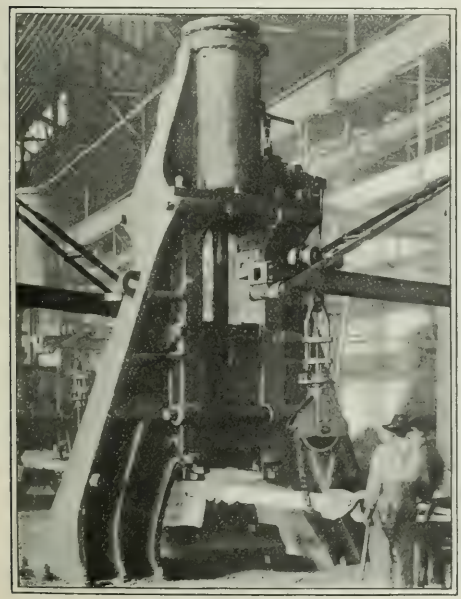


Fig. 4.—One of the Hammers with a Hot Axle in Position.

An interesting feature of the lathe floor is an installation of jib cranes, Fig. 8, to handle the axles in and out of the lathes. These cranes were designed by the Indiana Steel Company and built by the Whiting Foundry Equipment Company, and one of them is set opposite each lathe. The upright member of these cranes is a round hollow steel post, which revolves in roller and ball bearings in a cast iron pedestal. The jib is composed of two members, forming a track for a small four-wheeled trolley, which moves back and forth under the control of the workman. An individual motor is mounted near the top of each crane, and is geared to a revolving crank of sufficient radius to lift axles through the range required in the work. A loop of cable extends from this revolving crank over pulleys on the trolley, and down to a pulley and hook which carries the axle. A check switch on the motor can be set so that axles are lifted automatically to the right hight for centering in the lathe; the motor being started and stopped by a cord within convenient reach of the workman. The axle is picked up with gag tongs, which catch it at one end and hold it in a horizontal position to facilitate centering in the lathe, the tongs being hooked on the lifting cable which is controlled by the motor. Owing to the peculiar design of this crane, the workman loses very little time in picking up an axle, swinging it around and centering it in the lathe. This increases the efficiency of the lathe by reducing to a very small percentage of the working day the time spent in removing a finished axle and centering another.

Economy in Handling Material

The engineers in designing the axle mill have given very careful attention to the problem of economy in handling and transporting the material. The section occupied by the furnaces and the rolling mill is commanded by a 20-ton electric traveling crane. The hammer shop has two parallel runways of 45½ ft. each for 15-ton cranes. The finishing end of the mill is divided into three bays, 60, 50 x 50 ft. wide, each of which is covered by a 15-ton Alliance crane with spans



Fig. 5.—The Axle Straightening Press.

of 56, 45½ and 45½ ft. A peculiar feature of the hammer shop and finishing shop is that the girders down the middle, on which the cranes travel, are suspended from the roof trusses, so that there are no supporting columns to interfere with handling material, and the entire working space is unobstructed. The racks used for storing the semifinished and finished axles also contribute to the transportation system. These racks are practically railroad tracks, each rack consisting of two parallel steel rails raised from the floor on supports which place them at about the working hight of the machine tools used in the finishing shop. As the axles are laid horizontally on these racks, they are rolled easily and quickly by hand for any short distance, while the cranes overhead are available for carrying the material from one section of the plant to another. Similar racks set opposite each finishing lathe are used for inspection and temporary storage of the finished product.

A system of tunnels is provided for handling the scrap and chips. These tunnels run under the cutting off machines and the lathes, and chip cars are set under each machine to catch the scrap which drops into the cars through chutes in the floor. This keeps the finishing floor clear of scrap, and provides an economical system for handling the waste material. The chip cars are drawn out once a day, and the scrap is unloaded into standard railroad cars or into charging boxes which carry it to the open hearth steel plant. The tunnels also provide room for the return pipes, which carry the soda water back from the cutting off tools and lathes to the supply reservoir.

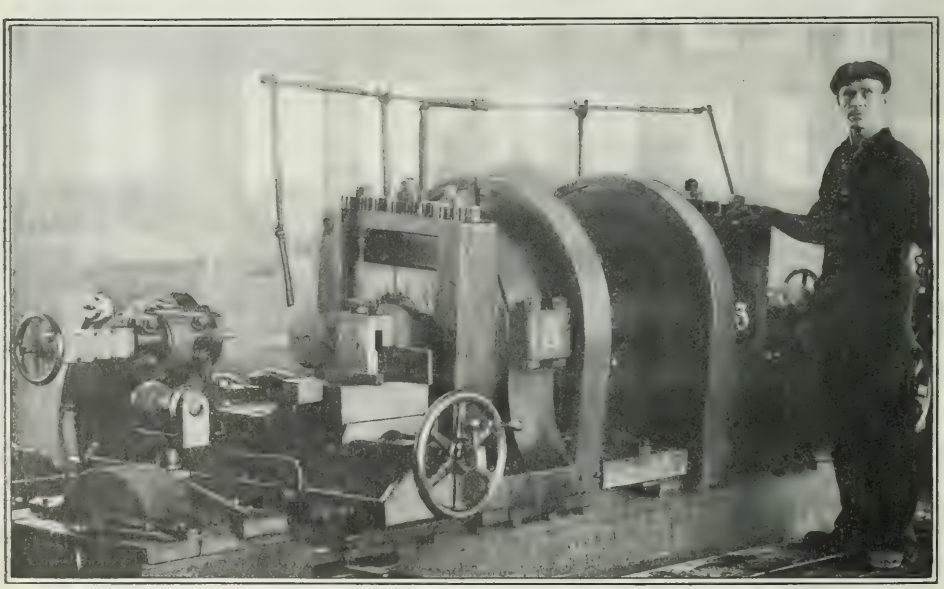


Fig. 6. One of the Axle Cutting-off Tools.

A system of forced ventilation is provided for the entire plant. The waste steam from the hammers will be used in winter for heating the finishing shop. The heating and ventilating plant is located overhead, supported by the roof trusses. The waste steam from the hammers passes through coils, and fans of large capacity are provided to carry the warm air through conductor pipes which extend the length of the building. Downcomers from these pipes bring a supply of air

liam Simons & Co., Renfrew, Scotland, bid $399,340, and Lobnitz & Co., also of Renfrew, bid $499,000. The commission had referred the bids to President Taft.

Bids were opened August 16 by Col. James G. Warren, United States engineer at Buffalo, for the dredging of the section of the United States ship canal through the Niagara River from the ship canal lock at the foot of Black Rock Harbor, Buffalo, to a point

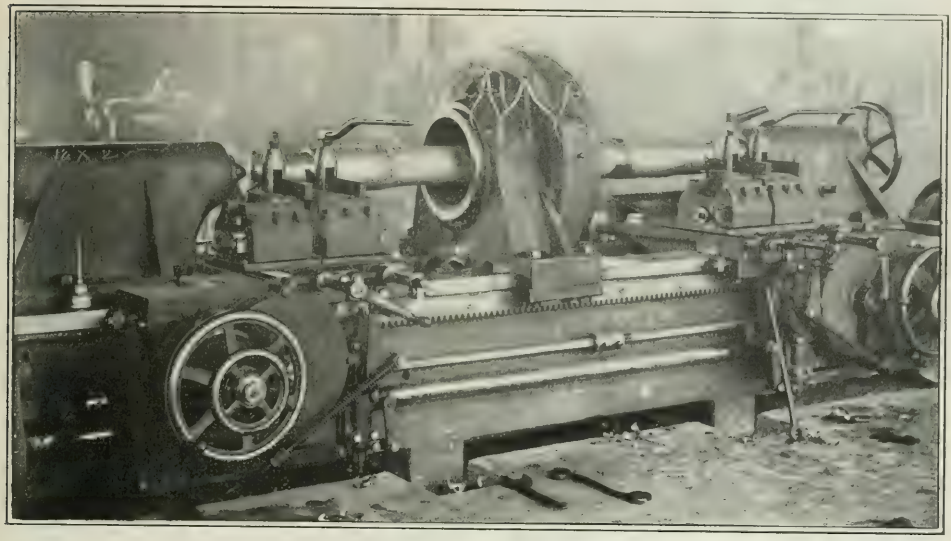


Fig. 7.—One of the Axle Lathes.

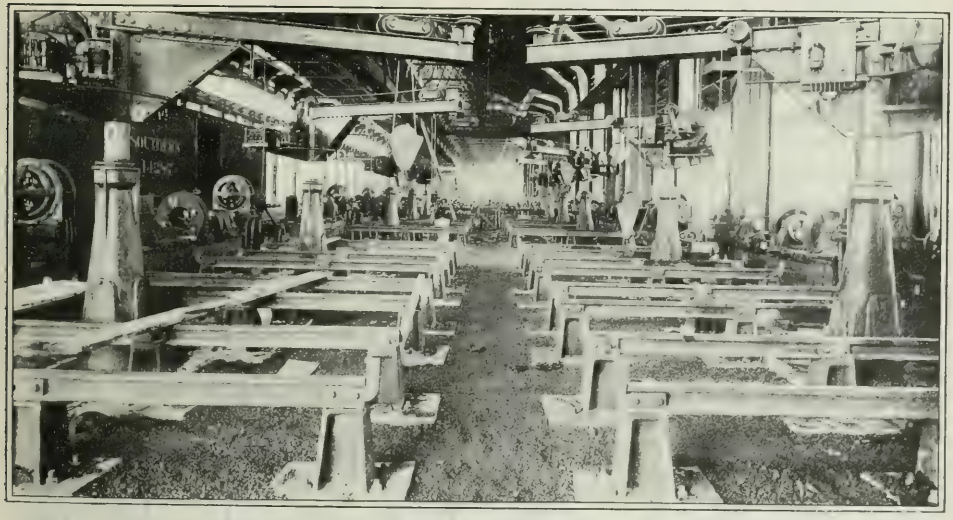


Fig. 8.—View of the Lathe Shop and Cranes.

opposite each group of tools. The plant is unusually well lighted by large side windows as well as skylights.

A Scotch Dredge for Panama.—The Isthmian Canal Commission has been authorized by President Taft to purchase from foreign builders a steel ladder dredge for the Panama Canal. The American manufacturers who bid on the dredge named a price more than double that of the leading foreign competitor. The Union Iron Works, San Francisco, bid $874,146, while Wil-

opposite the head of Grand Island. The channel is to be dredged to a depth of 23 ft., with a width of 400 ft., the work to be completed June 30, 1912. The bids have been submitted to Washington for award of contract. Upon the completion of this work the largest lake vessels will be enabled to pass through the ship canal and lock (800 ft. long, now nearing completion) at Black Rock Harbor down the Niagara River. The present channel depth of Niagara River opposite Buffalo is 18 ft., limiting boats to that draft, while the current is very swift, making the passage difficult

The New National Adjustable Spring Collet

The National Tool Company, Cleveland, Ohio, has brought out a new adjustable spring collet for automatic screw and turret machines shown in the accompanying illustrations, which is designated as the C. C. adjustable spring collet. It is claimed that this collet will eliminate spring collet expense by being nonbreakable and doing away with the necessity of having a full set of collets, and that it is a great time saver, as adjustments can be made instantly without removing the

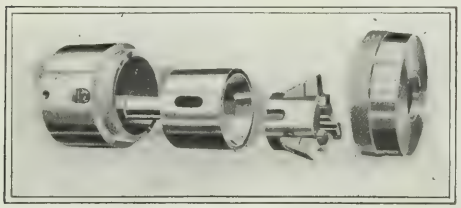


Fig. 1. The C. C. Adjustable Spring Collet, Made by the National Tool Company, Cleveland, Ohio.

collet from the chuck. After the collet is placed in the machine the adjustment is regulated in the usual way by a screw ring which turns to the right or left to secure the desired size. This does away with the necessity of dismounting the casing or hood and collet with each change in the size of stock. The collet will grip all sizes of stock, either round, hexagon, square or octagon bars, to its full capacity, thus taking the place of a full set of ordinary spring collets. The full length of the jaws when gripping bears evenly on any stock within the capacity of the collet. They hold the stock true, and it is claimed that danger of breaking is avoided because the bearing weight is evenly distributed on each jaw. The collets are furnished with three gripping jaws for round and hexagon stock, and with four gripping jaws for round or square stock. Fig. 1 shows the collet taken apart, and Fig. 2 the collet closed with draw bar attachment for engine, speed and turret lathes. The draw-in attachment replaces a full set of the ordinary draw-in spring collets, doing away

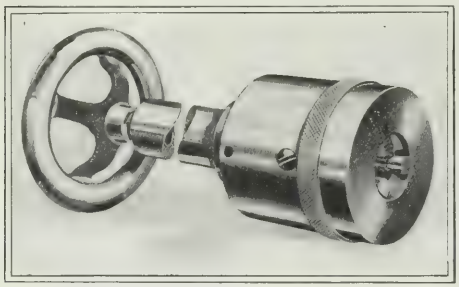


Fig. 2. Adjustable Spring Collet Fitted with Draw-in Attachment.

with the necessity of changing from one size to another.

In the construction of the collet the casing is threaded direct to the spindle, the operating sleeve fitted into the casing and the gripping jaw holder into the sleeve, all the parts being held by an outer steel cap. The tool when closed is dustproof, and it is claimed that trouble with chips is eliminated. The casing is of crucible steel, the sleeve is of hardened tool steel, and the jaws are of hardened tool steel ground on the outside and inside.

The C. C. adjustable spring collet is made in seven sizes, ranging from No. 1, with a gripping capacity of 1-16 to ½ in., inclusive, to No. 7, with a gripping capacity of 2½ to 4 in., inclusive. The draw-in attachment is made in three sizes, from No. 1-A for 12 and 14 in. lathes, with a gripping capacity of from ⅛ to ¾ in., inclusive, to No. 3-A for 20-in. lathes and larger, with a gripping capacity of from ½ to 1½ in., inclusive.

Conditions in the British Iron Trade

Reports from nearly all British iron and steel trade centers indicate slackness in demand. Shipments of Cleveland pig iron in July were disappointing, the total being only 84,541 tons, against 117,957 tons in June. For the seven months ending July 31 the pig iron shipments from the Cleveland district were 675,525 tons, compared with 678,674 tons in the first seven months of 1909 and 825,359 tons and 1,082,524 tons in the corresponding periods of 1908 and 1907, respectively. The stocks in Connal's stores at the end of July were 444,781 tons, an increase for the month of 8732 tons. It is also believed that stocks in makers' hands increased in July. The price of Cleveland warrants dropped in the last week in July to 48 shillings 7 pence, the lowest for more than a year. A gradual advance came in the following week, however, and the quotation on August 15 was 49 shillings 9 pence.

In the finished steel trade shipbuilding material is still in good demand, and while new business is not coming in as plentifully as in the second quarter of the year the mills are well engaged in meeting specifications on old contracts. The importation of German ship plates into Scotland is due to temporary difficulty in securing shipments from local works. There has been good activity in tin plates and in black and galvanized sheets. The rail mills have closed little new business recently. The Cape Government is inquiring for 10,000 tons of 80-lb. rails.

Castings Made by a New Process

The General Foundry Company, recently incorporated at Bradford, Pa., has equipped a plant with furnaces and machinery for the manufacture of converted steel castings by its own special process, which enables such castings to compete with malleable iron and open hearth steel. The manufacturer makes strong claims for the new product as to its cleanliness, strength and comparative cheapness. It can be tempered and case hardened. During the company's operations some interesting results have been obtained, a summary of which is printed in a series of circulars which are being sent to machine tool builders, car works, railroads, &c. Copies may be obtained by addressing the superintendent, who is an experienced foundryman. A complete laboratory is used in connection with the foundry, the new castings being made by the application of scientific methods. The general sales office is at Bradford, Pa., and agencies are to be established in the larger and more important manufacturing centers. E. T. Ward is manager, C. P. Kennedy is treasurer and J. E. Coulter is superintendent. W. H. Hulme of Bradford has a large interest in the company.

The Baldwin Forging & Tool Company, which has been operating a plant in Columbus, Ohio, for the past six years, expects to move into its new plant at Parkersburg, W. Va., December 1. The main structure will be 60 x 860 ft.; steel shed, 50 x 100 ft., and two warehouses, 50 x 200 ft. each. New machinery will be installed to provide for a daily output of about 500 dozen shovels. The company manufactures shovels, spades, scoops and drain tools. Frank M. Baldwin is president and treasurer.

Conveying Machinery for Nut and Bolt Scrap

The accumulation of scrap in iron and steel manufacturing industries pending a time when the best price may be obtained for it necessitates making some provision for handling and storing it. A bolt and nut works is perhaps the best examples of one of these plants, as large piles of small scrap result from the operation of the automatic nut machines. The Columbus Nut & Bolt Works, Columbus, Ohio, has found a satisfactory means of storing and handling its scrap in a very economical way. On the main floor of the factory 17 hot press and 8 cold press machines are ordinarily employed for making nuts and the trimmings and punchings are sorted and sent to the basement by chutes where the scrap is stored until it is sold. Fig. 1 is a view in the basement of the plant showing how the scrap is loaded into an elevator and Fig. 2 shows the chute on the first floor for discharging it into freight cars.

Prior to the installation of the conveyor all the scrap was shoveled by hand. The scale due to the use of natural gas furnaces rendered the process of separating the scale somewhat ineffective as it was done by hand, a shovelful being thrown at a time against an inclined screen. The material was then wheeled to the cellar and when the time came for loading was brought back again in barrels and dumped into the cars. In this way the services of from four to six men were required for several days to load 50 tons of scrap. Since the conveyor has been installed this labor has been reduced materially. The scrap is reclaimed and removed easily from the basement storage bins by a Jeffrey continuous bucket elevator built by the Jeffrey Mfg. Company, Columbus, Ohio.

Fig. 1 shows how the scrap is shoveled into the steel receiving hopper where the buckets are automatically loaded. This scrap is taken, including the scale and dirt, and is delivered into the loading chute shown in Fig. 2. This is provided with perforated screens and may be extended to connect directly with the freight cars being loaded, and as the scrap passes over the screens the dirt and scale are separated and delivered to a by-pass which returns them to a bin in the basement. The spout is adjustable to suit the varying hights of cars and is hinged at the top so that it may easily swing back against the elevator frame to allow the sliding doors communicating with the railway yard to be closed.

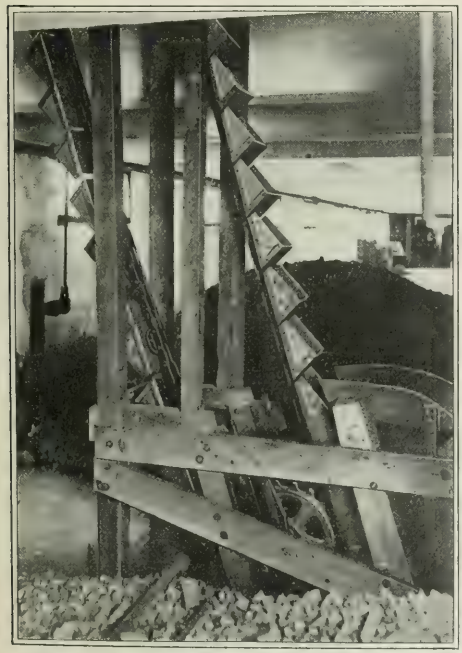


Fig. 1.—View in Basement Showing Platform Where Scrap Is Loaded Into Buckets of the Conveyor, Installed by the Jeffrey Mfg. Company, Columbus, Ohio.

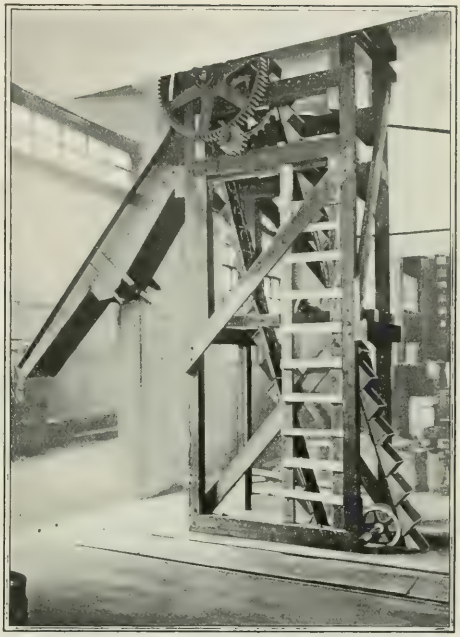


Fig. 2. Chute on the First Floor for Discharging the Scrap Into Cars.

The elevator buckets are hung on a Jeffrey Hercules elevator chain and form a continuous steel belt having sides and back. Each bucket has a capacity of from 40 to 50 lb. of scrap. At present the elevator is belt-driven from a line shaft, but it is so arranged that it can either be run by a belt from a line shaft or directly connected to an electric motor.

At the present time there are over 900 tons of scrap stored in the basement and storage bins and it is estimated that there will be nearly a carload of scale and dirt separated from it, as this refuse amounts at an average to ½ to ¾ per cent. of the total. When the scale and dirt are separated out from the scrap, they are removed from the basement by the elevator and delivered into cars or barrows through screens provided with veils.

The National Open Shop Publicity Bureau, 34 West Thirty-third street, New York, is circulating two pamphlets. One is entitled "The Employer and the Labor Union," by Marcus M. Marks, New York, and the other "The Story of Duluth and the Open Shop." The latter is a brief recital of the establishment of the open shop by the building trades in Duluth, with a summary of the improved conditions resulting therefrom. The Labor Committee of the Duluth Builders' Exchange reports that "it has been practically demonstrated that the open shop is a great and substantial benefit to the employer, the mechanic and the city of Duluth, and the welfare of the community and its industrial progress render its maintenance of vital importance."

The Mechanical Engineers in England

The Joint Meeting of the English Institution and the American Society in Birmingham and London, July 25 to 31, 1910

In 1904 the American Society of Mechanical Engineers was joined by a delegation from the Institution of Mechanical Engineers of Great Britain in a meeting at Chicago and St. Louis. Now, the American Society has returned the visit with interest in two senses of the word—its delegation numbered two or three times that which came to America the year of the St. Louis Exposition, and it has been not only interested, but instructed and delighted as well with its elaborate entertainment.

The holding of these joint meetings approximately five years apart, alternately in England and the United States, is cementing a bond of friendship between the members of this profession in the two great English-speaking countries that is full of significance for the future. The interchange of ideas can be enjoyed to a large extent by the exchange of Transactions between the societies, but the meeting together and jointly discussing various engineering topics brings that closer touch of personal acquaintance, the advantage of which is beyond measure. It means that the spirit of competition is giving place to one of co-operation, and the whole world will reap the benefit.

At this meeting there were three professional sessions, two in Birmingham and one in London. The first interested railroad men dealing with roundhouse practice, the second machine shop men, treating specifically of high speed tools and tooth gearing, and the third those interested in the electrification of railroads. The most animated discussion was brought out in the second and third sessions; opinions differed as to proper standards for gear teeth and the relative superiority of single phase alternating current and direct current traction motors. In both instances valuable material was added to general knowledge on the subjects, and all were agreed that uniformity of standards is greatly to be desired.

The papers and discussions are reviewed in the following report, and while space does not permit of more than brief reference to the excursions and social functions that occupied a majority of the time, it may be said here of the entire programme that it was extremely delightful in every detail, and especially to the Americans, so many of whom were enjoying experiences of a kind entirely new to them. The one regret was that so many events had to take place simultaneously that it was impossible for any individual to participate in them all. A special programme was provided for the ladies' entertainment, while the men attended meetings and excursions not calculated to interest the ladies. Altogether there were present at the convention between 600 and 700. A list of the American visitors was printed in *The Iron Age* June 14, 1910, and an account of the trip over of the official party and its reception at Liverpool in the issue of August 4.

BIRMINGHAM MEETING

FIRST SESSION

Officially the convention opened Tuesday morning in the Birmingham and Midland Institute, with an address of welcome by the Lord Mayor of Birmingham, Alderman W. H. Bowater, who referred to the part which Birmingham has played in the history of engineering. Beginning with James Watt, there is a notable list of Birmingham men who have figured prominently in engineering. It was here, too, that the Institution of Mechanical Engineers was organized in 1847. From these facts and that Birmingham is still an important center of mechanical engineering, he considered it an especially appropriate city to select for the joint meeting.

George Tangye, a member of the Reception Committee, added to the words of welcome, and very gratifyingly surprised the visiting society by presenting it with a framed letter in the hand of James Watt, written in 1777. It was a part in the collection of Boulton and Watt relics which Mr. Tangye has presented to the city of Birmingham, and for which he is custodian. He himself lives in the famous house, and threw it open for the inspection of the visitors during their stay.

President J. A. F. Aspinall of the institution responded to the welcome, and recalled some additional historical events of an engineering nature with which Birmingham was associated. It furnished, through Boulton and Watt, Robert Fulton's first steamboat engine, and was the birthplace of cotton spinning by machinery—the invention of John Wyatt.

For the American Society, Prof. W. F. M. Goss, vice-president, thanked the city and the institution for its cordial reception and feelingly accepted Mr. Tangye's gift, declaring that it would be greatly prized not only by the society, but by all American engineers. At his request, Secretary Calvin W. Rice read the inscription on the frame surrounding the letter, and explained that it would be given a prominent place in the Engineering Societies' Building in New York.

President Aspinall, taking the chair, expressed regret at the absence of George Westinghouse, president of the American Society, and announced that a telegram would be sent him of the institution's disappointment that he could not attend. Secretary Worthington read the minutes of the institution's previous meeting, and report on the election of members, which concluded the items of business, after which attention was turned to the presentation of a group of papers on English and American roundhouse practice, abstracts of which follow:

English Running Shed Practice

BY CECIL W. PAGET, DERBY, ENGLAND.

This paper is divided into two parts, a description of running sheds (engine houses or roundhouses are the American terms), and some features of their management. Running sheds in England are of two types, those in which the tracks are parallel, usually called straight sheds, and those in which the tracks radiate from a center turntable, commonly called round sheds. The advantages and disadvantages of the latter type are enumerated. Illustrations are given of two sheds, the latest examples of English practice, one a round shed and the other a straight through shed. The most modern type of shear legs, used to lift a locomotive while removing its wheels, is detailed, and other parts of the equipment usually provided. Other features described are the system of keeping stock and supplies, lighting, arrangements for washing out, methods of coaling, ash pits and water softening equipment. The account of running shed arrangements comprehensively covers inspections of locomo-

tives and their parts, running repairs, washing out of boilers, reports on engine failures, cleaning, system in passing engines through the repair shops and assigning them to their drivers, and the study of the results from statistics of the work of the various sheds. This system is that practiced by the Midland Railway, of which the author is the general superintendent.

Engine House Practice

BY F. H. CLARK, CHICAGO.

The complete title of this paper is "The Handling of Locomotives at Terminals to Secure Continuous Operation." It refers to such features of design and equipment as are considered good practice in the United States. A typical engine house is illustrated and described, and different types of coaling stations, sand drying apparatus, water tanks, ash pits and turntables. In contradistinction to English practice, instead of shear legs to raise a locomotive while removing its wheels, it is the American custom to provide drop pits by means of which wheels may be removed and replaced without jacking up the engine. Other details of the engine house construction and appointments are elaborated upon, including the building itself, the pits, heating and lighting, tool equipment, storage of materials for repairs, oil, &c., and means for washing boilers. A concluding section deals with engine house organization, and gives a statement of the averaged itemized cost of engine house service per month per engine on one road with which the author is familiar.

Handling Locomotives at Terminals

BY FREDERIC M. WHYTE, NEW YORK.

The scope of this paper is limited to established practices in the United States and Canada, and deals only with terminals handling about 100 locomotives a day, supplemented by the author's personal suggestions. Initially it covers the location of terminals and the division of responsibility among departments or divisions and other details of organization. The next section of the paper pertains to the layout of a locomotive terminal generally and with special reference to the engine house, the coaling plant, the ash pit, the sanding plant and the water supply. Under "Organization" are treated the duties of the master mechanic; traveling, engine house, yard, house and shop foremen; work report clerk, and dispatcher. Finally there is an extended discussion of the assigning of locomotive crews, contrasting the old practice of a certain crew to a certain engine with the present arrangement known as "pooling," in which any crew may be assigned any engine as convenience directs. More trains can then be handled with a given number of locomotives, but there are disadvantages that require special provisions to offset, which the author reviews at some length.

American Locomotive Terminals

BY WILLIAM FORSYTH, CHICAGO.

Some of the topics handled by the other papers in the group are covered in this paper, but with special reference to a particular engine house, that of the Pennsylvania Railroad at East Altoona, Pa. The freight tonnage passing through the terminal is claimed to be the largest handled by any single system of freight yards in the world. The total capacity of the yards is 10,500 cars. An outline is given of what the traffic amounts to, the locomotives used, the character of the line, number of employees, &c., and there follows a description of the engine house. The engine house organization is next explained, and the manner of reporting and performing daily work, tracing engines, engine dispatching, and considerable concerning the organization of the staff. The results in the shape of service obtained from engines by pooling are briefly referred to in conclusion.

Handling Engines

BY H. H. VAUGHAN, MONTREAL, CANADA.

This paper discusses particularly the practice of pooling engines. As to whether it is desirable or not depends, in the author's opinion, on whether the engines are engaged in passenger or freight service, and in the latter case on the conditions which exist. He proceeds then to take up these two kinds of service separately, and concludes that in passenger service pooling is objectionable under any conditions, and should be avoided if possible, and that in freight service pooling is advisable if conditions are such that engines cannot be run with assigned crews, and probably on divisions where business is so heavy that 60 engines per day or over are dispatched from the terminal. Where assigned crews can be used on engines the cost of repairs, the amount of fuel consumed and the class of service obtained will all be more satisfactory.

The first paper was presented by its author, and the four American papers by F. H. Clark, the author of one of them, using his own as a basis and referring to the others whenever they brought up additional points.

George Hughes, chief mechanical engineer of the Lancashire & Yorkshire Railway, opened the discussion, calling attention to some differences in practice. His road has adopted the straight dead-end shed, and found no particular difficulty with it. He agreed with Mr. Paget on the desirability of hot water apparatus for washing out boilers. Their average value of stores per engine is about $41, and he asked the value on the Midland Railway. The speaker's road has six movable shops (traveling vans) and distributed stores. They use water softeners and boiler compounds very successfully; much of their water is hard. Failures average two a day, with 1000 engines under steam. Most disabilities are due to boiler tube troubles. He took it that American turntables were as large as 100 ft. (he was later corrected in this, as 80 ft. is the maximum), and contrasted theirs, which are 60 or 65 ft. and many only 55. He was particularly interested in the paper dealing with the East Altoona shop, which he visited about five years ago. He regretted that more had not been said in the papers concerning engine cleaning, which is a great feature in English running shed practice as distinguished from American practice. Concluding, he referred to the lodging houses for engine crews maintained by his road.

Mr. Aspinall was especially interested in the American way of removing wheels, using drop pits. He declared it better to drop 3 tons of wheels than lift 30 tons of locomotive. He also referred to the Hollerith tabulating machine, an American product, which the Lancashire & Yorkshire, of which he is general manager, had found of great value as a labor saver in totaling up the data on engine drivers' reports. Referring to two forms of engine pits described in a recent series of articles in an American periodical, he sketched on the blackboard a cross section of pit he prefers having a flat bottom sloping slightly to one side for draining, and indicated his objections to concave or convex pit floors.

James M. Dodge, Philadelphia, speaking as a constructor of coaling stations and not a railroad man, referred to the American diversity of practice. Most generally used are inclined trestles and overhead pockets, but practice is far from uniform, on account of the varying requirements in individual cases. For filling bins where a long incline cannot be installed, it is common to employ balanced bucket type conveyors or chain bucket conveyors. Speaking of the division of responsibility among railroad officials, he criticised the usually numerous positions of limited authority, such as master mechanic, superintendent of bridges, &c., and indorsed the Santa Fé experiment of calling them all assistant superintendents. While their individual duties are distinct, they still have power to correct directly a deficiency discovered in any department without referring it through several other heads by correspondence.

Henry Fowler of the Midland Railway expressed interest in repairs, and was surprised at the high mileage records of locomotives mentioned in the American papers. On the matter of locomotive failures, he stated that their casualties among 3000 locomotives averaged 50 a month, and that their tube troubles were few, probably due to the use of copper tubes, which seems to justify them. Further, the universal English use of copper stay bolts rid them of much of the stay bolt trouble and rigid inspections necessary in America.

H. L. Gantt, New York, alluded to a report made by Dodge & Day and himself as to the efficiency of the Angus shops at Montreal of the Canadian Pacific Railway. These shops are in charge of Mr. Vaughan, the author of one of the papers. They found the shops already very efficient, but suggested some changes that have already shown good results. The principal fault was no provision for perpetuating the improvements worked out by the employees and laying out work for the men so that none are overworked, and all are di-

rected to perform their work to best advantage. The improvements which have been made by establishing a central planning department and a system of instruction for workmen and a new wage system are to be extended over the entire road, so that all shops can be brought up to the same standard of efficiency.

A. D. Jones, Horwich, emphasized the importance of providing wheel drops in train sheds on account of the great time saving. As between round and straight sheds he agreed there were advantages in both, but that the round were particularly easy to light satisfactorily. He was in favor of keeping the same drivers to the same engines if possible.

J. E. Sague of the New York Public Service Commission and formerly connected with the American Locomotive Company, at Schenectady, N. Y., compared English and American locomotive designs, and stated that Americans would do well to study English practice, particularly in precautions to prevent failures. In several details American designers have learned important lessons from the English, and the best results will come from a closer study and cooperation between the two countries.

Mr. Clark, closing the discussion for the American authors, remarked that 80-ft. turntables are the present limit. Attempts have been made to get 80 and 85 ft. ones, but the cost was prohibitive. He imagined that the American cost for stores would be higher than the English, but had no figures to substantiate it. He commended the English railroads for their thorough cleaning of engines. Some American roads give fair attention to this work, and have their reward for the expense in the greater ease of detecting fractures which might cause trouble if not discovered. He also indorsed the design of wheel pit floor described by President Aspinall.

Mr. Paget, replying to the discussion, was also unable to state definitely the cost of stores. He agreed that the expense of cleaning is well warranted. He did not believe that in England they were yet in position to adopt such an interchange of supervision as was mentioned by Mr. Dodge. The difficulties of preventing the necessity of long hours for freight crews, he explained, was experienced but largely handled by a train control department on the Midland, similar to the dispatching department in America. Concluding he gracefully returned the compliment paid the English by Mr. Sague, in acknowledging that they in turn have borrowed largely from American design.

At the close of this session luncheon was served in the Town Hall.

TUESDAY EXCURSIONS

Seven different excursions were arranged for the first afternoon, four of which were of a technical character; the works visited are briefly described later. The other three were pleasure trips, purely, to Stratford-on-Avon, Worcester (here the Royal Porcelain Works are located) and Stoneleigh Park and Kenilworth.

The South Staffordshire Mond Gas Company.—This company was formed by special act of Parliament in 1901 to make and distribute gas for heating and power over an area of about 123 square miles, and has its plant at Dudley Port, Tipton, about 7 miles from Birmingham. The plant was completed about five years ago, and comprises eight producers, each generating enough gas to supply 2000 hp. of gas engines continuously. The fuel is brought by canal boats to the bunkers and distributed from them by two 40-ton Hunt conveyors to storage bins over the producers. The gas leaving the producers at about 550 degrees C. passes through mechanical washers, ammonia recovery and gas cooling towers, centrifugal fans, scrubbers and meters before being compressed and discharged through the distributing mains. The air blast for the producers is furnished by engine driven Root blowers and water by Lee-Howl steam pumps. All other apparatus, fans, washers, &c., is electrically driven except the gas compressors (three Fraser & Chalmers, each of 450 hp.). The exhaust steam is used in the producers so that the steam users are practically reducing valves. Steam is generated by four 500-hp. Climax boilers and electricity for power and lighting by Westinghouse gas engine sets; two three-cylinder vertical engines are used, one active and the other reserve. The gas mains vary from 36 in. in diameter down, and the gas is distributed at 5-lb. pressure, reduced at the consuming points. The total length of trunk and gas mains is now 25½ miles. Over 100 works are using the gas for all kinds of metallurgical and heating operations and for power.

The Pump & Power Company's Testing Station.—At the same site, using the gas company's gas, and compressed air for starting, is the experimental equipment of the Pump & Power Company's Humphrey internal combustion pumps, comprising four of various types, the largest a four-cycle pump, delivering 250,000 gal. per hour, against a head of 35 ft. Special apparatus is provided for the testing. The gas is exploded directly in contact with the water, the movement of a column of which controls the pump. Except for the water suction valves and the small interlocking gear regulating the inlet and exhaust valves so that only one can open at a time, there are no moving parts or mechanism, and not even stuffing boxes or glands. Any gaseous fuel may be used. For lifts above 35 ft. an intensifier is used. In a pump of only 16 hp. the coal consumption was 1.06 lb. per horsepower hour in water lifted and 0.95 lb. for a 36-hp. pump.

The Austin Motor Company.—These works, at Northfield, about 7 miles from Birmingham, cover an area of 8 acres, 6 of which are occupied by shops, and builds several designs of automobiles. The machine shop has a modern equipment of machine tools, among them the following of American make: Warner & Swasey, Gisholt, Jones & Lamson and Bardons & Oliver turret lathes; Lucas boring machines; Fosdick radial drill; Prentice, Barnes and Hoefer drills; Garvin and Milwaukee millers; Whitcomb-Blaisdell and Pratt & Whitney lathes; Landis, Pratt & Whitney and Brown & Sharpe grinders. The other buildings are a hardening shop, power house, engine test house, with plating and polishing sections; erecting shop, copper and tinsmith's shop, Chassis test house, with wheel building section; patternmaker's shop, carriage building shop and finishing shop. About 1500 are employed, for whom a mess room is provided in a special building.

The Metropolitan Amalgamated Railway Carriage & Wagon Company.—These railroad car works, at Saltley, near Birmingham, were established by Joseph Wright in 1845. They now cover 43 acres, nearly half of which is in buildings. The workmen's mess room will seat 2000. The smithy contains 42 500 to 60,000 lb. steam hammers, 5 hydraulic presses and 10 furnaces. Adjoining it is the die sinkers' shop and hydraulic press shop, served by a 5-ton electric crane and containing five furnaces, 2 hammers and 13 hydraulic presses. The smithy power house contains blowing engines supplying blast and four Lancashire boilers, two of which are fitted with the Halpin system of thermal storage. Exhaust steam from the hammers is used to heat feed water. The steel underframe shop has five 3 to 10 ton cranes, a beam end milling machine handling bars up to 70 ft. long, six six-head beam drills 50 ft. long, and the usual straighteners, plate working machinery, &c., and a full complement of hydraulic riveters and pneumatic riveters, chippers and drills. The machine shop is soon to be rebuilt and enlarged. Among the more important machines are two 24-in. slotting machines, some triple geared lathes for steel castings, special buffer turning lathes and Lincoln type high speed millers. Ten motors aggregating 290 hp. drive the equipment. Only high speed steel tools are used. The power house has a capacity of 1060 kw. in General Electric steam engine driven generators, and also contains condensing, water pumping and air compressing plant and three Lancashire and two Babcock & Wilcox boilers, each of 2000 sq. ft. heating surface. The two latter burn wood refuse. The foundry, which adjoins, with pattern shop and storage, covers 18,000 sq. ft., and can turn out 10 tons of castings per day It is equipped with pneumatic and hand molding machines for small castings. Other buildings include packing shop for spare iron work, finishing shop, woodworking shops, saw mill (the equipment in this is driven by motors of a total capacity of 1051 hp.), car building shop, car body shop and paint shop. The whole works are lighted by electricity; over 550 arc lamps alone are used, and the total of 156 motors have a rated horsepower of 2352. The number of men employed is about 3000.

The Frankley Filter Beds.—The Frankley Works of the Birmingham Corporation Waterworks, provide a part of the city's supply. From several reservoirs collecting from a water shed of 70 square miles water is piped to Frankley for filtering. Here through a service reservoir divided in halves the water is decanted from one-half to the other, removing the grosser impurities, and is then passed through 18 filter beds of a total area of 14 acres. The filtering medium is fine sand superimposed on gravel. At present the average quantity of water filtered daily is nearly 20,000,000 gal. This is delivered to two pure water reservoirs. Part of the supply is pumped to two high level reservoirs.

GARDEN FETE

A rare treat for the Americans at least was the garden fête, held Tuesday evening in the Botanical Gardens at Edgbaston by invitation of the Birmingham Reception Committee. The Lord Mayor and Lady Mayoress of Birmingham and the chairman and vice-chairmen of the Reception Committee and the chairmen of the Executive and Ladies' committees received. The extensive gardens were beautifully illuminated, music was furnished by the Portsmouth division of the band of the Royal Marines, and refreshments were served in a large tent, concluding with a display of fireworks in the center of the garden.

SECOND SESSION

In the same place that the first session was held the second convened Wednesday morning, and proceeded at once to consider the first paper, an abstract of which follows:

High Speed Tools and Machines to Fit Them

BY H. I. BRACKENBURY, NEWCASTLE-ON-TYNE, ENGLAND.

After briefly reviewing the history of high speed steel tools and the gradual extension of their use in the 10 years since they were first introduced, the author defines the properties that make it useful and the three general classes in which such steels may be divided: A, for cutting mild and medium steel; B, for cutting hard steel, and C, for cutting very hard steel and for use where a sharp and lasting cutting edge is required. With regard to the power required to remove material, it has been found that more is required for a thin wide chip than for one of double the thickness and half the width, and at high speeds less power is required than at low speeds up to a certain point. It is difficult to lay down rules for cutting speeds, as conditions are so variable and it may be more important to preserve the edge and avoid frequent sharpening than to use the highest allowable speed. The proper cutting angle for a tool is the sharpest which will not break at the edge, as the sharper it is the less power is required. As high speed steel has improved, it has been found possible to make the cutting angle more acute. On turret lathes the highest class of high speed steel is now being used and in tools with a very sharp cutting angle. In twist drills the steel has been found particularly valuable, increasing the amount of work done in a given time threefold as compared with tempered steel drills and reducing the frequency of grinding. Generally speaking, full advantage is not taken of the cutting powers of high speed steel. The author advocates setting aside certain machines for roughing only. Usually old machines have enough power for finishing, and increasing their belt speed, so that they may be run with the back gear in, makes them efficient. Regarding considerations affecting the fitness of machines for the use of high speed steel, it is pointed out that more is involved than the mere ability to remove a large amount of metal in a short time, if such a demand upon it is infrequent, as such a machine is expensive for use on light work and when idle. A machine should be selected with reference to the kind of work it will have to do most of the time. Objections to cone driven machines are mentioned, and the greater desirability of geared speed changes or variable speed motor drive; also the necessity of accurately cut gears and amply strong feed mechanism. The paper concludes with a summation of the characteristics which should be possessed by machine tools using high speed steel, including roughing lathes, turret lathes, slotting machines, radial drills, milling machines and planers, and is supplemented with tables of data on high speed twist drills, turning tools, milling cutters, &c.

John Calder, Ilion, N. Y., speaking of the turning of locomotive and car wheel tires, mentioned some excellent records. In a shop of which he has knowledge the average output is eight pairs of locomotive tires turned in 10 hours, where five to six pairs is the usual standard. The tool was a Niles-Bement-Pond lathe. Many shops are turning 16 to 36 pairs of car wheels a day. The speaker showed lantern slides of a number of modern American tools, giving brief accounts of their features and principal dimensions. Among those so shown were Niles-Bement-Pond and Lodge & Shipley lathes, a Bullard vertical turret lathe, Niles-Bement-Pond and Cincinnati heavy millers, Gould & Eberhardt gear cutters, and a Pratt & Whitney new vertical grinder.

L. D. Burlingame, Providence, R. I., described an interesting boring fixture for duplicate work and the use of operation sheets in connection with operations of milling on a Brown & Sharpe machine. He also described continuous milling on a No. 5 vertical milling machine, and gave some records of high speed milling (gear cutting), using an air blast for cooling the cutter. He concluded with some accounts of notable grinding operations.

L. P. Alford, New York, had prepared a discussion abstracted from three articles which had appeared in the *American Machinist*, giving the results of tests on a number of rapid production machines. This included as among the most remarkable performances mentioned, that of a Colburn upright drill using Celfor twisted driils.

Charles Wicksteed, Kettering, England, agreed with a statement made in the paper that it is a pity more use has not been made of the arrangement fitted to the planers designed by Sir Joseph Whitworth for cutting on both strokes, and referred at greater length to the reversible tool holder, which does away with an idle stroke. Double cutting, he stated, has had a slow growth, but has certain advantages that will mean its more extended use. One use of two tools is to have the leading one cut through the scale, so that the following one enters clean metal. The situation is reversed on the return stroke. The cut is, therefore, divided between two tools. He thought that users of motor driven machine tools will come to realize the cost of power and see the desirability of eliminating an idle stroke. Still he granted the sufficiency in many kinds of work of a planer with quick return motion; for example, where the time of setting tools for double cutting would be a loss of advantage. Both quick return and double stroke have their field of usefulness, and he was pleased that the author had called attention to the advantages of double cutting.

William Lodge, Cincinnati, Ohio, emphasized the fact that high speed in the tool equipment is not the only consideration. How to get the best results from the workmen, route the work through the shop, and kindred provisions for increasing output are equally important. He spoke further of the need of greater attention to system in manufacturing.

Dempster Smith, Manchester, England, remarked the comparison in the paper of past and present practice, and agreed with the author that makers should guarantee the capabilities of their machines. Should a certain efficiency be required between the belt and the net power, he believed a great many gear drives would be modified or withdrawn altogether. He commented on experimental work and its value, holding that commercial results only are the true measures of usefulness. He also referred, as had the author, to the paper presented before the American Society by F. W. Taylor on "The Art of Cutting Metals," calling attention to the formula therein given for finding the proper cut to be taken, and showed how he considered it could be simplified.

Walter Carter, Sheffield, England, disputed the need in any shop of three varieties of tool steel, and regretted that the author had not given more about the economies of using the latest tool steels. He declared that round nose tools are wrong in principle, and that all cutting edges should be straight, so that the chips will roll off like paper and not waste power in being deformed. As another thing in shop practice that needs correcting, he mentioned grinding equipment.

F. W. Taylor, Philadelphia, Pa., was called upon, and though he had nothing to add concerning high speed steels, he wanted to second the statement made by Mr. Lodge of the need of system to increase production. He averred that the average shop in the United States could have its output doubled with present men and machines, and believed conditions are the same in England. It is also a partial solution at least of the labor problem. It will give the men what they want, higher wages and shorter hours. A scientific

study of the motions of the workmen, if properly carried out and its lessons applied, would result in greatly increased productivity.

In his closure the author expressed his appreciation of Mr. Taylor's remarks on motion study, and indicated that it has been applied in machine tool design by improving the facility of making speed and feed changes and placing all controlling levers within convenient reach of the operator. With Mr. Carter's declaration of the superiority of square edged tools, he took exception, maintaining that they make a rough cut.

The next two papers were presented by their authors, and discussed together, being on the same general subject. In substance they were as follows:

Tooth Gearing

BY A. D. STEVEN, BIRMINGHAM, ENGLAND.

The aim of this paper is to provoke discussion that may lead to more uniformity in opinions as to different methods of cutting gears and on various modifications for proportions of teeth. It applies more particularly to comparatively fine pitch gears, need having increased in recent years for greater accuracy in the cutting of such gears that they may run more smoothly and noiselessly at high speeds. Commenting on gear cutting machinery, the author, for bevel gears, favors generating machines of the Gleason and Bilgram types, but acknowledges the advantages of machines using formers; for spur gears, the rotary cutter type, such as the Brown & Sharpe, for its speed of production, but laments that its gears will not interchange with spur gears generated on Fellows gear shapers or Reinecker gear planing machines, and also discusses the advantages and disadvantages of the present popular hobbing process; for worm gearing the common methods of production are satisfactory. What evidently is most needed is any change in tooth proportions that will enable gears cut by any of these typical processes to interchange. The author considers an increased angle of pressure, the first alteration desirable, say, from the present common 14½ to 20 degrees, or, at most, 22½ degrees. This increases the strength of the tooth by broadening it at the base. Engravings from photographs of gear tooth models illustrate the author's comparison of teeth of various standards, generated and cut with rotary cutters, showing their inability to run satisfactorily together, and also reasons for a greater pressure angle. The author favors a short or stub form of tooth and a 20-degree pressure angle. It can be used down to a 12-tooth pinion in its true form and cut on either a single cutter or a generating machine; it is stronger than most commonly used forms; a very large proportion of its face does useful work, and the possible objections on the score of less contact and greater bearing pressure are so slight as to be nearly negligible.

Interchangeable Involute Gearing

BY WILFRED LEWIS, PHILADELPHIA, PA.

The author of this paper is the chairman of a Committee on Standards for Involute Gears appointed about a year ago by the president of the American Society of Mechanical Engineers to investigate the subject of interchangeable gears, and if desirable recommend standards. The paper is not a report of that committee, but explains somewhat the line upon which investigation has been made and is offered in the hope that it may draw out helpful criticism or approval. Responses to a circular letter to gear manufacturers showed great diversity of opinions. From the extent to which the present 14½-degree angle of pressure is established, some argue, that even if it is not the most desirable it would be annoying to change it or recommend any different standard which may simply add another system to those already in use and increase correspondingly the stock of cutters required. In this the author does not concur. A number of correspondents were of the opinion that because of the extending use of the hobbing process, the standard should conform to its work to insure interchangeability with all gears otherwise cut, but with pinions of fewer than 12 teeth, it appears that some modification of the involute curve will be necessary unless a larger than 20-degree angle of pressure is adopted. If such modification becomes necessary many feel that the method should be known and clearly defined to permit any makers of gears to make their own cutters. Of first importance in gearing is quiet and smooth running, then strength, durability and permanence of form. Friction and journal pressure are of less importance, but are to be tested by apparatus, the committee has devised which is described in the paper, and with which will be compared the Brown & Sharpe 14½-degree standard, the 20-degree stub tooth and 22½-degree tooth with addendum of seven-eighths the module, or about 0.278 pitch, and an effort will be made to record graphically the noise produced under different conditions of center distance. Hugo Bilgram, a member of the committee, has proposed as one method of avoiding interference in gears of small numbers of teeth, increasing the addendum. Though undesirable from the standpoint of interchangeability the possibilities of this are interesting and are discussed in the paper. Plans proposed by other members of the committee are also referred to, and the author concludes with his own recommendation—a system with a pressure angle of 22½ degrees and an addendum of seven-eighths of the module, adhering to the true involute form and avoiding empirical modifications while obtaining results comparable with the best now obtained by such means.

In presenting this paper the author supplemented it with data which has become available since the paper was written from tests made with the committee's apparatus. The main conclusion was that in no instance was the friction loss of sufficient magnitude to exercise a controlling influence upon the type of gear tooth to be recommended or adopted. The least friction was given by the gears of 20 degrees and 22½ degrees angle of pressure, which should further commend adopting a pressure angle and an addendum that will completely eliminate interference between a 12-tooth pinion and a rack. No modification from true involute form would then be required, the system would be clearly defined, and any of the methods of gear cutting now in use could easily be adapted to insure interchangeability.

The discussion was opened by P. V. Vernon, Coventry, England, who affirmed that the quality of silence is the thing most needed in gears, and that when that has been obtained it will be time to consider making them interchangeable. He hopes to see co-operation between the committees of the two societies.

C. R. Gabriel, Brooklyn, N. Y., had sent a written discussion, which was read by Secretary Rice, giving it as his opinion that the present so-called Brown & Sharpe standard will hold its own against any system for the general run of machinery, and that the benefits of modifications in the form of tooth are more imaginary than real. Better material and better hardening will remove most difficulties arising where high speed, durability and efficiency are required. However, certain modifications from theoretical tooth form give decidedly better results in practice, and he sees no reason why manufacturers of cutters should define such modifications as they make, as it is cheaper and more convenient to purchase stock cutters from reliable manufacturers than for gear manufacturers to attempt to make their own. He did not agree that all cutters should conform to hobs, as the hobbing process has its limitations. He favored the 20-degree pressure angle stub tooth, because it permits making more durable cutters for gear shapers and reduces the difficulties in making satisfactory hobs. However, the larger pressure angles are objectionable because of increased angular back lash, as compared with the 14½-degree standard for a like amount of wear, and decrease of addendum is decidedly objectionable in the small pitches, as the likelihood of error in depth of tooth and center distance of shafts remains constant for all pitches and sizes of gears; the present addendum is none too great, and for some purposes is increased with advantage. While the stub tooth has greater strength he does not consider it as satisfactory for all around service.

L. D. Burlingame, Providence, R. I., expressed the opinion that all plans for modifications suggested would require more cutters in a set, which he feels would not be approved by manufacturers.

Before the meeting adjourned resolutions of thanks to the Lord Mayor, Mr. Tangye and the various manufacturers and others in Birmingham who had contributed to the entertainment of the two societies were passed. Luncheon was again served in the Town Hall, and in the afternoon two alternative excursions were provided.

WEDNESDAY EXCURSIONS

University of Birmingham.—The university is the successor to the college founded by Sir Josiah Mason in 1875.

The original buildings are in Birmingham and the new buildings at Bournbrook, about 3 miles from the center of the city. The site is 25 acres, and an additional 19 acres was donated by Lord Calthorpe in 1907 for college games. The present departments are physics; chemistry; mechanical, civil and electrical engineering; mining and metallurgy. A power station furnishes electricity for power and light, steam for heating and Mond gas for various departments. Near it are a foundry, forge shop and a building for large furnaces and an experimental plant for the metallurgical department. An experimental mine covers an area of about 1 acre. The cost of the buildings already erected, including the Great Hall, was about $2,650,000. All of the departments have splendid equipment, the mechanical a machine shop, pattern shop (both filled with modern tools), drafting room, machinery museum, and an excellent gas engine laboratory; the electrical an extensive experimental laboratory; the civil an experimental hydraulic installation, and a testing laboratory, whose three largest machines are a 300-ton Avery, a 100-ton Riehle and a 50-ton Buckton machine (the first will take test bars 25 ft. long); the mining and metallurgical departments have a coal mining laboratory, drafting room and a metal mining laboratory for treating nonferrous ores, and numerous other laboratories and lecture rooms, as well as the furnace building before mentioned. A feature in the latter is a 2-ton Siemens steel furnace.

Mitchells & Butler's Brewery.—The business was founded in 1862. Malt is manufactured on the premises, the mechanical features in connection with which are very complete, including elevators, belt and screw conveyors and automatic weighing machines. Perhaps most of interest throughout the brewing process are the extensive provisions for keeping dirt and germs from contaminating the product and for insuring cleanliness in the cask and bottling departments. Electricity is largely used for power and lighting, and there are numerous steam and gas engines. The water supply is abundant and pure, principally obtained from deep artesian wells by the compressed air method.

BIRMINGHAM RECEPTION

The concluding event in the Birmingham programme was a reception Wednesday evening in the Council House by the Lord Mayor, Alderman W. H. Bowater and the Lady Mayoress, followed by music and an entertainment and a collation. The presidents of the two societies took the occasion to acknowledge the unusual courtesies which had been extended by the Lord Mayor, to which he responded gracefully and with much wit.

THURSDAY EXCURSIONS

No professional sessions were held Thursday. The excursions occupied the entire day, and each of the four alternative ones had its ending in London. All travel from the time the visitors reached Birmingham until the end of the meeting in London was furnished as a part of the entertainment, and was mainly by special trains, buses and launches.

One excursion passed through Coventry and Rugby, visiting one of the following works in each place:

Alfred Herbert.—This firm, established in Coventry in 1888 to manufacture machine tools, at present employs 1500 men. The product includes horizontal and vertical milling machines, turret lathes, automatic screw machines, automatic turning machines, light drills and universal grinders. The head works are in Butts, and the foundry and branch works at Edgwick, devoted to the building of milling machines. All machines are built in considerable lots, and with extensive use of special jigs and tools. The piecework system is employed. Particularly noteworthy in the equipment is the turret lathe department containing a battery of automatic screw machines used for making bolts, screws, handles, &c., from the bar, and a battery of automatic turning machines handling chuck work made from castings or steel blanks. A large part of the firm's business consists of supplying machines complete with outfits of tools for producing work to sample and guarantees of production are given. The testing department, where it is determined whether or not these guarantees are fulfilled, is of special interest. Group drive is employed, with each lineshaft driven by an electric motor. All main and countershafts are supported from the building columns and, as no heavy snows are experienced, an extremely light roof construction is possible. Following the inspection of these works luncheon was served in a new and as yet unoccupied building, and at its conclusion the Mayor of Coventry, Alfred Herbert, and General Manager Oscar Harmer addressed the visitors.

Daimler Motor Company.—This builder of motor cars has shops covering 14 acres at Coventry and Radford adjoining, and the entire site is 35 acres. It employs 4000, and turns out 50 cars a week, ranging from 15 to 57 hp. The crafts represented include molding, machinery, fitting, engine testing, erecting, car testing, coach making, painting, trimming, finishing, smithing, coppersmithing, electroplating, &c. When extensions in progress joining the foundry and erecting shop are completed the building will be 1340 ft. long by 180 ft. wide. Lighting is by electricity and incandescent gas. The heating is partly direct and partly indirect. The four-story machine shop has an up to date equipment electrically driven largely by individual motors. In all there are 180 motors, part of the power for which is generated by two 320-hp. Diesel engines. The engine testing department has more than 100 benches; both rope and electric brakes are used. All materials, raw and in course of manufacture, are tested in the laboratory, and its staff also supervise the heat treatment of parts, to which special attention is paid. In the body department an interesting shop is that making metal panels where the oxy-acetylene welding process is extensively used. In the erecting shop frame rivets are heated electrically and headed by a hydraulic riveter. All work is done on the premium bonus system.

Willans & Robinson.—At Rugby are this firm's Victoria Works, occupying 23 acres. The principal products now are steam turbines, steam and oil engines, condensing plants, pumps, &c.; it was originated in 1881 to construct steam yachts and launches and small marine engines. The 1000 employees, if they desire, are served breakfast and dinner in a mess room by a caterer, who for the use of the room and its appliances, a small salary and other advantages, is required to cook without charge provisions brought in by the men themselves. The main buildings are pattern shop, packing and shipping shop, machine and erecting shop, in which are also the forges, foundry and pattern storage. Stock is kept in steel bins and racks to reduce fire hazard. In the larger buildings, with contents generally noncombustible, wood is found only in the wood block floors and a small amount of wood lining in the roofs. The packing shop, pattern shop and pattern storage are isolated on account of their necessarily inflammable contents. The testing department is connected by a 3-ft. gauge railway, with the erecting shop from which engines, turbines and pumps may be brought for testing. The company has its own lighting and power station.

British Thomson-Houston Company.—This company, located at Rugby, manufactures electrical traction motors, generators, incandescent and arc lamps, Curtis steam turbines, rotary converters, electrical measuring instruments, high and low tension switches, and electric heating and cooking devices. The site comprises about 25½ acres, of which about half is occupied by buildings. The works were erected in 1900, and have a total floor space of 429,826 sq. ft. The 56 buildings are mainly of brick and steel construction. Progress of the work through the shops is continuous from raw material receiving end to testing and shipping end. Precautions against fire are complete. Heating and ventilating are combined in a warm air system. The tools consist largely of English and some American and Continental makes, and are all electrically driven, except the pneumatic and hydraulic machines. Small tools are grouped and large ones individually driven. Interchangeability of manufactured parts is secured by the use of jigs and fixtures. Special attention has been given to testing and inspection of parts and assembled products. The number of employees is about 2100.

The excursion passing through Litchfield gave opportunity to visit the Pipe Hill pumping station of the Southstaffordshire Waterworks Company, the Litchfield Cathedral, the birthplace of Dr. Samuel Johnson and the old grammar school attended by Johnson, Addison, Elias Ashmore, Garrick and Darwin. Luncheon was served in the George Hotel.

The Pipe Hill Pumping Station.—This station with 15 others and 15 reservoirs supplies a population of 694,000, covering an area of nearly 300 square miles and extending 40 miles in one direction. From this station the water is pumped to a reservoir 9½ miles distant. The plant at present contains one horizontal engine complete with bore hole and force pumps with space for another. The boiler house has three 8 x 30 ft. Lancashire boilers. The engine is of the compound, tandem, Corliss, surface condensing, rotative type, and was built by Hathorn, Davey & Co. of Leeds. The double acting force pump is behind the low pressure cylinder, the latter behind the high pressure, the crankshaft carrying the flywheel between the bore hole pumps and high pressure cylinder, and the two single bore hole pumps are worked by compensating levers actuated through a connecting rod by the engine crankshaft. The engine will pump 2,000,000 gal. per 24 hours from a depth of 300 ft., and deliver it against a head of 433 ft. at a speed of 180 ft. per minute. The stroke of the engine is 5 ft., and that of the bore hole pumps 5½ ft. The steam cylinders are 32 and 62 in. in diameter; the force pump barrel, 15¾ in., and the bore hole pump barrels, 15 in.

The third excursion was entirely a pleasure one, passing through Kenilworth, Warwick and Stratford-upon-Avon, visiting Kenilworth Castle, Guy's Cliff, Warwick Castle and Shakespeare's birthplace and Anne Hathaway's cottage, and the fourth excursion was the same but made in reverse order. In addition to these excursions a number of individual visits to works were arranged for.

LONDON CONVERSAZIONE

By invitation of the president and council of the Institution of Mechanical Engineers a conversazione was held in the Institution House, Storey's Gate, St. James' Park, Westminster, Thursday evening. President and Mrs. Aspinall received, music was furnished by the band of the Royal Artillery, and by vocalists and instrumentalists, and Dr. H. S. Hele-Shaw gave a short lecture with lantern illustrations on "Stream Line Experiments, Illustrating Aeroplane Stability," which was of fascinating interest.

LONDON MEETING

The third and last professional session was held Friday forenoon in the lecture hall of the Institution of Civil Engineers. The vice-president of that institution made an address of welcome, which was responded to by President Aspinall for the Institution of Mechanical Engineers, and Vice-President Goss for the American Society. The papers considered dealt with railroad electrification, and were presented in succession and discussed *en bloc*. The first two papers were given in abstract by their authors. Mr. Potter's was presented by H. H. Barnes, Jr., New York; Mr. Pomeroy's, by title, by Secretary Rice, and President Westinghouse's paper by C. F. Scott, past-president of the American Institute of Electrical Engineers. Abstracts of the five papers follow.

Electrification of Suburban Railways

BY F. W. CARTER, RUGBY, ENGLAND.

This paper discusses electrification of suburban railways as a means of regaining the traffic lost to tramways and motor omnibuses. Experience with the 18 electric railways now in operation in Great Britain shows that with the apparatus as now perfected there are very few breakdowns and delays and but small expense for repairs —0.06 penny per car mile (roughly 0.3 cent). Most of these roads use motor trains with multiple unit control. As a rule, the expense of operation is principally dependent upon the frequency of the stops, as most of the power is consumed in accelerating trains. The electrical losses during acceleration, the author declares, are approximately equal in direct current and single phase alternating current systems, in spite of the rheostat losses in the former, as the energy loss in single phase motors is much greater. The author sees little prospect of a general electrification of the country's railroads, as the expense would not appear to be justified by the advantages to be gained, except for heavy suburban service.

The Cost of Electrically Propelled Suburban Trains

BY H. M. HOBART, LONDON, ENGLAND.

The relative advantages of steam and electric train operation, according to the conditions existing in the vicinity, or the nature of the traffic, are discussed in this paper, and particularly the comparative costs of single phase alternating current and direct current systems. The paper analyzes the cases of four typical trains, two 150 ft. long and two 180 ft. long, one in each case driven by direct current motors and the other by single phase. The author's conclusions are that "the selection of the electrical system and also the determination of the service to be provided as regards schedule speed, distance between stations and intensity of traffic are all matters demanding the most careful attention, and that they are independent;" also that "the more severe the service and the more intense the traffic, the greater is the superiority of the continuous (direct current) system." He repeats a recommendation he made in 1904 that roads adopt 1200 volt direct current systems (upward of a dozen already have) and the increase in economy will further accentuate the contrast between the direct current and single phase systems.

The Economics of Railway Electrification

BY WILLIAM BANCROFT POTTER, SCHENECTADY, N. Y.

The author of this paper holds that single phase and three-phase alternating current rolling stock equipments are applicable only to exceptional conditions, and that for city and interurban service and for the electrification of steam roads, where the density of traffic requires a relatively large investment for rolling stock, as compared with that for a secondary distribution system, and the substation apparatus, direct current of 600 volts or higher, is most suitable. In short, the type of rolling stock equipment may be more important to economy of first cost and operation than the scheme of power distribution. In mountainous regions where the ability of a three-phase equipment to return energy to the line by operating the motors as generators when coasting down grade figures, that system has its advantages, but in all other cases it is a question of deciding between single phase and direct current. Purchased single phase current is furnished usually at 25 to 60 cycles, while for traction not more than 15 cycles is the preferred frequency, consequently rotary frequency changers may become as necessary as rotary converters are to a direct current system. The direct current equipment on account of its better efficiency and lower weight offsets the rotary converter and conductor losses so that the amount of energy required will therefore be about the same in either case for trunk line service. The paper proceeds to elaborate on the conditions which determine a choice between these two systems with a general leaning in favor of direct current, and the opinion that a standard system for all classes of service, while desirable, is impracticable. For interurban roads the author is pronouncedly partial to direct current, particularly at 1200 volts, and gives his arguments. In his conclusions he states that electric locomotives are well adapted for handling trains of cars that cannot be individually equipped, but that otherwise multiple unit control provides the most efficient handling of traffic.

The Electrification of Trunk Lines

BY L. R. POMEROY, NEW YORK.

This paper professedly approaches the subject from the standpoint of commercial considerations, assuming that from a physical and mechanical viewpoint electric traction is entirely adequate for railroad service. Extra capital will be involved in any system of electrification, and before it is decided upon assurance should be had that the net receipts will sufficiently increase to pay the interest on the additional investment, either by decreasing working expenses, increasing the revenue, or both. Sections, at least, of nearly all steam roads would return larger profits if electrified. To warrant a change, however, anywhere it must be possible to accomplish something with electric traction that is now impossible with steam. The author proceeds to show by data that the cheaper cost of power electrically supplied may be offset by traffic conditions, particularly in view of increased capital outlay, and declares that "the only cases where electric operation is commercially justified are in congested local passenger situations," and then "only when a large increase in business has been realized." Electric operation shows to greatest advantage in urban and suburban passenger service. With multiple unit trains, for example, the high rate of acceleration possible permits schedule speeds that cannot be maintained in steam operation. A more frequent service can be given without proportional increase in expense and light trains run with correspondingly reduced energy consumption. Better service will attract more travel, but this holds only for urban and suburban passenger service and not for trunk lines, and especially freight service. The author concludes with a discussion as to how to determine when improvements are justifiable, citing examples where they were made, and the results and where they were not made and why.

The Electrification of Railways

BY GEORGE WESTINGHOUSE, PITTSBURGH, PA.

In this paper the president of the American Society of Mechanical Engineers congratulated the president of the English Institution of Mechanical Engineers, and paid special tribute to the latter's observations on the effects of low center of gravity and heavy inflexible motor trucks upon the permanent way which called attention to costs that at first were not considered with sufficient care.

The author expressed his belief that "the increased capacity of a railway and its stations, the economies of operation and other advantages will bring about the systematic electrification of steam railways," and his wish that "the progress of the art may not be hampered and such electrification of our main lines delayed or rendered unprofitable by mistakes, which experience, judgment and foresight may enable us to avoid." The purpose of the paper is to emphasize the need of an agreement as to fundamental standards of construction so as to permit interchange of traffic. Present diversity of practice is deplored. It is further indicated that the great difficulty now is not the developing of suitable equipment, but the question of financial and general policy looking to the future electrification of railroads generally and not isolated cases of limited extent. For interchange of traffic the fundamental requirements for both steam and electric operation are given as: A standard gauge of track,

standard or interchangeable types of car couplers, brake equipment and heating apparatus and a uniform system of train signals, and in addition for electric operation uniform voltage and periodicity of current supply, location of conductors and the current collecting contacts of cars and locomotives of various lines and uniform types of control apparatus. As to choice of form of current supply, the author unqualifiedly favors alternating current, and particularly single phase motors. Details of a notable system of the latter character, the New York, New Haven & Hartford are given. With regard to their speed characteristics and other considerations affecting their suitability for train operation, direct current and three-phase and single phase alternating current motors are compared, showing mainly in the favor of the last named. The transmission system frequently becomes the most important factor in the cost of electrification and the relative simplicity of that for single phase operation is marked when contrasted with those for the other two types. Finally the author analyzes the requisites for a universal electric system, and regarding the future of electrification of railroads urges the need of determining the system which admits of the largest extension, and of promptly selecting standards which will allow complete interchange of traffic. Appendices describe the single phase system on the New York, New Haven & Hartford Railroad give data on electric locomotives of American design, a comparison of systems of electrification, review data upon electrified steam roads and electric roads for trunk line service and recount the early history of single phase railway motors.

The discussion took the form largely of a debate upon the relative merits of single phase and direct current motors. It was opened by Mr. Parshal, engineer of the Central London Railway, who told of some of the limitations imposed on companies operating in England, as, for instance, not being allowed more than a seven-volt drop in the ground return, &c. The New Haven system could not be operated in England, on account of the Board of Trade regulations. Where motor trains are used, single phase current, the speaker held, is not to be considered. He thought that beyond question of a doubt the single phase system is more expensive in first cost, will not give the same acceleration and is more expensive to operate.

R. D. Dale of the Midland Railway Company expressed the belief that main line electrification is imminent. He gave a paper before a joint meeting of the civil engineers, in which he showed that the single phase system does not have the disadvantages attributed to it. The Midland Railway's experience with the single phase system has been very satisfactory. In conclusion he criticised some of the figures in Mr. Hobart's calculations.

Greenwood Stirk, Halifax, had hoped to hear something from the Americans on track wear. He thinks that English wear is excessive, and believes it is worse with multiple unit trains. He attributed this to power being applied to push the train, forcing the car wheels to bear against the sides of the rails, and stated that this wear is not felt when the force is always in the nature of a pull as from a locomotive.

C. F. Scott spoke generally of the various special advantages that may come from electric operation, among them the ability to superimpose tracks and to build over railroad yards as a result of the elimination of steam and smoke. He made a general comparison between single phase and direct current systems, and he also thought Mr. Hobart's figures needed correcting, as very slight differences in assumptions (on which the author's calculations were largely based) may make considerable differences in results. An Indiana single phase road, he stated, makes the highest schedule speed in the world, and is the cheapest per car mile of any in the State.

A telegram from Phillip Dawson expressed his chagrin at being detained from reaching the meeting, as he wished to refute Mr. Hobart's figures, claiming that errors in assumptions vitiated the value of the results and conclusions, and that he would submit later written discussion.

Mr. Hobart, referring to Mr. Potter's paper, conceded that in the case the latter quoted single phase was preferable to direct current, but maintained that wherever this is true steam operation is superior to either.

Angus Sinclair, New York, did not concur with Mr. Westinghouse in anticipating eventual electric operation of freight trains. He thinks from his observation of railroad practice on the American continent that the chances for electric operation are very slim indeed.

A. B. Wilson, Belfast, declared three facts had been established. On suburban roads of moderately heavy traffic electric operation is capable of greatly reducing costs; adoption of electric traction is the only means of competing with other roads, and there are cases of extremely heavy freight traffic in suburban sections that would warrant electrification. To a railroad man, he said, two methods are confusing, still he was surprised that Mr. Westinghouse advised the adoption of the single phase system to the exclusion of all others. He thought it would be desirable, but impracticable.

Prof. F. R. Hutton, New York, agreed with Mr. Sinclair that it is a little premature to talk of electrifying everything; for instance, long tracks over the prairies where freight trains are hauled thousands of miles.

The authors or their representatives closed briefly and without bringing out any additional points. President Aspinall told of the experience of the London & Southwestern, the first in England to be electrified, and ventured that the saving of crew time and reduction of labor expense are more important than any details or methods.

The professional part of the convention was then adjourned, with votes of thanks from the visitors generally, proposed by President Aspinall, to those who had had a part in entertaining the two societies, and by Vice-President Goss, to the institution on behalf of the American Society.

Friday afternoon was left to the individual's disposition. Garden parties were given by Past-President William H. Maw and Mrs. Maw and Sir John Thornycroft and Lady Thornycroft, and the museum of the Public Record Office, containing the Domesday Book and other historical documents, was open to the visitors. Several availed themselves of the invitation to inspect the mechanical plant of the London *Times*.

INSTITUTION DINNER

As the concluding and principal social function of the convention a banquet was tendered by the institution to the officers and members of the American Society in the Connaught Rooms, Freemasons' Hall, London, Friday evening. President Aspinall presided, and following the loyal toasts gave "The Health of the President of the United States," which was acknowledged by the American Ambassador, the Hon. Whitelaw Reid. The other toasts were "The American Society of Mechanical Engineers," proposed by Sir William H. White, past-president of the institution, acknowledged by Prof. F. R. Hutton, past-president and honorary secretary of the society; "Our Other Guests," proposed by Edward B. Ellington, vice-president of the institution, acknowledged by Dr. R. T. Glazebrook, director of the National Physical Laboratory, and "The Institution of Mechanical Engineers," proposed by Dr. W. F. M. Goss, vice-president of the American Society, acknowledged by the president of the institution.

SATURDAY EXCURSIONS

The last and in many respects the most delightful of the excursions occupied the entire day, Saturday. By special trains half of the party was taken to Windsor and the other half to Marlow, each taking launches on the Thames to the other town and passing one another on the 13-mile sail through one of the most picturesque parts of the river. Trains again returned them to London. At Windsor both sections had the pleasure of visiting the historic old castle and under

the guidance of the Mayor of Windsor, Councillor C. F. Dyson were shown over the ground, and were so favored as to see St. George's Chapel, which was open to the public for the first time since the death of King Edward VII. All were taken through the State Rooms in the Castle.

In the evening some visited the Japanese-British Exhibition at Shepherd's Bush, and Sunday afternoon many went to the Zoölogical Gardens, Regent's Park, for which tickets were furnished. In the evening Westminster Abbey was visited by invitation of the Dean, where the party was shown through the chapels and other parts of the ancient edifice, inspected the memorial window recently dedicated to Sir Benjamin Baker, civil engineer, designer of the Firth of Forth Bridge and the Ashokan Dam, and remained for evening service in the nave.

From the little space that could be given in a report such as this to other than the technical features of the convention programme, it must still be evident that the institution's committees having in charge the preparations for this meeting were remarkably thorough. Much as Americans pride themselves on their ability to entertain professional visitors, it is a question if they have not something yet to learn from their English cousins.

Bliss Sheet Metal Working Machinery at the Brussels Exposition

[*The following description of one of the most prominent American exhibits at the Brussels International Exposition was specially prepared for The Iron Age a short time ago. Notwithstanding the destruction of a large part of the exposition by fire, August 14, this article will be of interest to many of our readers.*]

The display of the E. W. Bliss Company, Brooklyn, N. Y., at the Brussels International Exposition includes a large and varied collection of sheet metal working machines. The first of these is a large hydro-mechanical press, which combines the sustained and powerful squeeze of hydraulic action with the speed and accuracy of a merely mechanical press. The pressure exerted ranges from 20 to 600 tons, and is controlled by a safety valve to any desired point between these limits. The mechanical and the hydraulic motions are quite distinct. As soon as the clutch is thrown in the toggle straightens out so that the punch comes to within almost touching distance of the piece to be worked. At that moment the hydraulically actuated die bed effects the working pressure on the blank, rising the short distance required to accomplish the squeeze and returns while the punch is quickly raised to its starting position. The entire cycle takes less than 3 sec., and 20 strokes per minute may be thus utilized. The press operates without vibration, shock or noise, so that it may be placed on an ordinary solid shop floor, thus obviating the heavy cost of foundations necessary for drop stamps, heavy screw presses, &c. The smooth but powerful and continued pressure of this machine permits results to be obtained in a single squeeze which otherwise call for seven or eight operations and annealings. The manufacture is therefore much more rapid, not to speak of the elimination of annealings, and in addition this machine is easier than mechanical presses on the dies and they last much longer.

The company shows a whole line of machines for every phase of tin can and box manufacture. The well-known Bliss top and bottom zig-zag stamping presses are exemplified by an automatic and semi-automatic machine. The first, for cutting and stamping blacking boxes simultaneously, takes a full lithographed sheet, which is clamped in the carrier by a single movement and feeds it automatically under the die. The cuts are staggered, one touching the other as nearly as possible, so that the maximum economy in tin plate is attained. The finished pieces drop through the back of the press by gravity and the scrap, separated from the goods, is cut off in small pieces at every stroke. The press runs at 60 to 100 strokes per minute, according to its size and shape, and the whole operation is automatic, the sheet carrier returning to its original position after the last cut, ready for another sheet. The division is very exact, insuring coincidence between the cuts and the printing on the lithographed sheets, and as one operator can easily attend to two or more machines, the economy in labor and stock is great. The semi automatic lid machine works on the same principle, but the sheet carrier is pushed along by hand and stopped automatically in the right place for each cut. The operation, however, calls for practically no effort on the part of the operator, who, when once used to the work, can catch every stroke of the press. Aside from their great labor and stock saving qualities, these machines have the great advantage of presenting no possible danger to the operator's hands, which are not required to be near the tools while the press is in action.

An automatic body making and soldering machine is also shown, which produces lock seamed and soldered can bodies at the rate of 100 per minute. The cut blanks are simply piled in between inclined supports at one end of the machine and from start to finish the operations are entirely automatic, the finished body being ejected, properly wiped, cold and firm enough for immediate handling. It does all these operations simultaneously and much quicker than any one operation could be done separately, with a great deal more uniformity, and requires only a single operator. The bodies are now ready for flanging, which is done in an automatic machine that can be connected to the body former so that the bodies drop from one machine into the other, where they are flanged and automatically ejected at the rate of 60 per minute.

The company's line of inclinable power presses is represented by several improved models, with a new style of shaft and crank connection. The eccentric portion of the shaft is so made that it fills the entire space between the bearings and practically does away with the tendency to twist or bend under pressure. The crank connection transmits the motion of the eccentric shaft through wearing surfaces at least four times as large as usual.

The company has made a special study of straight sided presses and exhibits some characteristic models. Their most interesting feature is the Wilzin patent pressure controller, which permits these presses to be used not only for cutting, piercing and shaping work, but also for heavy embossing and similar work that is usually done in drop hammers and heavy screw presses. It acts as a sort of safety valve, and if the shaft meets greater resistance than the press is calculated to overcome, due to excessive thickness of stock or a punch adjusted too low, the compensator permits the slide to recede slightly at the extreme end of the stroke, thus allowing the shaft to complete its revolution without releasing the pressure on the piece being worked.

The Bliss swaging machines, for shaping, tapering, reducing, pointing, &c., such articles as metal pen and pencil holders, sewing machine needles, spectacle sides, metal umbrella rods, and, in the larger size machines, bicycle and automobile tubes and fittings, steel center bits, &c., are also shown. In comparison with turning, grinding and milling, these machines are said not only to permit a much greater output, but to eliminate loss of stock.

Valve Gear of the New Cochrane Open Heater

In *The Iron Age* of June 10, 1909, there appeared an illustrated description of the new Cochrane feed water heater, which had just been placed on the market at that time by the Harrison Safety Boiler Works, North Philadelphia Station, Philadelphia, Pa. This heater was a new model combined heater and receiver, for use in connection with exhaust steam heating and drying systems. One of the special features of the heater was the extra large separator, which was intended to purify all the exhaust steam delivered by the engine, including not only that entering the heater to raise the temperature of the boiler feed water, but also the surplus passing out to the heating or drying system. To cut the body of the heater out of service for cleaning or inspection while the heating system continued in operation, a manually controlled valve was provided to shut the separator off from the heater body and another to close the passage between the separator trap and the heater overflow. The latter was necessary in order that the trap might continue to drain the separator when the heater was out of service without allowing steam to enter the heater through the separator drain pipe and trap.

It is necessary that both valves be closed when it is desired to cut the heater out, and some provision must be made against accidental opening of the trap if a man is to enter the heater while the separator is receiving steam. In small heaters it was found practicable to connect the spindles of the two valves together and to turn them by a single lever. The handle for operating the valves is attached to the spindle of the upper one, while a connecting rod driven from a short crank on this spindle operates a second crank keyed to the spindle of the lower valve.

The steam valve between the separator and the heater is of the semi-cylindrical rotating type and is held against its seat by springs and also by the pressure of the steam. Where a pressure of 5 lb. or more is carried in the heater the total pressure over the valve of a large heater would render operation difficult by forcing the valve tightly against its seat. To obviate this a special valve gear, shown in Fig. 1, has been devised, in which the handle is attached to the spindle of the lower valve instead of to that of the upper and the lower end of the connecting rod, engaging the pin on the short crank of the lower spindle, is slotted so that the latter has a certain excess of motion over that of the upper spindle. The amount of this excess motion is so adjusted that in closing the upper valve shuts off first, as shown in Fig. 2, and then remains stationary, while the lower one rotates through the remaining arc of its motion, which it is enabled to do by the lost motion in the connecting rod. Thus the upper valve is closed while there is still pressure in the heater to balance the steam pressure on the outside of the valve. Subsequently the lower valve closes, cutting off the heater, after which any steam contained therein will either be condensed or escape from the vent pipe, which always forms part of an open heater. Once both valves are closed the operating handle is removed from its spindle before the cleaning doors of the heater are opened, making it impossible for the steam valve to be opened until the handle is replaced.

In opening the valves the lower valve will swing through an arc sufficient to establish communication for steam passing through the separator drain pipe and trap into the heater, thus equalizing the pressure on the steam valve before the latter begins to move. As soon as the pressure is the same on both sides of the valve the latter will slide easily and the operation of opening can be completed. During this operation the valve in the vent pipe of the heater should be closed to permit the pressure to build up in the heater when the lower valve is first opened.

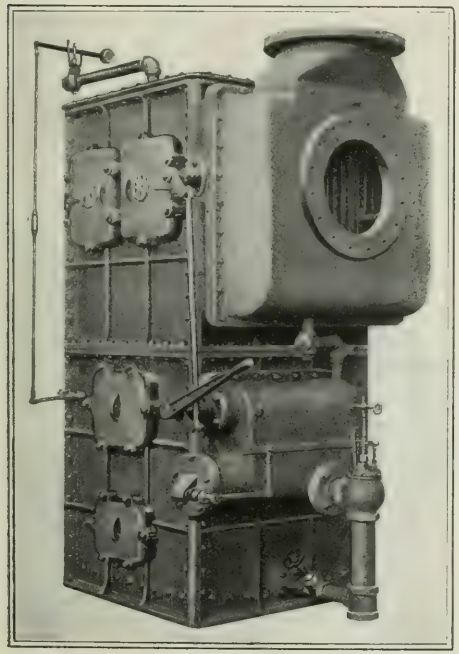


Fig. 1.—The Cochrane Feed Water Heater with Improved Valve Gear, Built by the Harrison Safety Boiler Works, Philadelphia, Pa.

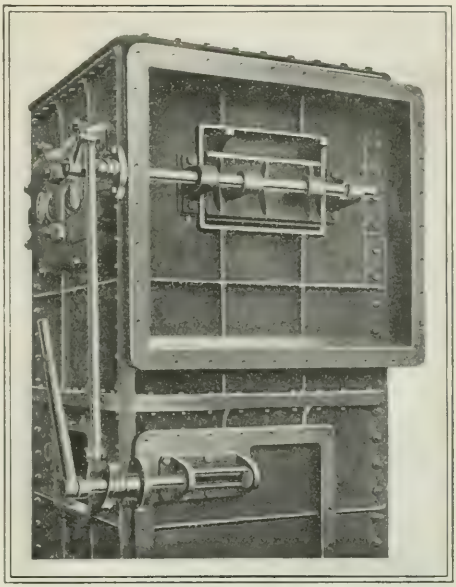


Fig. 2. Arrangement of Valves and Valve Gear in Cochrane Heater.

The American Iron and Steel Institute.—In furtherance of the plans adopted some weeks ago for the enlargement of the work of the organization, the American Iron and Steel Institute has opened headquarters at room 606, 30 Church street, New York. Howard H. Cook, who has been appointed assistant secretary of the Institute, is in charge.

The Peters Electric Headlight System

A New Headlight for Steam Locomotives Employing a Turbo-Generator

A new electric headlight system for steam locomotives has been placed on the market by the R. G. Peters Mfg. Company, 133 Grandville avenue, Grand Rapids, Mich., which consists of a turbo-generator and an electric arc lamp. The particular advantages claimed for the system are that it is as efficient as the electric headlight system now used at high speed electric interurban cars; it provides for a high or low power headlight, as may be demanded by the rules of the road or circumstances, and it is the logical system for providing steam locomotives with electric headlights, as the generator is steam driven. Fig. 1 shows the turbo-generator, Fig. 2 the assembled rotating element, Fig. 3 the two-carbon model of lamp and Fig. 4 the distribution of light from it.

The turbo-generator has all the advantages of the others of this type of economical steam consumption and low maintenance cost, and in addition is built to withstand the stress of railroad service. The turbine is of necessity small, but each part has been designed

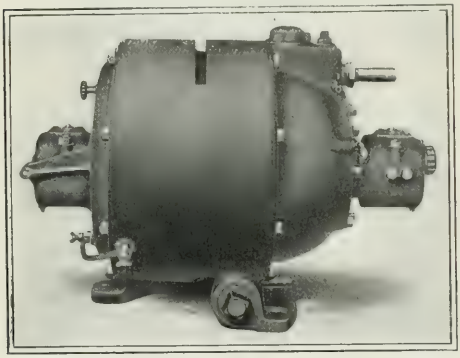


Fig. 1.—Turbine Generator Used with Electric Headlight System of the R. G. Peters Mfg. Company, Grand Rapids, Mich.

as simply as possible, so that any broken or worn parts can be easily replaced. The speed regulation is said to be very close and is controlled by a governor of extremely simple design. This governor is shown in Fig. 2 as a part of the assembled rotating element. All the parts are made of wrought or rolled metal, except the sleeve, which is surrounded by a heavy spring and bound at each end by a steel ring. The buckets of the turbine wheel are so formed and proportioned as to receive the steam from the nozzle efficiently and also from the intermediate reguiding buckets. The wheel is made from a solid disk of homogeneous wrought steel, which tends to give it great strength. The bucket is formed by a combination of a milled recess in the solid wheel plate and a specially formed partition fitted into slits and caught securely in place.

In addition to the regular control governor an emergency governor is provided, whose only function is to shut off the steam if by any chance the turbine overspeeds. This becomes operative when the speed is about 15 per cent. above the normal and when the emergency trip operates, it closes the emergency valve and the turbine is shut down automatically without any damage to any of its parts. When the main steam valve is closed by the operator and the pressure in the steam chest drops to zero, or nearly so, this valve automatically resets itself. An end-thrust collar is provided to take care of any end thrust of the shaft. This collar is so designed that it can move along, but cannot turn on the shaft, so that if the bearing should become overheated, due to its running dry, the thrust collar cannot seize on the bearing. This mechanism is so arranged that the end play of the shaft can be easily and quickly varied.

The generator is simple in construction, and, as far

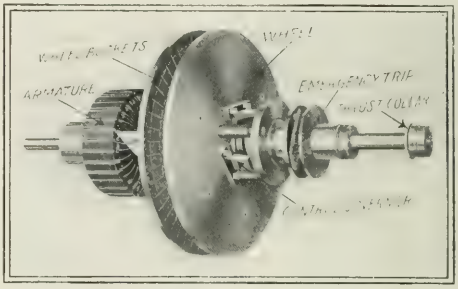


Fig. 2. Assembled Rotating Element.

as possible, all parts have been made readily accessible. The path of the magnetic flux is liberal in area and the wrought iron field cores are cast in place, which feature tends to increase the permeability of the magnetic circuit and consequently reduce the amount of wire required in the field coils. The pole shoes are laminated, thus reducing the losses due to eddy currents. The normal working load is 900 watts, which is sufficient to operate the arc headlight and five 8-cp. incandescent cab lights, but the design is such that a long run at a 50 per cent. overload is possible without damaging the generator in any way. The armature is built of iron punchings annealed, varnished on both sides and separated at intervals by punchings of insulating material, so that the eddy current loss in the armature is reduced to a minimum. The winding is of the ring type, and as the coils do not overlap and ample clearance is also allowed, a coil can be easily and quickly rewound. The insulation of the coils is thoroughly impregnated with a heat resisting varnish that is proof against oil, acid and water, and all is

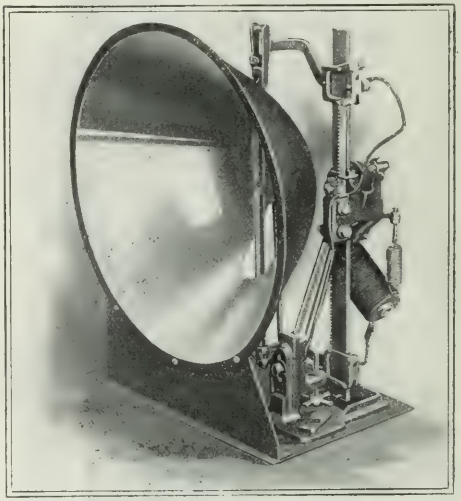


Fig. 3.—Two-Carbon Lamp in Reflector.

tested at 250 volts, or more than eight times that normally carried by the wires of the coils. The armature and commutator can be easily removed from the shaft. The latter is self-contained and built on the armature

sleeve, which fits into the armature spider. It is designed to stand very high speed, and a liberal number of segments have been provided. To relieve the operator on the road of the annoyance of filing down insulation between segments the mica is milled to a sufficient depth to last the lifetime of the commutator. On accouut of the high speed at which it revolves no foreign substance will remain lodged between the segments, and short circuiting of the armature is impossible, due to the absence of mica between the segments and the commutator surface.

The field coils are spool shaped and can be easily removed. They are wound with a copper ribbon having a cross sectional area equivalent to that of a No. 5 wire. A strip of insulating material wound about the copper ribbon and the entire coil itself are impregnated with heat resisting varnish. The use of a copper ribbon instead of wire results in less space being occupied by the field coil and placing both terminals on the outside of the coil, which reduces the chance of grounding The shoes on the ends of the pole pieces are designed to cover a large proportion of the armature surface and are laminated like the pole pieces. To remove a shoe it is only necessary to withdraw the through bolt

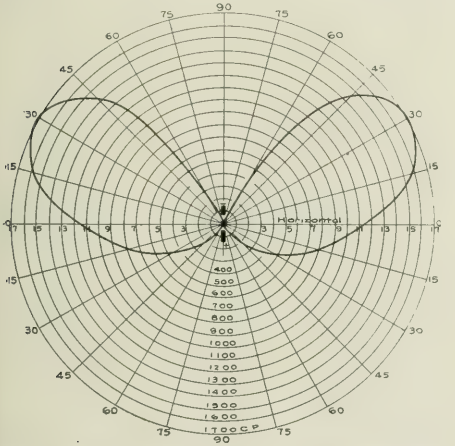


Fig. 4.—Curve Showing the Distribution of Light in the Vertical Plane from a Two-Carbon Lamp.

holding it in place and slip the shoe off the pole piece tongue, which extends into the shoe.

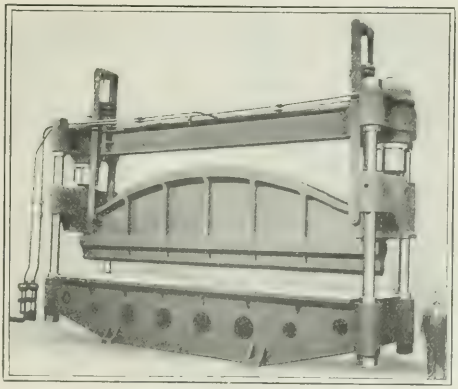
The most important points to be considered in connection with a locomotive headlight are the color of the light, the reliability of the lamp in operation, the ease with which it can be maintained in satisfactory working condition and the simplicity and durability of its construction. The first is especially important, as it should not be such as to cause the color of the signal lights to appear different than they really are. With the two-carbon type of lamp a soft, mellow light is produced, which, it is said, does not under any circumstances burn green. This lamp is so proportioned that it can be mounted in the reflectors ordinarily used by the railroads for oil headlights. Both electrodes are carbon and are in a vertical position. To maintain the arc at the focal point of the reflector each carbon is fed as it burns away by a mechanism working automatically and feeding them at the proper relative rate. It is said that the light produced by this lamp is easier on the eye and at the same time more powerful than any other type of electric headlight. All parts are made of high grade material and are liberally proportioned to withstand the strains of railroad service. The lamp can be quickly and easily trimmed and adjusted and will burn about eight and one-half hours for each trimming. The voltage at the terminals is normally about 27½ volts and the current consumed about 25 amperes. Fig. 4 shows a distribution curve of the light obtained from a test of one of these lamps, and it will be noticed that the intensity of the arc is about 1700 cp.

For illuminating the tracks satisfactorily on curves the headlight can be mounted on a turntable consisting of a round iron plate bolted to the headlight case and pivoted to the metal base plate, which is fastened to the boiler. The round plate is supported at its periphery by rollers held down by springs and the whole can be turned by a wire rope running back to the cab. The wiring for the cab lights is such that they may be turned off or on regardless of whether the headlight is burning or not. A double throw switch located in the cab enables an incandescent lamp to be substituted for the electric arc. This incandescent lamp is mounted in the reflector just in front of and below the focal point and is used when trimming the arc lamp, in its stead when the rules of the road require a less powerful headlight than the electric arc and in place of it should it fail to work satisfactorily.

In the design of the system the number of wearing parts has been kept as low as possible. These can be easily and quickly renewed. In the turbine the only wearing parts of importance are the main bearing and the thrust collars. The valve and the governor parts, which are the only other members subject to rubbing, are so lightly loaded and have such little movement that the wear is negligible. In the generator the only parts subjected to wear by friction are the brushes, the commutator and the bearings. The cummutator can be readily trued up by turning and the brushes and bearings may be easily and quickly replaced.

A Large Wood Press

R. D. Wood & Co., 400 Chestnut street, Philadelphia, Pa., have recently completed and shipped to the Fore River Shipbuilding Company, Quincy, Mass., the large keel plate bending press shown in the accompanying engraving. The overall length of this press is 28 ft., and it has a capacity to bend plates 25 ft. long. The bottom platen, which is of semi-steel, was cast at the builders' Camden foundry. It weighs 105,000 lb., and is 7 ft. wide. A special arrangement of operating



Press for Bending Keel Plates 25 Ft. Long, Built by R. D. Wood & Co., Philadelphia, Pa.

valves has been provided, so that one end of the top beam, which weighs over 50,000 lb., can be lowered while the other remains stationary. One point of special interest about the press, aside from its large size, is that it was built in nine weeks to fill a rush order from the Shipbuilding Company, and that this time includes the making of the designs and patterns for the castings.

Activity on the Cuyuna Range

The Kennedy Mine the First Shipper—Other Lake Superior Iron Ranges

MARQUETTE, MICH., August 13, 1910.—Much exploratory and development work is in progress in the new Cuyuna district in Minnesota. It is only within the past two or three years that general attention has been attracted to the field, yet it was as long ago as 1902 that the first systematic prospecting was carried on. This was by Cuyler Adams, the pioneer of the range. Then George H. Crosby, Rogers, Brown & Co., Pickands, Mather & Co., the Jones & Laughlin Steel Company and other individuals and mining concerns entered the district, with the result that the exploratory operations have now extended over a very considerable area. The first producer is the Kennedy mine at Rabbit Lake, the fee of which is owned by the Orelands Mining Company, G. H. Crosby and Wm. Harrison. It is 4 miles northwest of Deerwood and 3½ miles from the new town of Crosby, being on the so-called "North Range." Work at this property was started by the Rogers-Brown interests two and a half years ago. The shaft is down between 300 and 400 ft. Much lateral development has been carried on, and a stockpile of some 50,000 tons of ore has been accumulated. Such shipments as will be made this season will be forwarded over the Soo Line to the Wisconsin Central docks at Ashland, but next year the lake port will be Duluth. The Rogers-Brown lease calls for a minimum production of 100,000 tons a year, with the property developed. The same interests are developing a second mine in Section 11, 46-29, adjacent to the town of Crosby. The Orelands Company controls 700 acres. Guyler Adams is its president. The Brainerd Mining Company has 900 acres. This land has been leased to a steel consuming concern and is being explored. Drills also are at work on the properties of the Salisbury and Agate Lake Mining companies. The C. M. Hill Lumber Company of Saginaw, Mich., is exploring the Thomas Feigh lands in Section 16, 46-29, and is said to have located an extensive deposit. Drills are, in fact, at work in every direction on the Cuyuna.

On the Gogebic

A prospective producer on the Gogebic range is one that Ferdinand Schlesinger of the Newport Mining Company plans to open to the north of the Palms property in the Bessemer district. The tract consists of 80 acres, and is owned in fee by the county of Houghton, Mich. Exploratory work has been in progress with such satisfactory results that the Schlesinger interests have agreed to spend $250,000 in its development within the next five years.

The Newport Mining Company is to erect a hospital at Ironwood for the accommodation of its Gogebic range employees. The building will be of brick, 40 x 100 ft., and two stories. The Bonnie shaft at the Newport mine has been closed on account of the lack of demand for the quality of ore produced there. The men have been transferred to other workings of the property.

The recent accident at the G shaft of the Pabst mine at Ironwood, Mich., in which a 10-ft. hoisting drum burst, was most unusual. That no lives were lost was remarkable. The accident was due to the breaking of two cogs on the pinion driving the drums. This caused a jolt of the drum which stripped all the remaining cogs from the pinion, leaving the drum with no control except the hand brake, which was useless under the circumstances. The drum was pulling a 5-ton skip of ore, which was at the collar of the shaft, and with no control on the drum this skip dropped back with great rapidity, causing the drum to revolve so rapidly as to explode it. Fragments from the machine tore through the roof and front of the building, one of several hundred pounds going through the roof and falling back in the engine house.

New Work in the Iron River District

The Gleason and Goodman tracts in the Iron River district of the Menominee range, the development of which is now being undertaken, will be the first properties that the New York State Steel Company has operated in Michigan, though it is now working several mines on the Mesaba range. The terms of the lease from M. E. Gleason call for the highest royalty and bonus ever paid in the Iron River field. The royalty is 50 cents a ton. The deposit is estimated to contain fully 3,000,000 tons. Another piece of new work that is being started in the Iron River district is the sinking of a shaft to develop the ore found with drills on the Hall property in section 19, 43-34. This tract has been explored by the Florence Iron Company.

Railroad Extension on the Eastern Mesaba

The United States Steel Corporation, which a few years ago penetrated the extreme western portion of the Mesaba range with its Duluth, Missabe & Northern Railroad, is preparing to enter the extreme eastern portion of the range in similar manner. Its Duluth & Iron Range road, the present terminus of which is at the Spring mine, is to be extended 10 miles or more to the east. The extension will tap a large belt of timber owned by the Steel Corporation and other interests, and it also will open considerable areas of mineral land, much of which is held under option by George A. St. Clair and his associates. These holdings aggregate some 10,000 acres. The lands will be explored, with strong likelihood that a number of mines will be developed.

An interesting work just completed on the Mesaba iron range is the sinking of a concrete shaft at the Scranton property. The operation had been in progress more than a year, being conducted by the Foundation Company of New York. The shaft is 285 ft. deep and nearly 16 ft. square. A pumping station is now being cut at a point 30 ft. above the bottom. The Scranton lies in the southwestern outskirts of the village of Hibbing. It is held under lease by the Lackawanna Steel Company, but will be operated by Pickands, Mather & Co. The fee is owned by the State of Minnesota. It is estimated to contain approximately 20,000,000 tons of ore.

The Scranton formerly was known as the Elizabeth. The property adjoins the site of 20 acres upon which the United States Steel Corporation is establishing its new headquarters for the Hibbing district.

Railroad Equipment Orders.—Concerning the New York Central car requirements the *Railway Age Gazette* says that about 8000 box, gondola and hopper cars are being figured on, but that definite action will probably not be taken before January 1. Of the 260 locomotives which the New York Central Lines have decided to purchase, as heretofore reported, it is understood that orders for about 200 will probably not be placed for several months. The 21 freight locomotives ordered for the Michigan Central are considered a part of the 60 locomotives which the Vanderbilt lines are supposed to have placed. The New England Coal & Gas Company, Boston, is asking prices on 300 hopper cars and the Dairy Shippers' Despatch is again asking for prices on 100 refrigerator cars. The Havana Central is inquiring for 100 flat cars and 50 to 150 box cars, all to have steel underframes. The Baltimore & Ohio has ordered 5 Mallet locomotives from the Baldwin Locomotive Works and the Guantanamo & Western 3 from the American Locomotive Company.

New Tools and Appliances

A Large Ferracute Trimming Press.—Several heavy trimming presses for use in a prominent locomotive works have been built recently by the Ferracute Machine Company, Bridgeton, N. J. Two sizes of press were built, some for pressures of 300 tons and other for 200 tons, the former containing a side punch for similar work of a lighter character, which adds considerably to the capacity of the tool. The bed, which in the larger size measures 30 x 50 in., the bolster and the ram contain T-slots for die clamps. The stroke of the main press is 12 in., with a 10-in. adjustment, and the side punch has a stroke of 3 in. and a bed measuring 15 x 30 in. The drive of the machine is double geared, power being transmitted from the flywheel shaft by a pinion and gear to an intermediate shaft at the rear which in turn drives the large gear mounted on the main shaft through a second pinion. This arrangement gives a gearing ratio of 50 to 1. A clutch is provided for the press which enables the operator to start or stop it at any point in the stroke.

The Davis Expansion Boring Tool.—A number of improved boring tools have been developed by the Davis Expansion Boring Tool Company, Broadway and Bremen avenue, St. Louis, Mo. These tools are made of all styles and 21 sizes to meet the conditions and requirements of every shop, and are intended to screw on the end of an ordinary arbor or shank and be used either in a lathe, boring mill or drill press. One of the points of superiority claimed for this tool over the ordinary cutter lies in the ease and quickness with which adjustments can be made to compensate for wear. This tool is adjusted to any size within its range by simply inserting a key wrench in the squared hole of the adjusting screw which operates a double expanding tool steel wedge that forces the cutters outward.

Automatic Nut Burring Machine.—The Mechanical Equipment Company of Canada, 645 St. Lawrence Boulevard, Montreal, Canada, has brought out a machine which is designed to meet the need of nut manufacturers for a power machine capable of removing any form of burr that can be developed on a hot pressed nut. It is said that this machine has not only demonstrated its ability to completely remove the worst form of burr, but it can also put a skin finish on the nut if desired. The machine is simple in design, well built, and possesses structural features which make it especially adapted for nut and bolt works where the question of economy is considered. The operation of the machine is entirely automatic and the nuts require no attention after being placed in the stationary chute by the operator. The capacity of the machine is given as 14,000 nuts, ⅝ to 1½ in. internal diameter per 10-hour day.

Combination Air Compressor and Gas Engine.—The Flickinger Iron Works, Bradford, Pa., is manufacturing a combination gas engine and air compressor for supplying power and compressed air simultaneously. Both the engine and the compressor operate as a combined unit, one end of a single cylinder being used as an explosion chamber to develop the power while the other acts as a compressor. This arrangement enables the machine to be instantly converted into a simple gas engine while running or to throw the compressor into commission at any time, a feature which would be especially applicable to shops where power is required continuously and compressed air only at intervals.

Barr Drilling and Tapping Attachment.—H. G. Barr, Worcester, Mass., is equipping all of his drill presses with the automatic tapping attachment for converting a drill press into a combination drilling and tapping machine, which was illustrated and described in *The Iron Age* March 24, 1910.

Portable Electric Radial Drill.—The United States Electrical Tool Company, 1938 West Eighth street, Cincinnati, Ohio, has made a couple of changes in the portable electric drill illustrated and described in *The Iron Age*, July 30, 1908. These are mounting the drill on a truck so that it can be moved from place to place and providing it with two speeds, namely, 280 and 450 rev. per min. instead of the one speed with which the other type is equipped. As now built these tools will drill at factories for drilling the frames and also for general any angle and are used more especially in automobile drilling around the car.

Improved Single Crank Trimming Press.—The Toledo Machine & Tool Company, Toledo, Ohio, has brought out a new type of single crank trimming press for drop forgings. The detached outboard pedestal bearing has been eliminated in this machine, which reduces the floor space and tends to keep the flywheel shaft in alignment. The press is provided with an unusually heavy balance wheel of small diameter, which provides sufficient power for obtaining the maximum output, and the press is operated by a block clutch with gravity controlling mechanism. Double back gears are provided for the press, which is intended for trimming long forgings for crank shafts and similar work.

Lathe Milling Attachment.—The Young Machine & Tool Company, Worcester, Mass., has placed on the market a lathe milling attachment that is adapted for small shops and garages where there is not enough work to warrant the purchase of a regular milling machine. This attachment can handle a wide range of work and can be readily attached to or removed from a lathe. Either hand or power cross feed is available, the power feed being obtainable from the lathe itself by connecting the table on the attachment with the lathe cross slide. In this way a range of feeds is obtained equal to that available on the lathe. When hand feed can be used to better advantage, the cross slide and the table are disengaged. The dividing head furnished enables 133 divisions to be obtained. This head is attached to its base, so that it can be swiveled to a maximum angle of 55 degrees from the vertical and its position indicated by graduations. Much of the work for which this attachment is adapted can be bolted directly to the table, which is provided with a T-slot throughout its entire length and has a working surface of 4 x 22 in. The maximum distance between centers of the attachment is 13 in., and the dividing head center can be adjusted vertically to a hight of 5½ in. above the table.

Automatic Twist Drill Grinder.—A. E. Mill, Cincinnati, Ohio, has designed a twist drill grinder intended to simplify the operation of drill grinding, which is more or less complex, as correct grinding requires that the cutting edges, in addition to being of the same length, shall have a proper and uniform angle, and the clearance is so shaped as to give good support to the cutting edges and at the same time permit the free cutting action. The machine is entirely automatic in operation and will grind drills ranging from 3-16 to 3 in. in diameter. While being ground the drill revolves continuously at uniform speed, and the ordinary two-lip drill oscillates twice in one revolution upon a center which exactly coincides with the axis of the drill. This oscillation produces the required amount and form of clearance and is caused by a cam working against the stationary roller. In addition to the oscillating movement the drill is reciprocated to and from the emery wheel twice during each revolution by a second cam operating through a lever upon the block in which the drill spindle is mounted. The point of the drill is in contact of the wheel while the clearance for one lip is being ground, and is then withdrawn from the wheel an amount sufficient to bring the opposite lip in the correct position for grinding. The automatic feed of the drill is also effected by this reciprocating motion. Both automatic and hand feed are provided, and the former can instantly be released by disengaging the pawl from the ratchet wheel operating the feed, or it can be released at any predetermined point by an adjustable pin on the drill spindle sleeve striking the lower part on the trip lever and disengaging the pawl. The oscillating movement of the emery wheel is effected by an eccentric and it serves to prevent the cutting face of the wheel from clogging up. An adjusting screw is provided so that the entire face of the wheel may be used, thus keeping the wear uniform. For different sizes of drills the distance to the center of oscillation is changed to correspond.

Trade Publications

Electrical Apparatus.—General Electric Company, Schenectady, N. Y. Three bulletins. No. 4742 is devoted to the intensified arc lamp designed by the company for general illumination on direct-current circuits. The principal characteristics of the lamp are high efficiency and the daylight quality of its light. No. 4753 describes the G. E. Madza 400 and 500 watt incandescent lamps for standard lighting service in large stores, armories, factories, &c., as economical substitutes for other units of high candle power and clusters of small low candle power lamps. No. 4756 gives a graphic description of the ventilation of horizontal steam turbine alternators of 750-kw. capacity and should be instructive and interesting to those connected in any way with the operation of these machines.

Electric Novelties.—Ohio Electric Works, 6304 Ellen avenue, N. W., Cleveland, Ohio. Catalogue. Concerned with a large line of electric novelties and appliances, which includes lamps for operation with dry or storage batteries, flash lights, electric heating devices, massage machines, batteries, telephones, telegraph instruments, measuring instruments, small motors and generators, and a number of electric toys. All of the different appliances are illustrated and brief descriptions are given.

Transmission Chains and Sprockets.—Baldwin Chain & Mfg. Company, Worcester, Mass. Catalogue No. 10. Lists a number of different styles of chains and sprockets for transmission purposes. These include detachable bicycle chains in which the links are readily removable, block automobile chains, block and roller detachable and riveted chains and a special truck chain. Full size drawings of the different chains are given and tables of the different diameters of the various sizes of sprockets made are also included. A formula for calculating the pitch diameter of sprockets for any number of teeth is appended.

Soft Steel Sheets.—West Penn Steel Company, Brackenridge, Pa. Pamphlet. Calls attention to a number of different varieties of steel sheets which are manufactured for various purposes. These include blue annealed one and three pass cold rolled sheets, single pickled cold rolled sheets, re-annealed full pickled and full cold rolled open hearth steel sheets, special sheets for automobile and metal furniture work, tube steel sheets, metallic barrel and basket stock, electrical sheet steel, tack plate, chute steel and powder can stock. Tables giving the weights of the various sizes and gauges in which these sheets are manufactured are appended.

Multiple Spindle Automatic Screw Machine.—Davenport Machine Tool Company, New Bedford, Mass. Booklet. Gives general description and specifications for a multiple spindle automatic screw machine having a capacity for screws ½ in. in diameter and 2 in. long. A detailed description of the construction of this machine is given, which is supplemented by a number of engravings and sectional views.

Patternmakers' Supplies.—The Cleveland Fillet Company, 1444 East Forty-ninth street, N. E., Cleveland, Ohio. Catalogue and price-list. Lists a number of patternmakers' supplies and foundry chaplets. These include the Crescent fillets made in a number of different styles and sizes in both wood and leather, polished steel tools for pressing the fillet in position, corrugated steel joint fasteners, brass, malleable iron and wood dowel pins, rapping plates and draw screws, rules, pattern lumber, white metal and brass pattern letters and figures in a number of different fonts, steel hand clamps, chaplets, glue, shellac and lamp black, and the Foley band saw filing and jointing machine.

Spring Fitting Furnaces.—W. S. Rockwell Company, 50 Church street, New York City. Circular No. 11. Devoted to the Rockwell spring fitting furnace, which is designed to heat steel uniformly and cleanly. The advantages claimed for this furnace are locating the combustion chamber under the heating chamber, so that no hot blast or flame impinges directly upon the steel, which is always covered by a soft vapor and completely shielded from the atmosphere, placing the burner in the furnace directly under the eye and hand of the fitter, and an even distribution of heat. The furnace is entirely iron bound, heavily lined with firebrick, and is very strong and durable. Any average bricklayer, it is said, can build the furnace from the detailed drawings furnished by the maker, as no special shapes or tiles are required other than the burner tiles which are furnished with the ironwork and the burner. Another strong point claimed for this furnace is that a large number of springs can be turned out per day and all will pass rigid inspection. As regularly built these furnaces are equipped to use oil as fuel, but if desired gas burners can be supplied.

Concrete Piles.—The Raymond Concrete Pile Company, 135 Adams street, Chicago, Ill. Catalogue. Size 6 x 9 in.; pages 160. Calls attention to the use of the Raymond concrete pile in the foundations of structures ranging from manufacturing plants, docks, gas holders and smokestacks to viaducts, office buildings, hotels and private residences. Space is given to a brief sketch of the development of the concrete pile, followed by a description of the method of making and placing the Raymond piles. The advantages claimed for these piles are speed in placing, a greater carrying capacity, freedom from decay and a large initial economy. There are numerous illustrations in the book showing the methods of handling and placing the piles as well as the structures built on them. In a number of instances these illustrations are supplemented by brief descriptions of the structures. Data of the initial economy of the Raymond piles are given, together with a brief form of specifications for and a list of users of these piles.

Sheet Metal Stampings.—Bay State Stamping Company, 380 Chandler street, Worcester, Mass. Pamphlet. Relates to a line of sheet metal stampings which this company manufactures. These include oil hole covers, oil cups, screwdriver ferrules, emery wheel dressers, and turning tools for truing and shaping emery wheels. All the products are illustrated and the views are supplemented by brief descriptions.

Soldering Fluxes.—The Baltimore Chemical Company, Baltimore, Md. Three circulars. Relate to the Perfection soldering flux, which is said to produce stronger and neater work at a lower cost. It is also said to be free from uncombined acids of any kind, so that discoloration of the work and injury to the health of persons using it are avoided. This flux is packed in packages of four different sizes ranging from kegs of 55 lb. to barrels of 500 lb. It is made ready for use by diluting in the proportion of three parts of water to one of flux, and when so prepared 1 lb. will cap approximately 1600 ordinary sized cans.

Laundry Machinery.—American Mangle & Roller Company, 400 Main street, Racine, Wis. Pamphlet. Concerned with a line of hand and power operated laundry machinery suitable for hotels, hospitals and institutions. The different machines illustrated and described include mangles in a large variety of styles of sizes, an extractor or partial dryer, cylinder washing machines, and a dryer heated by stove, gas, steam or hot water. Brief descriptions accompany the illustrations and space is also given to the engines and boilers supplying the power for operating the machines.

Core Drills.—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletin No. 9001. Deals with the Davis calyx diamondless core drills, which are used to determine the character, order, thickness and extent of materials beneath the earth's surface by extracting cores or cylinders from an annular hole. The principal fields of application of this tool are in contracting, stone quarrying and coal or metal mining. This drill uses either a steel cutter or chilled shot or crushed steel as a cutting agent, depending upon the character of the work to be done. The former is employed for soft and medium rocks and one of the latter two for harder material. This drill removes cores from 1⅝ to 18⅝ in. in diameter to all depths up to 4000 ft. The illustrations show the drill in use for a number of different purposes, the cores removed and the different parts of the drills. The construction of the different parts and the operation of the drill are described and a brief table of specifications is appended.

Tool and Cutter Grinder.—The Miami Valley Machine Tool Company, Dayton, Ohio. Two loose leaf circulars. Illustrates and describes its No. 1 universal tool and cutter grinder, in which the emery wheel head and the table swivel instead of the body of the machine, which gives a quick adjustment. Other advantages are that the machines can be placed close to the wall or other machines, thus economizing floor space, and a vertical adjustment is required only when backing off taper reamers. An illustrated description of this machine was printed in *The Iron Age* February 24, 1910.

Automatic Time Register.—The Automatic Time Stamp Company, 160 Congress street, Boston, Mass. Folder. Illustrates the style D automatic time register for recording the starting and finishing time of various orders, jobs or operations, so that the elapsed time may be readily ascertained for cost keeping purposes. This method is now in use in nearly all the large manufacturing establishments in this country. Two types of register are built, one for stamping the time and the other, which is provided with a slide bar arrangement which can be shifted, to print the words stop and start, or in and out, in addition to printing the time. With either of these machines different styles of impressions can be made, such as the year, month, day and hour, which is the most common; the month, day and hour, and another which is the same as the first except that the time is indicated, as a.m. or p.m., the change at noon and midnight being automatically made.

Radial Drills.—The Mueller Machine Tool Company, 2425 Colerain avenue, Cincinnati, Ohio. Four loose leaf circulars. Pertain to the line of new radial drills which the company has recently designed. These are built in four sizes for either cone pulley or feed box drive, with 2½, 3, 3½, 4 and 4½ ft. arms. An illustrated description of the 4 and 4½ ft. model was printed in *The Iron Age* May 26, 1910.

Spring-Seat Valves.—The Crosby Steam Gauge & Valve Company, Boston, Mass. Set of nine loose leaf circulars. Deals with the Crosby spring-seat valves, which are primarily intended for high pressures and are recommended for superheated steam, although they are also well adapted for use as throttle valves for steam engines. The characteristic feature of the valve is the construction of its seat, which allows a greater contact surface, a resilient action which prevents jamming when the valve is closed, allows free action regardless of any variation in temperature, and prevents abrasion by the steam when the valve is

partly open. Other features claimed for this valve are strength, quality, durability and freedom from leakage at high pressure.

Blast Furnaces.—William B. Pollock Company, Youngstown, Ohio. Supplement No. 19 to the company's general book of views of blast furnaces which it has recently built. The photographs in this issue are of new stoves at the plant of the New Jersey Zinc Company, Palmerton, Pa.

Unions.—The Jefferson Union Company, Lexington, Mass. Circular. Describes the Jefferson style F male and female union, an illustrated description of which was printed in *The Iron Age* April 28, 1910. The special feature of this fitting is a spherical ground brass-to-iron joint in which a brass ring forms the seat or contact, thus doing away with any possibility of the union becoming corroded.

General Mill Supplies.—W. D. Allen Mfg. Company, 151 Lake street, Chicago, Ill. Catalogue No. 28. Size 6¾ x 9⅝ in.; pages 638. This is the company's 1910 catalogue, describing and illustrating the large and varied line of mill supplies which it handles. It includes all sorts of equipment for the mill, ranging from power transmission belts and pulleys to small hand grenades for extinguishing fires, and small pipe fittings. All the different pieces of equipment are illustrated and numbered to render ordering very easy. The alphabetical index of the different articles is very complete and covers 20 pages. This is supplemented by a three-page index to the figure numbers, which makes it very easy to locate any article either by name or number.

Heating System.—The Harrison Engineering Company, 42 East Twenty-third street, New York City. Bulletin No. 4. Concerned with the Harrison Aertube heating system, in which the fan system is employed. This system is said to be eminently satisfactory for large buildings because of its positive action and the ease with which the temperature and quantity of air and the point of admission are controlled. In the majority of these systems steam coils are used which require boilers, feed pumps, traps, &c., with their attendant expenses. In the Harrison system, tubular heating sections are used, the air from the fan passing through the tubes in a direction parallel to the heating surface and in a direct line with the distributing ducts. While coal is the fuel most often used in this system the heater is especially adapted for the utilization of waste heat from the exhaust of gas engines, furnaces, forges, ovens, &c. This utilization of waste heat is either independent of or in conjunction with the combustion of fuel on the heater grate, the supply there being regulated to make up a deficiency. Crude oil and producer gas are also said to give satisfactory results, the efficiency guaranteed being at least 80 per cent.

Metal Sheets.—The Stark Rolling Mill Company, Canton, Ohio. Folder. Concerned with Toncan metal sheets and roofing. These sheets combine durability, which was the one merit of the early iron sheets, with workability, the one great merit of the modern steel sheet which is used in their place. The Toncan sheets are less subject to corrosion than the former and more easily workable than the latter.

Milling Cutters.—Barber-Colman Company, Rockford, Ill. Catalogue A. Size 4⅞ x 7¾ in.; pages 63. Lists a line of cutters in a number of different styles and sizes for various purposes. These include plain milling cutters, milling cutters with nicked teeth, which are especially desirable for heavy milling, as the nicking breaks up the chips and permits a heavier cut than could otherwise be taken; side milling cutters, both plain and interlocking; straight, spiral and shell end mills; T-slot cutters, metal slitting saws, screw slotters and angular cutters. This comprises a portion of the regular line manufactured by the company and in addition special types of formed cutters can be made either from drawings submitted by the customer or a model can be designed by the firm to meet the requirements of the case.

Fillets.—The Benskin Mfg. Company, Canton, Ohio. Several circulars. Treat of the Perfect leather and wood fillet, which is made in a number of different sizes. Other foundry supplies, such as letters for patterns, dowel pins of wood and brass, and rapping plates are also covered.

Fuel Economizers.—The Green Fuel Economizer Company, Matteawan, N. Y. Bulletin No. 131, entitled "Heat Economy in Paper Mills." Contains a discussion of the most economical methods of utilizing heat in paper mills, and points out that contrary to the usual custom of using high pressure engines in order to have exhaust steam available it is possible to obtain better plant economy by using high efficiency condensing engines or turbines and heating the water necessary in the mill by a fuel economizer. The results of a number of tests in paper mills are given, where it is shown that an economizer can be used either to heat the boiler feed water alone or for heating the other water necessary about the plant and obtain a substantial fuel economy in either case. Photographs of a number of recent installations are shown, together with typical layouts of economizers in paper mills.

Firebrick Shapes.—Boulter Mfg. Company, 234 North Twenty-third street, Philadelphia, Pa. Circulars. Deal with a line of firebrick parts for electric, combustion, gas, oil and coal furnaces. These include bricks, stoppers, saggers, disks, tiles, slides, tubes and supports in all the regular sizes. One of the specialties of this company is its line of muffles, which includes four different shapes open at one or both ends in a great range of widths, hights and lengths. In addition to all the standard sizes of furnace parts and muffles, the company is prepared to manufacture special sizes and shapes.

Dredges.—The Bellefontaine Foundry & Machine Company, Bellefontaine, Ohio. Catalogue. Calls attention to a line of steam dredges, which are built in four sizes ranging from 1 to 2½ cu. yd. with either wire rope or chain for dredging and excavating. There are a number of illustrations showing the dredges in use and views of constructional details. These are followed by a general description of the machines, a partial list of users, and a table of dimensions of the different styles.

Coal Punchers.—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletin No. 5002. Relates to the new Ingersoll pick machine or puncher operated by compressed air, for undercutting in horizontal seams and pitching seams whose angle does not exceed 15 degrees from the horizontal. The advantages claimed for this machine over hand mining are a lower cost, as one machine is capable of doing the work of from six to fifteen miners; improved quality of the output, more rapid development, a reduced number of working places for the same daily output, and greater safety. The machine is described in considerable detail, supplemented by illustrations of the various parts, and there are also a number of illustrations of the puncher in use. A brief table of specifications and a list of repair parts with illustrations complete the bulletin.

Road Machinery.—Acme Road Machinery Company, Frankfort, N. Y. Catalogue. Size 6 x 9 in.; pages 136. This is the company's general catalogue describing and illustrating a line of road building machinery, contractors' and township supplies. The various machines used in the building of roads and accessories, such as wagons and plows, are all illustrated and described. In a number of cases considerable space is given to a description of the operation of the machine supplementing the description of the machine itself and in all cases a brief specification is appended.

Structural and Ornamental Ironwork.—T. H. Brooks & Co., 3104 Lakeside avenue, Cleveland, Ohio. Pamphlet. Covers a line of structural shapes, roof trusses, cast iron columns, vault lights, coal hole covers, sidewalk plates and store fronts. All of these lines are illustrated and in addition there are views of a number of buildings for which this company furnished the structural work.

Contractors' Equipment.—Walter A. Zelnicker Supply Company, Zelnicker Building, St. Louis, Mo. Circular. Lists a line of contractors' supplies, which include rails, spikes, locomotives, cars, boilers, bridges, buckets, cableways, air compressors, cranes, engines, pumps, steam shovels and a number of other pieces of equipment suitable for the use of contractors on all kinds of work.

Gas Producers.—The Forter-Miller Engineering Company, Pittsburgh, Pa. Catalogue. Concerned with a line of gas producers, which are made in a number of different types. These include the Forter-Trump mechanically operated gas producer with and without hand feed, the Forter hand-operated producers, and the Forter-Miller types of water sealed gas producers. All of these different types are illustrated and a general idea of their construction is given by sectional drawings. An illustrated description of the Forter-Trump gas producer was printed in *The Iron Age* May 26, 1910.

Couplings.—Central Tube Company, Pittsburgh, Pa. Mailing card. Refers to a line of wrought iron couplings, both black and galvanized, which are made in sizes ranging from ⅜ to 3 in. The advantages claimed for these couplings over the malleable ones generally used are greater strength, more service and lower cost.

Shafting.—The Fitzsimmons Company, Youngstown, Ohio. Price list. Concerned with the Fitzsimmons cold drawn polished Eclipse shafting, which is made in a number of sizes from 3-16 to 10 in. in diameter. In addition the firm also manufactures cold drawn steel in square, hexagonal and flat bars. The company can also furnish special grades and shapes for various purposes where they may be required and are prepared to make other sizes of rounds, squares and hexagons than those usually carried in stock.

High Speed Steel.—Lowenthal & Co., D. S. Morgan Building, Buffalo, N. Y. Booklet. Size 3½ x 6 in.; pages 16. Lists the different sizes of Elco high speed steel which it handles as sole American and Canadian representative for Vickers Sons & Maxim, Ltd., Sheffield, England. Handy high speed hints, tempering instructions, lists of extras and a table of weights of all shapes per foot are included. For ready reference several pages are devoted to the prices of the most commonly used high speed taper and straight shank twist drills.

Water Softener.—Dodge Mfg. Company, Mishawaka, Ind. Pamphlet entitled "Saving Fuel." Refers to the use of the Eureka water softener and purifier for removing scale forming impurities from boiler feed water. The operation of the apparatus is illustrated and described and a partial list of users is appended.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in round and square ..... ¢ per lb 1.90¢
1½ to 4 in x ⅜ to 1 in ..... "
1¼ to 4 in x ½ to 3-16 ..... ¢ per lb 2.10¢
Rods—¾ and 11-16 round and square ..... ¢ per lb 2.10¢

Angles:

3 in x ¼ in and larger ..... 2.10¢
3 in x 5-16 in and ⅜ in ..... 2.35¢
1½ to 2 in x ¼ in ..... 2.20¢
1¼ to 2¼ in x 3-16 in and thicker ..... 2.10¢
1 to 1¼ in x 3-16 in ..... 2.20¢
1 to 1¼ in x ¼ in ..... 2.30¢
¾ x ¾ to 1 in ..... 2.40¢
¾ x ⅜ to 1 in ..... 2.50¢
½ x ½ in ..... 2.55¢
½ x 3-32 in ..... 2.65¢

Tees:

1 in ..... 2.65¢
1¼ in ..... 2.45¢
1½ to 2 in x ¼ in ..... 2.15¢
1½ to 2½ x ⅜ to ½ in ..... 2.30¢
3 in and larger ..... 2.15¢

Beams ..... 2.10¢
Channels, 3 in and larger ..... 2.40¢
Tees and L, 3 in and larger ..... 2.30¢
Bands—1 to 6 x 5-16 to No. 8 ..... 2.15¢
"Burden's Best" Iron, base price ..... 2.15¢
Burden's "H. B. & S." Iron, base price ..... 2.95¢
Norway Bars ..... 3.50¢

Merchant Steel from Store—

per lb

Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.50@3.00¢
Best Cast Steel, base price in small lots ..... 7¢

Sheets from Store—

Black	One Pass, C R Soft Steel	R G Cleaned
	¢ per lb	
No. 16	2.90	3.00¢
Nos. 18 to 21	2.95	3.10¢
Nos. 22 and 24	3.05	3.25¢
No. 26	3.10¢	3.30¢
No. 28	3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ¢ per lb 12 @14½
Patent Planished, "W. Dewees Wood" ..... ¢ per lb A, 10¢; B, 9¢ net

Galvanized.

Nos 11 to 16 ..... ¢ per lb 3.30¢
Nos 22 to 24 ..... ¢ per lb 3.55¢
No 26 ..... ¢ per lb 3.75
No 28 ..... ¢ per lb 4.10¢

No 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos 22 and 24 ..... ¢ per lb 3.75¢
No 26 ..... ¢ per lb 3.85¢
No 28 ..... ¢ per lb 4.25¢

Corrugated Roofing—

2½ in. corrugated.

	Painted	Galvd
No. 24	¢ per 100 sq ft $3.85	$4.85
No. 26	¢ per 100 sq ft 4.00	5.00
No. 28	¢ per 100 sq ft 4.30	5.30

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IC, 14 x 20 ..... $5.35
IX, 14 x 20 ..... 7.00

A. Charcoal:
IC, 14 x 20 ..... $5.10
IX, 14 x 20 ..... 6.50

American Coke Plates—Bessemer—
IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40

American Terne Plates—
IC, 20 x 28 with ad 5 lb coating $8.70
IX, 20 x 28 with ad 8 lb coating 10.60

Seamless Brass Tubes—

List November 13, 1908 ..... Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 ..... Base price 18¢

Copper Tubes—

List November 13, 1908 ..... Base price 22¢

Brazed Brass Tubes—

List August 1, 1908 ..... 19½¢ per lb

High Brass Rods—

List August 1, 1908 ..... 14½¢ per lb

Roll and Sheet Brass—

List August 1, 1908 ..... 14½¢ per lb

Brass Wire—

List August 1, 1908 ..... 14½¢ per lb

Copper Wire—

Base Price, Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ¢ per lb 18 ¢
Sheet Copper Cold Rolled, 1¢ per lb advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 1¢ per square foot
Sheet Copper Polished over 20in wide, 2¢ per square foot
Planished Copper, 1¢ per square foot more than Polished

METALS—

Tin—

Straits Pig ..... ¢ per lb 35 @35¾¢

Copper—

Lake Ingot ..... ¢ per lb 14¾@15 ¢
Electrolytic ..... ¢ per lb 14½@14¾¢
Casting ..... ¢ per lb 14¼@14½¢

Spelter—

Western ..... ¢ per lb 6¼@6½¢

Zinc.

No. 9, base, casks ..... ¢ per lb 8¼¢ Open ..... ¢ per lb 8¼¢

Lead.

American Pig ..... ¢ per lb 5 @5¼¢
Bar ..... ¢ per lb 6¾@6¾¢

Solder.

½ & ½, guaranteed ..... ¢ per lb 22 @22½¢
No. 1 ..... ¢ per lb 19 @19¼¢
Licensed ..... ¢ per lb 17½@17¾¢
Prices of Solder indicated by private brand vary according to composition

Antimony—

Cookson ..... ¢ per lb @10¢
Hallett's ..... @10¢
Other Brands ..... @9½¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	per lb 10.75@11.00
Copper, Heavy and Wire	per lb 10.50@10.75
Copper, Light and Bottoms	per lb 9.50@ 9.75
Brass, Heavy	per lb 7.25@ 7.50
Brass, Light	per lb 5.75@ 6.00
Heavy Machine Composition	per lb 9.5 @ 9.75
Clean Brass Turnings	per lb 7.00@ 7.25
Composition Turnings	per lb 8.25@ 8.50
Lead, Heavy	per lb @ 3.50
Lead, Tea	per lb @ 3.25
Zinc Scrap	per lb @ 3.75

Nicholson Files

Sales of good files should remind you
You can all avoid a "rut" —
Just by stocking up and selling
Files like these that *always cut.*

Some Hardware merchants get in the "rut" of stocking any kind of files just because they are *cheap.* But such files don't *sell* and are "dead stock" on their shelves.

TRADE NICHOLSON MARK
U.S.A.

Nicholson File Company, Providence, R. I.

THE IRON AGE

Established 1855 — New York, August 25, 1910 — Vol. 86: No. 8

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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A Waiting Market

A More Cheerful Tone Becoming Perceptible

While actual business shows little improvement, a notably better feeling pervades the market on finished products. A more cheerful tone is perceptible in the reports received from every section. Inquiries are becoming more numerous, indicating that the usual improvement to be expected in the fall months is at hand. Specifications on contracts are good in all finished lines and special pressure is observed for deliveries of rails. Stocks of manufactured products are being reduced throughout the country and must shortly be replenished. Prices of all finished steel products are firm, except, perhaps, light sheets, even though new business is not active.

A turn for the better is manifested in structural material, both plain and fabricated. It is asserted with apparently good foundation that structural contracts cannot now be placed as low as two weeks ago and that buyers who were waiting for still lower prices have lost their opportunity for this fall at least. It is announced that bids for the Quebec Bridge, which may require 75,000 tons of steel, will be opened October 1, instead of September 1. Competition on this work will be sharp, but it is hoped that the contract will come to American manufacturers.

So far as the volume of new business is concerned, the wire trade stands first. This is the season for the sale of wire products, and the demand is excellent. Tubular goods come second best on the list. The leading interest has just taken contracts for 35 miles of 18-in., 25 miles of 20-in. and about 25 miles of 16-in. line pipe, while the general demand is excellent. The tin plate mills, with the exception of those closed by labor troubles, are running to full capacity, but largely on old orders.

Sales of pig iron have been light, but inquiries are now being received in the Pittsburgh and Chicago markets for considerable tonnages. Consumers are beginning to show more interest in covering their requirements up to the first or second quarter of next year. It is understood that the very large inquiry from a Western agricultural implement manufacturer which appeared in the market some time ago and was then withdrawn has been renewed.

Furnace companies are not disposed to sell much pig iron for forward delivery at present prices, as there is little or no margin of profit on such sales. The fact that prices are now down to cost or below it is indicated by the stubbornness shown against further recessions for the past two or three weeks. It must be admitted, however, that there seems to be faint chance of higher prices while stocks of pig iron in furnace yards continue as large as at present. The blowing out of more furnaces would certainly help the situation.

The coal situation in Illinois is beginning to cause concern among manufacturers and other industrial

buyers of Illinois coal. The mines of that State, which normally produce over 50,000,000 tons annually, have been closed since April 1 by a disagreement over coal miners' wages, and there seems to be no hope of an early settlement. Winter is approaching and the large production of Illinois will then be imperatively needed.

Iron ore shipments down the lakes are falling off still further and more vessels are being laid up because there are not enough cargoes to go round.

Scarcity of water has caused some inconvenience at Youngstown, Ohio, and for this reason reports of the closing of mills there should not be taken to mean lack of business. Cessation of operations would merely be temporary, awaiting the accumulation of a better supply.

Copper is in less active demand and prices are therefore not so strong, but efforts by buyers to shade recent quotations have not met with much success. Spelter is firmer, as producers seem to have the situation well in hand.

Tariff Agitation in Three Countries

Simultaneously, the tariff question is being brought to the front in Germany, Canada and the United States. In each country an agitation in favor of lower duties, much more pronounced than the work regularly carried on by free trade organizations, is now commanding attention. It seems but a short time since highly protective duties appeared to have been accepted as a correct national policy by the civilized world, and even Great Britain was looked upon as likely to fall in line. The nations which have revised their tariffs in recent years have not to any extent thrown open their home markets to their foreign competitors. On the contrary, care has been taken to provide even greater defense in tariff protection when an industry seemed to be in any need of it. But there has been a somewhat sudden revulsion of feeling in regard to this matter, especially in the three countries named.

The movement in Germany is characterized as a "revolt against protection," the protective policy being held responsible for the control of the leading industries by syndicates. We have large consolidations in the United States, and probably in some branches of trade we have combinations controlling output and prices, but at no time in our history were trade combinations so numerous and powerful as they have for years been in Germany. The latest returns regarding German syndicates show a total of 385, of which 19 cover the coal trade, 62 the iron and steel trades, 11 the metal industry other than iron, 46 the chemical industry and 31 the textile industry. These syndicates have exerted a powerful influence in the maintenance of domestic prices and in steadying trade by the allotment to each member of a specific share of it, but in addition they have performed a useful function in stimulating the German export trade by a system of bounties paid out of a fund provided for that purpose by each syndicate. These bounties are regulated according to the condition of trade at home and abroad, being increased when home trade falls off or foreign prices decline, but diminished when home trade is good or foreign prices rise. There are, however, numerous German industries dependent upon the syndicates for their supply of material and it is largely from these industries that the demand comes for a reduction of tariff duties. They claim that the duties enable the syndicates to raise their prices unduly, thus compelling outside industries to pay too much for materials which they use for the production of articles that must be sold at prices prevailing in the world's market. They further claim that their competitors in other countries are often the beneficiaries of the bounty system on exports which is maintained by the syndicates, thus securing German material cheaper than it can be bought in Germany and making competition in neutral markets much more severe than it would be otherwise. These smaller German manufacturers therefore assert that their condition is worse under protective duties than it would be under free trade. The Hansa League, which is working for "equal opportunities and rights for the commercial and industrial classes," is stated to be organized in 450 branches and 22 State federations and numbers among its members no less than 220 important commercial associations. The movement is thus a formidable one.

In Canada dissatisfaction with protective duties has always existed among the farmers. Agricultural associations have seldom met without adopting as part of their proceedings resolutions against bounties and the tariff on manufactured products. The Canadian Government has grown accustomed to this. But in recent years a new country has been developed in the Northwest, the population there is growing rapidly, and from that section comes a demand for lower duties which is far more insistent and aggressive than the deliverances of the agricultural associations. The people of Manitoba, Saskatchewan and Alberta have given Sir Wilfrid Laurier some uneasy experiences during his trip through those provinces when they urged him to give the country a lower tariff and to establish closer trade relations with the United States. This year they are suffering from short crops and regard high prices for manufactured articles a grievance. What they especially desire is cheaper agricultural machinery, but they would also like to get other things cheaper. The Premier declared his Government ready to enter into reciprocity with the United States in natural products. This would cover grain, fish, coal, farm products and possibly pianos and wagons. But they reminded him that the United States tariff law provides for the free admission of agricultural implements from countries granting free entry to American farm implements and urged him to take advantage of this provision. He replied that if the Americans are willing to show their good faith by agreeing that the reciprocal arrangement shall extend to parts ordered for repairs, he would gladly enter into such a compact. It is unlikely, however, that the Canadian Northwest will be appeased by this concession, if it should be secured, but will press for further tariff changes.

In this country we have the unique development of a demand for a more radical revision of duties coming from members of the political party responsible for the revision enacted into law only a year ago. The opposition party always attacks vigorously a new tariff, but this is perhaps the first instance in our history of such a demonstration by important members of the dominant party. While the demand comes mainly from the West, the movement has some influential supporters in the East. As the insurgents claim that they

are in favor of a reasonable degree of protection to American products, it would seem to be a battle over rates and not a contest as to principles.

Our Blast Furnace Capacity

The American Iron and Steel Association, in its *Bulletin* of August 15, gives most important details relative to new blast furnace construction. These statistics show the vigorous manner in which the iron trade met the demand for increased blast furnace capacity, which was such a conspicuous feature of the flush times of 1906-7. It will be recalled that the consumptive demand for pig iron was at that time so much in excess of the output of domestic blast furnaces, then running to their highest efficiency, that it was necessary to import considerable quantities of pig iron. From November 1, 1907, to June 30 of this year 35 blast furnaces, with a total annual capacity of 4,468,000 gross tons, were completed, while in that same period 12 furnaces, with a capacity of 287,000 tons, were abandoned or dismantled. This shows a net increase in capacity of 4,181,000 tons.

This tremendous addition to the blast furnace capacity of the country would certainly be more than ample for the requirements of the trade, if not another furnace was to be built for some little time. The impetus of the good times of 1906-7, however, was not exhausted by June 30 last, but at that time 16 more furnaces, with a total annual capacity of 2,083,500 tons, were in course of erection, of which two have since been blown in, having a capacity of 282,500 tons. In September three more are expected to be ready for operation, and another before the close of 1910, while the remainder of these furnaces in course of construction will be ready for operation in 1911, some of them very early in that year.

General Manager James M. Swank of the American Iron and Steel Association puts the approximate live capacity of blast furnaces, June 30 last, at 38,144,900 tons. Those which were expected to be completed in the remainder of this year are estimated to have a capacity of 728,500 tons. The approximate live capacity at the end of 1911 is placed at 40,228,400 tons.

It is difficult, indeed, to forecast the future of the American iron trade. At various times, after even short periods of depression, the consumption of pig iron in this country has advanced by leaps and bounds, surprising even the most sanguine by its tremendous gain. For instance, from 1903 to 1905 there was a gain in consumption of nearly 5,000,000 tons, the intervening year, 1904, having been a period of depression. It would seem, however, that our blast furnace capacity in 1911 will be sufficiently great to meet the requirements of the country much better than after any previous period of increased furnace construction. The highest level of consumption of pig iron ever attained in the United States was during the latter part of 1909 and early in 1910, when for a brief time the consumption appeared to be running close to the production. At that time the output of all kinds of pig iron was quite well sustained for a few months at the level of about 31,500,000 tons a year. Consideration of these figures would indicate to pig iron consumers a quite comfortable margin of furnace capacity to meet the requirements of expanding trade.

Extravagance Representing Real Loss

It is easy to throw the blame for something on the shoulders of the other man. For instance, a banker in discussing the apparent lack of capital for investment in bonds and other securities will name among the causes the general extravagance of the people, and will, perhaps, enumerate as one of the most deplorable examples of extravagance the widespread purchase of automobiles. After delivering himself in this way he will betake himself to Europe and will probably spend from $1000 to $5000 on his little summer outing.

Now, if men of this kind seriously believe that individual extravagance is much to blame for the indifferent market for bonds and other securities, they should begin with their own personal extravagances and cut them down, especially those which represent a complete loss to the country. The cost of a trip abroad is so much money absolutely withdrawn from the United States. No part of it comes back here in any way, shape or form. The abused purchaser of an automobile, however, will probably buy an American machine, which represents in its entirety money paid out to American purchasers of materials and to American labor, and, therefore, means the distribution of this money through various channels of home trade. Part of the amount represented in the purchase of an automobile must lodge somewhere along the line in the hands of a person who will save a portion of it for investment. There are certainly other methods of spending money which mean a greater loss to the country as a whole than the purchase of automobiles or other American-made luxuries.

Midsummer Canadian Pig Iron Statistics

The American Iron and Steel Association has received direct from the manufacturers statistics of the production of pig iron in Canada in the first six months of 1910.

Total Production.—The total production of all kinds of pig iron in the Dominion in the first half of 1910 amounted to 376,271 gross tons, as compared with 327,449 tons in the last half of 1909 and 349,641 tons in the first half. This is an increase of 48,822 tons as compared with the last half of 1909 and of 26,630 tons as compared with the first half. The production in the first half of 1910 was the greatest in any half year.

Classified Production.—The production of Bessemer pig iron in the first half of 1910 amounted to 129,208 tons, against 69,906 tons in the last half of 1909 and 99,639 tons in the first half of that year. The production of basic pig iron in the first half of 1910 amounted to 165,984 tons, against 192,853 tons in the last half of 1909 and 165,112 tons in the first half.

Furnaces in Blast.—On June 30, 1910, Canada had 16 completed blast furnaces, of which 12 were in blast and 4 were idle. Of this total 12 were equipped to use coke and 4 to use charcoal. In addition 3 coke furnaces were being built and 1 coke furnace had been partly erected and its construction indefinitely suspended.

New Furnaces.—The Dominion Steel Company, Sydney, Nova Scotia, is erecting a fifth blast furnace, to be 20 x 85 ft., which will probably be ready for blast in March, 1911, and will have an annual capacity of about 100,000 tons of basic and foundry pig iron. The Algoma Steel Company, Sault Ste. Marie, Ontario, expects to have its third furnace completed and ready for blast in December, 1910; it will be 21½ x 90 ft., and will have an annual capacity of about 150,-

000 tons of Bessemer and basic pig iron. The Canada Iron Corporation is adding a second blast furnace to its Midland plant, at Midland, Ontario, which will be 17¾ x 75 ft., will have an annual capacity of 90,000 tons, and is to be ready for blast this month.

Working Hours 60 Years Ago

The Schedule of Lucian Sharpe, Founder of the Brown & Sharpe Mfg. Company, When He Began Work in 1847

The schedule of working hours shown herewith was that of Lucian Sharpe, one of the founders of the Brown & Sharpe Mfg. Company, Providence, R. I., and gives the hours of labor which were required of men when he was employed by the Providence Machine Company in 1847-48. The original, in the handwriting of Mr. Sharpe, now hangs in the office of his son, the present treasurer of the company. No stronger commentary could be made of the extraordinarily rapid evolution in industrial conditions which has characterized the last 60 years.

The twentieth century employee of any machine shop would stand aghast were he asked to work such hours. Only upon a farm would they be tolerated. Not only was the average of hours of actual employment very high, but the total time consumed from the hour of beginning labor in the morning until the hour of closing at night covered practically all of each day. No period of recreation was possible. A man had little time except that required for labor and sleep. To begin work before 5 o'clock in the morning, as was the case in May, June and July, and end it at nearly 7 o'clock in the evening meant close to 14 hours, during which the workman was away from his home except during the brief intervals for meals. The only limits were the hours of daylight. Apparently, artificial illumination was practically unknown. If employed at all, it was wholly inadequate. Sanitary conditions were not good when considered by modern standards. In the winter shops were heated by wood burning stoves, and only a small proportion of the factory floor space came within the zone of comfortable warmth. Windows were small, and except during times of strongest sunlight men worked under a strain as regards their eyes. The Providence Machine Company manufactured cotton machinery, and doubtless its schedule was made to conform to that of the cotton mills. Hours of industrial employment generally were fashioned on those of the farm.

A comparison of wages is hardly possible. To-day men receive considerably more money for a shorter period of work, but the buying power of money was very different then than now, and the wants of work-

Providence Machine Company's Time Regulations.

	Bellring for work to commence	Bell rings for breakfast	Bell rings for return to work	Bell rings for dinner	Bell rings for return to work	Work ceases	No. of hours work
Jan. & Feb.	Sunrise	—	—	12.30	1.10	7.	11½ & 12
March 1st to 20th	Sunrise	7.30	8.10	12.30	1.10	7.	10½ & 11½
March 20th to Apr. 30th	Sunrise	7.	7.40	12.	12.40	Sunset	10½ & 12¾
May, June, and July	4.55	6.30	7.10	12.	12.55	6.45	12.5
Augt 1st to 15th	Sunrise	6.30	7.10	12.	12.55	6.45	12 & 11½
Augt 15th to Sept. 20th	Sunrise	7.	7.40	12.	12.55	Sunset	12 & 10½
Sept. 20th to Oct. 30th	Sunrise	7.30	8.10	12.30	1.10	7.	11.30 & 10.45
Nov. and Dec.	Sunrise	—	—	12.30	1.10	7.	11½ & 11½

Breakfast before commencing work in Nov. Dec. Jan & Feb.

men were much simpler and less expensive. Their savings brought them a much larger percentage of income. Nevertheless, the comparison is highly in favor of the employee of the present day, because, while he spends a good deal more money, he lives in far greater comfort than his predecessor of the middle of the nineteenth century. His investments may net him a smaller dividend, but he is able to do very much more for his dependents. In a vast number of cases his children are educated to be much more important factors in industry than he is, for they are given advantages of education which he did not have. From the standpoint of longevity and comfort and pleasure, the conditions surrounding his existence are immeasurably better. He shares with his employer a daily period of leisure. In many cases the hours of daylight which are his own are devoted to tilling a little farm in the country or a garden in the city. When criticism is heard of isolated cases where hours of employment are long, it is well to hark back to the time when every man worked as long as or longer than the exceptions do to-day.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug.24, 1910.	Aug.17, 1910.	July27, 1910.	Aug.25, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.00*	$16.00	$16.25	$17.25
Foundry No. 2, Southern, Cincinnati	*14.25*	14.25	14.75	16.75
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.50
Basic, delivered, eastern Pa	*15.00*	15.00	15.50	17.50
Basic, Valley furnace	*14.00*	14.00	14.50	15.25
Bessemer, Pittsburgh	*15.90*	16.15	16.40	17.40
Gray forge, Pittsburgh	*14.15*	14.25	14.40	15.65
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	24.50	24.50	24.50	24.50
Forging billets, Pittsburgh	*29.50*	30.00	30.00	28.00
Open hearth billets, Philadelphia	*27.50*	27.50	28.50	27.00
Wire rods, Pittsburgh	*28.00*	28.00	29.00	31.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**13.50**	13.50	13.00	16.00
Steel rails, melting, Philadelphia	*13.75*	13.75	14.00	17.00
Iron rails, Chicago	*16.00*	16.00	16.50	19.00
Iron rails, Philadelphia	18.00	18.00	18.00	19.75
Car wheels, Chicago	*14.50*	14.50	14.75	17.00
Car wheels, Philadelphia	*13.75*	14.00	14.00	16.00
Heavy steel scrap, Pittsburgh	**14.25**	14.25	14.00	16.75
Heavy steel scrap, Chicago	12.25	12.25	12.25	15.50
Heavy steel scrap, Philadelphia	*13.75*	13.75	14.00	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.40*	1.42½	1.42½	1.47
Common iron bars, Chicago	*1.37½*	1.40	1.40	1.40
Common iron bars, Pittsburgh	*1.45*	1.45	1.50	1.50
Steel bars, tidewater, New York	*1.56*	1.56	1.61	1.51
Steel bars, Pittsburgh	*1.40*	1.40	1.45	1.35
Tank plates, tidewater, New York	1.56	1.56	1.56	1.56
Tank plates, Pittsburgh	1.40	1.40	1.40	1.40
Beams, tidewater, New York	1.56	1.56	1.56	1.56
Beams, Pittsburgh	1.40	1.40	1.40	1.40
Angles, tidewater, New York	1.56	1.56	1.56	1.56
Angles, Pittsburgh	1.40	1.40	1.40	1.40
Skelp, grooved steel, Pittsburgh	*1.45*	1.50	1.50	1.40
Skelp, sheared steel, Pittsburgh	*1.55*	1.60	1.60	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.20*	2.20	2.25	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.65*	1.65	1.70	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	13.00	12.62½	13.50
Electrolytic copper, New York	**12.62½**	12.62½	12.50	13.25
Spelter, New York	**5.35**	5.20	5.20	5.85
Spelter, St. Louis	**5.20**	5.05	5.05	5.70
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	**4.30**	4.30	4.25	4.32½
Tin, New York	**34.50**	33.85	33.25	30.45
Antimony, Hallett, New York	*7.87½*	7.95	8.00	8.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c. plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to guage or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets: Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.15c. to 2.20c.; No. 28, 2.20c. to 2.25c.; No. 29, 2.25c. to 2.30c.; No. 30, 2.35c. to 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c.; No. 29, 3.45c. to 3.50c.; No. 30, 3.65c. to 3.70c. Painted roofing sheets, No. 28, $1.65 per square. Galvanized roofing sheets, No. 28, $3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
⅛ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43
2¼ in. and smaller, over 18 ft., 10 per cent. net extra.		
2¾ in. and larger, over 22 ft., 10 per cent. net extra.		

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, August 24, 1910.—(*By Telegraph.*)

Pig Iron.—The very low prices ruling for Bessemer and basic iron, and, in fact, all grades, have brought out considerable inquiry in the past week; at present, it is said, there are inquiries for 30,000 to 40,000 tons of Bessemer and basic iron, and also for a considerable tonnage of foundry iron. The furnaces are not willing to sell iron for extended delivery at to-day's prices, believing that later in the year and possibly within a month or two the pig iron market may improve. Stocks of pig iron in the furnace yards are very heavy and production is still heavier than consumption, so that under these conditions improvement in prices can hardly be expected in the near future. A sale of 1000 tons of standard Bessemer iron for prompt delivery was made at $15, Valley furnace, and also a sale of 1000 tons of basic at about $14, Valley, and another 1000 tons at a slightly lower price. We quote Bessemer iron at $15 to $15.25; basic, $14; Northern No. 2 foundry, $14; Northern gray forge, $13.25 to $13.35, and malleable Bessemer, $14.50, all Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—There is considerable new inquiry for billets and sheet bars, probably due partly to the lower prices that are ruling. Several sheet and tin plate plants have covered their requirements on sheet and tin bars for the balance of this year. We note a sale of 300 to 400 tons of forging billets at $29.50, Pittsburgh. We quote Bessemer billets at $24.50; Bessemer sheet bars, $25.50; open hearth billets, $25.50 to $26; open hearth sheet bars, $26.50, and forging billets, $29.50 to $30, all f.o.b. Pittsburgh, Wheeling or Youngstown districts.

(*By Mail.*)

While there is nothing tangible in the way of large contracts or increased sales on which to base the statement, the feeling in the iron market is more hopeful and prices are showing a stronger tone. The feeling is growing among the large steel interests that to yield any further in the direction of lower prices would be a mistake, and it is argued that the market is plenty low enough to warrant consumers in taking hold. A large contract for plates of desirable sizes to roll was offered to two or three of the leading plate mills at $1 a ton under the regular price, but the business was refused by all three mills. It is not believed that further reductions in prices would stimulate buying, and there is a strong feeling that the steel interests have decided to stand pat on the present market, and if business cannot be secured at to-day's prices to do without it. In the pig iron market there is no improvement to note, new inquiry being very dull, and when actual sales are made they are usually at prices that are regarded as under the regular market. It is reported that the Oliver Chilled Plow Company of South Bend, Ind., is again feeling the market for a large block of iron made up of 10,000 tons of Bessemer, 5000 tons of basic and 5000 to 5500 tons of malleable Bessemer. This concern was in the market in June for some iron, but did not buy. One or two small sales of standard Bessemer iron have been made on the basis of $15, Valley, and basic is obtainable at $14, Valley. Northern No. 2 foundry has sold for delivery over remainder of this year at $14, Valley furnace. The steel market continues quiet, with prices rather weak. A sale of 500 tons of Bessemer sheet bars was made recently by a broker at about $25, Pittsburgh, but there were some special conditions attached to the sale which account for the low price. In finished material the new bookings of the mills are light, but specifications against contracts already booked are coming in at a fairly satisfactory rate. The billet and rail sales division of the Carnegie Steel Company reports that its specifications so far this month have been larger than during the same period in July. Several of the leading pipe mills also report that actual orders sent to the mills so far this month are larger than in the same period last month. The rod, wire and nail mills of the Pittsburgh Steel Company at Monessen, Pa., which closed down about two weeks ago, are scheduled to start again on Monday, August 29. The Carnegie Steel Company has shut down eight of the 12 open hearth furnaces at its South Works at South Sharon, Pa., and also the blooming mill at the same plant. A plate mill of one of the leading interests is also closed this week for lack of orders. While the present situation in the iron trade is not satisfactory by any means, yet it is not without encouraging features, and it is believed that within a very short time, possibly shortly after September 15, there will be a much heavier buying movement. In the face of the light new buying prices are being remarkably well sustained.

Ferromanganese.—Last May and June most consumers covered their requirements in ferro for the remainder of this year, and as a result there is little or no new buying and no new inquiries are out. We quote foreign 80 per cent. ferro at $39, Baltimore, the freight rate to Pittsburgh being $1.95 a ton. On a firm offer and for large tonnage this price might possibly be shaded.

Ferrosilicon.—New inquiry is very light, most consumers having fully covered their requirements some time ago for the remainder of this year. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh, and blast furnace ferrosilicon as follows: $23 for 10 per cent., $24 for 11 per cent. and $25 for 12 per cent., f.o.b. Jisco and Ashland furnaces.

Rods.—The dull condition existing in the wire and wire nail trades is reflected in rods, new inquiry being very light, while specifications against contracts are coming in at only a fairly satisfactory rate. We quote Bessemer rods at $28 to $28.50 and open hearth and chain rods at $28.50 to $29, Pittsburgh.

Skelp.—As yet no agreement has been reached with the Sons of Vulcan on the puddling scale, this organization asking 50c. a ton more for puddling than called for in the Amalgamated scale. As a result, a number of puddling plants in the Central West are idle and there is a decided scarcity of iron plates. We quote: Grooved and skelp, 1.45c. to 1.50c.; sheared steel skelp, 1.55c. to 1.60c.; grooved iron skelp, 1.80c. to 1.85c., and sheared iron skelp, 1.90c. to 1.95c., Pittsburgh.

Muck Bar.—A number of puddling plants in the Central West are closed on account of the puddling scale of the Sons of Vulcan not having been signed, and this has caused a decided scarcity in the available supply of muck bar. We are advised that offers of as high as $29.50 to $30, Pittsburgh, have been made for high grade muck bar for prompt shipment.

Steel Rails.—For domestic use, new orders booked by the Carnegie Steel Company for standard sections have been very light; but this concern has taken some nice orders for export, and, in fact, has been receiving all this year a good deal of export tonnage in standard sections, which has served to keep the Edgar Thomson rail mills running to fuller capacity than otherwise would have been the case. New demand for light rails and specifications against contracts continues quite active. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c. and splice bars at 1.50c., at mill.

Structural Material.—The time for opening the bids on the Quebec Bridge have been extended for one month, or until October 1. There is quite a good run of small orders for structural material, but no large contracts in this district have been given out for some time. Reports that the Carnegie Steel Company would build structural mills at the Edgar-Thomson mills at Bessemer are officially denied. This concern has under way at present the building of a finishing shop for splice bars at Bessemer, and later on will build mills for the actual rolling of splice bars, this now being done at Duquesne. Possibly the Carnegie Steel Company will build a mill at Bessemer on which steel rails, sheet bars and tie plates can be rolled. There is not enough business in rails being placed to take the output of the Edgar-Thomson steel mills, and some other finishing mills will be erected at this plant, possibly next year, that will take care of the surplus output in steel. We quote beams and channels, 15-in. and under, at 1.40c. to 1.45c., Pittsburgh.

Plates.—The largest job in the market at present is the new water works for Portland, Me., bids for which are to go in by noon on September 12, and which will take about 10,000 tons of plates. There is no new buying of cars by the railroads, the only active inquiry in the market being that of the Chicago & Alton for 3000 steel cars, but it is not known now whether the order will be actually placed. The Pressed Steel Car Company is operating its steel car works at McKees Rocks and Woods Run to about full capacity, and is turning out at the two plants about 120 cars per day. This concern shipped on Monday, August 22, 133 cars and some steel under frames. General demand for plates is quiet, and several of the leading plate mills have very little work on their books, and are running one day on orders received the day before. We quote ¼-in. and heavier plates at 1.40c. in large lots and 1.45c. in small lots. It is stated that several of the smaller plate mills that make only a limited range of sizes are offering narrow plates at 1.35c., at mill.

Sheets.—The sheet market continues in very unsatisfactory condition, both as regards new demand and prices.

THE IRON AND METAL MARKETS

The trade has been expecting for some time that a new schedule of prices on a lower basis would be sent out by the leading mills, but this has not yet been done. Prices on one-pass, box annealed, black sheets are being cut $3 to $4 a ton, and on galvanized from $4 to $5 a ton. New demand is light and consumers are buying from hand to mouth to cover actual needs. Box annealed black sheets are on a basis of 2.20c. for No. 28, while No. 28 galvanized are about 3.25c., at mill, in carload and larger lots. On painted and galvanized roofing material prices are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets are printed on a previous page.

Tin Plate.—New orders being placed for tin plate are light, as this is always the dull season of the year, but the mills are booked for four or five months ahead and consumers are specifying very freely against their contracts. The output of tin plate by the American Sheet & Tin Plate Company is heavier than ever before in its history, this in spite of the fact that two of its leading plants, the La Belle at Wheeling and the Laughlin plant at Martin's Ferry, are both idle. All the leading tin plate mills are more or less behind in deliveries, and there is difficulty in finding mills that can take orders for reasonably prompt shipment. There has been a very notable increase in capacity for making tin plate in the Pittsburgh district in the past year, fully 50 or more new hot mills having been erected in this district, but in spite of this all the tin plate plants in the Pittsburgh district, with one exception, are running to full capacity and booked for some months ahead. The market is very firm, and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh. It is stated that on some small orders for tin plate for prompt shipment placed recently, 10c. to 15c. per box premium was paid.

Bars.—New demand for both iron and steel bars is relatively light, but specifications against contracts from the implement and wagon builders for steel bars are coming in freely and shipments by the mills are heavy. The puddling scale of the Sons of Vulcan, which calls for an advance of 50c. per ton over the Amalgamated scale for boiling, has not been signed, and as a result the output of iron bars in the Pittsburgh district is lighter at present than for some months. The leading steel bar mills are pretty well filled up with contracts over the next 60 days, but in iron bars the mills are not so well filled. We quote steel bars at 1.40c. in large lots and 1.45c. in small lots, while iron bars range from 1.45c. to 1.50c.. f.o.b. Pittsburgh.

Spelter.—The market is firm and slightly higher prices prevail, new demand being reported better than for some time. We quote prime grades of Western spelter at 5.15c., East St. Louis, or 5.27½c., Pittsburgh.

Hoops and Bands.—New orders being placed for both hoops and bands are relatively light, consumers pursuing the policy of buying conservatively and only in large enough quantities to cover actual needs. Specifications against contracts made prior to July 1, but which were not taken out, and also on some contracts made after July 1, are coming in at a satisfactory rate. We quote hoops at 1.50c. to 1.55c. and bands at 1.40c. to 1.45c., the latter carrying extras as per the steel bar card.

Spikes.—New demand is light, but in the past week a local spike mill has received contracts for about 3000 kegs of railroad spikes for the Chicago, Milwaukee & St. Paul and about 800 kegs for the Pan Handle railroads. We quote standard sizes of railroad spikes at 1.50c. to 1.55c., for Western shipment, and 1.55c. to 1.60c. for local trade. New demand for small railroad and boat spikes is only fair, buyers placing orders only for small lots to cover actual needs. We quote small railroad and boat spikes at 1.60c. to 1.65c.. base, in carload and larger lots.

Rivets.—New business being placed is light and nearly altogether in small lots to cover actual needs. The official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but these prices continue to be more or less shaded on desirable orders.

Shafting.—Makers report that new demand for shafting is rather light, but specifications against contracts placed by the implement trade prior to July 1 are coming in at a very satisfactory rate. Demand from automobile makers for shafting is lighter than for some time, and the mills are pretty well caught up on back deliveries. Regular discounts on shafting remain at 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—New demand for plain and barb wire and also for wire nails is reported to have been more active in the past week than for some time, and the mills regard this as a forerunner of the heavy demand expected with the opening up of fall trade. One leading plant making rods, wire and wire nails in the Pittsburgh district has been idle for several weeks, but is expected to start up in part at least on Monday, August 29. New demand for cut nails is light, buyers placing orders only in small lots to cover actual needs. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—Several of the leading pipe mills report that conditions are quite satisfactory in the lap weld sizes, but are not so good in butt weld pipe. The National Tube Company has taken contracts in the past week for 35 miles of 18-in. pipe, 25 miles of 20-in. and about 25 miles of 16-in. The Philadelphia Company is reported in the market for three miles of 8-in. On the larger sizes of pipe the mills are pretty well filled for the balance of this year, but have only a relatively small amount of tonnage on their books in the butt weld sizes. Prices on both iron and steel pipe are firm, the concessions made some time ago on iron pipe have largely disappeared owing to the scarcity, and higher prices being charged for iron plates. Discounts on both iron and steel pipe, printed on a previous page, are, we are advised, being maintained.

Boiler Tubes.—New demand for boiler tubes is light; both from the railroads and boiler shops very few new contracts for locomotives have been placed recently, while the boiler shops are short of work, and this naturally is reflected in new demand for tubes, which has been dull for some time. Discounts on boiler tubes, printed on a previous page, continue to be shaded.

Coke.—A leading blast furnace interest came into the market recently for 70,000 to 80,000 tons of furnace coke for shipment over remainder of this year, but the business has not yet been placed, except that the concern in question is reported to have closed contracts for about 20,000 tons of standard blast furnace coke for shipment in September, at $1.60 to $1.65, in net tons, f.o.b. at oven. Aside from this there are no other inquiries in the market for blast furnace coke, and new demand for foundry coke is also quiet, the foundries either being covered by contracts or buying in small lots from month to month. The output of coke in the Upper and Lower Connellsville regions last week was 367,273 tons, a falling off over the previous week of nearly 40,000 tons. There is a decided shortage of water at some of the coke plants, and this is seriously interfering with operations. We quote standard grades of Connellsville coke for prompt shipment at $1.60 to $1.65, in net tons, at oven, and $1.75 to $1.80 on contracts for remainder of this year. We quote standard grades of 72 hour foundry coke at $2.15 to $2.25 for prompt shipment and $2.25 to $2.50 on contracts. The Jamison Coal & Coke Company is going ahead in developing its coal holdings in West Virginia and will build a large number of ovens in Marion County, the new plants to be located at Farmington, Underwood and Barrackville, on the Baltimore & Ohio Railroad. This concern has 6000 acres of coal land in Westmoreland County, Pa., where it now operates 1408 ovens. It is one of the largest producers of standard grades of furnace and foundry coke in the country and is practically sold up for the balance of this year on both grades.

Iron and Steel Scrap.—The embargo on scrap routed for Monessen, Pa., is seriously affecting the market and prices on all kinds of scrap are weak, with very little material moving to consumers. About all the actual sales in scrap that are being made are by brokers to each other to cover shorts. No sales of moment have been made in this market in the past week. Dealers quote about as follows per gross ton, f.o.b. Pittsburgh:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.75 to 10.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.75 to 14.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	21.00 to 21.50
Steel car axles	19.00 to 19.50
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.50
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.50 to 7.75
Machine shop turnings	9.25 to 9.50

The Wilkoff Brothers Company, Youngstown, Ohio, dealers in iron and steel scrap of all kinds, has purchased the plant and site of the Youngstown Car Mfg. Company, at Youngstown, Ohio, and will move its yards to the new site within a month or two. At present the Wilkoff Brothers Company has no intention of doing any manufacturing, but will continue to carry on its present business of handling iron and steel scrap and metals.

THE IRON AND METAL MARKETS

Chicago

FISHER BUILDING, August 24, 1910.—(*By Telegraph*).

Conditions in the West are more favorable this week outside of the iron and steel industry than in the direct channels of the trade. Banking conditions are a little easier and the financial strain which caused more or less uneasiness during the summer appears to be wearing off. Crop advices grow better each week. A large corn crop is expected, and later reports on wheat and other crops are more favorable than the market information of two or three months ago. These favorable conditions, however, have not taken the form of any material increase in business in iron and steel. There is a better feeling in the trade and sales managers express more confidence in the future. The bar mills are receiving good specifications on yearly contracts, but new business is not so good as two or three weeks ago. Only a small amount of new structural business was booked last week. The wire trade makes about an average showing, and there is a fair run of new business in open hearth sheets. Purchases of railroad material are still on a very small scale. The coal situation is beginning to cause concern among manufacturers and other industrial buyers. The Illinois mines, which produce over 50,000,000 tons annually under normal conditions, have been closed since April 1, owing to a failure of operators and union officials to reach an agreement. Manufacturers had generally laid in good stocks of coal before the shutdown and prices did not advance until recently. Screenings for power plants now bring a premium of 50c. over the prices of a year ago, and mine run coal is now 25c. to 50c. higher, with prospects of further advances unless the Illinois mines are reopened. The prompt resumption last spring in Ohio and other States east of Illinois furnished ample supplies of coal for the summer trade, but the large production of Illinois is needed in the West during the winter.

Pig Iron.—Hopes of a buying movement have been encouraged among pig iron men by the appearance the past week of inquiries for a considerable tonnage. The Southern furnace interests in Chicago have received 12 or 15 inquiries for 1000 to 2000 tons each, deliveries generally running for the last quarter of this year and the first quarter of 1911. The Northern furnace interests have many tentative inquiries for deliveries running through the first quarter or first half. No important tonnage is reported closed for delivery running beyond the end of this year. The Northern interests are unwilling to sell at current prices for any extended shipment, and it is uncertain whether the Southern interests will take much business for extended deliveries at $11, Birmingham, except possibly on high phosphorus iron. The buyer has a considerable choice of brands at $11 for prompt shipment, but all of the old standard brands have been held at $11.50 or higher for the last quarter. A plow manufacturer at South Bend, Ind., whose inquiry in June for about 25,000 tons was withdrawn from the market at that time is now reported about to close for a large tonnage. The business is about equally divided between charcoal and coke iron, and a considerable part of the coke iron will be bought by analysis differing from regular No. 2, either Northern or Southern iron being available to meet the specifications. It is understood that anywhere from 20,000 to 50,000 tons will be purchased, the amount depending more upon price and other conditions than extended delivery, although contract deliveries until the third quarter of next year would be considered. Competition on this business will be close between Chicago, Toledo and Valley Furnaces and Southern iron. Chicago furnaces continue to hold $16 as the minimum at furnace for malleable Bessemer, or No. 2 foundry of regular grades, but it is understood that they have about 10,000 tons in their furnace stock of analysis iron on which April prices have been made in the local trade. Most of this iron is Gray Forge, which is not much in demand in the Chicago market. The following quotations are for August and September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.65 to 18.15
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The Chicago market is quiet but strong at $29 to $30, base, Chicago, for forging billets.

Rails and Track Supplies.—The trade is quiet, as Western roads will not be in the market for any large quantity of rails until they contract for next year's delivery. There are several inquiries for traction rails for delivery this fall, two of them being for 2000 tons each. Owing to the condition of the bond market construction work has not been as active on interurban railroads as it might have been the past summer, but money is becoming easier for these enterprises, and more progress may be made this fall by traction companies whose plans have been held in abeyance. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—Only a few small contracts were closed in the West last week. The American Bridge Company booked 200 tons of bridges for the Elgin, Joliet & Eastern Railroad and 100 tons of smelter construction for the Empire Zinc Company, near Denver. The McClintic-Marshall Construction Company took a 200-ton contract for a power station at Bakersfield, Cal., for the Pacific Gas & Electric Company. A building at Sacramento for the Folsom Investment Company, 100 tons, was let to the Palm Iron Works of that city. The agricultural building for the University of California, at Berkeley, Cal., 350 tons, was let to the Ralston Iron Works. Plans are being prepared in Chicago for a large furniture exchange building on the lake front south of Twenty-second street. The promoters of the enterprise claim to have made financial arrangements for a building which will require 14,000 tons of steel. A similar building promoted by other interests, which has been held in abeyance for some time, was planned to occupy the entire block west of the Board of Trade. There are reports of progress on plans for the new union depot in Chicago. The Pennsylvania Railroad interests, which control the plans of construction for a new union terminal west of the river, have begun wrecking all of the buildings on property owned by the company on the block north of Madison street on Canal street. It is understood that work on a new union depot will commence as soon as the northwestern terminal is completed this fall, as this will enable the old northwestern depot to be used for temporary accommodation of some of the roads now occupying the union station. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—It is understood that the leading interest is holding 1.58c. as the minimum for plates in this market, but outside mills have quoted 1.35c., Pittsburgh, on a limited product of narrow sizes. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The demand for blue annealed sheets is holding the Chicago market firm, especially for open hearth sheets. Prices continue weak, however, on black and galvanized sheets. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—The merchant bar trade has been quiet the past week, so far as new business is concerned, but the improvement in crop prospects is bringing out liberal specifications from the agricultural implement manufacturers. Inquiries for concrete bars have not been so active the past few days as they were a week ago. The bar iron market continues very dull, awaiting a more liberal buying policy on the part of the railroads. Buying from store is good, and the railroads are especially active in purchasing from store small lots of all grades of bars used in repair work. It is apparently the policy of the railroads just at present to pay store prices for small lots rather than to place mill orders and wait a little longer for delivery. The mills, however, are getting a fair amount of small railroad orders for immediate shipment. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—The trade is moving along quietly, with orders and specifications coming in at a daily rate just about equal to the average consumption for a year. The market is free from speculative purchases. In many cases jobbers have been disappointed because they did not have an opportunity to stock up at low prices to be followed by an advance, but this feeling is slowly wearing off. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—It is understood that the demand from the automobile trade will not be so urgent as it was last year, many of the largest concerns only contracting for about half the steel which they bought a year ago. In other directions, however, the demand for merchant steel is active, especially in the agricultural trade.

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Cast Iron Pipe.—The market is quiet and prices are quoted 50c. lower. This is the quiet season of the year in the Northern market, as buying for fall delivery is about over and it is a little early for specifications for delivery next spring. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Metals.—There has been good consumptive buying of copper the past week for September and October delivery. Published reports that consumers have bought enough to cover their requirements for two or three months are not correct as to Chicago territory, as there is still a considerable amount of business pending in the Chicago market. Tin and spelter are both higher, through speculative influence, but in these metals there is not much buying by consumers at present. Lead is quiet. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 35c.; small lots, 36c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.25c. to 5.30c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 11¾c.; red brass, 11½c.; yellow brass, 8⅞c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Old Material.—The movement of scrap in the Chicago market is extremely slow. Country dealers are not shipping and many of the railroads have been holding back their material for two or three months, so that there is not much scrap arriving for disposition. Heavy melting steel and other closely related grades of steel scrap are holding steady, but wrought and busheling scrap are quoted lower this week. There have been no consumers in the market seeking material for a long time, as buyers have had enough bargains offered them to cover their requirements and fill their yards. Dealers' stocks in Chicago are down to a minimum. One of the three largest yard stocks in Chicago was closed out last winter and other wholesale yards are carrying only the ordinary accumulation of assorted material. There are two railroad lists out this week, one from the Chicago, Burlington & Quincy, offering about 2500 tons, and one from the Illinois Central, offering about 3000 tons. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.50 to 15.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Philadelphia

PHILADELPHIA, PA., August 23, 1910.

Extreme quietness prevails in practically every branch of the trade. Buying has been confined to small lots for immediate needs, although some further inquiry, particularly in pig iron for delivery over the remainder of the year, is to be noted. No large orders have, however, been placed, and the market presents a strong waiting appearance, with prices somewhat firmer, in that sellers generally refuse to make any further concessions. A little more interest is being shown in the steel making grades of pig iron, but no important sales have been made. The finished material situation shows no particular change, buying is largely of a hand to mouth character, with occasional sales of moderate lots. While efforts to get price concessions are still being made sellers refuse to make reductions and the market presents a slightly stronger appearance. The demand for crude rolled products is dull, billets being inactive at unchanged prices. Very little movement is to be noted in old materials.

Pig Iron.—Sales have been on an extremely narrow basis, and several of the leading sellers express the belief that the week has been the dullest for many months. While there has been a fair volume of inquiry for foundry grades, running from small lots to upward of 1000 tons for prompt and the remainder of the year delivery, a good share is thought to have been largely for the purpose of testing the market, and in a number of instances, while fair sized lots are asked for, actual purchases represented but a small percentage of the original inquiry. Prices are unchanged but firmer, producers are unwilling to make further concessions, and $16, delivered, for standard brands of eastern Pennsylvania No. 2 X foundry iron represents the inside price. A differential of 25c. a ton is made on No. 2 plain. Sales, however, have been small, principally in lots running from carloads to upward of 100 tons, for near future shipment, at $16 to $16.25, delivered. Makers contend that these prices represent the bottom, and that as older orders at higher prices, which have enabled them to even up to some extent, have been worked off they would blow out their furnaces rather than take extensive orders at present prices, which taken alone would represent a direct loss. The cast iron pipe foundries in this district are still in the market for a considerable quantity of low grade iron, but as their idea of prices is about 50c. below that for forge iron, and sellers refuse to meet their views, very little business of any importance has been done. Virginia foundry grades are firm at $13.25 to $13.50, f.o.b. furnace, for No. 2 X foundry, with some producers making no variation in prices between No. 2 X and No. 2 plain. This represents $16 to $16.50, delivered in this territory, for No. 2 X, dependent on the freight rate. Further sales of low grade Virginia foundry iron are reported, one pipe interest in that territory taking, it is understood, about 4000 tons for delivery over the remainder of the year. More interest is to be noticed in the steel making grades; an Eastern melter is in the market for from 3000 to 4000 tons of low phosphorus iron. Small sales of this grade have been made at prices equal to $22.50 to $22.75, delivered in this vicinity. There has been some little inquiry for basic iron, but reported sales lack confirmation; this grade can be had for $15, delivered, Eastern mills. There has been no active demand for forge iron; small sales have been made at $15, delivered, which represents the market for that grade. The following range of prices represents the market for standard brands, for early delivery in buyers' yards, eastern Pennsylvania and nearby points.

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.75 to 16.00
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	15.00
Basic	15.00 to 15.25
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—The market is practically at a standstill. No inquiry is reported from consumers in this territory, although some small business is offered by Western buyers. Prices are entirely nominal, from $39 to $40, seaboard, being named for 80 per cent. ferromanganese.

Billets.—Consumers show little interest in the market, taking, as a rule, only small lots for early requirements. There has been no inquiry during the week for large lots nor for extended deliveries. Forging billets are a shade more active than rolling billets, and a little business for Western delivery has been booked by makers in this territory. Ordinary open hearth rolling billets are quoted at $27.50 to $28, delivered in this territory, although a concession of 50c. a ton can be had for desirable orders. Forging billets are quoted at $29.50 to $30, Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—A fair run of specifications is reported, but there has been a slight falling off in the volume of new business, and mills are not holding the average output as well as they did last month. The bulk of the sales have been in miscellaneous lots for prompt delivery, although some fair business in tank and ship plates is under consideration. Prices are somewhat firmer, 1.55c. delivered, representing the minimum for ordinary plates, although 1.60c. is sometimes obtained for small lots.

Structural Materials.—Several building propositions, under consideration in this district, are still unclosed. Some little bridge work, one requiring about 700 tons, has been taken and a new bridge proposition, requiring about 1000 tons, has come out. Some further moderate building work is also before the trade. Transactions during the week have mostly been small, with prices a shade firmer at 1.55c., minimum for plain shapes, delivered in this vicinity.

Sheets.—No variation in the demand is reported, buying continues of a small lot character, purchasers usually urging deliveries. There has been practically no demand for forward deliveries. For small lot business prices are unchanged, but could doubtless be shaded from $1 to $2 a ton

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for desirable orders. Quotations of Eastern manufacturers range as follows for prompt lots: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

Bars.—The demand is quieter and sales are principally in small quantities for early shipment. The recent quotation of 1.42½c. minimum for refined iron bars has been shaded and 1.40c., delivered in this vicinity, can be done. Other sellers, however, hold firmly at higher levels, so that 1.40c. to 1.50c., delivered, represents the full range of the market. Steel bars are moderately active at 1.55c. to 1.60c., delivered.

Coke.—Moderate sales of foundry grades for prompt and remainder of the year delivery are reported at unchanged prices. The demand, however, is not active. Furnace coke continues dull, very few sales of standard coke being made, although a sale of a moderate tonnage of second grade at $150, at ovens, is reported. Standard furnace coke is firm at $1.65 to $1.75, ovens. The following range of prices per net ton about represents the market for delivery in buyers' yards in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—While the market generally is dull, a shade more interest is shown in certain grades. Some mills are taking deliveries on old orders for heavy melting steel, placed at higher prices, but insist on the material being strictly up to grade; but dealers find it difficult to meet specifications at ruling prices. Further sales of old car wheels are reported, large lots selling down to $13.75, delivered. Buyers do not show a great deal of interest in the market, but in a number of cases take on small lots at bargain prices. Owing to the lack of transactions, quotations are practically unchanged. The following range, however, about represents the market for delivery in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia of 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	15.00 to 15.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

The No. 2 Furnace of the Warwick Iron & Steel Company, Pottstown, Pa., was banked for about a week, for repairs to the lining.

Buffalo

BUFFALO, N. Y., August 23, 1910.

Pig Iron.—The amount of new business taken during the week has been phenomenally small. Few furnaces are competing for business at the present unremunerative prices and the business offering is principally for carload lots, piecing out stock to cover temporary requirements. The only orders for larger tonnage reported was one for 1000 tons No. 2 foundry from a Connecticut company and one for 600 tons foundry irons for September and October delivery. One inquiry still under negotiation is for 1000 tons No. 2 foundry from the upper Hudson district. The demand for malleable and basic was very limited. Shipments continue to go forward in good volume on contracts, especially such as permit of Erie Canal routing. Prices are practically stationary, but are a little more firmly maintained by the principal interests. We quote as follows, f.o.b. Buffalo, for delivery during remainder of the year:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—The general situation is a little brighter with increased inquiry in most lines of finished products and all indications pointing to a good fall business. The demand for steel bars is well maintained, with 1.40c., Pittsburgh, the absolute minimum for large orders, and 1.45c. for small lots. An export order for Canada was received during the week for 1000 tons steel bars for cold drawn purposes. An inquiry is also in the market for 1000 tons Bessemer billets for Canadian export. Plates and shapes are in good demand, with many inquiries for immediate shipment for small jobs of structural work, 1.40c., Pittsburgh, being bottom for desirable orders; 1.45c. quoted on the general run of business, and 1.50c. for small miscellaneous orders. In fabricated material inquiry has improved somewhat, but prices still have a tendency toward softness. Bids are soon to be taken for the steel for two large freight houses to be erected by the New York Central Railroad at Utica, N. Y., requiring about 300 tons. Figures are also to go in next week for steel for the Buffalo Tuberculosis Hospital buildings at Perrysburg, N. Y., taking about the same quantity; bids are soon to be received for steel for the addition to the plant of the Hammersmith Paper Company, Erie, Pa., 400 tons, and for steel for the Y.M.C.A. building at the same place, 100 tons. The specifications for the St. Vincent's Hospital at Erie are to be revised and refigured. Tentative plans are being made for a new passenger station for the Lackawanna Railroad at Buffalo, which with the necessary track elevation will call for a large tonnage of steel. The Buffalo Structural Steel Company has closed contract for the fabrication and erection of the steel for the State Normal School at Oswego, 600 tons, and the Lackawanna Bridge Company, Buffalo, has taken 300 tons of bridge work for the Chestnut Ridge branch of the Central Railroad of New Jersey.

Old Material.—The market has taken on a slightly more favorable aspect, with a little more inquiry, than has been observable for a number of weeks past, especially for wrought scrap and iron axles. The taking of material on contract by the mills, while still dragging, shows a slight improvement. Prices remain practically unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.25
Old car wheels	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

A 15-mile freight belt line is to be built at Rochester, N. Y., extending from the Rush Reservoir to the State Industrial School.

Cincinnati

CINCINNATI, OHIO, August 24, 1910.—(*By Telegraph.*)

Pig Iron.—The situation appears to be clearing somewhat and most of the inquiries now coming in appear to be the forerunners of business and not merely being sent out to size up the market. Local interests are quoting on 3000 tons of gray forge iron, and there are quite a number of requests for prices on the regular foundry grades and some for the high silvery irons. The furnaces are yet very slow in soliciting for next year's delivery, and it will probably be well along in September before they get down to work and make up definite figures that will be attractive to buyers. The general day to day business is holding up fairly well, but orders booked mainly call for small tonnages. A central Ohio firm is reported to have purchased 1000 tons of No. 2 Northern foundry iron and also 500 tons each of Southern Nos. 2, 3 and 4. This was all for spot cash and prompt shipment, and it is stated concession was made in present market prices. Quoted prices remain the same, with $11.50 for Southern foundry No. 2, Birmingham, and around $11 for some of the Tennessee brands; Northern irons are quoted at $14.50 to $15, Ironton, all for shipment during the remainder of the year. There is a well founded rumor that further curtailment in production is contemplated in the near future for the Hanging Rock district. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—In the Wise County district there has been an accumulation of furnace coke stocks, and for prompt ship-

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ment the price has eased off a little. It is reported that some operations have been taken on spot business as low as $1.50. The contract price, however, is $1.70 and higher, individual conditions governing advances. New orders on foundry coke generally call for carload quantities, as most of the larger contracts have been placed. Connellsville and Pocahontas are quoted at $1.70 to $1.90 per net ton at oven. Foundry coke is being sold around the same figure in the Connellsville, Pocahontas and Wise County districts, and $2.10 to $2.15 would be the average quotable price, with some interests going as low as $2.

Finished Iron and Steel.—No change is to be noted either in prices or existing conditions. In spite of the fact that general business is reasonably good, there is very little doing in the finished material line. Structural material from warehouse is quoted at 1.90c. to 2c. and steel bars at 1.80c.

Old Material.—It is stated that railroad offerings just now are lighter than for any previous period. On account of large stocks on hand buyers are very indifferent about doing business. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Hickman, Williams & Co., pig iron and coke merchants, Cincinnati, Ohio, are distributing as a souvenir a highly finished brass desk clip, for holding correspondence or memoranda.

Cleveland

CLEVELAND, OHIO, August 23, 1910.

Iron Ore.—Some of the Lake Superior ore that has been offered for resale recently has been withdrawn from the market. Reports indicate that the owners have been unable to dispose of it. Shipments are gradually falling off, and more boats are being laid up because there are not cargoes enough to go around. With the exception of an occasional inquiry for a small lot for a mixture, the market is lifeless. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range Non-Bessemer, $4.20; Mesaba Non-Bessemer, $4.

Pig Iron.—The market in this immediate territory continues very dull. No sales of any size are reported. Local selling agencies report the receipt of some inquiries from surrounding territories for fair sized tonnages of foundry iron for delivery through the remainder of the year and the first quarter. One northern Ohio furnace that was expected to blow out September 1 will probably remain in blast a few weeks longer. Another is scheduled to go out shortly. There is no change in the price situation. No. 2 foundry is being offered at $14, Valley furnace, but some producers are refusing to quote lower than $14.25. The foundry melt appears to remain about the same as during the past few weeks. For prompt shipment and the remainder of the year we quote, delivered Cleveland, as follows:

Bessemer	$16.15
Northern foundry, No. 1	$15.25 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.15 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—The market is very quiet. There is practically no inquiry for foundry grades, consumers now being pretty generally covered by contracts. One local interest during the week closed a contract for its furnace coke requirements for September. We quote standard Connellsville furnace coke at $1.55 to $1.70 per net ton, at oven, for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 per net ton, at oven, for prompt shipment, and $2.25 to $2.50 for the last half.

Finished Iron and Steel.—The demand in finished lines continues rather light. Consumers as a rule are buying in only small lots for immediate needs, so that orders are nearly all for small tonnages. Prices are very firm at 1.40c., Pittsburgh, on steel bars, and a local inquiry for 1000 tons with immediate specifications failed to bring out a lower quotation. Less than car lots are not quoted at under 1.45c. Structural material is being firmly held at 1.40c., Pittsburgh, and that is the minimum quotation on plates, with the exception of one or two mills that make only the narrower sizes. Some plate and shape contracts have been placed for the remainder of the year at the 1.40c. price, but the mills generally are refusing to quote that price except for immediate specifications. The demand for small lots of structural material continues fairly good and some work that has been pending for some time has been placed. The contract for the new plant to be erected by the Seneca Chain Company, Kent, Ohio, requiring about 700 tons, has been awarded to the Mt. Vernon Bridge Company, Mt. Vernon, Ohio, and the contract for the structural steel work for a foundry addition to the plant of the Chandler & Price Company, Cleveland, requiring 500 tons, has been taken by the Riverside Bridge Company, Martins Ferry, Ohio. Although the plans for the 20-story building to be erected for the Dime Savings Bank in Detroit provide for Bethlehem sections, bidders are now asked to submit proposals for standard sections. About 3000 tons will be required. It is expected that proposals will be asked for shortly for the new plant of the Cleveland Electric Illuminating Company, that will require about 2500 tons. The demand for iron bars continues light and prices are weak. We quote iron bars at 1.35c. to 1.40c., at mill. The demand for sheets is inactive and lower prices are being made on galvanized. We quote No. 28 sheets at 2.20c. for black and 3.20c. to 3.25c. for galvanized. Blue annealed sheets, which until recently have remained firm at 1.75c. for No. 10, are easier and are now quoted at 1.70c., but this price can probably be shaded. Prices on steel rivets have been reduced to 1.90c., base, for structural and 2c. for boiler rivets. The market is not firm and the new quotations can probably be shaded.

Old Material.—The market continues very dull with no prospect of any change for the better in the near future. The only demand is for small odd lots, which mills are usually able to pick up at prices lower than the ruling quotations. Heavy melting steel and borings and turnings are weaker, but other quotations remain about stationary. The Nickel Plate Railroad closed August 20 on about its usual list. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, August 22, 1910.

The sentiment among pig iron buyers is much better, due to good crop reports and the curtailment of production in the South. No marked improvement in the demand is looked for in the next few weeks, owing partly to the bulk of the inquiries being for 1911 iron. The volume of business in coke is of small proportions, the large consumers having covered their requirements. An excess in receipts and shipments at St. Louis of nearly a million tons during the first six months of 1910 over those of any previous half year in the history of the city is shown by the statistics of the Merchants' Exchange. The total inbound and outbound freight handled by the railroads was 24,344,088 tons. Building in the city continues active, with a heavy demand from the Southwest for building material. Money, though in fair supply, is firm. Bank clearings in St. Louis, Kansas City and St. Joseph continue large and in excess of the same week in 1909.

Coke.—A canvass of the various sales agencies and merchant sellers disclosed that a limited business was doing in coke during the past week, particularly with the first mentioned offices, such demand as is passing being mainly of a jobbing character. Inquiries, too, were in small volume. Shipments on contract are active, however, and there were no requests for delayed delivery reported. The only large inquiry mentioned was one from a local foundry for 1000 tons, delivery over six months. During the past 30 days one merchant seller bought upward of 20,000 tons of foundry coke, and another merchant seller purchased 10,000 tons, all of which but 2000 tons has been sold, and of the sales one was 2000 tons which had not previously been reported. One office reports sale of 50 cars of Indianapolis by-product coke, shipment over a year. The tone of the market continues firm. Standard 72-hour Connellsville foundry is quoted at $2.25 per net ton, at oven, for spot to $2.35 to $2.50 for shipment over a year. Virginia is offered at $2.25

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to $2.50 for contract, f.o.b. oven. Car lot orders are 25c. per ton higher.

Pig Iron.—The unsettled feeling in pig iron continues, and the trade does not manifest much disposition to take on iron freely at the market price. It is still distinctly a buyers' market in that some furnaces do not make a firm stand to maintain the figures asked by the leading producers. A feature of the situation is the fact that an increasing disposition is becoming observable on the part of large consumers to contract for iron for the first quarter of 1911, and there is a corresponding lack of interest in the purchase of iron for delivery over the remainder of the year. In the report of inquiries received by the leading sales agencies mentioned below, it is noteworthy that more than 50 per cent. of them are for the first quarter of 1911. One office reports inquiries, mostly for No. 2 Southern foundry, aggregating 3000 to 4000 tons, with sales of 500 to 600 tons. Another broker reports various inquiries totaling 3500 tons with sales of 500 tons, mostly Southern foundry, while one of the largest commission houses sold but 200 tons. A merchant seller reports sales of 500 tons. Irregularity in price also continues to be a feature, quotations ranging from $11 to $11.50, Birmingham, covering shipment over the remainder of the year, but the higher figure is pretty firmly maintained for low phosphorus iron. Iron for shipment over the first half of 1911 is offered by two offices at $11.50, while No. 2 Southern foundry of standard quality can be bought for August and September delivery at $11, f.o.b. cars, Birmingham. Southern Ohio is quoted at $15, f.o.b. furnace, but some offers of 50c. less are understood to have been accepted.

Finished Iron and Steel.—The leading interest reports a quiet demand for standard rails, neither the steam nor electric railroads being in the market to any extent. Shipments on prior contracts are coming forward. For light rails there is a fair inquiry from coal interests. The local demand for structural material is small, and not much new business is being received from the Southwest, such inquiry as there is being for specific work. Bars are not in as good demand, the most inquiry being for steel. Consumers of bars are ordering out freely, however, on cantracts. There is only a limited business doing in track material, but large deliveries are being made on prior sales.

Old Material.—The leading dealers in scrap iron and steel state that, while the market is still dull and prices are easier on some lines, there is, in their opinion, a better feeling with large consumers, and indications are seen of a more active market obtaining in the near future. In steel scrap there is an undercurrent of strength, owing to prospective buying by rolling mill interests. There were no railroad offerings on the market last week. While still a dealers' market, prices are somewhat less of a nominal character than has been the case during the past 30 days. We quote dealers' prices as follows, per ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	15.00 to 15.50
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.75 to 13.25
No. 2 railroad wrought	11.75 to 12.25
Railway springs	11.50 to 12.00
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

The E. C. Smith Pig Iron & Coke Company, St. Louis, has been incorporated; capital stock, fully paid, $10,000; incorporators—W. W. Henderson, E. C. Smith and H. J. Marks. The offices of the company are in the Pierce Building.

The Puxico Iron Company, Puxico, Mo., has purchased the iron mines of the Big Muddy Coal & Iron Company in the Arcadia Valley and the mountains surrounding it. Between 25,000 and 26,000 acres are included in the transfer. William Chauvenit of St. Louis is reported to have been engaged to superintend the commencement of the work. More than 500,000 tons of ore lie on the dump of the old mines.

It is estimated that this city is now doing a business of upward of $12,000,000 a year in electrical supplies, which is a remarkable development for a comparatively new industry.

The Terminal Railway Association is now reconstructing the Merchants' Bridge approaches with steel and concrete, and is constructing new yards and team tracks at Tyler street. This addition will have a capacity of 400 cars daily.

The German Iron Market

BERLIN, August 12, 1910.

The situation in respect to organizing the pig iron trade has undergone a great change since last week's report. It looked then as if the new selling agency would be of only secondary importance, but within the past five days the negotiations have made such progress that the great organization of the trade may now be looked upon as practically completed. The independent furnaces at Emden and Bremen—the latter of which begins operations before the end of the year—have decided to join the movement, and to-day it was announced that the Siegerland group, with the exception of three companies, have also at last yielded to the inevitable. It is not yet stated whether an arrangement has been effected with the Luxemburg-Lorraine furnaces, but it is assumed that they will prove ready and willing to cast in their lot with the new organization. The furnaces there already have an organization of their own, and this will facilitate the making of an arrangement with them, if one has not already been made. Moreover, they are in part owned by the great companies of the Rhenish-Westphalian district, which are among the leaders in carrying through the new organization, and they are in part in the hands of families long identified with the iron trade—all circumstances favoring the conviction that these furnaces will be in the general organization. The three Siegerland furnaces that are keeping aloof are the Geisweider Eisenwerk, Charlottenhütte and Bremerhütte, about the most important furnaces there, but it is believed that the organization can get on without them. The decision of the other furnaces of that region to join was apparently adopted under practical compulsion, and a feeling of considerable embitterment is reported as existing among them.

While the new organization was intended to be only a selling agency at the time when it was formed, about a fortnight ago, it seems now to be regarded as practically certain that it will take the form of a syndicate, which means in German usage a considerably more compact and efficient organization than a mere association with a common selling agency. As to the amount of the pig iron product of the country to be covered by its operations, this will be relatively small in view of the fact that the great mixed producers smelt chiefly for their own consumption, and this iron is not included in their allotments. Thus the allotments in the new syndicate will hardly exceed 2,000,000 tons, whereas the make of pig in Germany this year will exceed 13,000,000 tons. It is feared that even so the allotments will be too heavy for the demands of the open market. The new organization has not yet given out a complete list of the allotments, and the price schedule will not be arranged for another week or two. It is believed that it will adopt a higher scale than the prices now ruling, but it will evidently attempt no considerable advance, since English furnaces would at once take advantage of such a change to ship large quantities of iron into Germany. It is noted with some concern that a Glasgow house has just established a selling agency at Duisburg on the Rhine, evidently with the intention of taking advantage of the new situation here.

Increased Demand for Pig Iron

The prospect that the syndicate would soon be a fixed fact has called forth a marked increase in the demand for pig iron. Some of the market reports state that the furnaces have been literally flooded with inquiries for iron for 1911 delivery. On the lower Rhine and in the Siegen region, however, producers are refusing to take orders so far ahead, in view of the uncertainties of the price situation. In the Luxemburg district, on the other hand, there has been considerable selling for 1911; one great company is mentioned which sold so heavily that it has now suspended further selling in order not to be oversold. The open market for pig remains weak despite this increased demand. On the Düsseldorf Exchange a week ago most grades of German iron were about 1 mark cheaper, and English iron was also lower. Heavy plates were partly lower also, but boiler plates and thinner qualities were higher, corresponding to the advance made by manufacturers as mentioned in last week's letter. The production of pig keeps up well; it reached 1,228,300 tons in July, as against 1,219,000 tons in June. The imports of foreign ores in July amounted to only 348,600 tons, as compared with 873,400 tons in July, 1909; but the decline is probably due to the extraordinarily heavy movement in June. It is announced that Krupp will erect another furnace at the Rheinhausen establishment, making the ninth furnace operated by that company.

The bar iron trade has grown more active since the

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association was renewed several weeks ago, and prices are also held more firmly by the few outsiders which had been making trouble. The chief of these latter, the Hoesch Company, has signed the new agreement and has stopped its cheap selling, and to-day it is announced that another of the chief independents has joined. In September the association is to meet to adopt the 1911 prices, but it is hardly expected that a change will be made. The wire association will meet next week to take action with regard to sales for the fourth quarter. It is reported that business in this specialty shows signs of improvement.

The shipments of steel rails, structural goods and billet materials by the Steel Syndicate in July amounted to 391,000 tons, against 448,000 tons in June; but July is usually a rather slack month. Germany's exports of steel rails this year show a big gain, whereas the exports from England, as given in the German press, have been considerably reduced.

The stock markets have shown a strong tendency for iron shares for a week or more. The market has been influenced by the prospects for organizing the pig iron trade, but particularly by increased dividends just announced by several companies. Hoesch pays 18 per cent., against 14 per cent.; Deutsch-Luxemburg, 11 per cent., against 10 per cent.; Vereinigte Stahlwerke van der Zypen und Wissener Eisenhütten, 10 per cent., against 7½ per cent., and Dortmunder Union, 3 per cent., against 2 per cent. (on its common stock).

German locomotive shops have just received orders for 50 locomotives from French railroads, and it has been announced this week that the Rumanian Government will order 86, dividing them equally between German and Belgian shops.

The capital of the Deutsch-Luxemburg Company, after the absorption of the Dortmunder Union, as described in last week's report, will be greater than at first supposed. The increase will be $8,700,000, bringing its total capital up to $23,800,000. A part of this is for acquiring the stock of a coal company.

Birmingham

BIRMINGHAM, ALA., August 22, 1910.

Pig Iron.—Considerable improvement has been noted in inquiries and, with the tonnage actually sold fairly attractive, the market now has a decidedly stronger tone. No concessions were made by the producing interests as an incentive for the partial reaction, and it is generally conceded that foundry trades have improved and founders' requirements become urgent. Of the sales known to have been made during the past week a lot of 1000 tons for shipment covering the remainder of this year is most significant. This tonnage was sold at $12, Birmingham, for strictly No. 2 foundry, and without any conditions to make the transaction other than regular. An aggregate of 900 tons for shipment commencing immediately and extending through September is reported sold at $11.50 for No. 2. A lot of 500 tons of No. 2 foundry also is reported sold at $11.50, but in this case it is understood that shipments are to cover the remainder of this year. Comparatively small lots of No. 4 foundry and gray forge for spot shipment have recently sold at a basis of $12 for No. 2, but, on the other hand, lots of 100 tons of No. 3 foundry for comparatively early delivery are available at the $11.50, Birmingham, basis. High manganese iron has within the week brought $12.50 for deliveries to cover September and October, and shipments further advanced are quoted with some reluctance. A very encouraging feature just at this time is the fact that in many cases shipments that have been deferred from time to time are being ordered out, and that all resale iron has practically disappeared. Of course there is considerable tonnage still in warrant yards, but there is no apparent eagerness to dispose of such holdings, and no interference in market conditions is anticipated from that direction while prices remain as at present. There has been an addition to the output by the blowing in of one furnace in the past week. However, in some cases furnace yards are practically depleted of stocks, and it is understood on good authority that one furnace will be blown out for relining in the next 30 days and that a further reduction in the output will be made for other reasons.

Cast Iron Pipe.—The general condition of this market has improved, in line with the improvement noted in other markets, but no specific information as to lettings other than have been previously mentioned is available. All local plants continue to operate to capacity, and in some cases certain sizes are being stocked in anticipation of contracts reasonably expected to materialize in a short time. The business actually placed in the past week is of fair volume and prices are about last published. Cast iron soil pipe plants are more active, and that material is being moved satisfactorily. We quote water pipe as follows, per net ton, f.o.b. here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12 in., average, $20.50, with $1 per ton extra for gas pipe.

Old Material.—The announcement of a resumption of operations at the plant of the Southern Iron & Steel Company on or about September 15 is the most encouraging feature in this market. The aggregate of consumption by local plants is at this time greater than for some time past, and for certain grades much better prices are being received. A revision in quotations has recently been made by dealers, but in the main quotations are nominal, and prices actually obtainable depend largely upon the nature of the inquiry. We quote revised asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

New York

NEW YORK, August 24, 1910.

Pig Iron.—The week has been decidedly quiet, transactions having been limited to small quantities. Inquiries have not been of a character to indicate any early buying of moment. A malleable manufacturer is inquiring for 1500 tons of malleable Bessemer, and some low phosphorus is under consideration, but the inquiries from the general foundry trade are few and small. As far as can be ascertained, no pig iron has been bought in this market by the cast iron pipe interests, although it is reported that purchases have been made in other sections. Some interruption to the movement Eastward of pig iron from Buffalo has occurred through the difficulty in securing freight room on Erie Canal boats because of the heavy grain movement, which is more attractive business to the boatmen. Prices are a shade lower, but not quotably different from those given last week. Northern foundry iron at tidewater is, therefore, continued as follows: No. 1, $16 to $16.25; No. 2 X, $15.50 to $16; No. 2 plain, $15.25 to $15.50. On Southern iron quotations are $15.75 to $16 for No. 1 and $15.25 to $15.75 for No. 2.

Steel Rails.—Rail orders continue light, the only transactions of any size reported for the week being 2200 tons of Bessemer and 650 tons of open hearth rails, taken by the leading interest. The pressure for deliveries on contracts is very strong.

Finished Iron and Steel.—In all lines the new business taken continues to be very light, but to some there is evident a slight increase in the volume of inquiries. It is believed now by many that the tide has turned, judged more by sentiment than by actual results so far in the shape of increased business, and gradual improvement is looked for from now on. Undoubtedly it will be several weeks at least before anything like the activity of last spring is again experienced. With the railroads practically out of the market and speculative building no longer in evidence the structural material interests are especially dull. Competition appears to be a little less keen, however, for such business as offers, indicating that prices have reached the minimum at which work can be taken without a loss under present conditions. Plates show little movement, particularly in the East, and steel bar deliveries are steadily improving. Three to four weeks is named for all but the smaller sizes, deliveries on which vary from 6 to 12 weeks. The bar iron business taken is quite satisfactory for the season in all respects except price. Large contracts and inquiries are scarce, but among the more important for structural work are the following: An apartment house on Ninety-eighth street, New York City, 1100 tons, taken by Ravitch Bros.; the Horton ice cream factory, 300 tons, taken by Alfred E. Norton; the Bryon Building, Duane street, 800 tons, taken by Levering & Garrigues, and 500 tons of reinforcing material for the elevated railroad structure of the Brooklyn Rapid Transit Company, taken by the American Bridge Company. For a power house at Montreal to be erected by J. G. White & Co. for the Canadian Power Company, the Structural Iron Company of Montreal will furnish 300 tons of structural material. Very little railroad work is coming out other than the usual small bridge orders that are continually being inquired for. The Central Railroad of New Jersey and the New York, New Haven & Hartford have a few such inquiries out, but practically the only important railroad work pending is that for track elevation work at Chicago for the Pennsylvania Lines West; on 900 tons of this no decision has been reached and 700 tons is still to be bid on. The Boston & Maine has let two bridges, 175 tons, to the New England Structural Company. There is no decision on the Sloan warehouse and nothing new has developed with regard to the New York Subway work, the New York Central terminal work or the Quebec bridge. Prices

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are firm on structural material, plates and steel bars all at 1.56c. to 1.61c. and bar iron at 1.45c. to 1.50c., all New York.

Ferroalloys.—Very little interest is being taken in ferromanganese, and those who have it on hand do not show any anxiety to sell at the existing low price. The usual quotation is $39 to $39.50, seaboard. There is a good demand for ferrosilicon, and a sale of 100 tons was made in this market during the week at about $56, seaboard.

Cast Iron Pipe.—The Department of Water Supply, Gas and Electricity of the city of New York will open bids to-day on a cast iron pipe laying job in the Borough of Richmond (Staten Island), involving the purchase of 5000 tons of 6 to 24 in. pipe and 200 tons of special castings; also for a straight purchase of 900 tons of water pipe for the Borough of Manhattan. Chambersburg, Pa., will open bids August 30 for 11 miles of pipe, which is to be either 14 or 16 in. A little more interest is manifested by the general trade, so that business shows rather more life. Carload lots of 6 in. are quoted at $23.50 to $24, per net ton, tidewater.

Old Material.—Dealers are feeling somewhat better, not because business has improved to any extent, but inquiries are coming in somewhat more freely and consumers, therefore, appear to be inclined to take more interest in the market. Holders are not expressing much uneasiness and are not disposed to press sales, believing that every day now brings a buying period closer. In cast scrap a little more business is being done, with a better run of inquiries. Cast borings are not so strong as they have been, as the special demand for this class of material appears to have been satisfied. Rolling mills are almost completely out of the market. Some inquiry has developed for heavy melting steel scrap, but no business of moment is reported. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	11.00 to 11.25
Heavy melting steel scrap	11.00 to 11.25
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	7.00 to 7.50
Wrought pipe	11.50 to 12.00
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, August 24, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper, Lake.	Copper, Electrolytic.	Copper, Tin.	Lead, New York.	Lead, St. Louis.	Spelter, New York.	Spelter, St. Louis.
August. 18	13.00	12.62½	32.75	4.40	4.30	5.25	5.10
19	13.00	12.62½	32.85	4.40	4.30	5.30	5.15
20	13.00	12.62½	....	4.40	4.30	5.30	5.15
22	13.00	12.62½	34.15	4.40	4.30	5.35	5.20
23	13.00	12.62½	34.55	4.40	4.30	5.35	5.20
24	13.00	12.62½	34.50	4.40	4.30	5.35	5.20

The pig tin market is attracting attention. London prices have advanced sharply as the result of a well organized corner there, and the New York market, as stocks are not plentiful, has followed suit. Copper is less active and prices are not so strong. Lead is firm, but in little demand. Spelter has advanced slightly. Antimony is cheaper.

Copper.—There is a higher speculative market in copper in London, as it is generally reported that production has been reduced 15 per cent. at least, but this is having a surprisingly small effect on the domestic market, as exports are light and prices here have, if anything, softened. One prominent selling interest is quoting lake copper at 12.87½c., but all other sellers of lake are demanding 13c. As the demand is rather quiet it is probable that a noticeable increase in inquiries would induce the interest in question to advance its quotations to the usually accepted market figure. One prominent dealer in electrolytic copper tried this week to place an order for that grade at a figure under 12.62½c., but was unsuccessful. This would make it appear that the slight weakness shown in the market is in tone only, as there is no pressure to sell at anything less than the prices which prevailed a week ago, which are 13c. for lake and 13.62½c. for electrolytic. The exports of copper so far this month have ammounted to 20,041 tons. In the London market today spot copper closed at £55 6s. 3d. and futures at £56 2s. 6d. The sales amounted to 500 tons of spot and 600 tons of futures.

Pig Tin.—Prices have advanced rapidly in the London market during the last week, as a result of what appears to be a successful corner operated by prominent interests in that market inclined toward speculation. The New York market has not followed the London market so closely, as in London there was an advance of £3 2s. 6d. within a period of two days, while in this market the advances were more conservative, amounting in all to an increase in price of about 65 points. Stocks of pig tin in this country are pretty well concentrated, and as the consumption just now is especially good it is thought in some quarters that the advance here is warranted. In other words, there are many people who seem to consider the prevailing price a fair quotation for spot tin, when it is taken into consideration that there is just about enough tin on hand for early delivery to take care of current consumption. There has been some good trading this week, and a fair part of the business done was with consumers who were in early need of the metal. The arrivals of tin so far this month have been 4070 tons, and there are 1715 tons afloat. In the New York market this afternoon pig tin sold for 34.50c. The London market closed with spot tin selling at £157 7s. 6d. and futures at £156 2s. 6d. The sales amounted to 150 tons of spot and 290 tons of futures. The market was steady.

Tin Plates.—The tin plate market is unchanged. The demand is fair and the prices in New York for 100-lb. coke plates is $3.84.

Lead.—Lead is quiet, but prices are being well maintained. In this market the leading interest seems to have controlled the situation of late, as far as supplying the wants of consumers is concerned, and is keeping its New York quotations relatively lower than at other points. In other words, lead can be had in New York for 4.40c., while in St. Louis, where the price is usually 15 points less than in New York, 4.30c. is asked. This condition exists in other quarters where the leading interest and outside sellers are offering the metal at comparatively higher quotations than prevail in New York. As the matter stands now, outside sellers do not care much about entering into competition with those in control of the New York market, and consequently they are demanding as high as 4.45c.

Spelter.—A decided improvement is shown in the spelter market, and it seems apparent that the producers will be successful in their decision to hold their supplies and wait for an improvement in business rather than to sell at a low price. The producers firmly declare that they would have no profit if they accepted anything less than the prevailing quotation for their stock, and claim that at times when the market has been below 5c. at St. Louis the metal has been sold at an actual loss to the producers. They all seem to be of the same opinion on the subject, and while consumers are buying the metal sparingly and only when they are actually obliged to, the market has advanced 15 points within a week and is very firm. The United States Steel Corporation is reported to have bought spelter rather heavily both here and in St. Louis during the last two weeks, and there is an increased demand from other galvanizing interests. Taken altogether, however, it is largely a hand to mouth market, but it is very evident that consumers' stocks are decidedly low. Spelter is now bringing 5.35c. in New York and 5.20c. at St. Louis.

Antimony.—Consumers are taking no interest in antimony, and prices have weakened again. Cookson's is being offered at 8.15c. and Hallett's can be had at 7.87½c. Chinese grades are being offered at 7.40c. to 7.50c., and Hungarian antimony can be had as low as 7.25c.

Old Metals.—The market is steady, with dealers' selling prices unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.75 to 9.00
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.50 to 9.75
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, St. Louis, August 22.—Lead is steady at 4.25c. to 4.30c.; spelter is firmer at 5.15c. to 5.20c., East St. Louis. Zinc ore is higher and quoted at $39 to $40 per ton, Joplin, base. Tin is quoted at 34.85c. per pound; antimony, 8.50c.; lake copper, 13.15c.; electrolytic, 13c., all at St. Louis. The demand for finished metals was better last week than for the previous week.

The total imports into the United States during the first full year under the new tariff law—12 months ending August 1, 1910—are shown by Bureau of Statistics figures to aggregate $1,562,621,181, of which 49.15 per cent. entered free of duty. The importations were larger than in any previous year.

The Machinery Markets

Business has picked up noticeably in the machinery trade in many sections of the country. Regardless of the recent heavy cancellations on the part of automobile manufacturers and makers of automobile supplies, there is a renewed demand from that source. Some good inquiries are before the trade in the New York market from two large magneto manufacturers, and automobile interests have been generous buyers in the Manhattan territory of late. In New England the automobile industries are sending in occasional orders for tools, and automobile manufacturers in that territory are going ahead with improvements and extensions. Inquiries have increased in the Pittsburgh market and there is a good scattered buying from the outside district. In Chicago the trade is still awaiting action on the part of the railroads in closing out lists recently issued, and there are some good railroad inquiries out in New York. Shops are very busy in Milwaukee, but the work there is mostly on old orders. In the Southwest municipal enterprises are attracting attention, and orders for equipment from city light and power plants are supporting the market. There is a diversified demand for machinery on the north Pacific coast, which is taken as an indication that the general trade there is picking up. Increased business is noticed in San Francisco, where business has suffered recently from labor troubles.

New York

NEW YORK, August 24, 1910.

Business in the New York market is somewhat intermittent. Houses that were doing very little business three weeks ago are now getting plenty of orders, while other machinery selling firms find that both business and orders have fallen off. The inquiries before the trade just now come chiefly from the general manufacturing field and no one industry seems to be booming. Automobile manufacturers have been good customers in the New York market of late, however. The Fiat Automobile Company has placed some good orders for its new plant at Poughkeepsie, and the Gun Motor Car Company, Utica, N. Y., has completed purchasing a full line of manufacturing equipment for its new plant. Some very good business is promised from automobile supply manufacturers. The Simms Magneto Company, 1780 Broadway, New York, is preparing to build a large plant in the vicinity of New York, and the company now has inquiries out covering a general line of tools and other machinery equipment which indicate that it will be a heavy purchaser before many weeks. The Bosch Magneto Company, 223 West Forty-sixth street, is preparing to build a large plant at Springfield, Mass., and work on the structure will be begun in about 15 days. Machinery men are following the movements of this company very closely, and they have been informed that purchasing against the machine tool list will be begun within the next 30 days. There are some branches of the machinery trade that are inactive, and one of these is that for the manufacture of coal handling and conveying equipment. Manufacturers of steel plant equipment are not getting much in the way of new business just now, but they are still busy in filling orders which were placed around the first of the year, when the steel plants were generous buyers in the machinery market.

Another automobile project that will call for some good expenditures for machine tools is that of the Mercedes Company, which has headquarters in the Times Building. This firm intends to build a two-story brick structure, 100 x 140 ft., at Long Island City, which will be used exclusively for the manufacture of motor trucks. William Lutgens, who is connected with the Mercedes people, has charge of the preparation of the machine tool list.

A fire, covering an entire block, which destroyed several factories, included the plant of W. Ames & Co., 312 Washington street, Jersey City, N. J., August 17, and the company's rolling mill was damaged perhaps beyond repair. Fortunately, the company's new works on Communipaw avenue, for which equipment was recently purchased, will be ready for occupancy within a month. It was intended to move some of the equipment from the old plant, and it is probable that machinery that was damaged will have to be replaced. The plants of Truslow & Fulle, cork manufacturers, the Riegal Sack Company and the Independent Baking Powder Company were totally destroyed in the fire.

A combination of all of the principal companies in Canada manufacturing light woodworking machinery and tools has been effected by the formation of the Canada Machinery Corporation, Ltd., with headquarters at Galt, Ont. The organization assumes control of the plants of the MacGregor, Gourlay Company, Ltd., Galt, Ont.; John Ballatine & Co., Ltd., Preston, Ont.; the Hespeller Machinery Company, Ltd., Hespeller, Ont., and the woodworking departments of the Goldie & McCulloch Company, Ltd., Galt, Ont., and the Sussex Mfg. Company, Ltd., Sussex, N. B.

The Crocker-Wheeler Company, Ampere, N. J., recently received a large number of orders, among which may be mentioned the following: Two 600-kw. direct current turbo type generators for the Iroquois Iron Company, Chicago, Ill.; these machines will be driven by DeLaval turbines; one 500-kw. synchronous motor generator set for the Tennessee Coal, Iron & Railroad Company, Ensley, Ala.; one 750-kw. direct current generator for the Superior Steel Company, Pittsburgh, Pa.; 3460 hp. in direct current rolling mill motors for the American Sheet & Tin Plate Company, Muncie, Ind.; 235-hp. form W direct current motors for crane service in the Central Furnace plant of the American Steel & Wire Company, Cleveland, Ohio, and one 375-hp. D. C. motor to drive an Ingersoll air compressor in the works of the Bethlehem Steel Company, Bethlehem, Pa.

An addition is to be made to the plant of Tiffany & Co. at Avenue C and Parkhurst street, Newark, N. J., which will consist of two one-story brick buildings to accommodate additional engine and boilers.

Deere & Co., manufacturers of plows, harrows, &c., Moline, Ill., have decided to locate their Canadian branch plant at Welland, Ont., where exceptional railroad and water shipping facilities and cheap Niagara power will be obtained. The site selected is along the east side of the Welland Canal south of the Page-Hersee Tube Works. It is stated that the plant will cost approximately $1,000,000 and employ 1500 hands.

The United Motors Company, Ltd., a recently organized Canadian company, capital stock $200,000, will build a plant at Welland, Ont., on a 5-acre site at the southeast corner of the Crossing of the Michigan Central and Grand Trunk railroads. The new company, which is headed by Frederick Sager of Detroit, who has been connected with the E. M. F. Company of that city, expects to have the plant in readiness for the manufacture of motor cars before the end of the year.

The General Chemical Company is building a two-story steel and brick addition to its Buffalo plant at Abbott road and the Buffalo Creek Terminal Railroad.

The Oliver Chilled Plow Works of South Bend, Ind., has commenced construction work upon its Canadian plant at Hamilton, Ont., which will comprise 15 or more buildings, including foundries and machine shops, forge and blacksmith shops, woodworking and paint shops, power house, warehouses and an office building, also a concrete dock 100 x 800 ft. The plans for the plant were prepared by Prack & Perrin, architects and engineers, Berger Building, Pittsburgh, Pa.

The Laidlaw-Dunn-Gordon Company, 115 Broadway, New York, has been awarded contract for furnishing and erecting a 2,000,000 gal. cross compound crank and flywheel Corliss condensing pumping engine for the water works at Perry, N. Y.

The United Construction Company of Albany was low bidder at $94,700 for constructing the steel bridge over the Oswego River at Bridge street, Oswego, N. Y.

An addition is being made to the blacksmith and machine shop of the Atlas Works of the Standard Oil Company, Elk street and the Buffalo Creek Railroad, Buffalo, N. Y.

The Hamilton Tube Company has purchased the concrete factory building, corner Patterson avenue and Major street, Welland, Ont., and is equipping it for operation.

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The Skinner Engine Works, Erie, Pa., is letting contracts for a foundry building, 63 x 100 ft., and a storehouse and shipping building, 20 x 200 ft.

The Village Trustees, Rockville Centre, N. Y., are receiving bids for a 1,000,000-gal. pump to be installed at the pumping station, to be operated either by steam or electricity.

The Nearsteel Company, Jersey City, N. J., has installed a No. 66 Newton patent cupola in connection with the remodeling of the plant which it is occupying.

The William Harris Heating Company has purchased the old plant of the Niagara Falls Heating Company, Niagara Falls, N. Y., and will remodel, enlarge and equip it with new machinery.

Chicago

CHICAGO, ILL., August 23, 1910.

Midsummer dullness continues in the Chicago machinery market. There are scattering inquiries and occasional sales, but Chicago dealers do not expect much activity in the market until general trade picks up in the fall. Owing to the suspension of purchases by the railroads there is a steady accumulation of pending or prospective railroad business, which will undoubtedly prove a very important factor in the trade some time this fall or early in the winter. Several large lists which have been issued in the past six or eight months are awaiting definite action, and in at least two other cases the data is being compiled by railroad officials for large lists for new shops. A committee of experts from the mechanical department of the Chicago, Burlington & Quincy has been visiting dealers and manufacturers to make selections of tools for the new shops at Havelock, Neb. These shops are now completed and the cranes and other heavy equipment have been purchased. Machinery men who have entertained the Burlington committee have been somewhat surprised that the members of the committee prefer water as a beverage, an incident which is significant of the great change that has taken place in recent years in the personnel of the men who control the purchasing business of railroads.

Relocation of the Chicago Machinery Center

Locally the summer has witnessed an important event in the Chicago machinery market. All of the houses that formerly were located in the block on Canal street from Madison street to Washington street have been compelled to move, and most of them have located on Jefferson street, two blocks west. The property on Canal street between Madison and Washington has all been acquired by the Pennsylvania Railroad, excepting one lot and building at the north end of the block, which is involved in a tangle of litigation. The Pennsylvania people are wrecking the buildings on the entire block which they control, but the machinery men have not been able to learn whether the property will be used as a part of a new union depot or whether it will be occupied as an affice building or for some other purpose. The block extends directly north from the old union depot and is opposite the new Chicago & Northwestern depot.

Jefferson street by this change will become the center of the machinery market, although several companies have found new locations on South Clinton street. The new building of the Marshall & Huschart Machinery Company, which has been mentioned in this correspondence, is on the west side of Jefferson street just south of Madison. North of Madison street is a new row of machinery houses with enameled brick and glass fronts.

The Cleveland Twist Drill Company's Chicago branch was moved May 1 from 29 North Canal street to a new building at 9 North Jefferson street.

The Norton Company, formerly at 27 North Canal, also moved May 1 to a new building at 11 North Jefferson street.

The Chicago Pulley & Shafting Company, formerly at 21 North Canal street, is now at 32-34 South Clinton street.

The Reeves Pulley Company, formerly at 7 North Canal street, moved about a year ago to 39 South Clinton street.

Fitz Simons & Co. and the Morris & Bailey Steel Company, whose Chicago branches were formerly at 11 North Canal street, are now at 21 South Clinton street.

The Adkins, Young & Allen Company, formerly at 23 North Canal street, has found new quarters a block north at 109 North Canal street.

The Machinists' Supply Company, formerly at 119 and 121 North Canal street, was not forced to move immediately by railroad operations, but as its lease expired next May it was decided that the company would erect a new building of its own at 19-21 North Jefferson street. This building, which is 40 x 150 ft., with three floors and a basement, is now occupied by the company, although the interior installation is not completed. It is a handsome building with steel shelving on all three floors.

The L. S. Starrett Company, formerly at 427 West Randolph street, has been attracted to the new center, and has located in a new building at 17 North Jefferson street.

The Charles G. Stevens Company, which has been located at 17-19 North Canal street, has been erecting a new six-story building at the corner of Jefferson and Monroe streets, and although the new building is not completed the company is moving its stock in order to vacate its old quarters.

The Union Drawn Steel Company's Chicago branch, 17-19 North Canal street, will have new quarters in the Stevens Building.

The Joseph H. Whitehead Company, machinists' supplies, formerly located at 107 North Canal street, is now occupying quarters at 12-14 North Jefferson street, where it moved during the month of March.

The Steam Power Devices Company, Chicago, has been incorporated with a capital stock of $6000 to do a general machinery business. The incorporators are Harvey L. Hanson, Leonard W. Novander and Arthur H. Boettcher.

The City Council of Moline, Ill., has directed the fire and water commissioners to advertise for bids for a 6,000,000-gal. pump.

The Hess & Hopkins Company, Rockford, Ill., has increased its capital stock from $50,000 to $500,000, and is preparing to enlarge its plant.

The People's Gas Light & Coke Company, Chicago, is receiving bids for the construction of a gas pump plant to be erected at a cost of $150,000.

The Crown Stove Works, Chicago, whose plant is located at 4631 West Thirtieth street, has been incorporated with a capital stock of $60,000. The incorporators are John Rogers, Jacob Ringer and Theodore Rabovits.

The Durand Steel Locker Company, whose plant at Waukegan, Ill., was recently destroyed by fire, has purchased the factory buildings of the Monarch Motor Car Company, Chicago Heights, Ill., which it is now equipping for the manufacture of steel lockers. It is understood that most of the equipment required has already been purchased.

The Liquid Carbonic Company, Chicago, will erect at Memphis, Tenn., a large factory building, for which it is now preparing plans.

The Illinois Electric Porcelain Company, Macomb, Ill., incorporated with a capital stock of $20,000, has purchased a site upon which it will erect a plant for the manufacture of electrical supplies. The officers of the company are: Charles Kettron, president; C. M. Erwin, secretary, and W. C. Sutton, treasurer.

The Pitner Pump Company, Chicago, has been incorporated with capital stock of $20,000 to manufacture automobile pumps. The company is located at 24 West Michigan street.

E. H. Lundy is seeking a franchise from the city of Eldora, Ill., for a concrete dam across the Iowa River and the erection of a new and modern power plant.

The United Zinc & Chemical Company, Springfield, Ill., is making improvements to its plant which will practically double its capacity. Of the new buildings to be erected the first will be completed by October 1.

The city of Braidwood, Ill., is considering the erection of a new electric light plant and the sale of its old one.

The Hillsboro Electric Light & Power Company, Hillsboro, Ill., has purchased a site for the erection of a new power plant, the work of construction to be started at once.

Lawrence Brothers, Sterling, Ill., have purchased a site for the erection of a factory building, plans for which have not yet been completed. They manufacture hardware specialties.

Philadelphia

PHILADELPHIA, PA., August 23, 1910.

The market continues quiet in practically all branches. In the majority of instances the volume of business transacted was less than during the previous week. Orders taken both by manufacturers and merchants continue of a single tool character, and little of the business taken has been on strictly fresh inquiry. The Pennsylvania Railroad has placed contracts for a few tools for its Cape Charles, Va., shops and an occasional odd tool, usually small, for some of its other shops, but there is nothing in the atmosphere to indicate any pronounced buying on the part of the railroads in the immediate future. The market generally exhibits the usual characteristics of the month, inquiries of nearly every kind are extremely light and pending business closes slowly owing to the vacation season. While reports of cancellations on old orders, particularly when long delivery on standard

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tools was involved is heard of, merchants and builders in this district have not been affected by that condition, although manufacturers of supplies and parts in connection with the building of tools have in a few instances reported that less urgency was shown for deliveries.

There is still an absence of any list of machine tool requirements covering any extended equipment; a few pretty fair propositions are under negotiation, but develop slowly; several prospective lists are in sight, but are not expected to develop into anything tangible for several months. No particular betterment in the demand for second-hand tools and equipment is reported, trade is dull and the demand of a day to day character. The foundry trade generally reports unchanged conditions, the melt, however, is being maintained at a pretty fair average. A scattered demand for boilers, engines and special power equipment is reported, with a very good prospective demand in sight.

The D'Olier Engineering Company has been awarded a contract by the United States engineers for the canal lock gates and operating mechanism for Black Rock Harbor, near Buffalo, N. Y. This will require, in addition to the gate operating mechanism, 10 large structural steel gates. The value of the contract is close to $146,000.

The Atlas Water Tube Boiler Company, which was recently incorporated under the laws of New Jersey and later purchased the rights of the Atlas Engine Company, Indianapolis, Ind., in its water tube boiler, established executive offices recently in room 217, Franklin Bank Building, Philadelphia. George R. Harvey is general manager and H. A. Scattergood secretary-treasurer of the company.

The Asbestos Fibre Spinning Company, North Wales, Pa., has awarded contracts for an extension to its plant, particulars regarding which are not obtainable.

The Pennsylvania Railroad Company has awarded, it is stated, the contract for the erection of the machine shop, power house and other buildings, to be erected in connection with its proposed improvements at Northumberland, Pa., to W. D. Steinbach & Sons, Lewistown, Pa.

John Melloy's Sons, Broad and Spring Garden streets, have let a contract to Appleton & Burrell, builders, for a five-story manufacturing building, 48 x 96 ft., to be erected at 1434-1436-1438 Brandywine street.

The Mfg. Foundry Company, Sinking Spring, Pa., has resumed operations after a month's idleness, due to an accident to its cupola. A new cupola has been installed, additions have also been made increasing the foundry capacity and assembling department 25 per cent. The plant resumes operations with a good volume of orders on its books.

The Philadelphia & Reading Railway Company has awarded a contract to the American Bridge Company, it is reported, for the widening of the deck plate bridge on the Reading division, below Perkiomen Junction, as well as a plate girder bridge in the same vicinity. This work is authorized in connection with improvements now under way on its line in that vicinity.

Alfred Box & Co. are busy in every department. There has been an active demand for both electric and hand power cranes as well as electric hoists. In connection with the latter class of products a new 42-page catalogue has just been completed, which the manufacturers will furnish on application. Among orders recently booked by the company the following may be mentioned: Edison Electric Illuminating Company, Brooklyn, N. Y., two 20-ton cranes; Pope Mfg. Company, Hartford, Conn., one 10-ton crane; Pennsylvania Railroad Company for its Sunbury and Baltimore shops, two 10-ton cranes; the Ball Engine Company, Erie, Pa., two 5-ton portable electric jib cranes; the Gowanus and Flushing pumping station, Brooklyn, N. Y., one 10-ton crane; Midvale Steel Company, Philadelphia, Pa., three 5-ton and one 10-ton special high speed cranes; Girard Iron Company, Girard, Ohio, one special 10-ton crane; Lobdell Car Wheel Company, Wilmington, Del., one 15-ton four-motor crane, and Wickwire Brothers, Cortland, N. Y., one 5-ton electric crane.

The Scott department of the Reading Iron Company, Reading, Pa., has been very busy. This is the foundry and machine department of the concern, and has been busily engaged on a large amount of work both for the company and outside customers. Work is progressing rapidly on the new puddle mill building by the Reading Iron Company, adjacent to its Keystone Rolling Mill, in connection with which a Roe patent puddling machine will be installed.

New England

BOSTON, MASS., August 23, 1910.

The automobile industry is still sending in an occasional cancellation of orders for machine tools, but at the present time the movement is not serious. Machinery builders believe that no very serious results are to be expected from this source, but do not anticipate the same volume of business from this trade, though it should not be dull. While expansion will be retarded replacements will be made, and considerable buying will be necessary if a producing balance is to be created in large works that have been purchasing lavishly without sufficient attention to proportions of equipment. The New England automobile builders are going ahead with their plans of extension with no apparent hesitation. Few, if any, cancellations of orders have been made by these concerns.

The ardent hope is held out that good mechanics will drift back from the Middle West to New England. They are needed badly here. The recent depression came at a time when the great automobile works were clamoring for men, offering large inducements in the way of wages, and the skilled workmen of this territory responded in large numbers. The New England cities in which metal manufacturing is a principal industry have grown rapidly in the last decade, as is shown by the census returns now being received. Instead of a shrinkage in labor supply there should be a large growth, and possibly changed conditions in the automobile industry will help a little. An increase in population based almost wholly upon the brass industry, that of Waterbury, Conn., is worthy of special mention, the percentage of growth being close to 60 per cent., a very remarkable figure in the face of the city's location many miles from tidewater.

The rivers of New England are feeling the effects of drought and water power is depleted to such an extent as to have a serious effect upon industry, especially among the textile manufacturers.

William A. Rogers, Ltd., Northampton, Mass., manufacturer of cutlery, will build an addition 40 x 46 ft., two stories and basement, and an existing building, 46 x 76 ft., will be raised one story.

The Atlantic Wire Works, Branford, Conn., manufacturer of iron and steel wire, will erect a new building, 40 x 117 ft., two stories, which will be equipped with new wire machinery.

The business of the National Metal Lath Company, Plainville, Conn., has been incorporated with a Connecticut charter and capital stock of $10,000. The incorporators are M. H. Treadwell, R. S. Allyn and J. F. Casey, all of New York.

The C. G. Garrigus Machine Company, Bristol, Conn., manufacturer of special machinery and tools, is preparing plans for a new power plant. The new shop has just been completed.

The Andrew B. Hendryx Company, New Haven, Conn., manufacturer of bird cages, picture cord, chain and fishing tackle, has increased its capital stock from $125,000 to $150,000, the new securities taking the form of a stock dividend, disposing of a surplus which has been accumulating for a number of years.

The Connecticut Company, which controls extensive street railroad interests in Connecticut, is planning to make a large extension to its power plant at Bridgeport, in which additional generating equipment will be installed.

The American Emery Wheel Company, Providence, R. I., manufacturer of abrasive wheels, is building an addition, 38 x 97 ft., in which five new kilns will be placed, three immediately and the others later on, when the need for still greater manufacturing capacity shall be felt.

Additions to general manufacturing plants include the following: Dartmouth Mill, New Bedford, Mass., large buildings for cloth room, picker room and storehouse; Paul Whitin Mfg. Company, Northbridge, Mass., four-story addition to factory at Rockdale, Mass., to cost $10,000; Cheney Bros., South Manchester, Conn., silk manufacturers, dressing mill 100 x 425 ft., two and three stories.

Cincinnati

CINCINNATI, OHIO, August 23, 1910.

It is stated that more heads of firms in this district are absent on vacations now than during any previous time. This naturally causes a slack period in local business. Machine tool builders report a fair number of inquiries, and those who have caught up with orders previously booked are receiving enough to keep them running on average time. The policy of not accumulating large stocks of tools still seems to prevail, and a careful estimate places the stocks on hand now at less than 40 per cent. of those usually carried. Practically this same condition exists with dealers in new machine tools.

Most of the foundries are operating on regular time, and those doing custom work appear to be getting enough day to day business to keep them from becoming discouraged.

The general situation may be summed up as being a waiting one and temporary lulls in buying are not at all disquieting, especially during this particular season. Practically, without exception, every one expects a good fall business.

The Cincinnati Tool Company, whose factory is in the

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Norwood suburb, is doing an excellent business in Central and South America, which trade was developed by personal visits of one of its officers. Some recent orders included shop tools for a number of the nitrate mining companies in Chile.

The G. A. Gray Company, Cincinnati, closed its plant for two weeks August 20, for the purpose of making some changes in its power equipment. A new 250-hp. boiler has just been installed that uses natural gas instead of coal as fuel. A 225-hp. cross compound Corliss engine and a larger dynamo will take the place of the company's present equipment. It has just finished work on a 56 x 56 in. x 24 ft. planer, which will be driven by an individual electric motor and two 24 in. x 6 ft. double head planers, belt driven, for the Brown & Sharpe Mfg. Company, Providence, R. I.

An addition, 65 x 115 ft., of steel and concrete construction, is being made to the erecting shop of the King Machine Tool Company, Winton place, Cincinnati.

The Crane & Breed Mfg. Company, Cincinnati, coffin manufacturer, is completing a large four-story factory on West Eighth street, and will soon commence the installation of the necessary manufacturing equipment.

The Baldwin Piano Company, Cincinnati, has had plans prepared for a three-story addition, 80 x 117 ft., to its factory on Gilbert avenue. Contracts have been placed for only a part of the woodworking machinery that will be required.

It is reported that the old Tranter rolling mill in Covington, Ky., has been leased by a firm now incorporating and that it will be placed in operation at an early date. Among the parties said to be interested in the enterprise are James W. Arnold, John F. and Harry Ankenbaur of Cincinnati, and E. C. Kelly, M. Troye and A. L. Brown of Covington, Ky.

The Compressed Wood Preserving Company, Spring Grove avenue and Winton place, Cincinnati, manufacturer of wood paving blocks, is making additions to its plant which will more than double its present capacity.

The Adams & Taylor Machine Company, Fort Wayne, Ind., has purchased a two-story brick building, 45 x 80 ft., on Clay street, and as soon as it can be fitted up will move the plant from its present location at 1318-1322 Erie street.

The Monitor Stove & Range Company, Cincinnati, Ohio, has nearly completed a new 40 x 100 ft. warehouse addition to its plant on the Chicago, Hamilton & Dayton Railroad.

The F. W. Wakefield Brass Company, Vermilion, Ohio, has been incorporated, with capital stock of $100,000. The company has been doing business at its present location for a number of years and has a fully equipped plant.

The Pioneer Brass Works, Indianapolis, Ind., is erecting an addition to its foundry, 30 x 50 ft., two stories, to be used for core room, metal room and storage purposes. The company is also installing a battery of core ovens.

F. H. Fulton, 1108 South La Fayette street, South Bend, Ind., is taking bids for the construction of a brass foundry addition 50 x 90 ft.

The Hawks Electric Company, Goshen, Ind., has commenced work on the construction of a new steam power plant, which will be equipped with two boilers of 600 hp. and steam turbine of 1000 hp., connected to a 625-kw. generator.

The H. P. Deuscher Company, Hamilton, Ohio, founder and machinist, whose plant was recently destroyed by fire, advises that it has not decided upon plans for rebuilding, but that the matter is now under advisement and that a definite decision will be reached in the course of a few days.

Detroit

DETROIT, MICH., August 23, 1910.

The past week has brought out less news in relation to industrial expansion than any similar period of the last few months, and in the Detroit market very little buying has been apparent. The principal developments of interest to the machinery trade relate to the extension of hydroelectric projects, electric railroad building and installations of pumping units for municipalities. For shop and foundry equipment the demand has been practically negligible. Proprietors of stone quarries and crushing plants are buying to some extent, but mainly with a view to next season's requirements, and the orders run largely to heavy machinery on which several months' delivery is demanded by the builders. The automobile situation is still uncertain, but seems to be unfolding along the lines mentioned in *The Iron Age's* reports of August 4 and 11. On this point more can be said with confidence in about a fortnight.

A feature of the eighteenth annual convention of the International Railroad Blacksmiths' Association, which has just been held here at the Hotel Cadillac, was a discussion of oxy-acetylene welding, following the reading of two papers on the subject. The consensus of judgment seemed to be very favorable to the use of this system.

An event which has an important bearing upon future purchases of machinery for hydroelectric developments in this State is the report just made to the State authorities by Prof. M. E. Cooley of the University of Michigan on certain large power companies. Among these are the Grand Rapids-Muskegon Power Company, Grand Rapids, Mich.; Pontiac Power Company, Pontiac, Mich.; Saginaw Power Company, Saginaw, Mich., and Bay City Power Company, Bay City, Mich. In each case the property is valued by Professor Cooley at considerably more than the bond issues for which permission is requested, and there seems to be no further obstacle to the improvement of the several plants.

A factory equipped with woodworking machinery and light metal working tools will be built at Muskegon, Mich., by the Cookerett Company, whose headquarters are now at Grand Rapids, Mich.

The Escanaba Traction Company, Escanaba, Mich., will have complete plans in hand this week for its new concrete dam and power house on the Escanaba River. Some of the details of equipment have already been settled, but others will be decided later.

The Krit Motor Company, Detroit, has increased its capital stock from $100,000 to $150,000.

The contract for a new steel bridge to be built at Mt. Pleasant, Mich., has been let to the Joliet Bridge & Iron Company, Joliet, Ill.

The addition to the factory of the Imperial Furniture Company, Grand Rapids, Mich., will be 65 x 168 ft., four stories, of mill construction. Electric power is to be used.

It is announced from Muskegon, Mich., that through the efforts of the local Chamber of Commerce, the Wright Cooler & Hood Company, now of Chicago, will build a large new factory in Muskegon for supplying the automobile trade. In its present location this concern employs 150 men.

The Eureka Machine Company, Lansing, Mich., has been gathering some interesting figures in relation to the economies effected by its mixers and offers very substantial guarantees of service. Despite the lateness of the season, business in this line continues good.

The water works system at Iron River, Mich., will be extended and some new equipment provided. The plans, however, are not yet complete.

The Marshall Furnace Company, Marshall, Mich., which has been offered substantial inducements by other industrial communities, including Jackson, Owosso and Muskegon, to build a larger plant in one of those cities, has announced its decision to remain at Marshall, where a definite policy of expansion will be entered upon. A new site of 10 acres is to be donated by the city for a factory of very considerable capacity.

The city of Sandusky, Mich., will issue bonds to cover the construction and equipment of a municipal power plant for electric lighting and pumping service. Bids on machinery will be taken some time during the coming fall.

The Shaw Electric Crane Company, Muskegon, Mich., has recently taken some heavy orders for large shop cranes, leading railroad companies being among the purchasers.

The Platt Iron Works, Dayton, Ohio, has been awarded contract for a pumping engine of 5,000,000 gal. daily capacity, to be installed in the city water works at Wyandotte, Mich.

The Industrial Works, Bay City, Mich., is increasing its force of patternmakers as a result of orders in hand for heavy work.

The Detroit Gear & Machine Company, Detroit, is putting on more men, particularly in the gear grinding department. Business is reported good for this season of the year.

The Chas. A. Strelinger Company, Detroit, is offering a very compact, easily operated electric set of 4 kw. capacity, driven by a gasoline engine, which can be very advantageously installed in small isolated plants. It can also be made portable by mounting on an ordinary truck.

A branch is about to be established in Detroit for the assembling and delivery of the light three-wheel commercial trucks manufactured by the Wagenhals Commercial Motor Car Company, St. Louis, Mo. A large factory may also be built here in the near future and this city made the headquarters of the company.

Plans are now practically complete for the structural iron plant, 115 x 200 ft., to be built here by H. B. Lewis. The specifications will be in charge of John Scott & Co., Ford Building, Detroit.

Funds will be provided shortly for the proposed improvements to the municipal power, pumping and sewage plants at South Bend, Ind. The enlargement of the water works will be taken up first.

The facilities of the Michigan Alkali Company, whose crushing plant at Alpena, Mich., contains some of the heaviest crushing machinery ever built, will probably need to be further increased before the opening of another season, as the demand for its product is steadily growing.

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The Bevier Gas Engine Company, recently organized at Kalamazoo, Mich., by D. A. Shepardson and others, will be prepared within a few months to enter extensively upon the manufacture of gasoline motors for various purposes.

The Hildreth Mfg. Company, Lansing, Mich., has in contemplation certain plans for enlargement which will call for some new tools, but no authoritative announcement of the details has as yet been made. The gasoline engines manufactured by this company have been readily sold, and there is apparently room for a much larger production.

Plans for the enlargement of the water power plant at Big Rapids, Mich., including the construction of a new flume and the installation of hydraulic turbines of greater capacity than those heretofore in service, are being prepared by Prof. Gardner S. Williams, Ann Arbor, Mich., who is recognized as one of the chief authorities of the Central West on the subject of hydroelectric developments.

It is proposed by the addition of another 12,000,000-gal. pumping engine to increase the capacity of the water works at Grand Rapids, Mich., to 35,000,000 gal. daily, and even this quantity may not suffice, owing to the volume of water now used for factory and other industrial purposes.

The Rapid Motor Vehicle Company, Pontiac, Mich., is installing a complete clam shell bucket coal handling crane system, manufactured by the Northern Engineering Works, Detroit. It has also installed a Northern 10-ton crane in its power station.

The Simplex Fence Machine Company, Battle Creek, Mich., has secured the patents formerly owned by the Battle Creek Wire Fence Company, and is now making preparations for the manufacture of fence machines until recently manufactured by that company.

The Standard Foundry Company, Detroit, Mich., is erecting an addition to its foundry, 51 x 63 ft., two stories.

The Globe Furniture Company, Detroit, Mich., has let a contract for the construction of a three-story factory building, 60 x 288 ft.

The J. E. Scripps Corporation, 65 Shelby street, Detroit, Mich., has plans prepared for a power building, 67 x 138 ft., five stories.

The Luce Furniture Company, Grand Rapids, Mich., has let a general contract for the construction of an addition to its plant, 140 x 530 ft., one story.

The Walker Motor Car Company, 1120 Chamber of Commerce Building, Detroit, Mich., recently incorporated with capital stock of $150,000, has received propositions from several towns, but has not yet decided upon a location for its factory. In the meantime, however, it is the intention to lease temporary quarters which will be equipped with sufficient machinery for the manufacture of at least 250 cars for the season of 1911. No arrangements have been made for the purchase of the equipment required. Electricity will be used for motive power.

Pittsburgh

PITTSBURGH, PA., August 23, 1910.

Scattered buying throughout the country is sufficient in volume to bring considerable business to the manufacturers of this district, but the local market has been rather quiet lately and dealers are giving more attention to preparations for fall trade than to the requirements of present business. Inquiries, however, are not lacking, and there is a good deal of estimating to be done, even though the understanding is that purchases will be deferred. Mill engineers and architects have men at work on numerous plans for projected new buildings or additions, and the details of equipment are being outlined, in many instances, considerably in advance of actual construction. Hence, there is a strong undertone to the market, and in spite of some drawbacks the situation is sufficiently promising to encourage expectation of a heavy fall and winter production in most lines of machinery building.

The authorities at Romney, W. Va., will engage an engineering firm to prepare plans for a pumping plant and water works system.

Improvements to be made in the system of the Du Bois Electric & Traction Company, Du Bois, Pa., include an addition to its car house and repair shop at that place.

The authorities at Hudson, Ohio, are in correspondence with manufacturers of this district on the subject of a producer gas plant and electric generator for municipal lighting.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has been awarded contract for all of the electrical machinery to be installed in the new municipal power plant now under construction by Bedford City, Va. The generators will be driven by hydraulic turbines built in the shops of the S. Morgan Smith Company, York, Pa.

Pump builders of this district will figure on machinery for the new filtration plant at Evansville, Ind., which is expected to be of considerable size.

From Herndon, Va., it is reported that power and crushing machinery will be purchased here shortly by the Belmont Trap Rock Company for a new quarry to be developed near that place, which will probably be electrically operated.

A contract has been placed with the Platt Iron Works, Dayton, Ohio, for two compound, duplex, direct acting pumps of large capacity to be installed in the new city water works plant at Wrightsville, Ga.

The power plant at Jayenne, W. Va., of the Fairmont & Clarksburg Traction Company, Fairmont, W. Va., which is equipped with General Electric generating units of 5000 kw. capacity, driven by gas engines and steam turbines, will be considerably increased in capacity. Two alternators of 1000 kw. each are to be installed in a building now under construction as an addition to the station.

The authorities at North Braddock, Pa., will soon be ready for bids on pumps, and probably electric motors, for the water works to be constructed there. Plans are now in course of preparation.

The representatives in this district of the Lambert Hoisting Engine Company, who are located at 117 Main street, Allegheny, Pa., have in hand numerous inquiries from quarry owners, mining and coal handling companies, construction firms, contractors and others for hoisting engines and cableways. This year electric hoists are more frequently specified than they have been heretofore.

The attention of large users has been quite strongly called of late by excellent service records to the new type of interpole motors, which are manufactured by the Burke Electric Company, Erie, Pa. These are capable of wide variations in speed, and have been found especially advantageous for certain classes of machine shop work.

It is reported from Moundsville, W. Va., that a new manufacturing plant of considerable size will be constructed there by the Railway Brake Shoe Company, for the production of the electric traction specialties indicated in its title. The machinery list will be large.

Further improvements are contemplated in the municipal water works system at Wheeling, W. Va., including a new pumping unit for supplying Wheeling Heights. An appropriation of $132,000 has been asked for the purpose by the committee in charge of the work.

Dinkey locomotives now form one of the best selling lines of the Lima Locomotive & Machine Company, Lima, Ohio, a new design embodying simplicity of operation and economy of fuel having recently been placed on the market. During the summer season the company has been enabled to accumulate a stock of these machines, so that prompt shipment can be made on orders.

The capacity of a sawmill included in the recent purchase by the Willson Bros. Lumber Company, Pittsburgh, of timber lands in West Virginia, will be enlarged and the equipment improved.

In addition to its original line, the Shunk Plow Company, Bucyrus, Ohio, is making a specialty of heavy scraper plows for road machines, which it carries in sufficient quantities for immediate delivery.

Another electric power plant, independent of any of those now in operation there, is to be erected in Altoona, Pa., this fall by a new organization known as the Pennsylvania Central Light & Power Company. The particulars are, however, not definitely known here, except in the office of a large manufacturing company that is said to be figuring on the equipment.

The Greenville Metal Products Company, Greenville, Pa., recently increased its capital stock from $250,000 to $600,000. The concern is hurrying work on its buildings, in which it will manufacture a line of automobile parts and steel specialties.

The Stewart Iron Company, Sharon, Pa., has awarded a contract to Taylor Brothers, local contractors, for the erection of a new concrete block laboratory, 20 x 50 ft., with a wing, 16 x 20 ft.

The Homestead Valve Mfg. Company, Homestead, near Pittsburgh, has completed the erection of a 30 x 100 ft. addition to its iron and brass foundry. This addition practically doubles its capacity in the foundry department. The company recently appointed the following new agencies: C. B. Ault, Kansas City, Mo.; Frank Boyle, Park Row Building, New York City.

The W. R. Beatty Machinery & Equipment Company, 30 Carson street, S. S. Pittsburgh, Pa., has been appointed sales representative for Pittsburgh and vicinity of the Blaisdell Machinery Company, Bradford, Pa., maker of air compressors. The Beatty Company will arrange to have several standard machines in its warehouse for exhibition purposes and to fill orders promptly.

The Fred F. Fischer Company, 1120 Park Building, Pittsburgh, now represent for that vicinity the following concerns: Nagle Corliss Engine Works, Erie, Pa.; Tower Engineering Company, Buffalo, N. Y.; Pennsylvania Boiler

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Works, Erie, Pa.; Trenton Engine Company, Trenton, N. J., and Bogart Gas Power Engineering Company, Buffalo, N. Y.

The G. M. Yost Mfg. Company, Meadville, Pa., has recently installed a lot of new machinery so as to take care of its increasing business. This company recently bought out the Williamson Vise Company, Bradford, Pa., and is making a very complete line of vises for all purposes.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has received an order from the La Blanca & Anexas Mining Company for 40 type MS motors, to be used in the company's mill at Pachuca, Mexico. The motors ordered range in size from 5 hp. on the pulp thickeners to 75 hp. on the tube mills. The order also includes seven 250-kva. O.I.S.C. transformers and one 12-panel switchboard.

St. Louis

ST. LOUIS, August 22, 1910.

Leading dealers state there have been several buyers in town during the past week, particularly from Tennessee, and it is noted that an increasing number of visitors from that section are using St. Louis as their machine tool headquarters. Some business has also been placed with local dealers by parties from Springfield, Ill. The reorganization of the St. Louis Car Company is a matter of congratulation and attracts much attention from parties interested in machinery, &c.

The Railway Steel Spring Company's plant at East St. Louis, one of the largest owned by this interest, which specializes railroad on springs, is fairly full of work.

The shoe factories have been buying some little machinery for repair departments, maintained by most of the plants for keeping their manufacturing equipment in shape.

The St. Louis Portland Cement Company is well employed at its plant on the northern city limits. This is the pioneer of the three large cement factories near St. Louis.

One of the brick companies has just placed its order for a 72-in. boring mill.

The Standard Oil Company's large new refinery at Wood River, Ill., is now in full working order. It represents an investment of several million dollars, and is equipped with an elaborate machine shop capable of building cars when necessary.

The Aluminum Company of America, which has a huge plant at East St. Louis, is running along steadily on the products of its mines in Arkansas.

The East St. Louis Locomotive & Machine Company finds business fairly satisfactory for this season. Its specialty is rebuilding all classes of locomotive equipment.

The St. Joseph Steam Laundry Company, St. Joseph, Mo., has been incorporated; capital stock, $20,000. The incorporators are S. O. I. Stone, Ella Stone, Nixon I. Stone and others.

The Citizens' Gas Company, Hannibal, Mo., has been incorporated; capital stock, $40,000. The incorporators are W. E. Moss, A. M. Hart, J. W. Thompson and others.

The Smith Locomotive Adjustable Hub Plate is the title of a new company organized at Pittsburg, Kan., to engage in the manufacture and sale of the patented device described in its corporation name. It is estimated that this device will save at least $1200 per year on each engine in taking up lateral motion. It has been for over a year subjected to a test by the Kansas City Southern Railroad. F. H. Smith is president.

Excavation work for the Richie Corrugated Iron Company's plant on Grand View avenue, Muscatine, Iowa, is to begin next week.

The repair shops of the Iowa Central Railroad are to be transferred from points along the line to Oskaloosa, Iowa, where the work will be concentrated.

The National Ruberette Company will soon erect a factory costing upward of $50,000 in Des Moines, Iowa, for the manufacture of a puncture-proof compound for automobile tires. A. O. Ayers is the president and H. G. Jones is general manager of the company. There will also be established a plant for the treating of tires with the compound.

Kolosick Brothers will erect in Washington, Iowa, a factory, 35 x 100 ft., for the manufacture of stock dipping machines, dipping tanks, &c.

The National Lead Company has obtained a permit to erect a corroding shed at 5520-5534 Manchester avenue to cost upward of $110,000, which will almost double the capacity of its plant. In addition, a $6000 stable and $5500 oil house will be built.

The Zittlosen Mfg. Company, St. Louis, Mo., has awarded a contract for the construction of a factory building, 60 x 126 ft., to be erected at a cost of $30,000.

The Dalton Adding Typewriter Company, Poplar Bluff, Mo., has awarded a contract for the construction of a three-story and basement reinforced concrete addition to its plant, 45 x 400 ft., to be erected at a cost of about $100,000.

The Board of Public Improvements, St. Louis, Mo., will receive bids October 17 for the construction of a one-story and basement brick and steel boiler house, to be erected at Bissells Point at a cost of about $350,000, including equipment.

The city of Columbia, Mo., will hold an election September 27 to vote on the issuance of $120,000 in bonds for installing a new municipal water and lighting plant.

At a meeting of the directors of the Mapleton Gas Company, Mapleton, Iowa, it was decided to reorganize the company and install new machinery.

The Lennox Furnace Company, Marshalltown, Iowa, has increased its capital stock from $250,000 to $350,000 to provide for an issue of $100,000 of 7 per cent. preferred stock. The new capital will be used in the extension of the manufacture of the Quick Action steel range with adjustable grate. It is the intention of the company to build in the spring a complete factory, plans for which have not been definitely decided upon at this time. The company will be in the market for all classes of equipment that pertain to a plant of this character.

The Des Moines Silo & Mfg. Company, Des Moines, Iowa, will build a steel frame lumber shed connecting with its present plant, 54 x 200 ft. The company is also considering the erection at Kansas City, Mo., of a factory, 120 x 240 ft.

Milwaukee

MILWAUKEE, WIS., August 22, 1910.

Some of the manufacturers here have the orders on their books so far reduced that they are beginning to make a more vigorous campaign for business, and as fall approaches most Wisconsin concerns will be getting in line for their share of the trade. Additional salesmen are already being engaged or withdrawn from office forces for work on the road, and considerable advertising literature will be sent out during the next few weeks. In certain lines of production, however, the shops are still provided with orders for a long time ahead, and no special effort will be made to increase bookings before late autumn or early winter. At that time new business will be needed for the numerous factories or additions now under construction which will then be completed.

The Burlington Brass Works, Burlington, Wis., is preparing to install electric motors, which will be operated on current from the plant of the Burlington Light & Power Company. Vaughn & Meyer, Milwaukee, are in charge of the plans for improving the company's power system.

The municipal electric generating plant at Columbus, Wis., will be remodeled and its capacity increased.

The Albert Trostel & Sons Company, Milwaukee, is preparing to rebuild the portion of its plant that was destroyed by fire. A one-story building, 120 x 150 ft., will be erected, and provision may be made for electric motor drive.

Two hydraulic turbines, each direct coupled to a 250-kw. alternating current generator, will be bought for the municipal power plant at St. Croix Falls, Wis. Plans and specifications are reported to be in the hands of W. G. Kirchoffer, Madison, Wis., who is the city's engineer.

The Wisconsin Bridge & Iron Company, Malwaukee, has been given the contract for another machine shop, to be erected by the National Brake & Electric Company. This is additional to the buildings recently mentioned.

An effort is being made by commercial interests in Racine to secure for that city the new plants of the Thomas Brass & Iron Works and Durand Steel Locker Company, whose factories at Waukegan, Ill., were destroyed by fire.

The proposed installation of a municipal lighting plant is being discussed by the authorities at New Holstein, Wis.

Improvements, which include the installation of some new machinery, will be made in the factory of the Werheim Woodwork Company, successor to the Werheim Mfg. Company, Wausau, Wis.

The Ahnapee Veneer & Seating Company, Algoma, Wis., is proceeding with plans for a two-story addition to its factory, 50 x 160 ft.

Among contracts recently awarded S. Freeman & Sons Mfg. Company, Racine, Wis., by municipalities is one for two boilers of 150 hp. each, to be installed in the city power plant at Batavia, Ill.

The electric generator for the new power plant of the C. B. Henschel Mfg. Company, Milwaukee, will be furnished by the Allis-Chalmers Company.

The Industrial Heating & Engineering Company, Milwaukee, has the contract for the heating plant, including

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two low pressure boilers, to be installed in a large parochial building at Fond du Lac, Wis.

The Milwaukee Structural Steel Company is starting work on a new fabricating plant, 60 x 130 ft., to be erected here, the power for which will be furnished by a gas engine. The principal contracts have been closed.

The contract for three new stokers to be used in the power plant of the Sheboygan Light, Power & Railway Company, Sheboygan, Wis., has been let to the Underfeed Stoker Company, Chicago, Ill.

The new warehouse to be erected by the International Harvester Company at Eau Claire, Wis., will be four stories, 85 x 120 ft., mill construction. The building contract has just been let.

The Radcliffe Mfg. Company, West Allis, Wis., has contract for the mill work on the new plant of the Milwaukee Machine Tool Company, at that place.

The A. Streich & Bro. Company, Oshkosh, Wis., is having plans drawn for a three-story addition to its factory, 46 x 136 ft.

The Northwestern Malleable Iron Company, Milwaukee, has arranged for the construction of four reinforced concrete storage buildings, each one story, 50 x 130 ft.

An independent steam heating plant, using blowers, will be required for the new office building of the Gisholt Machine Company, Madison, Wis., bids on which are about to be taken.

The address of the Clifton Light & Power Company, recently mentioned in this report, should have been given as Hudson, Wis., instead of Clifton, the president, B. W. Utman, being located at the former place. The contract for a power dam was recently placed, and the initial capacity of the electric generating plant will be about 400 kw. Current is to be transmitted to towns in the vicinity, as far as Hastings, Minn.

It is reported from Appleton, Wis., that two low pressure De Laval steam turbines of 75 and 300 hp. will be installed by the Thilmany Pulp & Paper Company, Kaukauna, Wis., to operate on the exhaust from Corliss engines.

The machine shop for repair work which has been operated by the Lange Canning Company, Eau Claire, Wis., in connection with its plant, was recently destroyed by fire.

A pump for fire protection service will be bought in the near future by the town of Gresham, Wis.

The General Electric Company, Schenectady, N. Y., has furnished for the plant of the Beloit Water, Gas & Electric Company a horizontal steam turbine and alternating current generator of 500 kw., making the total capacity of the station about 2000 kw.

It is reported from Ashland, Wis., that the Ross-Sellinger Company, whose present address is given as Sheboygan, Wis., will build a plant there for the manufacture of gloves. Power machinery will be among the requirements.

A factory addition, 30 x 40 ft., three stories, will be built at Fond du Lac, Wis., by the Longdin-Brugger Company for the manufacture of automobile tops. Brick and steel construction is to be used and provision made for electric power.

A rotary converter, to take current from the electric railway company's lines and change it for use in the factory, will be installed by the Allis-Chalmers Company in the new plant of the Helmholtz Mitten Company, at Cudahy, Wis.

Bids will be taken until September 1 by the State Board of Control, Madison, Wis., for two economizers to be installed in the heating plant of a State building.

C. W. Parry, Algoma, Wis., is having plans prepared for a factory building, 48 x 180 ft., two stories, to be used for the manufacture of opera chairs.

The South

NASHVILLE, TENN., August 22, 1910.

Most of the business transacted at present appears to be of a routine character, and supplies of different kinds are figuring more largely in the sales of jobbing houses and dealers than orders for mechanical equipment. Very few representatives are on the road, and a large percentage of orders come in by mail unsolicited. Manufacturers have recently been planning their production for the fall and winter months, and in some instances season contracts have been made for standard articles as far ahead as next spring. There seems to be more assurance of a steady run of business than has been promised at this time of the year in any period with which comparisons can be drawn, and the outlook generally is excellent. For the immediate future plants utilizing some form of woodworking machinery will be among the leading buyers of equipment, including power units and electric motors, but in other lines of industry buying orders will follow very closely the revival of trade in September.

M. L. Shepherd, whose present address is given as Montgomery, Ala., has organized the Shepherd Automatic Switch Company of that place, to establish a plant for the manufacture of a special type of switch for use either on steam or electric roads. The company is incorporated for $700,000.

The Calcasieu Veneer, Box & Crate Company has been formed at Lake Charles, La., and will install machinery in the plant formerly used by the Tupelo Ladder Company. H. E. Schrubb, secretary of the company, will be in charge of the arrangements.

The St. Petersburg Electric Light & Power Company, St. Petersburg, Fla., which has a battery of Berry boilers, furnished by Robt. Wetherill & Co., Chester, Pa., is about to double its capacity by the installation of two more of 250 hp. each, from the works of the same company.

The Casey-Hedges Company, Chattanooga, Tenn., will supply an 18 x 72 high pressure boiler for the new municipal power and pumping plant at Wrightsville, Ga.

It is understood that in order to provide an adequate water supply for Ensley, Ala., there will be installed a pumping station of 25,000,000 gal. daily capacity at a point known as Camp Branch, about two miles distant, whence it will be conveyed to a reservoir above the city and distributed by gravity. The Tennessee Coal, Iron & Railroad Company is reported to have had plans drawn for the project, which will include the construction of a large dam.

The Halls Light, Water & Ice Company, Halls, Tenn., will arrange for the installation of a public service plant.

The proposition to establish an electric power station at Livingston, Ala., has come to a head in the organization of the Livingston Light & Improvement Company, which will arrange for the installation of the necessary machinery.

A large plant for the manufacture of commercial fertilizers will be erected in North Montgomery, Ala., by the F. S. Royster Guano Company, whose main office is stated to be at Norfolk, Va.

Plans for a new power plant, cutting machinery and crusher, as well as other improvements, are about to be put in effect by the Broad River Granite Company, at Oglesby, Ga. The main offices of the company are in the Candler Building, Atlanta, Ga.

Representatives of the Buffalo Forge Company, who are located at Charlotte, N. C., have found this a favorable season for the installation of exhaust fans in planing mills, woodworking plants and furniture factories for refuse removal systems. Other lines of trade are also fairly active for this time of the year.

The American Stone Company, Richmond, Va., which controls a large quarry near that city, is figuring on the installation of a compressor plant, power, crushing and handling machinery, including a locomotive crane.

The Lafourche Dredging Company has been organized at New Orleans, La., with Wilton E. Aymar as secretary, and will provide machinery enabling it to participate in the large amount of reclamation work that is projected in that vicinity.

Governor Sanders of Louisiana has recommended to the Legislature that an act be passed authorizing municipalities to vote special taxes in aid of manufacturing plants or other industrial enterprises, the location of which it is desired to secure for particular communities.

The Fulton Company, Knoxville, Tenn., will erect a brick building, to be used as a manufacturing plant, near the company's factory on Second street.

The veneering plant of Tillman, Shannon & Co., Trimble, Tenn., was destroyed by fire August 12. The loss is $50,000, partially covered by insurance.

The Northwest

ST. PAUL, MINN., August 22, 1910.

Bookings recently have been light. Purchasing agents and others responsible for placing orders in behalf of industrial operations are largely on vacations, having taken advantage of the pleasant weather to make trips to the Northern lakes and woods, and for various other reasons negotiations are slow. There is, however, considerable business pending that will be closed upon within the next few weeks, so that the situation is far from discouraging. For all standard lines the market is otherwise about as mentioned in this report a fortnight since.

The North Dakota Heat & Power Company, Fargo, N. D., is proceeding with plans for the installation of an electric power and lighting system at Energy, N. D.

The building of a pumping plant to serve the community is under consideration by the authorities at Hartford, S. D., and an engineer will probably be engaged shortly to submit plans.

The plant of the South St. Paul Electric Light, Heat & Power Company, the contemplated enlargement of which was recently noted, has passed under the control of the Consum-

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ers Power Company, Stillwater, Minn., which will carry out the projected improvements.

Last week 32 students of the University of Commerce, Cologne, Germany, made a brief survey of industrial conditions at Duluth and then left for Butte, Mont., for a series of similar observations. The trip is being made under the auspices of the German Government.

The authorities at Preston, Minn., have engaged an engineering firm to prepare plans for a hydroelectric plant for municipal service.

The Watertown Light & Power Company, Watertown, S. D., recently had work started on a large new electric generating station.

The Elk City Mines Corporation, Elk City, Idaho, is enlarging its crushing and ore concentrating plant. Machinery sufficient to meet present requirements has been provided for, but more will be needed as production increases.

A power and pumping plant is to be purchased in the near future by the Gilt Edge Mining Company, Elk City, Idaho.

The Twin City Equipment Company, Minneapolis, has the selling agency in this section for the improved line of steam dredges built by the Bellefontaine Foundry & Machine Company, Bellefontaine, Ohio. The demand for machinery of this class is increasing as the result of the amount of development work now in progress.

The municipal power and pumping station at Lakefield, Minn., is to be enlarged and improved. A gas producer and gas engine, with alternating current generator, will probably be required.

Bonds to cover an expenditure for pumping machinery will be issued shortly at Butler, S. D.

Some damage to its property was sustained by the Minneapolis Desk Mfg. Company, Minneapolis, from a recent fire, but the operation of the factory itself will not be interfered with.

The city of Farmington, Minn., will issue bonds for a pumping plant and water works system. An electric plant will be established by a private corporation.

The National Power & Paper Company, recently incorporated at Duluth, Minn., of which Chas. Schulze is president and J. P. Rossman is vice-president, will build an electric power plant and pulp mill in Lake County, Minn.

A one-story dry house, 34 x 110 ft., will be built by the Shenango Furnace Company on its property at Hibbing, Minn.

The St. Louis Hotel, Floodwood, Minn., will be remodeled and a heating and lighting plant installed.

The O'Donnell Shoe Company, St. Paul, Minn., is erecting a new factory and office building of reinforced concrete construction, 50 x 140 ft., five stories, which is to be completed by November 1.

The Southwest

KANSAS CITY, MO., August 22, 1910.

Need of machinery for the equipment of municipal power and pumping stations, together with the numerous lines of subsidiary apparatus made necessary by new construction work, pipe lines, reservoirs, fire protection, &c., still constitutes the heaviest support of the market, and buying on this account will continue an appreciable factor in the situation throughout the fall. From the larger cities some orders of very considerable size are in prospect. The rate of growth in population has been such as to far outstrip the average provision made for maintenance and extension of public utilities, and with the necessity for larger capacity has come a general demand for heavier, more economical, machinery. In quite a number of instances to be acted upon shortly obsolete equipment will be altogether eliminated, even though still capable of rendering some service.

The Cleburne Gas & Electric Company, Cleburne, Texas, which has in operation electric generating sets of 300 kw. capacity, is about to build a large new power plant.

The new industrial community of Pearson, in the State of Chihuahua, Mexico, for which a steam turbine power plant was recently ordered by D. F. S. Pearson, owner of the Mexico Northwestern Railroad Company, will be made the center of important operations. A new sawmill is in process of construction, and a box factory will soon be under way. Other plants are to follow.

The installation of pumping machinery is under consideration by the authorities at Hearne, Texas.

The Arkansas City Portland Cement Company, Arkansas City, Ark., which was recently organized, is reported to have plans in hand for a large cement mill.

The Ozark Electric Light & Power Company, Ozark, Ark., is contemplating the installation of a gas producer plant, gas engine and alternating current generator of 75 to 100 kw.

Some new machinery for quarrying and cutting is being installed by the Sinclair Quarry Company at Carthage, Mo., and more will be needed later on.

A tilting furnace of the Harvey-Steele type will be installed by the Socorro Mining Company at Mogollon, N. M. It has already been ordered.

The Loewer Wire & Iron Works, Kansas City, is busy on orders for ornamental iron to be used in large buildings. The use of this material appears to be rapidly increasing in various parts of the Southwest.

The Ft. Scott Gas & Electric Company, Ft. Scott, Kan., which has an engine driven power plant of 400 kw., is having plans drawn for the enlargement of its electric generating and distribution system.

The contract for a filtration plant at Graham, Texas, has been given to the New York Continental Jewell Filtration Company, New York City.

Some new equipment has been ordered for the Bisbee Coalition Mining Company, Bisbee, Ariz., which represents a consolidation of properties in that vicinity, and additional machinery will be required later as development work progresses.

Power and timber cutting machinery will be required for a new mill to be built at Carthage, Texas, by J. C. Whitney.

The construction of a municipal power and lighting plant is about to be undertaken at Kiowa, Okla.

The Board of Trade at Camden, Ark., has arranged for the construction of a large cooperage plant. Further particulars can be obtained from the secretary.

The principal machinery has now been purchased for the large new generating plant of the Kansas Gas & Electric Company at Wichita, Kan., but some additional and subsidiary equipment will be required during the late fall or early winter.

The mechanical equipment of the Forrest City Box Company's plant at Forrest City, Ark., is being enlarged.

An electric power plant will be provided in the near future for Antlers, Okla., by the Antlers Light & Power Company, recently organized for that purpose.

It will be necessary before a great while to install a new pumping engine at Houston, Texas, as practically the entire supply of the city is now provided by the 25,000,000 gal. unit last purchased, the remainder of the machinery being unfit for sustained service.

Plans are about to be put into effect for a four-story addition to the plant of the Eller Wagon Company, Houston, Texas.

Engineers have been engaged by the city of Muskogee, Okla., to prepare plans for increasing the capacity of the pumping station.

The Board of Education of Wichita, Kan., is considering an expenditure of $50,000 for an electric light plant and equipment for the high school.

The Southwestern Iron Company, Guthrie, Okla., which recently increased its capital stock from $100,000 to $200,000, will build an addition to its present plant, 60 x 150 ft., to be used as a structural iron shop. There will be installed in the new building a punch, an air compressor, air tools for riveting and drilling and such other tools as are necessary for handling structural material. It is understood that this equipment has not been purchased.

The Faeth Iron Company, Kansas City, Mo., will build a six story and basement concrete factory building, 111 x 260 ft., at an estimated cost of $150,000, to be completed by January 1.

The Board of Regents of the school for the deaf at Sulphur, Okla., will ask for bids for constructing a steam and electric power plant at an estimated cost of $12,000.

The plant of the Crystal Ice Mfg. Company, Argenta, Ark., will be enlarged at an expenditure of about $50,000.

The Bessemer Gas Engine Company, Tulsa, Okla., will erect a warehouse for the accommodation of its increasing business.

The American Sash Weight & Mfg. Company of Muskogee, Okla., has been incorporated; capital stock, $2400. Incorporators—P. F. Gambill, F. M. Woods, W. Y. Dilley and others.

Proposals for constructing bridges and culverts will be received by the City Secretary of Waco, Texas, for constructing one 54-ft. span steel girder bridge and abutments; one 22-ft. span I-beam bridge and abutments; one 20-ft. span reinforced concrete culvert; one 7-ft. span reinforced concrete culvert, according to plans and specifications.

An electric light plant is to be installed at Flatonia, Texas. T. M. Spinks will take charge of the property. An investment of $15,000 will be expended in the enterprise.

The Marshall & East Texas Railroad has broken ground in Marshall, Texas, for the erection of its new shops.

The Southern Pacific Railroad will erect a new building at Houston, Texas.

The National Lumber & Creosote Company will erect a new plant at the junction of the Great Northern and the Houston & E. & W. Texas railroads, Houston, Texas. The buildings will be of brick, and will be fitted with all modern machinery. About 150 men will be employed.

THE MACHINERY MARKETS

San Francisco

SAN FRANCISCO, August 17, 1910.

A gradual increase of business is noted by local machinery merchants and manufacturers and the movement in general lines is probably up to the average for this season, dullness in some departments being balanced by unusual activity in others. Some lines which have been very quiet for the last few months are now beginning to receive some inquiry. New tools are not in demand locally, though a good many old tools are changing hands, and there is a constant inquiry for second-hand machines. A few machine tools have been sold to southern California shops, but none of these sales are of a very important nature, and the demand in that quarter is still somewhat curtailed by the strike at Los Angeles. Local dealers have sold several large machines to the Ajax Auto Traction Company, which is equipping a large machine shop at Portland, Ore.

Gas engine manufacturers are getting a heavy volume of business in the interior, though engines of Eastern make are used to a large extent for operating irrigating plants, agricultural and creamery machinery. The local factories are very busy on some large orders taken early this month for delivery to New Zealand and Australia. The export business to those places is considered more or less temporary, however, as manufacturers there are conducting experiments with internal combustion engines, and it is believed that they will be able to supply their own market within a few years.

Equipment for general construction work is in very fair demand, including hoisting engines, donkey engines and boilers, concrete mixers, &c., and in view of large contracts recently let for concrete construction and harbor improvements the outlook is good for continued demand in this line. Crushers also are an important factor, and there is some demand for cement and brick manufacturing machinery. Road machinery is still one of the leading features, but some curtailment in this line is anticipated with the approach of the rainy season.

Pumps continue to find a ready market. The greatest demand is for small gasoline or electric pumps, though there is some inquiry for larger units for use in mines and water works.

Woodworking machinery, which was rather quiet early in the summer, has been coming ahead for the last month, as the activity of the lumber market necessitates considerable additional mill equipment, and several purchases are expected in the near future to replace several mills recently destroyed by fire. The new sawmill of the Pacific Lumber Company, Eureka, Cal., one of the largest on the coast, was completed August 15. The Terry Lumber Company has purchased several large machines for its mill at Bella Vista, Cal. C. E. Ring is working on a project for a general woodworking plant at Eureka, Cal.

It is reported that the Northern Electric and Vallejo & Northern railroads will install large car shops near Sacramento, Cal., following an agreement in regard to the construction of a bridge over the Sacramento River by these roads in co-operation with Sacramento and Yolo counties.

The Hydraulic Clutch Company is looking for a factory site at Vallejo, Cal.

An inquiry is expected from the Government shortly for a hydraulic forging press for the Mare Island Navy Yard.

Plans have been completed for a new Southern Pacific machine shop at Santa Barbara, Cal.

The California Boiler Works has let contracts for a large one-story building on the site at First and Howard streets, San Francisco, formerly occupied by the Crane Company.

Clifford E. Coggins, formerly master mechanic for the Imperial Valley Transportation Company, has started a machine shop at Imperial, Cal.

The Frontier Foundry Company has been incorporated at Los Angeles, Cal., with a capital stock of $25,000, by W. W. Walsh, A. Morganti and B. D. Carle.

The Pittsburg Foundry Company, recently incorporated at Los Angeles, is having plans drawn for a foundry building on North Main street, that city, where new machinery will be installed.

The Union Iron Works will install oil burning equipment in three small steamers of the Western Fish Company, San Francisco.

The Santa Cruz-Portland Cement Company, San Francisco, will add a lot of new machinery to its cement plant at Davenport, Cal., during the winter

The Consolidated Gas & Electric Company has purchased a tract of land at San Diego, Cal., where it will erect a large gas manufacturing plant, with the largest gas holder in the State.

John Rapp & Sons, a local bottling firm, have let contracts for a new plant, in which they will install a complete outfit of bottling and refrigerating machinery.

The S. Beer Gold Mining & Extraction Company is installing a large crusher, three concentrators, pumping equipment, &c., in its plant at Sacramento, Cal.

Plans are being made for electric lighting machinery for the court house and jail of San Joaquin County, Cal.

The Standard American Dredging Company, which has a contract for deepening Pearl Harbor, Hawaiian Islands, has let a contract for a 6000-hp. suction dredge.

The city of Santa Cruz, Cal., is planning for the reconstruction of the municipal pumping and lighting plants.

Hind, Rolph & Co., a local shipping firm, have under consideration a project for the erection of a large repair shop on the Alameda, Cal., water front.

The supervisors of Monterey County, Cal., will receive bids September 7 for electric lighting and pumping machinery for the county hospital. Figures are being taken on the power house for the new San Francisco Hospital.

The city of San Bernardino, Cal., is considering the installation of a municipal light and power plant.

The Phillips Contracting Company is preparing to move its rock crushing plant from San Bernardino to Corona, Cal., and install a large amount of new machinery.

The North Pacific Coast

PORTLAND, ORE., August 19, 1910.

The demand for machinery depends less at present on a few leading industries, such as logging and mining, being more diversified than it was earlier in the year. For the coming quarter this condition will undoubtedly be accentuated, with corresponding benefit to the trade at large, as a slump in any particular direction has less effect upon the industrial situation as a whole. It is, in fact, very gratifying to the commercial interests of this section to note the growth of general manufacturing on the north coast, and by means of the various associations of business men in the several leading trade centers everything possible is being done to encourage it. This month the total of bookings for new machinery, supplies and repairs will show up very favorably, considering the time of year, and for September the prospects are generally good.

The Adrian Power & Water Company, has been organized at Adrian, Wash., to establish a public service plant.

A new power plant, hoist, &c., have been put in service this season by the Listen Lake Gold Mining Company, whose headquarters are at Baker City, Ore., and further purchases of mechanical equipment will be made as the property is developed.

The Smith & Watson Iron Works, Portland, Ore., have started work on a new forge shop, 60 x 130 ft., which will replace two smaller structures. It is reported locally that Frank McDonough, president of the McDonough Mfg. Company, Eau Claire, Wis., will become identified with the business, and that the works above mentioned will be utilized extensively for the manufacture of sawmill machinery, which is the McDonough Mfg. Company's specialty, the Portland concern to be known henceforth as the Smith-McDonough Company. This has not, however, been officially announced.

It is reported from Vale, Ore., that the commercial interests there expect to secure for the city the new shops of the Oregon Railway & Navigation Company and the Oregon Short Line.

A woodworking plant, the main building of which will be 100 x 200 ft., is about to be erected at Kenton, Ore., by the Nicolai Door Mfg. Company. It will be driven throughout by electric motors.

Figures are expected to be taken shortly by the Ransome-Crummey Company for one of the largest rock crushing plants in this section, to be operated in connection with quarries at Klamath Falls, Ore. Other machinery will also be required.

Equipment is being provided by the Pacific Ore Company for a new 100-ton reduction plant at Republic, Wash. The crusher, which will be placed in operation first, is to be of the Gates gyratory type.

The Anacortes Water & Electric Company, Anacortes, Wash., has added to its engine driven power plant a Curtis steam turbine generating set of 400 kw., supplied through the Seattle office of the General Electric Company.

The contract for a new bridge to be built at Irondale, Wash., in the vicinity of the steel mills, has been let to W. H. Davis, Olympia, Wash.

The Little Spokane Water Power Company, recently organized, will build a large hydroelectric generating plant and pumping station in the vicinity of Milan, Wash. The plans of the company are, however, not yet complete.

The Pacific Coast Condensed Milk Company, Forest

THE MACHINERY MARKETS

Grove, Ore., is reported to contemplate the erection of a new factory at Tillamook, Ore.

The Southern Oregon Water Power Company, Lakeview, Ore., has been incorporated with $300,000 capital stock to develop the water power on Warner Creek, in Lake County, Ore. Work will be started soon on the construction of a $140,000 power plant. The officers of the company are: F. H. Oliver, president; M. R. Jennings, vice-president, both of Spokane; E. K. Erwin, secretary and treasurer, Coulee City, Wash.

The Farther Central West

OMAHA, NEB., August 22, 1910.

While the demand for machinery in all of the industrial districts east of the mountains remains light there is more talk of projected plant extensions or improvements, and figuring on future requirements is becoming quite general, indicating the inauguration of a buying movement by the midle of September or first of October which will be of enough importance to justify laying in heavy stocks. Branch houses and dealers, as well as local manufacturers, are already anticipating this condition, with the result that deliveries are likely to be very promptly made on orders placed early in the fall season. There is a very reasonable hope that any congestion like that of last year can be altogether avoided. In the mining country ordering of equipment is steady and promises to average well for an indefinite period.

The Lewis Electric Light & Power Company has been organized to establish a public service plant at Lewis, Iowa.

An elevated steel water tank of 80,000 gal. capacity is to be erected for municipal water service at Hartington, Neb.

T. F. Stroud & Co., Omaha, Neb., are putting on the market a steel frame elevating grader, which combines light draft with great durability in service. This season it has been sold extensively to contractors and communities all through the West.

The plant of the Wyoming Electric Light & Power Company, Basin, Wyo., which is at present equipped with a 75 kw. engine driven generator, has been purchased by the city and will be improved.

A shaft house will be erected and new machinery ordered for the mine of the Gilpin Orion Gold Mining Company, near Central City, Colo., of which W. E. Meagher is manager.

The Canon Light & Power Company, of which P. H. Dodge, Colorado Springs, Colo., is one of the incorporators, has been organized to build a hydro-electric plant in that vicinity, the machinery requirements of which will be large. No purchases, however, will need to be made for some time.

The Omaha Structural Steel Works, Omaha, Neb., will increase its capital stock from $25,000 to $200,000. The company will erect a modern plant for the manufacture of structural steel of every description. The present officers are John W. Towle, president, and C. A. Pratt, secretary and general manager.

Polenske, Schellak & Co., Hastings, Neb., manufacturers of brick, whose plant was recently destroyed by fire, are now rebuilding their kilns and advise that as soon as they can make arrangements a dryer system will be installed and that new brick machines, crushers, &c., will be purchased. They are contemplating the use of electricity for motive power, in which case a number of motors will also be purchased.

Census Figures of Cities

The following are the population figures according to the thirteenth census of the 16 leading cities thus far reported:

City.	Population 1910.	Gain.
St. Louis	687,029	111,791
Pittsburgh	533,905	82,493
Detroit	465,766	180,032
Milwaukee	373,857	88,542
Cincinnati	364,463	58,361
Newark	347,469	100,399
Washington	331,069	52,351
Jersey City	267,779	61,346
Kansas City	248,381	84,809
Indianapolis	233,650	64,486
Providence	224,326	48,729
St. Paul	214,744	51,679
Columbus	181,548	55,988
Toledo	168,497	36,675
Atlanta	154,839	64,967
Syracuse	137,249	28,875

The Newhall Engineering Company's New Yards.—The George M. Newhall Engineering Company, 136 South Fourth street, Philadelphia, Pa., has its new yards in operation at Williamsport, Pa., where it is storing a large tonnage of relaying steel rails and splice bars. It is carrying all sections of relaying rails in stock for prompt shipment, and recently completed the delivery of about 3000 tons of 60-lb. rails to various concerns on the Barge Canal, New York State. A number of other orders for sections from 70 to 85 lb. have been completed. The new yards have a capacity for 20 cars on track at one time and are equipped with special unloading devices. The company is also making a specialty of rail joints, which it is carrying in stock to fit all sections of rail, from 16 to 100 lb. per yard.

Government Purchases

WASHINGTON, D. C., August 23, 1910.

Bids will be opened October 20, 1910, at the U. S. Engineer's Office, Vicksburg, Miss., for one self-propelled hydraulic dredge, including steam plant, propelling machinery, electric plant, pumping engine, condenser and evaporator plant, sand pump, suction pipe and ladder, winches and refrigerating plant.

The Navy Department, Washington, will open bids October 1 for power plant at the U. S. Naval Academy, Annapolis, Md.

Paymaster General, Navy Department, Washington, will open bids August 30 under Schedule 2809 for one set of gasoline machinery for motor barge and under Schedule 2791 for one steam locomotive crane.

The Isthmian Canal Commission, Washington, D. C., opened bids August 15 as follows:

Class 1.—For 320 water meters, ⅝-in., and 25 water meters, ¾-in.—Bidder 1, Builders' Material Supply Company, Kansas City, Mo., $2513.95; 2, The Crane Company, Washington, D. C., $2697.30; 5, The Hersey Mfg. Company, Boston, Mass., $4282.60; 7, The National Meter Company, New York City, $4508; 8, The Neptune Meter Company, New York City, $3067; 9, The Standard Water Meter Company, Brooklyn, N. Y., $2860; 10, The Thompson Meter Company, Brooklyn, N. Y., $3003; 12, Henry R. Worthington, New York City, $2406.50.

Navy Department, Washington, D. C., opened bids August 16 as follows:

Class 1.—For one 1100-lb. single frame steam hammer—Bidder 50, Eccles & Smith Company, San Francisco, Cal., $1470; 72, The U. T. Hungerford Brass Company, New York City, $1623; 98, Manning, Maxwell & Moore, New York City, $1500; 115, The Niles-Bement-Pond Company, New York City, $1522; 124, The Pacific Tool & Supply Company, San Francisco, Cal., $1500.

Class 31.—For one automatic hobbing gear machine—Bidder 98, Manning, Maxwell & Moore, New York City, $1585, $3124; 121, The Perrine Machinery Company, Seattle, Wash., $4788.35; 141, Schuchardt & Schutte, New York City, $4788.55.

Class 71.—For two lathes—Bidder 5, The Aumen Machinery & Supply Company, Baltimore, Md., $1202.50; 61, The Garvin Machine Company, New York City, $1284; 98, Manning, Maxwell & Moore, New York City, $1640, $1510; 115, The Niles-Bement-Pond Company, New York City, $1510, $1185.

Class 72.—For three automatic gear cutting machines—Bidder 60, Gould & Eberhardt, Newark, N. J., $6005; 88, J. P. Kemp, Baltimore, Md., $6017.

Class 81.—For one motor driven screw machine—Bidder 118, The National Acme Mfg. Company, Cleveland, Ohio, $2689, $2230.

The Oklahoma Steel, Iron & Wire Fabric Company, Enid, Okla., which was organized last spring with a capital stock of $50,000, advises that it has since that time erected and fully equipped a building, 160 x 220 ft., for the manufacture of field and ornamental fencing, reinforcement mesh for concrete, &c., sheet metal goods, fire escapes and other goods of similar nature. A complete machine shop is included. The company would like to secure the services of a thoroughly experienced man who is familiar with the manufacture of sheet metal goods to act as general manager.

The Omaha Structural Steel Works, Omaha, Neb., has increased its capital stock from $25,000 to $200,000 and is considering the purchase of a tract of 5 or 6 acres of land with trackage facilities, upon which it will erect a plant of much larger capacity than the one now operated for the fabrication of structural steel.

Personal

Harry O'Brien, formerly sales manager of the Seaman-Sleeth Company, Pittsburgh, has resigned to accept the position of superintendent of the hot rolling mill department of the Superior Steel Company, Carnegie, near Pittsburgh. Dan Lewis, formerly of the Algoma Steel Company, Sault Ste. Marie, Canada, takes his old position.

C. R. Gregg, formerly manager of the machinery department of the Scully Steel & Iron Company, Chicago, is now associated with Joseph T. Ryerson & Son in the mechanical department.

The Pittsburgh Coal Company, Pittsburgh, Pa., announces that J. H. Woods has been appointed manager of the lake shipping and fuel department at Cleveland, Ohio, succeeding J. A. Donaldson, resigned.

Mrs. Harriet Clark Fisher, owner and manager of the Fisher Anvil Works, Trenton, N. J., arrived home August 17 from an automobile trip round the world. She sailed for Europe July 19, 1909, in making the start on a journey replete with thrilling incidents. She had four companions, among whom was Harold Fisher Brooks, her nephew and secretary.

W. H. Wonfor, advertising and export manager of the Wm. Powell Company, Cincinnati, Ohio, will leave August 25 for a two months' business trip through Mexico.

Jennings S. Cox, Jr., general manager of the Spanish-American Iron Company's iron ore properties in Cuba, has arrived in New York for a stay of some weeks.

Howard H. Cook, who has been appointed assistant secretary of the American Iron and Steel Institute, in charge of the Institute's newly opened headquarters at 30 Church street, New York, has been connected for the past three years with the Bureau of Corporations at Washington.

The State Department has designated Dr. W. H. Tolman, director of the American Museum of Safety and chairman of the American Executive Committee of the International Committee on Social Insurance, a delegate on the part of the United States to the International Congress on Workmen's Insurance, to be held at The Hague, September 6 to 9. Among the questions to be discussed is the extension of social insurance to include others than workmen—that is, small trades people, shop keepers and farmers—provisions for widows and orphans by means of insurance, and insurance against unemployment.

James C. Wallace, Cleveland, Ohio, president of the American Shipbuilding Company, returned last week from a European trip.

E. T. Adams has resigned as chief engineer and manager of the gas and mill engine department of the Allis-Chalmers Company, West Allis, Wis., a position which he has held for the past five years. For many years he was the personal assistant of the late Edwin Reynolds in the old Edward P. Allis Company, and during that time specialized in low lift pumping, designing several of the largest and most efficient pumps of this class that have ever been built, notably those for the Thirty-ninth street station at Chicago, which gave a duty of approximately 150,000,000 ft.-lb. per 1000 lb. of dry steam, a 50 per cent. increase of economy over any previous mark. When the present Allis-Chalmers Company was formed he was manager of the pumping engine department, but resigned to go with the Westinghouse Machine Company as engineer in charge of the gas engine division. In this position he had charge of the design of the present Westinghouse large gas engine, the first built in this country for blast furnace and producer gas work. After nearly three years with the Westinghouse Company he returned to the Allis-Chalmers Company to take the position which he has just resigned. He designed the present Allis-Chalmers gas engine. During the last three months Mr. Adams has been abroad studying progress there with the internal combustion engine, including the Diesel engine.

E. R. Bowen, who has been associated with the Carnegie Steel Company for a number of years, has been appointed assistant manager of sales at its Philadelphia office, representing also the Illinois Steel Company and the Tennessee Coal, Iron & Railroad Company in the same capacity.

E. C. Sattley, manager of the Monessen, Pa., plant of the Page Woven Wire Fence Company, has been elected a director of the company and a member of the Executive Committee.

H. T. Wigham, manager of the London, England, office of the United States Steel Products Company, is now in this country on his annual visit, and was in Pittsburgh this week. Mr. Wigham expects to sail for England on September 5.

E. Steytler, assistant sales manager of the Pittsburgh Steel Company, is lying seriously ill in St. Francis Hospital, in that city, but strong hopes are entertained for his complete recovery.

Charles C. Cluff has been appointed manager of sales for the New York district of the Carnegie Steel Company, succeeding Charles W. Baker, who has resigned. Richard Wayland-Smith succeeds Mr. Cluff as assistant manager of sales. These appointments are effective September 1.

W. L. Kluttz has been appointed general superintendent of the Thomas Division of the Republic Iron & Steel Company, Southern district, succeeding J. E. Johnson, Jr., resigned, taking effect September 1.

Obituary

JOSEPH IRELAND IRWIN, Columbus, Ind., died August 13, at his summer home in Windermere, Ont., aged 86 years. He built the Indianapolis, Columbus & Southern Traction Company, the first traction line out of Indianapolis. He was president of the Union Starch & Refining Company, Edinburg, Ind. He was one of the founders of the National Tin Plate Company, Anderson, Ind., built in 1894-1895, and of a company of the same name which built a plant in 1897-1898 at Monessen, Pa., both owned now by the American Sheet & Tin Plate Company. President Harrison offered him the portfolio of Secretary of the Treasury, but he declined it.

EDWARD T. GILBERT, vice-president and treasurer of the Michigan Bolt & Nut Works, Detroit, Mich., died August 8.

OTIS H. CHILDS, chairman of the Executive Committee of the United Engineering & Foundry Company, Pittsburgh, Pa., died August 22 at Cleveland, Ohio, where he had gone for medical treatment. The cause of his death was apoplexy. He was 53 years old.

The American Society of Engineering Contractors.—This society, of which D. E. Baxter, 27 William street, New York, is president, and D. J. Hauer, 13-21 Park row, New York, secretary, will hold its annual convention in St. Louis, September 27, 28 and 29, in the Coliseum. The local Committee of Arrangements is E. H. Abadie, chairman; J. L. Westlake, W. C. Swartout and L. C. F. Metzger. Papers will be delivered by J. B. Goldsborough and Ed. Wegmann, both of New York, on "Dam Construction for City Water Supplies," and by George C. Warren of Boston on "Work Preliminary to Street Paving and Road Work." A banquet will be held, and several sight seeing trips will be made to important engineering work in and around St. Louis. The society has now nearly 800 members.

Iron and Industrial Stocks

NEW YORK, August 24, 1910.

Prices of securities have shown a downward tendency, which may probably be attributed to the apprehension of a scarcity of money caused by the demand for moving the crops. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chalm., com.	9	Pressed St., pref.	95½
Allis-Chalm., pref.	32 - 33½	Railway Spr., com.	32 - 34
Beth. Steel, com.	261/2 - 28¾	Republic, com.	30¾ - 34⅜
Beth. Steel, pref.	57 - 59¾	Republic, pref.	94 - 95½
Can. com.	8⅝ 9	Sloss, com.	57 - 59
Can. pref.	67¾ - 69⅝	Pipe, com.	15 - 16½
Car & Fdry, com.	47½ - 50⅛	Pipe, pref.	57¾
Car & Fdry, pref.	110½	U. S. Steel, com.	69¼ - 73¾
Steel Foundries	43 45	U. S. Steel, pref.	116 - 117⅝
Colorado Fuel	30 - 32¾	Westinghouse Elec.	59½ - 62½
General Electric	144 - 145	Am. Ship, com.	78
Gr. N. ore cert.	54 - 57	Chi. Pneu. Tool	36 - 36½
Int. Harv., com.	95¾ - 98½	Cambria Steel	42¾ - 43⅝
Int. Harv., pref.	117¾ - 118	Lake Sup. Corp.	21 - 23
Int. Pump, com.	40¾ - 40⅞	Pa. Steel, pref.	105¼ - 108
Int. Pump, pref.	81⅝ - 82¼	Warwick	9¾ 10
Locomotive, com.	34¼ - 39	Crucible St., com.	121½ - 127
Nat. En. & St., com.	16 - 16⅝	Crucible St., pref.	76¼ - 77⅜
Pressed St., com.	34¾ - 37½		

Dividends.—The Harbison-Walker Refractories Company has declared the usual quarterly dividend of ½ of 1 per cent. on its common stock, payable September 1.

Trustees of the Great Northern Iron Ore properties have declared a dividend of 50 cents a share, payable September 15. A dividend for the same amount was declared six months ago and $1 a share a year ago.

The J. A. Fay & Egan Company, Cincinnati, paid August 20 the regular quarterly dividend of 1¾ per cent. on its preferred stock.

The Collins Gear & Motor Company, recently organized at Pittsburgh with $250,000 capital stock, has purchased the plant of the Simpson Stove & Mfg. Company, Canonsburg, Pa., which has been idle for several years, and will change it into a plant for the manufacture of automobile axles, gears and motors. The new company will also erect another building, 60 x 300 ft., and expects to have the plant ready for operation about December 1. J. J. Flannery is president; D. P. Collins, vice-president and manager; J. M. Flannery, secretary, and H. A. Neeb, treasurer, all of Pittsburgh.

Announcement is made by James Bowron, vice-president of the Southern Iron & Steel Company, that on September 15 three open hearth furnaces and the blooming mill at the Alabama City, Ala., plant will be put in operation. It is also announced that a battery of 60 coke ovens will be put in operation at the Trussville, Ala., plant September 15, and that the furnace at Alabama City, Ala., will be blown in on basic iron about September 1.

The Western Pacific Railroad Company's first official passenger train through from San Francisco to Salt Lake was run August 18. Regular passenger service commenced August 22. The initial regular service consists of one train a day in each direction, with a running time between the two cities of about 36 hours. The new line is 921 miles long and has been in course of construction since September, 1905.

The new steel car ferry of the Marquette & Bessemer Dock & Navigation Company, which is being built to take the place of the one that was destroyed in a wreck late last season, will be launched at the Cleveland yards of the American Shipbuilding Company, September 3. It will be known as the Marquette & Bessemer No. 2.

The new lake freighter, the W. B. Dickson, named in honor of the first vice-president of the United States Steel Corporation, which is being built for the Pittsburgh Steamship Company, will be launched at the Ecorse yards of the Great Lakes Engineering Works, near Detroit, August 27.

The Use of Cast Iron Borings in the Foundry

By briquetting cast iron borings they can be used in the cupola in the same manner that scrap or pig iron is used. A method suggested by the S. Obermayer Company, Cincinnati, Ohio, now manufacturing and offering for sale a briquetting borings compound, is as follows:

Use 50 lb. of the briquetting compound to 1 ton of borings, mixing thoroughly in a dry state. Add sufficient water to temper this mixture, making it of about the same consistency as an ordinary core sand mixture. Next take a box taper mold of ordinary boards, measuring, say, 6 x 12 in. at the bottom and 7 x 13 in. at the top, which will make a block weighing from 50 to 55 lb. The taper mold is preferred, as it enables the block to come out of the mold more easily. After filling the mold with the mixture of briquetting compound and borings, it can be compressed with a small hydraulic or molding machine or by a compressed air or hand press, or it can be rammed by hand equally well. The blocks should then be placed in a temperature of approximately 75 to 80 degrees and permitted to remain in that temperature for about 48 hours. They will then be ready for use and can be dropped in the cupola in the same manner as pig iron.

The suggestion is made that the briquettes should not be used on the bed of the cupola, but in the charges following. For instance, the pig iron can be placed in the cupola in the usual manner, then the quantity of scrap desired and then the quantity of briquetted borings. This method appears to give the most satisfactory results. From experience with this material, from 10 to 15 per cent. of borings may be used to each charge in the cupola.

On application of Thomas S. Davis and George W. Todd, stockholders of the Diamond State Steel Company, Wilmington, Del., which went into receivers' hands in 1905, Judge Holland of the United States Circuit Court, Philadelphia, Pa., appointed Ira J. Williams as ancillary receiver. The action was taken to facilitate the recovery of certain assets of the company.

H. H. McClintic and L. L. Elwel of the McClintic-Marshall Construction Company, Pittsburgh, fabricators of structural steel, have gone to Panama in connection with the large contracts for Panama lock gates taken about a month ago by that company.

The Deforest Sheet & Tin Plate Company, Niles, Ohio, closed its plant several days last week to enable it to make repairs to leaky boilers. All departments are again in full operation, with business booked that will permit steady operations for some time.

The Potts Brothers Iron Company, Pottstown, Pa., will on August 29 start its plate mill, which has been idle for 18 months. The puddle mill, which was shut down in February, this year, will be put in operation at the same time.

The Republic Iron and Steel Company has blown in an additional furnace at its Thomas, Ala., plant, making a total of three stacks now being operated on foundry iron.

Newfoundland last week celebrated the three hundredth anniversary of the first permanent settlement on the island by John Guy and a party of Pilgrims from England in 1610.

The National Tube Company has blown out its No. 1 furnace at Lorain, Ohio, and also its No. 4 Monongahela furnace at McKeesport, Pa.

Sheet and Tin Plate Mill Strike Ended

At a meeting of the Executive Board of the Amalgamated Association, held in Pittsburgh August 23, it was decided to call off the strikes at the sheet and tin plate plants of the American Sheet & Tin Plate Company and also the sheet mill plants of the Youngstown Sheet & Tube Company, East Youngstown, Ohio, and the La Belle Iron Works, at Steubenville, Ohio, on August 27. This action, taken in spite of a recent vote of the members of the association against it, indicates that the officials of the association realize fully that the strikes at these different plants are hopelessly lost and nothing is to be gained by continuing them.

The strike at the plants of the American Sheet & Tin Plate Company started July 1, 1909, and was caused by the announcement that the plants of this company would be operated on the open-shop plan. Later the Youngstown Sheet & Tube Company and the La Belle Iron Works took the same stand and their men struck. These strikes were practically lost months ago, and the companies have been able to operate with nonunion men, with the exception of two or three mills of the American Sheet & Tin Plate Company, which it did not desire to operate. The sheet mills of the Youngstown Sheet & Tube Company and La Belle Iron Works have been in full operation for some months.

The Keystone Steel Foundry Company.—This company, with plant at Avonmore, Pa., on the West Penn Division of the Pennsylvania Railroad, on August 6 placed its new steel casting department in operation, and is now manufacturing a line of steel castings for miscellaneous uses. Its capacity is 75 tons a day, and includes castings from 1 lb. to 10 tons. The concern is engaged in the manufacture of iron castings for eight new open hearth furnaces for the Republic Iron and Steel Company, Haselton, Ohio, for which the Alex. Laughlin Company, Pittsburgh, has the contract. The daily capacity of the gray iron foundry of the company is from 16 to 20 tons. The concern will shortly install a new oxyacetylene welding plant for use in welding and cutting heads off of castings, which is a distinct improvement over the older method of cutting with cold saws. The company is now represented by the following agencies: Harry B. Hart, 303 Elks' Temple, Detroit, Mich.; Robert S. Bishop, Evans Building, Washington, D. C., and W. D. Curry, 431 Frick Building, Pittsburgh Pa. The officials are: Charles Biehl, president; John Sauers, vice-president, and John Weilersbacher, secretary and treasurer, and Louis H. Bregenzer, superintendent. The concern makes a specialty of steel castings for railroad and high-grade service and its gray iron foundry is specially equipped for mill work of all kinds. Its plant is operating to full capacity.

The Argentine International Exposition.—Circular No. 24, issued by the International Exposition of Railways and Land Transport at Buenos Aires, now in progress, and which is to end in November, has just been received. This circular comprises 24 pages of illustrations and descriptive matter. The text presents the history of the Revolution in 1810, which resulted in the independence of the Argentine Republic, in commemoration of which the exposition is now being held. It is an interesting narration of this most important event in Argentine history. Other articles give information to exhibitors and regulations governing the exposition. The illustrations are views of a considerable number of the principal buildings in the city, notable bridges, street scenes, docks and parks.

New Railroad Equipment Orders.—The *Railway Age Gazette* notes that the New Orleans, Mobile & Chicago has ordered 200 flat cars and 100 box cars from the American Car & Foundry Company; the Nevada Northern, 175 Ingoldsby dump cars from the Pullman Company, and the Southern Indiana, 484 coal and 7 caboose cars from the Haskell & Barker Car Company. The Texas Pacific is building 300 flat cars at its Marshall, Texas, shops. The Kansas City, Mexico & Orient is in the market for 11 passenger cars. A contract for nine Pacific type passenger locomotives for Korea has been placed by the Japanese Government with the American Locomotive Company. An order has been placed with the same company by the United States Steel Corporation for 15 locomotives.

The Chandler & Price Company, Cleveland, Ohio, manufacturer of printing machinery, has let the general contract for a large foundry addition to its plant to the W. B. McAllister Company, Cleveland, Ohio. The contract for the structural steel work has been awarded to the Riverside Bridge Company, Martins Ferry, Ohio. The building will be of structural steel brick and concrete, with concrete floors, four stories and basement. It will be triangular in shape, 50 x 162 x 200 ft. The first floor will be used for storage, the second floor for a core room and cleaning room, and the third floor, which will be the highth of two stories, will contain the molding room. A wing will be built for a new power plant. Contracts for the equipment have not yet been placed. It will include about six molding machines, two 10-ton cranes, a jib crane, coal, ash and sand conveying machinery, and an elevator. The power plant equipment will consist of one 125-kw. and one 250-kw. generator, two 250-hp. boilers, stokers, water heaters, &c.

The Associated Foundry Foremen of Philadelphia and vicinity will hold a banquet at the Hotel Bingham in that city on September 24. Plans are under way for an elaborate affair, subscriptions for which have been placed at $5 a plate. The following committee has charge of arrangements: President C. R. Brown, E. E. Brown & Co.; George M. Benkert, Fairmount Foundry Company; George W. Moore, J. W. Paxson Company; H. Bing, Bing Foundry Company; Thomas G. Smith, Midvale Steel Company; F. W. Robinson, W. C. Robinson & Co., and Secretary D. M. Kittenger, Pencoyd Iron Works.

The Wells Brothers Company, Greenfield, Mass., is sending the foremen of the various departments of the factory and their families on outings during the summer months. These outings take the form of all-day automobile trips through the surrounding country and to the nearby cities and towns. Usually two of the foremen are sent at each time, the company providing a touring car and paying all expenses. Each trip is about 125 miles long, occupying a full day. Dinner is arranged for at one of the hotels at the point of destination. These trips are all to different places, and have proved very enjoyable to the participants.

The Ingram-Richardson Mfg. Company, Beaver Falls, Pa., makers of porcelain enameled iron signs, has secured contracts for automobile license tags from the States of Connecticut, Massachusetts, Ohio, Michigan and Minnesota. These contracts will amount to about 300,000 plates. This company is putting up an addition to its plant, for which all contracts have been let and all machinery bought, work being pushed as fast as possible.

One of the Cherry Valley furnaces of M. A. Hanna & Co., at Leetonia, Ohio, was blown out last week, and will be relined if an examination shows the necessity for it.

Warwick Iron & Steel Company Improvements

The Warwick Iron & Steel Company, Pottstown, Pa., is constructing an ore bridge to be used in connection with the Brown ore-handling apparatus, to replace two steam locomotive cranes which for the past 10 years have been used for handling ore in its ore yards and also for rehandling it to the ore bins of the furnaces. Following the installation of the Gayley dry air plant, the product of the company's Nos. 1 and 2 furnaces was so increased that it found the present steam cranes inadequate. On several occasions the furnaces were seriously embarrassed on account of railroad deliveries being held up by snow storms or other causes, when the steam cranes were called upon to handle all the ore from stock piles necessary to keep the furnaces in operation. Improvements in ore handling machinery at Buffalo, as well as prospective changes at Port Richmond, Philadelphia, made it necessary to provide for more prompt handling of cars, so as to give the cars quick unloading, which was impossible with the steam cranes.

When this company was using large percentages of lake ores the ore docks at Buffalo and Erie furnished a convenient storage place during the winter season, so that it was unnecessary to provide storage room at the furnaces for all of its winter requirements. With foreign ores largely replacing lake ores, it was necessary, however, to provide storage room at the furnace for a large tonnage of ore, as there is no storage place provided at Philadelphia by the receiving railroad companies. The vicissitudes of ocean navigation, together with the irregular supply of vessels to deliver the foreign ores to the port of Philadelphia, was another argument in favor of the erection of improved ore-handling machinery to enable it to handle material and also to escape possible heavy charges for detention of cars under rules of the Interstate Commerce Commission.

Influenced by these conditions it was decided to erect the Brown ore-handling apparatus, which is now in course of erection. It is estimated that with this improved equipment a saving of several cents per ton will be saved in the cost of production of pig iron.

The St. Louis Car Company's Affairs.—The new plan for the reorganization of the St. Louis Car Company, St. Louis, Mo., means, industrially and financially, very much to the city. John I. Biggs, the Milwaukee capitalist, will, it is reported, have an interest approximating $1,000,000 which, with new money furnished by the president of the company, George J. Kobusch, and funds derived from the sale of the company's new preferred stock to a London syndicate, will, it is expected, realize $2,500,000. The car company has had a capital stock of $3,000,000, all common, and a bonded debt of $685,000, according to Poor's *Manual*. Its gross business when operated to full capacity is $10,500,000 a year, giving employment to 3700 workmen. The plant of the company, which is situated in North St. Louis, occupies 50 acres. Contracts have recently been accepted, representing a value of about $700,000, for the building of cars. Some of the largest orders for cars have been received from the Harriman electric railroads in the Far West, while others came from New Orleans and Milwaukee.

The National Roll & Foundry Company, Pittsburgh, with plant at Avonmore, Pa., uses a considerable tonnage of steel castings each month, which it procures from outside sources. To bring the manufacture of this product within its own control, the company contemplates enlarging its foundry and installing two fair sized open hearth furnaces. The complete details have not yet been mapped out, but will be available a little later. The company's property consists of about 16 acres of level land, on which additions are erected from time to time to care for its growing business. It is installing a new 200-hp. water tube boiler.

In a recent issue of the *Amalgamated Journal*, the official organ of the Amalgamated Association at Pittsburgh, the companies named below are stated to have signed the Amalgamated scale for the year ending June 30, 1911:

Whitaker Glessner Company, Wheeling, W. Va., and Martins Ferry, Ohio.
National Enameling & Stamping Company, Granite City, Ill., and St. Louis.
American Rolling Mill Company, Middletown, Ohio.
Carnahan Tin Plate & Sheet Company, Canton, Ohio.
Newport Rolling Mill Company, Newport, Ky.
Pope Tin Plate Company, Steubenville, Ohio.
Atlanta Tin Plate & Sheet Mill, Atlanta, Ind.
Follansbee Bros. Company, Follansbee, W. Va.
Empire Iron & Steel Company, Niles, Ohio.
Thomas Steel Company, Niles, Ohio.
De Forrest Sheet & Tin Plate Company, Niles, Ohio.
Zug Iron & Steel Company, Pittsburgh, Pa.
Youngstown Roofing Company, Youngstown, Ohio.
N. & G. Taylor Company, Cumberland, Md.
Top Mill Sheet Mill, Wheeling, W. Va.
Licking Rolling Mill Company, Covington, Ky.
Joliet Iron Products Company, Joliet, Ill.
Texas Rolling Mill Company, Fort Worth, Texas.
Cleveland Hardware Company, Cleveland, Ohio.
Judson Mfg. Company, Oakland, Cal.
Westerman Company, Lockport, N. Y.
Cincinnati Horse Shoe & Iron Company, Cleves, Ohio.
Griffiths Charcoal Iron Mills, Washington, Pa.
Tyler Tube & Pipe Company, Washington, Pa.
Union Sheet & Tin Plate Company, Marietta, Ohio.
Ewald Iron Company, Louisville, Ky.
Republic Iron & Steel Company.
Brown & Bonnell Works, Youngstown, Ohio.
Mahoning Valley Works, Youngstown, Ohio.
Toledo Works, Toledo, Ohio.
Inland Works, East Chicago, Ind.
Tudor Works, East St. Louis, Ill.
Corns Works, Massillon, Ohio.
Sylvan Works, Moline, Ill.
Gate City Works, Gate City, Ala.
Western Bar Iron Association Mills.
American Car & Foundry Company, Detroit, Mich.
Empire Rolling Mill Company, Cleveland, Ohio.
Fort Wayne Rolling Mill Company, Fort Wayne, Ind.
Highland Iron & Steel Company, Terre Haute, Ind.
Interstate Iron & Steel Company, East Chicago, Ind.
Helmbacher Forge & R. M. Company, Madison, Ill.
Helmbacher Forge & R. M. Company, St. Louis, Mo.
Kansas City Bolt & Nut Company, Kansas City, Mo.
Lake Erie Iron Company, Cleveland, Ohio.
National Rolling Mill Company, Vincennes, Ind.
Ohio Falls Iron Company, New Albany, Ind.
Union Rolling Mill Company, Cleveland, Ohio.
Railway Steel Spring Company, Detroit, Mich.

The World C. & C. R. Systems Company, Kirksville, Mo., manufacturer of cash and credit registers, has plans prepared for a new plant, which will cover 7½ acres. There will be 14 buildings, the largest of which will be 287 ft. in length, three stories. The company is negotiating with a number of cities which are trying to secure the new plant, but no definite decision has been reached as yet.

The Reliance Electric & Engineering Company, Cleveland, has just completed a contract for over 100 Reliance adjustable speed motors and Reliance constant speed motors for the Chicago Railways Company, Chicago, Ill. These motors are to be used to convert to individual drive the entire equipment of the latter company's machine and woodworking shops.

Isabella Furnace, No. 2, of the Carnegie Steel Company, in the Pittsburgh district which is being rebuilt, will be equipped with an external water cooling system, extending from the furnace top to the hearth jacket, the bosh being cooled in the same manner as that portion of the shell above the mantle. This equipment practically eliminates the use of cooling plates and the troubles usually incident to their use.

The Vulcan Plow Company's Bonus System

The plan by which the Vulcan Plow Company, Evansville, Ind., gives an annual bonus to its deserving factory employees, was inaugurated by the president of the company, Major A. C. Rosencranz, in 1906. It was his desire that all who, by faithful service and hard work, were contributing to the successful operation of the business should share in its profits. The first year the plan was put in operation on a conservative basis, through the distribution of $1300 among 22 foremen and workmen in amounts ranging from $25 to $150 each. The plan has since been enlarged from year to year, until in 1910 the total distribution approximated $5000, with about 100 employees participating.

In general, participation has been limited to those who have been employed 12 months or longer, and who have shown interest in their work. The amount each man receives is based on recommendation of the superintendent, subject to revision by the president. Careful consideration is given to each workman as regards his skill, reliability and value as a producer, character and length of service.

In the foundry, where all molding is piecework, a method of scoring has been adopted by which the amount of bonus each molder receives is determined largely by a continuous record of his attendance and output of castings, kept by the foundry timekeeper. A certain sum ($50) is allotted to each molder for a perfect record of attendance—*i. e.*, upon condition that he put up his full floor of molds every day throughout the year. From this sum $2 per day is deducted for every day lost and $1 for every day that less than 90 per cent. of his floor is put up. In case of illness lasting more than one week, with the patient under a doctor's care, the deduction is reduced to $1 per day.

A similar sum is allotted to each molder who carries the maximum amount of work that it is considered possible for an expert on each class of work to accomplish. Molders of less physical strength, energy and diligence share in proportion, as the total average amount of the piecework on their floors measures up to the maximum floor. Likewise a sum is set for a perfect record as regards discount or scrap castings, with smaller sums possible to molders whose discount amounts to 1, 2, 3, 4 or 5 per cent. of their regular floor.

In addition to these sums $25 is allowed to all men whose general attitude and spirit are satisfactory. Usually all molders are included under this item. First year apprentices are permitted to share in the plan on a basis of one-half the amounts allowed to journeymen molders, and all other apprentices share alike with the older men.

The total of these four amounts constitutes the bonus paid to molders. Under this plan several first-class men have received $100 or more, but the second grade workmen, who lose considerable time, receive but a comparatively small amount. This bonus is not considered as a part of a man's wages, but is rather a token of appreciation of valuable service rendered. No definite promise concerning it is made to the men, but it is the intention of Major Rosencranz to continue to make such an annual distribution as long as the profits of the business will justify it. In addition to the bonus fund set aside for the factory workmen, a sum is set aside for the salaried employees, which is usually distributed as a percentage on the salaries.

The bonus plan is an indication of the general policy of fair and liberal treatment of its employees by the company. In 1886 the working day was voluntarily reduced from 10 to 9 hours, on which basis it is still maintained.

The use of modern machinery and improved methods of manufacturing makes it possible to pay exceptionally high piecework and daywork rates. Deserving workmen are advanced in wages and grade of work as rapidly as their ability will warrant, and fair and impartial treatment is accorded to all. The shops are well lighted and kept free of dust by an efficient and exhaust system. Sanitary washrooms with shower baths and lockers contribute to cleanliness and comfort.

In case of accidental injury, whether the injured workman was at fault or not, medical attention is paid for by the company and one-half or more of the usual wages is given to injured workman while off duty. In addition, a Mutual Benefit Association, which pays sick and death benefits, is maintained by the employees and fostered by the company. Several employees have been assisted in the purchase of homes by arrangement with Major Rosencranz for monthly payments. All these things have aided in building up an organization of competent, contented and self-respecting workmen. Drunkenness is practically unknown, and profane or obscene language is seldom heard. The spirit of loyalty displayed by the employees is also very gratifying to the management.

Western Canada and the Steel Duties

A Tariff Problem for the Government

TORONTO, August 20, 1910.—When the Canadian Finance Minister communicated to the House of Commons last session the Government's purpose not to renew the bounties on iron and steel, he added that it was to be expected that the domestic manufacturers of iron and steel would ask for higher customs duties by way of compesation The Premier's tour of the West must have convinced him that, however other productive interests might regard a proposal to increase the duty on iron and steel, the Western farmers would be against it. At its last annual meeting the Western Grain Growers' Association, in which a large proportion of the farmers is represented, the policy of the Government in the matter of fostering the home production of iron and steel was strongly condemned. The Provincial branches of this association in Manitoba, Saskatchewan and Alberta brought this subject to Sir Wilfred Laurier's attention in the course of his present visit to the West, and the Premier heard some very plain talk expressing the farmers' views. It was intolerable, he was told, that steel rails manufactured in Canadian works should be sold for $24 a ton in the Punjaub and for $29 in Canada. The president of the Western Grain Growers' Association at Saskatoon pointed to some anomalies in the harvest machinery trade. The International Harvester Company has works at Chicago, Ill., and at Hamilton, Ont. The freight from Chicago to agricultural centers in Idaho is supposed to be about the same as from Hamilton to Saskatchewan. Yet, according to the Grain Growers' Association, the company sells its mower to the Idaho farmer for $48 and to the Saskatchewan farmer for $65. It is also a grievance of the Wsetern farmers that self-binders made in Toronto are sold in England for $147.24 and in the Canadian West for $168.

Unquestionably the agricultural opposition to the bounties and duties on iron and steel, as well as to the protection of industries utilizing iron and steel as material, has been stiffened by the recent mergers and by rumors of other mergers. In the West, too, the antagonism to protection has been intensified by the disappointment with the crop in the southern belt. This year a large proportion of the farm population beyond the Great Lakes will have to make their money go as far as possible, and the disparity between Canadian and United States prices for agricultural implements and other products into which iron and steel largely or solely enter will be particularly irritating. As the next

session is expected to be the last before the general elections, it would be rash for the Government to do anything for the iron and steel industry by way of offsetting the abolition of the bounties, for Western Liberal members would have to vote against such an arrangement. If they failed to do so, they would find their seats in danger.

Western Canada now furnishes a large part of Canada's consumptive demand for steel. As there are not in the prairie country or within striking distance of it any domestic industries producing from the ore forms of steel other than rails, the West tends to look to mills and shops across the line for its staple steel articles, machinery, &c. The Western Canadian demand is, in fact, very largely tributary to plants in the Western United States. Unless steel industries and derivative works spring up in the prairie country, it will be difficult for the Government to justify there its adherence to the protective policy in relation to iron and steel and the principal products of these materials. If there were local industries of this fundamental character there might be more cogency in the argument that the farmer was getting the benefit of a capacious home market in return for the price paid by him for protection. But it is to the export market that the Western farmer looks for the sale of the bulk of his produce.

C. A. C. J.

Curtailing the Lake Ore Output

Several Mines Shut Down—Old Range Developments

MARQUETTE, MICH., August 20, 1910.—Oglebay, Norton & Co.'s Bristol mine, the largest producer in the Crystal Falls district of the Menominee range, has reduced its working force from 275 to 200 men. A new shaft is to be sunk at this property. Pickands, Mather & Co. have suspended work at their Channing and Warner explorations in the Amasa field, north of Crystal Falls. This shutdown, which is for an indefinite period, affects 50 men. Work at the Channing had been in progress two or three years and it was generally supposed that a mine was on the eve of development. Railroad facilities had been provided by the Chicago, Milwaukee & St. Paul Company. The Cambria Steel Company has trimmed down the force of employees at its Republic mine, on the Marquette range, to the extent of about 50 men. All operations at Rogers, Brown & Co.'s Ohio property at Michigamme, Marquette range, have been suspended. The adjoining Portland mine, owned by the same interests and which produces a similar grade of ore, will continue to be worked vigorously. The Portland is operated by the steam shovel method and its costs are materially less than at the Ohio.

The Antoine Ore Company's Traders' property at Iron Mountain, Menominee range, is in commission again, after having been idle a fortnight or more. Orders had been received to pull the pumps and cease production, and the workings had filled with water when new instructions directed the resumption of mining operations. A force of 125 men is now employed and shipments are again proceeding briskly. Some 75,000 tons have been sent out so far this season.

The Chicagon property, midway between Iron River and Crystal Falls, is to be provided with shipping facilities this season. A branch line will be built by the Chicago & Northwestern Railroad and will also reach other properties of much promise. It is expected that the Chicago, Milwaukee & St. Paul will also tap the district in the not distant future, this with its proposed extension from Crystal Falls to the Iron River country. The Chicagon is operated by the Buffalo & Susquehanna interests. It has been under development the past few years and has opened a very considerable body of ore.

Development and Exploration Work

A find of importance in the Crystal Falls field is the discovery at the Lot Three property of what appears to be a good sized deposit. The strike was made at a depth of 425 ft., where both drifting and cross cutting are in progress. The ore is free of rock, so far as cut, and that already hoisted appears of wholly satisfactory grade. The Lot Three is a property of the International Harvester Company.

The Steel Corporation is exploring the Hilltop tract at Crystal Falls. A diamond drill is being used and the property will be thoroughly and systematically tested. The Hilltop adjoins the 40, where Benjamin Neely of Negaunee drilled into a large body of ore some months ago, and it is believed that it carries the extension of that deposit. The Spring Valley Mining Company, auxiliary to the Wellston Furnace Company of Wellston, Ohio, and in which Eugene Zimmerman of Cincinnati is largely interested, is undertaking exploratory work in the Wisconsin portion of the Menominee range, midway between the Crystal Falls and Iron Mountain districts. The property to be tested is in Section 24, 40-17, 3 miles west of the Florence mine. The indications are very favorable. A contract for diamond drill work has been awarded to the Cole & McDonald Exploring Company. The Spring Valley Company already has developed the Zimmerman mine in the Iron River district, which is a fine property.

At its big Chapin mine, at Iron Mountain, the Steel Corporation is erecting one of the largest and most modern miners' dry houses on the Menominee range. The building is of stone and steel and will cost $12,000. It will be 64 x 104 ft. in ground dimensions, will contain 660 steel lockers for the clothing of the men and will be equipped with shower baths and enameled wash fixtures. The construction will be in accordance with the very latest ideas in dry house erection and will be as near perfection from a sanitary standpoint as possible.

The Kloman Iron Company's property at Republic, Marquette range, is to be equipped with an engine and boiler house, 20 x 100 ft. The boiler plant will be of 200 hp. The engine, hoist and other equipment formerly employed at the Saginaw mine, at Norway, a Menominee range property abandoned a year ago, will be erected at the Kloman. The company's decision to install a plant of machinery would indicate that the exploratory work has been decidedly satisfactory. The Kloman is in the hands of the Jones furnace interests of Iron Mountain.

The United States Steel Products Export Company, 30 Church street, New York, has changed its name to United States Steel Products Company. The change in name is due to the fact that the company handles the entire foreign business of the subsidiary companies of the United States Steel Corporation, comprising all purchases of foreign material for their use as well as all exports of their products, in addition to which it conducts a construction business in foreign countries. The charter has been broadened, increasing its powers.

The plant of the Canton Iron & Steel Company, Baltimore, Md., and a quantity of crude and finished materials on hand, were sold at receivers' sale August 17. The plant was disposed of on a bid of $55,100 to John Brown, while the materials on hand went to the same bidder at approximately $13,000. While it is not known whom the bidder represented, it is believed that the plant and stock were bought for the Bauernschmidt interests.

The New Cincinnati Cone-Driven Miller

While there is a recognized field for the heavy and powerful single pulley type milling machine which has been brought to such a high state of development, there is still a demand for a cone driven miller capable of handling work as fast and accurately as the other type. Appreciating this, the Cincinnati Milling Machine Company, Cincinnati, Ohio, has redesigned its entire line of cone driven milling machines, and the accompanying illustrations show the more important improvements that have been made. Fig. 1 is a view of the redesigned machine, while Figs. 2 and 3 are front and rear views of the gear box.

keynote of the entire design is simplicity, coupled with ease in operation, and all the feed changes are obtained through the 12 gears shown between the housings. The drive is direct from the face gear, which meshes with the feed gear A, and power is transmitted through the change gears mounted on the two shafts in the feed box to the gear B, which drives the universal joint shaft.

The tumbler construction is the most striking feature of this design and is in the form of a large diameter cylinder supporting the tumbler shaft and the gear and in turn supported in the frame of the feed box This type of construction is said to eliminate all bending of the tumbler shaft, as well as vibration in the tumbler. While the tumbler operating lever projects through a hole in the feed box in the usual way, this

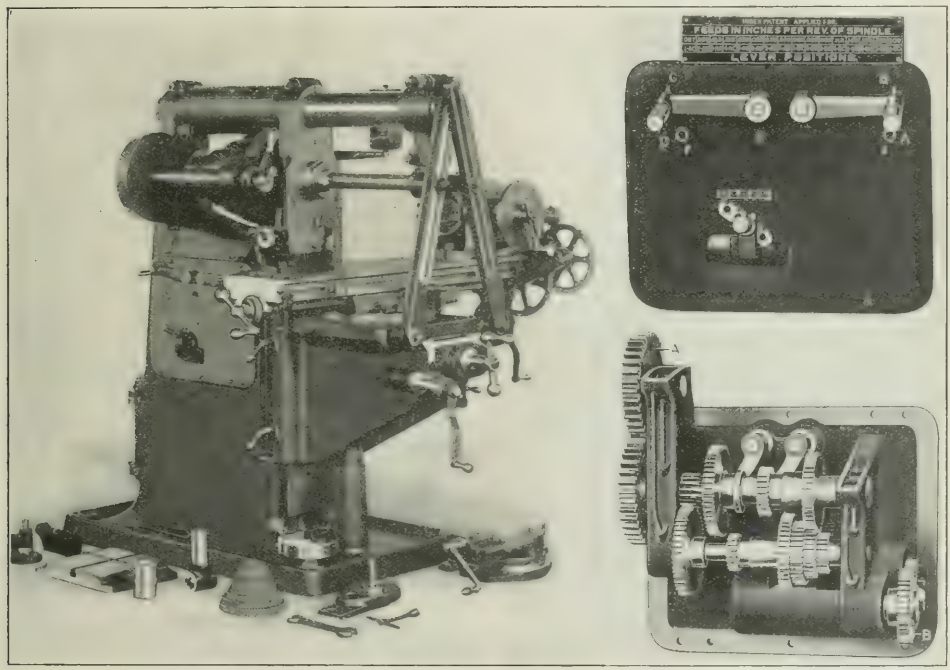


Fig. 1.—General View of the Machine.

Fig. 2. Front View of the Gear Box.
Fig. 3.—Rear View of the Gear Box.

The Cone-Pulley Driven Milling Machine, Built by the Cincinnati Milling Machine Company, Cincinnati, Ohio.

The column is similar to that used on the high power machine and is a symmetrical box section with straight lines, large enough to contain the feed driving mechanism. A single group of gears mounted in the column at a sufficient hight from the floor to bring all the operating levers within easy reach of the operator provide for feed changes, which range from 0.007 to 0.3 in. per revolution of the spindle. The lever arrangement and the feed index are shown in Fig. 2, and all of the 16 changes provided are obtained through the three levers shown. In making these changes one or all of the levers are shifted to correspond with the positions given on the feed index, which is mounted directly above them. This is of the same simple form as that used by this company on its line of high power machines and offers no chance for confusion, as the exact positions are plainly given below the figures representing the different feed rates and the operator simply has to move the levers to the positions indicated.

The inside of the feed changing mechanism is shown in Fig. 3. It is a single unit and when placed in the column becomes an integral part of the machine. The opening is completely closed at all times and thus the inside mechanism is thoroughly protected from dust.

Scarcity of labor in many countries is forcing the farmers to adopt labor-saving machinery, according to the Bureau of Manufactures of the Department of Commerce and Labor. A bulletin it has issued shows that nearly $30,000,000 worth of agricultural machinery was exported from this country in the fiscal year just ended, Russia and Argentina being the best markets. In Russia the competition is keen, as Germany sold about $8,000,000 worth of farm machinery to that country in 1909 and England $5,000,000 worth, while an estimate places the amount of American machinery sent there last year at about $7,000,000.

The population of Canada on March 31 last was 7,489,781, according to the estimate of the Canadian Census Department announced August 8. The population in 1906 was placed at 6,441,000, so that in four years the increase has been approximately 1,000,000. The figures for 1901 were 5,338,883.

Open Hearth Furnace Construction

Improvements in Recent Years as Developed by German Engineers

At the recent International Congress of Mining and Metallurgy held in Duesseldorf, a paper was read on "German Improvements in Open Hearth Furnace Construction" by O. Friedrich, engineer of the Julienhuette, Upper Silesia. It is a companion paper to the one by Herr Genzmer on "The Pig Iron-Ore Process in Germany," abstracted in *The Iron Age* of July 28, and represents the state of the art in that country. The Friedrich paper is translated in abstract below.

The introduction of the pig iron and ore process has brought many difficult problems to the designer and builder of furnaces. The ordinary scrap and pig iron process mainly consists in a melting together of the different materials. Through the charging of the cold additions the furnace receives a beneficial cooling, and the greater part of the heat of the flame is expended in their heating and melting. It is different with the pig iron and ore process. The molten iron brings in a significant amount of heat. The chemical reactions begin quickly and the slag foams, sometimes for an hour. This slag acts strongly on front and back walls, the bottom, and, under certain conditions, on the roof and ports. Further, the numerous spittings of basic slag are carried along with the waste gases and act destructively on the acid brickwork of the flues and checkers. Through the large increase in volume of the slag the incoming gases are deflected against the roof and so cause harmful local overheating. These and other conditions have to be met and various modifications have been introduced.

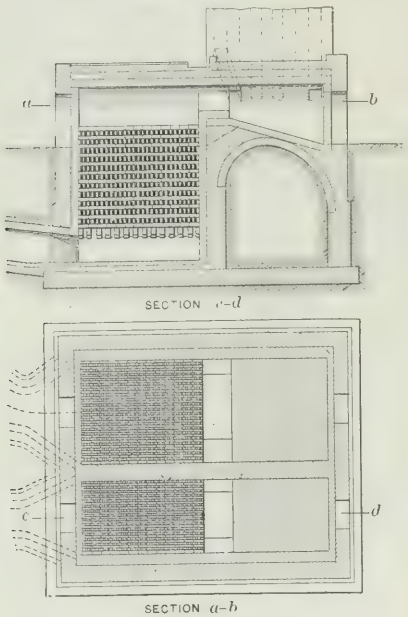


Fig. 1.—Arrangement of Slag Chambers Replacing Slag Pockets.

Regenerators and Slag Pockets

The cubical contents of the gas chamber are either equal to or are less than those of the air chamber. For large furnaces good results are guaranteed with a ratio of 1 to 1.4.

The small particles of slag and additions carried over by the waste gases have a very harmful effect on the checkers. They unite with the acid brickwork and form a readily fusible crust. This drips down and freezes in the cooler part of the chambers. Similarly the small particles of ore and lime, on account of the low temperature, sinter instead of fusing in this cooler part. In this way the free space is increased in the upper but diminished in the lower part.

Slag pockets are being replaced by slag chambers, of which a favorite arrangement is shown in Fig. 1. The chambers are under the furnace, so that the real regenerators lie sideways under the working floor. Their width is equal to that of the regenerators, which guarantees an even distribution of the waste gases. The greater part of the purification is brought about by the change of direction of the gases. The building of these chambers increases the cost of the furnace, but the protection that they afford is beyond doubt.

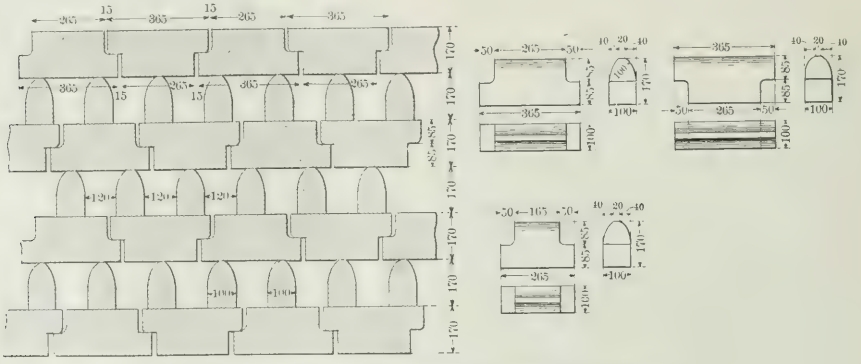


Fig. 2. Dietrich Shapes for Checkerwork (Dimensions in Millimeters).

At the Julienhuette the checker work lasts for from 2000 to 2500 heats, notwithstanding the pig iron and ore process is used exclusively, which, as remarked before, is very hard on checkers.

Naturally these chambers do not afford a complete

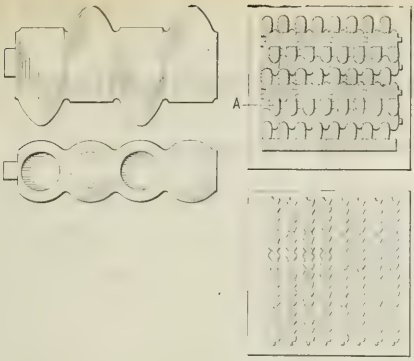


Fig. 3.—Knoblauch Shapes for Checkerwork

protection against the clogging up of the checker work with dust. One method in use is to use larger bricks in the lower part of the regenerators, which gives more free space. Recently a large number of specially shaped bricks have been introduced, some of which are worthy of mention.

In Fig. 2 Dietrich's system and his shape of brick are clearly shown. These bricks have been in use for a year at the plant of the Westfälischen Company at Bochum. According to the inventor, they have given very good service. The average is 800 heats for one 80-ton, two 60-ton and two 40-ton furnaces, which had neither slag pockets nor slag chambers.

In Fig. 3 are shown the brick and arrangement of Knoblauch, which is patented in Germany and other countries. These brick are characterized by elliptical

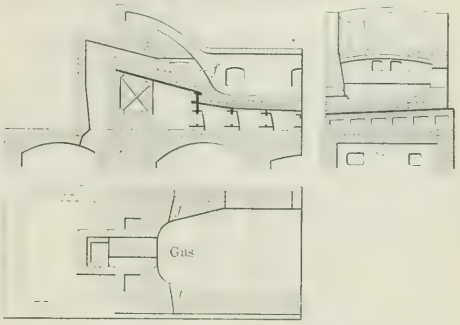


Fig. 4 Dietrich Arrangement of Ports.

ribs cut off alternately above and below. When built up the bricks expose rounded surfaces in every direction and offer about 50 per cent. more surface and in the narrowed places 100 per cent. more free space than the ordinary construction. They offer great advantages, especially in cases where the regenerators are not equal to the larger output desired from a furnace. These bricks are being tested at Witkowitz and Hubertushuette.

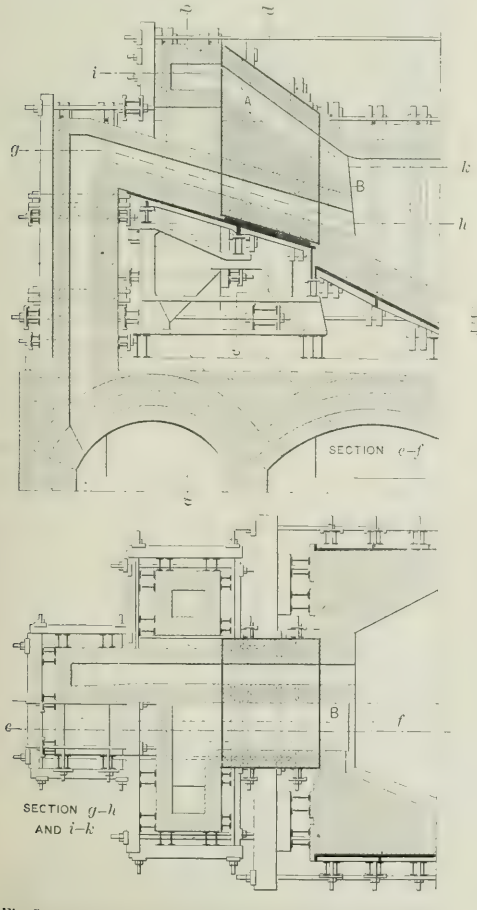
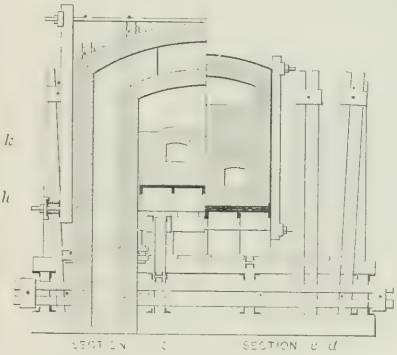


Fig. 5.—A Port Construction Which Permits of the Removal of the Front Portion. Vertical and Horizontal Sections.



Changes in Port Construction

A horizontal direction of the gas and air ports has been abandoned altogether, but the angle of slope must not be too steep. The air port is generally made somewhat steeper than the gas port in order to give good mixture of the gas and air. The angle depends a good deal on the length of the hearth, but good figures for large furnaces are 30 degrees for the air and from 15 to 17 degrees for the gas.

Two gas ports are generally used on the Continent, covered by two fan-shaped air ports. At Julienhuette only one gas port is used, without impairing the distribution of the flame or the melting capacity of the furnace. In this way the front and back walls are protected and the melter can give better care to his ports.

With regard to the ports of the furnace all unnecessary brickwork is being done away with to allow good air cooling. Two methods are adopted to obviate the rapid destruction of the ports, which has such a harmful influence on the working of the furnace. The first is to prolong their life as much as possible by suitable

construction, and the other is to arrange for a rapid removal of the defective parts and replacement with new ones. Proper cooling has a great influence on the life of the ports, but air cooling is insufficient. Water cooling is not used to any extent on the Continent, so that a discussion of it is outside the field of this paper.

In Fig. 4 is shown Dietrich's arrangement of the ports, protected by a German patent. The gas port discharges into a front chamber and not into the hearth direct. This chamber is covered by a removable roof, extending from the front to the back wall and forming the floor of the air ports. The exit for the waste gases is therefore very large, thus avoiding obstructions and melting down at this point. The chamber is provided with side openings, through which ferromanganese, spiegeleisen, &c., can be introduced and heated. These ports are in use at the Westfaelische Stahlwerke, but the tests are not completed.

At the Julienhuette tests have been made on the other method—namely, providing for a quick change of the front part of the ports that becomes most quickly

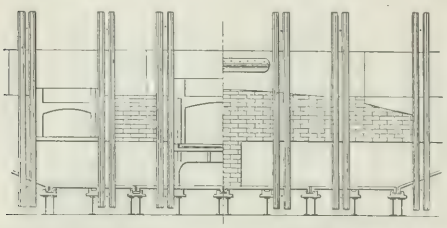


Fig. 6. A Recent Method of Reinforcing Front and Back Walls

destroyed. The arrangement is shown in Fig. 5 and is protected by patents. The air port lies directly over the gas port, but this has been found by experience to work all right; its cross section is greater than that of the two air ports together, which were previously used. The figure shows the changeable section used on a 40-ton furnace. It weighs about 20,000 lb. It is built on a cast steel plate and the roof of the air port is held in a frame, so that it can easily be lifted up.

The change is made by first taking away the supporting plates, then lifting off the roof of the air port and breaking away its side walls. The large solid part resting on the plate is then removed. The new part, carefully built up and dried, is put in place. It is naturally smaller than the opening, so it is bricked up all around; the side walls of the air port and the roof are put in place, the reinforcing completing the change. It takes from five to seven hours and the cost of two ports is about 1700 marks. At Julienhuette it lasts for 300 heats. With the ordinary furnace construction a roof lasted from 420 to 450 heats of 33 tons weight. The first 40-ton furnace of the new construction made 554 heats with one roof. It was slightly repaired and 325 more heats were made, so that from one shutdown to the other 879 heats and 34,200 tons of steel were made. A second furnace made 620 heats, the roof was repaired and it is still working. This construction has also increased the daily output considerably and is being introduced at Bethlen Falva.

The ratio of length of hearth to width varies, but in the large European furnaces is from 2.5: 1 to 2.7: 1. The extreme width is 12½ ft., which still allows ready repair of the back wall, and 34 ft. is the length. At Julienhuette the bath is maintained with 18½ in. depth to allow quick reaction of the slag and the metal. The roof is supported on columns and is made independent of the front and back walls. Cast plates are being used more and more to reinforce the furnace, openings being left through which to make repairs. An illustration of front and back walls is shown in Fig. 6.

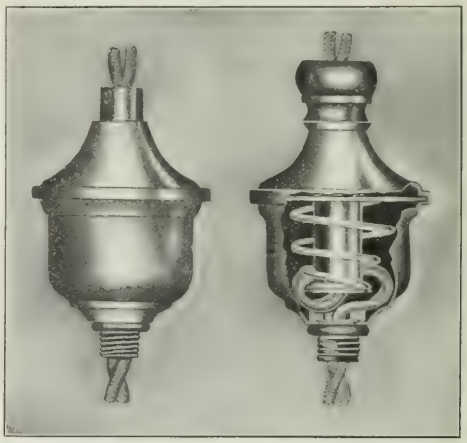
The above improvements are designed to make the open hearth process more reliable and capable of attaining the economies of the Bessemer process.

G. B. W.

The Tungstelet Shock Absorber for Tungsten Lamps

The installation of tungsten lamps in factories, stores and other places where they are subjected to considerable vibration has been limited in the past because of their fragility. To neutralize these vibrations, a number of shock absorbers have been recently brought out. One of the latest and most ingenious of these is the Tungstelet, manufactured by the Tungstelet Company, 101 Walker street, New York City, which is illustrated herewith.

As will be noticed this device is arranged so that the weight of the socket and shade is balanced against the compression of a spring, and any vibration or jar reaching the plunger to which the spring is attached is absorbed by it. This device is compact and provision



A Shock Absorber for the Suspension of Tungsten Filament Incandescent Lamps. Made by the Tungstelet Company, New York.

is made against breakage of the spring by having a flange on the plunger, and space is allowed for surplus wire, which removes any possibility of strain on the wire and allows the Tungstelet to perform its function. It can be furnished in any one of the standard finishes for fixtures, so that it is in harmony with whatever fixture it may be used with.

To prove the efficiency of the device the Tungstelet has been tested on a vibrating machine consisting of a motor to which the fixture stem is connected by an eccentric and caused to vibrate at a high rate of speed. A metallic filament lamp is attached to the stem, and when the motor is started is subjected to vibration, which is said to be far more severe than is ever possible in actual service even under the most trying conditions. In these tests the lamp was not affected by the vibrations, as they were absorbed by the Tungstelet.

One model H-8 engine drew a train of loaded coal cars, over a mile and a quarter in length, over the middle division of the Pennsylvania Railroad between Altoona and Harrisburg August 18. The train was made up of 120 steel cars, all of 100,000-lb. capacity. Telephonic communication was established between the engine and caboose of the train, and the engineer was directed by the officials from the rear end of the train. An average speed of more than 20 miles an hour was maintained over the division.

The Sauer Adjustable Shaft Bearing

Compensation for Wear Is Made by a Set of Bearing Blocks

A new type of adjustable shaft bearing which provides means for compensating for wear and insuring a proper alignment of the shaft by using a set of bearing members or blocks adjustable in a radial direction has been placed on the market by the Sauer Power Generating Company, 5115 Rosetta street, Pittsburgh, Pa. This bearing is of standard form, and is said to be especially adapted for all high speed machinery where accurate running is required. The special advantages claimed for it are simplicity of construction, easy adjustment of center and side motions while running and the elimination of liners, oiling grooves and shaving or fitting. Fig. 1 is a view of the bearing ready to be placed on the shaft, Fig. 2 is a section through the bearing showing it in place, while Fig. 3 is the threaded collar or thimble and Fig. 4 the tapered sleeve for adjusting the fit.

The bearing consists of a casing or shell suitably supported and a sleeve having several slots fits loosely around the shaft. The bearing blocks are inserted in these slots, as shown in Fig. 4, to slide freely therein and be adjustable relative to the shaft. At one end of

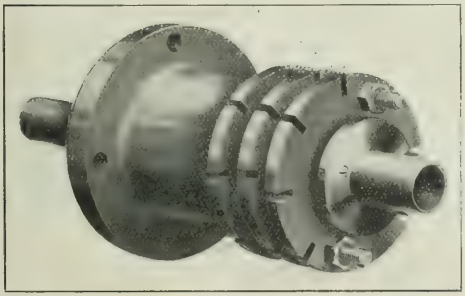


Fig. 1.—The Adjustable Shaft Bearing, Manufactured by the Sauer Power Generating Company, Pittsburgh, Pa.

the shell a thimble is placed between it and the bearing block and the engaging surfaces between these three parts are so arranged that the distance between the blocks and the shafts is regulated by the position of the thimble. The preferred construction is to make the bearing blocks wedge shaped with their outer faces at an angle to the axis of the shaft, rounded and tapering toward the end of the shell engaging the thimble. The bore of the thimble, which is indicated by the dotted lines in Fig. 3, is tapered to correspond to the outer faces of the bearing blocks. This thimble is threaded externally, and the bearing shell internally so that the threads engage, and by rotating the former the bearing blocks are adjusted accurately to insure a proper en-

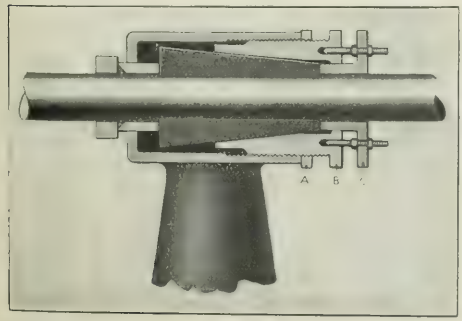


Fig. 2.—Sectional View, Showing the Bearing in Place.

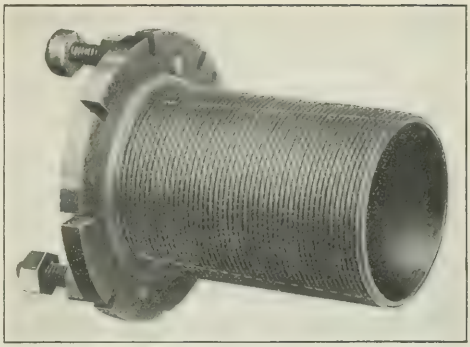


Fig. 3.—The Thimble. The Dotted Lines Show the Bore for the Taper Sleeve.

gagement with the shaft and to compensate for wear. To turn the thimble more conveniently an annular flange B is provided at its outer end, which enables the thimble to be engaged with a spanner or wrench.

The threaded ring A set on the thimble can be used to screw up against the end of the shell after the thimble has been adjusted as a lock nut to prevent displace-

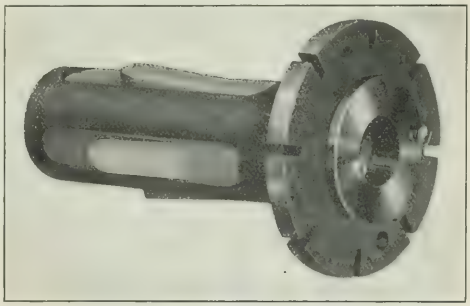


Fig. 4.—The Taper Sleeve with the Bearing Blocks in Place.

ment. Another means provided for locking the thimble consists of the annular flange C on the end of the sleeve surrounding the shaft through which a number of bolts pass. These bear against the flange B on the end of the thimble and are held in place by nuts on each side of the flange, which serve to force the bolts against it and lock them in place.

At the opposite end of the shell there is an annular flange extending inwardly and fitting on the sleeve surrounding the shaft. The space inclosed by this flange is utilized for storing oil to lubricate the bearing, and this may be fed into the chamber from a tank through a pipe tapped in the shell of the bearing. The oil passes from this space to the shaft through apertures in the portions of the sleeve between the bearing blocks, which are clearly shown in Fig. 4. Drippings of the lubricating oil may be drawn off from the bottom of the shell by another pipe and fed back into the tank by a pump or other device of this nature.

In use the center adjustment is secured by loosening the lock nut A and turning the inside tapered sleeve or thimble in Fig. 3 as the running fit requires. To adjust the side motion the nuts on the flange of the sleeve C are tightened. The only wearing parts of the bearing are the adjustable blocks shown in Fig. 4, which are made either of babbitt metal or bronze. As side friction on the bearing wears only one block at a time, it is possible by turning the sleeve to have all the blocks successively assume the position of greatest wear and wear them all down equally. New blocks can be easily set in position when the old ones wear out, as no special skill is required.

Automobile Manufacturers' Drilling Machines

A Line of Ball Bearing Machines Brought Out by the Henry & Wright Mfg. Company

The automobile manufacturers' drilling machine is the name given to a new type which has been brought out by the Henry & Wright Mfg. Company, 111 Sheldon street, Hartford, Conn. This line contains all the features which distinguish the company's smaller machines, and in addition some new ideas which add much to the usefulness of the machines for their particular work. The special field which these machines are intended to cover is handling the variety of work necessary in the manufacture of automobiles and other allied lines. The two initial sizes of the full line are the Nos. 1 and 6 machines, illustrated herewith in Figs. 1 and 2, respectively. The company's experience during three years' experimenting with these machines has shown that as they embody the principles of high speed and frictionless bearings, they are capable of a much wider range of work than was permitted by the proportions of what had formerly been considered standard practice. The limit of the plain bearing drill press was a ⅜-in. drill, and the high speed ball bearing machine permitted an increased range of holes up to ¾ in. without straining the frame. It was also demonstrated that in this type the belt was capable of conveying power to the spindle much in excess of the limits of the construction. The desirability of greater rigidity and correspondingly increased range were apparent to users of these machines, and their demands have led to the design of the new type which has a capacity in commercial usage of 1⅛-in. drills.

These new machines are much heavier and more rigid than the older models, are fully equipped with ball bearings and have sufficient power to drive high speed drills up to as large as 1⅛ in. The ball bearings are made interchangeable and can be renewed at small expense when required, thus prolonging the life of the machines indefinitely. The principles of the type are embodied in the No. 1 machine. There are various new features, among which is the location of the new spindle pulley drive beneath the frame at the top instead of above it, a departure from accepted design which permits a shorter and stiffer spindle. The spindle pulley bracket is braced supporting the spindle at both the top and the bottom instead of at the bottom only, which serves to increase rigidity. The drive employs a pair of hardened round bars instead of blocks. The method of attaching the spindle arm secures increased service and accuracy and consists of a screw at the top and the bottom of the spindle arm connection, working in conjunction with a key in a groove along the pillar. The details of this connection are clearly given in Fig. 1. The spindle sleeve has an inserted steel rack and the pinion which meshes with it is also much larger, longer and heavier. Adjustable stops are furnished to fit either the spindle at the top of the pulley or the rack. This adds to the convenience of operation and does away with the chance of straining the upper arm when the stop is forced down against it, as the operator exerts the strength requisite for the drive for which the machine is intended. For accurate drilling or counterboring to a specified depth the builder recommends using the stop for the rack sleeve.

A special type of new balanced idler pulley is used, together with a bracket which incloses the belt and prevents it from slipping when adjustments are being made. The machines are entirely belt driven and are made with from one to six spindles and in three sizes, for drilling to the centers of 16, 24 and 30 in. circles. The spindle is driven by an endless belt 1¾ in. wide and the rear shaft by a 2½-in. belt, the wider one being designed to furnish sufficient power to enable two operators to work on the same machine, if desired, and the individual spindles may be started or stopped without stopping the entire machine. The tables are made especially heavy and with extra wide and long ways and are equipped with a hand wheel and elevating screw. While every precaution has been used to furnish a table as stiff and unyielding as necessary to drill the heavy work designed to be handled, additional sup-

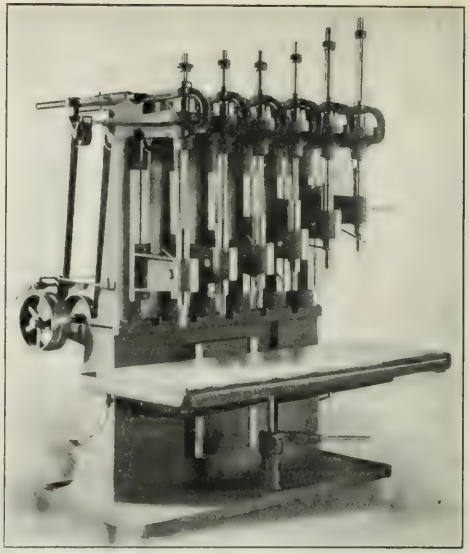


Fig. 2.—The No. 6 Ball Bearing Drilling Machine for Automobile Builders.

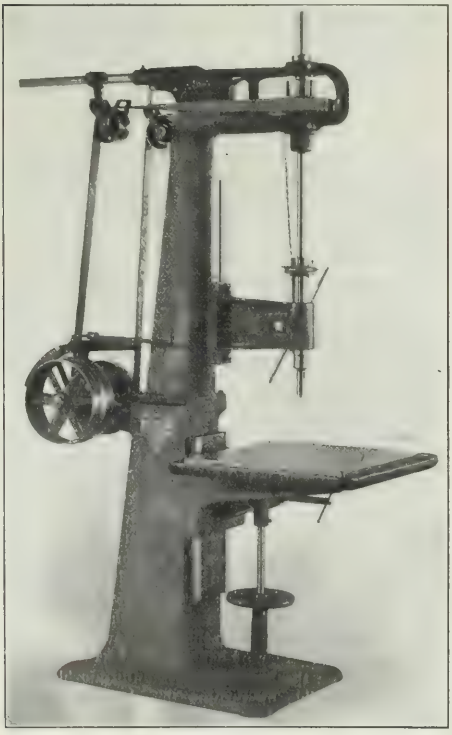


Fig. 1.—The No. 1 Ball Bearing Sensitive Drill Press, Made by the Henry & Wright Mfg. Company, Hartford, Conn.

port is furnished by two supporting jacks at the outer corners of the tables. Extra wide and deep oil grooves are provided around the tables, and, if desired, both ends may be connected by tubing with an oil tank inside the base. A rim is cast around the foot of the latter to prevent oil from flowing from the machine to the floor.

The No. 6 model embodies the various features of the No. 1 machine and also has a box base of exceptionally massive proportions. In this machine the adjustment of the table, which weighs 1100 lb., is accomplished by a ratchet device instead of the usual hand wheel to furnish greater leverage in raising it and to add to the convenience of the operator. The following table gives the principal dimensions and specifications of this size of machine:

Hight over all, feet	8½
Hight of base from floor, inches	36
Distance between spindle centers, inches	10¼
Maximum distance between spindle and table, inches	30
Diameter of spindles, inches	1⅛
Dimensions of table, inches	75 x 24
Floor space required, inches	81 x 62
Size of belt for spindles, inches	1¾
Driving belt for rear shaft, inches	2½
Weight of table, pounds	1,100
Net weight of complete machine, pounds	5,500

The series of tests which resulted in the design of these new machines were carried on in conjunction with one of the largest users of the company's product. The required limit of accuracy of the perpendicularity of the spindles is 0.002 in. in an 8-in. circle.

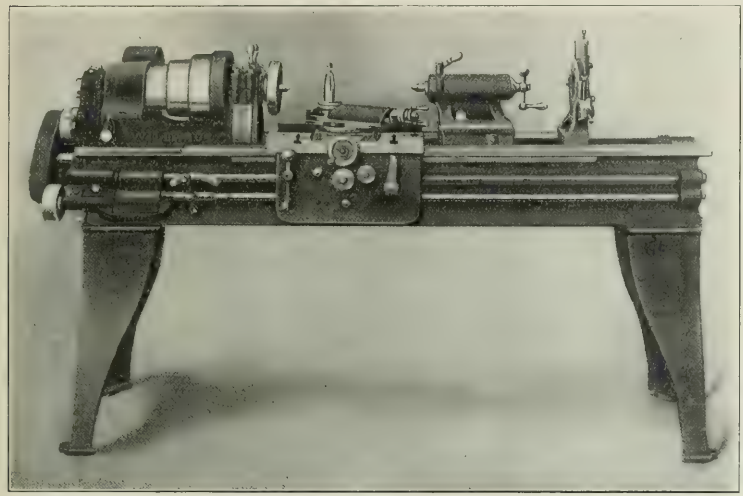
The Invincible Electric Bank Protection Company, Monroe, Wis., manufacturer of electric burglar alarm systems, steel filing cases, safe deposit boxes, steel desks and safe cabinets, was, on August 16, awarded the contract, amounting to $3269.75, for the steel desks to be installed in the assembly chamber of the new State capitol, Madison, Wis. The company has recently opened a branch agency in New York City, in charge of Philip Abrahams and Francis Koref, with offices at 29-31 Liberty street.

The Lake Superior Iron & Chemical Company, Detroit, Mich., has made an appropriation of $1,000,000 for the rebuilding of its chemical plants at Ashland, Elk Rapids, Newberry, Manistique and Chocolay. Details of the work to be undertaken have not yet been determined upon.

The Willard 13-In. Engine Lathe

The Willard Machine & Tool Company, Cincinnati, Ohio, is placing on the market a 13-in. engine lathe equipped with double back gears and a three-step cone pulley, which is illustrated herewith. As will be noticed, the tool is symmetrical and attractive in outline and it is claimed that it is built to withstand any strains that may be imposed upon it by the use of high speed steel tools.

All parts are manufactured to standard jigs and gauges and are practically interchangeable. The lead screws and feed rods are of special high grade carbon steel. All sliding surfaces are scraped to a bearing and the spindle and all cylindrical parts are ground to insure accuracy. The belt feed is 1½ in. wide and runs on large pulleys of equal diameter, giving an extremely powerful feed. The usual belt tightener is provided, and four changes of feed are obtained by simply moving a level to any one of four locations.



The 13-In. Engine Lathe with Double Back Gears, Built by the Willard Machine & Tool Company, Cincinnati, Ohio.

This lathe is equipped with plain or compound rest, follow and steady rest, change gears, large and small face plates, double friction countershaft and wrenches. The headstock has a bearing of 21½ in. on the bed, the spindle is 0.60 per cent. carbon crucible spindle steel and the front journal is 2⅜ in. in diameter and 4 in. long. The spindle is designed to hold a bushing bored for a No. 3 Morse taper. The bearings are high grade phosphor bronze and the gears are steel; the idlers are bushed with phosphor bronze. The tailstock is well proportioned and very rigid. The carriage has a bearing 18 in. long on the V-ways. The compound rest is unusually large, making it very rigid, and its design and construction are claimed to be new. All gears are entirely covered. The apron, including bearings in it, is cast in one piece, making it very stiff and strong. A safety device prevents throwing in the half nuts when either feed is connected, thus preventing breakage.

The Menne Oxygen Melting Process.—F. H. Kindl, 413 Bakewell Building, Pittsburgh, representative in the United States of the Menne oxygen melting process, has closed a contract with the Stewart Iron Company, Sharon, Pa., for a license to use the process; also with the Shenango Furnace Company, for its three furnaces at Sharpsville, Pa. The equipment included in contracts for the use of the Menne process does not take in the tanks with oxygen and coal gas. These are furnished by the Linde Air Products Company, Buffalo, N. Y. Where the tanks are owned by the furnace company the cost of oxygen and coal gas is about 2 cents per cubic foot, or considerably less than when this process was first demonstrated in the United States. Experience has shown that two tanks of oxygen and one of coal gas will open an ordinary frozen tap hole, cinder notch or tuyere in a few minutes. Two men are required to operate the apparatus.

Silicon Steel

Results of Tests Made Show Its Superiority Over Other Kinds

BY G. A. BISSET, NAVAL CONSTRUCTOR, U. S N., MUNHALL, PA.

The value of silicon as a content of steel lies in the fact that by adding it to low carbon steel it is possible to obtain steel with a tensile strength as high as that obtained in high carbon steel, while the other valuable characteristics of a low carbon steel are maintained, *i. e.*, ductility, reduction of area and impact resistance. While there is perhaps a slight loss in the ductility in the case of silicon steel from that obtained with a low carbon steel, the reduction of area and impact resistance are higher. The question as to whether or not impact resistance is less important than elongation or ductility is believed to be open to argument, especially where the steel is to be used for shipbuilding purposes. The curves shown in Fig. 1 illustrate the superiority of the silicon steel over the high carbon steel, the shaded area in each representing the total superiority. In each case the most marked difference is in the impact resistance. The base line in each curve represents ordinary medium steel of 0.20 per cent. carbon. The superiority of the silicon steel to the ordinary medium steel is represented by the algebraic sum of the areas of the curves above and below the base line. Although the difference in favor of the superiority of high carbon over medium steel is inappreciable, silicon steel shows a very marked superiority.

Figs. 2, 3 and 4 illustrate tests to destruction of flasks for compressed air made of low carbon, high silicon and vanadium-chrome-nickel and vanadium-chrome steels, respectively. The low carbon steel analysis was silicon, 0.192; sulphur, 0.016; phosphorus, 0.015; manganese, 0.50, and carbon, 0.23 per cent. The flasks had an external diameter of 7⅝ in. and a ⅜-in. wall. The length was 43 in. and the average weight 108½ lb. The physical tests of the flasks showed an elastic limit of 36,000 lb. per square inch and a tensile strength of 65,000 lb. The elongation in an 8-in. specimen was 27 per cent., accompanied by a reduction in area of 50 per cent. The results of the pressure tests are given in the following table:

Flask No.	Yield point at pressure. Pounds per sq. in.	Burst at pressure. Pounds per sq. in.	Corresponding elastic limit of material. Pounds per sq. in.	Corresponding tensile strength of material. Pounds per sq. in.	Remarks.
1	3,500	6,600	32,000	60,400	Annealed to 1590 deg. F. and reannealed to 1800 deg. F.
2	3,600	6,550	33,000	60,000	Annealed to 1590 deg. F. and reannealed to 1800 deg. F.
3	3,400	7,000	31,200	64,000	Do.
4	....	6,900	....	63,600	Annealed to 1590 deg. F.
5	3,600	6,700	33,000	61,600	Do.
6	3,600	6,600	33,000	60,400	Do.
7	3,600	6,800	33,000	62,400	Do.
8	3,600	6,600	33,000	60,400	Do.
9	....	6,600	....	60,400	Do.
10	....	6,850	....	62,800	Do.

The silicon steel on analysis showed carbon, 0.39; phosphorus, 0.035; manganese, 0.95; sulphur, 0.026, and silicon, 0.98 per cent. The flasks were 8½ in. external diameter, ¼ in. wall thickness and 51 in. long. 100,460 lb. per square inch, respectively, while the elongation in an 8-in. piece was 12.1 per cent., accompanied by a reduction in area of 37.1 per cent. The nickel-chrome-vanadium steel had a composition of carbon, 0.32; phosphorus, 0.012; manganese, 0.32; sulphur, 0.017; nickel, 3.3; chrome, 1.60, and vanadium, 0.19 per cent. These flasks had the same length and wall thickness as the others shown in Fig. 3, but the outside diameter was ⅛ in. greater. The physical tests be- The average of the physical tests of six flasks showed an elastic limit and a tensile strength of 66,640 and fore annealing gave 114,600 and 131,060 lb. per square inch, as the valves of the elastic limit and the tensile strength of the material. The elongation in 2 in. was 20 per cent. and the reduction in area 59 per cent. The results of the pressure tests are given below:

Flask No.	Yield point at pressure. Pounds per sq. in.	Burst at pressure. Pounds per sq. in.	Corresponding elastic limit of material. Pounds per sq. in.	Corresponding tensile strength of material. Pounds per sq. in.	Remarks.
3S	3,800	5,700	60,800	91,000	After annealing.
4S	4,000	....	64,000	.....	Before annealing.
4S	3,600	5,800	57,600	92,800	After annealing.
1VCN	....	6,600	.....	107,000	After annealing.
3VCN	....	6,350	.....	103,000	After annealing.

The chrome-vanadium steel had a composition of carbon, 0.2; phosphorus, 0.049; manganese, 0.6; silicon, 0.031; chrome, 1.05, and vanadium, 0.15 per cent. These flasks were 8 11-16 in. outside diameter with a ¼-in. wall, were 51 in. long and weighed an average of 105 lb. The physical tests showed an elastic limit ranging from 63,500 to 68,800 lb. per square inch and a tensile strength of from 84,000 to 93,000 lb. The elongation in 8 in. varied in different specimens from 8.25 to 16.5 per cent. and the reduction in area was between 41.8 and 50.4 per cent. The results of the tests follow:

Flask No.	Yield point at pressure. Pounds per sq. in.	Burst at pressure. Pounds per sq. in	Corresponding elastic limit of material. Pounds per sq. in.	Corresponding tensile strength of material. Pounds per sq. in.	Remarks
1V	....	6,350	.....	107,000	Not treated.
4V	6,200	6,450	105,000	109,000	Treated and tempered.
5V	7,200	7,700	121,000	130,000	Do.
6V	8,200	8,500	138,000	143,000	Do.
9V	7,200	7,500	121,000	126,000	Do.
12V	6,400	6,950	108,000	117,000	Do.
14V	7,400	7,650	125,000	129,000	Do.
13V	3,300	5,400	55,000	91,000	Treated, not tempered.
15V	3,300	5,000	55,000	84,000	Do.

Probably the most important requirement for flasks is that they should not shatter upon bursting from compressed gas pressure. Strength combined with lightness, however, is also desired. It will be noted that the flasks made of vanadium-chrome steel are vastly superior in every way. The superiority of this material over the vanadium-chrome-nickel appears on first sight unexpectedly great. The difference would probably disappear were it possible to harden and temper the latter properly. To do so it is held that the material must be sprayed, while hot, on both sides uniformly with water. This is impracticable in the case of flasks, though perfectly simple with special treatment steel protective deck plates of almost identical

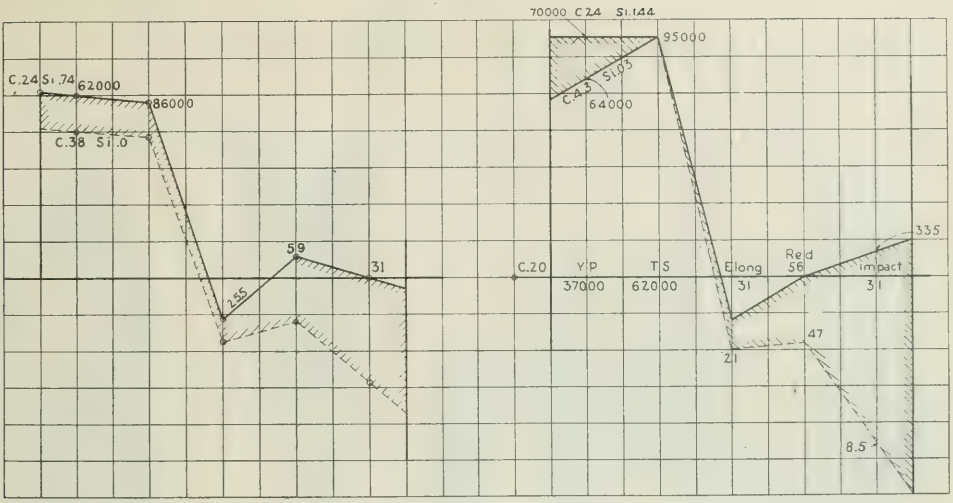


Fig. 1.—Curve Showing the Superiority of Silicon Steel Over High Carbon Steel.

composition. The vanadium-chrome-nickel steel is also difficult to work while hot, being very tough and hot short. The flasks of this material wrinkled and cracked badly at the neck in swaging down. It is believed that non-shattering flasks could be made from high silicon steel containing a carbon content of 0.20 to 0.24 per cent., the material having a tensile strength of about 80,000 lb. per square inch. A carbon content of 0.39 per cent., as in the flasks tested, is entirely too high for good elongation.

It is believed that the extension of the use of silicon steel for shipbuilding will mark an era in that industry. As its strength is about one-third greater than medium steel, its use in place of medium steel for the hull of a ship would result in a saving of 25 per cent. of the weight. Although its cost is now $20 per ton greater than medium steel, the cost of the hull of a vessel, whether built of silicon steel or medium steel, is practically the same, being only 12 per cent. greater in the case of silicon steel. For example, the hull of a vessel built of medium steel weighs 6000 tons, but as the tensile strength of medium steel is about 60,000 lb. per square inch, and silicon 80,000, the weight of a similar hull of equal strength made of silicon steel would be only 4500 tons.

There seems to be no adequate reason for the steel manufacturers charging this extra price for silicon steel. The actual reason is that silicon steel is used only by the Government, and in case of rejection this steel has to be cut into scrap and remelted, whereas the medium steel rejected for Government use is sold to the trade with very little loss in the shape of scrap. There is also a difficulty now encountered which will probably disappear with experience in the manufacture of silicon steel, as the slabs have scabs and tears on the surface which, unless chipped or ground out, will appear as snakes on the plate. These tears seem to be caused by the ingots being hot short. While the chipping out of the tears in itself does not require much labor, it is necessary to permit the slab to cool down before this work is undertaken, thus causing considerable loss and waste of time, as ordinarily the slabs are never allowed to lose their heat before rolling into plates. No tears occur in rolling the slabs into plates; hence the conclusion is that the ingots are not rolled into slabs at the right temperature. Little difficulty is experienced with silicon steel in England, where acid open hearth furnaces are used, instead of the basic, which are used almost exclusively in this country.

Plates, shapes and rivet rounds made of silicon steel were tested at the New York Navy Yard in 1909. The tests included rolling, punching, shearing and flanging, both hot and cold, and working to shapes, such as boss plates; for the shapes, punching, shearing and smithing to joggles, the effect of working heats being noted. The rivet rounds were used partly for the manufacture of rivets which were tested for shearing strength after having been driven up in such a manner on hull plating as to insure double shearing. Tests were made of the high tensile plates, both galvanized and black, the gal-

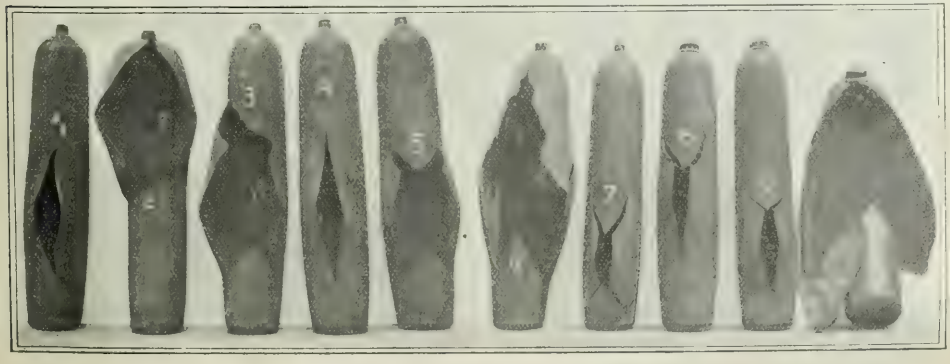


Fig. 2.—Low Carbon Steel Air Flasks Tested to Destruction.

vanized showing a slight gain in tensile strength. In the punching tests of the plates the material punched cleanly, did not build up around the lower circumference of the hole and did not break through the spaces between the rivet holes. The shearing test of the material was satisfactory, no perceptible difference being noted between the high silicon steel and regular medium steel. Some immaterial difference due to the difference in tensile strength of the two materials was assumed to exist, but this could not be verified by the means at hand.

On the rolling test the 10, 15 and 20 lb. plates, when rolled to a diameter of 20 in., showed no cracks or flaws on the outer circumference of the strips tested. The 40-lb. plates, however, when rolled to a diameter of 30 in. cracked across the strip in several places.

The results obtained on the hot and cold bending tests were considered very satisfactory, and compared most favorably with similar results obtained on hot and cold bending tests of mild steel plates. A portion of each high silicon steel plate was made up into a boss plate, and each boss plate was flanged hot on the end. Satisfactory results were obtained in every case, the material working without difficulty.

The angles and channels of high silicon steel were punched and sheared in the same manner as the plates and were further subjected to splitting, welding, bending and jobbing tests. It was found that the material welded without difficulty, but was tough in bending. In general the smithing test gave favorable results in every case.

Tests of the rivets resulted as follows:

Size. Inch.	Yield point.	Tensile strength.	Reduction in area. Per cent.	Shearing strength per square inch.
⅝	52,500	79,500	63.75	74,000
¾	54,000	77,000	62.5	70,000

The New York Navy Yard reported as a result of all tests made on high silicon steel that the conclusions derived were favorable to the use of the material for structural work in the manufacturing department at the yard. In the case of the tests conducted at the New York Navy Yard, the carbon content was in every instance higher than is recommended for high silicon steel. From the result of tests conducted at Carnegie Steel Company's works it was found that the carbon content should not exceed 0.28 per cent., while 0.23 and 0.24 per cent. gave the best results. In tests conducted at the navy yard the carbon content ran as high as



Fig. 3. Results of Destruction Tests of Silicon and Vanadium Chrome-Nickel Steel Air Flasks.

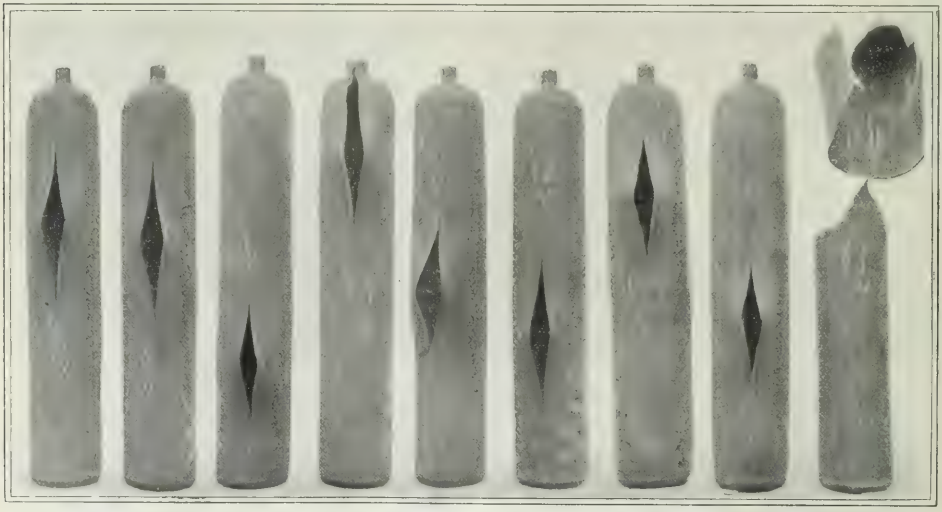


Fig. 4. Destruction Tests of Chrome Steel Vanadium Air Flasks.

0.44 per cent., or sufficient to cause great brittleness.

The following are the results of some tests of different steels made at the Homestead plant of the Carnegie Steel Company:

Object, rods. Inch.	Number.	Yield point.	Tensile strength.	Percentage of elongation in 8 in.	Percentage of reduction in area.	Bends.	Double shearing strength per sq. in.	Percentage of tens. strgth.
⅞	540	48,840	76,730	29.25	59.8	Flat.	99,740	65
	541	52,740	82,690	26.25	55.1	Flat.	109,500	66
	542	58,020	87,970	25.00	50.3	Flat.	113,300	64
	543	49,010	77,420	28.25	53.5	Flat.	105,800	68
	544	69,660	119,280	7.25	9.6		152,200	64
	545	48,500	75,720	26.25	49.0	Flat.	Shackles broke.	

Object, rods. Inch.	Number.	Yield point.	Tensile strength.	Percentage of elongation.	Length. Inches.	Percentage of reduction in area.	Impact.
7/8	540	61,710	82,280	28.0	4	62.0	34.08
	541	62,380	86,390	25.5	4	59.1	30.58
	542	70,340	94,900	25.0	4	56.2	33.5
	12,282	65,030	90,910	21.5	4	56.2	28.16
	41,117	57,060	80,960	22.5	4	49.9	16.5
	46,582	63,820	95,050	21.0	4	47.1	8.5
⅝	540	65,950	87,340	30.0	3	61.4	36.12
	541	68,100	91,400	28.0	3	56.0	33.1
	542	82,430	98,560	28.0	3	56.0	32.72
	6	51,030	67,570	32.66	3	67.7	35.87
	8	58,300	81,240	26.66	3	49.3	14.4
	7	66,910	108,000	20.0	3	41.2	6.02

Object, plates.	Heat.	Number.	Yield point.	Tensile strength.	Percentage of elongation in 8 in.	Percentage of reduction in area.	Bends.	Average impact.
½-in.	18,078	37,593-L	46,680	*80,700	*24.0	52.5	T. C. Flat.	L. 35.0
		37,593-T	43,480	*79,670	*24.75	50.9	L. C. Flat.	T. 30.0
		37,593-L	44,650	*79,610	*25.0	56.0	L. C. Flat.	...
		37,593-T	43,610	*78,580	*25.25	50.5	T. C. Flat.	...
1-in.	18,078	37,594-L	42,840	81,070	*23.75	43.5	L. C. Flat.	L. 25.0
		37,594-T	43,730	79,680	*23.75	42.0	L. C. Flat.	T. 25.3
		37,594-L	43,660	79,800	26.0	40.8	T. Q. Flat.	...
		37,594-T	42,000	78,300	23.75	33.9	T. Q. Flat.	...
½-in.	5,137	L	36,950	61,820	30.75	56.5	.....	L. 30.66
		T	36,960	61,740	32.0	54.1	.....	T. 26.66
1-in.	46,115	L	35,350	61,740	31.25	54.2	.....	L. 24.3
		T	35,260	61,740	33.0	50.6	.....	T. 23.3

* Broke within 2 in. of end measuring points.

Number.	Carbon.	Phosphorus.	Manganese.	Sulphur.	Silicon.	Nickel.
540	0.22	0.012	0.39	0.020	0.83	...
541	0.24	0.015	0.46	0.021	0.74	...
542	0.24	0.030	0.49	0.022	1.44	...
543	0.22	0.026	0.42	0.024	0.90	...
544	0.58	0.030	0.46	0.028	1.09	...
545	0.20	0.020	0.39	0.025	1.05	...
12,282	0.28	0.008	0.73	0.016	0.029	3.40
41,117	0.38	0.020	0.64	0.034	...	...
46,582	0.43	0.064	0.47	0.027	0.031	...
6	0.18	....	...	....	...	...
8	0.38	0.007	0.47	0.020	...	...
7	0.53	0.042	0.47	0.031	...	...
18,078	0.23	0.022	0.52	0.025	0.96	...
5,137	0.20	0.012	0.57	0.022	...	...
46,115	0.22	0.008	0.52	0.017	...	...

The impact testing machine consisted of a pendulum which was allowed to swing from a certain fixed hight and break a nicked specimen projecting radially into its path, the remaining kinetic energy being recorded on a dial and subtracted from the original kinetic energy of the pendulum, the result being the impact resistance, or, strictly speaking, the work done in breaking the specimen.

It is understood that high silicon steel was largely used in the construction of the Mauretania and Lusitania, the requirements being about as follows: Ultimate tensile strength, 74,000 to 85,000 lb. per square inch; elongation in 8 in., 18 per cent. The United States Navy requirements are: Minimum tensile strengths and elongations of 60,000 lb. and 25 per cent. and 75,000 lb. and 17 per cent. for medium steel and high tensile strength, respectively.

The steel manufacturers have found that the requirements for high tensile steel can be met much more readily by high silicon than by high carbon steel; consequently high silicon is now furnished regularly on all high tensile steel contracts. The French were, perhaps, the first to realize the value of silicon in steel. A number of years ago steel for rails in France was given a high silicon content, as it was known that such rails stood up much better under shock.

While the tests of high silicon steels of various contents made at Homestead were instituted upon the initiation of the Bureau of Construction and Repair, Navy Department, the conclusions and opinions expressed in this article have no connection with that bureau, but merely the author's personal views.

The Seneca Chain Company's New Plant

The Seneca Chain Company has awarded the contract for the construction of its new chain and forging plant at Kent, Ohio, to the Mount Vernon Bridge Company, Mount Vernon, Ohio. The new buildings will cover an approximate area of 3½ acres and will be constructed entirely of steel and iron, on concrete foundations. New and modern power appliances and operating equipment will be installed, with a view of securing the most economical production with the greatest efficiency of operation. The capacity of the new plant is to be somewhat larger than that of the old plant, destroyed by fire December 10, 1909, and with the plant at Mansfield, Ohio, will make it possible for the company to increase its output largely.

When the new plant is completed, which will probably be by November 1 to December 1, the company claims that it will make the most complete and best assorted lines of machine made and hand made chain in this country. Two new testing machines will be installed, making it possible to manufacture the largest sizes of chain in use to-day for any purpose, but especially in the line of anchor cables for large steamers, battleships, &c. A new catalogue descriptive of the entire product, which will include many new lines of forgings for railroads, &c., will shortly be issued. The company manufactures close and stud link yacht and vessel anchor cables; close and stud link marine railway haul-up and backing chains; proof, BB, BBB, steel loading, conveyor, crane, dredge, steam shovel, hoisting, sling, derrick, brake, switch, wrecking, uncoupling, lever, safety, sprocket, block, fence, wheel, trace, butt, stage, stake, harness and wagon chains, and cow ties.

The Crane Company's Fifty-fifth Anniversary.—The *Valve World* for July is devoted to the fifty-fifth anniversary of the Crane Company, Chicago. The anniversary was partly celebrated at Jerseyhurst, the country home of President R. T. Crane, at Lake Geneva, Wis., July 4, by a gathering of 76, comprising the managers of the several departments of the company and their wives. The managers of the branch houses presented him with a bronze group. The branch house employees gave him a silver loving cup. The directors, officers, superintendents and department heads gave him a silver service. On the following day a picnic was held at Riverview Park, near Chicago, which was attended by the thousands of employees of the company with their families. The Crane Company band, comprising 40 pieces, organized about two years ago, took a conspicuous part in the festivities.

An Improved Absorption Dynamometer*

Constructional Details of a New Testing Device

BY C. M. GARLAND, URBANA, ILL.†

In testing prime movers, the engineer often laments the dearth of efficient power-absorbing apparatus. Especially is this true in the testing of small high speed machines, such as automobile engines and steam turbines. In many cases the number of machines to be tested is large; in fact, in some instances each machine is given a brake horsepower test before leaving the factory; and in every case where a high degree of reliability is essential from the output, the percentage of machines undergoing test must be large. The attention of the writer was forcibly called to this need several years ago in the testing of a small steam turbine running at 2500 rev. per min., and through this experience the type of apparatus described below was designed and has been used with satisfactory results.

In the design of such a piece of apparatus, the following points enumerated in the order of their supposed importance were to be considered: It should be free from binding or seizing; it should be free from producing changes in the load, due to changes in the apparatus itself, such as change of temperature, wear or friction of parts, &c.; it should be capable of absorbing and accurately indicating a wide range of loads, from zero to the full capacity of the machine; the regulation of the load should be positive and instantaneous; the apparatus should require a minimum amount of attention and be capable of continuous service; it should be self-contained, occupy a small amount of floor space, and be free from noise and the splashing of oil and water; it should be capable of being quickly changed from one prime mover to another; and it should require a small amount of cooling water.

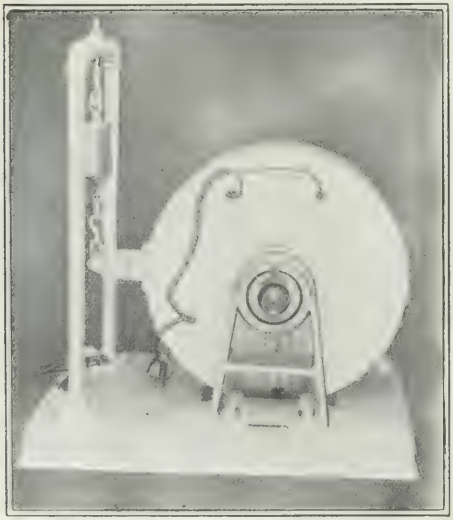


Fig. 1. The Improved Magnetic Absorption Dynamometer.

In considering the above items, it will be noted that the first two items practically eliminate mechanical friction apparatus from the field, while the next three practically eliminate machines depending upon the friction or resistance of liquids for their operation. With these two classes of apparatus removed, there only remained the principle of magnetic induction for the construction of an efficient absorption dynamometer.

Theory

This principle is that a conductor revolving in a field of variable magnetic intensity has an electric current induced in it. The reaction of this current upon the field that produces it causes a torque between the conductor and the field. There are two ways of dealing with the current induced in the conductor. In the one, the current may be collected by a commutator or slip rings and carried off from the machine; in the other, the current, or rather currents, generated in the conductor, may be allowed to remain, and, circulating in the paths of least resistance, they will ultimately short circuit among themselves and produce heat.

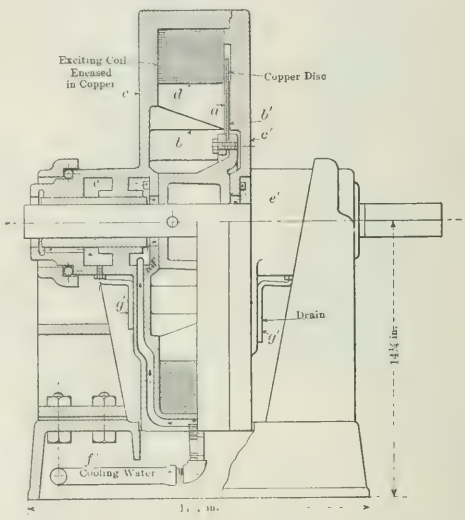


Fig. 2. End Elevation and Part Section.

In the first case, a dynamo mounted in a cradle serves as a very efficient and satisfactory type of dynamometer. There are, however, objections to its use. The currents generated must be taken care of either by water rheostats or lamp banks, which require considerable attention and occupy space or utilized in the performance of work which is in most cases impracticable owing to the irregularities in the testing.

If the currents in the conductor are permitted to short circuit themselves, the conductor is heated; the amount of heat produced is equivalent to the work absorbed by the dynamometer and may then be carried off by cooling water. This is the principle utilized in the design illustrated, a description of which follows.

The dynamometer consists of a metallic disk revolving between a set of pole pieces so constructed as to produce a magnetic field of variable intensity. Fig. 1 shows the front view of a machine designed to absorb 45 hp. at from 1200 to 1500 rev. per min. Fig. 2 is an end elevation and part section showing the construction of the dynamometer. It will be seen from this figure that it consists of a copper disk, *a*, mounted on a bronze hub and revolving in front of pole pieces, *b b'*. The magnetic circuit is made up of the casting *c*, the air gap and the cover plate *c'*, which are bolted together and carry the exciting coil *d* and the bearings *e* and *e'*. The magnetic yoke, made up of castings, *c* and *c'*, carrying the field coil and disk, is supported in ball bearings, and prevented from rotating with the disk by the spring balance shown in Fig. 1.

* Presented at the Spring meeting of the American Society of Mechanical Engineers, Atlantic City, May 31-June 3. For discussion of this paper see the report of this meeting printed in *The Iron Age*, June 9, 1910.

† Instructor in Mechanical Engineering, University of Illinois.

This latter measures the pull or torque between the rotating disk and the stationary yoke. The magnetizing coil is encased in copper, the terminals being carried out through holes in the casting *c*, which are carefully sealed after the coil is in place.

The heat generated by short circuiting the eddy currents generated in the copper disk, is carried off by the cooling water which enters through the base connection at *f*, Fig. 2, passing up through the bearings into the field casting, and then out through openings which are not shown. This water not only carries off the heat generated, but serves as a lubricant for the bearings. That which passes through accumulates in the central chamber *e*, and is discharged at the base of the machine through the drains *g g'*. Fig. 3 is a detail drawing of the left half of the field casting *c*, shown in section in Fig. 2. It will be seen that there are six poles in the machine. The circulating water enters at *i*, and leaves through the port at *j*. Similar ports are provided in the cover plate.

Operation

The engine under test is directly connected to the dynamometer shaft by a flexible coupling, the cooling water is turned on and the engine is started. After

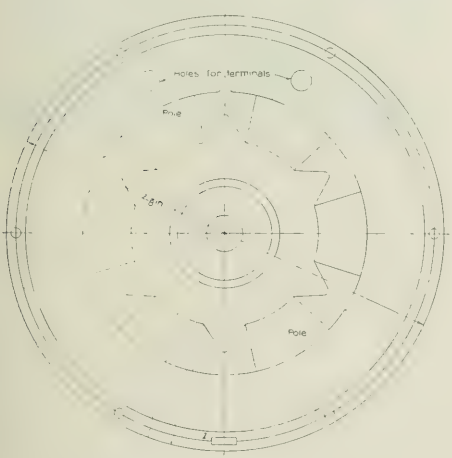


Fig. 3.—Left Half of the Field Casting.

normal speed is reached, the load may be thrown on by energizing the field coil. The amount of current, and consequently the torque or pull on the spring balance is regulated by a rheostat connected in series with the coil. After running a few minutes, the quantity of cooling water is adjusted so that the temperature of the machine does not exceed 150 degres F. In larger machines the coil may be wound with asbestos covered wire and the temperature permitted to reach 212 degrees, so that the cooling water is evaporated within the dynamometer, which reduces the amount required about 75 or 80 per cent.

The normal working temperature reached, the load on the machine remains absolutely constant, provided the line voltage is constant, for the mechanical friction, which is the bearing friction of the revolving disk, is small and practically constant, and changes in temperature due to changes in the supply of cooling water also affect the load on the dynamometer very little. The regulation by the rheostat is instantaneous and positive. When the dynamometer is driven by a smooth running engine, the torque, as indicated by the spring balance, will not show a variation of ⅛ lb., while the balance is sensitive to less than 1-16 lb. This indicates an accuracy that is not necessary even in the most refined testing work.

In the case of the present machine the torque is almost proportional to the speed and is a maximum at about 600 rev. per min. From this point the torque drops off about 15 per cent. at 1200 rev. per min., and remains almost constant from 1200 to 1500 rev. per min.

The torque depends upon the speed, number of poles, thickness of air gap, thickness and shape of the copper disk, and shape and spacing of the pole pieces. By varying the number of pole pieces, and the thickness of the copper disk, the point of maximum torque on the speed torque curve may be shifted anywhere from 25 to 2500 rev. per min.

This type of dynamometer is well adapted either for the testing of high speed motors with a wide variation in speed, such as the automobile engine, or for the testing of slow speed apparatus having a small variation in the speed. It can be built in practically any size from 10 hp. up. The principal disadvantage is the high initial cost, although this is not an item where serious and continuous testing work is going on, as in factories or in the laboratories of technical schools, for the labor saved and the increase in capacity resulting through the use of the machine will in a short time more than pay for the initial outlay.

The efficiency, which may be expressed as the ratio of the energy absorbed by the dynamometer, minus the energy supplied to the exciting coil, divided by the energy absorbed by the dynamometer, may be made anything up to 99.9 per cent., and depends upon the weight of copper placed in the coil. Ordinarily the efficiency is made about 96 per cent., or 4 per cent. of the power absorbed by the dynamometer is required in the form of electrical power for excitation.

New York Meeting of the American Iron and Steel Institute

The American Iron and Steel Institute, W. J. Filbert, secretary, makes a preliminary announcement concerning its first formal meeting, which will be held in New York City in October. Invitations to attend have been sent to leading representatives of the iron and steel industries in European countries and acceptances have already been received from a considerable number. The sessions will open at the Waldorf-Astoria Friday, October 14, at 10.30 a.m. On the same day there will be an afternoon session, and the entire day will be devoted to the address of President E. H. Gary and the reading of papers. In the evening there will be a banquet at the Waldorf-Astoria. For Saturday, October 15, an excursion around New York harbor has been planned. Various railroad terminals and important industries will be visited.

To give the foreign guests an opportunity to visit typical plants, the stated meeting will be followed by an excursion, which will probably be by special train. Leaving New York Sunday, October 16, at 8 p.m., the party will arrive in Buffalo Monday morning, where the works of the Lackawanna Steel Company will be visited. A trip will also be made to Niagara Falls. Leaving Buffalo in the evening of October 17, the train will arrive in Chicago the next morning. Tuesday and Wednesday will be spent in visiting the Gary Works and other plants in the Chicago district. Pittsburgh will be reached Thursday morning, and Friday and Saturday will be spent in that district. From Pittsburgh the party will take train Friday evening for Washington, where the Institute will be received by the President on Saturday, and the trip will terminate in New York Sunday morning, October 23.

Among those who will prepare papers for the meeting are J. A. Farrell, president of the United States Steel Products Company; Willis L. King, vice-president of the Jones & Laughlin Steel Company, and Charles Kirchhoff.

Freight Train Resistance*

Its Relation to Average Car Weight

BY PROF. EDWARD C. SCHMIDT, URBANA, ILL.†

Train resistance varies not only with the train speed, but also with the average weight of the cars of which the train is composed. While this fact has been known for some years, it has found inadequate expression and but little application. In the establishment of their tonnage ratings many railroads have altogether ignored it. In the tonnage ratings of a few roads it is recognized to the extent of allowing a difference in rating between trains composed of loaded cars and those consisting entirely or partially of empty cars. A still smaller group of railroads has fully recognized the significance of the facts above stated in establishing their tonnage ratings, which in such cases are usually termed "adjusted" or "equated" ratings. Most of these adjusted ratings have been empirically determined. In the few cases where they rest upon experiments made to determine the variations in train resistance with respect to car weight the data and results of such experiments have not been fully published. Existing train resistance formulæ likewise fail in most cases to take into account these variations of resistance with car weight; and probably much of



Fig. 1.—Car Employed in Making the Tests.

the divergence among them is properly to be ascribed to this fact.

In view of the facts just stated it has seemed desirable to make the tests whose results are here recorded. They were planned to determine the resistance of freight trains under the usual conditions of operation; and were designed to disclose at the same time, if possible, the relation existing, at any given speed, between train resistance and average car weight. Since the chief use of such information is in the production of locomotive ratings, the conditions of the tests have been made like those which prevail in normal freight train operation. The speed range, for example, is from 5 to 35 miles per hour; and the trains experimented upon were trains in regular service, and usual in their make-up. The track upon which the tests were made is believed to be representative of good main line construction. The tests have been made as part of the research work of the Engineering Experiment Station of the University of Illinois, conducted by the railway engineering department. They were begun in April, 1908, and were completed in May, 1909. All tests were made by means of Test Car 17, a dynamometer car, owned jointly by the University of Illinois and the Illinois Central Railroad, and were carried out on the Chicago division of this road. The exterior and interior of this car are shown in Figs. 1 and 2.

In the preparation of the report the aim has been to



Fig. 2.—Interior View of the Car.

present in it as brief a statement of the results and conditions as is compatible with a clear understanding of the tests.

Summary and Conclusions

The report deals with the results obtained from tests of 32 ordinary freight trains, whose chief characteristics were as follows:

	Minimum.	Maximum
Total weight, tons	747	2,908
Average weight per car, tons	16.12	69.92
Number of cars in the train	26	89

The trains, whose average weights were less than 20 tons or more than 60 tons, were composed of cars of nearly uniform weight; while those whose average car weights were between 20 and 60 tons were either

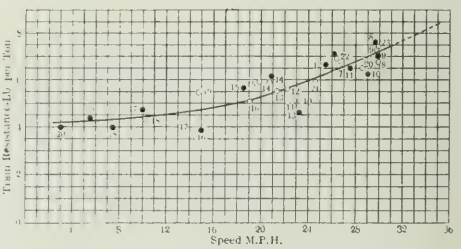


Fig. 3.—Typical Curve Showing the Relation of Resistance to Speed.

homogeneous or mixed as regards the weight of the individual cars. The tests were made during generally fair weather. The minimum air temperature during any test was 34 degrees, the maximum 82 degrees. The approximate average wind velocity prevailing throughout one test was 25 miles per hour; during all the others it was less than 20 miles per hour. The tests were made upon well constructed and well maintained main line track, 94 per cent. of which is laid with 85-lb. rail, the remainder being laid with 75-lb. rail. Except through station grounds, where screen-

* Presented at the spring meeting of the American Society of Mechanical Engineers, Atlantic City, May 31-June 3. For discussion of this paper see the report of this meeting printed in *The Iron Age*, June 9, 1910.

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ings or cinders are used for ballast, the track is full ballasted with broken stone.

The results of the tests are presented in Figs. 5 and 6, and in the equations given later on which are each different expressions of the same facts. The results are applicable to trains of all varieties of make-up to be met with in service, and may be applied, without incurring material error, to trains which are homogeneous and to those which are mixed as regards individual car weight. They are primarily applicable to trains which have been for some time in motion. When trains are first started from yards, or after stops on the road of more than about 20 minutes' duration, their resistance is likely to be appreciably greater than is indicated by the results here presented.

The Methods and Means Employed in Conducting the Tests

The tests were carried on by means of the dynamometer car here referred to as Test Car 17, which, when not in use, is held at Champaign, a district terminus. The car was operated from time to time in the regular trains leaving this point, partly northbound and partly southbound.

The plan was to determine, for each of the trains information essential to the investigation. Supplemented by an accurate profile and a record of train weight, they enable net train resistance to be calculated at any position of the train upon the road. The time record provides a means of calibrating and checking the speed curve. The pressure in the brake cylinder was recorded merely to make it possible to distinguish those periods during the test when the brakes were applied to the train; it being obviously necessary to ignore such portions of the record when making the calculations. The relative wind velocity and direction were obtained by an anemometer and a wind vane mounted on the roof of the test car. When compounded with the known speed and direction of motion of the car, these data permit the determination of the actual wind direction and wind velocity with respect to the track, which were recorded in each test for each point at which train resistance was determined. The location of the car upon the road was defined by marking upon the test car record the position of mile posts and stations at the moment they passed the car. Data concerning the train were obtained by one or two observers who had no other duties. All trains were

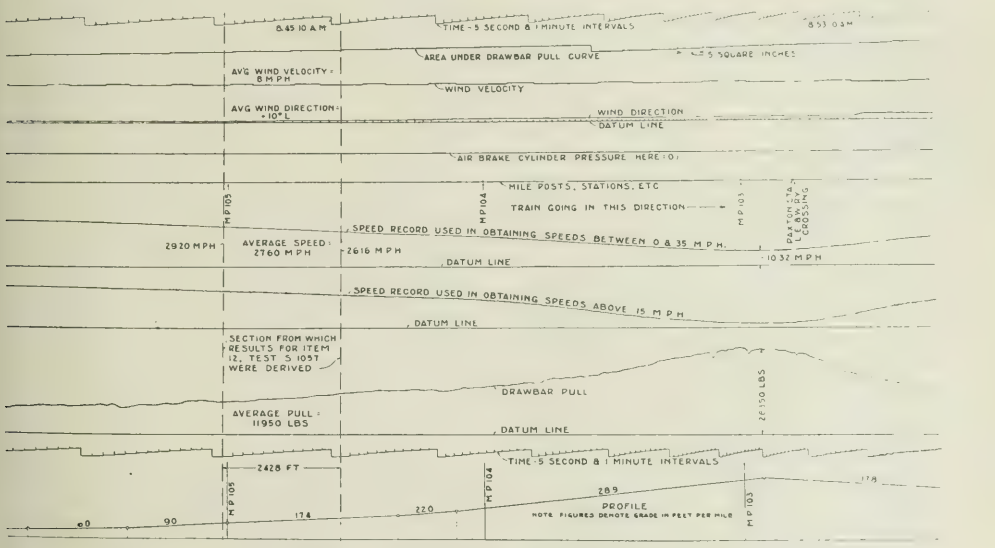


Fig. 4.—A Portion of One of the Test Records.

experimented upon, the relation of its resistance to its speed. This information was to be finally expressed as a resistance speed curve such as is shown in Fig. 3. The trains were so selected that their average car weights varied through as great a range as possible.

During each test the following information was obtained: The drawbar pull of the locomotive; the train speed; a continuous record of time elapsed from the beginning of the test; the pressure in the brake cylinder of the test car; the direction of the wind relative to the direction of motion of the car; the velocity of the wind relative to the car; the location of the test car upon the road; air temperatures and other weather conditions, and data concerning the train, such as its weight, &c.

The information on the first six points was obtained in the form of continuous graphical records upon the chart shown in Fig. 4, which is produced by the apparatus of the dynamometer car, from which any of the quantities may be determined at any point upon the road.

The curves of drawbar pull and speed provide the weighed to determine their tonnage and their lengths recorded.

All test car instruments were calibrated before the tests, and their calibrations were frequently checked during the progress of the investigation. All observers were men experienced in the operation of the test car, and many of them had participated also in the work of calculation, and were consequently aware of the points at which alertness and care were especially needed. No effort has been spared, in conducting the tests, to insure accuracy in the data. These facts are here mentioned as having some significance to one who may undertake to estimate the reliability of the results.

Test Conditions and Train Data

The test trains were all of such make-up as naturally resulted from the traffic conditions in the Champaign yards. For most of the tests the test car was coupled into the trains selected by the trainmaster, solely with reference to his convenience in operating and returning the test car. They include trains made up almost entirely of empty gondolas, others with con-

siderable variation in both load per car and kind of car, and still others composed almost entirely of loaded box cars or of loaded gondolas.

Practically all the trains were weighed upon one of the two track scales at Champaign in the usual manner, by pulling the train over the scales and weighing the cars successively without uncoupling. All the cars were provided with the usual four-wheeled truck, presumably the majority of the cars had journals conforming to the specifications of the Master Car Builders' Association, and it is safe to assume that all trucks were provided with wheels of 33-in. standard diameter.

Methods Employed in Calculating the Results

The immediate purpose in making the calculations was to produce for each test a curve showing the relation between resistance and speed, for as great a variety of speeds as the data would permit. This involves calculating the train resistance at various positions of the train upon the track, and the first step is the inspection of the test car record in order to select suitable points or sections at which the resistance may be calculated. The considerations of first importance are, that the points should finally represent as great a speed range as possible, and be approximately evenly distributed within this range. Only points and sections where the entire train was running and continued to run upon straight track were selected; resistance due to track curvature is therefore entirely eliminated. The data essential to the process of calculation are the drawbar pull of the engine, the train speed and its acceleration, the tonnage and the profile. Two processes were used, designated here as Method 1 and Method 2. By Method 1 the momentary values of pull, speed, acceleration and grade were determined for a particular position of the train upon the road; by Method 2 the average values of these quantities were determined for the period during which the test car was passing over a definite section of the track.

In Method 1 the point having been chosen, the pull and the speed were found by direct readings from the chart. This pull divided by the tonnage gives the gross train resistance at this speed, which was next corrected for both acceleration and grade resistance. The acceleration was determined by graphical methods from the speed curve, and the grade was found by correlating the train's position with the profile. The points

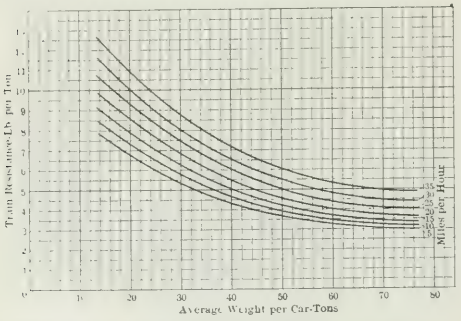


Fig. 5.—Curve Showing the Relation Between Resistance and Average Car Weights at Various Speeds.

were all so selected that at the moment under consideration the entire train was on a nearly uniform grade. Method 1 results in momentary values of train resistance at the points considered.

By Method 2 the average train resistance was determined for the period during which the test car at the head of the train was passing a selected section of the track corresponding to a certain length or section on the test car record, which was so selected that the speed of the car when entering was nearly equal to its speed when leaving, and further so that no considerable variations in speed occurred during transit over the section. The sections chosen have varied in length from about ¼ to 1 mile. The variations in speed in passing the section have generally amounted to less than 2.0 miles per hour, and the maximum is 11.7 miles per hour.

These portions of the chart being chosen, the average pull was next found by determining the average ordinate of the curve of drawbar pull, and the average speed was found by means of the section length and the time record. Gross resistance in pounds per ton was next derived by dividing this value of pull by the ton-

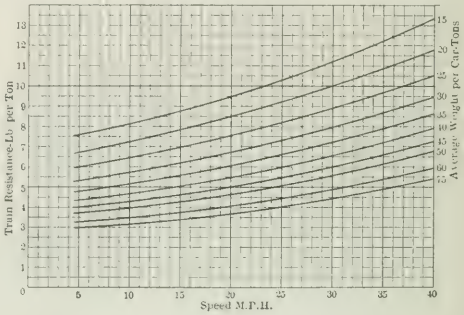


Fig. 6.—Curve Showing the Relation Between Resistance and Speed for Various Average Car Weights.

nage, and this gross resistance was then corrected for the resistance due to acceleration and grade as in Method 1.

In this case the average acceleration was found by considering the speeds at entrance to and exit from the section. In order to correct for grade, the elevation of the center of gravity of the train was determined for those positions of the train at which the test car entered and left the section, the difference between these elevations being the effective average grade, which either helps or opposes the locomotive while the train passes the section. These elevations of the center of gravity of the train may not be determined with sufficient accuracy unless the train at the moment is on a practically uniform grade. The section limits were therefore so chosen.

Method 2 results in a value of average train resistance for the average speed at which the train passes the section under consideration. It would be rigidly correct if train resistance varied uniformly with speed, in other words, if the curve showing the relation of resistance to speed were a straight line, but such is not the case, and the process therefore gives results which are slightly in error. However the section was so chosen that the difference between the speeds at entrance to and exit from the section was small; and for the speed range represented by this difference, the curve of train resistance deviates but little from a straight line. Such error as does result from the process is, therefore, very small and of no moment whatever when compared with the variations due to natural causes that occur in the resistance itself.

The two methods are fundamentally alike. Although the first is the less laborious, it requires the determination of acceleration at a point on the speed curve, which it is sometimes difficult to make accurately. For this reason the second method is generally preferable. Method 2 also deals with average values, and therefore tends to eliminate from the results the incidental momentary variations in resistance. Consequently the second method has been employed whenever possible, and the first method generally resorted to only in cases where the limitations imposed in the selection of sections for Method 2 would have resulted in too few values from which to plot the resistance curves. Of all the individual resistance values incor-

porated in the report only 32 per cent. were determined by Method 1. The care exercised in the calculations and a study of the plotted values obtained by both processes, seem to warrant the conclusion that their results are equally reliable. In Fig. 3 the circles represent values derived by Method 1, and the circular black spots represent values obtained by Method 2.

Even in freight train operation the tractive effort required to produce acceleration in speed is frequently greater than that required to overcome all other resistances combined. To produce, for example, an acceleration of 0.1 mile per hour per second, requires a tractive effort of about 9 lb. per ton, in addition to that required by net train resistance and grade resistance. Since the acceleration resistance may constitute so large a proportion of the gross resistance, it is important that its determination be made with great care. This fact has been impressed upon all concerned with these tests. In calculating the acceleration resistance, both the force required to produce acceleration in the rotation of the wheels and axles, and the force required to produce the acceleration in the motion of translation of the train as a whole were determined.

The test car records make it possible to distinguish those portions of each test where the brakes were applied. Such places, few in number, were of course avoided in selecting points and sections for determining resistance. The records also show where hot boxes and unreleased brakes were discovered in the train, and such defects were given consideration in making the calculations. They occurred infrequently, and their effect could not be distinguished in the results. While therefore such portions of the record were avoided if convenient, sections and points on the charts otherwise suitable for calculation, were not rejected on these accounts.

Early in the progress of this work, when low air temperatures were first encountered, it became apparent that when the train was first started from rest, its resistance, calculated for a number of points at which the speed was the same, occasionally was unusually high. This was true not only for those portions of the run made immediately after leaving the yards; but also for those portions immediately following stops on the road. For a number of tests such resistance values were plotted with respect to the distances from the yards of the points to which they apply. This process disclosed a surprisingly regular decrease in the resistance, until a distance of approximately 10 miles was reached, after which the resistance had settled down to a fairly uniform value. Similar variations were found to occur to some extent during tests where the air temperature was as high as 50 or 60 degrees. Since the variations in resistance are so great during the early part of the run no point or section within about the first 10 miles has been selected for calculation in any test. If other points or sections, located farther from the start, were near stops, such points were rejected unless further investigation proved that at these places the train resistance had become nearly uniform in value. Fortunately operating conditions were such as to entail few stops, and the selection of points and sections for the calculations has not been unduly limited on these accounts. The effect of these limitations is to make the results of this investigation primarily applicable to trains which have been for some time in motion. Since, however, stops are not usually made upon ruling grades; and if stops are made at other places the locomotive has available tractive power in excess of the requirements, the results of these tests are generally applicable in the solution of tonnage rating problems, except where the ruling grade occurs near a yard or other point where the trains are made up. In such cases the tonnage determined from the resistance curves here presented may prove to be somewhat too great.

All reasonable precautions have been taken to attain accuracy in the calculations. In determining each value of resistance, each step was duplicated at a different time, and generally by a different person. The transcription of all tables, the plotting of points and the drawing of curves have been similarly checked.

Results of the Tests

The immediate result of each test is a curve which shows for the train under consideration, the relation existing between train resistance and speed. Fig. 3 is such a curve and is fairly representative of the entire group of curves, and such discussion of it as follows is general in its application. The plotted points show unmistakably an increase in resistance as the speed increases, and the curve drawn represents the mean relation between resistance and speed. In Fig. 3 the maximum variation from this mean of any calculated value of resistance is about 20 per cent.; the next largest variation is 16 per cent., and other calculated values of resistance generally differ from the values determined from the curve by less than 10 per cent. In a majority of the tests the maximum variation is less than this.

These differences may be due in part to accumulated errors in the instruments or in the calculations. In all cases, however, where the calculated value of resistance varied by an unusual amount from the mean, all calculations leading thereto were repeated and errors thus discovered are eliminated from the report. The explanation for such differences need not be sought further than in the variations which actually occur from time to time, in the resistance itself. Variations in such components of train resistance as flange friction and wind resistance are probably sufficiently great to account for the differences discussed above. The data do not permit the influences of such components of resistance to be differentiated.

The curve drawn for each test has been accepted as representing the average values of net train resistance, with a degree of accuracy sufficient for the purpose of rating locomotives. Such temporary excess of resistance as may be expected to occur will generally be absorbed in that reserve in the tractive effort of the locomotive which must be allowed in any system of tonnage rating.

Fig. 5 presents the final results of the whole research. Each of these curves shows the mean relation which existed during the tests, between car weight and resistance at a definite speed, and it is believed that they are generally applicable to ordinary American freight trains, provided the conditions surrounding their operation are like those which prevailed during these tests. These curves enable one to determine the probable mean resistance of any such train, at speeds between 5 and 35 miles per hour, provided the average weight of the cars composing the train be known.

While Fig. 5 presents the main results of the experiments, the form in which these results are expressed is unusual. Ordinarily train resistance is expressed either as a curve or equation which defines the relation between resistance and speed, instead of the relation between resistance and car weight. Obviously to express the results of these experiments in the usual form a single curve will not suffice, since the influence of car weight cannot be thereby made evident. A number of curves will be required for this purpose, each of which will apply only to a definite average car weight. Fig. 6 presents such a group of resistance speed curves, which have been derived directly from the curves of Fig. 5, and it therefore exhibits in different form only such information as is obtainable from the latter.

The relation between the two may be made clear by explaining the derivation of the upper curve in Fig. 6, the one applying to a car weight of 15 tons. In Fig. 5 the ordinate corresponding to an average car weight of 15 tons cuts the seven curves there drawn at points where the mean resistance values are 7.62, 8.20, 8.81, 9.56, 10.37, 11.24 and 12.25 lb. per ton, corresponding

to speeds of 5, 10, 15, 20, 25, 30 and 35 miles per hour respectively. These values are the co-ordinates of seven points on a resistance speed curve applying to a car weight of 15 tons. These seven points have been plotted in Fig. 6, and the upper curve has been passed through them and extended to 40 miles per hour. The other curves were derived by a like process.

The relation between resistance and speed shown by each of the curves of Fig. 6 may be also expressed in the form of an equation. Formulæ 1 to 13 below are such equations, by which resistance may be calculated for any speed and for various car weights. In the formulæ R is the resistance expressed in pounds per ton, S is the speed expressed in miles per hour, and W is the average weight of the cars in the train expressed in tons. The formulæ are purely empirical, and are simply equations of parabolas so selected as to correspond very closely with the curves. The correspondence between the formulæ and the curves is such that the maximum difference between any value of resistance obtained by the formulæ, and the corresponding value obtained from the curves is 0.5 per cent. Since these are empirical equations their use should not be extended beyond the speed limits shown in Fig. 6.

The final results of the research are presented in Fig. 6 and in Formulæ 1 to 13. It is believed that by means of either the figure or the formulæ, the resistance of ordinary freight trains may be fairly accurately predicted; provided the conditions surrounding their operation are similar to those which prevailed during these tests and have been fully stated.

Train Resistance Formulæ.

When $W = 15$ tons; $R = 7.15 + 0.085\ S + 0.00175\ S^2$..... (1)
When $W = 20$ tons; $R = 6.30 + 0.087\ S + 0.00126\ S^2$..... (2)
When $W = 25$ tons; $R = 5.60 + 0.077\ S + 0.00116\ S^2$..... (3)
When $W = 30$ tons; $R = 5.02 + 0.066\ S + 0.00116\ S^2$..... (4)
When $W = 35$ tons; $R = 4.49 + 0.060\ S + 0.00108\ S^2$..... (5)
When $W = 40$ tons; $R = 4.15 + 0.041\ S + 0.00134\ S^2$..... (6)
When $W = 45$ tons; $R = 3.82 + 0.031\ S + 0.00140\ S^2$..... (7)
When $W = 50$ tons; $R = 3.56 + 0.024\ S + 0.00140\ S^2$..... (8)
When $W = 55$ tons; $R = 3.38 + 0.016\ S + 0.00142\ S^2$..... (9)
When $W = 60$ tons; $R = 3.19 + 0.016\ S + 0.00132\ S^2$..... (10)
When $W = 65$ tons; $R = 3.06 + 0.014\ S + 0.00130\ S^2$..... (11)
When $W = 70$ tons; $R = 2.92 + 0.021\ S + 0.00111\ S^2$..... (12)
When $W = 75$ tons; $R = 2.87 + 0.019\ S + 0.00113\ S^2$..... (13)

Discussion of the Results

Among those trains which are regarded as normal there are two or three whose resistance at some speed varies from the mean, as expressed in the curves, by as much as 23 per cent. The great majority, however, vary from this mean by about 10 per cent. or less. The data present no satisfactory general explanation for these differences in the resistance of different trains of like average weight per car. They may be due to difference in external conditions, or in train condition and make-up. Whatever the explanation, it is significant that about one-half of the trains experimented upon developed a resistance about 9 per cent. in excess of the mean resistance, which would be predicted by the use of Figs. 5 and 6. Obviously a similar excess may be expected with any train; it is suggested therefore that in determining the resistance of trains on level tangent track for the purpose of rating locomotives under operating conditions which demand conservative ratings, 9 per cent. be added to the resistance values obtained from the curves and equations presented. Such considerations are of little practical importance in rating locomotives for speeds above 15 miles per hour. In such cases an excess in resistance over that expected can result in nothing more serious than failure to realize the expected train speed.

It should be understood that this 9 per cent. allowance is intended to cover probable variations in the resistance of different trains under normal operating conditions. It in no way takes the place of that additional reserve which must be allowed to cover unusual variations in resistance due to low temperatures or high winds, nor of that reserve in the tractive effort of the locomotive necessitated by operating conditions which reduce the efficiency of the locomotive itself.

Objection may be made to the form of expression adopted in Fig. 5, in which the resistance is expressed solely in terms of average car weight, to the apparent neglect of the influence of those elements of resistance, such as air resistance, which are independent of weight, and which probably vary only with the number of cars in the train. The neglect is only apparent, however, for the process by which Fig. 5 was derived involves, although indirectly, recognition of the influence of the number of cars. It is quite likely that if Fig. 5 were applied to determine the total resistance of a single car, the result would be in error. Whatever objection may be urged against the form of expression adopted, it remains true that it rests upon experimental results obtained with trains of usual length, and that in practice one is not likely to encounter trains which present in this respect any extreme variation from the test data. The form of expression will not lead to error unless misapplied, and it was chosen because the results may be conveniently used in establishing tonnage ratings. It might likewise have been more rational to express the resistance in terms of load per axle instead of load per car, since the latter can operate to cause variations in resistance only in so far as it affects the former. Since, however, all American freight cars have four axles, the expression in either form would be identical. Convenience in application warrants the choice made in this respect also.

In Fig. 5 those portions of the curves which apply to average car weights below 20 tons were derived from trains which were quite homogeneous in their make-up as regards weight per car. These trains were necessarily composed almost exclusively of empty cars, since an average car weight of 20 tons or less cannot otherwise be obtained with cars of current design; and being empty they will be uniform in weight. Similarly for average car weights above 55 to 60 tons the test trains were necessarily uniform in make-up. For trains of average car weights below 20 and above 60 tons these curves are accepted, therefore, as valid, and applicable to any train to be met with in practice.

In Fig. 5 those portions of the curves corresponding to car weights of from 20 to 60 tons were, on the other hand, derived from trains which presented considerable diversity in make-up as regards weight per car. Some of these trains were composed almost entirely of loaded cars, others contained large proportions of both empty and loaded cars. In presenting the results in the form adopted the assumption is that the curves will be used throughout their entire range of average car weight to determine the total resistance of both homogeneous and mixed trains, and that, when so applied, they will lead to no material error. In view of the facts just stated it is pertinent to inquire whether this assumption is justifiable.

Assume two trains of equal tonnage, and of the same average weight per car. Assume further that one is composed of cars uniform in weight, and the others of cars of different individual weights. Now, if such trains are to have equal total resistance, it can be shown that the variation in resistance per car of the individual cars must be directly proportional to their weight. This implies that the curve showing the relation between total car resistance and car weight at a given speed must be a straight line, if homogeneous and mixed trains are to have equal total resistances at this speed. From Fig. 5 there have been derived such curves, showing the relation between car resistance and car weight. These curves correspond quite closely, but not exactly, with straight lines; and the correspondence is especially close for those portions of the curves which apply to car weights between 20 and 60 tons. From these facts we may conclude that the

curves of Fig. 5 are not quite equally applicable to mixed and homogeneous trains, but nearly so, and that if the curves are applied to both kinds of trains, we may expect a slight error in the resulting total train resistance.

Within the last two years the opinion has been expressed in some quarters that train resistance between speeds of 5 and 35 miles per hour is constant. It is proper to point out that there is nothing in the data here presented to support such a conclusion.

The wind velocities prevailing during the tests were generally less than 20 miles per hour. The data do not permit the influence of such winds to be differentiated from the other elements affecting resistance; but they do warrant the conclusion that this influence is small. In the introduction, train resistance was defined as the resistance in still air, whereas throughout the report the term is applied to the test results from which the influence of wind has not been eliminated. This inconsistency has been deliberately incurred to avoid unwieldy expression, and is partially justified by the facts just stated.

There is no point in comparing the results of these tests with formulæ in which the influence of car weight is given no consideration, nor with those not derived from tests on American cars of recent design. The results obtained on the Chicago, Burlington & Quincy Railroad and on the Pennsylvania Railroad are selected for comparison. When plotted on Fig. 5 of this report they show very close correspondence with the curve there drawn for 10 miles per hour, for car weights from 25 to 70 tons; while for car weights below 25 tons they indicate resistance values as much as 20 per cent. in excess of the results obtained during these tests.

The Estep Molding Fixtures

A simple appliance for hand manipulated bench molding apparatus, to facilitate drawing patterns, has been patented by Ezra Estep, superintendent of the foundry of the Sandwich Mfg. Company, Sandwich, Ill. Fig. 1 is a sectional view of the apparatus and Fig. 2 is a bottom plan view of a pattern plate and stripping plate.

Preferably, two-part hinged snap flasks are used. The pattern plate employed is interposed between the cope and nowel and has end flanges projecting beyond the sides of the flask when the parts are assembled. Each of the flanges has a hole to receive one of the dowel pins of the flask. Half patterns are formed upon the opposite sides of the pattern plate. The patterns shown in Fig. 2 are for a number of mongrel gears. The patterns and pattern plates are metal and the former are secured to the latter by screws.

A stripping plate is used in connection with the pattern plate to bear upon the face of the sand in the flask, during the withdrawal of the patterns. This stripping plate is of the same area as the pattern plate and its body portion is cut out to fit snugly over the nowel portion of each of the patterns. Flanges are formed on the stripping plate and correspond to the end flanges of the pattern plate. The nowel part of each pattern has a shank to separate it from the pattern plate, so that the full pattern protrudes through the stripping plate when the latter is in contact with the pattern plate. The stripping plate is connected to the pattern plate by bolts, which permit a limited separation, equal, if desired, to the depth of the pattern. Handles are provided for lifting the pattern and stripping plates and for separating them. These handles are pivoted to the stripping plate and have cam shoulders for bearing against the face of the pattern plate to separate the plates when the handle is swung to the service position. These handles are shown at the sides of Fig. 2.

In use the flask members are assembled with the pattern and stripping plates interposed between them

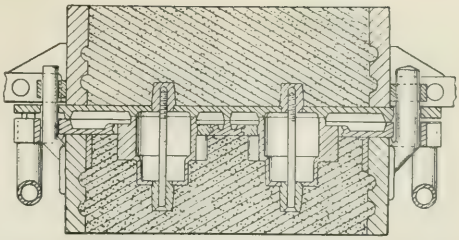


Fig. 1.—Vertical Section of the Estep Molding Apparatus.

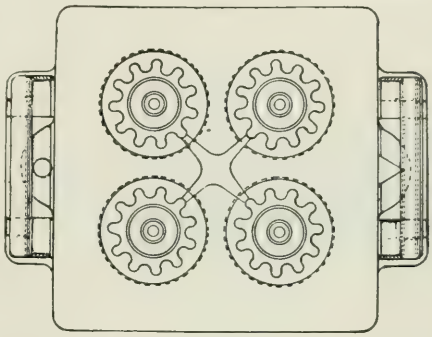


Fig. 2.—View of the Pattern and Stripping Plates from the Under Side.

and the handles in the position shown in Fig. 1 to permit the pattern plate to rest on the stripping plate, so that the pattern parts protrude through the stripping plate. The nowel is then filled with sand in the usual manner, and the sand rammed against the face of the stripping plate. The apparatus is then turned over to bring the cope uppermost. This is filled with sand and the sand rammed against the back of the pattern plate. The cope is now removed in the usual way, and the pattern withdrawn from the sand contained in the nowel by raising the handles. The pattern plate is separated from the stripping plate, and the latter bears upon the face or parting of the sand during this operation and serves to prevent injury to the edges of the mold by the withdrawing of the patterns. The pattern and stripping plates are now removed, and the parts of the mold reassembled for pouring, after which the flask is removed from the mold by opening the hinged frames.

A New Steel Casting Plant for Pittsburgh.—Charles Bailey and Joseph A. Kelly, Renshaw Building, Pittsburgh, formerly identified with the Reliance Tube Company of that city, have taken over the plant of the Scaife Foundry & Machine Company, Twenty-eighth and Smallman streets, Pittsburgh. They propose to incorporate, and will then rearrange the plant for the manufacture of high grade steel castings. The new owners have not definitely decided upon the corporate title nor the details as to the plant's capacity, &c. They are now going over this matter, and will shortly have inquiries out with engineers for the construction of one or more open hearth furnaces. They expect to have the equipment installed and the plant ready for operation about the end of October.

One of the two 100-ton tilting open hearth furnaces of the Tennessee Coal, Iron & Railroad Company, on which construction work has been in progress at Ensley, Ala., for some months, was put in operation last week. The other can be completed by September. This gives the company eight furnaces of 100 tons capacity each.

The Hydraulic Clutch Drive

A New Power Transmission Device for Gas Engines

The drive of the Hydraulic Clutch Drive Company, Washington, D. C., is designed to furnish a simple, positive and reliable control for gas engines. The principal advantages claimed for it are flexibility and simplicity. To the user it is said to offer ease of control, longer life of the engine and the car, less weight, fewer parts, and lower maintenance expense, while to the manufacturer it offers less cost to equip, no loss of power in transmission and less weight. This clutch has two rotatable elements with a chamber between them

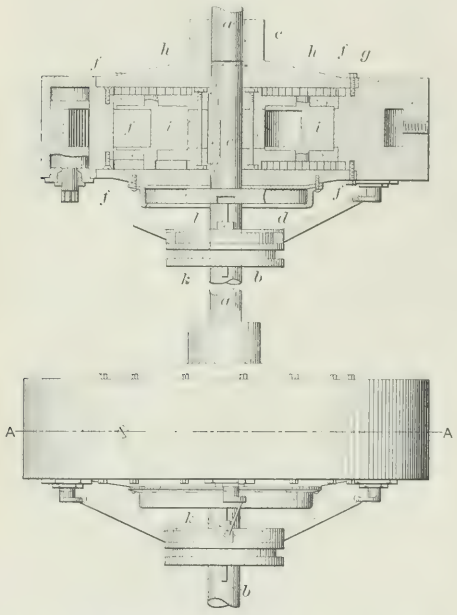


Fig. 1.—Axial Section on the Line B-B of Fig. 2 and Exterior of the Hydraulic Clutch Drive.

containing fluid that is driven around in passages by the driving element, and these passages are provided with valves to obstruct the flow of liquid to a greater or less extent and thus serve to couple the parts together and transmit the motion. Fig. 1 is an exterior and longitudinal sectional view of the clutch and Fig. 2 is a transverse section.

The outer casing of the clutch is formed of two disks and a spacing rim held in place between them by bolts. This rim is weighted and acts as a flywheel. The shaft sections are coaxial and are indicated at *a* and *b*, the former being the driving shaft and the latter the driven one. The outer casing is secured to the driving shaft by a key, *c*, and the driven shaft projects at its end within the casing and abuts the other shaft to sustain any end thrust. The driven shaft carries a hub, *d*, fitting between the side plates of the casing and fastened by a key, *e*. For convenience in assembling this hub is built up of three pieces, fastened together by countersunk bolts. It has annular peripheral flanges, *f*, producing an annular chamber, *g*, extending around within the rim of the casing, and the body of the hub also has a pair of opposite segmental recesses, *h*, which contain the rotatable pistons, *i*, fitting into the recesses and the chamber. These pistons have trunnions on opposite ends which are supported in bearings in the annular flanges and carry spur gears on their ends. These gears are made fast to the trunnions by keys and are fitted in circular depressions or seats formed in the outer side of the flanges of the hub. They mesh with internal gears set in rabbets in the opposite sides of the rim and within the side plates of the clutch.

Two pistons at diametrically opposite points, each carrying a pair of gears, sustain the drive when the parts are coupled.

Each of the pistons *i* has the form of a cylindrical block with a portion cut away, leaving a solid part which is segmental in cross section and whose inner surface coincides in the degree of curvature with the circumference of the hub, as is clearly shown in Fig. 2. The diameter of the piston is such that its outer surface is in rolling contact with the inner surface of the rim of the clutch, which is provided with a series of abutments on its inner side, so located that one of the two pistons will always be in active position. These abutments project to bearing contact with the hub across the chamber *g* and divide it into three parts. The surface of these abutments is that of a cycloid described by a point on the surface of the piston which rolls along the inner surface of the rim, thus keeping the surface of the piston in contact with the abutment at some point during the whole of its motion. The three chambers produced by the abutments are connected at the opposite ends by passages cored in the rim, whose cross sectional area equals that of the chambers, thus rendering a free flow possible. The flow of liquid through these passages is controlled by the os-

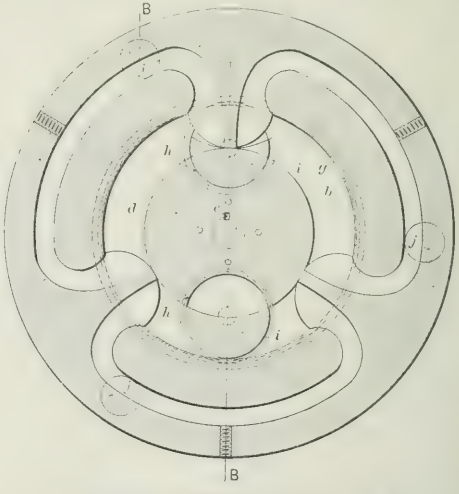


Fig. 2.—Perpendicular Section on the Line A-A of Fig. 1.

cillating valves *j*, whose sectional port area is equal to the similar area of the passages. These valves are encased in the rim and their stems project through the side. These valves may be turned to open or close the passages to a greater or less extent and consequently control the circulation of the liquid.

A shifting sleeve having a circular groove with a collar engaging it, connected by rods to crank arms on the valve stems, is employed to control the valves. The sleeve may be shifted along the shaft by an ordinary yoke or lever and when so shifted will turn the valves its full movement, completely closing them. This sleeve is keyed on the driven shaft and the collar is free to turn on the sleeve, so that the valves are closed when the sleeve is thrust toward the clutch casing. To take the strain off the gears and other parts of the fluid clutch after they have become coupled together a positive clutch is provided. This consists of a collar or disk fastened to the plate of the casing and extend-

ing around the shaft. This disk is fastened to the plate by a ring clamp and screws, with a leather disk placed between the collar and the casing. Thic collar has a notch, *l*, and the shifting sleeve has a lug, *k*, which will enter the notch when the sleeve is shifted to the full extent.

The arrangement and construction are such that the valves *j* will be fully closed before the lug *k* reaches the notch *l*, and accordingly the shifting lever or device may be stopped at that point, thus allowing the fluid clutch to operate the drive, but by throwing the lever to the last notch and shifting the collar to the full extent of its motion the lug will enter the notch and complete the positive engagement. Whenever quick variations of speed are needed the parts can be run under the liquid clutch alone; for full continuous speed the positive clutch may be thrown in to lock the driving and the driven elements together.

The chambers and the passages within the casing are practically filled with oil or other liquid, a slight space being left unfilled to allow room for the change in capacity incident to the entry of the pistons into the chambers. Such change, however, is slight, inasmuch as after passing certain points on the abutments the fluid flows into the recessed portion of the pistons sufficiently to equalize the capacity.

In operation the clutch casing rotates with the driving shaft, and, the oscillating valves being opened, the pistons travel or roll around in the chambers *g* through the action of the ring and spur gears and by their movement force the fluid around through the passages connecting the abutments, without movement of the driven parts. Closing the valves more or less obstructs the passage of the fluid in a proportionate amount and the motion or variable speed will be transmitted to the hub and the driven shaft in proportion to the extent of the closure of the valves.

Another application of this clutch is to use it as a brake by fixing one of the parts and operating the valves to bring the other to rest. While this clutch has been designed primarily for use on automobiles, it is not restricted to that field, but can be applied to any drive requiring a positive clutch, such as connecting a dynamo directly to a gas engine or for use in a motor launch.

New Tools and Appliances

Cold Cutting Circular Metal Saws.—The Simonds Mfg. Company, Fitchburg, Mass., has recently begun the manufacture of circular metal saws for cold cutting for machines of all descriptions. The material used in the construction of these saws is a special type steel, and is said to possess the advantage of longer runs or faster feed, or frequently both. Side clearance of these saws is obtained by grinding from the teeth toward the center, which is said to insure perfect clearance until the saw is worn out. These saws are made in different sizes, ranging from 8 to 36 in. in diameter, with the ordinary thicknesses.

Twenty-In. Upright Drill.—J. E. Snyder & Son, Worcester, Mass., have recently brought out a new design of 20-in. upright drill which is of the same general design as the 21-in. model illustrated and described in *The Iron Age* April 29, 1909. The construction is, however, somewhat heavier, and the main column, the arm supporting the table and the base are more rigidly designed. The spindle may be traversed either by a hand wheel or a lever and ratchet, is counterbalanced by a weight inside the column and has quick return motion.

Moline Multiple Spindle Drill Press.—A new design of multiple spindle drill press has been recently added to the line of the Moline Tool Company, Moline, Ill. The maker's regular double spiral drive is used on the machine, but in place of a table feed it is equipped with an all spur gear spindle feed so arranged that it can be tripped automatically. The machine is so designed that in addition to an automatic stop each spindle has an independent speed which is easily controlled. The spindles are counterbalanced and may be rapidly traversed by hand. The drill press has a capacity for drills up to 2 in. in diameter in steel, and the maximum and minimum center to center distances are 5 ft. and 6 in. Bronze bushings are provided for the spindles to run in, and the feed racks are cut from the solid in the spindle quill and are also bronzed bushed. Ball thrust bearings and back gears are also provided.

An Open Side Planer.—The Cleveland Planer Works, Cleveland, Ohio, has recently added to its line of open side planers a 60 x 84 in. machine arranged with an outside column, which can be employed to support a fourth head when such an addition can be advantageously utilized. This column is not intended as a stiffener for the cross rail which in common with the bed and the column is of box section, giving a stiff and strong construction. The cross rail, which is raised and lowered by power, has an extremely broad bearing on the face of the column to which it is square gibbed. It is possible to operate the heads from either side of the machine, and automatic feeds are provided in all directions. The side head has a large bearing on the column and can be lowered out of the way when it is desired to use the rail heads close to the table. The table is provided with T-slots and holes at frequent intervals which are not bored through. Phosphor bronze bushings are provided for all the bearings and can be easily removed when worn without interfering with the alignment of the machine in any way. All the gearing in the running parts can be removed from the sides of the machine so that repairs can be easily made.

Belt Shifter.—The International Belt Shifter Company, 624 Vance street, Toledo, Ohio, has brought out a combination belt shifter which in addition to shifting the belt retains it when in the off position, thus completely disengaging the belt from the shaft pulley. The apparatus consists of a frame similar in form to a segment of the pulley rim. Projecting from the curved portion of this frame toward the pulley are a number of spindles carrying rollers which form a support for the belt when the latter is shifted, thus performing the function of the ordinary idler pulley. The belt shifting mechanism consists of two shift bars mounted in brackets and from which project rollers for engaging the belt. The front shift bar moves the belt from the driving pulley to the retaining rollers, while the rear one shifts it back. The shifters are operated by pull chains and are automatically returned to their original position by springs.

New Acme Turret Lathe.—A line of turret lathes intended especially to withstand the strains incident to the use of high speed steels has been recently brought out by the Acme Machine Tool Company, Cincinnati, Ohio. They are furnished with or without a power feed to the turret, and also with or without an extra capacity automatic chuck. It is of the friction geared type and the back gears are engaged or thrown out without stopping the machine. A wide face three-step cone pulley is provided and two spindle speeds are available for each step. The hexagonal turret has a hole through the central stem of the same diameter as the tool holes which are tapped for bolting tools to the turret faces. Independent adjustable stops are provided for each hole of the turret, and these can be shifted to permit a slight movement beyond the stop when desired without disturbing the adjustment. A geared power feed is furnished for the turret and four rates of feed are instantly obtainable by shifting a lever. Sufficient distance is provided between the center of the turret and the top of the slide for large dies and turret tools to be swung.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, placed its new furnace C in operation August 16. This furnace is of the same size and type as its other two new furnaces, each being of 500 tons capacity daily, and the blowing in was under very favorable conditions. Furnace B, which has just finished a run of 21 months, was blown out August 13 for relining, not to be blown in again until sufficient business has been accumulated to justify it.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¼ in round and square	₰ lb 1.90¢
1½ to 4 in x ⅜ to 1 in	₰ lb 2.10¢
1½ to 4 in x ⅛ to 5-16	
Rods—⅜ and 11-16 round and square	₰ lb 2.10¢

Angles:

	Cts ₰
3 in x 2½ in and larger	2.55
2 in x 2-16 in and 3 in	2.35
1½ to 2 x ¼ in	2.30
1½ to 2½ in x 3-16 in and thicker	2.10
1 to 1¼ in x 3-16 in	2.20
1 to 1¼ x ¼ in	2.30
⅞ x ⅛ in	2.40
¾ x ⅛ in	2.50
⅝ x ⅛ in	2.55
½ x ⅛ in	2.65
½ x 3-32 in	2.85

Tees:

1 in	2.65¢
1¼ in	2.45¢
1½ to 2 x ¼ in	2.15¢
1½ to 2½ x 3-16 in	2.35¢
3 in and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1 to 6 x 5-16 to No 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H B & S" Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ₰
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

	Black		Galvanized
	One Pass, C R Soft Steel.	R G Cleaned.	
No. 16	₰ lb 2.90	3.00¢	3.20¢
Nos. 18 to 21	₰ lb 2.95	3.10¢	3.25¢
Nos. 22 and 24	₰ lb 3.05¢	3.20¢	3.35¢
No. 26	₰ lb 3.10¢	3.30¢	3.45¢
No 28	₰ lb 3.20¢	3.50¢	3.75¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₰ lb 12 @14½¢
Patent Planished, W. Dewees Wood ₰ lb A, 10¢; B, 9¢ net

Galvanized.

Nos 14 to 16	₰ lb 3.20¢
Nos 22 to 24	₰ lb 3.55¢
No 26	₰ lb 3.75¢
No 28	₰ lb 4.10¢

No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—Galvanized.

Nos 22 and 24	₰ lb 5.75¢
No 26	₰ lb 6.25¢
No 28	₰ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₰ 100 sq ft. $3.85	4.80
No 26	₰ 100 sq ft. 2.95	4.00
No. 28	₰ 100 sq ft. 2.68	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb coating	$8.50
IX, 20 x 28 with an 8 lb coating	10.50

Seamless Brass Tubes—

List November 13, 1908 Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 Base price 18¢

Copper Tubes—

List November 13 1908 Base price 22¢

Brazed Brass Tubes

List August 1, 1908 19½¢ ₰ lb

High Brass Rods—

List August 1, 1908 14½¢ ₰ lb

Roll and Sheet Brass

List August 1, 1908 14½¢ ₰ lb

Brass Wire—

List August 1, 1908 14½¢ ₰ lb

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz quantity (as) ₰ lb 18 ¢
Sheet Copper Cold Rolled, 1¢ ₰ lb advance over Hot Rolled
Sheet Copper Polished 20 in wide and under, 1¢ ₰ square foot
Sheet Copper Polished over 20 in wide, 2¢ ₰ square foot
Planished Copper, 1¢ ₰ square foot more than Polished

METALS—

Tin—

Straits Pig ₰ lb 35 @35¾¢

Copper—

Lake Ingot	₰ lb 14¾@15 ¢
Electrolytic	₰ lb 14½@14¾¢
Casting	₰ lb 14¼@14½¢

Spelter—

Western ₰ lb 6¼@6½¢

Zinc.

No 9, base, casks ₰ lb 8 ¢ | Open ₰ lb 8½¢

Lead.

American Pig	₰ lb 5 @5¼¢
Bar	₰ lb 6⅜@6½¢

Solder.

½ & ½, guaranteed	₰ lb 22 @22½¢
No. 1	₰ lb 19 @19½¢
Refined	₰ lb 17½@17½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₰ lb @10¢
Hallett's	@10¢
Other Brands	@09½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

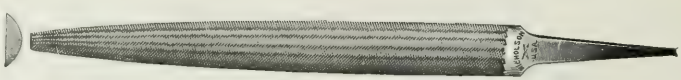
No 1 Aluminum (guaranteed over 99% pure), in Ingot for remelting @24¢
Rods & Wire Base Price 31¢
Sheets Base Price 33¢

Old Metals.

Dealers Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₰ lb 10.75@11.00
Copper, Heavy and Wire	₰ lb 10.50@10.75
Copper, Light and Bottoms	₰ lb 9.50@ 9.75
Brass, Heavy	₰ lb 7.25@ 7.50
Brass, Light	₰ lb 5.75@ 6.00
Heavy Machine Composition	₰ lb 9.50@ 9.75
Clean Brass Turnings	₰ lb 7.00@ 7.25
Composition Turnings	₰ lb 8.25@ 8.50
Lead, Heavy	₰ lb @ 3.50
Lead, Tea	₰ lb @ 3.25
Zinc Scrap	₰ lb @ 3.75

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THE IRON AGE

Established 1855

New York, September 1, 1910

VOL. 86: NO. 9

Published Every Thursday by the

DAVID WILLIAMS COMPANY

14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum, to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Heavy Pig Iron Buying

Improved Sentiment in Finished Iron and Steel

The feature of the week has been the beginning of what promises to be a heavy buying movement in pig iron. It began with the purchase by a large plow company at South Bend, Ind., of more than 40,000 tons of pig iron, comprising foundry, malleable Bessemer, high silicon and charcoal iron. The charcoal purchased comprised 12,000 to 15,000 tons, the malleable 10,000 tons, the Southern 8000 tons, and included in the remainder was about 8000 tons of Northern off-grade foundry iron. Some of this purchase was for early delivery, while on part of it the shipments will run over the first eight months of next year. While slight concessions are stated to have been made on the iron for early delivery, a better price than current quotations was secured by the sellers for deliveries running into next year.

This transaction has brought out much inquiry from other large pig iron consumers who have become convinced that it may be well to follow the example thus set. The Chicago district has inquiries for fully 50,000 tons of Northern and more than 30,000 tons of Southern, for delivery running through the first quarter and half. Pig iron sellers both East and West have an inquiry from a large manufacturer of soil pipe for 15,000 to 30,000 tons for its various foundries located in several States. Pittsburgh further reports large inquiries for foundry, Bessemer, basic and malleable Bessemer. More activity is noted in Buffalo, where good sales have been made, while a radiator company is asking for 6000 to 10,000 tons of foundry iron and a number of inquiries are in hand for iron for the first half of next year. At Cleveland both inquiries and sales show much improvement, purchases having been made by Michigan stove manufacturers. A St. Louis steel foundry is asking for prices on 10,000 tons of basic, half for next year's delivery.

The improved sentiment noted last week continues as to finished iron and steel. Specifications continue heavy in all lines and good inquiries are beginning to appear. A large consumer is in the market for 10,000 tons of steel bars for shipments running over a year and other steel bar inquiries may run the total quantity now in the market to 25,000 tons or more. The sheet and tin plate mills are negotiating for round tonnages of sheet and tin plate bars and some of this business has already been closed. One large independent

tin plate company has contracted with three mills for its requirements running over two and a half to five years, the settlements to be based on current market quotations. The American Sheet & Tin Plate Company has not yet decided to start up its three tin plate plants which were kept idle on account of the strike that was declared off last week, but it may be found necessary to do so in the near future for the purpose of supplying the heavy demand for tin plate. Chicago reports a large business in prospect in structural material. The plans for the new Union Depot alone in that city call for 75,000 to 100,000 tons. It is now regarded as extremely probable that September will show orders for finished iron and steel exceeding the deliveries.

The rail sales of the week comprise 9000 tons of ferrotitanium Bessemer rails sold to the Chicago, Milwaukee & St. Paul Railroad by the Lackawanna Steel Company, 3200 tons to local buyers by the Illinois Steel Company and 7000 tons to the Korean Railway by the United States Steel Products Company. Inquiries are in hand for a considerable quantity of rails from domestic roads, including one for 14,000 tons and one for 13,000 tons.

Pig tin has been soaring the past week. On Friday, due to London speculation, spot tin sold in New York at 36c. per pound, which is the highest price reached since August, 1907, when it sold at 36.12½c.

Workmen's Compensation and Pension Systems

Two essential questions which must be answered by an industrial company in establishing a workmen's compensation and pension system are: Shall employees contribute to the fund from their wages? Shall there be restrictions in the distribution of the benefits, including payment for injuries sustained during employment? These subjects bear a close relation to each other, and a conflict of purpose may follow an unskillful adjustment, even to the point of widening instead of narrowing the gap between employer and employees. A difference in practice must exist, comparing a system of which the total expense is borne by the owner with one where employees contribute a percentage of their wages, even though the amount collected from the latter source be relatively small. The workman procures a right to the benefits either by the terms of the contract of his employment or by the act of his own payments. The degree of the employer's obligation varies somewhat according to the financial conditions surrounding the system.

The comprehensive and farsighted plan of Cheney Bros., South Manchester, Conn., published in detail in another portion of this issue, affords an excellent basis of thought in considering the general question. Stated briefly, the employee of the firm who becomes a member of an association of his fellows (and none other is eligible), to which he contributes a part of his earnings, is entitled to sick and accident benefits, insurance against death from either cause, an annuity after long years of service, and, at the firm's discretion, a pension. All benefits but the last one are his right, provided he lives up to certain rules in his employment, and, as it affects sickness, to certain rules of private life. His own contributions to the fund are applied only to sick benefits and annuities, and for this purpose are duplicated by the firm, whose own guaranteed responsibilities are relatively large. The owners, however, determine the rules governing compensation in its several forms. For example, concerning accidents, an employee cannot expect to receive payment if his injuries are the result of "willful and gross carelessness or disobedience to rules reasonably designed for the protection of employees." In this connection it should not be lost sight of that the firm pays all accident claims from its own treasury.

Much can be said for a system of assessment of employees in connection with compensation. It need not be compulsory; a workman may decline to enter into the plan, but by so doing he fails to establish the right to participate in its benefits. The system must have its rules and restrictions, based upon length of employment and other factors, among them, perhaps, a regulation such as that quoted from Cheney Bros. The argument has been raised that where a workman contributes from his wages benefits should be paid him regardless of the circumstances of the case. The presumption is that the man voluntarily enters into an agreement to devote a portion of his wages to this purpose, with the idea of protecting his family as well as himself. It may be his substitute for another form of insurance. On this theory his dependents may be considered as contributing a certain share of the monthly assessment and, without fault of their own, must be losers should their breadwinner suffer injuries or death as a consequence of violating the rules of his employment. As to the additional expense which a freedom from restrictions would entail, the contention is that all of the employer's part of the obligation is figured into industrial costs and as such is borne by the consumer, and a slight addition to the burden would not be felt—a statement hardly to be accepted in some lines of trade where competition is close.

Probably the real secret of a successful compensation system is one of management rather than of restrictions or their absence. Rules such as these are made to be broken by discriminating directors. Provision must be made against imposition, as will be realized by those familiar with the *personnel* of great numbers of the workmen in American mills and factories. The successful system is operated to bring closer the owners and the people whom they employ. Manufacturers realize keenly that their workmen are suspicious of any plan which is represented to be based on humanity and generosity, because they credit the employer with no other motive than a wish to make money. Many of them see in compensation a means of reducing employers' liability charges, when, as a matter of fact, the cost of accidents is increased, sometimes materially. The employee still has the same recourse to the law that he has always enjoyed. He has something besides, in a source of compensation for which the laws of most States make no provision for him. Understanding those with whom he is dealing, the manager of the compensation system must be a law unto himself in his right to ignore rules should the individual case require it. This is fair to all—in systems where employees do not contribute, for they are getting something for nothing anyway; where they do contribute, justice may demand that the assessments of the sober, industrious workman shall not be used as payment for injuries to one whose habits have rendered him grossly or wilfully negligent.

A Labor Decision Which Explores New Ground

Supreme Court Justice John W. Goff of New York handed down an opinion August 27 which opens up a new phase of the controversy over the closed shop. An application having been made to him for an injunction to restrain what is known as peaceful picketing in the strike of the New York City cloak makers, he decided that this strike was in effect a conspiracy in restraint of trade. He based his decision on the precedent of the New York Court of Appeals in the case of McCord against the Thompson-Starrett Company, in which that court declared that it is against the public policy of the State for employers to control practically the whole trade in a community and to combine for the purpose of compelling workmen to join a particular union as a condition of employment. Judge Goff says:

If the rule laid down in the McCord case be the law, and it must be accepted as such, being the latest expression of the Court of Appeals, it must be applicable to workmen as well as to employers. It would be repugnant to reason to hold that it applies to one and not to the other. What the employers may not do the workmen may not do. If a combination of one to refuse employment, except on condition of joining a union, be against public policy, a combination of the others to cause refusal of employment, except on condition of joining a union, is alike against public policy.

The strike of the cloakmakers was begun for the purpose of forcing a closed shop agreement and also to secure shorter hours and higher pay. The court, however, holds that the primary object of the strike is to deprive other men than the strikers of their opportunity to work and drive them from the industry.

This decision is regarded as exceedingly important, as it will apply not only to the present strike but to any other strike where an attempt is made to enforce a demand for the closed shop. The labor unions will, of course, carry the case to a higher court, but the principle laid down appears to be difficult to overthrow.

Steel Balls and Their Manufacture

Recently in these columns attention was directed to some of the methods of manufacturing ball bearings. The production of an approximately perfect steel ball is becoming an almost vital matter, because of the considerable introduction of ball bearings which has already taken place and the much wider use which is reasonably to be expected. As to just what really constitutes an approximately perfect ball not every one is aware.

The application of ball bearings to bicycles in the latter part of the nineteenth century is undoubtedly largely responsible for their present known importance. It is also indirectly responsible for a certain amount of lack of confidence still persistent among the builders of machines and other apparatus. In the bicycle the load is small and the velocity inconsiderable. Thus, 200 lb. may be taken as the load; and the angular velocity of a bicycle wheel going at the rate of about 60 miles an hour is only 720 rev. per min. Under such favorable conditions of speed and load, ball races of imperfect design and balls of equally imperfect manufacture were entirely satisfactory, but when the attempt was made to deal with really severe conditions it was met with failure. It is now known that both designer and manufacturer were at fault. The designer did not know how the races should be formed; the manufacturer did not know the grade of perfection that was essential in both ball and raceway.

The proper design of the ball is obvious. It should be a perfect sphere. However, probably no one has yet made a perfectly spherical steel ball. The practical question then is, Within what limits must the imperfections lie? Ideas as to this have changed until now a ball of the highest quality must be perfect within 0.0001 in. This requirement comes largely because of the effort to eliminate play in the modern bearing. Radial clearance should be as nearly nothing as possible, which it cannot be if the balls are not of the same size, or if they are not perfectly round. It is impossible to make radial clearance negligible with the use of balls having any appreciable variation in size from one another or of balls deviating in any but the most minute way from perfect roundness.

It seems quite probable that when a ball passes under maximum load it is called upon to take nearly the whole of the load imposed upon the bearing itself. This load comes on with great rapidity, though by degrees; and passes off in the same way. It is imposed upon a minute surface, which is not provided with support of other metal from all sides. The ball must, therefore, be both hard and tough. There is a tendency to flake, and only special steels are able to furnish the qualities necessary. In other words, the steel ball of highest quality to-day is a ball which could not have been manufactured a few years ago, because of the want of a suitable material. The exact treatment necessary to give the best results has had to be sought also. Perhaps the best present practice is to make the ball of exactly the same degree of hardness as the raceways, all being made of the same steel; or to make the balls slightly harder, the chrome steel in the balls being of a somewhat higher carbon content than that in the raceways.

To-day the manufacture has been carried to such a point of perfection and the material is of such marvelous excellence that the performance of the highest grade of ball when associated with raceways of the best design and manufacture is but little short of wonderful. As builders of apparatus become alive to the possibilities, the application of balls and their raceways will rapidly extend.

Workmen's Compensation in Illinois

The Employers' Liability Commission of Illinois, established under the act of the last Legislature, to investigate the problem of industrial accidents and to prepare a bill for accomplishing a system of compensation for losses, has issued a statement of the plan which it will recommend for enactment into law. It is workmen's compensation, similar in general respects to the system already established in New York and in various European countries, but contains a highly interesting method of inducing both employers and employees to use this method of adjusting damages instead of resorting to the common law. The plan follows:

To make the law compulsory in form, but elective in fact, providing in the first instance that the employer shall pay the compensation, according to the scale set forth in the act, but reserving to both employer and employee their common law remedies, including trial by jury, providing, however, as to the employer that if he refuses to pay the compensation according to the scale provided, and forces the employee to his action at the common law, he shall not escape liability by reason of either (1) the fellow servant rule, (2) the assumption of the risk, or (3) the contributory negligence of the employee, unless his negligence be greater than that of the employer, in which event the damages shall be apportioned according to the relative degree of negligence, and the burden of proof shall be upon the em-

ployer; and providing as to the employee that he shall be presumed to have accepted the compensation law, and any acceptance by him of compensation under the proposed law, except necessary medical and surgical attention, shall bar the right of action at common law, and the beginning of any action at law shall bar his right to compensation under the proposed law, except in the case of willful negligence of the employer or his failure to comply with statutory or municipal safety regulations; these two limitations upon the rights of the respective parties being imposed for the purpose of inducing them both to accept the compensation law, and to refrain from using the present unsatisfactory methods of settling claims for personal injury.

To reduce the statement to a few words, the employer who declines to accept the compensation law in the adjusting of an accident case would be deprived of his three chief defenses under the employers' liability act, while, on the other hand, these defenses—that of the fellow servant, the assumption of risk and contributory negligence—would be at his disposal should it be the employee who selects the alternative. Under the New York law owners of industrial works are deprived completely of these cardinal features of employers' liability. Therefore in Illinois the employer would be proportionately better off, for the old rights would be reserved to him should he be willing to accept the provisions of workmen's compensation.

The scale of compensation recommended is not unusual. In cases of death where there are dependents, three years' wages are provided, but not less than $1500 nor more than $3000. Where there are no dependents the sum shall not exceed $200. For permanent disability a pension is established on the basis of 50 per cent. of the earnings of the employee, to be paid as long as disability lasts or until the compensation equals the amount of four years' wages. Where the disability is permanent, but only partial, the percentage of compensation or pension is reduced in proportion to the reduction in earning capacity. For temporary disability the basis is 50 per cent. of the earnings. For the permanent disability of minors the basis is 50 per cent. of the earnings of adults in the same line of employment.

The proposed law would apply to all employers of labor who have more than five persons employed at one time. The limit is a low one. The risk of the small employer, while proportionately the same as that of large works, is far greater in practice, for, while the chances are more in his favor, ill fortune in the way of a serious accident would mean in many cases a crippling loss.

It is interesting to note that neither Chicago employers nor labor leaders are pleased with the provisions of this proposed law. The employers object to the scale of compensation as being too high, while the labor representatives assert that what they first desire is an employers' liability law and they are not willing to consider at present compensation for injuries.

The High Cost of Living.—Secretary James L. Barton of the American Board of Commissioners for Foreign Missions, Boston, Mass., is given as authority for the statement that the problem of greatly increased cost of living is as acute to-day in Asia Minor, Armenia, Syria, Macedonia, India, Ceylon, China and Japan as it is in the United States. The problem has become a serious one with the board in view of its maintenance of some 600 missionaries, 4500 native preachers, teachers and assistants, and over 70,000 pupils in schools. Secretary Barton draws the conclusions that the rise of prices in the United States is not due to local conditions alone, since all parts of Asia, Africa and portions of the Pacific are affected alike.

The Western Steel Corporation

The *Pacific Builder and Engineer*, in its issue of August 6, gives an interesting illustrated description of the steel plant of the Western Steel Corporation at Irondale, Wash. The description, in addition to giving details which have already been laid before our readers, makes some further interesting statements. The fact is mentioned that a special bonded yard has been provided for the Chinese pig iron imported for the use of the steel plant. It is stated that "this feature is a financial gain to the corporation, as a large shipment of pig iron may be received from China at no investment to the American manufacturers, who take the pig out of bond as it is needed and pay for it as used." The blast furnace at Irondale is now being operated on a mixture of Chinese and Snohomish County ore, from which a high grade pig iron is obtained containing about 4 per cent. graphitic carbon, from 0.013 to 0.040 sulphur, 0.41 to 0.49 phosphorus, 0.08 manganese and from 0.99 to 2.68 silicon. The cost of production of the pig iron is given as follows:

[illegible]	$5.92
[illegible]	2.50
[illegible]	4.75
Limestone	0.66
Total	$13.83

It is stated that 1900 pounds of coke is used per ton of pig iron. Information comes from Pittsburgh that the corporation has given an order to the Lewis Foundry & Machine Company for a 9-in. bar mill. This will be three high, having one stand two high and one stand with two sets of pinions, making four stands in all. It will be used for making small bars and structural shapes, and is to be placed back of the 14-in. mill in the plant at Irondale. The 14-in. mill will, therefore, be used for rolling the heavier sizes of bars and shapes and will also turn out light rails.

Opening of the Pennsylvania Railroad Station in New York City

The Pennsylvania Railroad Company announces that its new station in New York City, which covers the entire area bounded by Seventh and Eighth avenues and Thirty-first and Thirty-third streets, will be opened September 8 for service between New York City and points on the Long Island Railroad. No definite date has been set for the inauguration of service from points west of New York City. This is the largest building in the world ever built at one time. An official booklet has been issued by the company, entitled "The New York Improvement and Tunnel Extension of the Pennsylvania Railroad," which contains 23 photographic reproductions illustrating both the interior and exterior, as well as giving views of the tunnels, the interior of one of the tubes and a picture of the Pennsylvania type electric locomotive. The construction of the tunnel extension was begun June 10, 1903; the tubes of the tunnel under the Hudson River were joined October 9, 1906, and those under the East River March 18, 1908, being the first tunnels for standard railroad trains constructed under these rivers. The construction of the New York station building was begun May 1, 1904.

At a meeting of stockholders of the Youngstown Foundry & Machine Company, Youngstown, Ohio, held last week, the following Board of Directors was elected: W. J. Wallis, F. A. Williams, B. G. Parker, S. K. Hine, A. E. Adams, H. A. Parrock and Emanuel Hartzell. The following officers were elected: W. J. Wallis, president and general manager; Frank A. Williams, vice-president and manager of sales, and B. G. Parker, secretary and treasurer.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug.31, 1910.	Aug.24, 1910.	July27, 1910.	Aug 27, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$16.00*	$16.00	$16.25	$17.25
Foundry No. 2, Southern, Cincinnati	*14.25*	14.25	14.75	16.75
Foundry No. 2, local, Chicago	16.50	16.50	16.50	17.50
Basic, delivered, eastern Pa.	*15.00*	15.00	15.50	17.50
Basic, Valley furnace	*14.00*	14.00	14.50	15.25
Bessemer, Pittsburgh	*15.90*	15.90	16.40	17.40
Gray forge, Pittsburgh	*14.15*	14.15	14.40	15.65
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	24.50	24.50	24.50	24.50
Forging billets, Pittsburgh	*29.00*	29.50	30.00	28.00
Open hearth billets, Philadelphia	*27.50*	27.50	28.50	27.00
Wire rods, Pittsburgh	*28.00*	28.00	29.00	31.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	**13.50**	13.50	13.00	16.00
Steel rails, melting, Philadelphia	*13.75*	13.75	14.00	17.00
Iron rails, Chicago	*16.00*	16.00	16.50	19.00
Iron rails, Philadelphia	18.00	18.00	18.00	19.75
Car wheels, Chicago	*14.00*	14.50	14.75	17.00
Car wheels, Philadelphia	*13.75*	13.75	14.00	16.00
Heavy steel scrap, Pittsburgh	**14.25**	14.25	14.00	16.75
Heavy steel scrap, Chicago	12.25	12.25	12.25	15.50
Heavy steel scrap, Philadelphia	*13.75*	13.75	14.00	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.40*	1.40	1.42½	1.47
Common iron bars, Chicago	*1.37½*	1.37½	1.40	1.40
Common iron bars, Pittsburgh	*1.45*	1.45	1.50	1.50
Steel bars, tidewater, New York	*1.56*	1.56	1.61	1.51
Steel bars, Pittsburgh	*1.40*	1.40	1.45	1.35
Tank plates, tidewater, New York	1.56	1.56	1.56	1.56
Tank plates, Pittsburgh	1.40	1.40	1.40	1.40
Beams, tidewater, New York	1.56	1.56	1.56	1.56
Beams, Pittsburgh	1.40	1.40	1.40	1.40
Angles, tidewater, New York	1.56	1.56	1.56	1.56
Angles, Pittsburgh	1.40	1.40	1.40	1.40
Skelp, grooved steel, Pittsburgh	*1.45*	1.45	1.50	1.40
Skelp, sheared steel, Pittsburgh	*1.55*	1.55	1.60	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.20	2.25	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.65*	1.65	1.70	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**12.87½**	13.00	12.62½	13.50
Electrolytic copper, New York	**12.62½**	12.62½	12.50	13.25
Spelter, New York	**5.35**	5.35	5.20	5.85
Spelter, St. Louis	**5.20**	5.20	5.05	5.70
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	**4.30**	4.30	4.25	4.32½
Tin, New York	**35.70**	34.50	33.25	30.45
Antimony, Hallett, New York	*7.87½*	7.87½	8.00	8.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c. base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.65c.; Nos. 9 and 10, 1.70c.; Nos. 11 and 12, 1.75c.; Nos. 13 and 14, 1.80c.; Nos. 15 and 16, 1.90c. Box annealed sheets: Nos. 17 and 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c. to 2.15c.; No. 27, 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c.; No. 29, 2.20c. to 2.25c.; No. 30, 2.30c to 2.35c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.25c. to 3.30c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.60 per square. Galvanized roofing sheets, No. 28, $2.95 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	55	67	53
½ in.	74	62	70	58
¾ to 3 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ¾ in.	63	51	59	47
1 to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	48
2½ in.	63	48
2¾ to 5 in.	60	55
6 to 13 in.	61	43

2¼ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and 1-in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

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Pittsburgh

PARK BUILDING, August 31, 1910.—(*By Telegraph.*)

Pig Iron.—There are heavy inquiries for foundry and steel making iron in the market, and it is probable that a good deal of tonnage will be closed up within a short time. While the market is not higher, prices are firmer, and it is now believed that bottom has been reached. We quote Bessemer iron at $15 to $15.25; basic, $14; No. 2 foundry, $14; gray forge, $13.25 to $13.35, and malleable Bessemer, $14.50, all Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—Makers of sheets and tin plates who buy their bars in the open market have been quite active with inquiries lately and considerable tonnage is under negotiation. It is believed that prices on steel have about reached bottom and consumers are naturally anxious to cover as far ahead as possible at present prices. We quote Bessemer billets at $24.50; Bessemer sheet bars, $25.50; open hearth billets, $25.50 to $26; open hearth sheet bars, $26.50, and forging billets, $29 to $29.50, all f.o.b. Pittsburgh, Wheeling or Youngstown districts.

Tin Plate.—The American Sheet & Tin Plate Company is operating at present 197 hot tin mills out of a total of 235, or 84 per cent. of its capacity. The New Castle Works, containing 20 hot mills; the Sharon Works, 20, and the Shenango Works, 30, are all in operation to full capacity, and were before the tin plate strike was declared off. The company is operating 78 per cent. of its sheet mill capacity, and has made no definite plans as yet regarding the starting of the Laughlin and La Belle mills in the Wheeling district and the Aetna-Standard at Bridgeport, Ohio, these three plants having been closed down for 14 months.

(*By Mail.*)

The stronger tone in the iron market referred to in this report last week continues, and there is no doubt whatever but that the whole situation is showing more strength and there is a more optimistic feeling regarding the future than for some time. Prices of pig iron, steel and on nearly all kinds of finished material have reached such a low point that large consumers are now interested in the market and some heavy inquiries for material for forward delivery are in the market. It is argued that with Bessemer iron at $15 or lower, basic below $14, steel billets about $24.50 and sheet bars slightly higher there is an incentive for large consumers to take hold and make contracts. The purchases of pig iron by the Oliver Chilled Plow Works of South Bend, Ind., are put at all the way from 40,000 to 50,000 tons, but as near as can be learned from reliable sources this concern has bought about 26,000 tons of pig iron, mostly for delivery next year and at very low prices. One interest is reported to have taken 10,000 to 12,000 tons of malleable Bessemer and 4000 to 5000 tons of another grade, while a second interest is said to have taken nearly 10,000 tons of Southern iron, while a small tonnage of malleable Bessemer went to a Cleveland interest. None of the prices paid for this iron has been made public or given out by the buyer, but it is known that the prices were attractive to the purchaser and possibly could not be duplicated to-day. There are other large inquiries in the market for Bessemer, basic, foundry and malleable Bessemer iron, and it is probable within the next week or two some further round lots will be closed. The Valley merchant furnaces object to selling iron for forward delivery at present low prices, asking from 50c. to $1 a ton advance where the deliveries on the iron run into next year. A number of the large independent sheet and tin plate mills are in the market for round tonnages of sheet and tin bars, and considerable business has already been closed. One leading independent tin plate plant has bought a heavy tonnage of tin bars, divided among three concerns, prices to be based on quotations in the market reports in *The Iron Age* and running over a period of two and one half to five years. Specifications against contracts in August in nearly all lines of finished iron and steel were much heavier than in July, and it is believed that September will show an increase over this month. The rod, wire and nail mills of the Pittsburgh Steel Company, which have been idle for two weeks or more, started up in full on Monday, August 29. This concern is the largest consumer of heavy steel scrap in the Pittsburgh district, and the fact that its plants have started up again has already created a better feeling in the scrap market. Specifications on contracts for wire and wire nails in August were heavier than in July, and the leading makers have considerable business ahead. Reports that the Youngstown Sheet & Tube Company would start at once erecting an open hearth steel plant at East Youngstown, Ohio, are premature. This concern will probably build during 1911 an open hearth plant at East Youngstown, to contain about six 50-ton furnaces, with a capacity of about 600 tons per day. The concern states that it needs a certain amount of open hearth steel for its finishing departments. Summed up as a whole, the market is better and still further improvement in September is expected. Prices are showing a firmer tone, and some low quotations on inquiries sent out two or three weeks ago have been withdrawn. Stocks of finished iron and steel held by jobbers are lighter than at any time during this year, and this is shown by the fact that in many cases orders sent to the mills carry with them urgent requests for prompt shipments. This is particularly true of the heavy stocks of pipe and wire products, which we are advised have been pretty well worked off.

Rods.—The increase in specifications in wire products in August has brought about a better inquiry for rods, most of which, however, is for small lots for nearby needs. We continue to quote Bessemer rods at $28 to $28.50 and open hearth and chain rods at $28.50 to $29, Pittsburgh. A sale of 500 tons of rods for chain purposes is reported at $28.60, at mill.

Skelp.—A number of puddling plants in the Central West are still idle on account of no agreement having been reached on the puddling scale with the Sons of Vulcan. For this reason several makers of iron plates are asking higher prices, and a sale of 1500 tons of wide iron plates is reported on the basis of about 1.92½c., maker's mill. We quote: Grooved steel skelp, 1.45c. to 1.50c.; sheared steel skelp, 1.55c. to 1.60c.; grooved iron skelp, 1.80c. to 1.85c., and sheared iron skelp, 1.90c. to 1.95c., Pittsburgh.

Ferromanganese.—One or two small inquiries have been up in the past week and prices seem to be a shade firmer. Several of the large importers are holding 80 per cent. foreign ferro at $39.50, Baltimore, and do not seem inclined to shade that price. We quote foreign 80 per cent. at $39 to $39.50, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—There is little or no new inquiry for this material, most consumers being covered for remainder of this year. Present prices of ferrosilicon are regarded as very low, and brokers who handle this material are urging their clients to take hold. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered. Pittsburgh, and blast furnace ferrosilicon as follows: $23 for 10 per cent., $24 for 11 per cent. and $25 for 12 per cent., f.o.b. Jisco and Ashland furnaces.

Muck Bar.—There has been some inquiry in the market for muck bar, and, owing to its scarcity, higher prices are being quoted, as high as $29 to $30 being asked by makers of muck bar that can ship promptly.

Steel Rails.—Coal mining and lumber concerns continue to place new orders freely for light rails, the Carnegie Steel Company having booked a larger tonnage in August than in July, last week's new sales and specifications having been particularly heavy. There is not much new inquiry for standard sections, only a very few small orders having been booked. The three Edgar-Thomson rail mills of the Carnegie Steel Company, at Bessemer, are operating to about 60 per cent. of capacity, and have a fair amount of work ahead. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—The American Bridge Company has taken a contract for about 12,000 tons of steel for a building in New York City and has also taken 4000 to 5000 tons of bridge work for Western roads. A new union depot in Chicago is being figured on, and if this goes through it is estimated that it will take at least 75,000 tons. The McClintic-Marshall Construction Company has taken several fairly large contracts in the past week and is now fabricating at its Rankin, Pa., shops the material for the Panama lock gates. Tonnage booked by the structural interests was heavier than in July, and the American Bridge Company will show a handsome increase this month over last month. We quote beams and channels up to 15-in. at 1.40c. to 1.45c., Pittsburgh. It is stated that on several inquiries for delivery at competitive points the lower price has been slightly shaded.

Plates.—Nothing has been done as yet with the inquiry of the Chicago & Alton for 3000 steel cars, and the opinion is that this order may not be placed. The local steel car companies have about enough work on their books to keep them moderately busy up to November 1, but after that have practically nothing. No contracts of moment for steel cars have been placed for two or three weeks, and no new inquiries are reported. Some of the leading plate mills have very little work on their books, and are able to ship out plates within two or three days after the order is received. We quote ¼-in. and heavier plates at 1.40c. in large lots and 1.45c. in small lots. It is stated that several of the

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smaller plate mills that make only a limited range of sizes are offering narrow plates at 1.35c., at mill.

Sheets.—New inquiry for sheets is better than for some time and considerable business has been placed for delivery over this year, this being due largely to the low prices that are ruling. No. 28 box annealed one-pass black sheets are being offered for delivery over remainder of this year at 2.15c. to 2.20c., at mill, and No. 28 galvanized at 3.20c. to 3.25c., at mill. On galvanized and painted roofing material prices are being shaded $2 to $3 a ton. Prices on sheets printed on a previous page about represent the general market, but for a very desirable specification could probably be slightly shaded. The American Sheet & Tin Plate Company has started up its sheet mill at Struthers, Ohio, containing six hot mills, and which has been shut down for about three weeks for repairs. Box annealed black sheets are on a basis of 2.20c. for No. 28, while No. 28 galvanized are about 3.25c., at mill, in carload and larger lots. On painted and galvanized roofing material prices are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets are printed on a previous page.

Tin Plate.—As yet the calling off of the strike in the mills of the American Sheet & Tin Plate Company has not resulted in the starting up of the Laughlin and La Belle tin mills in the Wheeling district, which have been closed for about 14 months, and the present plans of the company regarding these two plants have not been announced. There is much activity among the tin plate mills, which are running full on specifications against contracts and against which they are somewhat behind on shipments. Tin plate for prompt shipment is reported as scarce, and it is stated that recently premiums of 5c. to 10c. a box have been paid for prompt shipment. Prices are firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—New orders for both iron and steel bars being placed at present are light, but the mills rolling steel bars are receiving specifications freely against contracts from the wagon and implement builders, and shipments are moderately heavy. No settlement on the puddling and muck bar scale has yet been reached with the Sons of Vulcan, and as a result a number of puddling plants in the Central West are still idle. The mills rolling iron bars have only a fair amount of business on their books and new orders are not being placed very freely. We continue to quote steel bars at 1.40c. in large lots and 1.45c. in small lots, while iron bars are 1.45c. to 1.50c., f.o.b. Pittsburgh, prices depending on the nature of the order.

Spelter.—The market is showing more life than for some time, inquiries being better and prices firm and higher. We quote prime grades of Western spelter at 5.22½c. to 5.25c., East St. Louis, the freight to Pittsburgh being 12½c. per 100 lb.

Hoops and Bands.—Consumers are specifying at a fairly satisfactory rate against their contracts and shipments by the mills in August on actual orders were heavier than in July. We continue to quote hoops at 1.50c. to 1.55c. and bands at 1.40c. to 1.45c., the latter carrying extras as per the steel bar card.

Spikes.—No orders of moment for railroad spikes have been placed in the past week and makers of these are only fairly busy. Demand for spikes from the railroads all this year has been of a hand to mouth nature, in spite of the low prices that have been ruling for some time past. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—A fair amount of new business is being placed, but new orders are mostly for small lots to cover actual needs. Official prices on boiler rivets are 2.25c. and on structural rivets 2.15c., f.o.b. Pittsburgh, but these prices have been shaded by the makers for some time.

Shafting.—Specifications against contracts for shafting are coming in at a fairly satisfactory rate, but new demand from automobile makers and other consumers is not nearly so heavy as it was some time ago. Regular discounts on shafting remain at 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Specifications against contracts for wire products in August were heavier than in July, and September promises to show a still further increase over this month. The Pittsburgh Steel Company has started up its rod, wire and wire nail mills at Monessen, Pa., after being shut down about three weeks. This concern is having a particularly heavy demand for its electrically welded fences. There is a fair demand for cut nails, but mostly in small lots to cover urgent needs. It is stated that prices on wire products are being maintained, with the exception of the Southern district, several of the mills along the Ohio River in that district continuing to shade regular prices slightly.

Merchant Pipe.—In addition to contracts for about 75 miles of 4-in. to 8-in. pipe placed lately by the Texas Company, and about 35 miles of 10-in. to 16-in. by the Ohio Fuel Supply Company, the inquiry of the Busch-Everett Syndicate, which proposes to pump natural gas into St. Louis, is again active. This inquiry calls for 320 miles of 20 x ⅜ in. pipe and 135 miles of 20 x 5-16 in. pipe. It is said the Arkansas Natural Gas Company, in which a large number of Pittsburgh people are interested, has arranged for laying a gas line from the Louisiana fields to Little Rock, Ark. The line will be 235 miles long and will be laid with 10, 12, 16 and 18 in. pipe. The Manufacturers' Light & Heat Company, a local gas interest, is in the market for 23 miles of 16-in. pipe, and the Monongahela Natural Gas Company, also a local interest, is inquiring for about 8 miles of 10-in. I. D. pipe and about 6000 ft. of 12-in. O. D. pipe. On the larger sizes of pipe the mills are pretty well filled up for the next two or three months, and new demand for butt weld sizes is reported to be better than for some time. It is stated that regular discounts on iron and steel pipe, printed on a previous page, are being better maintained than for some time.

Boiler Tubes.—Demand for boiler tubes from the railroads has been light for some time, while the boiler shops have been placing orders only to meet current needs. It is believed that demand for both locomotive and merchant tubes will show betterment in the near future. Regular discounts on tubes, printed on a previous page, are still more or less shaded.

Coke.—The Isabella-Connellsville Coke Company, which has had a large cokeworks under construction at Rice's Landing, Pa., started up 75 new ovens last week, and will blow in more in the near future. It has finished 300 ovens at this place and 400 more are being built, all of the beehive type. This company took a very large contract for furnace coke for the new blast furnaces of the Jones & Laughlin Steel Company, at Aliquippa, Pa., and probably the entire output of the plant for some time will be shipped to that consumer. No large inquiries are in the market for furnace or foundry coke, most consumers having covered their requirements for the remainder of this year, but several large blast furnace interests continue buying coke from month to month.

Iron and Steel Scrap.—It is probable that before this week is out the embargo on scrap routed for Monessen, Pa., will be lifted, as the rod and wire mills at that place, which have been idle for about three weeks, were started up on Monday, August 29. New demand for scrap is better than for some time, and more material is moving from the dealers to consumers. Prices are also a shade firmer and some low quotations on scrap recently sent out by dealers have been withdrawn. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburg delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.25 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	11.50 to 11.75
Low phosphorus melting stock	17.50 to 18.00
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.75 to 8.00
Machine shop turnings	9.25 to 9.50

There is a good demand for cast iron borings, and sales of 700 to 800 tons were made, for spot shipment, at $7.85 to $8, Pittsburgh. Other sales include about 1500 tons of heavy steel scrap at $14.50, delivered; 1200 to 1500 tons of bundled sheet scrap at $12.15, delivered, equal to about $10.50 at shipping point; 50 tons of low phosphorus melting stock, running 0.04 per cent. and under, at $18, Pittsburgh, and about 250 tons of No. 1 busheling scrap at about $12.25, Pittsburgh.

Chicago

FISHER BUILDING, September 1, 1910.—(*By Telegraph.*)

In spite of the slack business conditions, Western shippers are complaining of delays in obtaining cars. The shortage of cars has not become serious, and is due to the practice of Western railroads of sending all their box cars to the country at this season for the first loading of grain. A severe car shortage is generally expected by shippers during

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Bars.—Even though the business offered is small, keen competition on the part of makers of refined iron bars is noted. Mills are short of orders in several instances, and while 1.40c. to 1.50c., delivered in this territory, about represents the market for refined iron bars, some producers would, no doubt, shade that price a tenth or more for desirable specifications. Steel bars continue firm, at 1.55c. to 1.60c., delivered.

Coke.—The market is not very active, but prices are firm and the proportion of low price sellers is decreasing. Sales of prompt foundry coke are reported at $2.25 per net ton, at oven, while contracts for requirements extending over the next six months have been made at $2.50 for standard foundry grades. Furnace coke is quiet, at $1.65 to $1.75, at oven. The following range about represents the market, per net ton, for deliveries in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—A little more interest has been shown in some grades, but on the whole the market still drags. A better volume of heavy melting steel is being taken by several of the Eastern mills, this being largely against old contracts. Railroad wrought is a trifle stiffer, due to the absorption, it is said, of a large share of this grade offered by the railroads, by other than the consuming interests. Sales during the week are reported at $16, delivered. The movement in other grades has been small and in some not enough business has been done to establish a market quotation. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cincinnati

CINCINNATI, OHIO, September 1, 1910.—(*By Telegraph.*)

Pig Iron.—The furnace interests are still holding back on next year's business and prices quoted now are considered prohibitive, when compared with prevailing figures, for delivery the remainder of the year. With the exception of the large purchase of a South Bend, Ind., plow manufacturer last week not much actual business has been transacted, but the inquiry is good and the general situation is becoming brighter. A large foundry company, having plants in various parts of the country, has sent out a request for prices from its Eastern office on over 30,000 tons of different grades of iron. A 2500-ton inquiry from a Dayton, Ohio, melter is also being worked on; 2000 tons of this is for Southern foundry, Nos. 2 and 3, and 500 tons for Northern No. 2. It is understood that this same firm has already purchased an odd lot of 200 tons of low grade Northern iron at a figure slightly below present market quotations. A central Ohio firm wants 1000 tons of malleable Bessemer for delivery the first half of next year. As freight rates to this point are practically all equal from the different districts it is expected that there will be a scramble for the order, but no price cutting is anticipated on account of the delivery date. There is also an inquiry out for a large tonnage of basic for shipment throughout 1911. Southern foundry No. 2 is quoted at $11.50, but for prompt shipment $11 can be done. Northern foundry No. 2 remains around $14.50 to $15, Ironton, with the usual reductions for lower grades. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Furnace coke for spot shipment is still weak. Some operators who had coke loaded on cars made concessions to move it quickly, and prices for prompt shipment have not been at all firm. For immediate shipment $1.50 is still being done in some sections. Contract prices remain the same as last week, and the intention of the coke producers to curtail production in line with the iron furnaces may serve to hold the market steady. Connellsville, Pocahontas and Wise County coke for future shipment are around the same figure, with $1.70 to $1.85, at oven, for the average grades. Foundry coke is very quiet. For prompt shipment some Connellsville coke has changed hands as low as $2, while some special brands have brought as high as $2.50. This same condition prevails in the Pocahontas and Wise County fields. The average contract price is about $2.10, with very little business doing.

Finished Iron and Steel.—The market is dull with only scattering orders being received. The inquiry for bars seems to be improving, but there is little actual business. We quote structural material, from warehouse, at 1.90c. to 2c. and steel bars at 1.80c.

Old Material.—The railroads continue to be indifferent sellers, and the large stocks in buyers' yards do not tend to promote much active business. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, August 30, 1910.

Iron Ore.—Ore firms are well up on shipments and the indications are that the movement from the head of the lakes will close November 10, as planned early in the season. While the August shipments will show a decrease as compared with July, the movement is still fairly heavy. More ore is being piled on the docks than a month ago and dock space is scarce, being hard to find, except where reservations had previously been made. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market shows considerable improvement both in the volume of inquiries and sales. The South Bend plow manufacturer who had an inquiry out last week is understood to have purchased about 45,000 tons, about one-half of which was sold by two Cleveland interests. Some of this is for delivery through the first half of next year. Several other sales in good sized lots are reported in the Central West. Two Michigan stove manufacturers are reported to have been buyers of considerable tonnage of foundry iron. In addition to the business closed there are inquiries pending in the same territory for about 25,000 tons of pig iron, including all grades except Bessemer. The local market is still very quiet, but some fair inquiries have come out from northern Ohio, among them one for 800 tons of Nos. 2 and 3 foundry from an implement manufacturer for the first half delivery, and one from a pump manufacturer for 150 tons of Nos. 1 and 2 for the same delivery. An Erie, Pa., engine builder is in the market for 500 tons of No. 2 for the last half. So far the renewed activity has not had the effect of stiffening prices. Some of the consumers seem disposed to buy for their first half requirements, but a number of furnace interests are as yet unwilling to quote for delivery beyond January 1. Some of the Valley furnaces are quoting 50c. above the current market for the first half delivery, or $14.50, at furnace, for No. 2. For prompt shipment and the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$16.00 to $16.15
Northern foundry, No. 1	15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.15 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—The demand for foundry coke, which has been very light for a few weeks, has again become fairly active. Several inquiries are pending for contracts until July 1, 1911. The furnace coke market continues very dull. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.15 per net ton, at oven, for prompt shipment, and $2.25 to $2.50 on contract.

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Finished Iron and Steel.—Practically no change is noted in the local situation. Mills are getting a fair volume of current orders and specifications for steel bars, plates and structural material, but these orders are all for quite small tonnages. No inquiries for round lots of material have come out. Prices on steel bars remain firm at 1.40c., Pittsburgh. The 1.40c. price is being maintained on structural material, and that price on plates is being shaded by only a few of the smaller mills that make the narrow sizes. Local mill agencies report that they are not feeling the effect of this competition, and are having no trouble in booking orders on the 1.40c. basis. In structural material the American Bridge Company has taken the contract for 350 tons for bridge work for the Wheeling & Lake Erie Railroad. The Great Lakes Engineering Works has received bids for 800 tons for its new plant at Ashtabula, Ohio, and the Cleveland Electric Illuminating Company will receive bids this week for the 2500 tons required for its local plant. The Cleveland Telephone Company will have plans out this week for an addition to its building, requiring about 500 tons. With the exception of the work now actually in prospect very little additional structural work requiring tonnages of any size is at present being planned by local architects, although considerable small work is still coming out and nearly all of the local fabricating shops have all they can do. The demand for iron bars continues light. The general quotation is 1.35c. to 1.40c., Cleveland mill, the former price being for outside shipment. The demand for sheets continues inactive. Prices are weak, but no further concessions are reported. We quote black sheets at 2.20c. and galvanized at 3.20c. to 3.25c. for No. 28, and blue annealed at 1.70c. for No. 10. The demand for rivets is light and prices are weak, there being practically an open market. The usual quotations of 1.90c. for structural rivets and 2c. for boiler rivets is being shaded.

Old Material.—There was a slight flurry among dealers late last week and the impression gained ground that an early improvement in the market could be looked for, although there does not appear to be any change in the situation that would indicate a better demand in the near future. Mills show no more disposition to buy and sales have been limited almost entirely to car lots, a large part of which went to foundries. The Pennsylvania Lines West have a list out of about 2500 tons, including 1400 tons of old steel rails, and the Wheeling & Lake Erie Railroad has a small list out, both of which will close September 1. No changes are noted in quotations. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, MO., August 29, 1910.

Though there is considerable inquiry for pig iron, mainly for far forward delivery, no large sales were made in this market the past week. Trade in coke is limited in volume. The receipts of pig iron from January 1 to August 1 were 192,490 tons; for the 12 months of 1909, 315,490 tons. Receipts of coke from January 1 to August 1, 105,100 tons; in the 12 months of 1909, 171,570 tons. The bank clearings for St. Louis and Kansas City were again in excess of the same week in 1909.

Coke.—The market is quiet, though there was a fair demand during the week from carload buyers and small consumers generally, with the usual deliveries on contract. Large consumers have mostly covered their requirements for a long period, and merchant sellers claim they are not anxious buyers, for the reason that they are inclined to believe that most of the business that has been booked in the Connellsville and Virginia fields has come from foundries and that furnaces have not been large buyers. The market is ruling fairly firm. We quote standard brands of Connellsville 72-hour foundry at $2.35 to $2.50, the first named figure for prompt and the latter for contract, per net ton, f.o.b. oven. Virginia coke, $2.25 to $2.35, f.o.b. oven. Carloads, 25c. per ton higher.

Pig Iron.—A leading broker reports an inquiry out for 5000 tons of basic for the remainder of this year and 5000 tons for shipment over the first quarter of 1911. Beyond this the week developed nothing large. Inquiries were confined almost entirely to irons of special character. There was some business offered for next year at current prices, but no furnace could be found to take it. Another sales agency reports sales aggregating 950 tons and inquiries of a miscellaneous character to the extent of 4000 tons. A third office reported inquiries for upward of 3500 tons, but regarded a part as made to keep posted. Southern foundry appears to be firmer than malleable iron and has the most attention. Southern No. 2 foundry for the remainder of the third quarter can be bought at $11, Birmingham, with the exception of certain brands. The market is regarded as $11.50, although some irons are being offered at less, but these are few and are not generally considered standard Birmingham. Ohio foundry and malleable irons are quoted at $14.50 to $15, f.o.b. furnace.

Old Material.—It is still a dull market in old material. There is some business doing in scrap steel and iron, neither kind having much call over the other, and transactions are mainly among dealers. Taking the small volume of demand from consumers and trading among dealers, together with buying from the railroads, there is just about enough business passing to make a market. The only offering for the week from the railroads was the Chicago & Eastern Illinois lot of 400 tons. Prices on some items in the list are lower, but relaying rails are quoted higher, being scarce and wanted. We quote dealers' prices as follows, per ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.25 to 14.75
Old steel rails, less than 3 ft	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	14.25 to 14.75
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

Metals.—The paragraph usually appearing in this report will be found under the heading, "Metal Market."

The St. Louis Blast Furnace Company's plant closed down August 22 for repairs, involving some relining. As soon as the necessary repairs can be made operations will be resumed.

The contract for the heating apparatus for the new post office was secured by the Hanley & Casey Company, Chicago, for $75,650.

Birmingham

BIRMINGHAM, ALA., August 29, 1910.

Pig Iron.—With the probable exception of a slight concession in freight differentials to certain localities, the schedule of $11.50, Birmingham, for prompt shipments or deliveries to cover the remainder of this year, has been maintained. The business actually transacted during the week shows the general condition of the market to have improved and the tonnage involved in bona fide inquiries now pending is very attractive. So far no report has been made of transactions involving deliveries after December 31. A number of inquiries have been made, and in some cases quotations on shipments to cover the entire first half were requested, but it is understood that nominal prices only have been elicited. At last two producing interests are now quoting an advance of 50c. per ton over the $11.50 schedule for deliveries covering the last quarter, and report is made of the sale of carloads and lots of 100 tons at such figures. It is generally understood, however, that $11.50, Birmingham, correctly represents the market either for prompt shipments or deliveries to cover the remainder of this year, and that any advance over that basis, unless under special conditions, would secure first quarter tonnage. The sale of 1000 tons at $11.50, for shipment over the remainder of this year, was effected during the past week. A lot of 500 tons for comparatively early shipment, was also sold during the week at $11.50, and a lot

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of 200 tons of especial analysis iron for prompt shipment was sold at $12.50, Birmingham. There has recently been some trading in pig iron warrants and the movement from warrant yards has been increased materially. The movement from furnace yards has also increased during the past fortnight and the increase can be accurately accounted for by the number of plants now in operation that were closed down at that time. Preparations are now being made for a resumption of operations at one or more idle plants and from all indications the local melt will be normal in very short time.

Cast Iron Pipe.—A fair volume of business has been transacted in this market and the sales effected as a whole are satisfactory to producers. A leading interest now announces that order book requirements are about equal to the make for the next 60 days and in no case has the stock on hand become cumbersome. We do not have specific information as to lettings for early dates, but we are reliably informed of good prospects. Water pipe quotations have not been changed and are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., average $20.50, with $1 per ton extra for gas pipe.

Old Material.—Dealers anticipate a heavy movement by reason of the recent additions to active mill capacity, but those anticipations are slow to materialize and the business actually being transacted is very light. No concessions are known to have been made that would indicate a desire to be relieved of stocks now on yards, yet all inquiries continue to have individual consideration and the market is not considered on a firm basis. Dealers adhere to former asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

San Francisco

SAN FRANCISCO, August 24, 1910.

The market in San Francisco and tributary territory remains rather quiet, the volume of new business showing little increase over that of July. A somewhat better feeling appears to exist among the jobbers, however, in anticipation of a general renewal of interest on the part of small consumers next month. Specifications for delivery from mills are coming out in a little better shape, and the distributive movement is keeping up on the same moderate scale as for some time past. A few fairly large inquiries are coming up in some departments, though the larger consumers still show hesitation in providing for future requirements. Judging by financial conditions the demand in the interior should be large, as crops have been good and prices for most California products are unusually high. There has been no curtailment of work on large improvement projects, for which a heavy tonnage will be needed at San Francisco, Los Angeles and interior points. The only particular cause for anxiety is the local labor situation. The time allotted for adjustment of the difficulties expired last week without any definite settlement, and employees are still working on an eight-hour basis. It is reported that the employers will decide upon a course of action within the next week, and in the meantime the outlook is uncertain.

Bars.—A considerable tonnage is moving on old contracts, but new business is mostly distributive. The larger buyers are beginning to take some interest, however, and while they are rather slow in placing orders they are likely to be actively in the market within a few weeks. From all indications the requirements of the consuming trade should be fully as large as last fall, though local merchants are in a position to supply a larger proportion of the demand than at that time. Jobbers are buying to some extent for future delivery, but their purchases of foreign material are being made on a smaller scale than a year ago. In view of their present large supplies, however, their purchases in the domestic market are still limited. The outlook is good for reinforcing material, for which there are some large inquiries, though most of the orders actually booked are moderate. Jobbing prices are firmly maintained, bars from store, San Francisco, being quoted at 2.50c. for steel and 2.30c. for iron.

Structural Material.—Local building was very quiet during the early part of the month, but is beginning to show some improvement, and according to local architects a further increase will take place within the next few weeks, as figures are to be taken shortly on several substantial structures. Two contracts of some importance have been let, both outside of San Francisco. The Ralston Iron Works will fabricate the steel for the Agricultural Building at the University of California, and the Realty Syndicate job in Oakland, over 600 tons, has been awarded to Dyer Bros. New work in San Francisco is confined to small jobs, which are fairly numerous, and mostly taken by local contractors. An award will be made in a day or two on the power house for the San Francisco Hospital. The steel contract is still withheld on the H. C. Capwell Building in Oakland and on the Eagles' Hall in San Francisco. Plans are being drawn for a large nine-story building on the Stanford lot at California and Powell streets. It is announced that the Pacific Electric Company will build a six-story steel frame building at Long Beach, Cal. Eastern fabricators are taking a number of small contracts for tank towers, &c., in interior towns. The movement of plain material on the coast is comparatively light. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Rails.—Light rails continue quiet, the movement for the summer season having been rather less than was expected except on the lightest sections. The movement of standard rails shows some increase, though individual purchases have been small. A few fairly large inquiries are coming into the market, and considerable business is expected in the North, though little is looked for from the interior of California. Interurban lines now in operation are holding off from the rail market, though they are placing some orders for general equipment. The city of Los Angeles has under consideration an ordinance requiring the use of grooved girder rails for all tracks in paved streets of that city.

Plates.—Orders are coming out in somewhat better shape than for several weeks, though the tonnage booked is still lighter than was anticipated in view of conditions last spring. The demand is still principally from fabricators of tanks and riveted pipe. Orders for this class of work are beginning to increase, though so far most of the new contracts have been small, with comparatively little business in the oil fields. An encouraging feature is the increasing use of fuel oil throughout the Pacific slope. A local oil company is planning to erect a large storage tank at Nome, Alaska.

Sheets.—Both black and galvanized sheets are in somewhat better demand than for some time, but the movement is still comparatively light.

Merchant Pipe.—The demand continues smaller than usual, even for the end of summer, but the movement both from mill and from store has increased to some extent over the extremely small volume of July. Several fair jobbing orders have been placed for country water works, and some buying of a sorting-up nature is said to have been done by local merchants, though the latter business is of small consequence. The smaller consuming trade is beginning to take a little interest in the market, but it is still too early for any large volume of distributive business, and jobbers do not anticipate much improvement before the end of the month. The local outlook is poor, but outside requirements are considered fully up to normal. No increase has been noted in the demand for either casing or line pipe in the oil fields, and there is little possibility of improvement until a market can be found for the present output of oil. While some demand may develop during the fall, conditions appear unfavorable for any large movement earlier than next spring, as delivery to the oil fields is almost impossible during the winter season.

Cast Iron Pipe.—The movement is still very moderate, but small orders are becoming more numerous, and a few fairly large purchases have been made. The largest recent orders have come from southern California, where the United States Pipe Company has taken two orders totaling 900 tons. The city of San Diego, Cal., is planning to expend about $300,000 in water works improvements. Several water and gas corporations are coming into the market, and with inquiries coming up from a number of small municipal water works a fairly large movement is in prospect for the coming month. Fire hydrants continue in good demand all over the coast.

Pig Iron.—There is a fair demand at various points outside of San Francisco, and the local movement continues on about the same scale as for several months. Few of the foundries are in steady operation and purchases are accordingly made on only a small scale, according to current requirements, very little iron being sold to arrive. The tonnage in transit from European ports is smaller than usual, but with considerable iron in store there is no likelihood of shortage. The market is irregular, transactions being too light to establish a very definite basis of prices, though approximate values are quoted as follows: Chinese, $23; Continental, $23; English, $23 to $23.50. Special grades of Scotch iron, to arrive, are offered at $25.

Old Material.—Aside from the continued movement of

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steel scrap for shipment to Atlantic ports, the market shows little feature, prices being about as before. There is a fair demand on Puget Sound, and occasional shipments in that direction are sent from San Francisco and Los Angeles. The local demand for cast scrap is very moderate, and there is some accumulation in the hands of dealers, who are holding for full prices. Quotations are as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

The German Iron Market

BERLIN, August 19, 1910.

The situation with regard to reorganizing the pig iron trade looks less clear than it did a week ago. As was described in last week's letter, the reorganization was stated to be practically finished, but it now appears that this news was premature. On Monday came the surprising announcement that the Siegerland group had, after all, failed to join, although it had been specifically stated several days before that they had agreed to come in. This agreement, however, now appears to have been provisional—that is, they would join if the three big Siegerland concerns mentioned last week also joined. These, however, have finally refused, and that leaves the entire Siegerland group out, though it is also reported that the other concerns are likely to join, even without the three referred to. The pressure upon them is powerful on the part of the big companies of mixed production, which are engineering this new organization and doing so in their own interests. It also appears that the Luxemburg-Lorraine furnaces have not yet decided to enter, and much doubt is expressed as to their intentions. Of the big mixed companies in the lower Rhine country and the Province of Westphalia only one remains aloof of the organization, namely, the Hasper Eisen und Stahlwerk.

Bar Iron Advanced

The biggest trade news this week is that the Bar Iron Convention, which was recently prolonged to the end of next March with a larger membership, yesterday raised the price of bars for the next quarter by 2 marks the ton in general, but 3 marks for shipment to Berlin and two eastern provinces, as well as for all shipments by water inside the country. In respect to the export business, it was resolved to recommend the works to stick to a price of at least 100 marks, f.o.b. Antwerp. Not a few of them had been selling as low as 98 marks for several weeks. The new home price is 114 marks or 112 marks, according to the point from which shipment is made.

The Steel Syndicate yesterday declared business in billets and structural shapes open for the fourth quarter at unchanged prices. In some directions it is reported that the mills running on these products are less briskly employed than hitherto, but other advices state that those running on structural shapes are doing more work since the big building trades strike was settled about six or seven weeks ago. The association of manufacturers of corrugated steel tubing voted on Monday an increase in the price of their products, but the amount added was not stated. The wire rod mills are holding a meeting to-day to open business for the fourth quarter, but it is expected that they will leave prices unchanged.

Mixed Tendencies of Trade, But a Generally Better Feeling

The news from the trade this week is rather confusing and uncertain. It appears that two different tendencies prevail. In lines of merchandise, the prices of which are likely to be affected by organizations about to be completed, there is a very active demand; but business is generally quiet where this artificial stimulus is lacking. On the whole, however, the feeling in the trade is not at all bad, and one hears many expressions of confidence that business will improve during the autumn.

The ore business is quite active. The Siegerland mines are briskly employed and are gradually increasing their output. From the Luxemburg-Lorraine district, too, better business in minette ores is reported, and the mining companies have been making additions to their working force. Business in foreign ores is brisk; the prices of both Swedish and Spanish ores are still tending upward. Some German companies are reported to have recently placed long-term contracts for Swedish ores. There is no let up in the turn out of the blast furnaces. It begins to be asserted with considerable definiteness that the new organization will raise the price of pig moderately in view of the high cost of ores.

In semimanufactured steel home consumers are calling for delivery in regular course, and there is some demand still for supplementary amounts. Foreign business, however, is weaker, inasmuch as the takings of English consumers have been reduced: Belgian mills, being rather hard pressed for work, are keeping prices low for this specialty. The foreign trade in structural shapes is rather sluggish, so far as new orders are concerned; but anything under contract is called for delivery with regularity.

The heavy plate business is the only section of the trade that can boast of great activity. The export movement is large, particularly to England. The home demand has also been considerably heavier, but that will most probably now be completely reversed, a strike and lockout covering nearly the entire German shipbuilding industry having begun several days ago. In wire nails business has become somewhat better. Better buying of tubing is reported since the shops have checked the mad price cutting that followed the break-up of the trade organization.

Germany's exports of iron and steel of all kinds in July reached 392,000 tons, as against 345,400 tons in July, 1909. This was a good record, but it was 32,000 tons less than in June. For the first seven months of the year there was a gain of about 550,000 tons over 1909.

The latest news from the Belgian market is that things are improving. Prices are rising from their low level of several weeks ago. Yesterday advances of a shilling a ton on export orders for bars of wrought iron and soft steel were made. This makes a total gain of 3 shillings since the beginning of the month. German competition is preventing an advance in the price of plates.

Two furnace companies of Luxemburg, the Escherhütte and the Burbacher Hütte, are planning the erection jointly of a steel mill. The capital will be 10,000,000 francs, besides a bonded indebtedness of 15,000,000 francs.

Buffalo

BUFFALO, N. Y., August 30, 1910.

Pig Iron.—The tone of the market appears to have improved slightly during the week; at least, there is a little more live interest manifested on the part of some consumers, although the increased interest is by no means general as yet. A number of inquiries for fair sized tonnages have been received, and a number of orders, ranging from carload to 1000-ton lots, have been placed, mostly foundry grades, for prompt and last half delivery. A local radiator company is in the market for 6000 to 10,000 tons of foundry irons, and a number of inquiries for first half 1911 delivery are being received. Consequently a rather more optimistic view of the situation is being taken by many furnacemen. Moreover, a stage is being reached on furnace order books where the higher priced contracts are approaching completion and the low priced orders taken more recently predominate, showing an average price of less than cost, and statements are made that unless there is a distinct improvement in prices within the next month or six weeks additional furnaces are likely to go out of blast in preference to being operated at a loss. Prices are stationary, but in the opinion of most furnacemen are unquestionably at the bottom and will shortly begin to move upward. We quote as follows, f.o.b. Buffalo, for delivery during remainder of the year:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—The week shows an improvement in most lines of finished materials, giving a total of sales for August considerably above the total for July. Buyers generally seem to have concluded that further reductions are not to be looked for and manufacturers that further cutting would not bring out more business in the long run. In steel bars an increasing number of orders are being placed at 1.45c., Pittsburgh, although 1.40c. is still the ruling price for large tonnages. One agency reports increased activity in universal rolled plates. Tin plate continues strong and there is an active market in wire products. The small job demand for structural material continues good, and there are a number of building projects under way requiring considerable tonnages of fabricated material for which specifications will soon be issued. The Lackawanna Bridge Company has received contract for the fabrication and erection of the 300 tons of steel required for the sheep pens to be erected by the New York Central Railroad Company at the East Buffalo stock yards to replace pens recently destroyed by fire. Contract for the steel for the Ford Automobile Company garage and sales building, Buffalo, was awarded to the Chas. Ernst Sons Iron Works. The Lackawanna Steel Company has completed plans for the erection of a new commercial bar mill at its South Buffalo plant, the cost of which will be $800,000.

Old Material.—The market continues dull, but the feeling among dealers is a trifle more optimistic, as there are

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some slight indications of an improvement in the demand observable and an increased buying movement is looked for within the next 30 days. Prices remain unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.25
Old car wheels	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

Metal Market

NEW YORK, August 31, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
August.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
25	13.00	12.62½	35.00	4.40	4.30	5.35	5.20
26	13.00	12.62½	36.00	4.40	4.30	5.35	5.20
27	12.87½	12.62½	...	4.40	4.30	5.35	5.20
29	12.87½	12.62½	35.65	4.40	4.30	5.35	5.20
30	12.87½	12.62½	35.65	4.40	4.30	5.35	5.20
31	12.87½	12.62½	35.70	4.40	4.30	5.35	5.20

The price of spot tin in New York is higher than local conditions warrant, but this is because of a successful corner in London. Lake copper has softened in price, but electrolytic remains firm. Lead is fairly active and firm. The advanced price of spelter is being well maintained.

Copper.—Copper is being taken only in small quantities, and it is apparent that large consumers stocked up during the buying movement of a few weeks ago. Because of the continued inclination on the part of one prominent interest to keep the price below 13c., there have been frequent offerings of lake copper during the last few days at 12.87½c., and the market should be quoted at that figure. Notwithstanding this condition, however, there are a number of large selling interests who deal in selected brands of lake copper holding out for 13c., and they seem to have abundant faith in the situation. The London copper market, which was in the throes of a speculative movement, due perhaps to a reflection of the excitement in the tin trade there, has steadied, and that feature is lending a strong undertone of confidence to the market here. Electrolytic copper is being sold in New York at 12.62½c., and the price delivered in the Naugatuck Valley, cash in 30 days, is 12.75c. Lake copper is generally quoted at 12.87½c. The exports of copper so far this month have been fairly good, amounting in all to 26,971 tons. As there is only one day's exports to be accounted for, the trade has been able to get a fair estimate of the situation, and an encouraging report is expected from the Copper Producers' Association, which will be issued within the next 10 days. Spot copper was sold in London to-day for £55 15s. and futures for £56 11s. 3d. Sales amounted to 400 tons of spot and 800 tons of futures. The market was quiet.

Pig Tin.—The excitement in the pig tin market in London, where a corner of stocks has been very successfully managed, had its effect on the New York market this week and export tin advanced on August 26 to 36c., which is the highest price it has reached in three years. In August, 1907, spot tin was quoted at 36.12½c. The price asked for tin in New York to-day is not consistent with the actual situation, as there is a good amount of tin on hand. Nothing like a corner in spot tin exists here, although stocks are fairly well concentrated. The August statistics, which will be made public to-morrow, will show that the consumption of pig tin during the month amounted to about 3700 tons. The arrivals of tin during the month, up to this morning, amount to 4770 tons, while there are 1490 tons afloat. Of the latter none is expected to arrive to-day. At the first of the month there was about 693 tons available, and subtracting the month's consumption from the arrivals and the tin on hand at the first of the month leaves a surplus of 1763 tons, which should be ample to take care of the immediate demand. Consequently, the higher prices asked for tin in New York this week were due entirely to the speculative movement. The trading is largely between dealers, and consumers are buying metal only in cases where they are badly pinched for stocks. Spot tin was sold in New York to-day for 35.70c. In London to-day spot tin sold for £163 and futures for £159 5s., an advance of 5 shillings above this morning. Sales amounted to 140 tons of spot and 300 tons of futures. The market closed strong.

Tin Plates.—Although this is not considered the buying season in the tin plate trade, there is a very healthy demand in New York at present. The mills are still behind in deliveries. The price in New York for 100-lb. coke plates is $3.84. The foreign market in tin plates is quiet and the price has not changed in the last week. To-day tin plate was quoted at 13s. 7½d. at Swansea, Wales.

Lead.—There is a fairly good demand for lead in New York, where consumers are inclined to take advantage of the fact that the metal is being sold relatively cheaper here than in other parts of the country. The movements of the leading interest, which continues to hold the price at 4.40c., New York, as against 4.30c., St. Louis, where the market is usually 15 points lower than here, are being closely watched by other sellers, who anticipate a slight advance in this market.

Spelter.—Consumers are taking a little more interest in the spelter market and the buying was better the past week than it has been at any time within the last two months. Only small lots are being asked for, however, but the orders, coming as they do from many sources, seem to indicate that consumers who were waiting for a lower market have been obliged to take stocks to carry them along. Spelter is now being quoted at 5.35c., New York, and 5.20c., St. Louis.

Antimony.—The antimony market continues weak and very little is being taken. Cookson's is offered at 8.15c. and Hallett's can be had at 7.87½c. Some grades of Hungarian antimony are being offered as low as 7.25c., and Chinese grades are selling from 7.40c. to 7.50c. The Hungarian and Chinese grades of antimony are being used more than ever before.

Old Metals.—The market is quiet but steady, with dealers' selling prices unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.75 to 9.00
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.50 to 9.75
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, August 30.—The buying movement in copper in this market during August reached very satisfactory proportions. Casting copper is firm in 100-ton lots at the price quoted below. The corner in tin has carried the price up again. Lead is quiet and only occasional inquiries are received for spelter in car lots. Old copper is a little higher, on general strength of the market, but the smaller consumers are not very active in buying. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 36½c.; small lots, 37½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.25c. to 5.30c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11½c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4⅛c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, August 29.—Lead is strong, at 4.25c. to 4.30c. Spelter is firm, at 5.20c., East St. Louis. Zinc ore is steady, at $40 per ton, Joplin base. Tin is quoted at 36.60c. per pound; antimony, 8.60c.; lake copper, 13.22½c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals was only moderate for the past week, but since August 1 business has been larger than for the corresponding time last year.

New York

NEW YORK, August 31, 1910.

Pig Iron.—Inquiries are more numerous. A large soil pipe company is asking for 15,000 to 30,000 tons, part for this year's and part for next year's delivery, to be furnished to its several plants in New York, New Jersey, Maryland, Alabama and Indiana. The smaller inquiries foot up quite a respectable aggregate. The sales of the week in this vicinity have not been large, but the volume of business has been slightly better than in recent weeks. It is interesting to note that requests are being received for more rapid shipments on contracts, indicating that the melt is increasing. Furnace companies are discouraging the placing of business for delivery next year, preferring to wait until the situation becomes a little clearer, hoping that a better price may then be obtained than the rates now ruling, which afford little or no profit. Quotations are unchanged, as follows, at tidewater: Northern No. 1 foundry, $16 to $16.25; No. 2 X, $15.50 to $16; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.75.

THE IRON AND METAL MARKETS

Finished Iron and Steel.—Improvement over the previous month was evident all through August, and particularly in the last two weeks. Prices generally are firmer, and while new business is still slack there is a decided increase in the number of inquiries in nearly all lines, indicating a prospect of better conditions in the near future. The bulk of the orders taken have been for small quantities, but they have aggregated a fair total. The plate business for this section has been holding up very well, and a good tonnage was booked in the month just ended. Bar iron orders are coming along in fair volume, and a little more desire is shown to cover for future delivery. The only structural contract of moment closed last week was the 12,000 tons for the southern half of the main building of the New York Central terminal in New York City, which has been pending for some time. It was awarded to the American Bridge Company. No decisions have been reached on the other older propositions. The New York, New Haven & Hartford Railroad has added to the number of small bridges it is in the market for, and now has a total of 14, for which something over 2000 tons will probably be required. The New Jersey Zinc Company is asking bids on an extension to its spelter department at Palmerton, which will call for about 1000 tons. Bids closed August 31 on an apartment house at Broadway and Eighty-ninth street, for which upward of 1000 tons will be needed. Prices remain unchanged, plain structural material, plates and steel bars being quoted at 1.56c. to 1.61c. and bar iron at 1.45c. to 1.50c., all New York.

Old Material.—Inquiries have increased in some grades. The demand for cast scrap is notably better. Steel scrap shows a little more life, but this is largely due to purchases by dealers, who evidently have old contracts on which shipments are now being demanded. A little more inquiry has developed for railroad wrought scrap. The rolling mill demand, however, is rather quiet, wrought pipe being no longer active, while both borings and turnings are neglected. Consumers were never so critical as they are now. Dealers are being forced to grade material much more closely and insist that they will be compelled to ask somewhat better prices for the work which this involves. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	11.00 to 11.25
Heavy melting steel scrap	11.00 to 11.25
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.00 to 5.50
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Steel Rails.—The sales of the week comprise 9000 tons of ferrotitanium Bessemer rails sold to the Chicago, Milwaukee & St. Paul Railroad by the Lackawanna Steel Company, 3200 tons to local buyers by the Illinois Steel Company and 7000 tons to the Korean Railway by the United States Steel Products Company. Inquiries are in hand for a considerable quantity of rails from domestic roads, including one for 14,000 tons and one for 13,000 tons.

Cast Iron Pipe.—The new public lettings are neither large nor numerous. The general demand continues to show some slight improvement. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Iron and Industrial Stocks

NEW YORK, August 31, 1910.

The course of the stock market has been somewhat erratic since last week's report. It was easily influenced unfavorably by political developments, but in the main showed considerable strength. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	8⅞- 9	Nat. En. & St., com....	15½
Allis-Chalm., pref....	32	Pressed St., com...	34 - 34⅞
Beth. Steel, com..	27½- 28½	Pressed St., pref....	95
Beth. Steel, pref..	56½- 58¾	Republic, com.....	29½- 30¾
Can, com.....	8⅛- 8⅜	Sloss, com.....	55 - 57½
Can, pref.....	67⅛- 68⅝	Pipe, com.....	15 - 15⅜
Car & Fdry, com..	46⅞- 48⅝	U. S. Steel, com...	67⅜- 71¼
Car & Fdry, pref..	110 -110½	U. S. Steel, pref...	115½-116½
Steel Foundries...	43¾- 44	Westinghouse Elec.	57½- 59
Colorado Fuel....	28⅞- 30¾	Am. Ship, com.....	77 - 78
General Electric...	142⅝-144⅜	Am. Ship, pref.....	109
Gr. N. ore cert....	53 - 55	Chi. Pneu. Tool...	35½- 37½
Int. Harv., com...	94 - 97½	Cambria Steel.....	41⅞- 42¾
Int. Harv., pref...	118½-119¼	Lake Sup. Corp...	20⅜- 22
Int. Pump, com.....	39	Warwick	10
Int. Pump, pref...	80 - 81	Crucible St., com..	12⅛- 12½
Locomotive, com...	33¾- 35½	Crucible St., pref..	76 - 77

Dividends.—The American Locomotive Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 31.

The Railway Steel Spring Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable September 20.

The Saftey Car Heating & Lighting Company has declared the regular quarterly dividend of 2 per cent., payable October 1.

The Underwood Typewriter Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

The Lake Superior Corporation has declared a dividend of 2½ per cent. for the year ending June 30, 1910, on the $3,000,000 noncumulative 5 per cent. income bonds, payable October 1. The only previous distribution was on October 1, 1906, when the full 5 per cent. rate was paid.

The American Can Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

Treatise on the Corrosion of Iron and Steel

In view of the present widespread discussion of the corrosion of steel and iron, the issue is timely of a comprehensive treatise on the subject by the Stark Rolling Mill Company, Canton, Ohio, maker of Toncan metal. The treatise sets forth, clearly and concisely, the facts concerning corrosion and rust, how and why they differ, their causes and what should be done to overcome them. Interesting comparisons are made of old-time iron and modern iron and steel, evincing that the degree of purity, homogeneity and density largely governs the life of iron and steel. The results of many comparative tests are shown by tables and illustrations, and these results will undoubtedly be of value to all sheet metal workers.

The general tone of the treatise is in line with the ideas of such eminent metallurgists as Cushman, Walker and Sang. No attempt is made to delve deeply into chemistry or the fine points of metallurgy. The simplicity of the English is a prominent feature, particularly when the technical nature of the subject matter is considered. The many uses to which a rust-resisting product like Toncan metal is adaptable are described and illustrated. The booklet is attractively printed.

The Greater Leavenworth Club, 529 Delaware street, Leavenworth, Kan., has issued a folder calling attention to the advantages offered by this city to manufacturers in the nature of cheap factory sites, low insurance rates, adequate transportation facilities and ample fuel and power. The city has a large area of undeveloped territory which is admirably suited to the needs of all varieties of manufacturing, as it is located on both rail and water and the freight rates are the same as those applying from Kansas City. At the present time Leavenworth has 67 industries located within its boundaries, all of which are prosperous and growing. To induce new enterprises, the club is prepared to negotiate for the donation of a free site or other reasonable bonus to any desirable business that will locate there.

Stanley G. Flagg & Co. expect on or about September 15 to remove their Philadelphia offices to the new Morris Building on Chestnut Street west of Broad street. They will then vacate their property at Nineteenth street and Philadelphia & Reading Railway Subway, where they have had their offices since 1882. Any patterns or large packages should be sent direct to their works at Stowe (Pottstown), Pa., via United States Express, or by Philadelphia & Reading Railway delivery.

Obituary

ISIDOR LOEWE, one of the most important manufacturers in Germany, died August 28. He was the head of the Ludwig Loewe Company, manufacturer of machine tools, and of the Mauser Rifle Company and a director in 15 other large manufacturing companies. He received his business training in the United States.

LUCIUS A. COLE, president of the National Lead Company, died August 25, at Carlsbad, Germany, where he had gone for his health in July. He was 62 years old. Born in Columbus, Ohio, he spent his youth in Columbus and Cincinnati. He then went to Parkersburg, W. Va., where he became associated with the late Col. W. P. Thompson in the oil business, and came to New York in 1890. In 1891 the National Lead Company was formed, of which Mr. Cole was first treasurer and later a vice-president, and when Colonel Thompson died, in 1896, he succeeded him as president. He was a director in various other companies. He leaves a widow, three sons and three daughters. Walter F. Cole, assistant treasurer of the Magnus Metal Company, New York, is one of his sons.

CHARLES T. PORTER, the eminent mechanical engineer, died in Montclair, N. J., August 29, aged 85 years. He was born in Auburn, N. Y., the son of John Porter, an eminent lawyer. He was awarded the John Fritz Medal April 13, 1909, for his work in advancing the knowledge of steam engineering and for improvement in engine construction. To him belongs the credit for first commercially demonstrating the high speed possibilities of the steam engine. He had been practically in retirement for the last 20 years owing to ill health.

AUSTIN HECKSCHER, president of the Richard Heckscher & Sons Company, Philadelphia, Pa., died August 27, at Westerly, R. I., following an operation for appendicitis, aged 52 years. He was early associated with his father, the late Richard Heckscher, in the development of the great Kohinoor coal mines in the anthracite regions at Pottsville, Pa. In 1886, together with his father and brothers, he leased the then idle blast furnaces at Swedeland, Pa., from the Philadelphia & Reading Coal & Iron Company, and effected their purchase in 1892. Under Mr. Heckscher's presidency and progressive policy since 1901 the plant has been greatly enlarged and modernized. The company has recently become affiliated with the Alan Wood Iron & Steel Company. He was also a director of the Central National Bank, Philadelphia.

CLIFFORD H. CHAFFEE, secretary and treasurer of the New York Air Brake Company, New York, died August 25, after a short illness.

FRANK H. THOMAS, a director of the De Forest Sheet & Tin Plate Company, Niles, Ohio, died on August 19, from an operation for appendicitis. He was 26 years old, and was a son of W. F. Thomas, former Mayor Niles, and for four years served as assistant postmaster at Niles.

Jones & Laughlin Improvements.—No. 1 Eliza Furnace of the Jones & Laughlin Steel Company, Pittsburgh, has been completely rebuilt in the short time of 95 days, and is again in blast. The Jones & Laughlin Steel Company awarded contracts last week for 96 additional houses for its employees at Woodlawn, Pa., the new town being built. This will give the company a total of 700 houses at Woodlawn, most of which are of brick construction, containing six rooms with bath and hot air furnace, and are modern in every detail. The company's new rod mill at Aliquippa, Pa., has been in operation for several weeks, and is operating very satisfactorily, but will not be up to full capacity for some time. The open hearth steel plant at Aliquippa, containing four Talbot open hearth furnaces, is rapidly nearing completion, and one or two of the furnaces will likely be ready for operation within the next two months.

United States Graphite Company Publications

The United States Graphite Company, Saginaw, Mich., has issued a number of exceedingly interesting publications regarding graphite. One of these is a beautifully illustrated brochure of 24 pages entitled "Graphite Mining in Mexico." The company owns the Santa Maria graphite deposits, which are located about 20 miles south of the mining town of La Colorada in central Sonora, Mexico, which were discovered in 1867. Work was begun in 1891, but commercial operations did not commence until 1895, since which time the present company has operated the mines. The illustrations show the methods employed in mining as well as Mexican social features. Another publication is the general catalogue No. 2, comprising 38 pages, which gives a complete list of the company's graphite products, with notes regarding their special uses. A third publication is entitled "Interesting Facts About Graphite Paint," and comprises 64 pages. It gives numerous illustrations of structures upon which the company's Mexican graphite paint has been used. A pamphlet of 16 pages is entitled "About Graphite Lubrication," and enters quite thoroughly into that subject. A pamphlet of 16 pages, entitled "Powdered Versus Flake Graphite for Lubrication," as its name indicates, discusses the two kinds of graphite, and presents cogent reasons why powdered graphite is claimed to be superior for lubrication purposes to flake graphite.

Dunbar Furnace Company Record.—No. 2 stack of the Dunbar Furnace Company, at Dunbar, Pa., which was put in blast in November, 1906, is still in operation and working very satisfactorily. This stack made 1929 tons of low sulphur malleable iron in the week ending August 27, and up to August 29 the stack has made 296,500 tons on the present lining, and is making about 280 tons of iron per day. The product of the company is malleable, basic, car wheel, forge and foundry grades. The stack has made only 62 tons of white iron in the last 39 months, and at present is running on malleable iron made from Lake Superior ore furnished by the Cleveland Cliffs Iron Company, and on by-product coke made in the company's Semet-Solvay ovens at Dunbar, Pa. Last week the consumption of coke per ton of iron made was 2035 lb.

The E. C. Smith Pig Iron & Coke Company was incorporated at St. Louis, Mo., August 24, with $10,000 capital stock. Edward C. Smith, the president, has been sales agent in St. Louis territory for the past six years for the Sloss-Sheffield Steel & Iron Company of Birmingham. Prior to that time he was manager at St. Louis for the Field-Evans Iron Company, following experience in the iron trade at Cincinnati with the Dayton Coal & Iron Company. The vice-president of the new company is John D. Evans, who has been in the pig iron business in St. Louis for the past nine years. E. W. Henderson, the treasurer of the company, is president of the Vandeventer Trust Company of St. Louis.

The Keystone Tube Works, which is building a new plant at Connellsville, Pa., reports that work is progressing satisfactorily, and that it will be making pipe about September 15. The company recently purchased about 5 acres of land adjoining its plant, on which extensions will be built as business increases.

The Machinery Markets

An excellent business is being done in the New York City machinery trade. There are railroad inquiries out which call for expenditures amounting to fully $250,000, and the outlook for September business is unusually good, while several houses report that their August business equals that done in June or July. A large railroad appliance manufacturing company and several other new enterprises will shortly come into the market in New York for a full line of machinery equipment, and there are many inquiries before the trade for machines for replacements. In other parts of the country reports are not quite so encouraging. The local demand in Pittsburgh is disappointing, but there is a good call for power plant and mining equipment. In Philadelphia some good railroad business has been placed, and there is a fair demand for small tools. The immediate business in Detroit and Cincinnati is somewhat slow, but a good fall business is promised in those markets. Inquiries in Chicago are scattered, and expected railroad business is still delayed. On the North Pacific Coast a good Alaskan business has developed, and some export business is coming from Australia. Export business has improved of late throughout the country, and it is thought in some quarters that this is due to the fact that many manufacturers have conducted business-getting campaigns for foreign trade to make up for the lack of domestic demand.

New York

NEW YORK, August 31, 1910.

Several New York machinery houses find that their August business was equal to that done in June and July and far ahead of the business done in August, 1909. A good illustration of the trend of business is contained in the fact that no one concern had its business swelled by unusually large orders, as most of the business done came from parties representing a varied line of manufacture and the orders were largely in small lots and principally for replacements. Just now there is a larger volume of inquiries than there has been in the last month, so the outlook is especially good. The Delaware, Lackawanna & Western Railroad has placed a few orders against a long list which has been out for several weeks, and the New York Central Lines are also placing orders against inquiries recently issued. It is estimated that the Delaware, Lackawanna & Western Railroad Company's list will call for expenditures amounting to $125,000 and the inquiries from the New York Central Lines will aggregate from $125,000 to $150,000. It is apparent that orders have been given to close out both of these lists, and this business alone should make the September trade especially good. There are a number of other large projects coming along in which active buying will be begun within the next 15 days, so that all things point to a good September business. The export trade has been especially good all summer, and from the inquiries now out it should continue good. There has been a good deal of export buying for the account of sugar plantations in Cuba and the West Indies and Mexican mining interests have been active of late. The demand for general machinery from Canada is as good now as it has been at any time within the last six months.

The United States Lighting & Heating Company, 30 Church street, New York, is preparing a list of machinery requirements to be installed in its plant at Niagara Falls, N. Y., which is now nearly constructed. The plant will include a main building, 200 x 400 ft., which has been about finished, and a number of smaller structures. The company has about 18 acres of land which will allow for future expansions. The United States Lighting & Heating Company was organized some time ago through the combination of a number of companies manufacturing electrical appliances, including lighting and heating systems for railroad trains and storage batteries for automobiles and commercial trucks. The company will not purchase any great amount of power equipment, as a contract has been made with the Electric Power & Mfg. Company for furnishing Niagara power to the works.

The Simms Magneto Company will within the next week commence the erection of a plant at Watsessing, N. J., for the manufacture of magnetos for automobile ignition. The plant will include a two-story building, 150 x 300 ft., located adjacent to the tracks of the Delaware, Lackawanna & Western Railroad at Watsessing, from which a spur will be constructed to the works. In the absence of Mr. Simms, who is at present in Europe, the purchasing of machinery will be held in abeyance, and the list will not be issued to the trade, it is understood, until late in October. William Shuler is purchasing agent for the company.

The International Harvester Company is having plans prepared for a malleable iron foundry and blacksmith shop, 450 x 500 ft., one story, which it will add to its Osborne Works, on North street and the New York Central Railroad, Auburn, N. Y. The building will be of brick, steel and concrete construction. Estimated cost, $150,000.

The item with reference to the International Auto League Tire & Rubber Company, Buffalo, N. Y., which appeared in the August 11 issue of *The Iron Age*, was erroneous in stating that ground had been broken for the company's factory at Akron, Ohio. It was the intention of the company to erect a new factory building there, and one of the directors stated to the Buffalo representative of *The Iron Age* that ground had been broken for the purpose. Later information is to the effect that before work was started the company received an offer of a building already constructed in that city and also offers of factories in two other cities, and these offers are now under consideration by the directors. The present headquarters of the company are at 72 Pine street, Buffalo.

The city of Rochester will build a refuse incinerating plant on Falls street of reinforced concrete at a cost of $100,000. F. T. Ellsworth, Commissioner of Public Works, City Hall.

The Langslow, Fowler Company, chair manufacturer, Rochester, N. Y., is erecting a new engine and boiler house of reinforced concrete at its plant on South avenue.

The Cooper Paper Box Company, Buffalo, is having plans prepared for a factory, 70 x 130 ft., three stories and basement, to be erected for its use at Sycamore and Mortimer streets.

The Cliff Paper Company, Niagara Falls, N. Y., has let contract for alterations and additions to its plant on the canal basin. The iron and steel work will be done by the Buffalo Structural Steel Company.

The Buffalo Tool & Supply Company, Buffalo, N. Y., Charles Hood, manager, 30 Chapin Block, dealer in second-hand machinery, is having plans prepared for a steel frame and glass warehouse and repair building, 75 x 350 ft., which it will erect on a two-acre site which it has recently acquired, having railroad facilities. The present city offices in the Chapin Block will be maintained.

The Watson Wagon Company has let the contract for its new wagon manufacturing plant at Canastota, N. Y., which will consist of several one and two story buildings and cost $125,000. Work will be started at once.

The Niagara Electro-Chemical Company, Niagara Falls, N. Y., will soon receive bids for a three-story grinding building, 30 x 30 ft., and an office building 40 x 103 ft., two stories, which it will add to its plant on Buffalo avenue.

Power Economies, Ltd., Montreal, P. Q., incorporated with $20,000 capital stock, has taken over the plant of the Power Economy Company, manufacturer of fuel saving specialties. The company advises it would like to negotiate with American manufacturers of power plant and fuel saving specialties with a view to handling their lines in Canada. The company will purchase a 10-in. lathe and a small drill press.

The Jules Motor Company, Ltd., 14 East King street, Toronto, recently incorporated with a $250,000 capital stock, advises that it has not definitely decided upon its plans for the future, but that it will do so at an early date.

Chicago

CHICAGO, ILL., August 30, 1910.

The Chicago machinery market continues quiet. There are no signs as yet of activity among the railroads in buying tools which they need for their shops, so that this prospective business continues to accumulate as a problem which the machine tool people will have to take care of in the fall. There are scattering inquiries from manufacturers and coun-

THE MACHINERY MARKETS

try shops, and the situation seems to be improving somewhat along this line. In a large proportion of these inquiries the buyers are willing to consider second-hand tools.

General business conditions throughout the West have improved very materially the past month. There is a better feeling and more activity in the iron and steel market, and in practically every branch of business. It is the general opinion that the trade is on the eve of a healthy recovery from the dullness of the summer months, but it will take some time for this improvement to get around into the channels of the machine tool trade in the form of any considerable buying movement. The financial unrest which was so apparent two months ago and had so depressing an effect on trade has been wearing off recently. Money is growing easier and there is more of a disposition to go ahead. The railroad situation, however, will probably not be settled until the Interstate Commerce Commission reaches a decision on the important freight tariffs that were suspended last summer.

The Chicago Coach & Carriage Company, Chicago, has increased its capital stock, and advises that later on it expects to build a new factory. The company is preparing to put a new type of car on the market which necessitated additional working capital.

The Roberts Portable Oven Company, 400 West Erie Street, Chicago, manufacturer of bakers' machinery, core and enameling ovens, &c., has purchased land for a new plant, upon which the work of construction will be commenced in the near future.

Since the fire which destroyed the plant of the Chicago Rawhide Mfg. Company, Ohio and Franklin streets, Chicago, the company has concentrated its manufacturing facilities at 1301 Elston avenue, in that city, having greatly enlarged the buildings. It is the intention of the company to engage in the manufacture of metal and rawhide gears and pinions on a much larger scale than heretofore, and it has installed a complete and modern machine shop equipment with this end in view. The machinery for the new machine shop has been purchased with the exception of a planer to bevel gears, and one or two small tools. The stockholders of the company remain the same, but there has been a change in the management. The new officers are as follows: W. H. Emery, president; W. H. Doe, vice-president; John T. Emery, treasurer and general manager; W. S. Hall, secretary.

Bids will be received until September 6 by the Board of Public Works of Hammond, Ind., for one horizontal cross compound condensing crank and flywheel outside packed steam jacket pump, with a capacity of 15,000,000,000 gal. per day.

Kraut & Dohnal, Chicago, are having erected at Ohio street and Western avenue a factory building, 65 x 100 ft., which will be equipped with an electric freight elevator and a steam heating plant.

The Big Four Railway is contemplating the erection at Mattoon, Ill., of a roundhouse, terminal facilities and other improvements at a cost of $150,000.

The Pneumatic Gate Company, Chicago, has plans prepared and is taking figures for the erection of a two-story foundry building, 80 x 80 ft., to cost about $7000.

The Imperial Brass Mfg. Company, Chicago, is receiving bids through its architect, Alfred S. Alschuler, 39 Jackson boulevard, for the construction of a manufacturing plant, 100 x 125 ft., five stories.

The Commonwealth-Edison Company, Chicago, is receiving bids through its architects, Holabird & Roche, for the construction of a power generating plant consisting of five buildings.

The Baker-Vawter Company, 143 Dearborn street, Chicago, has plans prepared for a factory building, 57 x 137 ft., to be erected at Benton Harbor, Mich.

The Illinois Wesleyan University, Bloomington, Ill., has awarded the general contract to Lewis & Kitchen, 1200 Michigan avenue, Chicago, for the construction of a heating plant, 50 x 75 ft., one story.

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New England

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try shops, and the situation seems to be improving somewhat along this line. In a large proportion of these inquiries the buyers are willing to consider second-hand tools.

General business conditions throughout the West have improved very materially the past month. There is a better feeling and more activity in the iron and steel market, and in practically every branch of business. It is the general opinion that the trade is on the eve of a healthy recovery from the dullness of the summer months, but it will take some time for this improvement to get around into the channels of the machine tool trade in the form of any considerable buying movement. The financial unrest which was so apparent two months ago and had so depressing an effect on trade has been wearing off recently. Money is growing easier and there is more of a disposition to go ahead. The railroad situation, however, will probably not be settled until the Interstate Commerce Commission reaches a decision on the important freight tariffs that were suspended last summer.

The Chicago Coach & Carriage Company, Chicago, has increased its capital stock, and advises that later on it expects to build a new factory. The company is preparing to put a new type of car on the market which necessitated additional working capital.

The Roberts Portable Oven Company, 400 West Erie Street, Chicago, manufacturer of bakers' machinery, core and enameling ovens, &c., has purchased land for a new plant, upon which the work of construction will be commenced in the near future.

Since the fire which destroyed the plant of the Chicago Rawhide Mfg. Company, Ohio and Franklin streets, Chicago, the company has concentrated its manufacturing facilities at 1301 Elston avenue, in that city, having greatly enlarged the buildings. It is the intention of the company to engage in the manufacture of metal and rawhide gears and pinions on a much larger scale than heretofore, and it has installed a complete and modern machine shop equipment with this end in view. The machinery for the new machine shop has been purchased with the exception of a planer to bevel gears, and one or two small tools. The stockholders of the company remain the same, but there has been a change in the management. The new officers are as follows: W. H. Emery, president; W. H. Doe, vice-president; John T. Emery, treasurer and general manager; W. S. Hall, secretary.

Bids will be received until September 6 by the Board of Public Works of Hammond, Ind., for one horizontal cross compound condensing crank and flywheel outside packed steam jacket pump, with a capacity of 15,000,000,000 gal. per day.

Kraut & Dohnal, Chicago, are having erected at Ohio street and Western avenue a factory building, 65 x 100 ft., which will be equipped with an electric freight elevator and a steam heating plant.

The Big Four Railway is contemplating the erection at Mattoon, Ill., of a roundhouse, terminal facilities and other improvements at a cost of $150,000.

The Pneumatic Gate Company, Chicago, has plans prepared and is taking figures for the erection of a two-story foundry building, 80 x 80 ft., to cost about $7000.

The Imperial Brass Mfg. Company, Chicago, is receiving bids through its architect, Alfred S. Alschuler, 39 Jackson boulevard, for the construction of a manufacturing plant, 100 x 125 ft., five stories.

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Cleveland

CLEVELAND, OHIO, August 30, 1910.

Business in the local machinery market as a whole continues quiet, although a little improvement is noted in some lines. Orders are mostly for single tools in small sizes. This business is coming principally from small manufacturing plants and repair shops. Some orders are also being placed by steel companies for machine shop equipment. While the automobile trade is generally quiet, one or two of the Michigan manufacturers are buying equipment for plant extensions. Deliveries have gradually grown better, so that good shipments can now be secured on nearly all standard tools. While few definite inquiries are coming out, the outlook is regarded as more favorable than a month ago, and there is a general feeling that there will be considerable increase in the volume of business during the latter part of September.

In special lines the demand for industrial cars and locomotives continues quite active. The demand for equipment for hydroelectric projects is fair and some good business in that line is in prospect. The outlook for a good volume of business in mine hoists during the coming fall is quite promising.

The local manufacturing situation is fairly satisfactory. In spite of the usual summer dullness, in general business few manufacturers in metal working lines outside of the automobile trade have found it necessary to reduce the number of their employees. Conditions in the foundry trade continue quite satisfactory. Nearly all of the jobbing foundries are comfortably filled with work.

Cleveland manufacturers are planning a two weeks' trade excursion through the West during the coming fall. Thirty concerns, members of the Chamber of Commerce, have signified their willingness to participate in the trip. As soon as 50 are secured arrangements will be completed and a special train chartered. The plans provide for visits to many of the principal cities in Iowa, Nebraska, Kansas, Missouri and Illinois.

The Wellman-Seaver-Morgan Company, Cleveland, reports that orders are holding up well and inquiries indicate a good volume of business in prospect. This company now has all of its departments well filled with work for the remainder of the year. It reports the receipt recently of the following orders for Hughes gas producers: Six producers for the new plant of the American Steel & Wire Company at Birmingham, Ala.; three producers for the National Tube Company at Lorain, Ohio; ten producers of the self-cleaning type for the plant of the American Sheet & Tin Plate Company at Gary, Ind., and one standard producer for the plant of S. F. Bowser & Co., Fort Wayne, Ind. The Wellman-Seaver-Morgan Company has also recently taken some good water wheel contracts. Among these is an order from Finch, Pruyn & Co., Glens Falls, N. Y., for two units, each a 2400-hp. horizontal turbine. An order has also been received for a third water wheel unit from the A. L. Swett Electric Light & Power Company for an addition to its plant at Medina, N. Y.

The Atlas Car & Mfg. Company, Cleveland, reports that the demand for industrial cars and locomotives continues very active, and that its plant is running 24 hours a day in all departments. This company has recently received additional orders for equipment for the Panama Canal, including three locomotives and a number of electric driven automatic cars for handling concrete. Other new orders reported by this company include 300 sugar cars, several industrial electric locomotives and a number of three-phase electric transfer cars.

The American Fork & Hoe Company, formerly a New Jersey corporation with headquarters in Cleveland, has been reincorporated as an Ohio corporation and its authorized capitalization increased from $4,500,000 to $6,500,000. Not all of the additional $2,000,000 in capital stock will be issued for the present.

The Marion Shovel & Dredge Company, recently organized at Marion, Ohio, has elected the following officers: John D. Owens, president; Clifford A. Owens, first vice-president; David Evans, second vice-president; George B. Christian, Jr., third vice-president; A. E. Cheney, secretary and general manager; George D. Copeland, treasurer; Henry J. Barnhart, chief engineer. The officers comprise the Board of Directors. It is expected that a portion of the company's proposed new plant will be in operation by January 1.

The American Range & Foundry Company, Cleveland, which recently decided to enlarge its plant, has now under consideration the disposal of its present plant on Union avenue and the erection of an entirely new plant on a site near its present location, on which an option has been secured. It is expected that definite plans will be made within two weeks.

The Ferro Machine & Foundry Company, Cleveland, has increased its capital stock from $433,000 to $600,000.

J. Elkes, 407 Perry-Payne Building, Cleveland, Ohio, is in the market for the following machinery: Revolving solder roaster, baling press for light scrap, such as steel clippings and cuttings; pumps to transfer solutions from one tank to another, wire baskets about a half or 1 ton capacity, loading or shaking machine, set of rolls to press and perforate old tin cans and other light metals.

The Globe Machine & Stamping Company, Cleveland, Ohio, is having plans prepared for a manufacturing plant comprising several buildings for the construction of which bids will soon be asked. Courtney & Emerson Company, Columbia Building, are the engineers in charge.

The Empire Plow Company, Cleveland, Ohio, is having plans prepared for a two-story factory building, 80 x 80 ft., on which bids will soon be received.

Cincinnati

CINCINNATI, OHIO, August 30, 1910.

The Ohio Valley Exposition, at Cincinnati, opened its doors August 29. The machinery hall is well filled with exhibits, some of which are from outside cities. There was a large attendance on opening day, and the local machinery interests expect the exhibition will bring them some nice orders from visitors from nearby territory.

If a rule that has been established by a number of machine tool builders in this vicinity becomes general, consignment stocks of tools to agents will soon become a thing of the past. Some firms even go so far as to refuse to sell a stock outright to an agent, unless the particular tools have already been sold. One tool only of each kind is intended to be kept on hand by the agent, and so soon as sales are made the name of the customer is furnished the manufacturer before shipment is made. This places the small dealers, some of whom have the same selling ability, on the same footing with those who may be financially stronger, and eliminates any stocking up of tools by agents for speculative purposes during flush periods when premiums can be demanded from the customer for prompt shipment.

The Missouri Pacific Railroad is inquiring in this market for some tools, but if it is as slow in purchasing as some of the other Western roads have been the machine tool people will have all the time they want in which to make up figures. Then general belief is, however, that the railroads will be compelled to do some heavy buying this fall, as shop equipment is known to be badly needed by all the Western railroads.

The Oakley plant of the Cincinnati Bickford Tool Company is nearing completion and the company expects to move in its new quarters November 1. The D. T. Williams Valve Company has leased the building on Spring Grove avenue, Cincinnati, now occupied by the Cincinnati Machine Tool Company, part of the Cincinnati Bickford Company, and will move from its downtown factory as soon as the tool company can vacate the premises.

The Fairmont Mining Machinery Company, Fairmont, W. Va., is making some extensions to its plant at that point. All the new machinery and tools to be installed will have individual electric drive. Holbert & Spedden, Fairmont, are the erecting contractors.

The Newport Rolling Mill Company is now operating its large plant at Newport, Ky., on full time. Orders coming in are scattered over a wide territory and the company expects an excellent fall business.

The Croghan Foundry Company has been incorporated at Tremont, Ohio, with $10,000 capital stock, to do a general foundry business.

On August 23 fire almost completely destroyed the plant of the Akron Tile & Roofing Company, Akron, Ohio. It is understood that the factory will be rebuilt at an early date.

The capital stock of the Toledo Computing Scale Company has been increased to $900,000, but no additions to its plant are planned for the near future.

The Central Wire & Iron Works, Indianapolis, Ind., incorporated with $5000 capital stock, has purchased the plant formerly owned and operated by F. B. Alley of that city. No improvements are contemplated, it being the intention of the company to manufacture the same lines as were manufactured by Mr. Alley.

The Seagrave Company, Central National Bank Building, Columbus, Ohio, has plans prepared for a two-story blacksmith shop, 50 x 167 ft., on which bids will soon be received.

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Cambridge City, Ind., will improve its light and water plants at a cost of $8000.

It is expected that the construction of the four additions to the Champion Division of the International Harvester Company's plant at Springfield, Ohio, will be started about September 1. There has been considerable delay in starting these buildings, owing to the fact that the plans and specifications were changed, the officers of the company having decided to make them larger than at first intended. Additional ground has been purchased for a new blacksmith shop and gray iron foundry.

Detroit

DETROIT, MICH., August 30, 1910.

Manufacturers, jobbers and dealers generally all through this territory are engaged at present in preparing for the opening of fall trade. Accumulations of shop-worn, slightly damaged or otherwise inferior material have been largely disposed of at a sacrifice to make room for new stock, and there is a notable movement everywhere to get business in line for prompt deliveries a little later on. Manufacturers are devoting particular attention to the production of parts which require the most time for machining and finishing, thereby putting them in a position to turn out the remaining parts quickly and assemble the complete apparatus in relatively short order. Standardization of all parts which can be made interchangeable has also progressed farther this year than in any previous season, and that fact alone will exert an appreciable influence upon future deliveries. The booking of new orders is slow at present, but prices hold firm and the market shows no signs of weakness.

The American Supply & Machinery Manufacturers Association, which numbers among its members the American Blower Company, American Injector Company, Detroit Lubricator Company, Detroit Oak Belting Company, Sterling & Skinner Mfg. Company, Roberts Brass Mfg. Company, Penberthy Injector Company and McRace & Roberts Company, Detroit; United States Graphite Company, Saginaw; Union Steam Pump Company and H. B. Sherman Mfg. Company, Battle Creek; Oliver Machinery Company, Grand Rapids, and Lufkin Rule Company, Saginaw, Mich., has opened a bureau of information at 55 Woodbridge street, Detroit, with Wm. M. Chamberlain in charge.

The new machine shop of the Root Spring Scraper Company, Kalamazoo, Mich., has been placed in service, and production for the coming year will be considerably enlarged.

The Lake Shore Engine Works, Marquette, Mich., has built for the Butte Balaklava Copper Company, Butte, Mont., an electric motor driven hoist of 300 hp., which is attracting a great deal of attention from mine operators. From the arrangement shown by the photograph of this machine, it is apparent that the unit is compactly constructed and capable of easy control.

Funds for the city water works at Imlay City, Mich., are being provided, and the matter of their suitable expenditure will be taken up in September.

The Yeomans Body & Box Company, Detroit, has been combined with the Monroe Body Company, Pontiac, Mich., in the name of the latter, and both plants will be operated to capacity. The capital stock of the enlarged company has been increased to $500,000.

A new building, 95 x 100 ft., which will be used as an automobile garage and probably also equipped for repair work, is to be erected by the Goodfellow Tire Company in Detroit. B. C. Wetzel & Co. of this city are in charge of the plans.

The Koenitzer Company, Saginaw, Mich., has under consideration the rebuilding of its plant, which recently burned. This was completed last spring, having been designed along the most modern lines by the Chas. H. Stebling Company, Milwauke, Wis., and will probably be practically duplicated.

Geo. W. Brown, Sturgis, Mich., has had work started on a brick and concrete furniture factory at Glengarry, near Bagnall (P. O.), Mich.

The Anhut Motor Car Company, Detroit, has changed its name to the Barnes Motor Car Company.

Unless other arrangements for power are made, a large electric generating station will be needed by completion of the Detroit & Lansing Railway, for which the St. Johns Construction Company, Chicago, are reported to have the construction contract. Further particulars are, however, not available at this time.

The De Pree Chemical Company, Holland, Mich., has let contract for a three-story building, 40 x 90 ft., to be used in its testing department.

A two-story addition will be made to the factory of the O. & W. Thum Company, Grand Rapids, Mich.

An addition to the automobile industry of Detroit is to be found in the establishment of the Puncture Proof Tire Company, which recently opened a shop at 269 Beaubien street.

The American Injector Company, Detroit, has maintained to excellent advantage this season its sales of the U. S. injector for boiler feed service, installations of which are to be found in almost every industrial community, including practically all of any importance. For the coming year a further increase in production will undoubtedly be necessary.

W. B. Mershon, Saginaw, Mich., is among the delegates appointed by Governor Warner to attend the National Conservation Congress at St. Paul, Minn.

The Winona Copper Mining Company, Houghton, Mich., is installing a new crushing plant, which will be equipped with heavy steam stamps of the same general pattern as those originally designed for Lake Superior copper mines by Edwin Reynolds. The new machines have been built in the Chicago works of the Allis-Chalmers Company, Milwaukee, and are among the first of the kind to be constructed for many years.

It is reported from Greensburgh, Ind., that a company known as the Carr-Lasner Radiator Company has secured a site there upon which to erect a manufacturing plant. The product will be taken by automobile makers.

The production facilities of the Michigan Turpentine Company, Bay City, Mich., are to be increased.

The Cooley Automobile & Tire Company has been incorporated to establish a plant in Detroit for the manufacture of motor cars and a new patent tire, the latter being the main product. John B. Chaddock is president; L. D. Cooley, vice-president and general manager, and F. H. McMullen, secretary. The capital stock is $50,000.

The Hancock Consolidated Mining Company, Hancock, Mich., is putting in service a new power plant, with hoisting engine and air compressor. A stamp mill will be erected as soon as the production is sufficient in volume to warrant it, and other machinery purchased at intervals as development work progresses.

The Toledo Massillon Bridge Company, Toledo, Ohio, is employing more lathe, planer and bench hands. Orders on the books are sufficient to insure work in the shops for some time ahead.

A new sewage plant, with pumps having a capacity of 3,000,000 gal. daily, will be built at Cadillac, Mich.

The Huron River Mfg. Company has been organized at Ann Arbor, Mich., to establish a plant for the production of automobiles and their parts. Bids are now being taken on the first of the new factory buildings to be erected, which is 40 x 456 ft.

Following the sale of bonds recently voted, an electric power station for municipal service is to be erected at Muskegon, Mich. The purchase of machinery will be taken up some time this fall.

The Wright Cooler & Hood Mfg. Company, Chicago, manufacturer of automobile parts, is having plans prepared for a one-story factory building, 99 x 141 ft., to be erected at Muskegon, Mich.

The Wolverine Brass Works, Grand Rapids, Mich., has issued an increase of $1,000,000 to its capital stock, to be used for extra working capital. The company recently completed several new additions to its plant.

Sealed proposals will be received by the city of Grand Rapids, Mich., until September 8, for the construction of a filtration plant.

The Ayers Engine & Motor Company, Trenton, Mich., recently incorporated, has taken over the business of the Ayers Engine Works of Rochester, Mich., and the Gilmore Motor Company, Detroit, Mich., manufacturers of portable and stationary engines and marine motors. The company has in the course of erection a new factory building, 50 x 170 ft., which is expected to be ready for occupancy by October 1. Practically all of the machinery and equipment required has been purchased.

The Michigan Crank Shaft Company, Detroit, Mich., will erect a factory building, 64 x 138 ft., and an office building, 18 x 37 ft., two stories.

Milwaukee

MILWAUKEE, WIS., August 29, 1910.

Trade during the past week has been only fair, and in the orders recently booked the smaller manufacturers, together with dealers, seem to be better represented than the large machinery builders of the State. The latter, however, have negotiations pending that are practically certain within the coming month to lead to the closing of quite a number of contracts of considerable size, and the situation is looked upon as favorable.

Sales of machine shop and foundry equipment are

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likely to be rather light for a time. There have recently been numerous installations of new tools in the plants or additions started last spring, and probably as many more are to be made by October 1. Purchases during the near future will be confined almost wholly to replacements, and many of these will not be determined upon until after the usual September meetings of directors or others identified with local industries.

In addition to the Newport mine, for which a large quantity of machinery has been purchased in recent years, Ferdinand Schleisinger, Milwaukee, will open up a new property on the Gogebic range in the Bessemer district of upper Michigan. This is to be operated under lease, which is reported to contain an agreement calling for the expenditure of $250,000 in development work within the next five years.

Ground has just been broken here for the immense new foundry of the International Harvester Company.

W. G. Kirchoffer, Madison, Wis., is preparing plans for a pumping plant to serve the city of Gresham, Wis. Specifications covering machinery will be ready in the near future.

The Beaver Dam Foundry Company, Beaver Dam, Wis., is preparing to install electric power equipment, taking its current from the mains of the Beaver Dam Light & Power Company.

The Mitchell-Lewis Motor Company, Racine, Wis., is reported, on apparently authentic information, to be preparing to enter upon the manufacture of aeroplanes on a commercial scale. A new form of motor is being developed for the purpose.

The Minneapolis Motor & Truck Company will have a new plant at Downing, Wis., the dimensions of which are given as 100 x 200 ft., two stories.

C. E. Search, manager of the production department of the Allis-Chalmers Company, who resigned some months ago for a period of rest and recuperation, has returned and will take up similar duties at the plant in West Allis.

The Cedarburg Box & Woodwork Mfg. Company, recently organized at Cedarburg, Wis., is taking bids on a new factory building. For driving the machinery, which is to be purchased shortly, electric motors will be used, power being purchased from the municipal plant.

The Milwaukee Separator Company, Milwaukee, which now operates in leased quarters, is planning to build a factory of its own, equipped with electric power.

A hydroelectric power plant will be built and equipped in the spring by the John Arpin Lumber Company, Grand Rapids, Wis., the location being at Radisson, Wis., where a timber dam is now under construction.

From Kaugauna, Wis., it is reported that Geo. L. Smith of that place is preparing plans for a large manufacturing plant to be built at Ashland, Wis., by a new concern that will be known as the Ashland Paper Company. The organization of the latter has not yet, however, been completely effected.

The contract for a new steel highway bridge over the Peshtigo River, near Marinette, Wis., has been taken by the Elkhart Bridge & Iron Company, Elkhart, Ind.

It is reported from Racine, Wis., that the Racine-Sattley Company has disposed of its wagon business to the Fish Bros. Mfg. Company, Clinton, Iowa, and will devote its attention henceforth to the manufacture of automobiles. This is not yet, however, officially confirmed.

The Janesville Machine Company, Janesville, Wis., is taking bids on two elevators, each 1½ tons capacity, for its new shop building. They are to be 7 x 15 ft. square for 60-ft. lift, and driven by electric motors.

The Milwaukee Bridge Company, Milwaukee, will furnish the steel work for a new viaduct to be built at Sheboygan, Wis.

L. H. Hall, Wausau, Wis., is maturing plans for the establishment of a plant to manufacture a new automobile of his design.

The new steel water tower required for municipal service at Waterloo, Wis., will be erected by the Chicago Bridge & Iron Works, Chicago, Ill.

The Albany Electric Light & Milling Company, Albany, Wis., is having plans drawn for a power plant, with hydraulic turbines connected to alternating current generators by shafting and rope drive.

The Templeton-Barrett Company, Milwaukee, Wis., manufacturer of kitchen specialties, will remove its plant and business to Marinette, Wis., where it will occupy quarters secured through the Chamber of Commerce of that city.

The La Crosse Plow Company, La Crosse, Wis., has increased its facilities by the purchase of a building containing 50,000 sq. ft. of floor space, which will be used for manufacturing and warehouse purposes. Orders for all necessary equipment have been placed.

The Racine Mfg. Company, Racine, Wis., is contemplating the erection of a four-story brick factory building, which will be fully equipped with automatic sprinklers.

The Berlin Machine Works, Beloit, Wis., is having plans prepared for a three-story addition, 55 x 120 ft., to be erected in connection with its present plant.

Baltimore

BALTIMORE, MD., August 30, 1910.

While the month of August has not been particularly active in some lines, trade generally has been about up to the usual average for the season, and in some instances business has exceeded that transacted in July. The call for machine tools has been quiet, a number of good propositions are pending, but both manufacturers and merchants note considerable difficulty in closing up business under negotiation. There has been a smaller general demand from the South. The railroads show little disposition to come into the market for any extended equipment or supplies. In this vicinity the demand for power equipment, particularly for heating, lighting and ventilating purposes, has been quite good; several fair contracts of this character, in connection with new building work have been closed, while several additional ones are still under negotiations. While some few contracts for structural work in connection with buildings have been placed, fabricators report a falling off in the demand. Subcontracts in connection with building work have been more freely placed, although considerable work of this character is still held up. The call for small shop supplies is up to the average and in instances reported better than last month. The foundry trade is not actively engaged, there is little demand for machinery castings and jobbing foundries are not very busy, except those making castings for the building trade. On the average foundry plants may be said to be operating at about 75 per cent. of full capacity.

Contractors and builders are well engaged, there is a large amount of municipal work under way and a fair demand for contractors' supplies and equipment is reported.

Industrial establishments generally are fairly well engaged, not so much on orders recently taken, but rather on contracts booked earlier in the year, on which deliveries are now being made as a rule. Those engaged in the various branches of the iron and steel trades have enough work ahead to keep them fully engaged for several months at least, before the expiration of which a general betterment in trade conditions is anticipated.

The Montgomery Chemical Company, Derwood, Md., will make considerable improvements to its plant, for the manufacture of case hardening compounds. A carbonizing plant, including a gaseous fired bench of six vertical retorts, gas producers and special apparatus for the prevention of smoke and odors and facilities for reclaiming of by-products will be installed. The engineering and chemical departments of the Baltimore Retort & Fire Brick Works, Baltimore, Md., are to supervise the work.

The general contract for the addition to the Hochschild-Kohn Company's department store has, it is stated, been awarded to Morrow Brothers, contracting builders. With the exception of the power plant, the various subcontracts are understood to have been placed. About 600 tons of structural material will be required.

The Monumental Brewing Company will erect a bottling plant at Seventh and Lombard streets, Highlandtown, Baltimore County, Md. The building is to be 100 x 400 ft., four stories. Steam heat, electric light and elevators are to be installed.

Joseph Goller, Mack River, Baltimore County, Md., will install a new generating plant. A 300-kw. alternating current generator and boilers are being considered. The new plant is to be put in during the early fall.

It has been announced that the contract for the erection of the new warehouse for William Keyser, on Grant street, between Pratt and Lombard streets, has been awarded to Edward Pilert. It will have a frontage of 40 ft. and extend back to Hollingsworth street. It will be three stories of brick and of general mill construction.

The contract for the high pressure pumping station, to be erected on South street, between Pratt and Lombard streets, for the city of Baltimore, for which the Bennett Building Company was the bidder under original specifications and low bidder under revised proposals, was awarded the contract at $148,000.

Competitive plans are to be prepared for a new theater to be built at 307-315 West Fayette street. The proposed building, which is to cost $100,000, will have a frontage of 125 ft. and a depth of 150 ft., be thoroughly fireproof and modern in every detail. The property on which the theater is to be erected has been purchased, but not until after January 1 will any actual construction work be done.

The Pennsylvania Railroad Company received proposals on August 31 for the erection of a number of buildings to comprise its Orangeville, Md., repair shops and round house. A number of Baltimore contractors are bidding.

The Montford Machine Casting Company reports the de-

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mand for machinery castings quiet; a fair run of jobbing work is, however, being taken, but business at this season is not up to normal and competition is very keen. Orders on hand are sufficient to keep the plant fairly well engaged.

The Weatherproofing Nail Company, 451 North avenue, is inspecting several factory buildings with a view of obtaining larger quarters for the manufacture of its products. Its present plant is too small for its business and more extensive quarters will be taken prior to the end of the year.

Crook-Kries & Co. have the contracts for the heating plant in connection with the addition to be built for the United States Fidelity and Guarantee Company; also for extending the present heating system of St. Mary's Industrial School. This company is extremely busy on work in hand and is figuring on a number of important heating and ventilating propositions as well as power installations.

The Baltimore Buggy Top Mfg. Company has purchased property at Maryland and Mt. Royal avenue, 75 x 124 ft., and will erect a three-story factory and salesroom. The contract for the building has been awarded to McLaughlin Bros., 915 Bolton street. Electric elevators, lighting and steam heat will be installed.

The Baltimore Bridge Company is operating its plant at full capacity, with some departments working overtime, in order to complete contracts on hand. Work is progressing rapidly on the Southern Building in Washington and the Emerson and Fidelity buildings in this city. Deliveries on a considerable volume of export work to South America are practically completed. New business has been somewhat less active, due in a measure to the inability to make early deliveries, the capacity of the plant at least two months being fully taxed.

The Detrich & Harvey Machine Company reports the usual seasonable dullness during August. A large volume of business is under negotiation, but for the most part prospective customers show little disposition to place orders. New business during the month has not been heavy, although deliveries on contracts in hand have been numerous. The plant is running at full capacity, orders taken earlier in the year being sufficient to keep it so occupied for several months.

T. C. Bashor & Co. have taken the contract for the power plant for the Munsey Building, in which three 125-hp. marine type boilers will be installed. Three 250-hp. corrugated firebox boilers are building for a New York customer, while orders for tanks of various sizes have been quite numerous. The boiler plant is operating at full capacity, and there is a very fair volume of new work being figured on. Business taken during August has been fully up to the average.

Friedenwald Brothers are quite busy. While domestic business has not been particularly active they have a large amount of work on their books for special machinery for the Crown Cork Company, Ltd., London, England, for its branch offices in Yokohama, Japan; Hamburg, Germany, and Rio Janeiro, Brazil. This machinery is used for the manufacture of the crown cork and seal in foreign countries.

Dietrich Brothers have been awarded the contract for the structural steel work for the addition to the United States Fidelity & Guarantee Company, requiring about 300 tons of shapes. They have also been awarded the structural steel and ornamental iron work in connection with the O'Neil Building; about 200 tons of structural material are involved. This concern reports a very fair run of business and is operating its plant at full capacity.

The Baltimore Retort & Fire Brick Company, which increased its capital from $50,000 to $100,000 subsequent to the fire which destroyed the plant about two years ago, will, without increasing its indebtedness, issue preferred stock to the value of $25,000 to provide additional working capital. Improvements to plant are contemplated, including the installation of a complete system of industrial railways. The plant is operating at full capacity, having a number of contracts for coal gas benches, including a large installation at Valdosta, Ga.; Charleston, S. C., and in the New England States, as well as orders for special fire clay shapes and brick being on its books.

Quite a few subcontracts for new buildings and additions in Baltimore and vicinity, for which general contracts have been placed, are still unclosed, among which are the power and heating plant for the Baltimore City Hospital, the boiler and heating plant for the Emmerson Building and the Emmerson Hotel. That for the elevators of the latter is expected to be closed during the current week.

Plans are in progress by C. L. Reeder, engineer, for a new office building for the American Agricultural & Chemical Company at South and Water streets, from plans by Owens & Siscoe, architects. A modern five-story brick building, 20 x 83 ft., is proposed.

At a meeting of the directors of the Frederick Railroad Company, Frederick, Md., extensive plans for improvements to the company's lines were determined upon. The electrification of the line from Frederick to Thurston was ordered. This branch has been operated as a steam road and the freight traffic will probably continue to be handled by that method. Some extension of the company's railway in Frederick was also decided. Plans for the erection of a large power plant, to be built jointly by the Frederick Railroad Company and the Hagerstown Railroad Company, to furnish power to both roads, were also practically agreed upon, although its location was not finally decided, but will probably be in the vicinity of Hagerstown, Md. A new corporation, the stock of which will be held by both railroad companies, will be formed to build and operate the power plant.

The Maryland & Pennsylvania Railroad Company is building a new round house and repair shop about a quarter of a mile above its present shops on Falls road, Baltimore. The round house will have a capacity for 17 stalls, although about one-half will be used at the time for a machine shop, carpenter shop, paint shop and minor offices. J. S. Morris is general manager.

St. Louis

ST. LOUIS, August 29, 1910.

The manufacturers of woodworking machinery find the demand quite slow, as the lumber producing industry seems to be passing through a rather unprofitable period. The production of lumber is excessive, and this combined with the increasing use of concrete and steel makes the business unremunerative.

The Moran Bolt & Nut Company and the St. Louis Screw Company find business very fair for this time of year.

The Lambert Hoisting Engine Company is putting in a stock of its hoisting engines at its store here, 717 North Second street. This agency handles a wide territory from St. Louis.

The eight plants of the American Car & Foundry Company in St. Louis and suburbs are running rather slow, owing to the railroads' present policy of curtailing equipment purchases. The new plant at St. Charles, Mo., is now pretty well completed. This plant will specialize on all-steel passenger equipment.

The Elliot Frog & Switch Company and the St. Louis Frog & Switch Company are both getting a fair run of orders for their specialties.

The St. Louis Axle Company is preparing to rebuild its foundry, recently destroyed by fire. Most of the machinery will be still available after some repairs.

The St. Louis Gas & Gasoline Engine Company, manufacturer of marine gasoline engines, finds business very fair for this time of year.

The American Steel Foundries, Commonwealth Steel Company and Scullin-Gallagher Iron & Steel Company are all greatly rushed with steel casting work for railroads, &c.

The National Carton Sealing Machine Mfg. Company, St. Louis, has been incorporated, capital stock, $50,000. The incorporators are George A. Cullum, August B. Cullum and Luther A. Nelson.

The Blechschmidt-Tallman Machinery Company, St. Louis, has been incorporated, capital stock, $10,000; incorporators—J. Blechschmidt, Roscoe S. Tallman and B. E. Hamilton.

The Missouri, Kansas & Texas Railroad will expend $100,000 for installing an electric conveyor system in the big freight houses now being constructed at Broadway and Mullanphry street. The system is patented by the Sprague Electric Company and is an electrically propelled tramway built in the platforms, for conveying all kinds of freight to and from the cars for loading and unloading.

The Vaughan-Minnig Shoe Company is erecting a $20,000 factory at Marshall, Mo., and as soon as the building is completed will remove to Marshall from Jefferson City.

The Otis Elevator Company has let the contract for the construction of an addition to its plant near Alton, Ill. The new building will cost about $60,000. The addition will be known as the woodworking shop and will be 132 x 226 ft.

The National Hydraulic Tire Setter Company, incorporated under the laws of Iowa, licensed to do business in Illinois, has erected at Springfield, Ill., a modern saw tooth factory, 75 x 80 ft., and the company is about ready to let the contract for another building of the same size. Two machines are manufactured—large and small. Also hydraulic box setters, hub binders, &c. The president of the company is H. M. Lourie.

W. B. Schnatterly, Nevada, Mo., has purchased a lot corner of Hunter and Cedar streets and will build a modern two-story machine shop. The building will be of brick, 24 x 60 ft.

The repair shop of the Western Motor Car Company, Springfield, Mo., has been purchased by Don L. Cross of Aurora, Mo., and L. N. Rinaman of Springfield. They will conduct business as the Ozark Motor Car & Machine Com-

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pany and will do a repair business, as well as the building of automobiles.

The National Lumber & Creosoting Company has commenced work on a paving block plant at Texarkana, Ark., to cost about $5000.

L. I. Barnes of Humboldt, Kan., and S. C. Garrett of Kansas City, Mo., will erect a cement factory near Tulsa, Okla. The plant will cost, it is stated, in the neighborhood of $1,250,000 and will be located on the railroad, near an extensive limestone district.

The reorganization of the Mapleton Gas Company, Mapleton, Iowa, has been completed and the following officers elected: J. E. Duschl, president; M. J. Goldberger, vice-president, and C. C. Jacobson, secretary and treasurer. A new gas house will be erected along with other buildings. The Tenny process carbureted water gas will be installed.

The Dowden Mfg. Company, Prairie City, Iowa, manufacturer of potato diggers, &c., will build an extension to its factory, 40 x 120 ft. The plant of the company covers about two city blocks.

Blue Hill, Neb., will install an electric lighting system in connection with the present water works plant.

The Lehigh Portland Cement Company has commenced work on its new plant at Mason City, Iowa. It will have a capacity of 5000 bbls. per day, and it is reported the cost of the works will be in the neighborhood of $2,000,000. The company owns 700 acres in the vicinity of Mason City.

The St. Louis Cotton Compress Company, at Hope, Ark., located at Main and Division streets, is to be removed to its new plant, which will be erected north of the city. It will be equipped with modern steam and hydraulic presses, and will represent an investment of between $40,000 and $50,000, with a capacity of 150 bales per hour and shed capacity of 20,000 bales.

The Contracting Machinery Company, Kansas City, Mo., has been incorporated, capital stock, $50,000; incorporators —J. W. Hoover, Louis A. Miller and Howard N. Hanson.

The Benton Peerless Mills, Benton, Ill., has been incorporated, capital stock, $20,000; incorporators—T. K. Ford, W. W. McCreery and Robert R. Ward.

The Okawville Electric Light & Ice Company, Okawville, Ill., has been incorporated, capital stock, $10,000; incorporators—John Fletsam, John J. Frank and Wm. F. Gagenbusch.

The J. F. Meyer Mfg. Company, Hannibal, Mo., has been incorporated, capital stock, $50,000; incorporators—O. B. Meyers, Arch. P. Meyers and J. Fred. Meyers.

The Dinks Parish Laundry Company, St. Louis, has been incorporated, capital stock, fully paid, $25,000; incorporators—D. L. Parrish, Chas. G. Givin, A. F. Williamson, and others. The company will establish a plant at Oklahoma City, Okla. The building and ground will cost $25,000.

The T. L. Horn Trunk Company, St. Louis, Mo., has leased for a period of 10 years the four-story building at the corner of Eighth and Howard streets, where it will consolidate the business of its several plants. The present factories of the company are fully equipped, but it is probable that additional equipment may be purchased at a later date.

Machinery for a pumping station to be built by the city is to be bought in October or November at Laplata, Mo.

The South

ATLANTA, GA., August 29, 1910.

Engineers engaged by municipalities and county boards, following the elections in which bond issues for improvements were voted, have within the past five or six weeks submitted numerous plans for pumping plants, electric power and lighting stations, filtration works, distribution systems, refuse destructors, &c., the month of August having been an especially active one in this respect. Consequently the buying of machinery for these various projects, which began early in the summer, has increased to an extent that overshadows every other line. At present it gives life to a market which would otherwise be extremely dull. Builders of boilers, heaters, storage tanks, reservoirs, &c., and manufacturers of pipes, valves, hydrants, pressure regulators or other auxiliary apparatus are also kept going in pretty good shape by the strength of this demand. In general the situation may be accurately gauged by the reports in *The Iron Age* of the past fortnight.

Boilers for the new municipal pumping plant at Gadsden, Ala., will be furnished by the Casey & Hedges Company, Chattanooga, Tenn.

Work is about to begin on the additions to be made to the shops of the Louisville & Nashville Railroad at New Decatur, Ala.

The construction of a municipal pumping plant has been decided upon at Seminary, Miss. An elevated steel storage tank may also be required.

The city electric plant at Pulaski, Tenn., which has a present capacity of 75 kw., will be enlarged and improved. Plans to that end are now under discussion by the authorities.

The machine shops of the Grant Land & Lumber Company, Selma, La., recently mentioned, in which an auto logging wagon is now being constructed, are among the most modern of any in the South, being equipped to handle anything from a jack to a locomotive. The company is a buyer, at frequent intervals, of the class of machinery and material usual to such shops.

The authorities at Thibodaux, La., have accepted the plans of G. U. Borde, New Orleans, La., for an electric power and pumping plant, the funds for which are already available. Purchase of the machinery will now be considered.

The Atlas Machine Company, Nashville, Tenn., which makes a specialty of woodworking tools, is putting on the market a new type of picket pointer that can be very easily and economically operated.

The municipal power station at Cairo, Ga., which is equipped with a Crocker-Wheeler generator of 50 kw., driven by a Harrisburg engine, will be more than doubled in capacity during the fall and early winter by the installation of new machinery. None of the proposed equipment appears to have as yet been purchased.

The Home Light & Power Company, recently organized at Greenville, S. C., is preparing to put in execution plans for an electric generating plant.

The purchase of machinery for an electric power and pumping station will be authorized shortly at Rutherfordton, N. C., where a bond issue for the purpose has been voted.

A new veneer cutting plant, the main building of which will be 75 x 130 ft., is planned for erection in Stockton, Ala., by the Bacon-Underwood Veneer Company, Birmingham, Ala.

The authorities at Albertville, Ala., have under discussion the construction of a pumping plant and water works system.

The installation of pumping machinery for municipal service is being planned at Cleveland, Miss.

The contract for a steel bridge over the Conasauga River at Conasauga, Tenn., has been awarded the Joliet Bridge & Iron Company, Joliet, Ill.

The Primo Motor Car Company, Atlanta, Ga., whose organization and plans have previously been mentioned in *The Iron Age*, was recently incorporated for $150,000.

Three Curtis steam turbines and generators, with an aggregate output of 9000 kw and large overload capacity, are to be installed in the Ensley, Ala., power plant of the Tennessee Coal, Iron & Railroad Company. Some auxiliary apparatus will be needed later.

The Northwest

ST. PAUL, MINN., August 29, 1910.

There is at present a decided dearth of news in relation to new construction. Many projects which involve the purchase of machinery are known to be under consideration, but in the absence of authoritative information no details of these can be given out. Salesmen for the leading machinery houses meet with the same difficulty in attempting to open negotiations for sales, being told that the plans have not yet been fully decided upon. With so many responsible officials absent in turn upon vacation trips it seems to be impossible to get enough together in any industrial corporation at one time to talk over any matter involving more than routine business. In this, however, there is also a deliberate policy of delay. To some extent the commercial situation of the country just now is rather disquieting, and among financiers of the Northwest there is a disposition to go a little slow with investments of all kinds.

In connection with the machinery displays this year at the Minnesota State Fair, there will be an innovation in the shape of an exhibit of iron ore, mining and handling methods made by the Oliver Iron Mining Company, Duluth. Officials of the company, including President W. J. Olcott and Major John U. Sebenius of the engineering department, are taking a personal interest in the matter.

The affairs of the Northwestern Tool & Machinery Company, Minneapolis, which went into bankruptcy some time ago, are now being wound up, the machinery and other stock having been disposed of at private sale. A settlement with creditors will shortly be effected.

The plant of the Northern Heating & Electric Company, St. Paul, has passed under the control of H. M. Byllesby & Co., Chicago, Ill., and will be developed along the lines

THE MACHINERY MARKETS

that have recently been followed by that concern with reference to other Northwestern properties.

C. C. Crabtree, Rapid City, S. D., has organized a company for the establishment of a crushing and gypsum manufacturing plant of 4000 bbls. daily capacity. Engineers have been engaged to prepare the plans.

The Superior Iron Works of Duluth and Superior, Minn., will build a three-story brick and concrete addition, 40 x 120 ft., to its building on Grand avenue, near Third street, Duluth.

A new boiler house costing $50,000, which will be equipped with the most modern apparatus, is to be erected in connection with the city and county hospital in Minneapolis.

The Northwestern Metals Company, Helena, Mont., whose plans were mentioned some time ago, is now remodeling and adding to the old Steadman foundry at that place, converting it into a 100-ton electrolytic ore reduction plant. Most of the equipment has been ordered, but some apparatus will be needed up to the time of completing the installation, which is set for February 1.

The Northwestern Steam Boiler & Mfg. Company, Duluth, Minn., is building for the Duluth, Missabe & Northern Railroad a number of steel dump cars of a new type invented by Victor and S. A. Rakowsky of that city. An experimental car has been in service on the road for some time past, with very satisfactory results. The contract mentioned will be duplicated for the Duluth & Iron Range Railroad.

The Caledonia Mining Company, Wardner, Idaho, is preparing to build an ore reduction plant, for which thoroughly modern machinery will be required. Electric power is to be used.

The project for a pumping plant to serve the community will soon come to a head at Hettinger, N. D., where plans are now in course of preparation.

Pumping machinery will be purchased in the near future at Pine City, Minn., and a system of water works and sewage installed.

The Northern Pacific Railway is preparing to expend a large sum in the improvement of its terminals at Como, Wyo., including a car shop addition, 178 x 190 ft., and an extension of the boiler plant.

The U. S. Acetylene Lighting Company, Minneapolis, Minn., has been incorporated with $20,000 capital stock. The officers of the company are: A. M. Harrison, president; S. T. Johnson, secretary and treasurer; V. P. Roberts, vice-president.

The Cycloid Mfg. Company, Minneapolis, Minn., has been incorporated with $600,000 capital stock for the manufacture of farming implements. The incorporators are A. E. Paegel, W. P. Cockey and C. O. Furbush.

The North Pacific Coast

PORTLAND, ORE., August 26, 1910.

With respect to plant improvement, the machine shops and foundries on the north coast have made greater progress this summer than in any of the years preceding, and they are now in condition to handle the heavy run of business that is expected to set in before winter. For repair work, as well as new machinery building, the most modern facilities, such as oxyacetylene or electric welding outfits, have been installed. Provision is also being made for larger stocks than usual of spare parts, especially for sawmills, woodworking plants and mines, or ore reduction works, so that these can be promptly shipped when breakages occur.

In the line of current orders, the Alaskan trade still plays a prominent part, and there is some buying for export to Australasia and the Orient. The local demand covers a great variety of equipment of a miscellaneous character, with considerable marine work.

A large steam dredger for service in the Hawaiian Islands is being built for the Standard-American Dredging Company by the St. Johns Shipbuilding Company, Portland, Ore. The machinery for operating it is to be installed at Honolulu.

The Oregon Foundry, Portland, Ore., is putting on the market a loader for lumber and similar material, which is driven by a direct connected electric motor, making a compact, quick acting and economical unit.

The chisel tooth saws manufactured by R. Hoe & Co., New York City, are being handled at Seattle, Wash., by the Puget Sound Machinery Depot, which has found them in good demand.

G. F. Nelson, Seattle, Wash., has been elected vice-president of a company which is being organized there to establish a plant for the manufacture of graphite. The style under which it will operate has not yet been decided.

The Willapacific Power & Water Company has been organized at Willapacific, Wash., by Chas. E. Miller, J. F. Wilson and Chas. McCauley to build a hydroelectric power and pumping plant for service in that community. Mr. Miller is also interested in the Pacific Wood Pulp Mills, which has just been incorporated there, and other industrial enterprises for which electric power will be furnished.

The Pacific Light & Power Company, Walla Walla, Wash., which recently secured control of a number of electric power, lighting and traction properties, is preparing to make large expenditures for improving and enlarging the various plants. The purchase of considerable machinery will be involved as the company's plans are matured.

It is reported from Vancouver, B. C., that plans are now being made by the Imperial Car, Shipbuilding and Drydock Company, Ltd., recently organized there, for a pressed steel car building plant, dry dock and shipbuilding yards.

The Zimmerman-Wells-Brown Company, Portland, Ore., has the agency for some of the best standard lines of Eastern built power and pumping machinery, including the Kewanee Boiler Company's boilers, Goulds Mfg. Company's power pumps, Bates Machine Company's heaters and engines, Gardner Governor Company's air compressors, pumps and governors, and Houston, Stanwood & Gamble Company's slide valve engines, which are used largely in sawmill work. The exhaust fans, blowers and forge equipments of the Buffalo Forge Company are also handled by this concern, together with other machinery.

As the result of a recent visit from fire the plant of the Coquille River Electric Company, Coquille, Ore., will need to be rebuilt, and the former capacity of 15 kw. is to be considerably extended, as Myrtle Point, Norway and other communities are now included in the company's system. The generating unit which has been operated consisted of a General Electric generator driven by an Atlas engine.

The construction of a municipal water works system has been decided upon at Okanogan, Wash.

Steel castings from the foundry of the Columbia Steel Company, Portland, Ore., have been in increasing demand this season along the North Coast. Users find them very dependable in quality, and many who formerly ordered at a distance are now specifying them.

The Southwest

KANSAS CITY, MO., August 29, 1910.

From different parts of the Southwest come encouraging reports of the prospects for fall trade, and at a few of the leading centers of distribution there has recently been buying for the account of industrial enterprises, reclamation projects, &c. Some of the contracts that are now being closed represent negotiations which have been long pending, but an appreciable share of the purchasing is due to the success attending the efforts of local commercial organizations, as heretofore mentioned, to secure new manufacturing plants for their several communities. With the arrival of cooler weather the campaign for industrial plants will be pushed vigorously, and developments of interest to machinery houses may be looked for throughout the autumn months. Meanwhile, in the judgment of traveling salesmen who are once more canvassing the territory, there will be a gradual improvement in current business until all lines are again very active.

Machinery for a pumping plant will probably be required by November 1 at Paris, Ark., where plans for the construction of water works are under consideration. A large expenditure for the purpose is contemplated.

Through the efforts of the Commercial Club at Tulsa, Okla., arrangements are reported to have been made for the erection there of boiler works and a structural fabricating plant by the Robison Boiler & Mfg. Company. Those identified with this company are also said to be interested at Capton, Ohio, but it can probably be best addressed in care of the secretary of the organization mentioned.

The Webb City & Centerville Foundry & Machine Works, Webb City, Mo., is offering roll shells of chilled semi-steel, which show excellent results in service and have demonstrated their wearing qualities very thoroughly in competitive tests.

Development work is about to be extensively entered upon by the Commercial Mining Company, Prescott, Ariz., which will require the purchase at intervals of considerable machinery. The shaft has already been sunk 200 ft.

The contract for an elevated steel tank at Wilson, Kan., has been awarded the Chicago Bridge & Iron Works, Chicago, Ill.

The Mosher Machine & Foundry Company, Dallas, Texas, is making a specialty of structural iron for building purposes, and some enlargement of its fabricating plant will

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probably be necessitated before spring. The outlook for future trade is excellent.

The Copper Creek Mining Company is now having shipped to its property from the railroad station at Winkleman, Ariz., the material for two 75-ton furnaces, and it is the intention, a little later on, to build a converter plant of 150 tons capacity. A feature of operating economy is to be the installation of a battery of boilers utilizing the waste heat from the furnaces, the fuel for which will be oil. Other improvements are also under way or contemplated, and considerable new equipment will be required in the course of the next few months.

The Gatesville Light & Power Company has been organized at Gatesville, Texas, to establish an electric power plant for public service.

The American Wells Works Company is carrying in stock at Dallas, Texas, for immediate shipment, a very complete line of pumping and well-drilling machinery, including gasoline engines and air compressors.

The directors of the Board of Trade, Fort Worth, Texas, are planning a vigorous campaign for promoting the industrial growth of that city, including the location there of new manufacturing plants.

The Dallas Electric Light & Power Company, Dallas, Texas, which has been making improvements in its plant, is offering for sale a 900-hp. Corliss engine, which was recently displaced by other equipment.

The Casa Grande Land, Power & Development Company, Casa Grande, Ariz., will install a power and water distribution system for irrigation purposes. The equipment, which has been principally ordered, will consist of oil burning furnaces, marine boilers, steam turbines and centrifugal pumps, making it one of the most modern plants of its kind in the country. The president and chief engineer recently visited the East for the purpose of selecting the machinery.

Sealed bids will be received until September 9 at the office of W. S. Shannon, city clerk, Durant, Okla., for furnishing material and work connected with the construction of a filtration plant and an electric light plant and lines for the city of Durant.

Broken Arrow, Okla., has plans prepared for the construction of a water works system, including wells, tower and tank, steam plant and power house, to cost $30,000.

The Hazen Power & Light Company, Hazen, Ark., incorporated with $25,000 capital stock, will begin work at once on the construction of a plant to furnish electric power for industrial purposes. The company will also manufacture ice and furnish power for lighting purposes to the surrounding country.

The city of Terrell, Texas, will expend $10,000 for improvements to its light and water plants.

Charles Ilfield Company, Las Vegas, N. M., is considering the erection of a warehouse and cold storage plant at Albuquerque, N. M.

Charles H. Halt and others of Denver, Colo., have completed plans for establishing a $500,000 manufacturing plant in San Antonio, Texas. Five factories, under one management, will be erected. One will be a foundry and structural steel department, one for the manufacture of wire goods, one for tinware and similar goods. Mr. Halt and his associates are interested in wire fabric manufacturing plants at Denver, Colo.; Seattle, Wash., and Enid, Okla.

A State charter has been granted to the Duncan Electric Light & Ice Company, Duncan, Okla.; capital stock, $75,000. The directors are E. S. Bessey and M. M. Dunaway of Oklahoma City, and John C. Keys of Cleveland, Ohio.

The Farther Central West

OMAHA, NEB., August 29, 1910.

A matter now attracting considerable attention here, and one that seems likely to have an important bearing upon the future of the machinery market in this section, is the project of the Commercial Club of Omaha for an annual industrial exhibition, which will adequately represent the manufacturing and commercial interests of the city and State. Owing to the progress that has been made during the present decade in the industrial development of the Missouri Valley districts, as well as some of those lying farther West, there is opportunity for a very comprehensive display.

Sales of machinery continue light. Equipment for power and pumping plants, air compressors, hoists, electric railway material and contractors' outfits are the most active in the list, with a scattering demand for metal and woodworking tools, mill and factory appliances, heating and ventilating apparatus, &c.

The purchase of an additional pumping engine is under discussion by the city officials at Davenport, Iowa, and an appropriation for the purpose will probably be made this fall. The crank and flywheel type of engine, with Corliss valve gear, is most likely to be selected for the service.

The Sac City Electric Company, Sac City, Iowa, which has a power plant of 200 hp., will probably add to its boiler capacity in order to provide for heating the business district.

It is proposed to construct a municipal pumping plant and water works system at Ellsworth, Iowa, to cost about $65,000.

A modern high duty pumping plant will probably be installed next spring at Clinton, Iowa, where the authorities are having plans prepared.

J. Frank Kinney and W. E. Kinney, Shelby, Neb., and Wm. E. Pratt, Lincoln, Neb., are officers of a new company which is being organized to establish a large plant for the manufacture of graphite in the vicinity of Seattle Wash.

The Iowa Engineering Company, Clinton, Iowa, has prepared plans for a power and pumping station at Pella, Iowa, the equipment of which will include a battery of three boilers, with heater and feed pumps; two engine driven generating sets for alternating current, two centrifugal pumps and motors for driving them, with other auxiliary apparatus. Further information can be obtained from the company or from the city clerk of Pella, by whom bids will be taken until September 6.

The power equipment of the Cheyenne Light, Fuel & Power Company, Cheyenne, Wyo., which now consists of engine driven generators with an aggregate output of 750 kw., will probably be enlarged in order to provide more current for centrifugal pumping units used in irrigation projects of the vicinity, which are operated by electric motors.

Equipment for water works will be required in the near future at Cheyenne Wells, Colo., where a municipal system has been decided upon.

The Omaha Commercial Club has under consideration propositions affecting the location here of a number of industrial plants, one of which is to be taken up by the Executive Committee at its next meeting involves the building of a large factory for the manufacture of pianos.

Johns & Oliver, Central City, Colo., have leased what is known as the Mitchell mine and are erecting a shaft house. An air compressor, hoist, &c., are to be put in operation and other machinery purchased as the work progresses.

Authorization for the purchase of two new boilers of 350 hp. each for the city power and pumping plant at Hastings, Neb., has been refused, but the matter will be taken up again in the fall, as the equipment is needed to meet the requirements of the service.

The Navarrio Mining & Tunnel Company has been organized, with C. E. Smith, Empire, Colo., as manager, and is beginning extensive development work, which will lead to the purchase in the near future of some operating machinery.

The Hawkeye Pearl Button Company, Oskaloosa, Iowa, will erect a new plant to employ about 100 men.

The city of Mulvane, Kan., will expend $30,000 for the construction of a water works system. Robert P. Scyer, city clerk.

The Quam Hydraulic Vacuum Cleaner Company, Waterloo, Iowa, incorporated with $10,000 capital stock for the manufacture of hydraulic and electric vacuum cleaners, will occupy leased quarters, for which the necessary equipment has already been purchased and installed.

The Spaulding Mfg. Company, Grinnell, Iowa, manufacturer of vehicles and motor cars, is erecting a new factory building, 74 x 218 ft. All equipment to be installed has been contracted for.

The City Council of Columbus Junction, Iowa, is preparing to establish an electric light plant.

Government Purchases

WASHINGTON, D. C., August 30, 1910.

The Paymaster General, Navy Department, Washington, will open bids September 6, under schedule 2824, for appliances for use with oxyacetylene welding plant, and one Herbert automatic file testing and indicating machine. Under schedule 2826 for two turbo generating sets, one motor generating set and one switchboard.

Major G. D. Deshon, medical corps quartermaster, Hot Springs, Ark., will open bids September 10 for furnishing and installing one triplex motor driven pump and two motors, one A. C. and one D. C.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 23, under class 41, for six complete sets propelling machinery for 20-ft. motor dories, as follows: Bidder 6, the Atlantic Company, Amesbury, Mass., $200.30; 23, the Camden Anchor Rockland Machine Company, Camden, N. J., $170; 33, the Eagle Company, Newark, N. J., $145; 37, the Fairbanks Company, Washington, D. C., $150; 38, the Ferro Machine & Foundry Company, Cleveland, Ohio, $175; 41, the Fulton Mfg. Company, Erie, Pa., $175.59; 66, the Lackawanna Mfg. Company, Newburgh, N. Y., $130.

For Tariff Revision Piecemeal

In a letter to William B. McKinley, chairman of the Republican Congressional Committee, which is intended for use as a campaign document, President Taft expresses his expectation of securing further revision of the tariff by amending one schedule at a time. That portion of the letter which bears upon this matter, in connection with the Payne tariff act, is as follows:

The Criticisms of the Payne Bill

The bill has been criticised for certain of its rates and schedules. Some of the criticisms are just and some are wide of the mark and most unjust.

The truth is that under the old protective idea the only purpose was to make the tariff high enough to protect the home industry. The excess of the tariff over the difference in the cost of production here and abroad was not regarded as objectionable because it was supposed that competition between those who enjoyed the high protection would keep the price for the consumer down to what was reasonable for the manufacturer. The evil of excessive tariff rates, however, showed itself in the temptation of manufacturers to combine and suppress competition, and then to maintain the prices so as to take advantage of the excess of the tariff rate over the difference between the cost of production abroad and here.

The Payne tariff bill is the first bill passed by the Republican party in which the necessity for reducing rates to avoid this evil has been recognized, and it is therefore a decided step in the right direction and it ought to be accepted as such. On the whole, it was a downward revision, particularly on articles of necessity and on raw materials. The actual figures on the first year's operation of the law demonstrate this. It must also be remembered that the tariff rates in the new law on imported liquors, wines and silks were increased substantially over the Dingley rates, because these were luxuries and it was intended to increase the revenue.

The charge that the present tariff is responsible for the increase in the prices of necessities is demonstrably false, because the high prices, with very few exceptions, affect articles in the tariff upon which there was no increase in rates or in respect to which there was a substantial reduction.

The Tariff Board

Perhaps more important than any one feature of the operative part of the tariff law is that section which enables the Executive to appoint a tariff commission or board to secure the needed information for the proper amendment and perfection of the law. The difficulty in fixing the proper tariff rates in accord with the principle stated in the Republican platform is in securing reliable evidence as to the difference between the cost of production at home and the cost of production abroad. The bias of the manufacturer seeking protection and of the importer opposing it weakens the weight of their testimony. Moreover, when we understand that the cost of production differs in one country abroad from that in another, and that it changes from year to year and from month to month, we must realize that the precise difference in cost of production sought for is not capable of definite ascertainment, and that all that even the most scientific person can do in his investigation is, after consideration of many facts which he learns, to exercise his best judgment in reaching a conclusion.

The commission, however, already selected and at work, is a commission of disinterested persons who will ascertain the facts, not in a formal hearing by examination and cross examination of witnesses, but by the kind of investigation that statisticians and scientific investigators use. When the commission completes its work, either on the entire tariff or on any of the schedules in respect to which issue has arisen, and the work of the commission shows that the present tariff is wrong and should be changed, I expect to bring the matter to the attention of the Congress with a view to its amendment of the tariff in that particular. Of course this will be impracticable unless Congress itself shall adopt the parliamentary rule, as I hope it will, that a bill to amend one schedule of the tariff may not be subject to a motion to amend by adding changes in other schedules.

It will thus be possible to take up a single schedule with respect to which it is probable that a great majority of each House will be unprejudiced, to admit the evidence, and to reach a fair conclusion, and this method will tend to avoid disturbing business conditions. For these reasons it seems to me that all Republicans—conservative, progressive and radical—may well abide the situation with respect to the tariff until evidence now being accumulated shall justify changes in the rates; and that it is much better for them to vote for Republicans than to help create a Democratic majority which would be utterly at war with the protective principle, and therefore would have no use for the findings of the tariff commission, as we may certainly infer from the solid Democratic vote in the present Congress against the necessary appropriation for the commission's work.

The Harriman Rotary Engine

A new type of rotary engine has been developed from the inventions and patents of J. Emery Harrington, Jr., 53 State street, Boston, Mass., and the results of a test made at the Massachusetts Institute of Technology show a steam consumption of 31.02 lb. per brake horsepower-hour.

The rotor case of the engine contains a simple cylindrical rotor, eccentrically keyed to a straight shaft. In operation a rocking abutment between the inlet and the exhaust ports is held in place by the pressure of the working fluid to prevent short circuiting. The projecting part of the rotor contains a simple metallic packing strip, and the ends of the rotor contain packing rings which bear against the side covers. During a portion of the time the rotor is under direct steam pressure and during the balance of the revolution the steam is cut off and permitted to expand.

The engine tested had a rotor 9.4 in. in diameter and 8 in. long, revolving in a case 12 in. in diameter. The shaft in the rotor was 4 in. in diameter, with no angles or cranks, and ran in bearings 13 in. long and 3¼ in. in diameter. These bearings have an oil storage capacity of 1 gal, and the lubricant is fed to the shaft by wicks and then returns to the well. The test was run in the usual manner and the results showed that when running at a speed of approximately 500 rev. per min. 25.72 hp. was developed, as measured by a water brake, and the steam consumption was 31.02 lb. per brake horsepower-hour.

Automatic Cushioned Water Pressure Reducing Valve.—The Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa., has added an automatic cushion water pressure reducing valve to its line. In this valve the pressure to which it is desired to reduce the water is regulated by a spring, which is compressed to the desired tension by a plate on top of the valve. This spring acts on a piston attached to the main valve spindle and forces the valve open. The water on the high pressure side of the valve passes underneath this piston and through a port in the main valve spindle. When the pressure on the low pressure side reaches the spring setting the valve closes.

Trade Publications

Steam Traps.—Richard J. Flinn, West Roxbury, Mass. Circular. Calls attention to the Flinn differential trap for draining the water of condensation from steam pipes and coils, engine cylinders, receivers, jackets and separators, steam kettles, drying cylinders, &c. The action of this trap is independent of the temperature of the water handled and it will work equally well, it is said, at any pressure below its maximum. It is not affected by vibration or oscillation, which renders it adaptable for marine use, and has only three parts.

Electric Generators.—The Ideal Electric & Mfg. Company, Mansfield, Ohio. Bulletin No. 1051. Gives constructional details of a new line of revolving field alternators which this company has recently perfected, and shows also test curves and data on the performance of these machines under various service conditions. These machines are built in standard sizes up to and including 250 kva. in all standard voltages. A discussion and curves showing the influence of the power factor upon the efficiency, the heating characteristics, the exciting current and the power required to drive these machines are included. An illustrated description of the 100-kva. model was printed in *The Iron Age*, August 4, 1910.

Centrifugal Pumps.—The De Laval Steam Turbine Company, Trenton, N. J. Booklet entitled "High Efficiency of Centrifugal Pumps." Contains a number of charts and information regarding the testing of centrifugal pumps and how to interpret the charts giving the results of such tests. The relative importance of the various features of pump design and the adaptation of centrifugal pumps for all methods of driving and classes of service are discussed. The characteristic curves of a number of pumps are shown and the conditions for which each pump was designed are given to illustrate the accuracy with which these conditions were met by the designer. The illustrations show De Laval pumps adapted for delivering against heads varying from a few feet up to 1600 ft., while the capacity varies from those employed for feeding small boilers up to models delivering 30,000 gal. per minute.

Tin Roofing.—The American Sheet & Tin Plate Company, Frick Building, Pittsburgh, Pa. Pamphlet entitled "The Roof of Quality and Service." Treats of the advantages of a good tin roof as regards cost, service, repairs, protection against the elements and fire, weight, adaptability, application and appearance. The various styles of roofing tin made by this company are shown and described briefly. These include both terne plates and continuous rolls made from them.

Wire Straightening Machines and Riveters.—The F. B. Shuster Company, New Haven, Conn. Booklet. Size 3¼ x 6 in.; pages 24. Relates to the automatic wire straightening and cutting machine and the elastic blow riveters of this firm. A brief history of the process of making articles from wire is given and two of the wire machines of the company are shown. The riveters are described in a general way and illustrations of three of the types manufactured are employed to supplement the text.

Metallic Cement.—H. W. Johns-Manville Company, 100 William street, New York City. Mailing card. Devoted to the J-M Leak-No metallic cement for making permanent repairs to all leaks in iron and steel articles. Some of its applications are to repair blistered boiler plates, make cracks, spongy spots and sand and blow holes homogeneous with the rest of the metal, and stop leaks against any pressure of oil, steam, gas, ammonia, brine or water.

Nuts.—The Milton Mfg. Company, Milton, Pa. Pamphlet. Calls attention to a line of nuts for use on automobiles of all kinds from light runabouts to heavy touring cars and those used for making speed records. These nuts are made either soft or case hardened and to conform to the A. L. A. M. standard sizes.

Steel Car Paint.—The Joseph Dixon Crucible Company, Jersey City, N. J. Booklet. Points out the merits of the Dixon paint for steel cars and illustrates a number of types of these cars upon which it has been used with good results. Color chips showing the four colors in which this paint is made are also included.

Magnetic Separators.—Dings Electro-Magnetic Separator Company, Milwaukee, Wis. Folder. Pertains to a line of magnetic separators for brass foundries and metal refining works, where they are employed to remove iron from brass and copper turnings, borings, punchings, &c. The construction is such that a large primary magnet body and a series of secondary induced magnets mounted upon a rotating disk act on the material. Among the special advantages claimed for this type of construction are that the stock is brought under a powerful magnetic field at two different points, which is equal to two separate treatments with an ordinary separator and no opportunity for mechanical entanglement is afforded.

Automatic Wood Screw Machinery.—Amstutz, Levin & Co., Rorschach, Switzerland; Ed. Brand, 472 Moss Lane East, Manchester, England, sole sales agent. Catalogue W-50. Deals with a line of automatic high-speed wood screw machinery which includes heading presses, head turning and slotting machines and thread cutting machines. The range covered by these machines is from 0.053 in. in diameter and 1¼ in. long to 0.433 in. in diameter and 6 in. long, while thread cutters for larger sizes can be built to order. In operation these tools are entirely automatic and they are designed to give a maximum output with a minimum of waste.

Advertising Service.—George H. Gibson Company, Tribune Building, New York City. Pamphlet entitled "How to Reduce the Expense of Selling Machinery." Describes improved methods in promoting the sale of machinery by educational work and advertising. The several kinds of advertising literature intended to arouse the interest of consulting engineers, owners and operating engineers are discussed as well as the channels through which it may be distributed. Hints on the preparation of advertising literature are given that will be of value to any one responsible for promoting the sales of products of an engineering or mechanical nature, and a brief statement of what this company is prepared to do for clients completes the pamphlet.

Blowers and Vertical Engines.—American Blower Company, Detroit, Mich. Two bulletins. No. 284 gives general description and specifications of the Sirocco fans and blowers. The different types of fans are illustrated and outline drawings show the different standard arrangements and types. Tables of dimensions of the various standard types complete the bulletin. No. 288, superseding No. 232, is devoted to the ABC vertical self-oiling engine. Complete and detailed illustrations supplement the description of the engine and a number of views show the engine performing various kinds of work.

Woodworking Tools.—Wessman Tool Company, Rockford, Ill. Catalogue. Size 6 x 9 in.; pages 56. Calls attention to a line of hollow chisels and wood boring tools. These include hollow mortising chisels, bits used in connection with them, and a number of bits for special uses. All of these different tools are illustrated and brief specifications are included.

Electrical Appliances.—General Electric Company, Schenectady, N. Y. Four bulletins. No. 4718 covers all the apparatus for a complete series incandescent lighting system. No. 4750 treats of standard couplings for coupling electric apparatus together or to other machinery. The different types described are illustrated and connection diagrams are appended. No. 4752, superseding No. 4620, relates to rectifier sets, luminous arc lamps and all auxiliary apparatus for complete series luminous arc rectifier systems. No. 4760, superseding No. 4643, deals with direct current instruments for switchboard use.

Welding.—Goldschmidt Thermit Company, 90 West street, New York City. Pamphlet entitled "Thermit Welding of Castings and Forgings." Deals with the use of thermit in making general repairs to castings and forgings. Illustrations and descriptions are included of the repair of electric motor casings, street railroad car trucks, armature shafts and flaw and shrinkage holes in castings.

High Pressure Blowers.—B. F. Sturtevant Company, Hyde Park, Mass. Catalogue No. 140. Refers to the use of the Sturtevant high pressure blowers for handling air or gas at any pressure below 10 lb. per square inch for supplying air blasts for cupolas, forge fires, smelting, hardening, tempering and annealing furnaces and pneumatic tube systems. Space is given to the construction and operation of these blowers, followed by instructions for installing them and the report of a test made. The blowers and their various parts are illustrated and brief tables of dimensions are appended.

The Canton Sheet Steel Company.—C. A. Irwin, secretary and general manager of the Canton Sheet Steel Company, Canton, Ohio, states that it is expected the new works will be ready for operation about November 1. The main building is all steel, 135 x 300 ft., and there are two smaller buildings. The company is installing a number of mills and work on the plant was started last May. W. W. Irwin is president; H. S. Renkert, vice-president; J. E. Graham, second vice-president, and C. A. Irwin, secretary, treasurer and general manager.

The Lake Superior Mining Institute journeyed to Gary, Ind., on the occasion of its annual meeting August 25. An election was held in the evening, resulting in the choice of the following to serve for the ensuing year: W. J. Richards, president; A. J. Yungbluth (re-elected), secretary; E. W. Hopkins (re-elected), treasurer. The members had spent that day in Chicago, visiting places of interest, including the plant of the Sullivan Machinery Company and the warehouse of Joseph T. Ryerson & Son. The following day they inspected the Indiana Steel Company's plant at Gary.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Assumption of Risk of Injury.—A steel mill foreman assumed the risk of being injured by being caught by a set screw on a revolving shaft, while leaning against the shaft, where he knew of its presence and had worked about the shaft for more than two years. (New York Supreme Court, Appellate Division, Fourth Department, Larsen *vs.* Lackawanna Steel Company, 123 New York Supplement 1077.)

Remedy of Employee on Wrongful Discharge.—An employee wrongfully discharged before the expiration of the period for which he was engaged can either regard the contract as broken and sue at once for his damages, or he can hold himself ready to work under the agreement and at its expiration sue for the agreed salary, less a reasonable deduction of the amount that he could have earned elsewhere. (Massachusetts Supreme Judicial Court, Allen *vs.* Chicago Pneumatic Tool Company, 91 Northeastern Reporter 887.)

Liability for Injury to Employee.—The mere fact that an employee was injured while performing his work does not establish his employer's liability therefor, it being necessary to establish negligence under some particular provision of the employers' liability act. A workman directed to repair a switch cannot base his employer's liability for injury received, while doing the work, on the defect he was repairing. (Alabama Supreme Court, Walton *vs.* Tennessee Coal, Iron & Railroad Company, 52 Southern Reporter 328.)

Liability of Employer for Acts of Employee.—An employer is not liable for injuries intentionally inflicted by an employee, unless they were inflicted while the employee was acting within the scope of his employment. (Alabama Supreme Court, Johnson *vs.* Alabama Fuel & Iron Company, 52 Southern Reporter 312.)

Liability of Employer for Defects in Construction Work.—In the construction of a steel bridge a traveling derrick was operated along rails laid on wooden ties, and as the work progressed the ties and rails were relaid in front of the derrick. Held that the construction company is not liable for the death of an employee caused by his stepping upon an end of a tie from which the spikes and rails had been removed, since the duty of an employer to furnish a safe place of work for his employees does not apply to conditions arising in the course of construction. (New York Supreme Court, Appellate Division, First Department, Brady *vs.* Pennsylvania Steel Company, 123 New York Supplement 905.)

Employee's Failure to Use Safety Appliance Bars Recovery for Injury.—A steel company is not liable for injury to an employee caused by the capsizing of a locomotive crane while assisting in moving a heavy steel casting, where the employees were furnished a device to prevent such accidents but failed to use it. (New York Court of Appeals, Dowdell *vs.* Lackawanna Steel Company, 91 Northeastern Reporter 789.)

Employer's Duty Not Deputable—Assumption of Risk by Employee.—An employer cannot avoid his duty to use ordinary care to furnish reasonably safe appliances for the performance of work by delegating it to another. An employee need not inspect tools furnished him, and does not assume the risk of injury through their defective condition unless he knows of the defects or they are obvious. This rule applies to a workman holding a steel cutter used in cutting the heads of rivets while another workman strikes it with a maul. (Texas Court of Civil Appeals, Buchanan & Gilder *vs.* Blanchard, 127 Southwestern Reporter 1153.)

Duty of Employer to Provide Safe Exit from Place of Work.—An employer being bound to furnish a safe exit from the employee's place of work, as well as a safe place of work, is liable for injury to a workman caused by slipping upon scrap iron lying on the floor of the room through which he was passing. (St. Louis Court of Appeals, Strobel *vs.* Gerst Brothers Mfg. Company, 127 Southwestern Reporter 421.)

Proof Required Respecting Emery Wheel Accident.—In a suit by an employee to recover for personal injury caused by the breaking of an emery wheel, based on alleged negligence of the employer in failing to provide flanges for use in connection with the wheel, it was incumbent upon the employee to show not only that improper appliances were furnished, but that the accident was caused by the particular defects pointed out, it being insufficient to merely show that the accident might have resulted from such defects. (United States Circuit Court, District of Rhole Island, Beardsley *vs.* Howard & Bullough American Machine Company, 176 Federal Reporter 619.)

Liability for Injury to Employee.—An employer is not liable for injury to the operator of a reamer, caused by a slipping of a board of the platform on which he stood, if use of the platform was prohibited by the employer and the employee was taught to operate the reamer from the floor. A workman who places a finger in a nipple or piece of pipe to be reamed, the piece of pipe being grasped in a vise and so fixed as to approach revolving knives on a foot lever being pressed, assumes the risk of injury resulting from a board slipping in the platform on which he is standing, causing his foot to press the foot lever, whereby his finger is brought in contact with the knives. (Maryland Court of Appeals, McGee *vs.* Cuyler, 75 Atlantic Reporter 970.)

Effect of Concurrent Negligence.—An employer cannot defeat liability for an injury resulting directly from his negligence by showing concurrent negligence of a third person. (Alabama Supreme Court, Alibama Steel & Wire Company *vs.* Thompson, 52 Southern Reporter 75.)

Liability for Death of Employee.—An iron manufacturing company is not liable for the death of a workman who, being employed to repair a furnace, rode a tramcar to the top and was dumped into the furnace, where the company had provided another way for employees to ascend, there was no defect in the appliances, stop blocks could have been so placed as to have prevented the accident, and the engine was operated by an unauthorized person. (Alabama Supreme Court, Tobler *vs.* Pioneer Mining & Mfg. Company, 52 Southern Reporter 86.)

Risk of Injury Assumed by Employee.—One employed in a foundry to hook and unhook chains used in connection with a crane in moving objects, assumed the risk of being injured by a movement of the crane without a signal, where he knew that no signal was customary and had worked several months without protesting against his employer's failure to fix a rule governing operation of the crane. (Wisconsin Supreme Court, Kraczek *vs.* Falk Company, 126 Northwestern Reporter 30.)

Partnership's Right to Property in Partner's Name.—Property standing in the name of a partner may be partnership property, though it was not acquired with firm funds, since it may have been a part of the capital of the firm contributed by such partner to the firm assets. (Michigan Supreme Court, Cleveland-Cliffs Iron Company *vs.* Hull, 123 Northwestern Reporter 891.)

Electrical Equipment Orders Small.—It is stated by the Boston *News Bureau* that two-thirds of the General Electric Company's enormous sales since the beginning of the fiscal year January 1 last have been small orders. In the old days $500,000 and $1,000,000 orders were not infrequent and were depended upon to hold up the total of a year's sales. To-day a $250,000 order is a rarity. The average value of orders booked in the 11 months to December 31 last was slightly more than $200. This current year the average value per order promises to go below $175, while the total number of orders received will probably exceed 350,000. This small order business is positive proof that the electrical industry has now reached a point of permanency where a broad consumptive field for its products is constantly assured. In the coming days when security markets permit of flotation of big power and street railroad projects or consolidations, large $1,000,000 and $2,000,000 orders will again crop out.

The Bayonne Steel Casting Company, Bayonne, N. J., an affiliated company of the Reading Steel Casting Company, Reading, Pa., ran its first heat of steel August 20. A record in the construction of a complete steel casting plant has been made by this company, in that almost exactly three months from the date on which possession of the property was taken, May 16, a heat of steel was made. Orders have already been taken which will be sufficient to run the plant, which is claimed to be the largest of its kind in the country, at full capacity for several months. A description of the new plant was printed in *The Iron Age* of May 12.

The Advisory Board of the Amalgamated Association, in addition to calling off the strikes at the sheet and tin mill plants of the American Sheet & Tin Plate Company, La Belle Iron Works and Youngstown Sheet & Tube Company, has also called off the strikes at the plants of the Stark Rolling Mill Company, Canton, Ohio, and Clark Rolling Mill Company, Massillon, Ohio.

Automobile Mortgages

President Benjamin Briscoe of the United States Motor Company recently wrote to 24,000 bankers in the United States, asking them to furnish him with the number of people in their vicinity who had mortgaged homes or who had borrowed money to purchase automobiles. Replies received from 4830 bankers state that there are 198,216 automobiles in their cities and towns. Of this number only 1254 have been purchased by the placing of mortgages and only 7475 have borrowed money without mortgage to purchase automobiles.

With less than 1 per cent. of automobiles bought on mortgages and less than 4 per cent. purchased with borrowed money, recent claims of alarmists are conclusively proved to be practically without any foundation whatever. The thorough investigation by the United States Motor Company has unquestionably exploded the irresponsible statements of a group of men who have endeavored to make the public believe that the automobile capital represented an economic waste. As a matter of fact, figures show the automobile business to be built upon as sound a foundation as that of any other industry.

Many of the letters are filled with optimistic statements, and there is probably no class of business men in the country who are in a better position to throw light on the future of the automobile industry, and in fact any business, than the bankers. These letters reveal the exact conditions in all sections of the country, and it is with considerable gratification that a big percentage of the letters speak in glowing terms of the various business purposes to which the automobile is applied.

It is surprising that so many so-called pleasure cars are used by physicians, contractors, real estate dealers, farmers, the bankers themselves and other business men. Reports show that hundreds of the bankers own cars, and they do not hesitate to say that they consider them helpful, not only in ways of recreation, but in business as well.

Many of the letters deal upon the usefulness of the automobile for farmers. The automobile has brought the farming sections closer to the cities and is making the boys contented with farm life. It is keeping many of the farmers' sons on the farm instead of leaving the farm for city life. The farmer can go to town with a load in a short time and get back and do a day's work. In the evening they use the car in taking their families to lectures, concerts or the theatre, and get home in time for a good night's sleep. It is the belief of many of the bankers in the rural sections that the automobile makes agricultural life worth living.

Pittsburgh Firm to Build Furnaces for Gary Sheet and Tin Mills.—The Forter-Miller Engineering Company, Hartje Building, Pittsburgh, has just secured a contract from the American Sheet & Tin Plate Company, Pittsburgh, for the erection of all the various furnaces required in its new sheet and tin plate plant at Gary, Ind. The contract is an important one, and includes nearly 60 furnaces of all types and sizes. Work is to be started at once, and it is expected the furnaces will be completed and ready for operation in about four months.

During the first seven months of this year nearly $1,500,000 in benefits has been paid by the relief departments of the Pennsylvania Railroad system to members unable to work and to families of members who died. In the month of July alone the sum of $162,337.04 was paid out in benefits, and since the relief departments for both the lines east and west of Pittsburgh and Erie were established the total sum of $28,820,337.24 has been paid out.

"Poaching Proprietors"

In several localities where strikes in foundries are now raging, says the *Bulletin* of the National Founders' Association, the proprietors are resorting to the antiquated policy of engaging molders and coremakers from the plants of their fellow manufacturers who may be conducting open or nonunion shops or themselves combating strikes. These proprietors will do well to bear in mind the sound advice given by President Henry A. Carpenter in his report to the last convention of this association. This advice was as follows:

"I desire to impress upon our members the fact that little or nothing will be gained permanently, when you are face to face with a strike, or when simply short of molders, by robbing the foundry of your neighbor and enticing his molders to come into your plant. There is no semblance of generalship in the pursuit of the policy of 'robbing Peter to pay Paul.' Molders have been taken from my own foundry under conditions such as these, and since I have been president of this association the very foundrymen who depleted my force have been the first to complain because some other proprietor had in turn replenished his supply from their plant."

The Mix Athletic Field for Dodge Employees.—In keeping with its progress in welfare work, the Dodge Mfg. Company has just opened to employees of its plant at Mishawaka, Ind., an athletic field fully equipped for tennis, croquet, quoits, bowling on the green and pitching horseshoes. As an honor to Melville W. Mix, president of the company, and father of the proposition, the field has been named after him by the Dodge Club, under whose direction it will be conducted. The ground measures 107 x 122 ft., and is located near the factory buildings and in a section of the city easily reached by Dodge men. The place is inclosed by a woven wire fence, by which its benefits can be exclusively enjoyed by the parties directly interested. Surrounding the field is a system of tungsten lights, affording facilities for indulging in the various sports after dark. Under shade trees comfortable lounging seats have been placed as a resting place for players and for the use of lookers-on.

Social Insurance Payments in Germany.—Dr. William H. Tolman, Director of the American Museum of Safety, New York, makes the following statement regarding the workings of the German Governmental system of workmen's insurance: "From the latest available statistics, furnished me by Dr. Zacher, Director in the Imperial Bureau of Statistics, I learned that from 1885 to January 1, 1909, the German employers have paid $1,100,000,000; the workmen $981,000,000, and the empire, in special payments to the invalidity department, $146,000,000. To these sums should be added $231,000,000, receipts from interest and other incomes. The grand total receipts for social insurance amount to $2,449,000,000. The insured workmen have received in compensation $1,740,000,000, of which $980,000,000 was paid for care during sickness and restoration to health; accordingly, while the workmen have paid 3.9 billion marks, they have received in compensation 3 billion marks more than they themselves have paid."

The Sanford-Day Iron Works, Knoxville, Tenn., has about completed extensive improvements to its blacksmith, machine and carbuilding shops. The company will build an addition to its foundry, making it 100 ft. longer and about 60 ft. wide. This new department will be devoted entirely to the manufacture of car wheels and will be equipped with the usual pits, trolley system, &c.

Personal

The directors of the Railway Steel Spring Company have elected W. H. Marshall, president of the American Locomotive Company, as a director and a member of the Executive Committee, to succeed William H. Silverthorn, deceased. They also elected F. F. Fitzpatrick a member of the Executive Committee. No action was taken on the election of a new president at the meeting.

Charles C. Cluff has been appointed manager of sales for the New York district of the Carnegie Steel Company, Illinois Steel Company and Tennessee Coal, Iron & Railroad Company, succeeding Charles W. Baker, who has resigned. Richard Wayland-Smith succeeds Mr. Cluff as assistant manager of sales. These appointments are effective September 1.

David W. Pye, vice-president of the Safety Car Heating & Lighting Company, New York, has resigned to become president of the United States Heating & Lighting Company. With his retirement the Safety Company announces the appointment of John J. Mallay as general purchasing and supply agent, with charge of all departments heretofore under Mr. Pye.

Jonathan E. Jones, secretary-treasurer of the Alan Wood Iron & Steel Company, Philadelphia, Pa., is spending a month's vacation in the Adirondacks.

J. N. Chester, formerly associated with the Epping-Carpenter Company, Pittsburgh, has resigned, and he and Thomas Fleming, Jr., for the past three years chief of designs on water works and sewerage in the State Health Department of Pennsylvania, have formed a partnership as consulting engineers, with headquarters at Pittsburgh.

Fred K. Maus has been placed in charge of the Scully Steel & Iron Company's downtown office, which is in room 634, First National Bank Building, corner Monroe and Dearborn streets, Chicago. A regular automobile service for the benefit of the company's customers will be maintained between this office and its general offices at Twenty-fourth street and Ashland avenue.

J. E. Johnson, Jr., whose resignation as general superintendent of the Thomas Division of the Republic Iron & Steel Company was recently announced, leaves that company to become manager of the Ashland plant of the Lake Superior Iron & Chemical Company at Ashland, Wis. During Mr. Johnson's superintendency of the Thomas furnaces all their previous records for coke consumption and pig iron output were broken and new records for the Birmingham district were established.

C. H. Conover, vice-president of Hibbard, Spencer, Bartlett & Co., Chicago, who has been in Europe since early in July, is expected to return about October 1.

George R. Le Baron retires September 1 from the El Paso Foundry & Machine Company, El Paso, Texas. For the last three years he has managed the supply business of the company and held the office of secretary. He is going into the real estate and insurance business in the same city, taking over Mr. Leavell's interest in the firm of Broddus & Leavell, and the firm name from September 1 will be Broddus & Le Baron.

F. W. Jaeger, manager of the American office of Alfred H. Schutte, 90 West street, New York, who has been spending six weeks visiting the European offices of the company he represents, has returned to this country.

An employee of the Crucible Steel Company of America, Pittsburgh, who had occupied a responsible position for some years, has been arrested, charged with frauds against that concern in the sale of iron and steel scrap. He is now under heavy bail to answer these charges, and the amount involved is said to be over $150,000.

Suggestions in Ordering Wire Cloth

The Buffalo Wire Works Company, 316-320 Terrace, Buffalo, N. Y., calls attention to the fact that numerous manufacturing consumers and other purchasers of wire cloth are not sufficiently familiar with this class of product to give proper specifications with inquiries or orders. Correspondence is then necessary, which frequently causes annoying delay.

The company has, therefore, issued a card which gives practical suggestions. An illustration shows the exact sizes of wire as used in iron and steel wire cloth, both in decimal parts of an inch and, according to the Washburn & Moen gauge, which is the standard for this product. Other illustrations are given for the purpose of indicating how the mesh and space are to be determined. The mesh in wire cloth denotes the number of openings per lineal inch, measuring from center to center of the wire. Space denotes the actual size of openings or space between the wires. The number of lineal feet is an important factor in ordering at all times. The width is an item often forgotten, and should be plainly mentioned. In stating the gauge of wire wanted, it may be advisable to mention the decimal showing the thickness of the wire, which would then preclude any possibility of a mistake. The material should by no means be overlooked—that is, whether the cloth is to be of steel, iron, and whether galvanized or not, brass, copper, &c. It is further advisable to furnish samples when possible, or to state for what use the cloth is intended.

Idle Cars Diminishing.—On August 17, according to the weekly bulletin of the American Railway Association the net surplus of idle cars on the lines of the United States and Canada stood at 73,679, a decrease of 29,102, or about 28.3 per cent., from two weeks before. Decreases were not confined to any one section of the country, but the general awakening in freight activity which became marked at the first of the month was continued. The Middle West reported the largest reduction in car surplus, the need for carriers shrinking the supply about 34 per cent. Box cars were particularly in demand. The decrease in the past month has brought the total far below the figures for the corresponding period of last year. It is believed that a shortage is inevitable, and the Committee on Relations Between Railroads has already warned shippers and the roads to expedite freight shipments as much as possible.

The Forged Steel Wheel Company's New Steel Plant.—The new steel plant of the Forged Steel Wheel Company, at Butler, Pa., will be ready for operation in a short time. It contains six 60-ton open hearth furnaces and a slabbing mill. The steel output will be finished on the slabbing mill, the slabs to be used by the company in the manufacture of car wheels, which in turn will be used by the Standard Steel Car Company, the parent interest. The McClintic-Marshall Construction Company, Pittsburgh, erected the steel buildings, and a 55 x 60 in. reversing engine has been installed in the plant by Mackintosh, Hemphill & Co., Pittsburgh. Niven McConnell, for some years superintendent of the open hearth plant of the Sharon Steel Company, Sharon, Pa., now owned and operated by the Carnegie Steel Company, is superintendent of this new open hearth plant.

The Westinghouse Machine Company, East Pittsburgh, Pa., has begun the construction of the first pair of marine turbine engines ever built in this country for the use of the American Navy. Work has also been started on the first two Melville-Macalpine reduction gears, which promise to revolutionize steam turbine service on vessels.

New Lake Superior Mines

Some Mines Closing, but General Activity Continues

MARQUETTE, MICH., August 27, 1910.—Within the past year the United States Steel Corporation has opened five new mines in the Hibbing district of the Mesaba range. Two of these, the Mace, an underground property, and the Uno, an open pit, have recently entered the shipping list. The others are the Harold and the Mississippi, both of which are wrought from beneath the surface, and the Dale, whose deposit will be extracted by the steam shovel method. An exceptional record was made in developing the Mace. Clearing the ground preparatory to shaft sinking was not started until last Christmas, yet already the propty is sending out ore. The mine adjoins Corrigan, McKinney & Co.'s big Stevenson pit on the west. It is equipped with a fine plant of machinery and a steel shaft house. The ore is of high grade, and the deposit is extensive. Only 70 men are employed, but this force will be increased as fast as it can be done advantageously, the underground openings at present being somewhat limited.

What appears to be an important strike of ore has been made in the Biwabik district of the Mesaba by an exploring syndicate of which Joseph Sellwood of Duluth is the head. One drill hole has penetrated the deposit to a depth of upward of 100 ft. The tract being tested consists of 40 acres in the western outskirts of Biwabik and between the Canton and Holland properties. It had been in the hands of various interests for a number of years, yet notwithstanding its favorable location it has not been given systematic exploration until recently. Indeed, more drilling is in progress in the Biwabik district at present than at any time in the past. Exploration is being conducted throughout the territory from Aurora to McKinley. The Steel Corporation particularly is active in this respect.

Only One Mine Active in Nashwauk District

The Pearson and LaRue mines, in the Nashwauk district of the Mesaba, have suspended operations and it is expected that they will be out of commission the remainder of the season. The slow demand for ore is ascribed as the reason. The LaRue is a property under control of M. A. Hanna & Co. The Pearson is a property of Joseph Sellwood. It is an underground proposition, opened two years ago. There is considerable ore in stock and this is being shipped. On the Cleveland-Cliffs Iron Company's Crosby mine, at Nashwauk, production is being pushed. The Hawkins property of the International Harvester Company, the only other shipper at Nashwauk, also is being operated briskly

A prospective early shipper on the Mesaba is the Elizabeth property, located on the east side of Longyear Lake and within the village limits of Chisholm. The mine has recently been sold by the John Helmer Exploration Company to interests represented by E. Drew and N. O. Pearce of Chisholm. The shaft has been extended to the ore body at a depth of 135 ft. and lateral development is under way. Tracks to the Elizabeth are being extended by the Great Northern Railroad. The Helmer Company at present is operating at Buhl under a contract with the Iron Mountain Mining Company, composed of business men of that village and other Mesaba range towns. Fifteen hundred ft. of diamond drilling will be done in a tract held under option and which lies within the village limits. The land adjoins the Culver property, the exploration of which has been very satisfactory.

Ten iron mining companies, the articles of incorporation of which have now been filed with the Register of Deeds of St. Louis County, Minn., have recently been organized at the head of Lake Superior. The titles of the new concerns are the Cambridge, Lebanon, Cumberland, Clarion, Crawford, Lancaster, Ligonier, Warren, Luzerne and Westmoreland. Each company is capitalized at $50,000, each has a life of 30 years and each may incur an indebtedness limited to $500,000. The directorate is the same in all, it consisting of A. T. Banning, C. H. Deighton, John Ames, A. E. Manthey and E. W. Stewart, all of Duluth.

Viaducts Over Ore Pits

An interesting work now practically completed is the construction of a steel viaduct spanning the Burt pit of the United States Steel Corporation in the Hibbing district of the Mesaba. The bridge is 350 ft. long and 80 ft. high. It gives a new outlet from the village, or at least it replaces one that must be abandoned on account of mining operations. The viaduct is the only structure of its kind on the Mesaba range, although at Corrigan, McKinney & Co.'s Stevenson mine the pit is spanned by a suspension bridge erected for the accommodation of the employees, the shafts and the shops being located on one side of the long and deep mining excavation, and the town and the offices of the company on the other. There is a clear span of 525 ft. at the Stevenson pit, and the total length of the cables upon which the bridge is suspended is 815 ft. These cables are hung on either bank from towers which are 50 ft. high, and securely anchored in concrete abutments planted deep in the earth.

The Stevenson pit is one of the very largest on the range, and that means in the world, for nowhere else except at Panama can excavations more stupendous in extent be found than in the Mesaba country. The steam shovels at the Stevenson have created a cavity a mile in length, more than 800 ft. in width and 140 ft. in depth. The erection of the suspension bridge a year ago has been the means of saving the employees the long walks formerly necessary. A viaduct similar to that at the Burt pit, but much larger, is in progress of construction over the tracks of the Steel Corporation's Duluth, Missabe & Northern Railroad at Proctor, 7 miles from the ore docks, and where are located the classification yards of the company. The span here will be 300 ft. in length on each side of the tracks. With the approaches the bridging will aggregate 1500 ft. The viaduct is being provided to do away with blockading the highway, such as is now frequently the case, as the ore trains are weighed. The work is being done by the American Bridge Company, builder also of the structure at the Burt pit.

The Hartford Mine

The United States Steel Corporation's lease on the Hartford mine having expired, mining operations at that Marquette range property have been suspended. The mine will not remain idle long, however. It has been leased for 10 years by the Republic Iron & Steel Company and will be restored to the active list shortly. The Hartford is one of the best mines in the Marquette district. It is owned in fee by the Teal Lake Iron Company, of which Gordon Fellows of New York City is the principal stockholder. It was leased to the Steel Corporation 10 years ago. Since that time it has produced 1,700,000 tons of ore, the great bulk of this being mined the past five or six years. The largest output was in 1906, when 365,000 tons was shipped. There are two shafts, the deeper of which is down 975 ft.

Prior to the time that the Steel Corporation took over the Hartford the property had been explored by the fee owners only in a quiet sort of way. The new operator placed a diamond drill in commission and put down several deep holes, tapping ground that had not then been tested. The Steel Corporation was successful in locating a very fine deposit of Bessemer ore and at once pushed a shaft into it. The property was given an excellent and substantial equipment, including a steel shafthouse. This equipment, it is understood, will

be purchased by the Republic Company. The Hartford adjoins the Republic Company's Cambria mine at Negaunee, and for that reason it can be operated to better advantage by the new leaseholder than any other concern. The properties will be connected by drifts. The Republic Company has been in need of an additional shaft at Negaunee, and one would probably have been started this year if the Hartford had not been taken over. The Steel Corporation still has considerable ore in stock at the property. A steam shovel is now loading this and will be busy with the work for a number of weeks.

New Publications

The Chemists' Pocket Manual. By Richard K. Meade. Size, 6¼ x 4 in.; pages, 444; illustrations, 39. Bound in leather. Price, $3. Published by the Chemical Publishing Company, Easton, Pa.

This is the second edition of a practical handbook containing tables, formulas, calculations, information, physical and analytical methods for the use of chemists, chemical engineers, assayers, metallurgists, manufacturers and students. In revising the book the subject matter has been entirely rearranged and many sections rewritten. Many new tables have been added and the section on analytical methods has been augmented by the addition of considerable new material, so that the book is double its former size. The compiler has endeavored to present information that would be of service to the plant chemist and chemical engineer in as condensed form as possible. The entrance of the chemist into the field of chemical plant engineering has made the inclusion of data and tables bearing on chemical engineering necessary in this book.

The volume is divided into two sections, one of which is general and deals with weights and measures, conversion tables, specific gravity of acids and alkalies, physical properties of gases, calibration of apparatus, volumetric solutions and analysis, qualitative analysis and assaying. The other is concerned with select methods for the technical analysis of substances such as iron, copper and lead ores, blast furnace slag, bearing metals, coal, gases of all kinds, water for both drinking and boiler feed, Portland cement, lubricating oils and soap. The methods given in this section are those which the author has tried in his own experience as a consulting and analytical chemist and chemical engineer, or have been secured from other practical chemists, and in a number of cases the text is supplemented by illustrations showing how the apparatus should be set up.

Taschenbuch fur Eisenhuttenleute (Pocket Book for the Iron and Steel Metallurgist). Size, about 5 x 7 in.; 946 pages; 610 illustrations. Written by a special committee of the Akademischer Verein Hütte, numbering 47, all men prominent in their special departments and some of them of international reputation. Published by Wilhelm Ernst & Sohn, Berlin. Price in cloth, 15 marks; in leather, 16 marks.

This book consists of five sections and an appendix. The first section, 285 pages, is subdivided under the following headings: Physical laws and tables, temperature measurements, laws of freezing and cooling, metallography, metallurgical-chemistry of iron, chemistry, ceramic pyro-chemistry, mineralogy, testing of material and methods of application. These subjects are treated in considerable detail and form a splendid groundwork for the rest of the book.

Section two, 85 pages, is devoted to fuel. The subdivisions are kinds of fuel, laws of combustion, materials for furnace construction, gas producers and coke manufacture. The last subject is very well treated, the writer of this part being Prof. O. Simmersbach.

The third section, 103 pages, takes up machines and by-products, under the following subdivisions: Power production, which is again subdivided into boilers, piston engines, turbine engines and large gas engines, and electrical machinery; auxiliary machinery, such as blowing engines and cranes.

The fourth section, 188 pages, is one of the most important, being devoted to iron and steel production and foundry practice. First come 50 pages on the different phases of pig iron production. The succeeding subdivisions are on wrought iron, the basic Bessemer process, the open hearth process, crucible steel, electric furnace steel and foundry practice. Fifty-seven pages are devoted to the last named, under the headings iron foundry, malleable iron, the Goldschmidt process, steel foundry, the small Bessemer, and the use of compressed air. The information on each subject is up to date and is presented in a very concise, practical way.

Section five, 216 pages, appears to be the most valuable and is on the working up of material. It treats of rolling mills and rolling mill practice in an exhaustive way. The subdivisions will not be given in detail as they are very numerous. Here, again, the information is given in an admirably concise manner and is very valuable. The two final subdivisions are on wire drawing and hammer and press work.

The appendix consists of 35 pages of statistics and tables. Many tables are also given in section one. The value of the book would have been considerably enhanced if many more references had been included. Even a busy steel works manager or foundry foreman often wishes to obtain more information on a subject than can be found here. As a whole, it is well worthy of its distinguished editorial board and of a place on the shelf of all interested in iron and steel production.

G. B. W.

A Canadian Open Hearth Record

The 5-ton basic open hearth furnace of the steel foundry department, Londonderry Iron & Mining Company, Ltd., Londonderry, N. S., is doing excellent work and proving, so far as known, a world's record breaker. The regular metallic charge is 12,000 lb., of which 40 to 50 per cent. is local sand pig iron carrying 1.25 to 1.40 per cent. phosphorus and occasionally as high as 0.2 per cent. sulphur. About 20 per cent. of limestone is used. Heats have been made—from beginning to charge to tapping—in well under four hours and an excellent quality of castings, both chemically and physically, produced. When considered that the furnace is charged by hand, and the charging alone takes about two hours, the work accomplished is all the more remarkable.

Owing to the intermittent character of operation common to steel foundry practice, only two heats per day of 24 hours are at present taken off, but everything points to a possibility, by continuous operation, of 30 to 40 heats per week of six days.

The furnace is built for producer gas, with slag chambers underneath the gas and air uptakes, and the regenerator chambers are under the charging floor. Present fuel, however, is oil. This is the only 5-ton basic open hearth furnace in Canada, and was designed and built by William Brown, the company's general superintendent, who also designed and built, assisted by Frank Smallwood, construction engineer, the entire steel foundry plant. Mr. Brown was for some years open hearth superintendent for the Dominion Iron & Steel Company, Ltd., Sydney, N. S., and prior to that held a similar position with several of the leading United States manufacturers.

The rod mill at the South Sharon, Pa., works of the American Steel & Wire Company, has resumed operations after being closed down for about six weeks for repairs and inventory.

Testing the Hardness of Metals

A Schedule of Standards Used by Automobile Engineers

In a paper on "Testing the Hardness of Metals" presented at the midsummer convention of the Society of Automobile Engineers at Detroit, Mich., July 28-30, A. F. Shore, inventor of the scleroscope, covered in part the ground traversed by his paper at the last Atlantic City meeting of the American Society for Testing Materials. A synopsis of the latter was given in *The Iron Age* of July 7, 1910, page 40. The Detroit paper presents also data developed in connection with automobile testing, from which the following extracts are made:

Only One Kind of Hardness Important

An almost complete set of hardness standards for various parts of motor cars has already been promulgated. These standards were gained by the practical method of trying out parts of various kinds of steel of predetermined hardness, under long and severe service. Some eminent American and European engineers have failed to understand certain conditions in metals, on which the scleroscope and the ball test agreed, but on which the sclerometer (the diamond scratching machine) and Foppl's test of forcing two metals together, as well as the Keep drill test, disagreed. Perhaps one of the things which has always been confusing is the claim that there are a number of different kinds of hardness, as tensile hardness, cutting hardness, abrasive hardness, elastic hardness, static hardness and shock hardness. Tensile hardness is supposed to be due to an increase of strength in a metal after cold rolling, without increasing the hardness as measured by the several scratch and drilling methods. Cutting hardness is based on the fact that if brass shows the same hardness as copper, in some instances the brass will cut the copper, but the copper will not cut the brass. Abrasive hardness is usually seen in materials which, according to the scleroscope and ball tests, show a low physical hardness, but which cannot be cut by tools of superior hardness; while the sclerometer or drill test gives high hardness readings. Elastic hardness is supposed to be what the scleroscope measures. The shock hardness is also what this instrument is alleged to measure, while static hardness is what the ball test measures.

According to my researches, there is but one kind of hardness which is really important. This may be defined as rigidity and resistance to penetration or deformation. It really does not matter whether a specimen can be filed or not, as long as hardness consistent with strength can be obtained. There is a close relation between the measured hardness and the elastic limit. Possibly this may be called tensile hardness, but it is not necessary to so call it.

Auchy has suggested the term "brittle hardness." Perhaps there is room for such a term as applying to carbon tool steels or any other steel not capable of taking a permanent set before fracture. It seems the term would be useful in differentiating between materials that are tough hard and those that are brittle hard, assuming that the hardness in each instance is the same. Tough hardness, if we may use this term, is one that can usually be obtained with steels alloyed with nickel, chromium or vanadium, and with pure low carbon steels having just enough carbon to harden up to a certain point high enough to include them in the category of automobile steels of the higher tempers.

Defective Treatment

Take an alloy steel, which has considerable tough hardness when properly heat treated. When overheated or soaked in the fire too long there will be a drop in its hardness as compared with the highest hardness obtainable, as shown by the scleroscope; yet it may not be fileable in the least.

If parts made of plain carbon steel case hardened, it is understood that the hardness should be up to about 100. When parts go to the inspector to be tested it may develop that there are two pieces which show, say, 90 hard, indicating that there has been chemical deterioration or improper quenching and simultaneous temper drawing due, perhaps, to the use of overheated oil.

Cutting tests are influenced by the abrasive element, attrition resistance, in a metal, which is strictly of a chemical origin. Whenever the file is used it will show something of the sorbitic, or martensitic condition; yet the file may absolutely ignore the true physical hardness. Without the file it would be a question in the mind of the inspector as to how the drop in hardness from 100 to 90 was brought about. If he takes the file and makes it bite a sorbitic tendency is indicated, and it is certain that the quenching has been improper and a certain amount of temper drawn. It may be that the parts will harden up to the standard when quenched properly. If the part is file hard a martensic tendency is shown, and it is certain that deterioration has occurred in the fire, which may be from one of two causes: chemical deterioration, due to excess of sulphur in the cement, or overheating for some length of time.

Case hardened parts when overheated and crystallized, although file hard, often show a hardness under the scleroscope as low as 60. Obviously such parts would fail in service. These drops in hardness due to deterioration by overheating or overexposure to the heat will be found to exist in almost any kind of steel, whether tool steel or alloy construction steel. The scleroscope is used as a means for calibrating the pyrometer in general.

Hardness Standards

The following is a list of hardness standards now in use by automobile engineers, having been obtained by several of the leading manufacturers, who worked independently and came to conclusions agreeing within 5 per cent.:

Frames, chrome nickel steel, 40 to 45 hard (represents an elastic limit of 75,000 to 90,000 lb. per square inch); plain carbon steel, 34 to 40 hard (represents an elastic limit of 40,000 to 50,000 lb. per square inch).

Axles, chrome nickel steel (0.35 carbon), 40 to 50 hard.

Crank shafts, chrome steel (0.35 carbon), heat treated, 45 to 55 hard. When the hardness is as low as 40, as careful experiments prove, the elastic limit is not only too low, but the rate of wear is very fast. A hardness of 65 is safe, being only a medium spring temper; but it is usually difficult to get this, and it is not absolutely necessary. When made of carbon steel the resistance of crank shafts to wear will be in proportion to the hardness. However, when the hardness is only 40 and the manganese and silicon contents are high, the resistance to wear is improved without increasing the hardness, although the elastic limit is always in proportion to the measured hardness.

Transmission shafts (square), chrome nickel or vanadium steel, 55 hard. When of plain steel the same hardness, but the shafts should be of larger dimensions.

Transmission gears.—The hardness specified for these parts runs from 60 to as high as 90, depending on the character of the steel used, as well as on the stresses imposed. The standard strictly adhered to by manufacturers of guaranteed gears is 80 to 85, when chrome nickel steel of good quality is used. When the hardness is up to 88 there is little danger due to brittleness. But when it is up to 90, breakage on corners occurs. Therefore, in sliding gears 85 seems to be the proper hardness.

Starting crank jaw, 60 hard.

Pump shaft, 70 to 80 hard.

Piston pins, cold drawn steel tubing (case hardened), 95 to 100 hard.

Steering arms, 90 hard on the friction surfaces.

Ball joint bearing surfaces, 55 to 75 hard.

Valve lifter roller pin, 60 to 65 hard.

Clutch shaft master gear, 70 to 80 hard.

Exhaust cams, 80 to 85 hard.

Valve lifter roller, 85 to 100 hard.

Inlet cams, 85 hard.

Fan cones, 70 to 75 hard.
Ball races, 85 hard.
Valve heads, 50 to 60 hard.
Cam shafts, 80 to 90 hard.
Steering worms, 70 to 80 hard.
Thrust and ball bearing rings, 80 to 95 hard. The lower hardness is confined to tough alloy steels, showing a high attrition resistance; the higher applies to plain steel after drawing temper.
Engine valve plungers, 90 to 100 hard.
Cones, 70 to 80 hard.
Keys, &c., 75 to 80 hard. This is a temper somewhat higher than that of piano wire, and is regarded as a high spring temper, making shearing practically impossible.
Nuts (special hardened), 90 to 100 hard.
Screws and bolts, all 40 to 50 hard. These ordinarily run from 20 to 35. When screws and bolts are subject to shearing the resistance offered will increase 95 per cent. for each increase in hardness of 100 per cent. Bolts are frequently subjected to undue strain through the use of large wrenches, but when they are hardened they offer considerably more resistance, and they retain their rigidity to a nearer approach to the elastic limit, which latter condition is also advanced by heat treatment.

Results With Springs

The writer has collected a lot of leaf springs made of different kinds of steel, such as are used by different motor car manufacturers, and which have failed in service, either by sagging or breaking. The idea was to ascertain, if possible, the most notable shortcomings; also to learn whether or not the hardware test would be of service. While considerable work is left to be done in this connection, it developed that in nearly every instance where failure occurred, either by breaking or sagging, a low hardness was indicated.

Springs made of chrome vanadium steel failed by sagging, at slightly under 60 hard, while the other leaves of the same spring, 60 and a little over, did not show evidence of failure, thus indicating by the scleroscope that 60 hard is the lowest safe limit for this steel. Thus far in the case of no springs that have failed in any way we found an overhardness. Good vanadium steel would be about 80 hard.

The writer has come to the conclusion that the proper hardness for ordinary carbon steel springs is from 60 to 75, and for special tough alloy steels from 60 to 80.

If the inspector were to select springs by hardness test, his decision would not be always correct, although he could eliminate most of the failures which now occur, as follows: All springs below 60 hard, while they may withstand the bend test usually given a leaf spring, will sag or break after some service.

Conclusion

The whole situation seems to point to three things as being necessary: Uniformity of raw material used, control of the heat treatment, and careful calibration of the pyrometer by aid of the hardness test.

The Mining Engineers' Visit to Panama

A recent issue of the *Canal Record* says: "The fall meeting of the American Institute of Mining Engineers will be held in the Canal Zone, and arrangements have been made to accommodate at the Hotel Tivoli the 125 members who are expected to attend. The delegation will arrive at Colon on the Hamburg-American steamer Prinz August Wilhelm on Tuesday, November 1, and leave for New York on November 8. On the day of their arrival it is proposed to show them the lock and dam work at Gatun, and then take them to their headquarters at Hotel Tivoli. On November 2 they will be taken through Culebra Cut. November 3 is the anniversary of the independence of Panama and, as no work will be done on the canal on that day, the visitors will have an opportunity to attend the carnival in the city of Panama. On November 4 the works at Pedro Miguel and Miraflores will be visited, and on November 7 the relocation of the Panama Railroad."

Charcoal Iron Car Wheels

The complaint that "cast iron wheels are not as good as they used to be" is taken up by the *Railway Age Gazette*, which goes back to the days of cold blast charcoal furnaces, with 10 to 15 tons a day output, and cites the irons of this description that were used in making chilled car wheels. The pig iron in one case cited (Greenwood in central Pennsylvania) had a tensile strength of about 22,000 lb., which was brought up to 33,000 lb. by remelting in the air furnace. It had 2.83 per cent. combined carbon out of a total of 4.14 per cent., and silicon was 0.43 per cent. The wheels were cast against an iron chill quite in accord with present practice, and were piled, while still hot, in the Whitney annealing pits, which had been previously heated to the temperature of the wheels, where they were allowed to cool. In the following discussion of the service rendered by the charcoal wheels of the old days our contemporary points out that the chilled charcoal iron wheels of to-day do not represent deterioration metallurgically:

Old Time and Present Day Wheels Compared

As to the service which these wheels rendered there are no records. None were kept because there was no realization of the necessity for or desirability of such records and because it was generally expected that, under the light total loads of about 40,000 lb. on eight wheels, they would outlast the car. It would be a safe guess, then, to assume their life at from 12 to 20 years. It is needless to say that such a life is unknown under present day conditions. The point is what would the same wheel do now? Pure cold blast charcoal iron is but a memory because it gave way long ago to the warm blast product, which is to-day its most related survivor. There are still a few wheels made of a warm blast charcoal iron, where the blast runs from 450 to 500 degrees F., and the furnace output still ranges from 15 to 25 tons a day. The condition has not changed for 30 years. Made from a brown hematite ore, melted in a charcoal furnace, with a fuel comsumption of 1 to 2 of ore, the pig probably varies but little from that used in making the good old wheels of the past. The ore runs about 50 per cent. of iron, and the product possesses the high chilling qualities needed for car wheel metal.

Based on past practice which was so satisfactory for the wheels of light cars, the mixture still consists of 40 per cent. of this warm blast pig with a balance of car wheel scrap. The only change lies in the weight of the wheel, which has increased from 450 to 700 lb. But these wheels are put under cars weighing 40,000 lb. with a capacity of 100,000 lb., instead of those weighing 18,000 lb. and carrying a load of 20,000 lb. Speeds are not only higher but the average daily mileage is probably greater; so that the stresses imposed are undoubtedly much more severe than the mere difference of loads would indicate.

From the reports of a road using these wheels, it is learned that where the removals are for purely wheel defects, such as worn through the tread, shelling out, seamy treads and the like, the life ranges from 10 to 38 months, with an average of between 29 and 30 months for all wheels removed. If this life is considered on the basis of the probable ton mileage carried, and this is put at the low figure of four times that of the wheels under the light 10-ton cars, we find that the actual work done will correspond to about 10 years of service under the old conditions. This undoubtedly falls short of what was actually done under the light cars, but is enough to indicate that the charcoal iron wheel is probably quite as good metallurgically to-day as it ever was.

The point is, is it good enough or can it be improved? Undoubtedly brake action and the heat resulting therefrom are responsible for much of the excessive stress put upon a wheel, and the inference to be drawn from a pamphlet issued by the Association of Manufacturers of Chilled Car Wheels is that an increase in the thickness of the plate will go far toward relieving the strains so set up and in dissipating the heat. But of the wheels removed, to which allusion has been made, it is not brake action but legitimate wear that is responsible for the major portion, so that, basing the statement upon the assertion of the manufacturer that no change has been made in methods, from the mining of the ore to the delivery of the wheel, in 30 years, it is not in a reversion to the good wheels of the past that we must look for the betterment of the cast iron wheel of to-day, but to an improvement of the present methods of manufacture and possibly in the quality of the metals used in the mixtures though it may be said that these wheels do seem to be giving better results than others that are made under the more modern conditions of a greater tonnage all along the line from the furnace to the annealing pit.

Iron and Steel Analysis

A Modification of the Oxidation Method for Determining Sulphur

J. WARREN T. BEELER*

Much has been recorded as to the relative merits of the oxidation or gravimetric method and the evolution or volumetric method for sulphur. Particularly in foundry and steel works laboratories has the evolution method found favor, due to the rapidity with which a great number of determinations may be carried out at once; but for a commercial testing laboratory, where the sulphur content of samples received may vary in one day from 0.010 or under in a high grade of pig iron to 0.200 and over in white iron, this method has serious drawbacks.

On the other hand, few works or commercial laboratories can afford to run sulphurs by the standard method of solution in and oxidation by concentrated acids, when it is necessary to take the better part of a day with constant care and attention to dissolve and evaporate a few samples only, and then wait some hours before filtering, after precipitating the barium sulphate with barium chloride.

Very little can really be said in favor of the evolution method except for its speed, and the writer proposes to describe in detail a modification of the oxidation method, which will no longer leave any one the excuse of saving time for using the former.

The method to be described has been used for some months in the author's own laboratory with perfect success, and he has seen it used previously for two years, day in and day out, on all kinds of pig irons, products, steels, alloys and miscellaneous work with constantly increasing dependability. As to accuracy the method has been repeatedly checked by various analysts on a large variety of reliable standards, Government and otherwise. While, so far as is known, this modification has never been published, the method was not worked out by the author, and he claims no originality therefor. It has been found necessary to follow the procedure quite closely, hence it is given below in considerable detail.

The Method for Irons

For irons, a two-factor weight of 2.750 grams in the case of sulphur content up to 0.100, and single factor if higher, is carefully weighed and brushed into a 300-c. cm. Erlenmeyer flask of Jena glassware. Thirty cubic centimeters of concentrated nitric acid is added, and the flask is placed on the cooler part of a hot plate until solution is practically completed, as shown by the cessation of all action; now 5 c. cm. of concentrated hydrochloric acid is added, and the flask pushed into the center of the plate where it quickly goes to dryness. Although in some cases there will be a little spattering just before dryness is reached, the nature of the container precludes all loss thereby.

The baking is continued until the oxides will break loose from the bottom of the flask, or if, as sometimes happens, these oxides will not break loose, then continue baking for five minues after all fumes of nitrous oxide have disappeared. Take off the plate, cool, add 20 c. cm. of concentrated hydrochloric acid, and evaporate down again to a heavy syrup.

There will now be under 5 c. cm. of total liquid; the proper concentration can be told with a little experience by the crackling sound produced on shaking the flask for a second or two.

Next, 2 or 3 c. cm. of concentrated hydrochloric acid is added again, the contents of the flask are just brought to a boil and removed from the plate. Hot water is added in sufficient amount to about fill a 2-in. funnel twice on filtering; and the contents of the flask are thrown on a filter paper carefully fitted in the funnel. The flask is rinsed out three times with cold water and the paper washed alternately with hot dilute hydrochloric acid (10 per cent.) and cold water until the washings come through perfectly clear and colorless.

The filtrate is best caught in a tall plain beaker of 150-c. cm capacity, and the volume should be kept down to two-thirds the capacity of this beaker. Now add 15 c. cm. of barium chloride 20 per cent. strong, and slowly bring to a boil, allowing to boil quite hard for 15 to 20 minutes; then push back to a cooler portion of the plate and allow to settle for one-half hour. Filter through double filter papers of dense quality. Wash the precipitate carefully on the paper with hot, dilute acid; allow to run through, and refilter; next wash alternately with cold water and hot dilute acid until the paper and washings are absolutely colorless. An experienced operator may accomplish this in four washes, two of each kind. Ignite the barium sulphate as usual, taking care not to hurry at first.

For Steel

In the case of steel, the procedure differs only in method of solution. If the steel is mild or low in carbon content, no trouble will be experienced, but if the carbon is high, or alloy steels are met with, solution may be hastened by adding a little concentrated hydrochloric acid in the first place; and occasionally it is necessary to add a few cubic centimeters of the hydrochloric several times. Furthermore, the steels are much more likely to bump and spatter, so that evaporation must take place much more slowly; or else a pair of tongs may be used for shaking over a free flame and the evaporation hastened by blowing through a so-called blower—a bent glass tube of large bore with a rubber connection for the mouth.

Ferroalloys

In the case of ferroalloys, especially ferrosilicon, recourse may be had to a small amount of C. P. hydrofluoric acid, but this must be added very slowly and cautiously, and the solution must be baked twice and well, or else the sulphur will be high; due probably to the formation of an insoluble double fluoride. The use of hydrofluoric acid is not to be recommended, but sometimes solution is otherwise impossible, and if the precautions stated are carefully observed no error will result therefrom.

As mentioned before, this method is capable of a very high degree of precision, but it will be found necessary to adhere to the above directions very closely. There are a number of simple but radical changes over the old procedures which all combine to reduce the time factor to a minimum. It may be well to emphasize these points.

The Changes in Procedure

In the first place, the simplest and yet most radical change of all over former details is the use of the 300-c. cm. Erlenmeyer flask for solution and evaporation. It is, however, quite necessary to use Jena glassware or its equivalent for this purpose, as the strain is severe. To any one who has carried through the tedious and cumbersome evaporations in casseroles or beakers on a sand bath the use of the Erlenmeyer in this instance will come as a revelation.

Another distinct change comes in the use of the barium chloride solution of 20 per cent. strength. It has always been recommended to use a 10 per cent. solution, but the stronger solution seems to give a more granular and rapidly settling precipitate.

It may be well to speak of the washing of the barium chloride. Too much care cannot be exercised at this point; if thorough washing is not accomplished the results will surely be high, as noted by numerous writers from various causes; on the other hand, care

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must be used not to stir up the precipitate too much, else the barium chloride tends to pass through the filter and give consequent low results. If at any time the method gives suspicious results, the chances are all in favor of carelessness at this stage of the process.

This method has been tried out on a great variety of materials, and it is safe to say that it can be used on anything that is dissolved or decomposed by the strong acids. It has even been used successfully, with slight modifications, on such things as paper, cloth and rubber.

A short table of results on standards and miscellaneous material taken at random from the author's notebook will give one proof positive of the accuracy:

Table of Results.

Blank	0.001
Carbon iron	0.005
Carbon iron	0.006
Dora iron	0.023
Dora iron	0.023
Open hearth steel	0.057
Open hearth steel	0.059
Bessemer steel, 0.060 standard	0.060
Bessemer steel, 0.060 standard	0.061
Cast iron, 0.034 Government standard	0.034
Cast iron, 0.034 Government standard	0.033
Crucible steel, 0.020 standard	0.019
Crucible steel, 0.020 standard	0.020
Chrome tungsten steel	0.012
Chrome tungsten molybdenum steel	0.008
Chrome tungsten molybdenum steel	0.008
White iron, 0.250 standard	0.250
White iron, 0.250 standard	0.247
White iron, 0.250 standard	0.246
Ferrosilicon	0.022
Ferrochrome	0.007

In conclusion, it may be emphasized that the method has three general characteristics which insure its popularity: It is available in foundry and steel laboratories for all classes of work, low and high grades alike; it is absolutely accurate; and it is rapid, in fact, very rapid, for the degree of accuracy given.

Two or three determinations, if given the sole attention of an experienced operator, may be concluded in one hour. A batch of 24, started at 8.30 a. m., may be finished by a careful and rapid manipulator at 1 o'clock in the afternoon. He will also have time to attend to the corresponding 24 determinations of phosphorus in the same period.

Coal Car Distribution Among Mines

Distribution of coal cars by railroads among the mines along their lines must be made, according to an opinion handed down August 18 by the Interstate Commerce Commission, in accordance with "an equal or a justly ratable use of the facilities of an interstate carrier," and with "the assurance also that no other shipper shall fare ratably better at the hands of the carrier."

The opinion was rendered in the case of the Hillside Coal & Coke Company against the Pennsylvania Railroad Company. It is held that the defendant's rule "providing that the capacity in tons of such 'assigned' cars shall be deducted from the rated capacity of the mine in the distribution of all 'unassigned' cars is unlawful and discriminatory." It is announced, therefore, that the rule unduly discriminates against the complainant and other coal operators similarly situated and is in violation of law.

The commission reaffirms its previous ruling to the effect that "the owner of private cars is entitled to their exclusive use and that foreign railroad fuel cars assigned to a particular mine cannot be delivered to another mine," but it again holds that "all such cars must be counted against the distributive share of the mine receiving them."

In this particular case the complainant claimed damages of about $127,000 because cars for the shipment of coal were not delivered to it. This phase of the matter, however, it reserved by the commission for further argument.

The Hayes Run Fire Brick Plant

The Hayes Run Fire Brick Company, Orviston, Centre County, Pa., manufacturer of high-grade fire brick, suffered the loss by fire of the principal part of its plant July 29, 1909. Deciding at once to rebuild, and to erect a better plant than the one destroyed, the directors instructed General Manager Carroll W. Keller to visit a number of the best equipped fire brick works in the country for the purpose of incoropating the most approved features in the new construction. Buildings of brick and steel were decided upon, and the result is a practically fireproof set of buildings, all well lighted and ventilated and equipped with the most modern appliances. The production of brick was resumed just six months after the fire.

The main building, which covers the drying floor, is 85 x 304 ft.; the crusher and bin building, which adjoins the main building, is 50 x 80 ft. and 40 ft. high; the engine and boiler building is 50 x 50 ft. The dry press and ground clay department is located in a separate building, 25 x 75 ft., three stories high, equipped with elevators and conveyors. In this building are a Clearfield dry pan, a Dunlap perfect clay screen and a large Boyd dry press. The machinery in the hand-made department consists of a large Champion crusher, with elevator and conveyor, and two Clearfield wet pans. The power for running the plant is generated by two Keeler boilers and a Nordberg Corliss engine. The electric light plant, which is located in the engine room, is of capacity sufficient to light the whole plant as well as the streets and many of the buildings in the town.

There are 20 kilns for burning brick, with a capacity of 40,000 bricks each. The capacity of the hand-made department is 35,000 to 40,000 bricks per day and of the machine-made department from 15,000 to 20,000 bricks per day. The clay and coal used are taken from the company's own mines, about 4½ miles distant, and conveyed to the plant over its own railroad.

The company finds its trade constantly growing, not only in this country but in other countries as well. The export trade is on the increase, large shipments having recently been made to Cuba, the Philippine Island and New Zealand. E. L. Orvis is president of the company, J. R. Stevenson is vice-president and W. O. Bentley is secretary. The treasurer, I. L. Harvey, who is a son of the organizer of the company, now deceased, takes an active part in both the manufacturing and sales departments.

The plant for briquetting blast furnace flue dust at the Duquesne Works, Duquesne, Pa., of the Carnegie Steel Company is receiving much attention in the daily papers, which refer to the matter as the first attempt to utilize this waste product. This is not correct, as the briquetting of flue dust has been in progress at a number of other blast furnaces for a long time. The plant at Duquesne, however, is the first of its kind in this country. It is an application of the Gröndal process, which is controlled in the United States by the American Gröndal Kjellin Company, 45 Wall Street, New York. A statement regarding this was made in *The Iron Age* of March 31, shortly after the contract for the installation of this plant was placed.

R. W. Raymond, manager of the industrial department of the Seattle Chamber of Commerce, Central Building, Seattle, Wash., states that opportunities can be found in that city for iron working plants of various kinds. He mentions, especially, a plant for the manufacture of steel castings.

The Argentine Exposition

The United States Steel Products Company's Exhibit

The following description of the elaborate exhibit now being made at the International Exposition of Railways and Land Transport at Buenos Aires, Argentina, by the United States Steel Products Export Company, whose name has just been changed to United States Steel Products Company, is taken from the English daily paper of that city, the Buenos Aires *Herald*, of June 23:

Owing to the importance of the United States Steel Corporation in the industrial world, and the romance surrounding its operations, the exhibits of the products of its mills must be of great interest to all visitors to the North American section of the Railway and Land Transport Exhibition. It is largely due to the excellence and cheapness of its manufactures that modern methods of building have developed. The United States Steel Corporation consists of the following producing companies: Carnegie Steel Company, Illinois Steel Company, American Steel & Wire Company, American Sheet & Tinplate Company, American Bridge Company, Lorain Steel Company, National Tube Company, Shelby Steel Tube Company, Tennessee Coal, Iron & Railroad Company. In addition to these is the United States Steel Products Export Company, which has charge of the entire foreign trade of the United States Steel Corporation, and in that capacity is exhibiting in Buenos Aires.

A New Policy as to Exports

The purchasers of North American manufactures have heard so much about the intermittent dumping of these goods into other countries that they have come to believe that the only interest North American makers have in export business is the selling of their surplus to foreign countries at times when their own market is dull. This is no longer the attitude of the larger and more progressive companies, which now realize that satisfactory foreign business cannot be transacted on that basis. By the establishment of its export company the United States Steel Corporation scientifically blazed a trail which others are following in this country.

Regardless of home conditions is a certain proportion of the output of the mills at the call of the Export Company, whose policy it is to retain clients when they are obtained, and to cater for their requirements, regardless of the condition of the home market. In addition to this, the fact that this organization handles nothing but export materials enables it to give the attention to the requirements of customers that a company handling both export and home sales cannot do.

The importance of South American trade, due to the rapid development of the various countries, particularly Argentina, resulted in the establishment of an office in Buenos Aires. Later on offices were opened at Valparaiso and Lima. In connection with the Buenos Aires office there is an engineering department with competent engineers in charge.

It is chiefly due to the United States Steel Products Export Company that North American industries have a creditable representation at the exposition. The Export Company, realizing the value of the opportunity offered, undertook to interest other companies in the project, and its representations were so successful that the foremost industrial enterprises in the country decided to take space and show their products to the people of Argentina on the occasion of her centennial.

An Entire Building Used for the Exhibit

The display made by the United States Steel Products Export Company in the North American section is fully worthy of the great corporation both as regards size and quality. It occupies an entire building, 75 meters (346 ft.) long by 15 meters (49 ft.) wide, and embraces nearly every class of steel material, ranging from springs to a 60-ft. turntable for a 127-ton engine.

Realizing that the exhibits which are found most interesting are generally those where machinery or appliances are in operation or construction, the company has installed a blacksmith's forge with artisans engaged in making tests demonstrating the quality of materials. There is also a series of illuminated transparencies showing the various stages of manufacturing steel rails, beginning at the ore pile. In manufacturing steel products the corporation's mills have full control of every stage, from ore to the finished product. This not only gives them control of the manufacture, but could not be obtained where a portion of the operation depended on outside interests. This is of particular importance with respect to ores, which vary considerably. The mills always obtain their ores from the mines owned by the constituent companies.

The Shelby table, which will be exhibited by the Tube Department, deserves special mention, as it is constructed entirely of seamless tubing. The top is made of short pieces of Shelby seamless tubing set firmly endwise in a matrix of special composition. The top is polished to an even surface and covered by a sheet of plate glass. This design is perfectly symmetrical and balanced, and there are more than 3000 pieces of tubing used in making it.

The exhibit of the Bridge and Building Department will consist of a locomotive turntable, an office building and some miscellaneous material.

The turntable is a 60-ft. structure designed for turning a 127 gross tons engine. The rolled steel of this table is open hearth steel, ultimate strength 55,000 lb. to 65,000 lb. per square inch. The saddle casting is readily attached to the center girder of the turntable and rests on the cylindrical top surface of the upper roller box, thus securing freedom of motion longitudinally and a uniform distribution of the weight of the rollers. These locomotive turntables are made for any capacity of locomotives and from lengths varying from 40 to 85 ft.

An Office Building Shown

The office building is designed to show typical structural steel work. The limited space would not allow of an elaborate building. Sufficient will be shown, however, to give an idea of the steel structural building which plays so important a part at the present time in the cities of the United States. In New York, in particular, and in almost every city of any size, in a greater or lesser degree, steel construction is now employed for all office, hotel, warehouse and large buildings. This means a greater utilization of ground space on account of the hight to which these buildings can be erected, and, consequently, a rise in rental and land values.

This method of building was begun and has been carried to its greatest limits in New York, which, owing to the fact that it is mainly located on a narrow island, has only a limited area, and the "downtown" section

has become enormously valuable, one tract having recently sold for about $1 a square inch.

In order to use this land to the best advantage, the method of steel construction was brought into use. This makes it possible to erect buildings 20 to 30 stories in hight in the course of a few months. Some of these buildings stand on extremely small pieces of land and the steel structure is in reality a bridge turned on end. In New York few office buildings are put up in the "downtown" section, at the present time, of a hight less than 20 stories.

The great value of land in Buenos Aires and increasingly high rents make this form of construction the one that is bound to be largely adopted here, and the United States Steel Products Export Company, realizing this, has established a technical office in charge of engineers who have had wide experience in the United States in this class of construction, so that architects or proprietors of buildings may send their plans there and have an estimate and a complete design made for steel construction.

This style of construction has the double advantage that it is more economical than bricks or stone for large buildings, and that the building can be erected in less than one-half the time.

The first building of this kind put up in this city was the Plaza Hotel, an 11-story building, the steel for which was all manufactured and fabricated by the United States Steel Products Export Company, and shipped to the site ready for erection. The company has since secured orders for a number of other buildings of the steel skeleton type. It is at the present time erecting the 13-story building of the Oficina de Ajustes de Ferrocarriles, and has just completed the Grand Hall at the exhibition, which was erected and roofed in in less than 30 days.

The Carnegie Steel Exhibit

The visitors will naturally give attention to the exhibit of the Steel Department. The name Carnegie, which is the name of one of the constituent companies of the United States Steel Corporation, is rapidly becoming known in South America and other parts of the world by reason of the excellent quality of steel that it represents, and by the fact that Carnegie steel sold by the United States Steel Products Export Company is constantly offered in foreign markets regardless of the home demand at the mills where it is produced. Carnegie steel is manufactured by the Siemens-Martin basic open hearth and the acid Bessemer processes, in addition to which several special processes of manufacture are in use. The steel is manufactured according to specifications commonly used in the United States, but, when required, can be made to conform to most of the standard governmental and railroad specifications.

The Schoen solid forged and rolled steel wheel, which will be on exhibition, is the natural outcome of the demand of the railroads and tramways for a wheel of simpler form than a steel tired wheel, but of the same high quality of steel. This demand was met in 1903 by Charles T. Schoen, the pioneer builder of all steel cars, in the manufacture of the Schoen steel wheel. The wheel is made from a single piece of steel of the quality used for the manufacture of tires and through a process of forging and rolling an entire homogeneous wheel is produced. The process consists of forging the steel under two hydraulic presses of 7000 and 5000 tons pressure, and then rolling the web and rim in a set of specially prepared rollers, which bear with great force against each side of the web, at the same time pulling endwise against the inside of the rim. A second set of rollers engages the opposite face of the rim, while the fifth roller resists the longitudinal pressure of the web rollers and bears against the tread and flange.

Several hundred thousand Schoen wheels have been in service on American railroads for the past seven years, and it has been determined from the mileage records obtained that for goods wagons (freight cars) a mileage of from 15,000 to 20,000 miles can be secured per 1-16 in. wear. As the steel is of the same quality as tire steel, it can be re-turned in the lathe, just as a steel tire is.

The use of steel sheet piling for construction work has only come into general use of recent years, but it now displaces wood formerly used for coffer dams and for temporary subaqueous construction. The light weights are specially adaptable to sewer work and the heavier weights are suitable for driving through harder material.

Steel piling is driven in the same way as wood piling, with a drop hammer or ordinary pile driving steam hammer, and it has an advantage over wood in that it may be withdrawn and re-used. This is extremely important in this country where the price of wood is so high. For temporary construction purposes steel piling has had much use in coffer dams for bridge piers, buildings and light houses, and in deep water cribs for water works intakes. It is particularly adapted to the permanent construction of docks, sea walls, water bulkheads, casings, breakwaters, wharves, dykes, locks and all forms of construction where it is necessary to resist the percolation of water.

Street Rails and Steel Ties

Some of the Lorain open hearth steel tramway rails, frogs and switches will be seen. These are rolled for all the standard American sections, the 10 British standard sections and a large number of special designs for nearly every country in the world.

Lorain tramway rails are rolled from basic open hearth steel, carbon 0.60 to 0.75, phosphorus not over 0.04, silicon not to exceed 0.20, manganese 0.60 to 0.90. Lorain rails have a tensile strength of 110,000 lb. per square inch.

Lorain special frogs and crossings with manganese steel insets are used on most of the important tramway systems of the world, and have always given satisfaction. They are employed extensively in Buenos Aires, Montevideo, Bahia, Rio de Janeiro, Sao Paulo, Manaos, Para and elsewhere.

In the United States, owing to shortage of wood suitable for making railroad sleepers, a demand has sprung up in the past few years for steel sleepers, and here in Argentina, owing to the impossibility of securing sufficient "quebracho" sleepers, steel sleepers have already been introduced on a number of the leading English railroads.

Most of these have been of the trough type, but in the exhibit of the United States Steel Products Company the type will be shown which has found favor on the North American railroad lines, where conditions are similar to those in this country. They are made in the form of a joist with a wide base, making them extremely easy for tamping. There are several different weights, suitable either for the heaviest traffic of a railroad, or in lighter sections for tramway purposes. This latter form is particularly serviceable where concreting is necessary in paved streets.

The United States Steel Products Export Company will have a forge working in its exhibit for the purpose of demonstrating the remarkable qualities of Carnegie X, which is the name used for the highest grade of bar manufactured where a tough ductile bar is required, and where Lowmoor and other expensive irons have heretofore been exclusively used. Carnegie X shows the same or even more remarkable results, at a cost of about one-half of these high-grade irons.

One exhibit of this company which will not fail to interest "estancieros," is the exhibit of woven wire fencing, which is made in several different styles suitable for estancias or quintas. This fencing is strong enough to keep in cattle and arranged with a small mesh for the first 18 in., which will keep out hares.

The Steel Corporation's Products in South America

The products of the United States Steel Corporation are in use all over South America. In Argentina some of the bridges and buildings for which the American Bridge Company has supplied material shipped ready for erection on the site are as follows: Buildings for Argentine Quebracho Company; highway spans for Entre Ríos; steel sheet piling for Buenos Aires & Pacific Railroad, and Department of Ways and Bridges and Department of Irrigation of the Argentine Government; car house for La Capital Traction Company; 30-meter span for Province of Corrientes; Plaza Hotel, Buenos Aires; Railway Building (Clearing House), Buenos Aires; Santa Fé station of the Ferro-Carril Central Norte; two 136-meter and one 167-meter spans for F. C. Central de Buenos Aires; Grand Hall for Railway Exhibition; apartment house for Mr. Del Solar, Buenos Aires; bridges and building for Paraguayan Central Railroad; shot tower for Society Anónima Elaboración General de Plomo Rosario de Santa Fé.

Steel rails have been furnished to a great number of South American railroads, including the following:

Argentina.—F. C. del Norte, F. C. Central Northern, Patagonian Railways, Buenos Aires Great Southern, Argentine Great Western, Entre Ríos Railways.

Chili.—Trans Andino, Chilian Government (Longitudinal).

Bolivia.—National Railways of Bolivia.

Peru.—Peruvian Southern, Peruvian Central.

Ecuador.—Guayaquil & Quito.

Colombia.—F. C. del Canca, Colombian National, Amage Railway.

Brazil.—Central Railway of Brazil, San Luis a Caico Railway, Araraquera Railway, Cie. Auxiliare (Rio Grande do Sul).

Tramways for which it has supplied rails or special work are these: Anglo-Argentine Tramways, Arica-La Paz Railway (Chili), Baturite Railway, Bolivian National Railways, Buenos Aires Electric Tramway Company, Buenos Aires Grand National Tramways, Buenos Aires & Belgrano Tramways, Cia. Gen. de Trans. de Buenos Aires, Central Railway of Peru, Cerro de Pasco Railway Company, Chemins de fer de l'Equateur, Chimbote Railway Company, Anónima Tranvías Eléctricos de Caracas, Concepcion Electric Company, Entre Ríos Railway, Guayaquil & Quito Railway, Linha Circular (Bahía), Lacroze Tramways, Bahía Tramways, La Capital Traction & Electric Company, La Paz Tramways, La Sociedad Comercial de Montevideo, Lima City Tramways, La Electra Guadalajara, Manaos Tramways, Para Tramways, Roí de Janeiro Tramway Light & Power Company, Santa Marta Railway, Southern Railways of Peru, Tucuman Tramways, Transatlantic Tramways of Montevideo, Trilhos Central Bahía, United Electric Tramways of Montevedio, Union & Marowas Tramways.

Pemberton Smith is to be congratulated on representing such a corporation in Buenos Aires, and the corporation is to be heartily congratulated on having such an able representation.

Australian Industrial Conditions

SYDNEY, NEW SOUTH WALES, July 9, 1910.—The labor party, which has always wielded great political power in Australia, without having absolutely a free hand to work out the programme of its leaders, carried the day in the recent Federal elections. For the first time in its history the commonwealth, for good or ill, will be dominated in its legislative action by men whose activity in the way of hampering capital and defying the manual toiler has for years been more in evidence in this southern land than anywhere else in the world.

Notwithstanding the extreme views of the leaders of the party into whose hands political power has fallen, conservative business men do not seem to be at all apprehensive of radical action by the new government. There is a general willingness to accept the situation and to let the new legislators have an opportunity to work out their programme upon the lines which the labor leaders have long advocated, but which, until now, they have not been able to carry as far as they desired. "Let them have a fair chance; if they make a failure of it we'll turn them out," is a phrase heard, which may be taken as reflective of the attitude of the business community.

The state of New South Wales appears to be enjoying a fair share of prosperity, although the long strike of the coal miners at Newcastle caused great local depression, which has not yet been entirely dissipated.

A more vigorous attempt is being undertaken by the authorities in Australia to induce immigration and active efforts are being made to establish new industries. This is especially the case in western Australia. At a recent banquet the president of the Perth Chamber of Commerce said that £5,000,000 had been invested in manufactures in western Australia, but the investors had had a hard struggle, and had received but little assistance from the government. In order to build up the industries they desired the government to give preference of, say, 10 per cent. to all goods made in the state. They also thought the government should establish a museum showing what could be manufactured in western Australia. They would never rest content until every bit of agricultural machinery required by their farmers was manufactured or produced in the state.

An effort will shortly be made to manufacture heavy steel rails here, for the government railroads. A few days ago the Sydney *Morning Herald* had the following:

> A proposal that heavy steel rails shall be manufactured at Lithgow is now under consideration. It has always been hoped that the manufacture of steel rails, which form such a heavy proportion of the total manufacture of steel, would be undertaken in Australia, and at the time of the making of the contract between G. & C. Hoskins, Ltd., and the state government, the manufacture of the heavy steel rails used on the railroads was allowed for, whenever the time arrived when Australian works were competent to manage it. The project has now at last come up for serious consideration.

Commenting upon the subject further, the same journal cites facts from the history of steel manufacture in America.

The establishment of an adequate system of wireless telegraphy, a movement rather long delayed in a country with so extensive a coast line and such important maritime interests as Australia, is now being considered here.

Bounties aggregating £32,578 12s. were paid by the Commonwealth government during the financial year ending June 30. The beneficiaries were G. & C. Hoskins of the Lithgow Works. The total was made up as follows: Pig iron, £23,510 8s.; steel, £1491 5s. 6d.; puddled bars, £1254 3s. 4d.; galvanized sheets, £286 13s. 4d.; wire netting made from wire manufactured in the United Kingdom, £6036 3s. 10d. The quantities on which bounty had been paid were, roughly, as follows: Pig iron, 39,183 tons; steel, 2485 tons; puddled bars, 2090 tons; galvanized sheets, 203 tons; wire netting, 3460 tons. The total value of the galvanized sheets and wire netting on which bounty had been paid was as follows: Galvanized sheets, £2866; wire netting, £60,361.

G. & C. Hoskins intend to work the rich iron ore deposits which are known to exist at Tallewang, 12 miles from Gulgong. A lease of a large area of Crown and private lands has been secured, and it is intended to construct a light line of railroad from the existing line to the ore property. The ore will be sent to Lithgow for treatment. There is enough ore in sight, it is said, to give employment to 100 men for the next four years.

J. J. D.

Building Up an Export Business

BY WILLIAM J. A. BAILEY, NEW YORK.

Certain fundamental rules must be followed by those who wish to create a worth-while trade in foreign markets, and these will serve as a basis for the sale of any product in any country of the world. While quality and price must always be considered, still there are far more serious essentials that make for the permanent, growing satisfactory business which is the aim of all manufacturing industries conducted on a modern basis. In a previous article * I discussed the methods used by the majority of our manufacturers to secure trade in foreign markets, and I pointed out the defects of these methods. It is true that no system can be perfect, and that what might prove resultful with one class of goods may not answer for another, yet no matter what specific methods may be employed a certain substantial foundation must be constructed in every case. Some of our manufacturers to-day are doing a successful business throughout the world, and a careful examination into the methods they have employed will reveal the fact that they took up the subject in a most intelligent and broad-minded manner, and secured success by a constant application of that much spoken of, but little used, article—common sense.

The most essential element in foreign trade exploitation is the absolute necessity for the manufacturer to reach the buyer direct and use his own efforts to create a demand for his products. It is immaterial through what channels the orders may come, but the creating of the business must be the work of the manufacturer himself, and to assist in this a few suggestions are offered, outlining a careful sales system. In fact, these may well be called

Success Axioms for Export Trade

1. The most important proposition is to ascertain where your products will sell best. This is also, perhaps, the most difficult, as it involves a careful analysis of the requirements of the various countries and a thorough understanding of conditions in each place.

2. A thorough study of an atlas of the world is recommended, and a clear conception should be obtained of each country individually with regard to its area, population, climate, laws, language, currency, stage of material advancement, &c.

3. The business methods of the countries in which you plan to exploit your product should be carefully analyzed and conformed to. The world is large, and the people are of vastly different temperaments in the different parts, so that where local prejudices or idiosyncrasies of any kind are met with they should be respected and even favored.

4. Your products must be adapted to suit the individual requirements of each market. Sometimes the style of package, shape, size, color, or other feature must be altered to secure a trade for an article, and while the first few orders may not prove profitable in this connection, yet you place yourself in a good position to compete successfully for the trade. If a manufacturer becomes convinced that a profitable business would be obtained by complying with the wishes of his prospective foreign customers, he should not hesitate to swerve far from his present standardization in manufacture.

5. The American system of weights and measures is awkward, and used in but few foreign countries. Where possible the system in vogue in each country should be used, but for all ordinary requirements the metric system will be of the utmost value, as this has been adopted in almost all countries.

6. Your catalogue should be printed in English, French, German and Spanish. The extra cost is something, it is true, but it makes a vast difference in the catalogue as an order producer. A buyer likes to have everything as convenient as possible, and when it is remembered that in large cities abroad buyers are besieged by actual salesmen with samples ready to demonstrate their line personally in the buyer's own language at a price delivered in the buyer's city, you will realize the competitive value of a catalogue printed in an unknown language with the price in an unknown currency and frequently with delivery in some little town in the interior of the United States. If it be found worth while, the catalogue should be printed in the native tongue of each country. Prices should be in American, German, French and English currencies—certainly in English money, as this is readily calculated all over the world.

7. Directions for using, assembling or operating an article should be in very plain language, avoiding all local expressions, and should be printed in the native language of the country to which sent, whether this language be Hindustani or Swedish.

8. Pay particular attention to packing, as the means of transportation in foreign lands are diverse and often very crude. Detailed information on this subject should be obtained so that this most vital matter may be treated carefully. If export packing costs more in labor, material, &c., then simply add that to the price, but by all means give this question its proper consideration.

9. While actual credit—that is, open account—is hardly ever requested in foreign business, yet dealers must receive long dating on their drafts. This necessitates a thorough knowledge of their financial standing, for though you receive cash from the banks at time of shipping, yet you must trust the buyer to honor the draft when due.

10. Study carefully the best shipping routes and methods. In the first shipment to any country extreme care should be used to conform to every single requirement, as a simple omission may cause considerable annoyance to the buyer. A little inquiry in the proper places will evolve a knowledge of how to ship quickest, cheapest and safest.

11. It is usually bad policy to substitute in an order. Such a habit, which prevails freely in the United States, is stigmatized abroad. Therefore, unless specifically permitted to substitute, do not ship anything except the article ordered.

12. After establishing an agent in a place, protect him fully. Scrutinize every order that comes in and make certain that he is given credit for every bit of business coming from his market. Treat your agent as you would your partner, and never break faith with him, no matter what alluring offers may be made you from other sources.

13. Show only the deepest respect for the people of other countries. Feel that they are your equals in every way, and are entitled to the same kindly courteous consideration you tender your largest customers at home.

14. Do not be impatient for quick returns. A good export trade is the outcome only of the most patient, painstaking work, which frequently at the outset is keenly discouraging. Foreign trade must be fought for, but once you get into a market the business will usually be found more satisfactory than your domestic trade.

15. Arrange to have personal supervision over your foreign customers at all times. This may be effected in many ways.

While the above suggestions by no means cover the whole subject, yet they are the most essential features in building up an export trade, and a strict adherence to them will enable any manufacturer to secure the maximum amount of trade for his products in foreign markets.

* July 7, page 66.

A New Benefit and Pension System

Cheney Brothers' Plan for the Insurance of Employees Against Sickness, Accident and the Disability of Old Age

Organized co-operation between manufacturers and employees for the relief of workmen who are incapacitated through accident, sickness or the disability resulting from advancing years is increasing in a large way in this country. Many owners have for years acted with humanitarian motives in standing between their people and want, but until quite recently without systematized effort. The modern principle has been adopted by Cheney Brothers, South Manchester, Conn., in their plan, just announced, for industrial insurance and old age pensions. Briefly stated, the employee who becomes a member of the Benefit Association profits by insurance against sickness and accident and resultant death; by an annuity, paid from the income of a fund accruing from the contributions to the association; and by an old age pension paid by the company, independent of the association, but to members of the association only. The company undertakes the greater share of the expense of the system, and retains control of the conduct of the association by naming a majority of the Board of Trustees. In a statement by the company the economic side of the system is clearly set forth thus:

The Company's Statement

In the case of accidents, it is the replacing of a haphazard system, more or less dependent upon the varying discretion of department managers with a uniform system guaranteeing a just and equal treatment of each case. In a wider sense, it is a definite statement by the company of the general principle under which it has acted for many years—that injuries, so far as they are a necessary incident to industry, are a part of the cost of production and should be borne to that extent by the consumer, and not entirely by the injured person. The plan provides for a means of determining this factor of the cost of production more definitely, and of insuring both the company and the employees against it. In the case of sickness it is an extending of the company's past relief to individuals and tubercular patients so that it is not dependent entirely upon charity, but is an encouragement to the efficient and provident employees who are willing to make a sacrifice to secure the additional benefits guaranteed.

Both injuries and illness occasion a large economic waste to the company as well as to the employees, on account of lost time, idle machinery and ineffective work. It is to the direct interest of the company as well as the individual to bring about a re-establishment of health and consequently efficiency by supplying the best conditions possible for recovery.

In the case of pensions, the practice of the company has tended toward their bestowal in cases of necessity. The new regulation makes a pension dependent on the part of the company on long, efficient and faithful service; and, further, on the part of the employee upon his willingness, independently of it, to supplement his pension by a definite degree of providence on his own part in the form of an annuity. This makes a pension not so much a charity as an acknowledgment of the additional value of length and fidelity of service; it provides a pension for the efficient, thrifty employee as a matter of sound business policy, rather than to the less efficient and improvident hand as a matter of charity.

The Foundation of the System

The key of the whole system is that no employee is entitled to any of the benefits unless he or she, as a member of the association, shall contribute to the fund, though such contributions are applied only to sick benefits and to the annuities. The company adds 25 per cent. of the totals paid in by members, and in addition bears the entire expense of the accident benefits and the pensions.

Accident benefits will be paid to members who are injured in the service, but none will be paid where the accident results from the member's own willful and gross carelessness, or disobedience of rules reasonably designed for the protection of employees. The benefits follow:

(*a*) In case of death, three years' wages, and reasonable funeral expenses.

(*b*) In case of total incapacity, half pay during the continuance of disability, excepting the first three days, for a maximum of six years.

(*c*) In case of partial incapacity, after the resumption of work, one-half the difference between the wages earned before and after the injury. Such partial incapacity benefits continue for such part of the six years as the total incapacity benefits have not been paid.

(*d*) In all cases of accidents to members medical and surgical attendance, artificial limbs and hospital maintenance, where necessary, are provided at the expense of the company.

(*e*) One per cent. is added to the above accident benefits for every year of service over five; and in the case of married members supporting families, 5 per cent. for each child, until a maximum of 25 per cent. is reached.

Sickness and Death Benefits

The sick benefits will be paid from the contributions of the members, plus one-quarter of their totals, which will be paid in by the company. The members are divided into five classes, according to their average weekly wages. In case of sickness or injuries other than those suffered in the service of the company, they will receive one-half of the mean wage of their class for the first 52 weeks (excepting the first six days) and one-quarter for the second 52 weeks; and in the case of death one-half of the mean yearly wage of their class. The specific contributions and benefits of each class follow:

Schedule of Sick and Death Benefits.

	Class A.	Class B.	Class C.	Class D.	Class E.
Those receiving weekly					
More than		$7.50	$12.50	$17.50	$22.50
Not more than	$7.50	12.50	17.50	22.50	....
Mean wage of class.	$5.00	$10.00	$15.00	$20.00	$24.00
Benefit per week—					
First 52 weeks	$2.50	$5.00	$7.50	$10.00	$12.00
Second 52 weeks.	1.25	2.50	3.75	5.00	6.00
Death claims	$130.00	$260.00	$390.00	$520.00	$624.00
Weekly contribution—					
2 per cent. of mean wage—full members	$0.10	$0.20	$0.30	$0.40	$0.50
*1¼ per cent—limited members	.06¼	.12½	.18¾	.25	.31¼

* Limited membership purchases not death claims or annuity.

Annuities

As to the annuities to which members will be entitled from the income of the accrued fund, they are payable:

(*a*) To men over 70 years of age and women over 60 years of age, who shall have been contributors to the fund for 10 years and who shall be retired from active service with the company.

(*b*) To men over 65 years of age and women over 55 years of age, who shall have been contributors to the fund for 15 years and who shall be retired from active service with the company because of incapacity for further work.

(*c*) To men or women of any age who shall have been contributors to the fund for 20 years and who shall have become permanently incapacitated for further work in the service of the company.

No annuities will be paid for 10 years, at the end of which time they will be approximately as tabulated below, class A being chosen as the basis, so that the amounts given should be multiplied by 2, 3, 4 and 5, respectively, to get the higher classes:

Monthly Annuities of Class A.

Age at retirement.	Years contributed. 10.	15.	20.	25.	30.	35.	40.	45.	50.
70	...	...	...	$1.60	$2.21	$2.98	$3.93	$5.12	$6.58
65	...	...	$0.83	1.19	1.64	2.20	2.89	3.75	...
60	...	$0.44	.67	.96	1.31	1.75	2.30	...	...
55	$0.22	.58	.57	.81	1.10	1.47	...	...	...
50	.20	.33	.50	.71	.96	...	...	...	...
45	.18	.30	.45	.63	...	...	...	...	...

Pensions

The pensions established may be granted by the company to the following classes of employees, if members of the association:

(a) To any employee over 50 years of age, who has been 25 or more years in the service, and who has become totally incapacitated for further work at any employment or trade; or to those employees as much younger than 50 as they have worked years more than 25, who have become totally incapacitated.

(b) To men, after 25 years of service, who are 70 years of age or over; or to men for the same term who are from 65 to 69 years of age, inclusive, and have become incapacitated for work of a like character to their past trade or employment.

(c) To women, after 20 years of service, who are 60 years of age or over; or to women for the same term who are from 55 to 59 years of age, inclusive, and have become incapacitated for work of a like character to their past trade or employment.

The amount of the monthly pension will be determined by the employee's efficiency as expressed in wages and years of service, and is 10 per cent. of the average monthly wages for the 10 years preceding retirement plus 1 per cent. of the same amount for every year of service, as shown in the following table:

Estimate of Amount of Monthly Pensions for Various Rates of Wages and Terms of Service.

Average monthly rate of wages..	$36	$40	$45	$50	$60	$70	$80	$90	$100
Term of service. Years.	$	$	$	$	$	$	$	$	$
20	10.80	12.00	13.50	15.00	18.00	21.00	24.00	27.00	30.00
25	12.60	14.00	15.75	17.50	21.00	24.50	28.00	31.50	35.00
30	14.40	16.00	18.00	20.00	24.00	28.00	32.00	36.00	40.00
35	16.20	18.00	20.25	22.50	27.00	31.50	36.00	40.50	45.00
40	18.00	20.00	22.50	25.00	30.00	35.00	40.00	45.00	50.00
45	19.80	22.00	24.75	27.50	33.00	38.50	44.00	49.50	55.00
50	21.60	24.00	27.00	30.00	36.00	42.00	48.00	54.00	60.00
55	23.40	26.00	29.25	32.50	39.00	45.50	52.00	58.50	65.00

The World's Production of Pig Iron

James Watson & Co. of Middlesbrough, Glasgow, Liverpool and Swansea, have issued an interesting estimate of the world's production of pig iron. The totals in each case are compared with those of the previous year and of 1907:

	1907.—Tons.	1908.—Tons.	1909.—Tons.
United States	25,781,301	15,936,018	25,795,470
Germany	13,045,760	11,813,511	12,917,653
Great Britain	9,923,856	9,289,840	9,664,287
France	3,588,949	3,344,145	3,514,638
Russia	2,748,298	2,751,000	2,817,000
Austria and Hungary	1,789,165	1,952,750	1,947,300
Belgium	1,427,940	1,182,311	1,632,350
Sweden	603,400	563,300	443,000
Spain	380,580	430,000	420,000
Canada	581,146	563,672	677,000
Italy	148,200	80,000	147,000
Japan	42,919	147,217	150,000
India	40,000	38,000	39,350
China	62,148	66,409	74,000
Mexico	16,238	16,615	58,850
Totals	60,179,960	48,174,788	60,327,998

The McKenna Brothers Brass Company's New Agency.—The McKenna Brothers Brass Company, Pittsburgh, no longer represents the Firth-Stirling Steel Company, Demmler, Pa., for the sale of tool steels made by that company, but has recently taken on the line of tool steels made by the Vanadium-Alloys Steel Company, Latrobe, Pa., which recently completed its new plant. The latter company manufactures Vasco special carbon steel, Vanadium and Magnet steels and a new high speed steel known as Red-Cut-Special. In addition to the manufacturer's own sales representatives in New York, Philadelphia, Boston and Cleveland, the McKenna Brothers Brass Company will have traveling salesmen call on machine shops, automobile builders, structural plants, &c., in various parts of the country. William H. McKenna has charge of the tool steel department and is now perfecting his sales organization. A stock of all grades of tool steels made by the Vanadium-Alloys Steel Company will be carried in stock by the McKenna Company to facilitate filling orders promptly.

The Open Hearth—Electric Furnace

In an address on "What Electrochemistry is Accomplishing," at the seventeenth general meeting of the American Electrochemical Society, in Pittsburgh, May 7, 1910, Dr. Joseph W. Richards spoke as follows regarding the open hearth and electric processes of making steel:

The open hearth furnace is, at present, the most important of the methods of manufacturing steel—"tonnage steel." It makes steel from pig iron and scrap of proper quality, or from pig iron and iron ore (mill scale), or from pig, scrap and ore. It makes its best steel on silica hearths from high grade material low in sulphur and phosphorus, and its cheapest steel on basic hearths from almost anything. The electric furnace can do any or all of these things, and, as a general proposition, produce better steel from given material than the open hearth furnace. Under what circumstances it will pay to use the electric furnace instead of the open hearth furnace would take at least one lecture to discuss; we will not go deeply into it here. In Europe, countries which have very cheap water power, around $10 per horsepower year, and fuel costing $4 to $6 per ton, are finding the electric furnace the cheaper; with power costing $20 and coal $5, the two are about on equal terms; in Pittsburgh, with power at $30 and coal at $1, the open hearth furnace is by far the cheaper for producing such steel as it can produce.

However, even here the combination of Bessemer and electric furnace is possibly cheaper than the all open hearth process; the combination of open hearth and electric furnace processes is quite possible and practicable, to produce crucible quality steel on a large (tonnage) scale, and the combination of the open hearth and electric furnace into one furnace is not only a possible combination, but is actually being "tried out." The latter idea is to take an open hearth furnace and to place electrodes in the roof. The furnace is run as an ordinary open hearth furnace, with the electrodes withdrawn; and at the close of the open hearth heat gas and air are shut off entirely, the electrodes lowered into proximity to the bath and the heat finished as an electric furnace heat. The idea is sound and practicable, and will result in the production of better steel than can be obtained from any open hearth furnace, at but a slight advance on the cost of the open hearth steel, say $2 to $3 per ton.

As to the capacity for enlargement of electric steel furnaces, they started out to duplicate the crucible steel process, producing 100 lb. of melted steel at a heat, and in eight years have risen to 15 tons capacity. In Europe an electric calcium carbide furnace of 18,000 kw., capable of producing 200 tons of carbide daily, is in practical operation. A furnace of like power capacity could be built to make steel, and would be a 200-ton furnace or larger. We can, therefore, say with assurance that, with a little more experience and experiment, electrometallurgists will be able to furnish the steel maker with electric steel furnaces as large as are wanted—up to 200 tons capacity if desired.

The electric manufacture of steel is coming upon you in Pittsburgh, surely and quickly. It will be an immense industry, and will bring with it corresponding power and wealth. It will call for the best efforts of your mechanical engineers, metallurgists and electrical engineers, aided by electrometallurgists whom you must either bring in or develop yourselves.

The year 1910 will be historic in your annals, because of the great awakening to your advantages as an electrochemical center and from the fact that future historians will record: "In that year electric manufacture of steel was first begun in the Pittsburgh district on a commercial scale."

A Unique Exposition of Machinery

The National Machinery Company Demonstrates to Its Guests a Wide Line of Bolt, Nut and Forging Equipment

The National Machinery Company, Tiffin, Ohio, gave an exposition of a full line of bolt, nut and forging machines at its works, Monday and Tuesday, August 22 and 23, and entertained a large and notable gathering of manufacturers and their engineers and practical shop men, together with representatives of the mechanical departments of some of the great railroad systems. A large proportion of the visitors stayed the two days, for the reason that a briefer study of the equipment would have been inadequate. The company had made every preparation for the care of its guests. The large, highly lighted main building was an excellent exposition hall. Manager E. R. Frost took personal charge of affairs and had a capable corps of assistants, including the members of the large selling force and skilled demonstrators who gave to the interested investigators a comprehensive idea of each individual tool.

It is doubtful if precedent exists for a method of presenting such a broadside of announcements of new machinery to the trade. More than 50 different types and sizes of tools were on the floor, many of them in producing operation. All were new, either in their complete form, or in improved design, with refinements of construction and mechanism to increase their general efficiency. New sizes have been added to make complete an equipment for the manufacture of nuts, bolts and rivets, and for general forging and upsetting. Most interesting of all were the new types shown in operation, comprising a 1½-in. vertical roll threading machine; a 3½-in. heading, upsetting and forging machine; a lag screw pointer; a six-spindle semiautomatic nut tapper; a nut burring machine, and a die sharpening machine for grinding bolt cutter and other threading dies. A new ½-in. wedge grip continuous motion rivet header attracted much attention. A new friction slip flywheel is embodied in the headers. Another novelty of the new line is a four-head bolt-cutting machine, designed primarily for railroad shops and other similar works, the idea being that several sizes of bolts may be cut at a single setting.

The Heading, Upsetting and Forging Machine

The 3½-in. heading, upsetting and forging machine is intended to supply the needs of railroad and bridge shops and other plants where various forging operations as well as bolt work must be handled. The construction is massive; the total weight is 48,000 lb. The machine has direct motor drive, connection being through a rawhide pinion. The bed is a semisteel casting, with a distribution of weight which gives great strength and stiffness. Removable wearing plates are placed under and at the sides of all the reciprocating slides, preventing wear upon the bed.

The starting clutch, operated by a floor treadle, is of the double cushion type, affording two opportunities to start the machine during each revolution. One or more revolutions may be made as the operator shall direct. When the foot is removed from the treadle a friction brake automatically stops the machine on the back stroke, with the grip dies open. The grip die slide is operated by toggles and a toggle slide actuated by chilled cams on the main shaft, and as the shear on the side of the machine is a part of the grip slide casting, the slide has bearing surfaces on both sides of the die box, insuring a smooth parallel movement and tending against cramping and wear. The toggle slide carries two large chilled rolls against which the cams operate. The rolls being adjustable and toggles backed by an adjustable wedge, the position and movement of the grip slide may be adjusted with nicety. Shearing pins as safety devices are provided on both heading and gripping slides. The speed of the machine is 40 strokes a minute, the ratio of gearing 4½ to 1, the width of belt 12 in. and the floor space required 10 ft. 8 in. by 12 ft. 4 in.

The Vertical Roll Thread Machine

The 1½-in. vertical roll thread machine presents interesting features, several of them radical departures from the standard practice. It is a massive tool, weighing 28,000 lb., rigid throughout to eliminate any tendency to spring of the parts which back up the dies. The machine will roll threads 1½ in. in diameter by 4 in. long, 1¼ x 5 in. and 1 x 6 in. The customary flat dies are used in a vertical position, which permits the lubricant to flow freely and thoroughly and to keep the dies free of scale, insuring a perfect, well filled thread. The slide is backed by a train of hardened steel rolls, which are actuated by a gear and rack at the top, giving a smooth movement and requiring less power for operating.

The Six-Spindle Nut Tapper

The 1-in. six-spindle semiautomatic nut tapper was shown for the first time, being the first of its type to be built. The spindles are raised and lowered automatically by means of cams on a back shaft, which is actuated by differential gearing from the driving shaft. The raising and lowering motion as well as the resting time of the spindles are variable quantities, being determined by the adjustment of the cams. The feature is valuable in procuring the maximum speed of operation, for the machine can be set for the producing limit of the operator, and thus made to set the pace for him. The cams are timed so that the spindles act in succession. The operator has but to slide the blank into position for tapping and to remove the finished pieces from the tap shank where they accumulate. The taps being held in a spring collet are released automatically should there be an excess of threaded nuts.

The Nut Burring Machine

The 1¼-in. semiautomatic nut burring machine is a new type also built in the 2-in. size. It is designed to remove the rough edges or burr from all sizes of United States standard square and hexagon hot pressed nuts from ⅝ to 1¼ in. The operator has only to place the nuts in a slot and move them forward. The raising and lowering of the spindle and the feeding of the nuts to the position under the cutters are automatic. The machine and not the workman determines the rate of production. An injector moves the nut to position under the cutting head, where it is burred on the downward movement. The head raises, the operator moves forward the row of nuts in the slot, and the next incoming nut ejects the finished piece. A new type of burring head is employed, carrying four cutters, one of which acts to remove any fin which is turned over the edge by the action of the other blades. Safety reliefs are provided upon the vertical movement of the burring spindle and on the injector, and a compensating spring takes care of any variation in thickness of the work. The machine requires a floor space of 3 ft. by 4 ft. 4 in., the net weight is 2200 lb., the width of belt 4 in., and the countershaft speed 310 rev. per min.

Lag Screw Gimlet Pointer

The ½-in. lag screw gimlet pointer, which is also built as a ¾-in. machine, points and threads blanks at a single operation at the rate, per 10-hour day, of 8000 ½-in. bolts, 12,000 ⅜-in. and 15,000 ¼-in. bolts under manufacturing conditions. Its capacity in length is 12 in. The rough blank is inserted in a revolving spindle, and a hand lever brings the carriage containing the cutting die across the end of the bolt, forming the gimlet point, the sharp tip being retained, which permits the screws to be started by hand in hard wood. The operation completed, the carriage returns to its idle position and the blank drops out. The thread is formed at the point only. The body of the bolt goes to the regular bolt cutter. The cutting tool is cylindrical in form, cut away longitudinally of its axis, and its life is long, because sharpening may be continued until the cylinder is cut away through almost its entire circumference. The main spindle runs in self-oiling bearings of large proportions. The finished work drops from the machine into a receptacle, while chips and oil pass to a removable chip pan, whence the oil drains to its reservoir.

Die Sharpener

Much interest was taken in the National die sharpener, a tool designed to scientifically sharpen precision bolt cutter and other threading dies. The purpose is to replace the slower hand grinding and at the same time to secure uniformity of product, so that all tools in a set will work alike. Provision is made, with micrometer indexes, to give any angular adjustment of the work to the grinding wheel. One size wheel, 6 in. in diameter, is used.

Wedge-Grip Continuous-Motion Rivet Header

The ½-in. wedge grip continuous motion rivet header, which follows the general design of the ¾, 1, 1¼ and 1½ in. sizes, is recommended for all styles of single blow work, such as rivets, track bolts and carriage bolts, and will cut off and head simultaneously all sizes up to ½ in. in diameter and 6 in. long. The speed of the machine is 80 rev. per min., its floor space 4 ft. 2 in. by 6 ft. 3 in., the net weight 10,250 lb. and the width of belt 5 in. The feature of the type is the gripping mechanism, which is designed to act without undue strain on the face of the dies. The gripping slide is actuated by a sliding wedge bar, having a contact area of large size to permit complete lubrication. The wedge is driven by a simple toggle movement connecting with the heading slide. The one-pitman crank which drives the machine connects directly with this slide. The bed is a semisteel casting, heavily constructed to avoid spring. Removable liners prevent wear on the bed. The large bearings of the main shaft are of the split removable type, having ring oilers, and the caps are tongued into the bed. The steel pitman is of the locomotive type, with gib and taper key for adjustment and with phosphor bronze boxes. Removable wearing surfaces are provided on the faces of the gripping wedge, and steel protects all faces of the die seats. Automatic safety relief for the gripping dies acts up to the time the dies are closed, when the grip becomes absolute. After relieving the machine the relief resets itself automatically, it being unnecessary to stop the machine. An improved stock gauge can be adjusted while the machine is running, by the turning of a stationary hand screw.

Railway Blacksmiths Entertained

The National Machinery Company entertained the International Railway Blacksmiths' Association at the works August 19. The association concluded its annual convention at Detroit, Thursday and Friday mornings, the members and their families to the number of 300 boarded the company's special train, which made a record run ahead of the Twentieth Century Limited. Arriving at Tiffin special cars conveyed the guests to the Auditorium, where luncheon was served them. In the afternoon the men of the party were taken to the works, where they enjoyed the exposition, while the ladies and children went to Meadowbrook Park, where a band concert and games provided entertainment. A supper at the Auditorium preceded a carriage drive to the special train, which took the party back to Detroit.

The World's Production of Coal in 1908

Prof. R. A. S. Redmayne, Chief Inspector of Mines of Great Britain, in Part IV of the Home Office Report and Statistics, presents the following table of the production of coal in the world in 1908:

Country.	Metric tons.
Great Britain and Ireland	265,725,704
Australia	10,357,218
British Borneo	98,712
Canada	9,875,902
Cape Colony	111,461
India	12,974,558
Natal (including Zululand)	1,696,570
New Zealand	1,890,839
Orange River	402,230
Rhodesia	148,881
Transvaal	2,733,071
Total for British Empire	306,015,146
Other countries:	
Austria-Hungary	48,966,222
Bosnia and Herzegovina	659,962
Belgium	23,557,900
Bulgaria	162,992
Chile	939,836
China*	†8,890,000
Corea	†5,895
France	37,384,384
Indo-China	347,000
German Empire	215,286,349
Holland	908,201
Dutch East Indies	432,923
Italy	480,029
Japan	14,825,363
Formosa	‡92,042
Mexico	1,024,579
Peru	§185,565
Philippine Islands	10,035
Portugal	4,614
Roumania	100,783
Russia	25,059,100
Servia	293,125
Spain	4,118,276
Spitzbergen	2,464
Sweden	305,206
Switzerland	‖ 5,000
Turkey	771,203
United States	377,250,021
Venezuela	†14,064
Total for other countries	762,143,133
Total for the world	1,068,158,279

* Output from certain Provinces only. † Figures for 1906. ‡ Output for Kelung district only. § Figures for 1907. ‖ Estimated.

George J. Hagan, People's Bank Building, Pittsburgh, furnace engineer and contractor, has been awarded a contract for a Hagan 8 x 16 ft. four-door heating furnace to be installed in the guide mill of the Sligo Iron & Steel Company, Connellsville, Pa. This company has a stock of bar iron ready for prompt shipment and reports business good. The American Rolling Mill Company, Middletown, Ohio, has contracted with the American Stoker Company, New York City, for 24 stokers, to be used in firing the sheet and pair furnaces installed by Mr. Hagan some time ago. Mr. Hagan is the sales representative for the American Stoker Company in Pittsburgh and vicinity.

W. Ames & Co., proprietors of the Jersey City Spike & Bolt Works, Jersey City, N. J., state that the fire which recently occurred in their plant destroyed only the rolling mill building and not the entire works. They are still operating their spike and bolt factory. Their new plant on Communipaw avenue, Jersey City, will be started in about one month's time.

The Influence of Galvanizing on the Strength of Wire

At the International Congress of Metallurgy, held at Duesseldorf recently, Dr. Heinrich Winter of Bochum read an elaborate paper on the above subject. Particularly in mine installations is it important to protect the hoisting ropes by a suitable rustproof covering. Coating with zinc has been found to answer the purpose admirably, for the protection afforded depends upon the formation of a couplet in which the zinc of the galvanized iron forms the electro positive element and the iron the electro negative, when the material is immersed in water or other fluids. The zinc takes up oxygen, gradually forming a zinc oxide, while on account of the evolution of hydrogen the iron remains inert even if the continuity of the zinc coating is slightly broken.

In the process of hot galvanizing there is no question, however, but that the strength and particularly the resistance to bending and torsion are considerably affected, and the purpose of the paper in question was to determine the degree of this action. Many theories are given regarding the loss of tensile strength. Poor material is cited, but tests have shown that even the best of material suffers loss. Again, the steel is supposed to have been "overdrawn," but microscopic tests do not show signs of this in materials losing 28 per cent. of resistance to torsion effects. Finally, irregularity in the coating of zinc is supposed to change the resistance to torsion, by obstructing the power applied in varying degree in the test piece. This also will not explain the situation, for many wires with uneven coats of zinc showed practically no deterioration in this regard.

How Tests Were Made

To study the matter carefully, the first thing was to note whatever changes might be produced by the drawing down of the billet to wire. Twelve test pieces were therefore cut from the material from the original billet down to the actual wire, pickled and galvanized, but not annealed. These sections represented the various stages through which the material went, and were etched by immersion in a copper-ammonium-chloride solution (1:12) for one minute each, the copper deposited being carefully wiped off with absorbent cotton while under water. The lighter outer zone as distinguished from the darker inner zone, showing segregation, could be followed plainly through the whole series made from this billet. Further etching with an alcoholic solution of picric acid (1:25) for 15 minutes indicated that the grain of the inner higher phosphorus zone was larger than the outer one with lower phosphorus. The results of the physical tests on the material showed the usual phenomena, an increased ultimate strength, with brittleness to a point to almost wipe out the power to twist it in the final wire before further heat treatment.

In order to not disturb the zinc layer in making sections for polishing, the wire was first cleaned carefully with alcohol and ether, placed in a solution of copper potassium cyanide, and a weak current applied to coat it with copper. It was then washed with alcohol and ether, and finally melted into Rose's alloy, which on account of its low melting point gave a perfect protection for the galvanizing coat, and yet did not alter the microstructure of the material. Finishing up the polished sections with a very little rouge on parchment paper with a 2 per cent. solution of ammonium nitrate for five minutes, thus etching them, gave excellent results. With 125 diameters enlargement the makeup of the section is plainly shown. A dark band for the zinc, light for copper and black for the Rose metal, with lighter color for the steel. A separate band may be distinguished between the iron and the zinc coat.

Absorbed Hydrogen Gas Does Damage

This material, it should be remembered, was pickled before galvanizing. Hence many investigators brought back the brittleness of galvanized steels to an absorbed hydrogen from the acid bath. This absorbed gas can, therefore, do considerable damage. Further investigations, however, have shown that heating the steel up to 250 degrees F. for four hours removes this effect entirely. Hence, inasmuch as the microscope does not show any indications of an iron hydroxide either there remains only the theory that between the zinc and the iron there is a layer of an iron-zinc alloy, formed either because the wire was left in the zinc both too long in contact with the zinc, or that the bath was too highly overheated. That such an alloy exists is well known, every galvanizer being worried by large amounts of "dross," which contains 3 to 5 per cent. iron, and is a very brittle material. On the other hand, in order to get the zinc coat to stick to the iron, it is necessary that such an alloy be made with the iron, the composition varying from high zinc at the contact to no zinc a little distance into the iron, as was clearly shown by Sherard Cowper-Coles.

A study of the structure of the material before galvanizing shows that where this is large grained and easily to be penetrated, much zinc gets in. Even where the microscope does not show the layer of the zinc-iron alloy, it is undoubtedly there as a very fine one, and depending upon the extent of this layer will be found the phenomenon of loss in power to bend and twist when taken in connection with the change in structure through the heat treatment. It is well known that with soft steels the elasticity is changed with temperatures as low as 750 degrees F., but it also takes some time to do this. Hard drawn steel would consequently become softer by remaining in the bath longer, but this gain will quickly be offset by the formation of a heavier layer of iron-zinc alloy.

The conclusion of the paper is that the wire industry is perfectly capable of furnishing galvanized wire which has not suffered seriously as to its physical properties, this being a question of proper practice in regard to removal of damage done by pickling, and proper bath temperature and time of the wire remaining in it. It is, therefore, necessary to treat the wire before galvanizing to remove the hydrogen absorbed and to regulate the temperature of the zinc bath between close limits. The latter is not easy, as there are difficulties in pyrometry and also in the proper firing where many wires are passed through constantly with consequent irregular lowering of the temperature.

R. M.

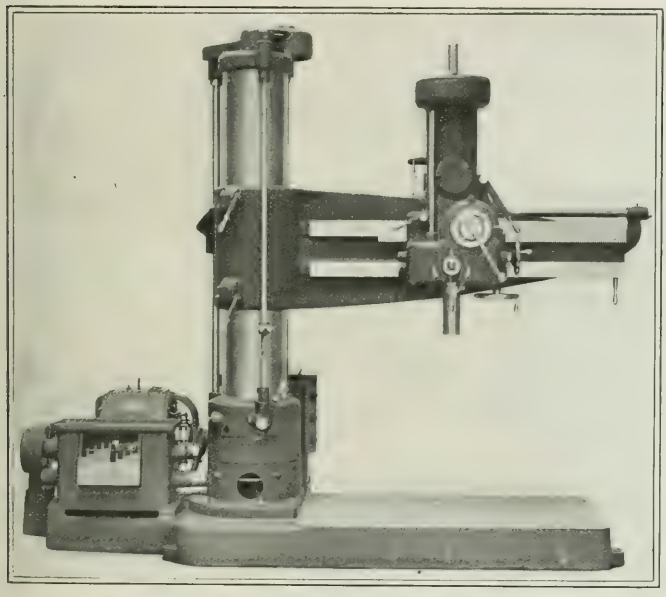
Cholera Hurts the Russian Iron Trade.—The epidemic of cholera now raging in Russia is having a serious effect on its iron trade. A cablegram from St. Petersburg, under date of August 25, says: "The Minister of Commerce to-day called a meeting of the metallurgical industry to discuss a proposal for the temporary free importation of pig iron to relieve the iron famine and reduce excessive high prices. Iron manufacturers in the St. Petersburg, Moscow and Riga districts have complained that producers in South Russia are unable to fill contracts. They give as the reason the desertion of their mines by workingmen, who are fleeing *en masse* from the cholera." On the following day advices were more cheerful. The iron manufacturers reported that their workmen were beginning to return to the mines in considerable numbers. The proposal to reduce the duty on pig iron had a particularly good effect in spurring the employers to take measures to combat the exodus of the workmen.

The Cincinnati Bickford No. 2 Plain Radial Drill

A 5-Ft. Model, the First of a New Line

For some time the Cincinnati Bickford Tool Company, Cincinnati, Ohio, has been working upon a new line of radial drills, and the No. 2 machine illustrated herewith is the first of the line to be completed. These drills are made with three lengths of arm, 4, 5 and 6 ft., respectively, the middle size being the one shown.

To resist the torsional and bending strains from the upward pressure on the spindle when heavy drilling is being done, the arm is of pipe section and proportioned at all points according to the load, so that as a whole it possesses a degree of strength unequaled by any other form of construction. Two binder handles shown in the engraving are provided for clamping the arm to the column. The arm can be rapidly raised and lowered by power, the latter motion at a speed twice that of the former. The column extends to the top of the sleeve, and is internally ribbed to add to its stiffness. It is bolted to the base, giving it exceptional rigidity and eliminating vibration, both of which are essential to the production of high class work. It is fitted with two ball bearings, one of which carries the weight and the other the side pressure of the swinging members.



The New 5-Ft. Plain Radial Drill with Style F Motor Drive, Built by the Cincinnati Bickford Tool Company, Cincinnati, Ohio.

The head is a decided departure from customary practice, and is conspicuous for the length of its bearings, the simplicity of its construction, the durability of its wearing parts and the convenient position of the operating levers. The back gears are incorporated in the head, and can be engaged or disengaged while the machine is in motion. These gears furnish three changes of speed at each of which more than two and one-half times the pulling power of the next faster one can be transmitted to the spindle. The reversing clutch is operated from the front of the head. This is of the familiar toggle joint type, and at its lowest speed is capable of transmitting power far in excess of that obtainable from the belt.

When the drill is fitted with a speed box, as shown, 24-spindle speeds are available, and when fitted with a cone pulley 15 are available. These are correct for cutting speeds of approximately 35 ft. per minute for diameters of from 7-16 to 6¼ in., the range being from 21 to 306 rev. per min. The speed box is operated by a single lever, which furnishes any one of eight changes when moved to the corresponding notch. The figures on the plate below the notches give the proper settings for the different diameters of drills. The spindle sleeve has an unusually long bearing in the head, and exerts pressure on the spindle through a ball thrust bearing. A safety stop is provided for tripping the feed within the limits of its movement, and the quick return lever controlling the vertical movement of the spindle engages the feed the instant it is pulled. A convenient means for regulating the amount of expansion of its friction ring is also provided. The depth gauge is graduated to read in either sixteenths up to 6 in., or in millimeters up to 150, and may be set to trip the feed at any desired depth within these limits. Eight changes of feed in approximately geometrical progression are provided for each spindle speed. These range from 0.006 to 0.03 in. per revolution of the spindle, and any one of these feeds can be substituted for any other while the machine is in motion by the maker's standard lever operated dive-key.

The gearing throughout the machine is of such pitch, face and material as to insure long life under continuous duty at the horsepower recommended by the builder. It is completely encased throughout, and in no instance does the peripheral speed exceed 1000 ft. per minute. The base is unusually heavy, especially where the column is bolted to it It is provided with ribs and cross ribs and also large T-slots. The plain box table, shown in the illustration, is also provided with T-slots. These machines can be equipped with the builder's style E or style F motor drive, the latter being the one shown.

The following table gives the principal dimensions and specifications of the drill:

Hight of base, inches	8
Size of working surface of base, inches	42 x 63½
Vertical range of arm, inches	42
Horizontal range of head, inches	48⅝
Maximum distance of spindle above base, inches	72
Minimum distance of spindle from base, inches	12
Diameter of column, inches	14
Total hight of column from floor, inches	112⅝
Diameter of spindle at least section, inches	2⅝
Vertical range of spindle, inches	18
Morse taper of spindle	No. 5
Working surface of table, inches	21 x 28
Hight of table from base, inches	22
Speed of motor, revolutions ptr minute	1,200
Horsepower required	7½
Weight (net), pounds	12,150
Weight (domestic shipping), pounds	12,400
Weight (foreign shipping), pounds	14,000

In a series of tests made on this drill at the builder's shop for driving drills of various diameters at various speeds and feeds in cast iron, it was found that while some of the tests consumed as much at 16.5 hp., it is nevertheless preferable that the size of the motor be limited to 7½ hp., as such a motor can be relied upon to deliver an overload of 50 per cent., or 11.25 hp. This is sufficient power to permit a feed of 0.03 in. for all sizes of drills up to and including 2½ in. and a cutting speed of 70 ft. or over to be used.

Nodulizing Wet Iron Ores

The Process in Use at the Fernie Works in Germany

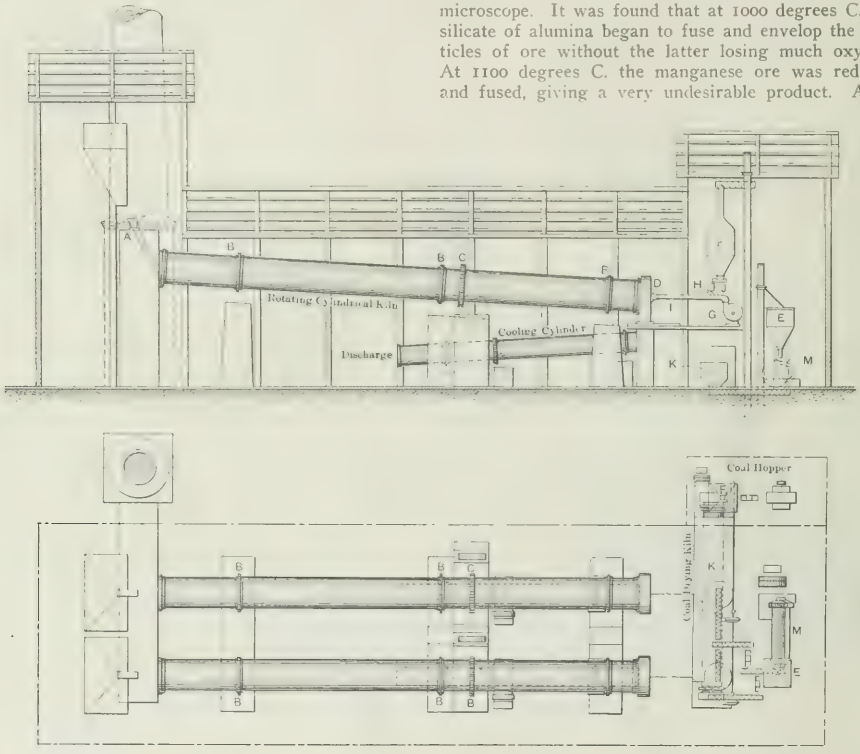
In the issue of *Stahl und Eisen* for May 4, 1910, is an article on "The Nodulizing Process at the Fernie Works, near Giessen," as applied to a soft brown iron ore. It is written by Friedrich Witte, and is abstracted below:

This process has been used at the Fernie Works for about a year, and is being applied successfully at Teschen, Austrian Silesia, to the treatment of flue dust, fine spathic ore and pyrites residues. The ore treated at Fernie contains nodules and pieces of pyrolusite and a considerable amount of silicate of alumina. The analysis of an air dried sample is as follows:

	Per cent	
Fe_2O_3	31.96	(22.37 per cent. Fe)
MnO_2	29.04	20.54 per cent. Mn.
MnO	2.82	
Al_2O_3	9.35	
SiO_2	12.97	
P	0.08	
H_2O	8.09	Chemically combined.
CO_2	0.44	

The ore as mined contains from 20 to 30 per cent. water, averaging 25 per cent., so that the metallic contents would be 16.78 per cent. Fe. and 15.41 per cent. Mn. The high moisture of the ore and its unfavorable condition for smelting caused the management to try experiments for years, leading to enrichment and improvement before shipment. It was thought that briquetting would be a success, owing to the large amount of clay in the ore, but this was found to be too expensive and did not give a good product. Experiments were then made at Frankfort-on-the-Main with a small cylindrical rotating kiln (of the same type as those used in cement works) by Fellner and Ziegler, who have made application for a patent on the process. It was found that all the water could be expelled, and the ore furnished in solid but porous pieces, very suitable for furnace work. Following the experiments a furnace was built at Fernie, and after many difficulties a practical process was developed, after which a second furnace was built 114 ft. 10 in. long by 7 ft. 10 in. in diameter.

Mr. Esch wrote of the difficulties in the summer of 1908. The chief one of them was to find the exact temperature to give nodulizing without fusing. Careful pyrometric measurements were made, and many examinations of thin sections of the finished product with the microscope. It was found that at 1000 degrees C. the silicate of alumina began to fuse and envelop the particles of ore without the latter losing much oxygen. At 1100 degrees C. the manganese ore was reduced and fused, giving a very undesirable product. After many trials it was also found that if the ore were exposed to the highest temperature for about 13 ft. of travel the right product was obtained.



Iron Ore Nodulizing Plant with Two Rotary Kilns at the Fernie Works, near Giessen, Germany.

Construction and Operation of Plant

Herewith we show an elevation and plan of a two-furnace plant as used at the Fernie Works. The charge, as uniform as possible, is introduced through a feed pipe at A. It slowly works its way down the kiln, losing its moisture and being nodulized at the hottest part of the furnace. The kilns, which are inclined at 6 degrees, are nearly 115 ft. long by 7 ft. 2½ in. in diameter; they are made of riveted boiler plate and lined with firebrick. They are provided with three steel rings, B, supported on two rollers of cast steel. Both furnaces are revolved at a speed of one revolution a minute by a geared ring, C, using one 40-hp. motor. The furnaces revolve at the lower end in a frame, D, that permits of the nodules dropping into the cooling cylinder below. The frame can be removed for repairs to the kiln.

The kilns are fired with pulverized dried coal, the coal coming from Westphalia. It is first dried in a

kiln, K, similar to the nodulizing kiln, 49 ft. 2 in. long by 5 ft. in diameter. It is smooth inside, with no lining, and makes three revolutions per minute. It is inclosed in brickwork, in which it is heated by means of a grate fire. The dried coal is elevated to the hopper E, above two grinding mills, M. From here the dust is elevated and discharged into the hoppers F, from which the kilns are fed by means of the fan G, the pipe I and the dust feed J. The fan at 800 rev. per min. gives about 3500 cu. ft. of air, at a pressure of from 2⅜ to 2¾ in. of water. The pipe I tapers from 14 to 10 in. in diameter at the entrance to the kiln. The coal dust is fed into the pipe at H and may be regulated as follows: Three small screw conveyors carry the dust from F to a larger conveyor that discharges into the closed box J. From here it falls through H into the pipe I over a shaking device. In the box J is another controlling valve, through which surplus dust falls down a pipe to a conveyor and is carried back to F. A wood fire is built in the kiln and the coal dust is admitted when this is well ablaze. It burns with a long flame and the feed is carefully regulated to prevent too hot a flame. Producer gas was not found to give the desired temperature.

Character of Nodulized Product

The nodules leave the kiln at about 1000 degrees C. and fall into the cooling cylinder, which is similar to the kiln, but only lined in the upper half. The nodules may be discharged directly into a car or into a storage hopper. They are, for the most part, well fritted and porous, with only a small amount of fines. A typical analysis follows:

	Per cent.	
Fe_2O_3	37.59	(26.31 per cent. Fe)
MnO_2	9.91	
MnO	20.70	(22.30 per cent. Mn.)
Al_2O_3	10.31	
SiO_2	15.94	
P	0.09	
H_2O	0.31	Chemically combined
CO_2	0.05	

The metallic contents have been raised from 32.19 per cent. as mined to 48.61 per cent. The Fe_2O_3 is not reduced, but a reduction of a large part of the Mn O_2 is unavoidable.

The output of the large furnace is from 120 to 180 tons a day, and based on its good performance compared with the smaller one, the Fernie people recommend a furnace 164 ft. long by 9 ft. 10 in. in diameter, the output of which is estimated at from 200 to 250 tons per 24 hours. The greatest difficulty in operation is an annular growth of fused material in the hottest part of the kiln. It is due to too high a temperature and to nonuniformity of the charge. The removal of such a ring is said to cause a shutdown of only four or five hours.

The power consumption at the Fernie Works is 170 hp., distributed as follows: One 40-hp. motor for the kilns, two 15-hp. motors for the fans and 100 hp. for the coal drying cylinder, grinding mills and conveyors. The coal dust consumption amounts to 12 to 15 per cent. of the nodules produced. It is believed this can be reduced to 10 per cent. in the large kiln proposed. This is important, as this is the chief item of cost. The cost of such a plant in Germany will be about $50,000. With an output of 60,000 tons per year, using 10 per cent. of coal dust, 140 hp., four men for each shift, and German prices for labor, fuel and power, the cost is expected to be 63 cents per ton of nodules, including everything.

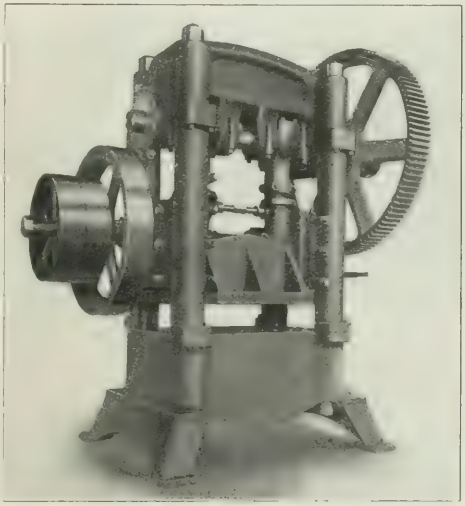
The paper closes with a careful calculation of the economy of employing the process and the much greater suitability of the product for furnace use. The plant at Teschen, mentioned before, has obtained the following results with pyrites residues and fine spathic ore. Pyrites residues containing 64.18 per cent. Fe. and 2.94 per cent. SiO_2 showed after treatment 65.23 per cent. Fe. and 4.17 per cent. SiO_2. The spathic ore has 31.81 per cent. Fe., 6.70 per cent. Mn. and 7.49 per cent. SiO_2. After treatment it had 45.58 per cent. Fe., 10.99 per cent. Mn. and 11.30 per cent. SiO_2.

The process is seen to be very similar to at least two so-called nodulizing or sintering processes that are in successful use in the United States. G. B. W.

A New Max Ams Double Pitman Press

An interesting double pitman press designed especially for the severest forming and stamping operations has been developed and placed on the market by the Max Ams Machine Company, Mount Vernon, N. Y. Several important and new features are embodied in the design of the press. Among them is a built-up type of frame in which all the working strain is taken by the four large steel tie rods shown in the engraving. This is said to eliminate all possibility of overstrains.

The slide extends through the openings in the uprights at the ends of the press, thus making it possible



The No. 1015 Double Pitman Press, Built by the Max Ams Machine Company, Mt. Vernon, N. Y.

to utilize the entire surface of the bed and to handle sheets measuring 20 x 48 in., although the distance between the uprights is only 34 in. When feeding material from front to rear sheets 25 in. square can be taken care of easily.

Bearings located on either side of the double pitman connections serve to support the double eccentric shaft rigidly. The eccentrics themselves are formed as solid enlargements of the shaft, which allows them very large bearing surfaces. One advantage claimed for this press is that the working strains are taken up directly by the main frame instead of the cranks, which is generally the case, thus eliminating springing and avoiding uneven wear. The clutch controlling the operation of the press is solid with the shaft, and is practically noiseless in its action as well as strong and durable.

The tight and loose driving pulleys are 28 in. in diameter by 6-in. face. The ratio of the gearing is 8½ to 1. The flywheel weighs 1100 lb., and the complete press 20,000 lb. Parallel adjustment of the slide, strong pitmans and all the other features common to this type of press are embodied in its construction.

Blast Furnace Charging Abroad

The Use of Wire Rope Cableways in European Plants

BY DR. ALFRED GRADENWITZ, BERLIN, GERMANY.

There are two distinctly different means for charging blast furnaces, one using the skip hoist and the other the wire rope railway. The former consists of raising the raw material from some point close to the blast furnaces to the furnace mouth by a hoist inclined at an angle of 55 to 70 degrees, and dumping it from an automatically discharging bucket. This process can be used only where the space immediately surrounding the furnace is unoccupied; and, moreover, it is at least desirable that elevated tanks for ores, limestone and coke should be installed in the immediate neighborhood of the furnaces, preferably parallel to the latter. Transporting material on wire rope railways, on the other hands, affords the possibility of discharging immediately into the furnace without any transfer from distant places. Several blast furnaces can be connected together by light bridges to avoid interruption of operation due to a local or partial breakdown in service. In this case the discharging operation no longer occurs automatically.

A decided advance over the use of wire rope railways was made by the design of electrically propelled suspended railways which have been found an excellent means of conveyance in the case of lines comprising many curves and branch lines. The trucks of these suspended railways are even able not only to discharge, but to charge themselves automatically.

The latest development in this line is a combination of a suspended railway with the wire rope railway principle. At the beginning of the ascent the electrically propelled suspended railway trucks, as they arrive at regular intervals, are coupled automatically to the traction cable of the blast furnace wire rope railway and thus drawn up the incline, while the current supply is discontinued. On arriving at the charging platform they are automatically uncoupled, while their contact bows are again applied to the live wire, and thus they continue their way automatically and are discharged at the blast furnace mouth by tilting. The trucks then return to the incline, where they are coupled automatically, and after traveling down the traction rope are uncoupled and proceed to the storage bunkers. Manual labor is required in this case only for lifting the hopper valves in loading the trucks and for tilting the trucks into the furnace mouth. Some men are further required for superintending the amounts of material conveyed and distributing them to the furnaces.

This system lends itself to solving the most difficult problems. It is practically independent of the original arrangement of the plant, the raw material bunkers being installed at any distance from the blast furnaces, even other buildings being situated in the intervening space. While the number of trucks required for dealing with the plant obviously increases as the distance increases, the output and wages remain strictly unaltered. The main importance can accordingly be attached to the arrangement of the foundry buildings and blower houses, the transportation of raw materials becoming a matter of secondary interest.

A typical plant of this kind is that of Messrs. Gebrüder Stumm, Ltd.,* at Neukirchen, on the Saar, Rhenish Prussia, Germany, which has been installed by the inventors of this system, Messrs. Adolf Bleichert & Co. A conveniently subdivided iron hopper serves to receive the various kinds of ore and the lime stone, this hopper being provided at its bottom with valves through which the truck bodies of the suspended railway can be filled immediately. In fact, there are three sets of valves, corresponding to the three charging tracks, 1, 2, and 3 (Fig. 1), respectively. The latter are continued horizontally as far as their junction with the arranging tracks.

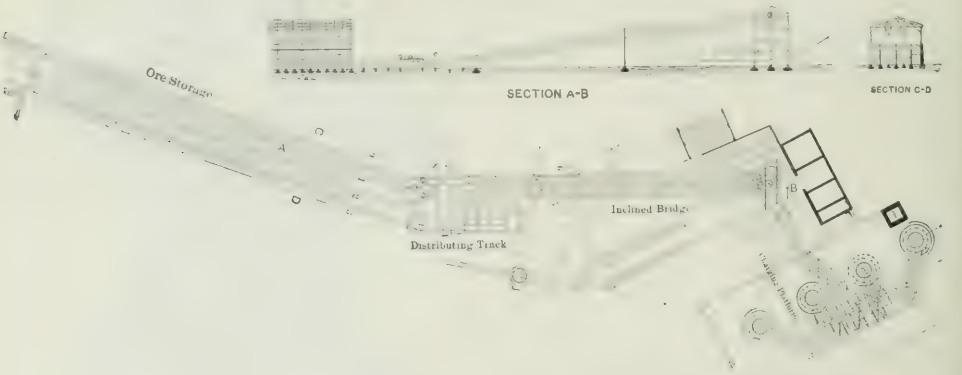


Fig. 1.—Plan of the Furnace Charging Plant Installed at the Furnace of Gebrüder Stumm, Neukirchen, Germany.

In the direction of track 4, leading toward the distributing tracks, there is fitted an automatic high-speed weighing machine for suspended railway trucks, with meter and self-recording device; at an obtuse angle to the axis of the hopper building is situated a bridge with the wire rope railway connecting the distributing tracks and the charging platform. To provide for a reserve, the railway is double tracked with two ascending and two descending tracks, thus preventing any temporary standstill. The traction cables on the inclined bridge are so arranged that each two tracks situated beside one another can be used for taking up

* Reference to this equipment was made in an article entitled "Suspension Railways in German Iron Works," printed in *The Iron Age* August 26, 1909, and some of the views therewith are interesting as supplementing the ones herewith.



Fig. 2.—Blast Furnace Charging Platform.

the filled trucks, and the two remaining for withdrawing the empty ones.

The trucks located on the arranging track are set moving from a central switching station, situated at the end of the junction switches of the distributing track, in order then to proceed automatically toward the coupling station of the wire rope railway. The clutch used to connect the truck to the traction cable is known as the Automat clutch, patented by Messrs. Bleichert, which being actuated by the weight of the truck insures a safe attachment of the latter to the traction cable. Each of the ascending sections is provided at the lower end with a coupling device, and at the upper end with an uncoupling device, whereas each of the descending sections shows the same arrangement in a reversed order. As a truck comes running along from the distributing tracks, it enters the first or second ascending track, according to the position of the switch, and passes over the coupling station where it is held against the traction cable, while the motor at the same time is thrown out. After traversing the inclined section, the truck is uncoupled of its own accord at its upper end, while the traveling motor at the same time is again thrown in, so that the truck, according to the position of the switch, will proceed toward one of the four blast furnaces.

Each blast furnace mouth is surrounded by an annular track shown in Fig. 2, on which the truck is stopped. After being discharged by hand, it is thrown in again immediately, in order to proceed empty toward the inclined section, and after descending the latter to travel over the extreme fourth section 9 of the ore hopper building, as far as its end. The transverse distributing track, situated there is connected by switches to the three charging tracks below the hoppers, so that the man stationed there may distribute it to any one of the various sections.

As the whole plant comprises 55 trucks, which in the course of operation are either moving independently or in interconnection, or else are at rest, while the supply to the blast furnace mouth should occur with remarkable regularity, and as several kinds of ore have



Fig. 1.—Electrically Operated Car Dumper.

to be dealt with, these measures of precaution are obviously of the highest importance, preventing any collisions or excessive difference in the distances between the trucks. The safety of the plant is secured by a special arrangement, consisting of subdividing the trolley wire into different block sections, the section just traversed being disconnected from the feeders

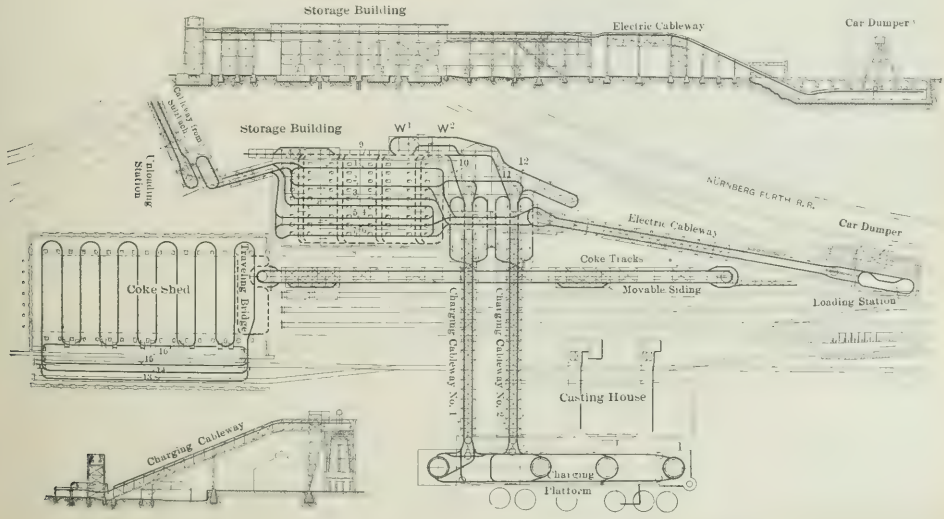


Fig. 3.—Diagram of the Plant at the Maximilian Works, Rosenberg, Austria.

through switches operated automatically by the trucks.

The switches and crossings are protected by similar safeguards, preventing any two cars traveling simultaneously over a given switch. Should the supply of trucks, for some reason or other, be increased or diminished, several trucks containing the same kind of ore will accumulate on the same section of track. When a truck, traveling on the inclined bridge, has traversed a given distance on the latter, it will throw in backward by the block arrangement, the front part of a section of the distributing track on which these trucks are located. The first of the waiting trucks then travels automatically toward the coupling station through the length of a block section, and as the remaining trucks on the arranging track advance in the same manner, the last section of this track will become unoccupied. The trucks then wait until the first truck, now stopping on the distributing track, continues its course.

Another interesting plant of the same type which, as is generally the case, at the same time serves for the transport of coke, has been installed at the Trynietz Works, at Teschen, Austria. This is especially interesting because of the very unfavorable position of the coke ovens, which, though being separated from the blast furnaces by a number of other buildings, offer no difficulty to the operation of the electrically propelled suspended railway. An open storeyard, with elevated tracks, is used, on which the ore is discharged, for the greater part, into iron chutes, while the remainder, if required, is removed by shoveling.

Another very extensive plant is that of the Maximilian Works, at Rosenberg, Upper Palatia, Austria, where all elevated tracks are dispensed with. As will be seen from the plan in Fig. 3, the incoming trucks arrive at a tilting device, Fig. 4, whose platform can be inclined to the right or left, and which is provided with two hoppers. Trucks equipped with braking chains can therefore be tilted without any change in position. The ends of both hoppers are situated in a tunnel, in which an electrically propelled wire rope railway terminates. After being filled there, the trucks are drawn up the inclined section, Fig. 5, to proceed



Fig. 5.—Inclined Section Between Car Dumper and Furnace Hoppers.

with electrical propulsion as far as the elevated bins. The ore trucks then deviate to the right on track 1, in order to return over track 2 to the inclined section after having been automatically discharged at some point. The trucks filled with limestone deviate to the left, traveling over the tracks 6 and 7. On the tracks 4 and 5 are dumped the raw materials coming from Sulzbach, the suspended railway trucks there being charged through a hopper served by the old wire rope railway, to which an extension has been added. Below the elevated bins are situated eight transverse suspended railway tracks (shown in dotted lines) connecting two longitudinal tracks 8 and 9, on one of which the trucks arrive and return on the other after traversing a weighing machine over track 10 or 11, toward one of the two furnace charging cableways. The reserve track 12 is intended for the case of a temporary breakdown in the car dumper.

The coke, which also arrives by rail, is stored in a covered shed. An electrically propelled suspended railway, with winch trucks, is used for charging the coke stores, Fig. 6. The filled trucks are lifted and run on the inside longitudinal track 16, and thence to one of the loops extending transversely over the coke store. After being emptied, the truck then returns to the



Fig. 6.—View of Cableway in Coke Shed.

charging tracks. Two longitudinal tracks, located near the ground, are used for removing the coke from the shed. On the two longitudinal tracks moves a bridge, equipped with rails, so as to allow the trucks to get to any point desired. The longitudinal rails are connected to the extensive rectilinear coke railway, on which the trucks get to the starting station of the charging cableway.

The two charging cableways are located on separate inclined bridges, thus dispensing with any crossings on the charging platform. The trucks are moved by a cable engaging simple forks arranged on each truck beside the clamp, worked on the incline. In fact, the adhesion of these forks is quite sufficient on horizontal sections.

The saving of hands effected by these installations is remarkable indeed. In the case of the Gebrüder Stumm 50 men can be dispensed with in each shift, and the saving at the Maximilian Works amounts to 70 hands, though three furnaces are at present in operation in place of the two formerly used.

The average power consumption at the plant first described is about 10 kw. and on the incline 12 kw., giving a total of 22 kw., which compares very favorably with the power consumption of inclined elevators. The repair cost, corresponding to the renewal of cables, is quite immaterial.

Cotton sold on the New York Cotton Exchange at 20 cents per pound August 29 caused by a corner in August options. This is the highest price realized since 1873.

Canadian Developments

Mackenzie & Mann in the Mattagami Ore Field

TORONTO, August 27, 1910.—It is reported upon what appears to be good authority that Mackenzie & Mann have taken what is called a working option on 400 acres of iron lands at Grand Rapids, on the Mattagami River. This is in the iron field that has recently come into prominence in Ontario's Hudson Bay slope. Five diamond drills are to be sent up from Toronto. Two or three miles beyond the deposits at Grand Rapids, and about that distance nearer Moose River, indications of the presence of good ore are reported. Still another field is said to have been discovered in that locality, but in a new quarter.

Mackenzie & Mann have large interests in the Atikokan iron range in the Rainy River district, and in the Atikokan Iron Company, whose furnace is at Port Arthur. They are also part proprietors of the Moose Mountain iron mine about 25 miles north of Sudbury, in the Algoma district. Of still another iron property, in the vicinity of the latter, the company has a large share. These are all on the Canadian Northern Railway, whose links are being rapidly joined in a transcontinental system, under the control of Mackenzie & Mann. In British Columbia, across which province a section of the Canadian Northern Railway is being built, the firm is likewise interested in iron properties. Not long ago Mr. Mann stated that if a blast furnace and steel plant did not soon come into existence in British Columbia through the enterprise of other parties, he would establish such works there himself. His company recently acquired the great coal properties of the Dunsmuirs. The erection of a blast furnace in Toronto was an undertaking to which Mackenzie & Mann were giving much attention a few years ago, but the financial stringency that began in 1907 rendered it necessary to drop the matter at that time. It was intended to smelt Moose Mountain ore here, the Canadian Northern branch from Sudbury having been completed to Toronto.

The Grand Rapids ore deposits are not on the Canadian Northern, though doubtless a line would be built to them from that system if it were found that they were of such magnitude and their contents were of such quality as to warrant such branch extension.

Bounty Pleas

The case for the continuance of the bounties on iron and steel is presented in a letter from Bras d'Or, recently published in a Montreal newspaper. In this the statements are made that Germany, through the kartel of wire rod manufacturers, gives a bounty of 15 marks, or $3.60, a ton on exports; that the export price is 74 marks, while the selling price in Germany is 95 marks. The Canadian duty on pig iron is, it is pointed out, only $1.50 a ton under the preferential tariff and $2.50 under the general tariff. This is exclusive of the bounty. An anti-protection correspondent takes up these statements and shows that in spite of sacrifice prices at which the kartel bounty enables the German article to be sold abroad, Canada imported no German pig iron in 1909 and only $25,000 worth of German wire. The antidumping duty would offset any disparity between the price ruling in Germany and that at which sales would be made in Canada.

Imports of Pig Iron and Castings

As Canada's imports of pig iron swell, its imports of cast iron water pipes and gas pipes do not increase commensurately with its demand for them. That demand is at the present time quite voracious, but more of it is being satisfied by domestic producers than ever before. A very considerable proportion of the enlarged tonnage of pig iron imports goes to the manufacture of these classes of pipe. In Toronto, the National Iron Works, Ltd., is doubling its capacity for the manufacture of cast iron pipe. When its extensions are completed, as it is expected they will be by the beginning of next year, they will be able to melt 100 tons of pig iron a day.

Undervaluation of Motor Cars

Customs officials at Canadian ports on the international boundary are on the alert to prevent the entering of automobiles at undervaluations. In the opinion of the collectors the practice is a very common one, and they have been exercising their wits to check it. Several months ago some seizures were made. Since then the cases may have been numerous, but they seem not to have been flagrant enough to be detected. A few days ago an automobile and motor cycle were stopped at Niagara Falls, and may be confiscated, on the ground of undervaluation for duty. The car was valued for duty at $1500, and the customs officials maintain that it is worth at least $4000.

Plans for Canadian Warships

Firms that desire to tender for the construction of the vessels to be built for the Canadian navy must send their experts to London to examine the plans. These the British Admiralty declines to intrust to parties outside the United Kingdom even for confidential inspection. Though the vessels are to be paid for by Canada, to be Canada's property, and entirely under Canada's control, the building of them must be in accordance with designs approved by the British Admiralty. The Canadian Government, having had no experience in such work, is altogether dependent on the Admiralty in the matter. As the vessels will be built by British firms or by Canadian firms allied with British, there is, after all, no hardship in the requirement that the plans be examined in London. C. A. C. J.

The Olmsted-Flint Company Will Make Belting

A new firm of belting manufacturers has entered the field in the organization of the Olmsted-Flint Company. The incorporators of the new company are Willard I. Olmsted, Stanley B. Flint and George S. Baker. It will maintain its principal sales offices at 136 Liberty street, New York, with a branch house at 1026 Arch street, Philadelphia. It is expected that branch houses will be established in the near future in Boston and Chicago.

The new belting concern, it is understood, has taken over a large leather belting factory in Philadelphia for the manufacture of its leather belting. In addition it will manufacture and sell a complete line of rubber belting, canvas stitched belting, Balata belting and solid woven belting. The Olmsted-Flint Company will also represent exclusively in the United States several European manufacturers of belting and transmission specialties.

The members of the new company are well known in the belting field. Mr. Olmsted, who heads the organization, has been in the belt business for many years, connected with several of the largest manufacturers. He is personally known to the heads of several thousands of factories, principally in New England. Mr. Flint, vice-president of the company, has traveled in connection with the belting line in all parts of the United States for several years. Mr. Baker, secretary, has for several years been editor of a belt engineering publication. Also connected with the organization is F. M. Schiffmacher, a well-known engineer in the transmission line, who will take charge of the engineering department.

Andresen-Evans Grab Buckets

A New Style Designed for Two-Line Operation

During the last two years the Andresen-Evans Company, 1501 Monadnock Building, Chicago, Ill., has been engaged in developing two styles of grab buckets, the type A for two-line operation and the type B for operation with three or more lines. These buckets are

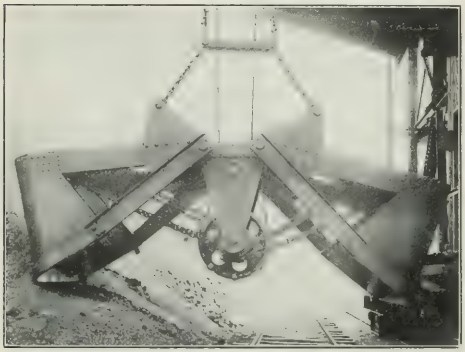


Fig. 1.—The Type A Grab Bucket Made by the Andresen-Evans Company, Chicago, Ill., Fully Opened.

new in the principle of their design and construction, and the illustrations show quite clearly the former type for handling all kinds of bulky material and especially iron ore, cement clinker and coal. Fig. 1 shows a 7½ cu. yd. bucket opened to its fullest extent for lowering into a pile of material, Fig. 2 is a view of the same bucket gathering its load from a stockpile as it closes, while Fig. 3 shows the bucket completely closed with its load ready to be hoisted by a conveyor bridge.

As will be noticed from the illustrations, this bucket has some resemblance to older types, but most of its features are different from all others. Even the differential drum which is common to this bucket and the clamshell type is not carried by an extension of the scoops as is the usual method, but is mounted in a separate centrally located frame, which also carries at its upper corners the bearings for the hinge shafts supporting the scoops. Four two-part chains are used to transmit power from the differential drum to the scoops.

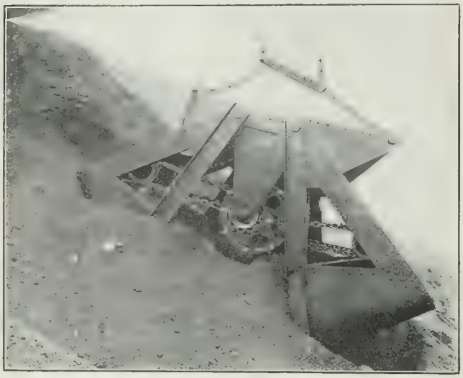


Fig. 2.—The Bucket Collecting Its Load—Capacity 7½ Cu. Yd.

The designers of practically all drag buckets intended for digging heavy materials employ compound motions for obtaining a favorable cutting path at the edge of the scoop as it closes. It was necessary in order to secure this result to employ separate links and centers of rotation for the front and back corners of the scoops or an equivalent sliding motion. In this new grab the path of action of the cutting edge and inclination of the trays is obtained by the simple swinging motion of the rigidly braced scoop about separate pivots located a slight distance apart which gives a practically similar action. In closing the chains always pull in a direction approximately opposite to the line of the resistance of the cutting edge and act through a comparatively long lever arm. The combination of this feature with the multiplication of power from the differential drum and the cutting action just mentioned gives a very powerful closing action and permits very difficult material to be dug. These buckets are said to have the widest opening of any grab of equal capacity, and this with its favorable closing action insures a full load each time with a resulting maximum efficiency of the plant. The scoops are so shaped that the excess material squeezes out the back before hoisting instead of packing and preventing closing. In a test recently made in unloading a coal boat, one of these buckets took 61 per cent. more material per trip than another grab of the same rated capacity.

In a grab bucket for any purpose a long reach when

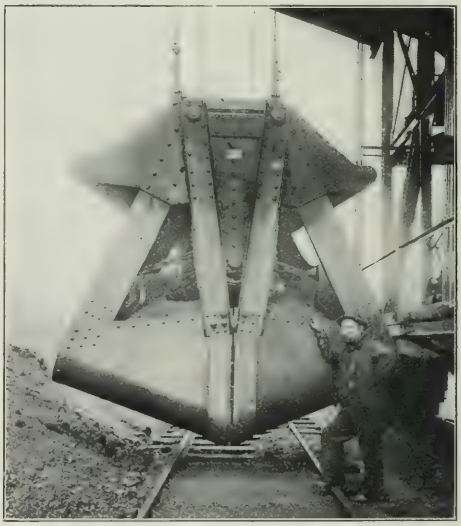


Fig. 3.—The Bucket Loaded Ready to Be Transported by the Bridge.

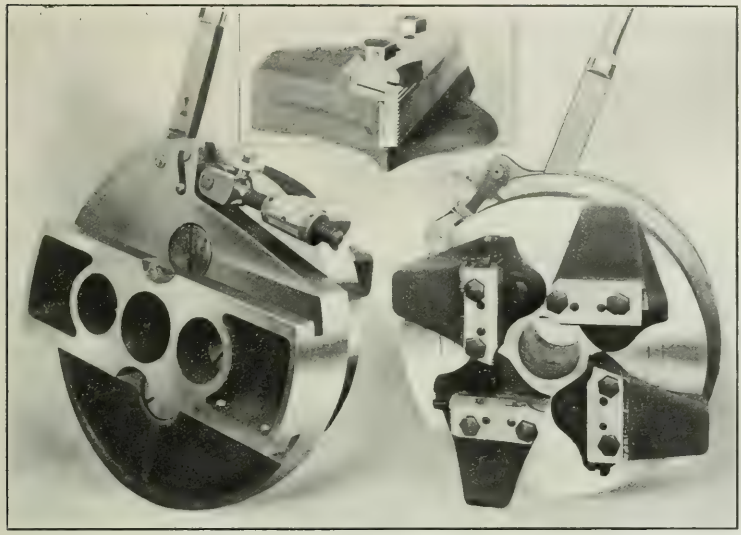
open, if obtained without making the hight too great when closed, is very desirable. This is especially true when the bucket is to be used for unloading boats since it enables a large portion of the material beneath the decks between the hatches to be removed and reduces the cleaning up by hand shoveling. In these new buckets this long reach is said to be attained to an unusual degree which is shown in Fig. 1, the distance being over 50 per cent. greater than with a clamshell bucket. This is due to the design, as when this new bucket is opened it has not only the reach of the scoops themselves, but the added effect of the distance between the hinge shafts. A grab bucket should also have small headroom over the open scoops and a low center of gravity when opened, both of which are claimed as features of this new type. The former is valuable in connection with the long reach in getting under the deck of a boat, and the latter enables the grab to fill properly without tipping over when landed on the side of a pile of material, a condition under which a large portion of its work is done.

These buckets are built in a number of different sizes ranging in capacity from 1 to 7½ cu. yds.; the

latter is the size illustrated. Each size is built in two different weights, one which is designated as the coal digging grab being intended for coal and other light materials, while the ore digging grab is used for ore and difficult excavation work. Either type can be used on two-drum hoists.

The Landis Stationary Pipe-Threading Die Head

A new type of stationary die head for pipe threading, manufactured by the Landis Machine Company, Waynesboro, Pa., which employs the maker's standard type of die with a manually operated die head, is illustrated herewith. This head is designed especially for use on pipe threading machines where the pipe revolves and the head remains stationary, the dies being opened and closed by hand. The die holders and head are made entirely of steel, and the latter can be mounted on the carriage of any of the standard pipe machines and is handled in the same manner as other styles of heads.



Front and Rear Views and Enlarged Detail of a Die Holder of the New Stationary Die Head Made by the Landis Machine Company, Waynesboro, Pa.

The heads are made in four standard sizes to take work up to and including 4 in. One of the great advantages of this die for threading pipe is that one set of dies will cut all the diameters coming within the same pitch. For example, there is but one pitch covering the sizes from 1 to 2 in., inclusive, and one set of dies covers this range, while the same is true of the other pitches. The holder which is shown in the upper part of the engraving, is used where it is not necessary to cut very close to a shoulder. The clamp holding the chaser in place is what the builder terms its mill clamp, and besides holding the chaser rigidly protects it in case the pipe splits, which frequently occurs. This clamp comes down over the shoulder of the die and is rounded out near the cutting point so as to act as a guide for the rough ends, and at the same time when a twist occurs in the pipe the strain is put largely on the clamp and thus the die is protected so that the chance of breakage is small. In threading a pipe close to a shoulder, as in the case of a short nipple, a clamp is used which comes flush with the front edge of the chaser only, thus permitting the die to run up close against the shoulder.

The chaser for these die heads is made from high speed steel, which eliminates necessity for annealing, rehobbing or retempering, and the life is said to be many times that of any other die. The die is easily sharpened by grinding the ends of the chasers and again setting them to the correct cutting position in the holders, which is indicated by a small gauge furnished with each head.

Advantages claimed for this die are it can be used at cutting speeds of 25 to 100 per cent. higher than hobbed type and that the rake can be ground to suit the quality of the material in the pipe to be threaded. The heads are graduated for setting the dies to the different diameters to be threaded and are closed and opened by hand. When in the closed position the die is rigidly locked, but it can be opened and closed freely by the lever projecting from the top. Another advantage claimed is long life of the dies.

All dies are made to interchange, and if one chaser of a set should be worn out in advance of the others it can be replaced without purchasing an entire set. Dies of any one pitch will interchange on any of the die heads so long as the pitch is within the range of the head. For example, dies for threading a 1-in. pipe on a 1-in. head will thread the same diameter pipe on a 2-in. head, or vice versa, thus avoiding the necessity of carrying a large assortment of dies to cover a wide range of work when using a number of these heads.

James Watson & Co., Glasgow, Scotland, in their circular dated August 19, say: "Owing to the continued strike of miners at Bilbao, hematite prices are distinctly firmer, warrants and makers' iron having appreciated 1 shilling to 1 shilling 6 pence per ton on the week. We have to report a fairly active market for Cleveland warrants, with a hardening tendency, although on realizations the close is 1½ pence per ton under the best price of the week. There have again been evidences of more outside interest taken in the market, and consumers continue to buy to cover their requirements well forward. With an active home trade, and more Continental buying, the pessimistic sentiments which have been predominant here for some months are gradually disappearing."

Papers of incorporation have been filed by the Alaga Mining, Power & Development Company, which has taken over 6000 acres of brown ore lands in Cherokee County, Alabama. Y. A. Dyer is president and secretary of the corporation, with E. F. Enslen treasurer, both of whom are of Birmingham, Ala. Washers have been installed and steam shovels are ready for operation. It is intended to commence operations with an output of 3000 to 5000 tons of ore per month.

A New Single Stroke Open Die Header

The E. J. Manville Machine Company's New Type Containing Several Improvements

An improved type of single stroke open die header is shown in the illustrations, as designed and built by the E. J. Manville Machine Company, Waterbury, Conn. It is intended for heading long rivets and wood screw blanks, tire bolts, &c., which are subsequently shaved to remove the surplus stock and the fin under the head caused by the joint in the gripping or heading dies, and for cutting and heading rapidly wire where the fin marks are not detrimental. The machine is built in six sizes, ranging from the No. 00, shown in Fig. 1, for work up to ⅛ in. in diameter and 1½ in. long, to the No. 4, illustrated in Fig. 2, which will manufacture headed blanks up to ⅝ in. in diameter and 7 in. long, where the heads are of such proportions as to make desirable the single stroke design.



Fig. 1.—The No. 00 Pedestal Base Type Open Die Header.

This type lends itself to greater speed than the solid die, because feeding the wire between the dies ejects the finished piece without loss of time, and because the blank is moved quickly through to bring it in line with the heading punch. The open die type machine is particularly adaptable for work of greater length than 8 or 10 times the diameter.

A feature of the new design is the carrying of the dies in a steel lined pocket formed in the frame, from which they may be removed quickly. They are supported by and slide on a hardened tool steel plate, and are backed by a similar plate which takes the shock or thrust of the heading punch. A sliding cover plate bears on their upper surface and can be moved on a track toward the gate, exposing the dies for quick changes. The construction of the die holder permits casting in the bed a heavy tie extending from side to side just below the dies and close to the line of pressure. It also allows applying a rigid mechanical wire stop against which the end of the wire is pressed by the feed rolls just as it is being cut off, as in a solid die header, thus insuring uniform length of blanks. Another resulting feature is a fine adjustment for length, which may be made while the machine is in motion.

The toggle gripping mechanism consists of hardened tool steel parts and is operated by a positive acting cam of tool steel on the end of the crankshaft. The toggles are contained within a heavy bracket or box cast solidly on the side of the frame. The construction is such as to greatly reduce the fins on the blanks. The three smaller sizes are constructed with a single toggle link, while the three large machines have a powerful compound toggle with a double set of links, thus distributing the strains over a large area. The company's breaking plate has been introduced into the type to minimize the chance of breaking the machine in case the wire is caught between the dies. The machine frame is of large cross section, while the crankshaft is of hammered heat treated nickel-steel and runs in bushings which support it close to the crank pin. The gate has a large bearing surface, carefully scraped to fit the frame, and the connection at the crank end is bronze lined. Careful study has been given to the matter of lubrication, sight feeds being employed, while the wire is automatically oiled as it enters the machine.

The capacities of the several sizes and the principal dimensions are as follows:

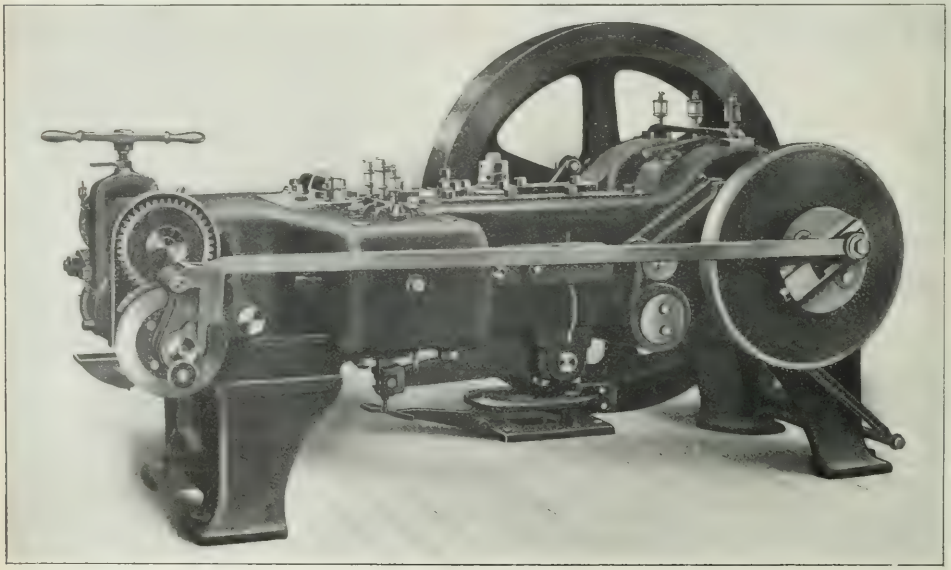


Fig. 2.—The No. 4 Open Die Rivet Machine Built by the E. J. Manville Machine Company, Waterbury, Conn.

Machine No.	00	0	1	2	3	4
Diam. of wire, in..	1/8	5/16	1/4	5/16	3/8	5/8
Length of rivet, in.	1 1/2	2	2 1/2	3 1/2	6	7
Size of dies, in....	1 5/16	1 7/16	1 7/16	1 11/16	1 7/8	2 5/8
Diam. of punch, in..	1/2	7/8	1	1 7/16	1 7/8	2 1/8
Stroke of gate, in..	2 1/4	2 3/4	3 1/2	5	7	8
Diam. of feed rolls, in.	4 1/2	5	6	7	9	10
Diam. of wheel, in.	26	30	42	51	60	60
Face of wheel, in..	3 1/2	4 1/4	5	5 1/2	6	8
Weight of wheel, lb.	154	275	365	675	1,080	2,500
Rivets per minute..	250	200	150	100	80	60
Net weight, lb.....1,200	2,000	3,200	5,300	9,300	19,000	
Floor space, ft...2 1/2x3 1/4	2 1/2x4 3/4	3 1/4x5 3/4	4x7	4 3/4x8	6 2/3x10	

The two smaller sizes are mounted on a heavy pedestal with large base, a design which makes it convenient to get at the tools, and permits the work to drop into a receptacle placed on a shelf at the front of the pedestal.

The New Queen City Safety Multiple Punch

With a view to eliminating the possibility of accidents to the operators which frequently occur in working presses and punches of the ordinary type, the Queen City Punch & Shear Company, Cincinnati, Ohio, has recently placed on the market the safety multiple punch, which is illustrated herewith. This machine is designed for punching angles for making fence posts, and has an oscillating table or platen which moves in and out at each stroke of the plunger or ram. Fig. 1 shows the table in its customary position, while Fig. 2 illustrates the forward or tilted position. It is said that it would be a case of willful negligence on the part of the operator or feeder for his hands to be injured. With this punch it is claimed that two bars can be punched at the same time in one stroke.

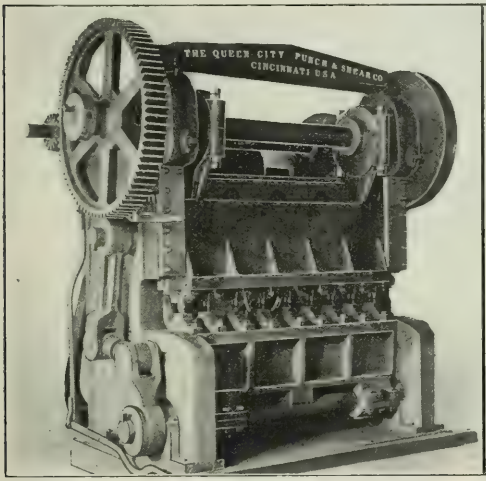


Fig. 1.—Table in Position.

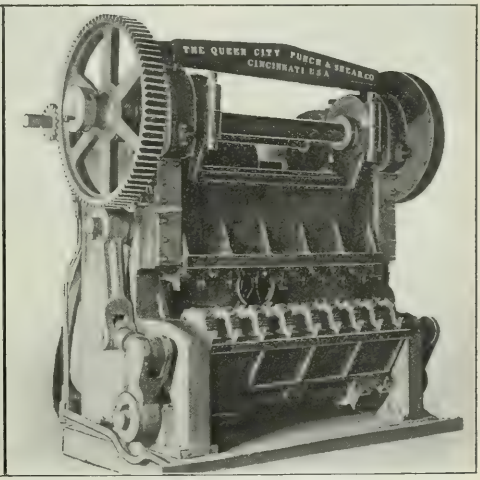


Fig. 2.—Table Tilted Forward.

Two Views of a Safety Multiple Punch with Oscillating Table, Built by the Queen City Punch & Shear Company, Cincinnati, Ohio.

The machine is very substantially built, and arranged so that the punches and dies cannot get out of alignment. It is provided with a safety stop clutch, which is released or locked instantly by the operator. In this way the machine runs continuously, and the speed is regulated by the character of the work and the ability of the operator to handle it rapidly. This punch is somewhat similar to the punch placed on the market by this company some time ago, which was illustrated and described in *The Iron Age* August 19, 1909. This, however, was a double acting machine, requiring an operator on each side, and while, of course, it was capable of turning out a greater amount of work, it has been found that the single acting type is much more satisfactory, especially where heavy bars are handled.

A Cobalt-Chromium Alloy

A paper was read by Elwood Haynes, president of the Haynes Automobile Company, Kokomo, Ind., before the American Chemical Association at San Francisco, July 16, entitled, "The Production of Alloys of Nickel and Cobalt with Chromium." The author tells of his first experiments in 1895 in the production of alloys of nickel with iron, chromium and other metals. In 1905 he repeated some of these, with a view to utilizing the alloys of cobalt and nickel with chromium for ignition points in gas engines. The final outcome was the production of an alloy containing 75 per cent. cobalt and 25 per cent. chromium which by proper treatment could be hammered into thin sheets at a bright red heat without signs of cracking. The material had an elastic limit of 79,000 lb., tensile strength of 96,000 lb. and an elongation of 3 per cent. A pocket knife blade and several table knife blades were made from it and were found satisfactory. By reducing the quantity of chromium and adding other metals, alloys have been produced, the author says, which are proof against nitric acid and sufficiently malleable to be worked cold. Other combinations have resulted in alloys which would readily scratch quartz crystal. The most noteworthy property of a combination of three parts cobalt and one of chromium is said to be its resistance to corrosion. The author gives no data as to cost of production but says that the alloy is particularly suitable for small cutting instruments, for pocket knives and table cutlery, since it holds its edge well and is proof against tarnishing.

The Orion, Great Britain's greatest battleship, was launched at Portsmouth, England, August 20. The armored cruiser Lion, recently launched, is of 26,350 tons, and the Orion will displace only 22,500 tons; but her ten 13.5-in. guns and her new, deadly equipment of torpedoes render her by far the most powerful battleship afloat. The Orion will have a speed of 21 knots and will carry 4000 tons of fuel, giving her an unusually wide radius of action.

The Highland Iron & Steel Company, Terre Haute, Ind., has purchased the rolling mill plant of the Blue Island Rolling Mill & Car Company, Blue Island, Ill., which it will operate in connection with its plant at Terre Haute.

Pridmore Molding Machine Roll-Over Attachments

The accompanying illustrations show the Pridmore heavy double shaft stripping plate machines, both the round and square types, built to be operated as roll-overs, with the service of a crane or hoist. Figs. 1, 2 and 3 illustrate the 36-in. round machine, fitted with a mower wheel pattern; Figs. 4 and 5 show a large square machine fitted with a 52-in. threshing machine gear.

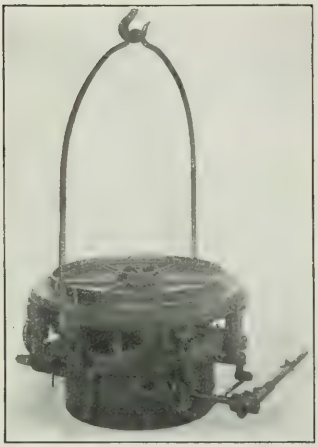


Fig. 1.—The Bare Machine.



Fig. 2.—The Flask Rammed.



Fig. 3.—Rolled Over and Drawn.

A Round Heavy Double Shaft Stripping Plate Machine Built by Henry E. Pridmore, Chicago.

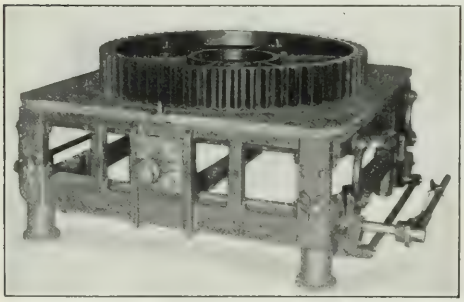


Fig. 4.—A Square Pridmore Heavy Double Shaft Stripping Plate Machine with the Pattern Up.

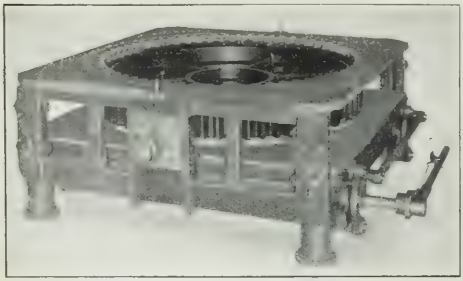


Fig. 5.—The Same Machine with the Pattern Drawn Down.

The attachments necessary to effect this method of operation are the trunnions to which the hoist bale is attached and the special turnover handle. The operation of making a mold on a machine of this design consists of setting on the flask and ramming it up, clamping it with the bottom board to the machine, adjusting the crane, turning the entire equipment over and setting it down on the floor, then drawing the pattern upward away from the mold, lifting the machine off and returning it to the floor ready for the next mold to be made. One of the advantages to be derived from this method of operating a stripping plate machine is that the necessity of baring the drag flask is obviated. The cope, of course, can be made on the same machine, but the turnover features are not utilized.

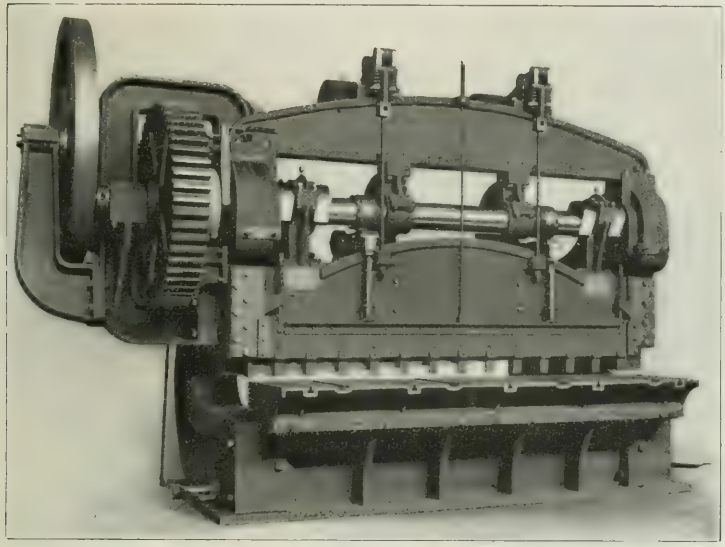
Turnover attachments can be applied to any of the numerous sizes in which these double shaft machines are built; the nature of the work to be molded determines whether such a principle of operation is desirable. Patterns such as gears, &c., having deep pockets are handled to great advantage on machines of this design. These machines are made by the firm of Henry E. Pridmore, Chicago, Ill.

The United States Radiator Corporation's Chicago Branch.—The United States Radiator Corporation is busily engaged redecorating and fixing up its commodious quarters at 34 Dearborn street and 99 Lake street, Chicago, and expects to have a full line of its products on the floor for display purposes in the course of a couple of weeks. From 250,000 to 500,000 ft. of radiation and from 300 to 400 boilers of various sizes will be carried in stock in a warehouse located at Kingsbury and Indiana streets, from which all business in the Chicago territory will be taken care of. Facilities for making shipments from this warehouse are exceptionally good, as it has lighterage service on the river and connection with the system of the Illinois Tunnel Company which reaches all railroad terminals. A railroad siding has just been completed.

The Algoma Steel Company, subsidiary of the Lake Superior Corporation, is rapidly completing its merchant steel plant. This plant, which occupies a building 720 ft. long, consists of two mills, one 12 in. and one 18 in. Electric power will be supplied to these mills by a gas engine plant, now nearing completion, comprising eight 2200-hp. Allis-Chalmers engines, four of which will be used as blowing engines and the others for general power purposes. The 12-in. mill will have a 900-hp. motor and the 18-in. mill a 1500-hp. motor. Half of the new by-product coke plant will be in operation before the close of this year.

A Large Long & Allstatter Gate Shear

The Pullman Car Company has recently purchased from the Long & Allstatter Company, Hamilton, Ohio, the very large gate shear which is illustrated herewith. While there are no new features involved in its construction, the shear is nevertheless interesting on account of its size. This machine is intended for shearing plates, and the heaviest one that can be cut at one stroke of the slide is 12 ft. long and 1 in. thick. The shear is entirely self-contained and carries the motor which furnishes the power for operating it.



A Gate Shear for Cutting Plates 12 Ft. Wide and 1 In. Thick, Built by the Long & Allstatter Company, Hamilton, Ohio.

One especially interesting feature is that the end of the cam shaft and all the countershafts are so supported as to leave the floor around the machine free from obstructions. The shear has an automatic clamping device which holds the material while it is being cut and releases it as soon as the cut is made.

When assembled the weight was over 130,000 lb., although the floor space occupied, 10 x 20 ft., was much less than that required by some shears of a much smaller capacity. The stroke of the shear is 8 in., the ratio of the gearing is 14 to 1 and the flywheel is 82 in. in diameter.

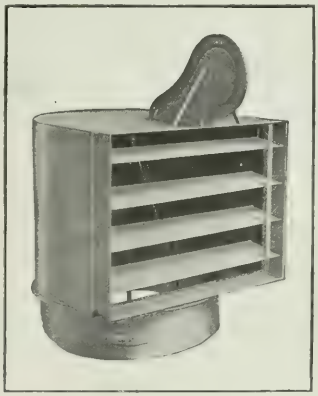
The Swartwout Rotary Ball Bearing Ventilator

The need of providing pure air for operatives in various lines of mechanical work has been pretty well settled; the question now is how to get adequate ventilation at the least cost. In many factories the ventilation is inadequate, generally because the apparatus considered is costly and involves a continual operating expense. While expensive apparatus is desirable for some types of buildings, this prohibitive first cost and continual maintenance expense is frequently unnecessary, as an outlet in a room to permit the heated air to escape is often all that is required. It needs, however, an effective ventilator, and the Ohio Blower Company, Cleveland, Ohio, claims to have such in the new Swartwout rotary ball bearing ventilator illustrated herewith.

This ventilator is said to embody features that make it effective at no expense other than the first cost. In the circular rim bound type of ventilator the air is required to make two right angle changes of direction, while in the Swartwout it escapes with a single turn and through ample openings. As compared with the other type this ventilator swings with every change in the direction of the wind, and when air moves across the top of the ventilator the entire area of the opening is effective in allowing the air which has been induced to flow upward to escape. In the circular type it is said that a much smaller portion delivers air.

The main part of it is suspended on a tripod which revolves on ball bearings. The four louvres are constructed so as to close by gravity, thus rendering the entire ventilator dust and storm proof. The opening of the louvres is accomplished by pulling a chain from the inside of the building, and all four open simultaneously as they are hinged to the same rod. If desired the metal top of the ventilator can be replaced by glass, and the joints made waterproof by the application of cement. When this is done the ventilator acts as a combined ventilator and skylight, and closing the openings does not shut out the light, as the louvres are at one side of the glass top.

This ventilator is made of Toncan metal, which is rust resisting, and especially adapted for exposed sheet metal work. Its use was adopted to overcome the difficulties encountered in the use of ordinary forms of charcoal iron, galvanized steel and similar materials, and tests made have proved this new metal to be much more durable than the materials generally employed in the construction of ventilators.



The Swartwout Rotary Ball Bearing Ventilator, Made by the Ohio Blower Company, Cleveland, Ohio.

The Rowbottom Ball Bearing Disk Grinder

The disk grinding machine shown in Fig. 1 has been added to the line of the Rowbottom Machine Company, Waterville, Conn. It is built in three sizes, having disks of 12, 18 and 24 in. in diameter respectively. A departure from the standard practice in machines of the class is mounting the spindle in ball bearings, as shown in Fig. 2, the Hess-Bright type having been selected for the purpose. At the right end of the machine is a sliding table having two T slots for fastening angle plates or fixtures. The table is controlled by a hand lever, and an adjustable stop screw limits the inward motion to insure a uniform thickness of the finished product. The table has an angular adjustment to

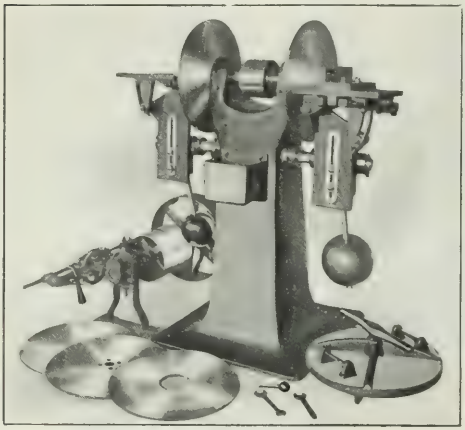


Fig. 1.—A New Ball Bearing Disk Grinder Built by the Rowbottom Machine Company, Waterville, Conn.

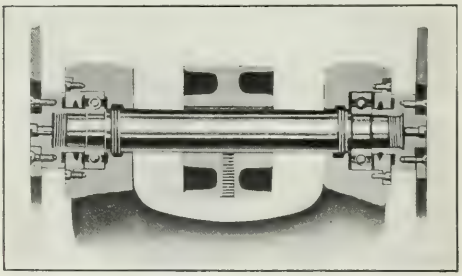


Fig. 2.—Section Through the Spindle, Showing Details of the Bearings.

the face of the disk, and the whole is balanced for a swinging motion across the face.

At the left end is a plain table with a lip on the front edge, which is square with the face of the disk, for convenience in grinding the ends of pieces square with the edges. This table also has the angular adjustment and the swinging motion. Either table may be fastened in a fixed position, and each is adjustable in a vertical direction to permit the greatest surface to be presented to the most effective cutting part of the disk. A water pot is attached to the machine for cooling pieces where heavy grinding is to be done.

The sectional view, Fig. 2, shows the construction of the spindle bearings. The ball bearings are connected with grease cups, which insures a supply of lubricant without attention over long periods.

Another Merchant Mill at the Lackawanna Steel Works.—The directors of the Lackawanna Steel Company, at their regular meeting, August 25, authorized the expenditure of about $800,000 for the immediate construction of an additional merchant mill at Buffalo. This is in keeping with the board's policy of further diversification of Lackawanna Steel Company's products, and will enable the company to distribute more of its steel among consumers in its natural territory. It is expected that the new mill will be ready for operation about July 1, 1911.

The Spartan Chain Pipe Wrench

The slant of the teeth on the jaws of the Spartan chain pipe wrench, made by the Drop Forging Company of New York, West Side avenue and Fisk streets, Jersey City, N. J., is the principal feature on which are based the claims for its excellent satisfaction in use. Otherwise it is constructed on the same general lines as the standard approved patterns of chain wrenches.

The slant of the teeth is plainly shown in Fig. 1 herewith, from which it will also be noticed that the inclination is opposite on the two parts of the jaws and that both are in directions which, when the wrench is used, tend to force the jaws against the handle instead of spreading them, reducing the strain on the bolt heads. The main purpose of the slant of the teeth is to give

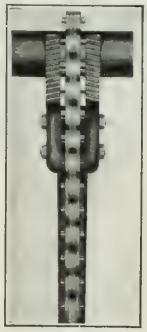


Fig. 1.



Fig. 2.

The Spartan Chain Pipe Wrench Made by the Drop Forging Company of New York.

an immediate bite on the pipe, even when the teeth have become worn. It gives directly the effect that is sought with a straight toothed pipe wrench when the user cramps or twists it so that the biting edge of the teeth is at an angle with the pipe, to secure a grip.

The two-bolt connection of the jaws to the handle, shown in Fig. 2, gives additional security to the jaws, besides permitting the use of the lower bolt for temporary repairs in the field if the upper bolt should break and another not be procurable. The Spartan wrench is drop forged throughout, even the handle. The chains are hand made, of a special steel of very high tensile strength, and the jaws are hardened and tempered to insure long life of the teeth. Six sizes of wrench are made, covering a range of pipe sizes from ⅛ to 12 in.

The Lynchburg Foundry Company, Lynchburg, Va., which has increased its capital stock from $500,000 to $600,000, is preparing plans for an addition to its works to be 35 x 160 ft., three stories, fireproof construction. No machinery is to be bought for this addition, as the company's equipment is already sufficient. The new building will not be contracted for, but the work will be done by the company by day labor. This company owns and operates the McWane Pipe Works and Radford Pipe Works, manufacturing cast iron pipe, and the Lynchburg Plow Works, manufacturing chilled and cast plows.

The Jefferson Swing Union

The Jefferson Union Company, Lexington, Mass., is making a new swing union, which consists of two 45-degree elbows with a spherical iron-to-iron seat ground to a perfect fit, the two ends being connected by a nut of either brass or malleable iron. These unions can be furnished at a slight extra cost with the Jefferson brass-to-iron seat, consisting of a narrow brass ring sunk in a channel and fitting it tightly. A lip of iron keeps the brass ring from coming in contact with the fluid, and also protects it from injury if the pipe is screwed in too far. A description of this seat appeared in *The Iron Age*, April 28, 1910, in connection with an illustration of the new style F union of this company. Where space is limited the swing union can be furnished with a special notched nut that can be set up with a bar of iron and a hammer instead of a wrench.

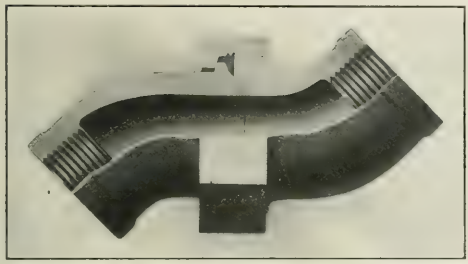


Fig. 1. The New Swing Union Made by the Jefferson Union Company, Lexington, Mass.

Fig. 1 shows the construction of this union, and Fig. 2 typical different angles at which the two parts may be made up to connect pipes. These vary from slightly offset parallel pipes to two pipes in the same plane at a right angle. It is possible in the intermediate positions to make connections between pipes at a great variety of angles and the joint is said to be always tight, regardless of the angle of connection, because of the spherical seat. Combining one end of the swing union with the regular fittings makes it almost a universal union, as it is then applicable to many kinds of odd connections and accomplishes the same results, it is claimed, with several less parts and in a shorter time than is possible by any other means.

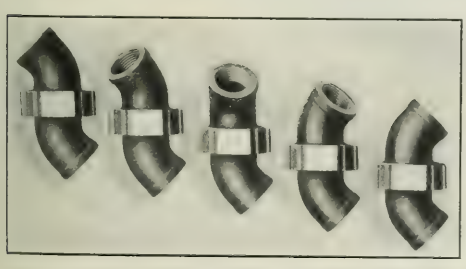


Fig. 2.—Different Positions in Which the Jefferson Swing Union Can Be Used.

These unions are especially applicable to the awkward lines followed by piping around stationary and marine gas engines, automobile engines, &c. With an iron-to-iron seat, these unions can withstand the high temperature of the exhaust from gas or gasolene engines, while the internal form, as shown in Fig. 1, is in such easy lines as to obviate back pressure. By using the Jefferson style F union and a notched nut, connections can be made in a very short time. The materials used in the manufacture of these unions are selected with special reference to their resistance to corrosion when being used in the neighborhood of salt water.

New Tools and Appliances

High Power Vertical Millers.—The Becker Milling Machine Company, Hyde Park, Mass., is building a line of new model high power vertical milling machines. In developing these machines the builder has strived to secure the highest possible efficiency, using the belt driven spindle, while for the heavier cuts recourse is had to the direct-connected back geared spindle. The machines are equipped with a constant speed driving pulley, and the changes in spindle speeds and feeds are secured through gear boxes.

Handy Portable Electric Drill.—The New York Electric Tool Company, 136 Liberty street, New York, has brought out a portable model in which a specially designed street railroad type of motor has been substituted for the light fan type generally used, and hardened steel and phosphor bronze gears have supplanted the cast iron ones. The body is made of steel which is thoroughly annealed to offer the highest possible magnetic permeability for the motor field, and at the same time acts as a protector for the working parts of the machine.

Automatic Tooth Rounder.—A new automatic tooth rounding machine has been placed on the market by Schuchardt & Shutte, New York City, which is designed to chamfer the teeth of gears for all classes of work, and more especially those used in sliding transmissions. The machine uses a profiling cutter carried in a spindle that can be swiveled to angles best suited for any gear tooth. Motion is transmitted to the spindle carriage by a box cam, which moves the spindle head crosswise on the cross rail. The arbor, carrying the gears to be cut, is reciprocated by a large indexing gear, in turn controlled by change gears which time it in accordance with the number of teeth in the gear that is being operated on. This motion is entirely automatic, and the operation is continuous from start to finish, thus dispensing with individual indexing. A single gear or several can be handled at once, and the teeth can be rounded on both sides at the one setting.

Universal Micrometer Caliper.—In the new model brought out by Gilbert, Harris & Co., Chicago, Ill., no effort has been made to retain the reading measurements of the ordinary micrometer, but simply to produce a tool with a wide range of application in producing duplicate parts or fits of various kinds where a known allowance can be made. The micrometer consists of a drop forged frame with a sliding rod in one end for quick adjustment and a micrometer screw in the other for fine adjustments and allowances. Both adjustments can be securely locked when set, and the ends of the rod and the screw are convex, so that it can be used on running work in a lathe the same as an ordinary pair of calipers or as an inside caliper.

Furniture for Machine Shops.—The Western Tool & Mfg. Company, Springfield, Ohio, has brought out several new pieces of furniture for use in machine shops. One of these is a toolmakers' vise stand, which is ordinarily used in the customary position, but if desired to hold work in unusual positions a side attachment is clamped in the hole of the column and the supporting stem of the vise held at any desired angle. Other pieces include a compact rack for holding 12 different sizes or kinds of steel and two forms of shop stands. One of these is designed to be used in connection with lathes, and the lower shelf is arranged to provide a convenient place for change gears and dogs, while two shelves are provided for holding the work, and there is a drawer for small tools or gauges. The other stand is of the portable type and can be conveniently moved to any part of the shop. It is frequently used for holding work after it is operated on by one machine and the whole stand is then moved to the next machine for further operations.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:
1 to 1⅞ in. round and square ... ₩ lb 1.90¢
1½ to 4 in. x ⅜ to 1 in. ...
1½ to 4 in. x ¼ to 5-16 ... ₩ lb 2.10¢
Rods—⅜ and 11-16 round and square ... ₩ lb 2.10¢

Angles:

	Cts ₩ lb
3 in. x 3½ in. and larger	2.10¢
3 in. x 3 1-16 in. and less than 3½ in.	2.35¢
3½ to 2½ in. x 3 in.	2.35¢
1½ to 2¼ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.20¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ⅛ in.	2.40¢
¾ x ⅛ in.	2.50¢
⅝ x ⅛ in.	3.75¢
½ x 3-32 in.	4.35¢

Tees:

1 in.	2.65¢
3/4 in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Zees—1½ to 6 x 5-16 to No. 8	2.70¢
Burden's "Best" Iron, base price	4.75¢
Burden's "H B & S" Iron, base price	2.95¢
Norway Bars	6.00¢

Merchant Steel from Store—

per ₩ lb

Bessemer Machinery ... 1.90¢
Cast Cast Steel, Tire and Sleigh Shoe ... 2.50@3.00¢
Best Cast Steel, base price in small lots ... 7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No 16	₩ lb 2.90¢	3.00¢
Nos. 18 to 21	₩ lb 2.95¢	3.10¢
Nos. 22 and 24	₩ lb 3.05¢	3.20¢
No. 26	₩ lb 3.10¢	3.30¢
No 28	₩ lb 3.20¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ... ₩ lb 12 @14½¢
Patent Planished, W. Dewees Wood ... ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos 11 to 16 ... ₩ lb 3.20¢
Nos 22 to 24 ... ₩ lb 3.55¢
No. 26 ... ₩ lb 3.75¢
No 28 ... ₩ lb 4.10¢
No 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos 22 and 24 ... ₩ lb 5.75¢
No 26 ... ₩ lb 6.25¢
No 28 ... ₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24 ... ₩ 100 sq. ft.	$3 85	4.80
No 26 ... ₩ 100 sq. ft.	3.50	4.40
No. 28 ... ₩ 100 sq. ft.	3.00	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IC, 11 x 24 ... $8.35
IX, 11 x 24 ... 7.60
A. Charcoal:
IC, 14 x 20 ... $5.10
IX, 14 x 20 ... 6.50

American Coke Plates—Bessemer—
IC, 14 x 20 ... 97 ½ ... $4.10
IX, 14 x 20 ... 5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb coating ... $8.50
IX, 20 x 28 with an 8 lb coating ... 10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908 ... 14½¢ ₩ lb

Brass Wire—

List August 1, 1908 ... 14½¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz quantity lots) ₩ lb 18 ¢
Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot
Sheet Copper Polished over 20 in wide, 2¢ ₩ square foot
Planished Copper, 1¢ ₩ square foot more than Polished

METALS—

Tin—

Straits Pig ... ₩ lb 36 @36½¢

Copper—

Lake Ingot ... ₩ lb 14¾@15 ¢
Electrolytic ... ₩ lb 14½@14¾¢
Casting ... ₩ lb 14¼@14½¢

Spelter—

Western ... ₩ lb 6¼@6½¢

Zinc.

No 9, base, casks ... ₩ lb 8 ¢ Open ... ₩ lb 8½¢

Lead.

American Pig ... ₩ lb 5 @5¼¢
Bar ... ₩ lb 6⅜@6½¢

Solder.

½ & ½, guaranteed ... ₩ lb 22 @22½¢
No. 1 ... ₩ lb 19 @19¼¢
Refined ... ₩ lb 17¼@17½¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₩ lb .@10¢
Hallett's ... @10¢
Other Brands ... @9½¢

Bismuth—

Per. lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ... 34¢
Rods & Wire ... Base Price 31¢
Sheets ... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible ... ₩ lb	10.75@11.-
Copper, Heavy and Wire ... ₩ lb	10.50@10.
Copper, Light and Bottoms ... ₩ lb	9.50@ 9.7
Brass, Heavy ... ₩ lb	7.25@ 7.5
Brass, Light ... ₩ lb	5.75@ 6.0
Heavy Machine Composition ... ₩ lb	9.50@ 9.7
Clean Brass Turnings ... ₩ lb	7.00@ 7.-
Composition Turnings ... ₩ lb	8.25@ 8.5
Lead, Heavy ... ₩ lb	.@ 3.5
Lead, Tea ... ₩ lb	.@ 3.-
Zinc Scrap ... ₩ lb	.@ 3.-



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THE IRON AGE

Established 1855

New York, September 8, 1910

Vol. 86: No. 10

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Down to the Rate of July, 1909

Pig Iron Output Now 22.5 Per Cent. Less Than in February

The reduction in pig iron output in August was insignificant, the coke and anthracite furnaces producing 2,106,847 tons, against 2,148,442 tons in July. On September 1 the 243 furnaces in blast had a daily capacity of 66,468 tons, against 253 furnaces with 68,368 tons daily capacity on August 1. Production on September 1 was at the rate of about 24,500,000 tons a year for all kinds of iron, charcoal iron included, whereas the record outputs were 25,781,361 tons in 1907 and 25,795,471 tons in 1909.

Our pig iron production in August was smaller than in any month since July, 1909. The list of active furnaces at the opening of this month was 70 less than the maximum of 313 reached February 1, and the yearly rate of production was 7,150,000 tons less than the February rate of 31,650,000 tons—a falling off of 22.5 per cent. in seven months.

As to the condition of stocks, definite information is lacking. In western Pennsylvania the Mahoning and Shenango valleys and on the south shore of Lake Erie there was an increase in August; an increase also in Virginia, but a decrease in Alabama, while the limited stocks in eastern Pennsylvania remained about stationary. The steel works companies lowered their stocks somewhat. It would seem that there is still a call for curtailment in production.

The pig iron trade is not building high hopes on the activity developed in spots in the past two weeks. The prices realized were not encouraging, though it is recalled that buying movements have sometimes followed just such cuts. The basis of sales for 1911 is the chief matter of moment now. Sellers want from 50c. to $1 advance from the low level; but buyers are not ready to pay an advance. There are indications that common ground may be found for 1911 buying on a pretty liberal scale before the end of the month. In the Chicago district over 100,000 tons is involved in inquiries for the first quarter and first half of next year.

Several sales of basic iron have been made, including 10,000 tons in northern Ohio for shipment to Chicago, and 5000 tons at Philadelphia, the latter somewhat below $15. At St. Louis one steel casting interest has withdrawn an inquiry for 10,000 tons of basic iron and another has come into the market for 5000 tons.

Some little interest has been shown in sheet bars in the Central West and offers of Bessemer sheet bars at $25 at maker's mill are reported.

In finished materials manufacturing and consumption are in close relation, conditions being plainly against contracting in a large way. The recent low prices on pig iron have had their effect on finished lines. While steel manufacturers are showing no special eagerness to take business as the tonnage on their

order books diminishes, the policy of buyers rests on the plain indications that any higher prices are an indefinite distance in the future.

Some good export business in rails is pending and is expected to be closed shortly. In other products also the export trade is quite satisfactory. The Grand Trunk is in the market for 10,000 tons of rails.

In structural work the chief new item is 5100 tons of bridges for the Oregon Trunk Line, taken by the Pennsylvania Steel Company. At Cleveland the Cleveland Electric Illuminating Company's building, 3100 tons, brought out sharp competition.

The Portland, Maine, water pipe contract, on which bids are to be opened next Monday, will call for 12,000 tons of 42-in. cast iron pipe and 6300 tons of 48-in. riveted steel pipe.

Thus far the only increase in tin plate output since the strike against the leading producer was declared off is at Elwood, Ind. Shipments on accumulated orders are very heavy.

Labor Day, 1910

The celebrations of Labor Day throughout the country on Monday were under conditions not greatly different from those of similar anniversaries in other years. The record of the past year shows little indication of any important shifting of position by organized labor or by those who have had occasion to resist its aggressions. In general the year's developments have been favorable to wage earners. Wage advances have been granted by hundreds of employing companies, many of these being made voluntarily, while in other cases, particularly in the railroad service, demands were made which were granted in whole or in part. The strike of the Philadelphia street car men brought out anew the injustice and futility of the sympathetic strike, and latterly the Columbus, Ohio, traction strike has furnished another instance of failure to enforce the closed shop. On the other hand, the Buck's Stove & Range Company settlement with the unions is the one outstanding example, in the labor history of the year, of the restoration of the closed shop régime in a plant which for several years had been classed among open shops. It is probable, however, that too much significance has been given this settlement, so far as the foundry is concerned, in view of the much smaller number of skilled molders now required since the introduction of molding machines. In the iron trade the event of the year has been the formal calling off of the strike in the mills of the American Sheet & Tin Plate Company, marking the end of labor union regulation of any operation of the United States Steel Corporation's subsidiaries.

Progress has been made in the year in the voluntary establishment of added benefits for employees. The pension and accident compensation systems which the United States Steel Corporation has announced, and those of the International Harvester Company and other corporations, represent an outlay of hundreds of thousands of dollars a year. In addition, new employers' liability legislation has taken from employees a certain measure of risk they have borne heretofore and put it upon the employer.

In spite of these new assets of labor which the past year has yielded, the burden of much of the comment on the labor situation that has come out in the past week is the hard lot of wage earners in the United States. Little is said of the high wage scale now ruling in most employments, or of the fact that this is by far the best labor market in the world. The aid of the pulpit has been enlisted on the side of the unions. Their campaign of violence and coercion against men who do not join them is kept in the background, and their lawless aggressions are either justified as inevitable features of a state of war which is assumed to exist when a strike is called or excused as unfortunate episodes in the general movement they are credited with directing in behalf of human betterment.

No feature of labor day or "labor Sunday" oratory is more deplorable than that which assumes a natural hostility between employers and employees. No real progress will be made toward the solution of the labor problem until more emphasis is put upon the community of interest between proprietors and wage earners. The fanning of animosities between men of large means and men whose chief or only capital is manual skill or other ability to earn a daily wage is bound to drive farther apart those who must co-operate if the country is to have any real industrial prosperity. It is most unfortunate, at a time when the country is seeking an opening for another forward movement in industry, that political issues should be made of inequalities in distribution of wealth, as though by the outcome of a single election all that is at fault, or assumed to be at fault, could be set right once for all. What is wanted is not the marshaling of reasons why industrial workers should enter upon a crusade against corporations and why the present social order should be wrenched into alignment with the plans of reformers of the violent type; not the sowing of discord and discontent. The great need to which this year's Labor Day developments point most distinctly is a willingness to recognize recent progress in the improvement of labor conditions and in the spirit of co-operation, not of revolution; to work for peace and friendliness rather than play upon passion and discontent.

A Weakness in Selling Machinery

A manufacturer who uses a large amount of metal working machinery remarked recently that machinery builders frequently fail in their efforts to secure the best methods of handling work in connection with machines that are installed by them. The designer bends his entire energies upon creating a machine to accomplish a certain range of production. He puts it up to the user to ascertain the best methods of handling the work in the machine. This, however, is not always accomplished.

Some companies employ experts whose duties include the task of attacking problems such as these, for the benefit of their salesmen as well as their customers, but probably in the majority of cases the designer ceases his best efforts with the completion of the machine. This fact is occasionally brought to light in the attempt of a salesman to interest a manufacturer in a new type of tool. He quotes a rate of production for a certain work, in the belief that he is promising the customer a large saving over his existing methods. He is then surprised to learn that the rate of production he promises is not nearly so large as is actually being done. The machine is a powerful one. Its cutting ability and accuracy are unquestioned. Its capacity is in reality well in excess of that which the manufacturer quotes back at the salesman for the machines already in use. But the latter does not know the facts, because of his failure to understand that the high rate is due

not so much to the equipment but to the methods employed in handling the work to and from the machine. In manufacturing this counts for a very great deal, as every one familiar with the question understands fully. The salesman should assist the customer in increasing production, not only by means of the machines which he has for sale but in the way of doing work with the machines. Doubtless every salesman would promptly assert that this is exactly what he is always attempting to do. In a great many cases, however, he does not succeed, because he does not know how. He may do the best he can, but he would be at much greater advantage should he be assisted by the results of expert investigation conducted by members of the engineering forces of the company which he represents.

In the case of a new type of milling machine a salesman attempted to interest a manufacturer of agricultural implements, and when asked the output which might be expected stated a figure which was about one-quarter of the actual production with a special machine built by the user and containing few of the new principles of design. It was a serious mistake. Before estimating the output the job should have been studied in all its phases, including the handling of the work.

A Factory Fallacy

In the endeavor to reduce production costs there are two courses open besides that of cheapening the raw material. One of these is to increase the rate of production; to make greater the volume of work flowing through the plant. To this end machines are speeded up to and often beyond the limit, the defense being that, if the life of the machine is so many million pieces, what difference if it is replaced a few years sooner than its slower cousin? To this end also we have the introduction of complications, as, for instance, enabling one machine to accomplish in one stroke what two did before, night and day shifts, &c. Increased production obtained thus usually means considerable investment for new equipment, the funds being obtained often by the deferring of dividends or the acquisition of additional capital. Undertaken too precipitately, it has been known to mean actual costs much greater than estimated; with the best judgment available, it usually possesses in varying degrees the uncertainty of a gamble. This is in addition to the money cost.

The second method by which production cost may be reduced is to cheapen the labor items. This is usually done either by cutting wages or by employing a cheaper grade of help. The results of both of these plans show up favorably at the start in the calculated cost, but there are many who are coming to doubt the ultimate benefit of following such a policy. Where wage cutting or the reduction of the price allowed per piece is resorted to, there will be found to exist a general reluctance on the part of the work people to do their utmost, which puts such a shop in the position of a motor car that misses fire every fourth stroke. And where a cheaper grade of labor is employed, with the same manufacturing conditions, the saving in prime cost is very often more than offset by decreased production, inferior product, spoiled work and an increased overhead expense due to the inferior general intelligence of the working force. Where a shop manager may take the utmost pains to use only the best of material and the latest types of machinery, he is often guilty of the inconsistency of employing inferior help. It is one of the most widespread accepted fallacies of the present.

The auditor of a large manufacturing concern in the East put the matter of rate cutting in a very clear way recently. He was telling how in one of Cæsar's campaigns that ruthless warrior punished the entire garrison of a conquered village by cutting off the right hand of each man at the wrist. The men weren't much good after that. What you want in your factories and mills is not only men with all their faculties alive, but you want those right hands of theirs to be the most willing and skillful in the land—at least, that is what you ought to want. And to get such men, or to make such men out of the members of your present force, it will not be necessary for you to spend thousands for new machinery and buildings; it will not be necessary for you to spend one cent; in fact, it is claimed by students of these matters that it will put money in your pocket at the very first step—the "company" and the "help" will profit alike.

The two steps to be taken are, first, to encourage the workmen by rewarding efficiency, and, second, to fill your shops with the best grade of help that will come to you. Guarantee that no cuts in wages will be made where a man's efficiency enables him to earn more than his fellows. Do not be hoodwinked into believing that you are a gainer in the long run by a policy which takes the very heart out of your workers. It is not your custom to cut a clerk's wages when he proves capable of greater things. You usually raise him and get a better man for the slight outlay.

The Panama Canal and South American Trade

The completion of the Panama Canal is no longer a remote event. The time is approaching so near that sharp rivalry has sprung up among several cities, each of which desires to hold an international exposition to celebrate the completion of this great undertaking, and to direct attention to the part that such cities expect to play in the enjoyment of the increased commerce and general business which will follow the diversion of a large portion of the world's shipping through this short cut to the west coast of America. It seems opportune, therefore, to call the attention of our manufacturers to the necessity of making preparations for enjoying some of the increased trade with South American countries, for which this canal is primarily intended.

Many manufacturers who are in a good position to handle South American trade are expecting that the mere opening of the Panama Canal will completely revolutionize their export business, yet probably only a very few are doing anything toward laying a foundation for this expected foreign trade. This appears to be the case especially with regard to manufacturers of machine tools, who, if they are doing anything, are working along this particular line in but a desultory fashion. Most of them appear to have the vague idea that after the canal is in operation orders will come to them almost without the asking. It is needless to say that those who are entertaining this belief will undoubtedly be disappointed. The time is at hand when there should be a decided awakening as to the necessity of laying a good foundation for the development of the business expected to follow the opening of the canal.

Pig Iron Production

A Small Decrease in August

Capacity Active September 1 Represents About 24,500,000 Tons a Year

Our September 1 returns from the blast furnaces show that production was reduced very little in August, the total of coke and anthracite iron being 2,106,847 gross tons, as compared with 2,148,442 tons in July—a falling off of but 42,000 tons. The number of furnaces in blast September 1 was 243, with a capacity of 66,469 tons a day, a reduction of 10 in the number of active furnaces in the month and of 1900 tons a day in capacity.

The small reduction in output in August was more contributed to by merchant furnaces than by steel works furnaces. The former produced 21,429 tons a day, as against 22,122 tons in July, and the latter 46,534 tons, as against 47,183 tons in July. The daily rate for all furnaces in August, 67,963 tons, was the smallest for any month since July, 1909. Production on September 1 was at the rate of about 24,500,000 tons a year (estimating the production of charcoal iron at about 30,000 tons a month), whereas the output in 1907 was 25,781,361 tons and in 1909 25,795,471 tons.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with August, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
August, 1909	51,354	21,192	72,546
September	53,361	24,146	79,507
October	57,097	26,789	83,886
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,876	27,740	85,616
March	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963

August Output by Districts

The table below gives the production of all coke and anthracite furnaces in August and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)	August. (31 days)
New York	166,307	171,461	163,575	162,901	158,666
New Jersey	29,092	22,973	18,443	18,962	19,177
Lehigh Valley	64,910	70,344	66,944	61,014	63,878
Schuylkill Val.	61,084	65,725	60,349	61,340	64,926
Lower Susquehanna and Lebanon Val.	71,694	65,667	60,315	60,043	54,442
Pittsburgh dis.	543,531	510,514	483,909	502,711	510,352
Shenango Val.	124,440	120,301	130,290	113,280	113,500
West. Penn.	141,246	144,578	132,344	129,786	116,117
Md. Va. and Kentucky	77,032	82,071	82,181	75,051	76,477
Wheeling dis.	106,736	94,217	76,166	73,164	68,341
Mahoning Val.	225,588	218,243	208,988	215,282	211,575
Central and North. Ohio.	181,805	144,344	145,393	139,627	122,960
Hocking Valley, Hanging Rock and S.W. Ohio.	48,264	43,290	41,521	30,163	32,490
Mich., Minn., Mo., Wis., Col., Wash.	75,802	71,588	68,051	65,863	66,096
Chicago dis.	351,272	358,509	328,953	264,136	258,145
Alabama	173,071	165,937	160,970	143,313	140,015
Tenn., Georgia and Texas	41,889	40,418	37,086	31,806	29,690
Totals	2,483,763	2,390,180	2,265,478	2,148,442	2,106,847

Capacity in Blast September 1 and August 1

The following table shows the daily capacity of furnaces in blast September 1 and August 1. These figures are based largely on the performance of the furnaces in August and July:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks	Sept. 1. Number in blast.	Sept. 1. Capacity per day.	August 1. Number in blast.	August 1. Capacity per day.
New York:					
Buffalo	16	14	4,545	14	4,635
Other New York	7	3	582	3	537
New Jersey	8	3	620	3	612
Spiegel	2	..	....	..	....
Pennsylvania:					
Lehigh Valley	23	12	1,910	12	1,895
Spiegel	3	2	151	2	160
Schuylkill Valley	16	7	1,934	8	2,063
Low. Susquehanna	7	5	928	5	935
Lebanon Valley	10	6	828	7	932
Pittsburgh dis.	50	40	15,524	42	16,010
Spiegel	3	2	366	2	302
Shenango Valley	20	12	3,560	12	3,310
West. Pennsylvania.	27	16	3,840	17	4,280
Maryland	4	4	965	4	973
Wheeling district	14	6	2,205	7	2,360
Ohio:					
Mahoning Valley	23	18	6,483	19	6,575
Central and North.	22	10	3,505	12	4,105
Hocking Val., Hanging Rock and S. W. Ohio	15	8	945	8	887
Illinois and Indiana	31	21	8,230	20	8,245
Spiegel	3	1	240	2	277
Michigan, Wisconsin and Minnesota	10	6	1,010	6	1,075
Colorado, Missouri and Washington	7	4	1,080	5	1,170
The South:					
Virginia	23	11	1,290	11	1,360
Kentucky	5	1	195	1	125
Alabama	46	22	4,585	21	4,510
Tenn. and Georgia	20	9	947	10	1,035
Totals	415	243	66,468	253	68,368

Among furnaces blown out in August were Buffalo Union B in New York, one Bird Coleman in the Lebanon Valley, one Isabella, Soho and one Monongahela in the Pittsburgh district, Sharon in the Shenango Valley, one Cambria in western Pennsylvania, No. 2 Ashland in Kentucky, one Mingo in the Wheeling district, Cherry Valley in the Mahoning Valley, two Lorain in northern Ohio, Belfont in the Hanging Rock district, one Union in the Chicago district, Zenith in Minnesota, Missouri at St. Louis, Helen in Tennessee.

The list of furnaces blown in in the month includes Buffalo Union C in New York, one Eliza in the Pittsburgh district, Hall in the Shenango Valley, Norton in Kentucky, Marting in the Ironton district, one Calumet at South Chicago, one Mayville in Wisconsin, one Pioneer in Alabama.

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production. 1908.	1909.	1910.	Spiegeleisen and ferromanganese. 1909.	1910.
January	664,415	1,117,823	1,773,201	12,325	19,538
February	745,802	1,073,363	1,620,539	10,046	21,296
March	841,502	1,140,553	1,739,212	23,743	25,591
April	725,548	1,093,092	1,669,898	22,478	22,304
May	759,674	1,256,448	1,619,283	20,834	26,529
June	717,689	1,365,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,991	1,442,572	22,313	25,756
September	933,514	1,660,839	.....	28,148	.....
October	996,487	1,769,904	.....	25,384	.....
November	1,041,167	1,689,994	.....	23,376	.....
December	1,090,339	1,768,799	.....	20,791	.....

Pig Iron Production and Prices Plotted

The fluctuations in pig iron production from January, 1907, to the present time are shown graphically in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

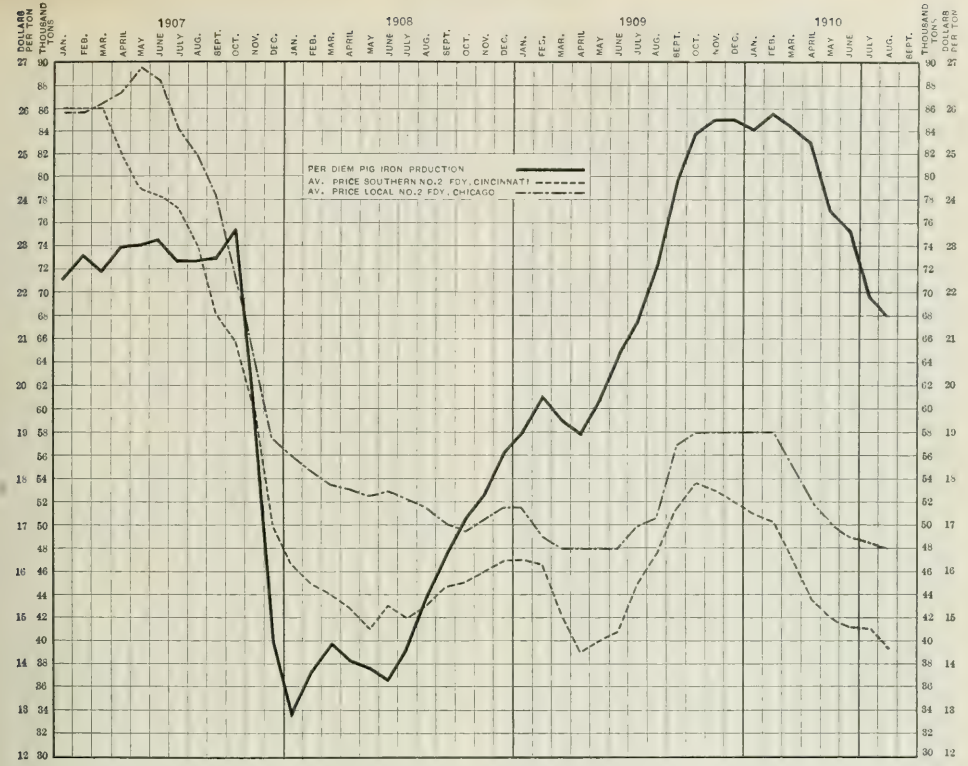


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to September 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron Delivered at Chicago.

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	39,619	59,232	84,459
April	73,885	38,289	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	36,444	64,656	75,516
July	72,763	39,287	67,793	69,305
August	72,594	43,851	72,546	67,963
September	72,783	47,300	79,507	.....
October	75,386	50,554	83,856	.....
November	60,937	52,595	84,917	.....
December	39,815	56,158	85,022	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	....	....
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	....	....
Nov.	19.50	20 66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

The Record of Production

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,250,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	.....
October	2,336,972	1,567,198	2,599,541	.....
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

The Jamison Coal & Coke Company and Its Miners

In connection with the strike of the coal miners in the Latrobe, Connellsville and Greensburg fields in western Pennsylvania, which has been going on for some months, many sensational and untrue reports have been printed in the daily press, which put a number of the coal operators in those districts in a bad light. One of these reports was to the effect that all the coal companies operated company stores and that the earnings of the miners were nearly all absorbed by such stores, leaving practically no money for the miners when their store bills were paid. Such reports have been printed regarding the Jamison Coal & Coke Company, which operates stores with most of its coal mines; these mines being isolated from towns, and being a convenience for the men. This company quotes from its records that for the first six months of 1910 the wages of the miners employed at its various coal mines amounted to $782,049.55, while the deductions by the company for rents, store orders, fuel and tool sharpening amounted to $227,247.11, leaving the sum of $554,802.44, which was paid in cash by the company to its miners. In other words, for the period noted above, the Jamison Coal & Coke Company paid out in cash more than double the deductions made from wages of its miners for all purposes.

Furnace C of the Buffalo Union Furnace Company, Buffalo, N. Y., which has been idle for several months, was blown in August 29. Furnace B was blown out for repairs August 28.

Pig Iron Production

A Small Decrease in August

Capacity Active September 1 Represents About 24,500,000 Tons a Year

Our September 1 returns from the blast furnaces show that production was reduced very little in August, the total of coke and anthracite iron being 2,106,847 gross tons, as compared with 2,148,442 tons in July—a falling off of but 42,000 tons. The number of furnaces in blast September 1 was 243, with a capacity of 66,469 tons a day, a reduction of 10 in the number of active furnaces in the month and of 1900 tons a day in capacity.

The small reduction in output in August was more contributed to by merchant furnaces than by steel works furnaces. The former produced 21,429 tons a day, as against 22,122 tons in July, and the latter 46,534 tons, as against 47,183 tons in July. The daily rate for all furnaces in August, 67,963 tons, was the smallest for any month since July, 1909. Production on September 1 was at the rate of about 24,500,000 tons a year (estimating the production of charcoal iron at about 30,000 tons a month), whereas the output in 1907 was 25,781,361 tons and in 1909 25,795,471 tons.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with August, 1909, is as follows:

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	Steel works.	Merchant.	Total.
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December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,876	27,740	85,616
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May	52,235	24,867	77,102
June	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963

August Output by Districts

The table below gives the production of all coke and anthracite furnaces in August and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	April. (30 days)	May. (31 days)	June (30 days)	July. (31 days)	August (31 days)
New York	166,307	171,461	163,575	162,901	158,666
New Jersey	20,062	22,375	18,446	18,962	19,177
Lehigh Valley	64,910	70,344	66,944	61,014	65,878
Schuylkill Val.	61,084	65,725	60,349	61,340	64,926
Lower Susquehanna and Lebanon Val.	71,694	65,667	60,315	60,043	54,442
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Shenango Val.	124,440	120,301	130,290	113,280	113,500
West. Penn.	141,246	144,578	132,344	129,786	116,117
Md., Va. and Kentucky	77,032	82,071	82,181	75,051	76,477
Wheeling dis.	106,736	94,217	76,166	73,164	68,344
Mahoning Val.	225,588	218,243	208,988	215,282	211,575
Central and North. Ohio.	181,805	144,344	145,393	139,627	122,960
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Totals	2,483,763	2,390,180	2,265,478	2,148,442	2,106,847

Capacity in Blast September 1 and August 1

The following table shows the daily capacity of furnaces in blast September 1 and August 1. These figures are based largely on the performance of the furnaces in August and July:

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Spiegel	2	..	....	..	....
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Spiegel	3	2	151	2	160
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Michigan, Wisconsin and Minnesota	10	6	1,010	6	1,075
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Totals	415	243	66,468	253	68,368

Among furnaces blown out in August were Buffalo Union B in New York, one Bird Coleman in the Lebanon Valley, one Isabella, Soho and one Monongahela in the Pittsburgh district, Sharon in the Shenango Valley, one Cambria in western Pennsylvania, No. 2 Ashland in Kentucky, one Mingo in the Wheeling district, Cherry Valley in the Mahoning Valley, two Lorain in northern Ohio, Belfont in the Hanging Rock district, one Union in the Chicago district, Zenith in Minnesota, Missouri at St. Louis, Helen in Tennessee.

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June	717,689	1,365,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,991	1,442,572	22,313	25,756
September	933,514	1,660,829	.....	28,148	.....
October	996,481	1,769,094	.....	25,384	.....
November	981,167	1,689,994	.....	23,376	.....
December	1,090,339	1,768,799	.....	20,791	.....

Pig Iron Production and Prices Plotted

The fluctuations in pig iron production from January, 1907, to the present time are shown graphically in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:



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October	75,386	50,554	83,856	.....
November	60,937	52,595	84,917	.....
December	39,815	56,158	85,022	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.96	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	....	....
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	....	....
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

The Record of Production

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,250,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	.....
October	2,336,972	1,567,198	2,599,541	.....
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

The Jamison Coal & Coke Company and Its Miners

In connection with the strike of the coal miners in the Latrobe, Connellsville and Greensburg fields in western Pennsylvania, which has been going on for some months, many sensational and untrue reports have been printed in the daily press, which put a number of the coal operators in those districts in a bad light. One of these reports was to the effect that all the coal companies operated company stores and that the earnings of the miners were nearly all absorbed by such stores, leaving practically no money for the miners when their store bills were paid. Such reports have been printed regarding the Jamison Coal & Coke Company, which operates stores with most of its coal mines; these mines being isolated from towns, and being a convenience for the men. This company quotes from its records that for the first six months of 1910 the wages of the miners employed at its various coal mines amounted to $782,049.55, while the deductions by the company for rents, store orders, fuel and tool sharpening amounted to $227,247.11, leaving the sum of $554,802.44, which was paid in cash by the company to its miners. In other words, for the period noted above, the Jamison Coal & Coke Company paid out in cash more than double the deductions made from wages of its miners for all purposes.

Furnace C of the Buffalo Union Furnace Company, Buffalo, N. Y., which has been idle for several months, was blown in August 29. Furnace B was blown out for repairs August 28.

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Bars.—New buying in both iron and steel bars is light, but specifications against contract received by the mills in August were fairly satisfactory and heavier than in July. The railroads are not placing many new orders for iron bars and the mills rolling iron bars are badly in need of tonnage. It is said that the Carnegie Steel Company will start work in a short time on its new steel bar mills to be erected at Girard, Ohio. The steel for these mills will be shipped from the Bessemer and open hearth steel plants of the company at the Ohio Works, Youngstown. We quote steel bars at 1.40c. in large lots and 1.45c. in small lots, while iron bars are ruling at about 1.45c., Pittsburgh.

Spelter.—The market continues firm and prime grades of Western are quoted to-day at about 5.20c., East St. Louis, or 5.32½c., Pittsburgh.

Hoops and Bands.—There is not much new buying in either hoops or bands, but specifications against contracts are being received by the mills at a fairly satisfactory rate. We quote hoops at 1.50c. to 1.55c. and bands at 1.40c. to 1.45c., the latter carrying extras as per the steel bar card of September 1, 1909.

Spikes.—New demand for railroad spikes from the railroads is light, and is only in small lots to cover current needs. The demand for small railroad and boat spikes is fair, but all the spike mills could take care of a good deal more business if they had it. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—There is a fair run of new orders for rivets, but mostly in small lots to cover current needs, consumers not caring to anticipate.

Shafting.—The new demand for shafting is only fair, and specifications against contracts from automobile makers and other large consumers are not as heavy as they were some time ago. Regular discounts on shafting remain at 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Specifications against contracts for wire products received by the leading interest in August showed an increase of about 700 tons a day, as compared with July, and other makers of wire and wire nails report a very substantial increase in orders booked and sent to the mills in August over the previous month. At the same time it is true that the wire trade is not showing as heavy a volume of business as expected, consumers still being largely inclined to place orders only for small lots to cover current needs. The demand for cut nails is fair, but is mostly in small lots, jobbers and consumers not desiring to anticipate requirements. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—The order for 23 miles of 16-in. pipe for the Manufacturers' Light & Heat Company has been placed with a local interest, while the Monongahela Natural Gas Company has placed contracts for 44,000 ft. of 10-in. pipe and 7300 ft. of 12-in. The Ohio Fuel Supply Company has placed an order with a local interest for 3½ miles of 6-in. pull weight steel line pipe. It is probable that the inquiry of the Everett-Busch Syndicate, which proposes to pipe natural gas from Shreveport, La., to St. Louis, and which calls for nearly 400 miles of large pipe, will go over into next year. It is so late now that it is not desired to start work on this large project at this time. The general demand for merchant pipe is showing some betterment, and the pipe mills refer to the present condition of the pipe trade as being fairly satisfactory. Discounts on iron and steel pipe now in effect are printed on a previous page.

Boiler Tubes.—There is a fair demand for locomotive tubes from the railroads, but it is not nearly as large as the mills would like to have it. The new demand for merchant tubes is also light, and discounts on both locomotive and boiler tubes printed on a previous page are still more or less shaded.

Coke.—The new demand for both furnace and foundry coke is quiet, and no large inquiries for blast furnace coke are in the market. Several furnace interests have not yet covered their full requirements for the remainder of this year, but are buying from month to month. A contract has just been closed by the Whitney-Kemmerer Company, Oliver Building, Pittsburgh, for the entire output of the Dunlap-Connellsville Coke Company for ten months, beginning September 1. About 60,000 tons of furnace coke are involved, the output of the works being about 6000 tons per month. Prices are on a sliding scale, based on the average monthly prices of basic pig iron. The output of coke in the Upper and Lower Connellsville regions last week was 361,913 tons, a decrease over the previous week of nearly 4000 tons. Standard grades of blast furnace coke for prompt shipment are held at about $1.60 to $1.65 per net ton at oven, and about $1.75 to $1.80 on contracts for forward delivery. Best grades of 72-hour foundry coke are held at $2.15 and up to $2.50 per net ton at oven.

Iron and Steel Scrap.—There is not much improvement to note in the demand, consumers still pursuing the policy of buying only such scrap as is actually needed, not being convinced that present prices will be maintained. The embargo on scrap routed for Monessen, Pa., has been lifted. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.25 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	11.50 to 11.75
Low phosphorus melting stock	17.50 to 18.00
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.75 to 8.00
Machine shop turnings	9.25 to 9.50

Chicago

FISHER BUILDING, September 7, 1910.—(*By Telegraph.*)

The differences between Illinois coal operators and miners remain unsettled at this writing. Industrial buyers of coal have become keenly interested in the situation, as screenings are so scarce that lump coal is being crushed for use in modern power plants. An indirect result of the situation will prove serious later on. The West is bare of stocks of coal, both for industrial and domestic use, and when the Illinois miners resume, after being closed since April 1, the railroads will be congested with the movement of coal which will have to be given preference over other freight. This will delay and congest the movement of industrial freight and aggravate the car shortage which is generally expected during the winter. At the present time complaints are becoming more common among shippers of delay in getting cars for loading. A similar condition prevailed in the fall of 1906 and was followed by a very severe car shortage. No important inquiries for cars have been reported from Western roads the past week and the continued absence of railroad buying is the only backward feature in the iron and steel market. Business is good in wire products, sheets, merchant steel and other lines of general consumption. Inquiries have been received, however, for standard rails for delivery this year amounting to 30,000 tons, and several roads are preparing their orders for next year for large tonnages. There is also evidence that the malleable foundries are getting more railroad business, as they are buying railroad malleable and steel scrap on a more liberal scale than for several months. The bar iron mills are also getting more liberal orders, one railroad having purchased 300 tons last week. The market for old material shows more life and prices are firmer but have not advanced to any marked extent.

Pig Iron.—The inquiry for pig iron has broadened out considerably during the past week. It would be difficult to estimate the amount of iron involved in inquiries for the first quarter and first half of 1911, but it would easily foot up 100,000 to 200,000 tons. A majority of the buyers throughout the West have begun to show keen interest in prices for 1911. Their inquiries, however, have been received coldly by the furnace interests. On both Northern and Southern iron furnaces are willing to accept business for first quarter at an advance of 50c. over the price for last quarter, but the buyers have not reached a point where they will consider paying higher prices, and there has been no actual increase in the melt or the volume of business of foundries to force action. For the time being buyers are not taking as much interest as formerly in Southern iron for prompt or early shipment. It is believed that foundries in Chicago territory are generally covered to the end of the year on Southern iron. It is estimated that stocks of iron at Southern furnaces, including warrant iron, increased since last April and amount to 300,000 tons. The refusal of furnaces to quote beyond December is explained by the argument that it may be good business policy to sell iron at cost from furnace stocks or current production, but they cannot afford to make forward contracts at prices which do

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not show a profit. The Northern furnaces in this territory have taken the same position. They claim that current prices are down to cost and they can only afford to sell on the present basis for early deliveries. There are more inquiries for Northern iron for prompt shipment, and sales last week by local furnaces were larger than the present rate of production, including a considerable tonnage of off grade and gray forge iron. A local steel plant has purchased 10,000 tons of basic for delivery this year from a furnace east of Chicago. A local sale of 2000 tons of basic is noted to a Milwaukee steel foundry. The malleable foundries in this territory are more active in purchases of iron for the remainder of the year, and also figure largely in inquiries for the first half of 1911. The following quotations are for September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.65 to 18.15
Jackson Co. and Kentucky silvery, 9%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—There are only occasional orders in this market, chiefly for forging billets. Ordinary lots are going at $29, base, for forging billets, Chicago, but this price could be shaded on any large tonnage.

Rails and Track Supplies.—While the railroads may not come into the market with large orders for next year until the rate inquiry is settled, there is an awakening of interest among the roads in their requirements. Inquiries are pending for about 30,000 tons of standard sections for this year's delivery and it is known that several roads have prepared estimates for their requirements for 1911. A recent purchase by one road included 9000 tons of Bessemer rails from Chicago, along with 9000 tons of ferrotitanium Bessemer rails from Lackawanna. The demand for track supplies is not so heavy as it was last spring, but the mills are still fairly well supplied with specifications. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—The mills are getting a good run of orders for plain material, as many of the fabricators reduced their stocks during the summer and are now buying more liberally to take care of their current business. The principal business let last week was a bridge contract of the Oregon Trunk Railroad, 5100 tons, which went to the Pennsylvania Steel Company. This contract covers the Celilo bridge in Oregon and two bridges over the Des Chutes River. This is a road which the Hill interests are building in Oregon. The Chicago, Burlington & Quincy has ordered 1000 tons of bridges from the American Bridge Company. A city viaduct at Fort Dodge, Iowa, 535 tons, was let to the Indiana Bridge Company, Muncie, Ind. The Morava Construction Company has secured a 700-ton contract for the Burdick Hotel, Kalamazoo, Mich. A 300-ton contract for a coal tipple for the Bunsen Coal Company was let to the North Works of the Illinois Steel Company. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—A fair amount of new business is received from fabricating shops, but the lack of car business which runs into the heaviest tonnage makes the market somewhat weak. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The demand is very steady and satisfactory for jobbers' lots of open hearth sheets and there is also good buying in moderate lots by manufacturing consumers. The price situation remains practically unchanged, although there is a little better feeling in the market. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—Specifications on yearly contracts for soft steel bars are very satisfactory and will keep the mills fully occupied this fall. The hard steel bar mills report the market quiet. The bar iron mills are doing a little better on new business, but railroad buying is generally confined to small lots for immediate shipment. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Manufacturing consumers of wire products are specifying more liberally. In the jobbing trade a stocking-up movement has been under way for some time on nails and barb wire, as well as other wire products, as stocks in the hands of jobbers and retail distributers were reduced during the summer. Crop conditions continue very favorable and the mills will have a heavy run of fall business. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Merchant steel continues one of the strong branches of the steel industry, sustained chiefly by liberal specifications from the agricultural implement manufacturers. There is, however, a better general demand from the manufacturing and jobbing trade, and the demand from store for small lots is very satisfactory.

Cast Iron Pipe.—No large lettings were reported last week, but the leading interest received one mail order for 600 tons of water pipe and another for 400 tons. Routine orders for fall shipment are holding up well. No large inquiries have come in yet for winter and spring shipment, but the foundry interests are not anxious to book business for next year, as the iron market may improve enough to stiffen prices later on. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—Conditions have improved considerably in the scrap market during the past week, reflecting the general improvement in business conditions. Some of the dealers are asking higher prices, but the market has been slow to follow their efforts. There are more inquiries from gray iron and malleable foundries and a considerable tonnage of cast and malleable scrap has been placed with consumers. One lot of rail crops which the owner was unable to move during the summer, amounting to 1700 tons, was sold last week at about the market price. It is evident that the larger malleable foundries which run on railroad work are either getting good contracts or expect to have more railroad business in the near future. The demand for cast scrap is also good, but dealers have not been successful in obtaining any higher prices than heretofore quoted. Melting steel is moving freely to local consumers at about $12.50 delivered. Taking the market all round, the change during the past week has been chiefly in the willingness of consumers to take whatever is offered them if dealers will sell at current prices. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Carl R. Briggs and Joseph H. Turivas, who have been connected with L. Bregman & Co. for the past six years, have engaged independently in the scrap business under the firm name of Briggs & Turivas, 1346 First National Bank Building, Chicago.

D. & G. Kaufman, formerly with offices in the Rookery, Chicago, have discontinued business owing to the recent death of G. Kaufman and the retirement of his brother, the senior member of the firm, from active business.

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Philadelphia

PHILADELPHIA, PA., September 6, 1910.

While the market in this territory may be stronger sympathetically, the volume of business actually transacted during the week has been small, both in crude and finished materials. There are still a number of fairly good inquiries pending, but consumers are pursuing a waiting policy, hoping for price concessions. Producers, however, present if anything a somewhat stronger front on the price question, particularly for pig iron and some classes of finished materials, and offers under current quotations have been generally turned down. Deliveries on crude material contracts are being freely taken, and producers continue to operate on the same average basis as for the last month. In finished materials, particularly plates and shapes, contracts could be entered for fair sized lots, but makers refuse, as a rule, to accept business for delivery before the year end. Steel billets are a trifle easier, with current business small. A better demand for sheets is reported, but prices are lower and concessions for tonnage available. The refined iron bar market continues dull and there has been very little movement in old materials.

Iron Ore.—Statistics available show the importation of iron at the port of Philadelphia during the first 30 days of August to have been 114,298 tons, valued at $342,067. This is quite a falling off as compared with the month of July, when importations reached 154,953 tons, valued at $514,041. A classification of the July importations shows 54,304 tons arriving from Mediterranean, 32,358 tons from Newfoundland, 48,336 tons from Swedish and 20,000 tons from Cuban ports. The movement in foreign ore shows a decrease, owing to the successful efforts, in some cases, on the part of consumers to have shipments deferred, and it is anticipated that, for a time at least, importations will continue to fall off. Practically no new business has been done in the ore market. The majority of consumers are oversupplied as far as this year's requirements are concerned. Efforts to have shipments of lake ores deferred have not been so successful as they have been in foreign ores. No fresh purchases of lake ores have been made, consumers anticipating a reduction in price about the first of the year. Foreign charters are practically stationary, ranging from 9s. to 9s. 3d. from the south of Spain.

Pig Iron.—Buyers appear to be in no haste to make purchases, and transactions during the week have again been comparatively light. The majority of the sales have been in the foundry grades, but transactions are still confined to small lots for near future delivery. There is, however, a little more firmness in prices, and while consumers have endeavored to place business at less than $16, delivered, for standard brands of No. 2 X foundry iron, they have, as far as can be learned, been unsuccessful in their efforts. In fact, some sellers have refused to accept orders at $16.25, delivered. No effort is made by producers to force business at the present range of the market, nor will they accept orders on which the delivery extends beyond the year end. With both buyers and sellers pursuing a waiting policy, the market shows little signs of immediate activity, although there is a general feeling that it will not be very long until buyers take hold more aggressively. Sales of foundry grades are small individually; occasionally a lot of several hundred tons is taken, but the bulk of the business runs from carloads to 100-ton lots. Some producers have taken a few orders covering fair lots for New England delivery. The cast iron pipe makers are still holding out for lower prices, their idea being about $14.50, delivered, for foundry forge, but sellers have not yet met their views, although they are probably not holding quite as firmly the recent $15 level for forge iron. Small lots have been picked up by the pipe foundries, but no heavy transactions are reported. There has been little movement in Virginia foundry grades, small sales for early delivery being made at unchanged prices. There has been a little business done in the steel making grades, a purchase of 5000 tons of basic iron by an Eastern mill, for November-December delivery, being reported at $15, delivered, which flatly represents the market. An inquiry for about 2500 tons for early delivery from another Eastern consumer is also before the trade. Low phosphorus iron has been sold in small lots at $22.50, delivered in this vicinity. One transaction, involving about 1000 tons, is heard of, but lacks confirmation. A little betterment in the demand for forge iron is noted, a sale of between 2000 and 3000 tons for rolling mill purposes, as well as several smaller lots, having been made at equal to $14.75 to $15, delivered in buyers' yards in this immediate vicinity. No change is noted in the general range of prices except for forge iron, which is a shade lower. The range of quotations for standard brands delivered in buyers' yards in this vicinity during the remainder of the year is as follows:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.75 to 16.00
Virginia, No. 2 X	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.75 to 15.00
Basic	15.00
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—The market is at a standstill. No inquiry beyond a few small lots from Western consumers is reported. Prices are largely nominal, at $39 to $40, Baltimore.

Billets.—Consumers appear to be content to buy in small quantities for near future requirements, and current business in rolling billets has been rather light, although specifications on old orders continue to come out freely and keep mills comfortably busy. There is, however, a little improvement in the demand for forging billets. Prices are easier. Ordinary lots of standard open hearth rolling billets are quoted at $27, delivered in this territory, and for attractive specifications could possibly be shaded. Forging billets are firm at $29, Eastern mill, as the minimum price, the usual extras applying for high carbons and special sizes.

Plates.—The demand is not very active. Consumers would contract for their supplies for the remainder of the year, but mills, as a rule, are not particularly anxious to enter business of that character, preferring to take small miscellaneous orders, such as have been placed here of late. There seems to be a stronger feeling in connection with prices, not that any immediate advance is likely, but there is evidently less disposition on the part of the Eastern mills to make concessions from 1.55c., delivered in this territory, for the general run of business. A few large tonnages are in sight, but the bulk of the business around is of a miscellaneous character. Specifications on old orders are reported as coming out quite freely.

Structural Material.—A very satisfactory run of miscellaneous business is reported, but the majority of the propositions running into any tonnage are still held up. One hotel addition covering some 700 tons has been closed, together with several smaller buildings. A moderate amount of bridge work, outside of that for the Quebec Bridge, is pending. Prices are unchanged and mills appear to be a trifle firmer in their views on prices for plain shapes, the minimum quotation for which remains at 1.55c., delivered in this vicinity.

Sheets.—Business is still quite irregular. Orders are largely for small lots for prompt delivery, and prices are a shade easier. Some mills are still fully engaged, while others are less active, but few have any tonnage for forward delivery on their books. For ordinary prompt business prices are a tenth less than recently quoted, and further concessions would, no doubt, be made for desirable specifications. Quotations of Eastern manufacturers range as follows for small, prompt lots: Nos. 18 to 20, 2.60c.; Nos. 22 to 24, 2.70c.; Nos. 25 and 26, 2.80c.; No. 27, 2.90c.; No. 28, 3c.

Bars.—The demand has again become lighter, business offered in refined iron bars being in small lots, on which makers show little inclination to shade quotations. Prices, therefore, are unchanged, at 1.40c., minimum, for refined iron bars, delivered in this vicinity, although a concession of one or two hundredths might be made for desirable orders. Steel bars are in fair demand, at 1.55c. to 1.60c., delivered in this territory.

Coke.—Little movement in either foundry or furnace coke is to be noted. A few contracts for moderate lots of foundry coke at $2.25 to $2.50 per net ton, at ovens, are reported, but the tonnage has in no case been large. Furnace coke for forward delivery is quiet at $1.65 to $1.75. One transaction covering several thousand tons of Connellsville furnace coke for September delivery is, however, reported at $1.55. Prices, as a rule, are unchanged and firmly maintained, the following range representing quotations per net ton, delivered in buyers' yards in this territory:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—There has been little movement in any grade. The market is stronger sentimentally, but prices are unchanged. No. 1 railroad wrought has been sold at $16.25, delivered, although the leading purchaser does not offer over $15.50, delivered. No. 1 heavy melting steel is being shipped more freely to Eastern steel mills, but these deliveries apply largely on old, high priced contracts. Transactions in other grades have been light and, in some, insufficient to establish a market. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

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No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cleveland

CLEVELAND, OHIO, September 6, 1910.

Iron Ore.—All of the wild carriers under contract with the Pittsburgh Steamship Company will get their last cargoes for the season during September, so that the movement down the lakes will fall off heavily after the first of next month, and more boats will be forced to go out of commission. In view of an early closing of navigation other ore interests are getting their ore down as rapidly as possible, and it is expected that the tonnage to be shipped after November 1 will be very light. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Ore shipments for August were 6,964,381 tons, making the total movement until September 1 28,829,029 tons. This is a gain of 6,238,480 tons over the same period of last year.

Pig Iron.—The market continues fairly active. While there are not so many large inquiries as during the previous two weeks, there is considerable inquiry for small lots of foundry iron, a good share of which is coming from this immediate territory. The larger part of the inquiry is for iron for delivery after January 1, but many of the buyers also want iron for the fourth quarter. Several of the furnace interests are as yet refusing to quote prices for delivery after the first of the year. The usual quotation by furnaces willing to sell for delivery after January 1 is $14.50, Valley furnace, for No. 2, or 50 cents above last half prices, but this price can probably be shaded by a buyer who wants iron for delivery extending through the fourth quarter and into the first half. We note the following sales of foundry grades: Two 1000-ton lots to local consumer, one of Northern iron for early delivery and the other of Southern for the last and first quarter; 500 tons of northern to a local foundry for the fourth quarter; 500 tons of Northern in north central Ohio for the fourth quarter; 1500 tons of Northern and Southern to a central Ohio pump manufacturer for the first half and 1000 tons of Southern to a manufacturer of plumbers' supplies in the Pittsburgh territory for the fourth quarter. A leading implement manufacturer has an inquiry out for 2000 tons of No. 2 and 2000 tons of low grade iron for delivery at its Ohio plant through the last quarter and possibly extending into the first half, and several other inquiries for lots of 500 tons and under are pending. Southern foundry No. 2 is quoted at $11 to $11.50, Birmingham, for prompt shipment and $11.50 for the first half, but the Alabama furnaces generally appear to be unwilling to quote prices for the first half. For prompt shipment and for the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90 to $16.15
Northern foundry, No. 1	15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.15 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—Some additional contracts for foundry coke for delivery until July 1, 1911, have been closed, but the market is not active. Consumers are well covered for their requirements for the remainder of the year. Prices on foundry grades are firm. The furnace coke market is inactive. We quote standard Connellsville furnace coke at $1.60 to $1.75 per net ton, at oven, for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 per net ton, at oven, for prompt shipment and $2.25 to $2.50 on contract.

Finished Iron and Steel.—The contract for the new plant to be erected by the Cleveland Electric Illuminating Company, requiring 3100 tons of steel, has been placed with T. H. Brooks & Co., Cleveland. The contract for the plain material will probably be placed within the next two or three weeks. No other structural work of any size is at present pending here. General conditions in finished lines remain practically unchanged. No inquiries for large lots of material are coming out. Specifications on contracts are fairly good and a moderate volume of orders is coming out, but they are for small tonnages, so that the market can be said to be generally quiet. Steel bars are firm at 1.40c., Pittsburgh, and with the exception of some shading on plates by mills making the narrower sizes, the 1.40c. price on plates and structural material is being firmly maintained. Manufacturers are generally fairly busy, but those not covered by contracts are buying only for their immediate needs. The demand for iron bars continues light, but the local mills are getting enough orders to keep running. Prices remain stationary at 1.35c. to 1.40c., at mill. The demand for sheets is still light and the usual concessions on prices are being made. We quote black sheets at 2.20c. and galvanized at 3.20c. to 3.25c. for No. 28. Jobbers report a fair volume of warehouse orders.

Old Material.—After continued dullness lasting for many weeks, the market now shows a little activity and dealers are hopeful of a further improvement. Local mills were in the market during the week and their purchases aggregated quite fair tonnages. A firmer feeling has resulted among dealers, but business has not been sufficient to cause any general advance in prices. Dealers are buying some material for stock, but say that not much scrap is being offered them. The Erie and Hocking Valley railroads closed on small lists September 6. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, September 7, 1910.—(*By Telegraph.*)

Pig Iron.—The majority of orders received the past few days were for amounts ranging from 100 to 500 tons, and while the books of some interests showed up reasonably satisfactorily others did not fare so well. The Dayton, Ohio, firm mentioned last week placed an order for 1500 tons of Southern iron, divided into three different grades, and it is understood the market price was paid, but delivery for some of this iron extends into next year. A purchase of a small quantity of Northern foundry is yet to be made by this same melter. A southern Indiana company is asking for prices on 2000 tons of foundry iron and there are two fair-sized Michigan inquiries being worked on. The purchases of the leading cast iron pipe interest during the past few days are understood to have been heavy, but local offices did not receive any large tonnage from this source. There is much difference of opinion as to next year's prices and it is generally understood that no quotable figures have yet been named for Southern irons. Prominent interests are holding Northern No. 2 foundry at $15, Ironton, for first half delivery and it is rumored that an offer below this would be acceptable to some furnaces for first quarter shipment. However, the furnaces both in the Northern and Southern districts appear indifferent, as they feel confident there will be a betterment in prices some time soon. For shipment the remainder of the year No. 2 Southern foundry is quoted at $11.50, but some Tennessee furnaces are accepting business at $11, Birmingham basis. Northern irons are held at $14.50 to $15, Ironton. Only small quantities of malleable are changing hands and $14.75 seems to be the prevailing market figure. The fair amount of inquiry coming in is encouraging, but the market is still a waiting one. The St. Louis inquiry for 20,000 tons basic is withdrawn. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

Coke.—An Eastern consumer has just closed contract with a local firm for a quantity of furnace coke, deliveries running into the third quarter of next year. The tonnage

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involved makes this the largest sale consummated here for several months.

(*By Mail.*)

Coke.—A little better inquiry for small lots of foundry coke is to be noted this week. Furnace coke continues a slow seller so far as new contracts are concerned, and while the spot shipment price is a little better for some brands, some operators are understood to be willing to fill orders at a figure below market quotations. The average contract price for Connellsville, Wise County and Pocahontas furnace coke is $1.75 per net ton, at oven, and for the last named field it is emphatically denied that any better figure for future shipment is obtainable. Connellsville 72-hour foundry coke is held around $2 to $2.10 for prompt shipment, with a 10c. to 15c. advance ruling for contracts. The leading grades of Pocahontas and Wise County foundry are about on the same level.

Finished Iron and Steel.—The demand for structural material and steel bars appears to be better. Considerable business was booked last week, if the past few weeks previous can be taken as a standard. Dealers having stocks on hand, proportionately speaking, fared better than the mills. Hoops and bands were also good sellers during the past few days. The warehouse price of steel bars is 1.80c. and that of structural material 1.90c. to 2c. The mill base price on hoops and bands is 1.55c., and it is stated that this figure is generally maintained.

Old Material.—Some small lots of scrap are being picked up by local dealers, and quantities of corresponding size are absorbed by the foundry interests, but no large tonnages are changing hands. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., September 5, 1910.

Pig Iron.—Aside from the larger inquiry the past week, the chief item of interest to the iron trade of the Birmingham district has been the large inroad on furnace stocks. There has been a larger movement the past month of warrant iron, as well as other stocks, and a careful summary of stocks on hand September 1 shows a reduction in Alabama to the extent of over 60,000 tons. This is so great a reduction that the figures are being carefully gone over again to-day, but there is not the least doubt that stocks on furnace yards have shown a very material shrinkage for the month just closed. July showed some reduction, and with this heavy inroad on stocks for August, and with the unusually large inquiry for the first few days in September, sellers of iron here feel decidedly more optimistic than for several months. It is true that iron sold in some instances at $11, Birmingham, for No. 2, but it is doubtful if one could secure any tonnage of consequence at that figure to-day, especially for forward delivery. Practically all interests are declining to quote for 1911 delivery, while $11.50 seems to be the well-established figure for the remainder of 1910. The high grades of well-known brands are now very scarce, and some special irons, where the phosphorus is low for Southern iron, with high manganese, are bringing quite a fancy premium for even the lowest grades. Of course, these special irons are sold almost exclusively by analysis, and $12.50 is easily obtainable for lower grades running down to 1 per cent. in silicon. No additions have been made to the production the week past, although another stack will doubtless be added this week.

Coal and Coke.—The demand for coal continues excellent; in fact, the Alabama coal operators have had a better trade on coal this summer than for the past three years, due to strikes in the Western and Southwestern fields and to the fact that not so much is coming down the Mississippi River as in former years. Contracts are being placed now for a great deal of foundry coke, while there is shown a better tone to the market for furnace coke.

Cast Iron Pipe.—The manufacturers of cast iron pipe, both small and large sizes, express a more hopeful feeling, though, perhaps, more or less in sympathy with the pulse of the iron makers. All the local plants are comfortably filled with orders for some 60 to 90 days, and while contracts on the books at this time, perhaps, show no appreciable margin of profit, yet the managers of sales feel confident that, with improved buying in all iron and steel lines, better prices must soon prevail. The crops of the country at large appear to be a good average in all directions and will bring good prices. The pipe people, therefore, expect that a little later on there will be a vast number of lettings on the part of the smaller municipalities that are to a large extent dependent upon the success or failure of the crops—especially through the Central West and Southwest—while the South is doing more in that line to-day than ever before. We quote water pipe, per net ton, f.o.b. cars here, as follows: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., $20.50. Gas pipe, $1 per ton higher.

Old Material.—The scrap iron people are a bit slow to feel any improvement, as the movement continues rather light. Quotations are still nominal and are about as follows:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

One of the Sloss City furnaces is expected to go in blast this week.

The Central Iron & Coal Company has practically completed repairs to its stack at Holt, Ala., and it will doubtless be lighted about October 1.

The work of overhauling one of the two Woodstock furnaces at Anniston is progressing favorably, and it is the purpose of the Anniston Iron Corporation to put this one furnace in operation during October.

St. Louis

ST. LOUIS, September 5, 1910.

The volume of general business continues large, as evidenced by the bank clearings for St. Louis for the month of August, which show an increase of nearly $17,000,000 over the clearings for the same month last year. The feeling in the iron market is somewhat better, there being more disposition to regard prices as steady and a more active demand is now pending.

Coke.—With most of the leading sales agencies business in coke the past week was quiet, the inquiry and sales being of very moderate proportions. There was one sale of a large lot for delivery into this territory which will be reported at another center. The sale of 1000 tons of foundry coke, for shipment over the remainder of the year, is reported. Prices are ruling steady and firm. We quote standard Connellsville 72-hour foundry at $2.25 to $2.35 per net ton, at oven, for prompt and contract shipment; Virginia coke $2.25 per net ton, f.o.b. oven; carloads 25c. per ton higher.

Pig Iron.—A leading house reports the following sales: 1000 tons Southern iron to an outside foundry for spot delivery; 500 tons for shipment over the last quarter; 500 tons for shipment over the first quarter 1911; 450 tons for September-October delivery; 300 tons high silicon iron for shipment over the remainder of the year. Another leading sales agency reports an inquiry from a local steel foundry for 5000 tons basic for shipment over the first quarter 1911; also an inquiry for 500 tons No. 2 Southern for early shipment. The sale of 600 tons No. 2 Southern to a local steel foundry for shipment over the first quarter 1911 was divided between two offices. An inquiry is reported by a third broker for 1000 tons No. 2 Southern, shipment over the first quarter 1911. Merchant sellers report new business dull, but are shipping freely on prior sales. Speaking of the market as a whole the feeling has improved, and a more active demand is confidently looked for from now on, but with respect to prices, the most that is expected is the maintenance of present quotations. There is some irregularity in prices for Southern foundry, depending on brands for delivery and with respect to iron for 1911, only a limited number of furnaces are willing to name prices. We quote No. 2 Southern foundry for shipment over the remainder of the year at $11, though some brands are held at $11.50; for shipment over the first half 1911, some furnaces name $11.50, f.o.b. Birmingham basis. Ohio foundry and malleable irons are quoted at $14.50 to $15, f.o.b. furnace. The demand for malleable iron is quite small.

Finished Iron and Steel.—The demand for standard rails is limited; for light rails there is a fair demand from coal interests, in view of the prospect of the settlement of the strike, and also some inquiry from lumber people. For structural material only a moderate business is doing. From manufacturers and jobbers there is a fair amount of inquiry for bars. In track material a steady but moderate demand is reported by the leading interest.

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Old Material.—It is still a dealers' market in scrap iron and steel, with only a moderate volume of trade. The following railroad offerings are reported: Missouri Pacific, about 1500 tons; Wabash, 500 tons; St. Louis & San Francisco, 350 tons. Light sections relaying rails are in good request from lumber interests. For the general list no material improvement in the demand is looked for at present. Prices on steel scrap are not quite as strong as last week. We quote dealers' prices as follows, per ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.25 to 14.75
Old steel rails, less than 3 ft.	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	14.25 to 14.75
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.25 to 12.75

The following quotations are per net ton:

Iron fish plates	$14.25 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boiler, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

Statistics compiled by the officials of the railroads indicate that nearly $70,000,000 has been appropriated in the last five years for terminal improvements in St. Louis.

The investments in electric railroads in the St. Louis district, in Missouri and in Illinois, now aggregate $142,066,000. The length of the lines is about 735 miles.

Buffalo

BUFFALO, N. Y., September 6, 1910

Pig Iron.—The outlook is slightly more encouraging from the producers' point of view, there being a perceptible increase in inquiry both for last quarter and first half. Present conditions are still far from satisfactory, however, as a majority of consumers continue the hand to mouth policy in buying, and furnace interests are averse to considering present prices, which are down to the limit, for next year's delivery, and most of them are refusing to quote for extended deliveries. One interest reports sales aggregating 6000 tons for the week, principally foundry grades, and all for delivery within the next three months. Another reports two orders of 2000 tons each and one for 1000 tons of No. 2 X and No. 3 foundry. Also quite a number running from 500 to 100 tons and carload lots coming from implement, cast iron pipe and stove makers, for delivery over the last half. A company at Medina, which has been in the market for 1500 tons of foundry grades for soil pipe manufacture, is reported to have purchased. A New England concern has had inquiries out for 5000 tons of basic, but has not yet placed order in this district. Shipments on contracts are very heavy. Prices remain practically the same as for last week, although in some instances a shade harder for small orders. We quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—The general situation is promising and indications that purchases are coming into the market for their fall requirements are more pronounced. New business in all lines keeps up in fairly satisfactory volume, with wire products leading. The inquiry for sheets is better, and tin plate continues to be a strong feature. In steel bars a larger proportion of orders are being taken at 1.45c., Pittsburgh, and some interests are not contracting even at this price beyond January 1. There is a good demand for sheet piling in small lots for work to be finished up before winter sets in. The Canadian export demand for bar products from agricultural implement and carriage makers is also good. In structural material the demand is running in fairly satisfactory volume, and specifications for a number of new building projects are soon to come out, including the Jerome Hotel at Erie, Pa., which will call for about 800 tons of steel. Bids will soon be received for structural steel for a theater and office building, to be erected at Syracuse by the Keith Theater Syndicate, and for a wholesale grocery warehouse at Binghamton, each of which will require a good tonnage. The Buffalo Structural Steel Company was low bidder for the fabrication and erection of the steel for the Utica Hotel, Utica, N. Y., 1230 tons, but the contract has not yet been awarded. The Syracuse Bridge Company has received contract for the fabrication and erection of the steel, about 1000 tons, for the theater and office building to be erected at Syracuse for W. Snowden Smith. Plans for the Buffalo Tuberculosis Hospital and for the Y. M. C. A. building, Erie, Pa., are to be revised and new bids called for.

Old Material.—Quiet conditions and slack demand continue and only a small amount of business is being transacted. Dealers are, however, anticipating an improvement in demand in the near future. Prices remain about the same as a week ago. We quote as follows per gross ton f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

The Rogers-Brown Iron Company has filed plans with the Bureau of Buildings, Buffalo, for the cast houses, engine house, boiler house and hoist houses and for stacks for the two blast furnaces which it is adding to the blast furnace plant at South Buffalo that it recently took over from the Buffalo & Susquehanna Iron Company. Construction work on the new furnaces and buildings is well under way.

New York

NEW YORK, September 7, 1910.

Pig Iron.—The buying in the past week in Eastern markets has been chiefly by pipe works, both manufacturers of soil pipe and of gas and water pipe. The inquiries by a large manufacturer of soil pipe amounted to over 31,000 tons, shipment being called for over the remainder of this year and the first quarter of next year. Nothing has been done in this case on iron for 1911, but the purchases for this year are believed to exceed 7500 tons, being largely No. 3 and No. 4 iron. An Eastern Pennsylvania pipe works has bought 2000 to 2500 tons of No. 3 and gray forge iron for delivery this year. On the soil pipe iron referred to above some low prices came out, the statements of sellers being to the effect that odd lots were moved on which for one reason and another they were willing to go below recently prevailing prices. At Buffalo, for example, some iron running 1.75 to 2 per cent. in silicon was sold at 75c. below the common price for iron classed as No. 2. Foundries have not been in the market in this district and in New England to any extent since the sale of 2500 tons made recently at Worcester, Mass. Where deliveries for next year have been called for furnaces have been quoting 50c. to $1 a ton above current prices. It is believed quite a little buying for 1911 will develop before the end of this month. Quotations are as follows, at tidewater: Northern No. 1 foundry, $16 to $16.25; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.75

Ferroalloys.—There is a fair demand for ferromanganese, and prices seem to have strengthened. The price at seaboard is now $39.50. Consumers seem to have supplied their wants in ferrosilicon, and inquiries are light; it is being held at $56, seaboard. There is talk of a syndicate being formed by parties interested in ferrosilicon abroad, and if it materializes prices are very likely to be advanced.

Finished Iron and Steel.—A little further gradual improvement in these lines is evident, but still mainly in the shape of inquiries. This, however, is having its effect in stiffening prices. Among the larger matters pending in structural materials are 1000 tons of bridge work in connection with the station of the Commonwealth-Edison Company, Chicago; the Masonic Temple in San Francisco, which will require 1500 tons; the Leary Building in Seattle, 1000 tons; an addition to the Marshall-Field wholesale store, Chicago, 900 tons; a coal handling plant in Birmingham, 1600 tons; a three-span double track bridge, 500 tons, for the New York, New Haven & Hartford, and a four-span double track bridge for the Lehigh Valley. Bids closed September 6 for a steel and concrete substation for the New York Edison Company which will require about 400 tons.

THE IRON AND METAL MARKETS

Bids will close September 12 on the steel work for what is known as area N-32 of the suburban station of the Grand Central terminal, requiring 1000 to 1200 tons. The Philadelphia & Reading is expected to come into the market shortly for about 1500 tons for work at Philadelphia. Among contracts closed are 400 tons for the Cincinnati, Hamilton & Dayton, taken by the American Bridge Company; 800 tons for the Missouri Pacific, taken by the Virginia Bridge & Iron Company; 1500 tons for the Southern Pacific at Houston, Texas, taken by the Noelke-Richards Company; and 850 tons for the annex of the St. James Hotel, Philadelphia, taken by the Eastern Steel Company. From the foregoing contracts pending and closed it is apparent that the railroads are showing a disposition to take a more active part than they have for some time. Conditions in the plate trade are practically unchanged. One large contract pending in the East is that for the Sebago pipe line for the Portland, Me., water supply. Bids will be opened September 12 for 6300 tons of 48-in. steel pipe, either lock bar or riveted, requiring ¼, 5-16 and ⅜ in. plates, 92½ to 93 in. by 160 in. The remainder of the line, about 12,000 tons, will be cast iron pipe. Specifications are better on steel bars. On account of the holidays it is difficult to compare present conditions in the bar iron market with those a week ago, but on the average orders are apparently unchanged in volume. No changes in prices are reported, plain structural material, plates and steel bars being quoted at 1.56c. to 1.61c. and bar iron at 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—Interest is now centering on the opening of bids at Portland, Me., next Monday, when the pipe will be selected for the large contract then to be placed. The city of New York rejected the bids on 900 tons of water pipe submitted August 24 and a reletting has been advertised for September 14. These are the most important lettings now coming up in the East. The general demand is exceedingly light. The nominal prices of carload lots of 6-in. are still $23.50 to $24 per net ton, tidewater.

Old Material.—The situation has slightly improved. It would seem that the lowest level of prices for this period of inactivity has been touched, and values are again tending upward, even though almost imperceptibly in some lines. Heavy melting steel scrap is in better demand, and though this may be attributed to covering by dealers who sold short some time ago there is, nevertheless, a better call from steel companies in eastern Pennsylvania whose stocks are running low. It is stated that good selected steel scrap is in scanty local supply. Other kinds of old material that are somewhat scarce and are wanted are car and locomotive tires, iron axles, No. 1 railroad wrought, cast borings and malleable scrap. Very little material can now be had at any of the quotations made last week. Dealers' quotations, per gross ton, New York and vicinity, as revised, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	12.00 to 12.50
Heavy melting steel scrap	12.00 to 12.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	16.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

Metal Market

NEW YORK, September 7, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper. Lake.	Copper. Electrolytic.	Copper. Tin.	Lead. New York.	Lead. St. Louis.	Spelter New York.	Spelter St. Louis.
Sept. 1	12.87½	12.62½	35.70	4.40	4.30	5.35	5.20
2	12.87½	12.62½	35.40	4.40	4.30	5.40	5.25
3	12.87½	12.62½	....	4.40	4.30	5.40	5.25
6	12.87½	12.62½	35.95	4.40	4.30	5.40	5.25
7	12.87½	12.62½	36.20	4.40	4.30	5.40	5.25

The tin market is following fluctuations in the copper market very closely and pig tin went to 36.40c. this morning. Copper is being held firmly, but there is not much trading. Lead is active and hardening in price. Spelter has advanced 5 points.

Copper.—The copper market is in very good shape, and if the report of the Producers' Association, which is due tomorrow, is encouraging an advance in price is likely to result. Consumers are apparently waiting for the report, as they show but little disposition to buy. Many sellers of lake copper are refusing to let their stocks go at less than 13c., but the persistent action on the part of one leading seller in offering the metal at 12.87½c. is keeping the market at that figure. Electrolytic copper is selling at 12.62½c., and some dealers are asking 12.75c. According to figures compiled by C. Mayer, secretary of the New York Metal Exchange, the exports of copper during August were exceptionally good, but the total exports for the eight months of this year show a decrease of 25,224 tons, as compared with the same period of last year. The exports continued good during the first six days of September, amounting to 4295 tons. The London market closed to-day with spot copper selling at £55 11s. 3d. and futures at £56 6s. 3d. The day's sales amounted to 200 tons of spot and 300 tons of futures. The market was quiet.

Waterbury Average.—The Waterbury average for August was 12.75c. The average price of lake copper in New York for August was 12.93¾c. and the average price of electrolytic was 12.59⅜c.

Pig Tin.—The London pig tin market reacted a little during the latter part of last week, but since last Friday it has advanced £5. This morning's cable shows an advance of £2 over yesterday's price, and the New York market was immediately raised to 36.40c., which is the highest price that has been paid for pig tin in this market within the last three years. While stocks are not any too plentiful here there is a comfortable supply of pig tin on hand and consumers seem to be well stocked up, as they are doing very little buying. Most of the business done in this market was between dealers, and the market has assumed a speculative tone, which has resulted in New York prices following the fluctuations in London very closely. The pig tin statistics for August show that the deliveries into consumption for the first eight months of the year were 4300 tons more than in the same period of 1909. Shipments from the Straits for August were 967 tons larger than the same month of last year, but shipments for the first eight months show a decrease of 1571 tons, as compared with the same period of last year. An indication of the scarcity of available tin is contained in the fact that the visible supply on August 31 was 1239 tons below that of August 31, 1909. Pig tin was sold in New York this afternoon for 36.20c. The London market closed to-day with spot tin selling at £166 and futures at £157 12s. 6d. The day's sales amounted to 220 tons of spot and 370 tons of futures. The market was rather dull.

Tin Plates.—There is a good movement in tin plates, and an especially good demand exists for foreign tin plates. The price of tin plates at Swansea, Wales, was advanced to 14c. this morning, which is a raise in price of 3d. The advance is caused by the unusually high price of pig tin in the English market. The price for 100-lb. coke plates in New York it $3.84.

Lead.—Outside sellers of lead who have been offering the metal at 4.40c., which is the same price asked by the leading interest, have advanced their quotations to 4.45c. This is due to the fact that there is a rather good call for lead, and if anything in the way of a buying movement develops it is thought that quotations will be advanced all along the line. The metal is still relatively higher in St. Louis than in New York, and 4.30c. is demanded for it in the St. Louis market.

Spelter.—Spelter has advanced five points, and it is thought in some quarters that the price may go still higher. Producers of spelter show little disposition to sell at the existing price, and some manufacturers have actually refused to make sales at the current quotations. The price of zinc ores is being very firmly maintained, and it is apparent that producers intend to hold back their supplies until the expected fall demand develops. Consumers are replenishing their depleted stocks by buying in small quantities. Stocks of spelter in New York are still scarce, but there is plenty of it held on board cars at East St. Louis ready for shipment. For some reason New York for the time being has ceased to be a shipping point.

Antimony.—Buyers are neglecting the antimony market, and prices are very weak. Cookson's is offered at 8.15c. and 7.87½c. is asked for Hallett's. Hunagrian grades are offered at 7.25c. and some Chinese grades are selling as low as 7.10c.

Old Metals.—The market is dull, and dealers' selling prices have been lowered in some instances. We quote today's market as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

THE IRON AND METAL MARKETS

Metals, Chicago, September 6.—Local interests have been selling copper the past week for November delivery, and a fair amount of business has been closed without any change in current prices. Tin has recovered from the decline last week and the local market is unchanged. Spelter is a shade higher. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 36½c.; small lots, 37½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.30c. to 5.35c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11½c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 25½c.; tin foil, 29c.; block tin pipe, 31c.

Metals, St. Louis, September 5.—Lead is quiet at 4.30c.; spelter is active and strong at 5.25c., East St. Louis. Zinc ore is strong under good buying at $42 to $43 per ton, Joplin base. Tin is quoted at 35.75c. per pound; antimony (Cookson's), 8.60c.; lake copper, 13.22½c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals was moderate, as is usual at the end of the month. The demand from railroads is smaller.

Iron and Industrial Stocks

NEW YORK, September 7, 1910.

Little interest has been taken in the stock market the past week, the volume of transactions having been unusually small. The trend was downward, but there was no special development in the business world to cause a movement in that direction. In the absence of anything more important, the decline was attributed to the utterances of our ex-President on his Western tour. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref.	31	Pressed St. Car, pref.	93½
Beth. Steel, pref.	57½ - 58	Railway Spr., com.	31 - 32
Can. com.	83¾ - 84½	Railway Spr., pref.	91 - 91½
Can. pref.	68¾ - 68¾	Republic, com.	29½ - 30
Car & Fdry., com.	46½ - 47¾	Republic, pref.	94
Car & Fdry., pref.	110¾	Sloss, com.	55 - 56
Steel Foundries	43	Pipe, com.	16 - 16½
Colorado Fuel	29¾ - 30	U. S. Steel, com.	69⅞ - 69⅞
General Electric	*141¾	U. S. Steel, pref.	115¾ - 116¾
Gr. N. ore cert.	53¾ - 54⅛	Westinghouse Elec.	50
Int. Harv., com.	94⅛ - 95¼	Am. Ship, com.	77
Int. Pump, com.	38⅝ - 39	Cambria Steel	41½ - 42¾
Locomotive, com.	34½ - 35⅜	Lake Sup. Corp.	21 - 22
Locomotive, pref.	103⅛	Pa. Steel, pref.	108
Nat. En. & St., com.	15½ - 16	Crucible Steel, com.	12 - 12¼
Pressed St., com.	34 - 35	Crucible Steel, pref.	75½ - 76¾

* Ex dividend.

New Tools and Appliances

Combined Cam and Valve Grinder.—The Bay State Grinder Company, Worcester, Mass., has built a machine carrying two 1 x 12 in. wheels mounted in interchangeable collets, which is provided with attachments for grinding gas engine cams and valve faces. The cams are ordinarily ground one at a time, but two can be ground simultaneously if the combined length of the hubs does not exceed 3½ in. Two arbors with No. 4 Morse taper shanks and ground to correspond to any size of cam shaft are furnished with each attachment. The master cams are generated by grinding from models furnished by the customer, and the rough cams are ground from the model. The master pattern rotates against a hardened steel plate turned to the same size as the grinding wheel, and as the latter wears down another guide plate of the reduced size of the wheel is turned into position for the master cam to rotate against and so on until the grinding wheel is worn out. The valve face grinding attachment has a hardened and ground spindle fitted with a draw-in chuck, which will grind valves without using center holes. This attachment is regularly furnished for a face angle of 45 degrees, but can be furnished for any angle desired, and a special attachment for grinding valves on centers is also made. Both these attachments can be detached from the table, so that the machine can be fitted with one of each or two of either kind, or with an internal grinding attachment, so that the complete outfit can be used if desired.

New Line of Unions.—The E. M. Dart Mfg. Company, Providence, R. I., is making a new line of unions which are an adaptation of the company's regular union, having two bronze seats and used in connection with the regular forms of pipe fittings. These new unions can be made in any desired combination. These fittings are said to possess the strength of iron pipe fittings in the pipe end, and are made with strong nuts, substantial shoulders and in heavy patterns.

New Electric Tools.—The New York Electric Tool Company, 136 Liberty street, New York, is bringing out a new line of electric tools, including drills, tool post grinders and portable buffers having many novel features. At present the drills are made in three sizes. The smallest has a capacity for drilling ¼-in. holes in steel and ½-in. in wood, is 10½ in. high and 4 in. in diameter and weighs 6¼ lb., while the largest will drill ¾-in. holes in steel and 3-in. holes in wood, weighs complete 22 lb. and is 14½ in. high by 5 in. in diameter. Each drill has a four-hole, form-wound series motor, with a cylindrical frame of crucible steel annealed to give the maximum permeability. The armature is built up of soft steel laminations, insulated with a coating of special japan and mounted on a hollow steel shaft, which drives the chuck spindle by hardened steel and phosphor bronze gears. A thrust bearing with steel balls is provided for taking up the thrust. The tool post grinder, running on direct current, is fitted with a ¼ x 3 in. wheel, which runs at 6000 rev. per min., and is especially adapted for grinding lathe centers, although it can be used equally well on a shaper or planer for surface grinding. Means are provided for excluding dust from the bearings, and the positions of the oil cups are such that the bearings are lubricated in any position the grinder may be placed. A novel feature is the offsetting from the center of the wheel shaft, thus permitting the use of grinding wheels of very small diameters. The portable buffer, which can be run on either alternating or direct current, weighs 6½ lb., and drives a 3-in. rag wheel at a speed of 5000 rev. per min. It does very effective work on metals (particularly those used on automobiles) that need a burnish instead of a polish to protect them from the weather. The buffer has ball bearings for the shaft, and an extension front head of small diameter, so it can be used in getting at difficult corners and inaccessible places.

A New Type of Friction Clutch.—The Hill Clutch Company, Cleveland, Ohio, has brought out a new Smith friction clutch. The same principle of action that has been embodied in the standard clutch of this company has been retained, but a number of changes have been made in its design and construction which adapt it for heavier and more continuous service. These clutches are built in three sizes, having three, four and six arms, according to their capacity, and the frictional resistance is produced by wood rubbing against iron. The shoe area is very large, and the coefficient of friction is claimed to be the same at all points, due to the improvements which have been made in the clutch. The engagement of the clutch is positive, a toggle action being employed to apply the pressure instead of springs. Two special features of this clutch are the ability to remove any working part for repairs without disturbing the main spider casting or pulley, and the self-centering feature by which the jaws form a shaft-aligning device without the use of shaft bushings.

Cast Iron Soil Pipe Prices.—Corrected soil pipe prices, received too late to appear in "Mill and Machinists' Supplies" in another part of this issue, are as follows: Standard, 2 to 6 in., 68&10&10&5% discount; extra heavy, 2 to 6 in., 73&10&10&5; fittings, standard and heavy, 80&10&10&5, all delivered at Eastern points.

Both the Alleghany and Buena Vista furnaces of the Oriskany Ore & Iron Corporation, Iron Gate, Va., are now in blast, the former having been blown in September 2 after repairs.

The American Locomotive Company

Report for the Fiscal Year Ending June 30, 1910

The ninth annual report of the American Locomotive Company, including the Montreal Locomotive Works, Ltd., covering the operations of the fiscal year ending June 30, 1909, presents the following statement of earnings, as compared with the previous year:

	1909-10.	1908-09.
Gross earnings	$32,203,392.10	$19,008,633.97
Manufacturing, maintenance and administrative expenses and depreciation	29,605,443.09	17,665,962.38
Net earnings	$2,597,949.01	$1,342,671.59
Interest, &c., on bonds of constituent companies, coupon notes, &c.	513,190.69	355,532.36
Profit	$2,084,758.32	$987,139.23
Dividends on preferred stock at 7 per cent.	1,750,000.00	1,750,000.00
Surplus	$334,758.32	*$762,860.77
Net credit to profit and loss	$334,758.32	*$762,860.77

* Deficit.

The condensed general balance sheet, as of June 30, 1910, is as follows:

Assets.

Cost of property		$51,741,791.57
Securities owned:		
Richmond Locomotive & Machine Works bonds.		118,000.00
Sundry securities		495,800.00
		$613,800.00
Convertible assets:		
Cash		$1,702,268.77
Accounts collectible		9,698,072.97
Bills receivable		817,508.04
Accrued interest		3,514.98
Material and supplies		5,375,900.89
Contract work in course of construction		2,218,812.43
Steam shovels, contractors' locomotives and automobiles manufactured for stock		286,389.99
		$20,102,468.07
Notes discounted (per contra)		$2,433,584.25
Total		$74,891,643.89

Liabilities.

Preferred stock		$25,000,000.00
Common stock		25,000,000.00
		$50,000,000.00
Bonded debt of constituent companies:		
Richmond Locomotive Works		$550,000.00
Dickson Mfg. Company		562,500.00
Rogers Locomotive Works		305,000.00
Montreal Locomotive Works		1,500,000.00
		$2,917,500.00
Current liabilities:		
Gold coupon notes		$6,911,000.00
Accounts payable		3,337,707.58
Accrued interest		121,866.68
Unclaimed interest		1,587.50
Dividends on preferred stock, payable July 21, 1910		437,500.00
		$10,809,661.76
Endorsements (per contra)		$2,433,584.25
Extraordinary additions and betterment fund		689,788.47
Profit and loss:		
Balance June 30, 1909	$7,706,351.09	
Add profit as shown in summary of operations above	334,758.32	8,041,109.41
Total		$74,891,643.89

From the accompanying statement to the stockholders by President W. H. Marshall, the following extracts are taken:

"The surplus, after a charge for depreciation of $803,484.35 and the payment of the preferred dividend, was $334,758.32, as compared with a loss of $762,860.77 last year, showing an improvement in the net results of $1,097,619.09. During the first half of the fiscal year there was but slight increase in the monthly output, as compared with that of the preceding year of depression, the revival in plant activities being confined to the six months ended June 30, 1910. About the time of this resumption in activity the agitation throughout the country for increased wages spread to our plants, and this company, in common with other industrial and railroad companies, made substantial increases in wages of shop employees. As a large part of the output for the year had been sold at prices which did not anticipate the extent of such labor increases, there was a resultant decrease in the margin of profit.

"To meet the constantly increasing demand for an economical commercial vehicle, and in view of the possibilities of this line of industry, the automobile department has devoted considerable study to perfect the design of commercial trucks. We now have on the market a most successful 3-ton truck. A 5-ton truck has been developed and will be put on the market during the present year.

"The Board of Directors on August 25, 1909, authorized the issue of $5,000,000 par value 5 per cent. gold coupon notes, dated October 1, 1909, in three series, as follows: F, $1,000,000, maturing October 1, 1912; G, $2,000,000, October 1, 1913; H, $2,000,000, October 1, 1914. These notes were issued for the purpose of providing funds for increasing the capacity of the company's plants, principally at Dunkirk, Richmond and Schenectady, the expenditures aggregating between $3,500,000 and $4,000,000. A large part of these expenditures have already been made, and it is expected the work will be completed by January 1, 1911. The company has also spent on its plants during the year $482,708.58 of the extraordinary additions and betterment fund, leaving a balance in that fund of $689,788.47.

"In the forepart of the year, a surplus of cash having accumulated in excess of immediate needs, the company purchased such of the notes maturing in 1910 as were offered at favorable terms. On October 1, 1910, there will be paid the balance of the fourth installment of short term gold notes, amounting to $911,000, which were issued October 1, 1906, leaving a balance outstanding of this issue of $1,000,000, and total outstanding notes of $6,000,000.

"At the beginning of the fiscal year the company had unfilled orders on its books amounting to $6,150,000, and on July 1, 1910, the amount was $17,550,000.

"The balance sheet includes a charge of $2,433,584.25, representing equipment trust notes discounted by this company in advance of maturity, and as there is a possible obligation in the event of any default in payment, a like amount is also shown as a contingent liability. The notes are secured by a lien upon the locomotives and the security is ample."

The Carnegie Dock & Fuel Company has purchased 80 acres of land adjoining the property of the Zenith Furnace Company, Duluth, Minn., and will spend about $1,500,000 in the erection of a coal handling plant on the property. According to reports from Duluth the dock will be 2700 ft. long, 350 ft. wide and will be equipped with the most approved coal handling machinery. It is expected that the work will be pushed early next spring, although a start may be made this fall.

The Jones & Laughlin Steel Company is rapidly finishing up its new construction work at Aliquippa, Pa., and its No. 4 blast furnace may be started this month. One or two of the four Talbot open hearth furnaces are also scheduled to start early in October.

The National Tube Company had one furnace in blast September 1 out of the five at its Lorain, Ohio, group. Two of these furnaces went out in August, one on August 14 and the other on August 31.

The Machinery Markets

The machinery trade is improving in a number of commercial centers from which reports of dull business have been coming for the last three weeks. The expansion of the Labor Day holiday to several days, now so general in the East, has affected business slightly in and around New York, but trade shows more life in Chicago, Cleveland and Detroit, for instance, where it has been rather dull of late. In all those localities a good fall business promises to materialize. In the Northwest a heavier volume of business is noted, and inquiries from jobbers and dealers in Minnesota and the Dakotas are coming in stronger. There is a good call for equipment from the mining districts. Trade has begun to pick up in the South, and inquiries are more numerous. The indications in that territory are that requirements for new equipment will be very large during the coming fall. In the Southwest funds coming from the sale of crops are being invested in the machinery trade to such an extent that the market there has been put on a good basis. An increase in buying is noted in the Central West, and the tone of the market both there and on the north Pacific Coast shows a decided improvement.

New York

NEW YORK, September 7, 1910.

With the exception of orders that have come in from the New York Central Lines and the Delaware, Lackawanna & Western Railroad, the machinery trade in New York the past week has been rather dull. This is to be partly accounted for by the Labor Day holidays. Inquiries have fallen off and there are no new developments in the forthcoming projects which have been mentioned in these columns in the last three weeks. There is an undercurrent of optimism among dealers and manufacturers' representatives in New York and vicinity and if only half of the business in sight materializes trade in the fall should be very good.

Manufacturers of leather belting have been very busy of late and orders have been coming in so well that advanced prices which were made about nine months ago are being maintained. Prices in leather belting fluctuate more than machinery prices and this should be taken as an indication that business is excellent in that line. Most of the orders booked lately among leather belting houses have been for replacements rather than for new projects, but it is reported that there are some large inquiries in that trade calling for belting for new enterprises and if they result in business manufacturers of power equipment will probably share in the projects.

It is understood that the United States Lighting & Heating Company, 30 Church street, New York, which is preparing to buy for a large plant at Niagara Falls, expects to move considerable of its machinery to Niagara Falls from other plants. Nevertheless, this equipment will be supplemented by additional new machinery which will call for expenditures amounting to a good round sum.

The machinery trade in general has been experiencing a good call for equipment from manufacturers of agricultural implements. The International Harvester Company is a good customer just now and there are inquiries out from large plow making concerns. American agricultural manufacturers are extending their export business much faster than manufacturers in other lines of mechanical equipment and their purchases are going far toward supporting the market at this time.

The Henry & Wright Mfg. Company, Hartford, Conn., has been highly gratified to find that its business in the month of August proved to be the largest for any month in its history. The company manufactures ball bearing drilling machines.

The Bridgeport Chain Company, Bridgeport, Conn., manufacturer of welded steel wire chains, has made a large increase in its capital stock. Plans and specifications have been made for extensive additions to the plant, but the increase will not be made this year, but next, should business conditions require the greater capacity at that time. The company builds its own automatic machinery, and at present a large number of these machines are in process of construction, the ultimate aim being that facilities shall be so great that it will not be necessary to operate the factory overtime. The company has been obliged to run 24 hours a day during a portion of the last and present year in order to meet the demands of customers.

The Seymour Iron Foundry, Seymour, Conn., will erect a new foundry on a site just purchased on North Main street. The main building will be of reinforced concrete and brick, 50 x 200 ft., one story, and fireproof throughout. The cupolas and coreroom will be in an ell, 15 x 50 ft. Ample light will be provided, the north end being composed practically entirely of windows, while overhead will be large steel frame skylights. The foundry will have two cupolas, one for the regular line of machine castings, the other for special work. Three cranes will provide for the handling of heavy work and an industrial railway will assist in the economical operation of the plant. An office building, 30 x 40 ft., will contain room for pattern storage. The business was established in 1899. E. A. Klatte is the sole owner.

The American Valve Company, Coxsackie, N. Y., is erecting a power station, 60 x 66 ft., in which will be installed two 100-kw. generators, to be direct connected to a 125-hp. Ideal engine. The company's new equipment will include a lighting plant and a vacuum steam heating system, all of which will be in operation about October 1. The company is also breaking ground for a two-story fireproof pattern storage building, 20 x 40 ft.

The McKim Foundry & Machine Company, Lockport, N. Y., has been incorporated with $25,000 capital stock, to take over the business and continue the operation of the McKim plant on Green street, the capacity of which will be tripled by the erection and equipment of an extensive brick addition. The officers of the new company are: President, Daniel G. McKim; vice-president, Lawrence J. Hooker; secretary and treasurer, Harry Wood, formerly of the Lockport Rubber Company.

L. P. Rays, Carthage, N. Y., is erecting a factory for the manufacture of automobile lamp shades. Considerable machinery and equipment will be required.

The Wiard Plow Company, Batavia, N. Y., has completed plans for a foundry addition of brick and steel, 60 x 70 ft., to its plant on Swan street and the New York Central Railroad.

The Norton Carborundum Company is arranging to enlarge the capacity of its plant, at Chippewa, Ont., by the addition of six electric furnaces.

The Reddin Iron Works, Syracuse, N. Y., has completed plans for the erection of a new foundry building, 77 x 148 ft., adjoining its present plant.

The Reading Iron Works, Reading, Pa., has let contract for a 34 x 50 ft. addition to the boiler house at its plant on Cedar street.

The Reading Saddle Mfg. Company, Reading, Pa., will erect and equip an addition to its factory on Maple street.

The Canadian General Electric Company is receiving bids for an extension of the machine shop at its plant in Petersboro, Ont. Frederick Nichols, second vice-president, 212 King street, West Toronto.

The Pennsylvania General Electric Company has had plans completed and is receiving bids for a gray iron foundry building, 450 x 800 ft.; also for two other foundry buildings, each 200 x 400 ft., two stories, and for a machine shop, 161 x 400 ft., two stories, to be built at its plant in Erie, Pa. Brick, steel and concrete construction.

The Erie City Iron Works, Erie, Pa., is having plans prepared for an office building addition to its plant, 65 x 88 ft., two stories and basement, of brick and structural iron.

Crandall, Stone & Co., Binghamton, N. Y., manufacturers of carriage hardware, have let contract for a machine shop addition, 50 x 109 ft., two stories.

The Washburne Mfg. Company, Syracuse, N. Y., has been incorporated with $125,000 capital stock, to manufacture radiators, valves and pipe fittings. The incorporators are J. L. Washburne, J. A. Geddes and C. M. West of Syracuse.

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Philadelphia

PHILADELPHIA, PA., September 6, 1910.

As was pretty generally expected, the volume of business transacted by the trade during August was usually below the average for that month, customarily a dull one under ordinary circumstances. The vacation season has had considerable effect on negotiations under way, and in many cases interfered with the closing of propositions which the trade had hoped to clean up early in the summer. The past week showed no betterment in the demand; the final holiday of the summer season, Labor Day, was pretty generally observed, and the transaction of business, unless particularly urgent, deferred. During the current month, however, the trade feels that the market will show some betterment; scattered railroad inquiries, which have heretofore been awaiting final action, are expected to close up, and if the expected improvement in the iron and steel trade develops the demand for machinery should show more activity.

What little business has been done has been confined to small equipment of a miscellaneous character, usually single tools. The diminished buying by the automobile trade is felt sharply, but there is some further business of this character in sight. Railroad buying in this district has also been very meager, but the outlook is somewhat better, although no very large individual lists are anticipated. Machine tool builders are for the most part still busy on orders previously on their books. There have been few cancellations here, and few have been the builders who have had to run in stock orders to any extent to keep fully occupied. There is no doubt, however, that the majority of manufacturers would be glad to be able to get some little stock ahead, so that they may be prepared to make good deliveries when the demand begins, as, no doubt, at that time, purchasers who have been deferring orders will want the earliest possible shipments.

Quiet conditions are reported in the demand for second-hand machinery, which branch of the trade is governed largely by the same conditions that influence the demand for new tools. Less active inquiry is noted for power equipment; there is a very fair volume ahead and some little business in the smaller classes of boilers, engines and electrical equipment is constantly being transacted. The foundry trade shows no increased demand and very few foundries are working up to full capacity.

The Philadelphia & Reading Railroad Company is about ready to ask for bids for the construction of an elevated railroad to replace the present grade tracks of its Port Richmond branch in this city. The work will cost about $3,000,000. Contracts have recently been placed by the Reading Company, it is stated, for considerable preliminary work in connection with a proposed creosoting plant, to be erected at Port Reading, N. J.

It is said that a large manufacturing plant is to be erected at Seventh and Filbert streets. No definite information is available, but a number of properties in that vicinity have been recently acquired with the purpose stated in view.

The Barrett McKee Company, Baltimore, Md., has commissioned Owens & Siscoe, architects, in that city, to prepare plans for a large factory building to be erected at German and Greene streets. The structure is to be three stories and will be used as a shirt factory.

The city of Hancock, Md., which recently received bids for the construction of a water works plant, has, it is reported, decided to reject all bids and readvertise for new prosopals. Penniman & Fairley, Marine Bank Building, Baltimore, are the engineers.

The City Service Company of New York was incorporated last week under the Delaware laws with a capital stock of $50,000,000, and is empowered to engage in the manufacture and distribution of light, gas, heat and power. A. P. Anderson of New York, and James M. Satterfield and A. B. Magee of Dover, Del., are the incorporators named, who refuse any details of the company's plans at this time.

The Wilkinson Foundry & Mfg. Company has been incorporated with a capital of $200,000, and will manufacture and deal in automatic stokers and machinery. The incorporators named are Joseph C. Laird, John J. McGuirk and Charles S. Wilfong. Particulars are not available.

The Hutchinson Baking Company will erect a new building for baking purposes in Walnut street, below Thirty-third street, where property, 98 x 256 ft., has recently been acquired. The contract for the building has, it is stated, been awarded to Joseph Bird.

The Crook-Horner Supply Company, Baltimore, Md., has been incorporated with a capital stock of $100,000 for the purpose of manufacturing, purchasing and dealing in plumbers', machinists' and mill supplies. Its headquarters will be in Baltimore. The following are the directors of the new concern: William H. Pitcher, Harry A. Booth, K. Kunnecke, J. S. Schuseler, Emil Boucher and Charles E. Schaur.

The John T. Jones Holding Company, Camden, N. J., has been incorporated under the New Jersey laws, with a capital stock of $1,000,000, for the purpose of manufacturing steel and metal bands. The incorporators are John T. Jones, Albert Jones and Elmer Jones.

The Packard Motor Car Company, in this city, is preparing to erect a four-story building at Broad and Wood streets, which will be used by it as a garage. The property acquired for the purpose measures 70 x 300 ft. Plans for the erection of several other large garages by automobile interests are understood to have been completed, one of which is to be located at Broad and Wallace streets, but those interested state that they are not yet prepared to make their plans public.

Chicago

CHICAGO, ILL., September 6, 1910.

Conditions are improving in the Chicago machinery trade. Dealers have received more inquiries the past week, and the outlook for fall trade is generally brighter. There has been a fair volume of trade all summer, making due allowance for the usual dullness of the midsummer season, but the very large sales of tools to automobile manufacturers a year ago have been missed this summer. It has taken a considerable increase in orders from other fields of the machine tool trade to make up for the absence of automobile and railroad purchases. There is no new light in the machinery market on the policy of the railroads. The witnesses who have appeared thus far before the Interstate Commerce Commission have made a poor showing to justify a general advance in rates, and there is a feeling that recent scandals in the management of a leading Western road will have the effect of defeating or postponing the general advance which the railroads have sought. The purchase of new tools, like the purchase of cars and locomotives, has been held in suspense by the railroads, awaiting fulfillment of their hopes of larger revenues. Something will have to be done soon, however, as a severe car shortage is expected this winter, on account of the run-down conditions of locomotives and cars. Shop facilities have not been kept up for repair work, so that cars and engines are in no condition to go into the strain of winter traffic.

The Chicago, Burlington & Quincy is taking a long time to close on purchases for the new shops at Havelock, Neb., which were completed early in the summer. A committee of the company's mechanical experts has spent two months visiting factories on whose tools bids have been submitted. Machine tool men like the idea, as it enables them to give practical demontsrations and tests of their tools, and the members of the committee will gather technical ideas which will make their tour a good investment of their time. The committee, wherever possible, recommends three competing tools, leaving the choice of the three to the purchasing department. The only disadvantage of this plan for selecting tools is that a committee cannot visit all the manufacturers who bid on a large list, and those who do not have the opportunity for a demonstration in their shops are placed in an unsatisfactory position.

Old settlers on Canal street, in Chicago, do not like the publication of reports that the machinery district is being removed to Jefferson street. A large and important section of machinery row remains undisturbed on Canal street, on the east side, north of Washington street. The large Chicago stocks of Manning, Maxwell & Moore and Hill, Clarke & Co. remain in the block north of Washington street. The O. L. Packard Machinery Company and many other houses remain at their former locations. It is understood that most of these houses have long leases, with option for renewal, and they are not likely to be disturbed by any upheaval in connection with plans for a new Union Depot.

It has been understood that the largest stock of machinery in the world was carried on Canal street. Several years ago the business overflowed to Clinton and Jefferson streets, so that the district now covers three streets instead of one. This section of Chicago is becoming more important every year in commercial activity. A new Federal building for the postal service will be located in the near future in or near the machinery district. The Government now has a $9,000,000 investment in a post office building in the heart of the loop, but other Federal business is crowding the postal service, and plans are under way for a new business west of the river to be used exclusively for postal business.

The Emerson-Brantingham Company, Rockford, Ill., has completed a new concrete factory building, 742 ft. long, three stories. The new building will be occupied by the company's wood shop, experimental department, pattern shop and har-

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row department. An addition has also been made to the plow shop.

The Standard Construction Company, South Bend, Ind., general contractors, has been incorporated with $30,000 capital stock by Andrew Dushane, George Allen and Rex T. Miller.

The Universal Lifter Company, Worthington, Ind., has been incorporated with $10,000 capital stock to manufacture hoisting machinery. The directors are A. F. Wilson, G. L. Wilson and Guy Wilson.

Cincinnati

CINCINNATI, OHIO, September 6, 1910.

There has been a slight change in the business from the automobile industry, and some machine tool builders have lately received a few orders from this source. There is also an easier feeling over the expected further cancellation of orders booked some time ago. In spite of this a few shops have temporarily laid off some of their men, but as business from the general trade is holding up fairly well, and with many inquiries in hand, it is not expected that this condition will last long.

The railroads continue indifferent buyers. Several large lists have been figured on and others are known to be pending, but late purchases have been very light. As an instance of how badly some roads need equipment, one large system entering Cincinnati has been held up in switching cars promptly because the yard locomotives were in no condition to handle the traffic. This would probably be denied by the higher officials; nevertheless, it is true. The inference is that if the switching equipment is in such a condition that on the road must be equally as bad and probably worse. If so, the movement of the crops will develop a serious problem and may call for some large and quick expenditures this fall for rolling stock and repair shop tools.

Some of the foundries are busy on day to day work, while others are operating on light time. The business is sporadic and frequently a foundryman will close down Saturday with just a day's run ahead, and on Monday morning receives enough orders to keep him pouring the entire week.

The demand for the larger sizes of steam units, together with the satisfactory amount of repair work coming in, has enabled the Tudor Boiler Works Company to keep its plant on Third street, Cincinnati, running on full time. This same condition probably exists with all boiler factories that take in repair work, the volume of which generally counterbalances the scarcity of new orders.

The Theo. Hirschfeldt Sons Company has begun work on the erection of a one-story brick cooper shop, 60 x 90 ft., in the Camp Washington district, Cincinnati.

Among recent contracts taken by the Roche-Bruner Building Company, Cincinnati, is one for a 11-story steel and concrete office building to be constructed at Huntington, W. Va., for Robson & Pritchard of that city.

Work is progressing rapidly on the new horse collar factory of the Couch Brothers Mfg. Company, North Fairmount, Cincinnati. The building will be three stories, 50 x 125 ft., and of brick and steel construction.

The E. H. Bardes Range & Foundry Company, Cincinnati, has commenced work on a one-story brick addition to its plant, 35 x 55 ft., which will be used as a pattern storage room.

A three-story addition, 60 x 90 ft., of brick and concrete construction, is planned for the factory of the Corcoran Lamp Company, 1710 Reading road, Cincinnati.

The Dayton Auto Truck Company is a new incorporation at Dayton, Ohio, with $50,000 capital stock. The incorporators are Louis L. Wehner, Geo. W. Ozias, Chas. A. White and Henry A. Lewis. It is stated that a factory will be erected for the construction of brewery trucks, but no building details are yet available.

Carl A. Albrecht, Second National Bank Building, Cincinnati, is the principal organizer of the Carla Land & Irrigation Company that contemplates developing some coal lands in Dimmit County, Texas. A short railroad and an electric power plant will be constructed as soon as the company completes its incorporation.

The foundations for the new machine shops of the Chesapeake & Ohio Railroad near Melbourne, Ky., are about completed, and work on the buildings will be pushed. The railroad company denies that it will move its Covington, Ky., shops to the new location, as has been currently reported, but states the Melbourne shops are intended to relieve the congestion at some of its other points where repair work is done.

The Dean Mfg. Company, Newport, Ky., has just received an order from Australia for 15 of its Fox two-cycle marine motors.

The Toledo Computing Scale Company, Toledo, Ohio, has increased its capital stock to $900,000. L. S. Rose is president of the company.

The International Steel & Iron Construction Company, Evansville, Ind., has been incorporated with $100,000 capital stock, as manufacturers and contractors. The directors are H. F. Decker, F. G. Weber, O. J. Oehlkuch and Henry Bohnsack.

The Louisville Cement Company is experimenting with a new cement manufactured at its plant at Speeds, Ind., which it is believed will be superior to Portland cement and, if successful, will revive the cement industry in southern Indiana. The various plants in which at one time a large part of the cement of the country. The new product is made of hydraulic cement, plaster of Paris and steel slag. With the exception of one ingredient, the raw material for the new cement is all found in Clark County, where the plant is situated.

The Sheet Metal Specialty Company, Evansville, Ind., has been incorporated with $10,000 capital stock, to manufacture car fenders. The incorporators are Jesse, Frederick and Edna Helser.

The Lexington Motor Car Company, Connersville, Ind., has increased its capital stock from $50,000 to $100,000. T. M. Coats is president of the company.

The Merchants' Heat & Light Company, Indianapolis, Ind., will add to its new plant a 10,000-hp. engine, in preparation to bid on the city electric street lighting. The order has been given to the Allis-Chalmers Company of Milwaukee.

Cleveland

CLEVELAND, OHIO, September 6, 1910.

With the beginning of September a little more life has appeared in the local machinery market and the general feeling seems to be improving. Now that the vacation season is practically over dealers are looking for an improvement in orders. Sales during the week were light and no large inquiries came out, but business suffered the usual interruption from the holidays. Some of the dealers see a good indication in the fact that their August sales showed a slight improvement over July. Builders of some lines of machine tools report conditions better than are found by the dealers. For example, a leading maker of turret lathes states that with the exception of the automobile trade, which is buying very little at present, the sales of their company are practically normal, the demand being well scattered among various users. Having confidence that general conditions will be good some of the local manufacturers in metal working lines are planning plant extensions and others that previously arranged for additions are going ahead with their improvements. In most cases the purchase of the additional equipment needed is being delayed until the extensions are well under way.

The demand for electrical equipment is quite satisfactory. While no inquiries for large installations are coming out a good volume of business in small orders is being booked. Considerable of this business is coming from northern Ohio lighting plants, that are buying more new equipment to replace old or for extensions than they have at any previous time during the past two years.

Obstacles in the shape of negotiations with the city over the possession of lake front land, which for a time held back the extensive dock improvements planned by the Pennsylvania Railroad along the west breakwater in Cleveland, have been finally removed and the work of filling in is now going ahead at the rate of about 100 carloads per day. Plans for the docks are now being prepared at the office of the chief engineer in Pittsburgh. The docks will probably be of concrete. It is not expected that the dock work can be started before next summer, and it will be some time later before the machinery can be installed. It will take about two years to complete the improvements. The equipment will include large coal and ore handling plants. The handling plants will be installed close together, so that when a car of coal is unloaded the car can be moved quickly on a gravity track to take on a load of ore. In connection with the general improvement the Pennsylvania Railraod will in the next few months erect a McMyler car dumper on the coal docks on the east side of the Cuyahoga River to replace the present coal handling machinery at that point, the capacity of which is too small for present needs.

The Cleveland Foundry Company is planning the erection of a large new plant, which will eventually be as large as its present plant. A 12-acre site has been purchased on Ivanhoe road in the new manufacturing district in the eastern part of the city, along the Nickel Plate Railroad, on which construction work is expected to be started this fall. The preparation of plans is now in the hands of engineers. The company has grown very rapidly during the past few years,

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and it has no room for further extensions at its present large plant on Platt street. With the erection of the new plant the company will have two plants in operation in different sections of the city.

The W. S. Tyler Company, Cleveland, maker of ornamental metal work, will enlarge its plant by the addition of three stories to its main building, 64 x 264 ft. Plans are being prepared by George S. Rider & Co., engineers. The addition will be of steel and mill construction. For the present the additional room will be used largely for warehouse purposes.

The plant of the Van Dorn Electric Mfg. Company, Cleveland, was recently taken over by the Van Dorn & Dutton Company, which occupies an adjoining plant and was owned by practically the same interests. The business of the former company is now being conducted as the electrical department of the Van Dorn & Dutton Company, the products of the department being electric drills and reamers. The company reports that it is well filled with orders. Some of its gear products are sold up for about 10 months ahead.

At the recent annual meeting of the Ohio State Boiler Company, Lorain, Ohio, H. O. Wormser retired from the general managership. Officers were elected as follows: H. O. Wormser, president; H. Y. Baxter, vice-president and general manager; H. L. Worden, secretary and treasurer. The officers and John Schoenberger, Frederick Burgett and Dr. E. V. Hugg comprise the Board of Directors. This company was organized some months ago to manufacture a new type of boiler. Two boilers are being constructed at the plant of the Brunk Machine & Forge Company, and it is announced that as soon as their efficiency can be demonstrated steps will be taken to establish a plant for their manufacture.

The Sabin Machine Company, Cleveland, has changed its name to the Sabin-Curtis Machine Company, being recently incorporated under that name. The company has outgrown its present quarters and will soon begin the erection of a new plant, a site for which is now under consideration. Some new equipment will be needed. The company makes special machinery and will make some additions to its present products.

Through the efforts of the Board of Trade at Warren, Ohio, it is announced that the Vulcan Furnace Company will remove from Buffalo, N. Y., to that city and establish a plant for the manufacture of mechanical fuel feeders. The Board of Trade is to erect a plant, 40 x 120 ft., which the company is to lease. It is expected that it will be ready for operation by November 1.

The new foundry of the Orville Pump & Furnace Company, Orrville, Ohio, was placed in operation a few days ago. The main building is of steel, brick and concrete, 63 x 152 ft. The front, 30 x 63 ft., two stories, contains the pattern shop and offices. The cupola has a capacity of seven tons per hour. The plant is equipped with a 60-ft. electric traveling crane. The power equipment, in an adjoining building, consists of a 120-hp. Corliss engine, two 100-hp. boilers and two 50-hp. generators. The company will shortly begin the manufacture of pumps in addition to its other products.

The contract for the new plant to be erected in Cleveland by the Reliance Electric & Engineering Company has been let to the Carey Construction Company of Cleveland. The work is now under way.

The Cleveland Castings Pattern Company reports a good demand for patterns of various kinds. Among other orders this company has just received one from the Erie Railroad for about $5000 worth of patterns for locomotive cylinders, wheels, frames, &c.

The plant of the Vanrot Metal Company, Lorain, Ohio, was practically destroyed by fire a few days ago, the loss being about $8000. The buildings were a complete loss and the furnaces and machinery either totally destroyed or badly damaged. It is announced that the plant will be rebuilt at once.

Pittsburgh

PITTSBURGH, September 6, 1910.

There has not been much improvement in actual market conditions since last reported, so far as the sale of machinery is directly concerned, but the outlook for future business is more encouraging, partly as a result of the betterment in the situation affecting the products of the furnaces and mills, of which the settlement of the tin plate strike and kindred difficulties is an example. Moreover, the slate has been wiped pretty clean, and for the coming productive season the manufacturers and dealers of the Pittsburgh district are getting what practically amounts to a fresh start, without any, or at least with a veritable minimum, of the encumbrances that ordinarily accumulate between spring and autumn. Stocks of machinery in the hands of dealers, both new and second-hand, are generally free from material which is difficult of sale; most manufacturers have put themselves in a position to provide for an enlarged output with prompt deliveries; labor conditions are favorable; prices have been holding firm, and there is less cutthroat competition than the trade has known for years past. Altogether, therefore, the situation would be exceptionally promising were it not for the turmoil throughout the country caused by the approaching elections. To what extent this condition will hinder the normal development here of fall trade it is as yet too early to determine.

It is announced that the two-story brick manufacturing plant formerly occupied by Jas. Bonair & Co., containing a brass foundry, tin shop and power plant, with boiler, engine, &c., together with operating machinery and other equipment, will be sold at public auction on the premises, Fortieth street and the Allegheny Valley Railroad, Pittsburgh, on September 15. The book accounts, rights, privileges and franchises of the company, which is a Pennsylvania corporation, will be included in the terms of sale.

The Riter-Conley Mfg. Company, Pittsburgh, has been awarded a large contract for piping, which will be put to an unusual use. It includes 5224 ft. of 26-in. and 36-in. mains to be used as siphons in diverting the flow of a river from one side of the mountains to the other in connection with the Uncompahgre Valley irrigation project in Colorado. This is being carried out by the United States Reclamation Service.

Manufacturers here will figure on the equipment of a new electric generating station to be built by the Frederick Railroad Company, Frederick, Md., which is expected to be of large capacity. Steam turbines and alternating current generators will probably be selected for the main units, with auxiliary apparatus to correspond.

The Massillon Bridge Company, Massillon, Ohio, has been awarded the contract to build a large steel bridge over the Cimarron River not far from Sapulpa, Okla.

Improvements which will involve the purchase of some new equipment, including electrical apparatus and probably air compressors, pneumatic appliances, &c., are to be made in the yards of the Erie Railroad at Meadville, Pa.; Kent, Ohio, and Jamestown, N. Y.

It is reported from Johnstown, Pa., that W. Horace Rose, Percy Allen Rose and Forest Rose of that city have secured control of the various properties of the Savage Firebrick Company, and will double the capacities of the manufacturing plants that have been maintained at Meyersdale and Hyndmon, Pa., thus necessitating the purchase of considerable machinery.

The Bonney-Floyd Company, Columbus, Ohio, whose business slowed down somewhat during the summer, in common with that of other foundries in the district, is looking forward to a lively demand for steel castings this fall.

An addition is being made to the planing mill of Pence & Geyer's furniture factory at Hillsboro, Ohio, and some new machinery will be installed.

The Franklin Steel Company, Franklin, Pa., is making a specialty of tripartite steel poles, used for supporting overhead wires and cables. The demand for material of this class is steadily increasing. One of the extending fields of application is railroad signal service.

The Harris Pump & Supply Company, Pittsburgh, is selling agent here for the various types of pumps manufactured by the Deming Company, Salem, Ohio, which are being largely installed in this district.

The large manufacturing plant which formerly belonged to the Keystone Bridge Works, but has latterly been the property of the American Bridge Company, is being taken possession of by the New Method Art Glass Company, which will remove from its present location. The main is a three-story structure, 40 x 225 ft., with a smaller one adjoining, and additional ground has been leased by the new occupants for another factory, 40 x 150 ft. Some new equipment will be needed for the works, as remodeled and extended, but the details of this have not yet been fully determind upon. The New Method Art Glass Company was originally located at Wilkinsburg, Pa., and now occupies quarters in Pittsburgh at 3117 Pennsylvania avenue.

The Morgan Engineering Company, Alliance, Ohio, is reported to be deriving a good share of its business at present from the Pittsburgh district. The company's offices here are in the Frick Building.

The Best Mfg. Company, Pittsburgh, in addition to the manufacture of its various specialties, which include adjustable wedge gate valves, is taking complete contracts to furnish and install the piping for power plants designed for any service.

The Willetts Company, Pittsburgh, has commenced work at Fairmont, W. Va., on a large new manufacturing plant for the production of clay goods used in the glassmaking industry. All of the machinery and handling equipment will be motor driven. It is expected that the plant will require nearly a year to build, and purchases of the apparatus needed will be made gradually within that period.

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The following contracts for the new 2400 hp. boiler plant of the Diamond State Fibre Company, at Bridgeport, Pa., have been placed by F. W. Dean of Boston, the company's engineer: Building to Frank R. Heavner, Norristown, Pa.; boilers to the Bigelow Company, New Haven, Conn.; induced draft and economizer to the Green Fuel Economizer Company, and water heater and purifier, a Cochrane, to the Harrison Safety Boiler Works.

The contract for the coal conveying machinery has not yet been placed.

The Pittsburgh Feed Water Heater Company, Pittsburgh, has received a contract for two 30,000-hp. horizontal open type water heaters for the Brunots Island power house of the Pittsburgh Railways Company, at Pittsburgh. The heaters will weigh about 50 tons each and are said to be the largest of their type ever built in this country. They are expected to be installed in October and will have all improvements embodied in similar type heaters of smaller capacity.

Detroit

DETROIT, MICH., September 6, 1910.

Sales of both new and second-hand machine tools, foundry equipment, power units, electric motors, &c., have increased somewhat within the past week, and it looks now as though the fall buying movement had definitely set in, although still subject, of course, to occasional lapses. Dealers have also been cheered by further announcements of new factory building and improvements in existing plants, which are again becoming numerous, as indicated in the following items. Others, which are known to be in contemplation, will be definitely announced before the end of the present month, and there are enough such projects to exert a very considerable influence upon the future of the market. Both this week and last the feeling that has attended primary elections all through the State has been a disturbing factor, so far as current business is concerned; but it will all be over shortly and there seems to be nothing further in sight to prevent a steady improvement in industrial operations of all kinds. The automobile companies are maturing or readjusting their plans for the coming season and there will be more buying for this account in the near future. Despite reports to the contrary, the general policy of expansion decided upon some time ago has experienced no serious setback, and, subject to certain changes made desirable by better shop methods recently inaugurated, it will be consistently carried forward.

Extensive improvements, involving the purchase in due course of new pumping machinery, will be made in the water works system at Marquette, Mich., where an engineering firm has been engaged by the city authorities to make recommendations and submit plans.

The Manistee Iron Works Company, Manistee, Mich., has added to its facilities for large marine repair work by the construction of a dry dock capable of holding 200-ft. steel vessels, and this part of the company's business will be extended.

The Beck Power Sprayer Company has been organized and will establish a manufacturing plant at Lansing, Mich.

The Detroit Brazing Company, Detroit, is having a steady run of business in the repairing of broken castings for machinery of all kinds, including automobile parts.

The Auto Parts Mfg. Company, Detroit, has decided upon plans for a new building that will double its present capacity. Fred C. Niedermiller of this city was recently elected secretary. The business has been rapidly extending, and it is a question whether the added facilities now provided for will be adequate to the requirements of the company's trade by the time they are completed.

The Detroit Mfg. Company, Detroit, has increased its capital stock, and it is reported that arrangements will be made in the near future for the erection of a new factory building.

G. A. Mueller is preparing plans for a new factory building, 35 x 60 ft., two stories, for the Glass Enameled Package Company on the Terminal Railroad tracks at Gratiot street, Detroit. It will be of brick construction.

The Peter Smith Heater Company, Detroit, Mich., has reached a record this season in the sale of its hot water heaters, which makes over 10,000 now in use on the principal traction systems of the country. The manufacturing facilities of the company are being gradually extended to meet the demand.

The Anderson Forge & Machine Company, Detroit, is providing for its new plant an installation of steam hammers which will handle anything from the smallest auto part work up to the heaviest forgings used for motor trucks and similar purposes.

The Horton Autoette Mfg. Company has been incorporated at Detroit for $100,000.

The Wheel Truing Brake Shoe Company, Detroit, is putting on the market a device for keeping locomotive and car wheels in trim while they are in service. This has proven a valuable adjunct of steam and electric railway equipment and the company's output is steadily increasing.

A steam hoist of small capacity, which will be displaced later on by one of larger size, is about to be installed by the New Baltic Mining Company on new ground at Houghton, Mich. Another air compressor is also being added to the power house equipment.

The Warren Motor Car Company, Detroit, is completing its large new manufacturing plant.

The W. J. Burton Sheet Metal Works, Detroit, is experiencing a very active season, having found it necessary to put on more die makers and other skilled operatives.

A three-story addition, 80 x 100 ft., equipped with machinery electrically operated, will be made to the plant of the Bay View Furniture Company, Holland, Mich., for the manufacture of extension tables. The capacity of the factory is to be doubled.

It is reported from Lansing, Mich., that the Air Cooled Motor Company of that place will add to its shop equipment.

The Rapid Motor Vehicle Company, Pontiac, Mich., is placing in commission its new power plant, which has been equipped with engine driven generating units furnished by the Allis-Chalmers Company, Milwaukee. The boilers are of the water tube type, having furnaces with automatic stokers.

One of the lines of production which the American Blower Company, Detroit, has developed to quite a large extent is the manufacture of dryers, both standard and special, for a variety of industrial purposes, including the manufacture of brick and other clay products. Anything in this line can be furnished promptly from among the company's numerous designs.

The Everett-Metzger-Flanders Company has practically concluded the purchase of land in Detroit adjoining its present plant on West Jefferson avenue, in order to provide for future extensions.

As the result of damage from a fire last week, the plant of the Cadillac Water & Light Company, Cadillac, Mich., may be remodeled for larger capacity and improved in various ways, although the generating units escaped the flames and service to industrial plants in the vicinity was only temporarily interrupted. The present equipment of the station consists of four engine driven dynamos of 500 kw. capacity.

The Barker Mfg. Company, Lansing, Mich., is offering to the trade as one of its specialties a governor pulley which can be used on an engine or line shaft to excellent advantage for a starting and speed regulator.

The first mining properties to be operated in the upper peninsula of Michigan by the New York State Steel Company are now being opened up near Iron River, Mich.

The Bryant & Berry Company, Detroit, has found this a very favorable season for the sale of propellers, which it manufactures for motor boat service. A special design has been developed that produces a very appreciable increase in speed as compared with other types, and this feature of the business gives evidence of growing into a very large industry in itself.

The Chalmers Motor Company, Detroit, has increased its capital to $3,000,000.

The equipment of the new power plant that is being installed by the Hancock Consolidated Mining Company, Hancock, Mich., includes eight 72 in. by 18 ft. firetube boilers of 150 hp., which are furnished by the Kewanee Boiler Company, Kewanee, Ill.

St. Louis

ST. LOUIS, September 5, 1910.

Numerous small manufacturing shops are getting ready to start up in this field. This is indicated by the investigation of machine tools being made by the parties interested at the various machine tool houses each day.

The Sayman Company, St. Louis, manufacturer of medicated soap, will erect a new factory on Franklin avenue to cost $75,000. The new building will have about 155,000 sq. ft. It will be equipped with modern machinery, including a printing department.

The Dalton Adding Machine Company, Poplar Bluff, Mo., is very busy and contemplates some extensive improvements. It has considerable machinery now on order.

The Duncan Foundry & Machine Company, Alton, Ill., is quite busy. It manufactures coal machine equipment.

The United Railways Company is operating its shops continuously. Besides keeping up the repairs on the large number of cars in service it is completing seven new all-steel street cars per month.

The Scullin-Gallagher Iron & Steel Company, St. Louis,

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recently placed an order for a 10-ton three-motor traveling crane.

The St. Louis Cordage Company, which operates a large hemp rope factory, finds business satisfactory for this season.

The Moning Shoe Company, Marshall, Mo., has been incorporated; capital stock, $80,000; Hugo Moning, president. The site for a factory has been purchased.

P. P. Buddy, St. Joseph, Mo., has been awarded the contract for the erection of the King foundry and the Specialty Shoe Repair Machinery Company's building in Industria, Mo.

It is reported that the Lanyon Zinc Company's smelters, for 14 years in operation at Iola, Kan., are to be removed to Springfield, Ill., on account of the shortage of gas for fuel; also that the acid works of the U. S. Zinc & Chemical Company are to be removed from Iola to Kansas City, Mo., from the same cause.

The plant of the Central Box Board factory at Sterling, Ill., was partially destroyed by fire August 31, entailing a loss of nearly $100,000.

The Union Pacific Railroad will erect a new roundhouse at Belleville, Kan.

The Ringen Stove Company, St. Louis, is now preparing to erect a plant to cover 8 acres of ground, recently purchased on Chouteau avenue. The plant will include a two-story building, 65 x 720 ft., and when completed will have a daily capacity of 1500 stoves.

The Davis Expansion Boring Tool Company, 3914 North Broadway, St. Louis, Mo., will begin in the near future the erection of a new plant. The expenditure which will be made for new tools is estimated at $80,000 to $100,000.

The South

CHATTANOOGA, TENN., September 5, 1910.

The machinery trade in nearly all localities of the South, so far as can be estimated from reports made by representatives of leading manufacturers and jobbers, is beginning to pick up again to a noteworthy degree. There has been no large volume of sales apparent lately, but numerous inquiries are coming in to dealers at the principal centers of distribution, and some manufacturers are closing contracts for considerable work that will be used as a filler during the late fall and winter months. Shops, foundries, fabricating plants, planing mills, furniture factories and other establishments in related lines are expected to buy just as freely this fall as they did a year ago, and the probability is that their aggregate requirements in the way of new equipment, as well as material, will be larger than in any previous season.

Important improvements, including the probable purchase of a new pumping unit of large capacity, will be made in the water works system at Aiken, S. C.

Some cargo handling machinery may be required in connection with a new dock which the New Orleans, Mobile & Chicago Railroad, Mobile, Ala., is planning to build in the vicinity of that city.

The Moniac Chemical Company is building a new plant at Jacksonville, Fla.

Preparations are under way to replace the plant of the Gulf, Red Cedar Company, Lebanon, Tenn., which recently burned. New power and operating equipment will be required.

The Atlanta Car Wheel & Mfg. Company, Atlanta, Ga., is offering, in place of the old style wheel for electric traction service, one of a new reinforced spoke pattern, which is especially adapted to high speeds. By means of a method of uniform chilling, which extends for some distance beneath the surface, great durability and long wear are insured.

The woodworking plants at Glenmary, Tenn., of the Tennessee Lumber & Coal Company, Nashville, Tenn., which were recently destroyed by fire, will be rebuilt and equipped with modern machinery.

The W. E. Caldwell Company, Louisville, Ky., has found one excellent source of demand for its elevated steel tanks, sprinklers, &c., in connection with fire protection systems for Southern mills. Similar installations have also been made for isolated plants in other parts of the country and in many instances the effect upon insurance rates has been very considerable.

Among the power generating plants in the South equipped by the Westinghouse Electric & Mfg. Company, one which has been widely visited by engineers and users of power machinery is that of the Atlantic Coast Line, which furnishes current for motors driving tools in the shops of the road at Waycross, Ga. This includes two steam turbine units generating alternating current and rotary converters that change it to direct current for operating the machinery.

The Casey-Hedges Company, Chattanooga, Tenn., is making quite a feature this season of its patent steel boiler settings, which are being called for more and more as the advantages of this construction come to be understood in various parts of the country, including the South.

The Tellico River Power Company, Tellico Plains, Tenn., is preparing for the construction of a hydroelectric power plant of 4000 to 5000 kw. capacity, with reinforced concrete flume, steel penstock and alternating current generator units.

The American Brake Shoe & Foundry Company, through its Chattanooga branch, is selling brake shoes of the special steel back type to quite a number of industrial roads in the South, as well as the regular freight lines, particularly for use on heavy grades.

The Frost Pump Company, Bristol, Va., has been incorporated with $25,000 capital stock to manufacture the Frost patent pneumatic displacement pumps. The buildings are in course of construction and all necessary equipment has been purchased. Frank Miller, Bradford, Va., is president.

Steps are being taken by the citizens of Abbeville, La., toward organizing a stock company to build a sugar factory. About $20,000 has already been subscribed.

Milwaukee

MILWAUKEE, WIS., September 5, 1910.

Trade here is still somewhat slow, compared with what it was during the spring and first two months of summer, and there has recently been more uncertainty expressed with reference to fall buying than is customary at this season of the year. A good deal of business is in prospect, both locally and from other sections of the continent, as well as abroad; but here it involves improvements or needed changes in established plants rather than new construction, and final decisions in relation to these are being quite generally held in abeyance until the trend of autumn business can be observed.

W. A. Brazeau, Grand Rapids, Wis., who has been long identified with the industrials of this State, was recently elected secretary and general manager of the newly organized Inland Empire Paper Company, which will erect a large electrically driven manufacturing plant at Coeur d'Alene, Idaho. Wilbur S. Yearsley, Spokane, Wash., is president of the company. A second mill is to be built on the Spokane River at a point not yet definitely determined. The company will probably generate its own power by means of hydroelectric plants.

The Reliance Iron & Engine Company, Racine, Wis., has been crowded to capacity this summer in the production of the gasoline engines, which it manufactures under the trade name of Sta-Rite, and for the coming season a considerable increase in shop facilities is reported to be planned.

An addition, 80 x 144 ft., will be made to the Commerce street power station of the Milwaukee Electric Railway & Light Company, to provide room for the installation of steam turbine units. A new substation on the South Side of Milwaukee, 40 x 57 ft., is also to be erected.

The boiler shop of the J. I. Case Threshing Machine Company, Racine, Wis., is to be extended by an addition, 100 x 100 ft., of brick and steel construction. Information relating to the equipment needed can be obtained only by direct inquiry.

Peter Arinovitz, Marinette, Wis., is putting up a two-story shop, 30 x 60 ft., for use in rebuilding and repairing second-hand machinery, which he handles in addition to a large trade in metals.

A low pressure boiler plant will be installed in the mill of the Ashland Paper Company, Ashland, Wis., whose plans for a new manufacturing establishment were recently mentioned, to furnish steam for various uses in connection with paper making. Power for driving the machinery by means of electric motors will be purchased from the Ashland Light, Power & Street Railway Company.

The Lyons Boiler Works, De Pere, Wis., will install two boilers of 300 hp. each in the power plant of the Buckstaff-Edwards Company, Oshkosh, Wis.

The Lipman Mfg. Company, Beloit, Wis., is putting out a line of small rotary pumps for circulating water and oil in connection with internal combustion engines and other purposes. The automobile trade is taking a considerable percentage of the company's product.

Among the requirements of the Lignum Chemical Company for its new plant at Marinette, Wis., will be a battery of boilers and a line of alternating current motors. It is probable that the electric power for operating the plant will be obtained from the Menominee & Marinette Light & Traction Company.

The Smith Gas Power Company, Lexington, Ohio, has been given the contract for a producer plant to be installed in connection with the Brodesser Motor Truck Company's

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new factory at Juneau, Wis. The purchase of an 85-hp. gas engine from the Rathbun-Jones Engineering Company, Toledo, Ohio, has also been decided upon by this company.

An electric motor of 150 hp. will be installed by the John P. Dousman Milling Company, De Pere, Wis., to run its elevator.

The State Board of Control, Madison, Wis., will take bids until September 12 on a deep well turbine pump for a 17-in. well.

The McDonough Mfg. Company, Eau Claire, Wis., is putting on the market a type of resaw known as the Junior, which is especially adapted to service in planing mills, box factories and other woodworking plants where a speed of 100 to 125 ft. per minute is sufficient. It is claimed for this tool that it is a strong, efficient, practical machine, and that it can be handled and adjusted more quickly than any other on the market.

The Milwaukee Electric Railway & Light Company has started the foundation work on 15 shops and a large power plant to be used in building steel frame cars for its system.

The Raymond Mfg. Company, Marinette, Wis., has sold to the Newport Mining Company, Milwaukee, a number of log handling machines to be used in connection with timbering for its mine in upper Michigan.

The Hartmann, Nelson & Zapfe Company, operating a machine shop and boiler repair works at Green Bay, Wis., have bought a manufacturing plant there, and will raze the buildings in order to erect new shops on the site. The equipment of the latter will include forging machinery and tools for heavy marine work, besides what it is needed for the company's other lines.

The A. Ewald Machine Works, Oakfield, Wis., is making a specialty of a steel spring friction pulley for use with light running machinery.

A new power plant and pump station, with an addition to its woodworking factory, will be made by the Anson-Gilkey-Hurd Company, Merrill, Wis. The machinery required is understood to have been principally ordered.

The John Lauson Mfg. Company, New Holstein, Wis., in addition to its regular line of gasoline engines, which are built in sizes up to 50 hp., is putting out a 1 hp. unit for small power and pumping service that is proving very popular with the trade.

Two new stories are being added to the plant of the Racine Stool Company, Racine, Wis.

The Elderon Light & Power Company has been organized at Elderon, Wis., to establish a public service plant. The installation of an electric generating set will be considered shortly.

The contract for building and equipping a municipal electric power plant at Crandon, Wis., has been let to the Langstadt-Meyer Construction & Supply Company, Appleton, Wis.

An addition is to be made to the factory of the Racine Auto Top Company, Racine, Wis.

The Beaver Dam Malleable Iron Company, Beaver Dam, Wis., is busy on orders for railroad companies, including the tie plates and rail braces which it manufactures each season in considerable quantity.

Two 8-in. pumps for dewatering are being installed for the Vinegar Hill Mining Company, at Buncombe, Wis., by the Galena Iron Works, Galena, Ill.

The engineering firm of D. C. & William B. Jackson of Boston and Chicago, is planning some improvements for the Janesville, Electric Company, Janesville, Wis.

The Southwest

KANSAS CITY, MO., September 5, 1910.

The influence of funds made available in the agricultural districts as the result of crops marketed during August is beginning to be felt in the machinery market. Numerous owners of local manufacturing plants, including machine shops and foundries, who have interests in farms under cultivation, are now ready to consider closing orders for new operating equipment in which they have previously hesitated to invest, and the money thus spent has a tendency to deplete the stocks of dealers. Small steam and gasoline engines, pumping outfits, electric lighting sets and apparatus of general utility are also included in the lines affected by buying orders from the interior districts. The machinery houses that during the summer depended for their sales mainly on correspondence are again starting their representatives out on the road, and a number of new agencies recently established for Eastern firms have commenced to canvass the territory for orders. There are, in fact, signs everywhere of greater activity, and by the end of this month autumn trade will undoubtedly be in full swing.

The United Zinc Company, Galena, Kan., is extending its operations in the Lehigh district. Two pumping units for dewatering have been installed on property recently acquired there, and additional machinery will be needed as development work progresses.

The Atlas Metal Works, Dallas, Texas, is making gas machines one of its specialties. The outlook for fall trade in this line is fairly good, and there will probably be a good deal of buying during the next few months.

Plans are now in course of preparation for the power equipment of the St. Joseph & Savannah Interurban Railway, St. Joseph, Mo., the construction contract for which was recently let. Wm. P. Foster, secretary, is in charge of the work.

Bids will be taken some time this month on machinery for a municipal power and pumping plant for Oakley, Kan.

The O. K. Harry Steel Works, Dallas, Texas, is turning out a good deal of tank work and corrugated material for roofing, siding, &c., for which the activity in new building has created a widespread demand.

The Thumb Butte Mining Company, Prescott, Ariz., is completing development work which will lead to the purchase before long of additional operating machinery.

The city of Maysville, Okla., has decided to install machinery for a pumping station, but it will be some weeks before specifications are ready.

A complete stock of power transmission machinery for Southwestern trade is carried at Enterprise, Kan., by the Philip Smith Mfg. Company, Sidney, Ohio, which makes a specialty of that type of apparatus.

Two large centrifugal pumps have been installed by the Chino Copper Company, Santa Rita, Ariz., for supplying water to its mill from wells sunk in the vicinity, and with the completion of a larger supply line the capacity of this plant will be increased.

Bids for the equipment of a new electric plant to replace the one that burned some weeks ago will be taken in the near future at McPherson, Kan., by the municipal authorities. Gas engine driven units will probably be selected for the service.

The contract for a new steel bridge at Ottawa, Kan., has been awarded the Canton Bridge Company, Canton, Ohio.

Plans are in course of preparation for a pumping plant to be installed by the city of Onaga, Kan., but the details have not yet been fully decided upon.

An electric light plant and water works will be built at Hamburg, Ark., to cost about $40,000. The water works will have about 5 miles of mains.

The Southern Pacific Railroad Company's pumping plant and water tank at Sanderson, Texas, were destroyed by fire August 23.

The Bowser Drilling Company, Houston, Texas, has been incorporated; capital stock, $5000; incorporators—C. C. Bowser, Erwin Smith and Claude Smith.

The Farmers' Union gin in San Marcos, Texas, was destroyed by fire August 31, entailing a loss of $12,000. It will be rebuilt of brick and concrete and made as nearly fireproof as possible.

A sugar mill will be built at Harlington, Texas, to cost about $400,000, and have a capacity of 400 tons daily. Lon C. Hill, a local capitalist, is largely interested, and is looking after the construction of the mill.

The Boardman Company, Oklahoma City, Okla., has been incorporated; capital stock, $20,000; incorporators—John R. Boardman, John Fleisman and Charles E. Rice, to engage in the manufacture and sale of metals and machinery.

The Northwest

ST. PAUL, MINN., September 5, 1910.

A heavier volume of inquiries is noted by representative manufacturers, jobbers and dealers of Minnesota and the Dakotas, while from all of the mining districts of the Northwest that escaped damage from forest fires the reports are most encouraging. Development work undertaken in the spring or early summer has, in many instances, reached the stage where purchases of additional operating machinery are necessitated, and for properties that have been on a paying basis the erection of crushing and concentrating mills, roasting or smelting furnaces, refining plants, power installations, &c., are contemplated. It is evident that trade in the western part of this territory will form a larger percentage during the coming fall, than ever before, of the total amount obtainable in all sections. Therefore, with the growth of local industries at this end, the outlook at present is very bright.

An addition, 40 x 130 ft., is to be made to the factory of Stott & Son, at Winona, Minn.

The Fargo Bridge & Iron Company, Fargo, N. D., has taken the contract for seven steel bridges to be erected in the vicinity of Mandan, N. D.

The Boston & Corbin Mining Company has in operation

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at Corbin, Mont., an electric hoist built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and is pushing development work. The erection of a concentrating plant is contemplated for the coming season.

The Northwestern Development Company, Wallace, Idaho, in which Edw. Donlan is principally intersted, has secured title by court proceedings to the water power at Thompson Falls and is planning to construct a hydro-electric plant with an ultimate capacity of 24,000 kw.

It has been practically decided by the authorities to add a motor-driven centrifugal pumpt of 20,000,000 gal. daily capacity to the water works system of Minneapolis. Bids, however, are not likely to be taken for some weeks yet.

The Gunther Machinery Company, Minneapolis, which has built up a large trade in both new and used machinery for metal or woodworking, finds prospects for the fall season excellent. There is every evidence that a widespread demand will be developed within the next few months.

The machinery for the new mill of the C. A. Smith Lumber & Mfg. Company, at Marshfield, Ore., which was principally furnished by the Diamond Iron Works, Minneapolis, has just been put in operation. This completes the largest plant of its kind on the Pacific Coast.

The contract for an elevated steel tank, to be used in the city water system at Duluth, Minn., has been taken by the St. Paul Foundry Company, St. Paul, Minn.

The Gates-Osborne Mfg. Company, Marshalltown, Iowa, manufacturer of automobile and buggy tops, will move to Indianapolis, Ind., where it has leased manufacturing quarters. Frank E. Gates is at the head of the company.

The Farther Central West

OMAHA, NEB., September 5, 1910.

While autumn trade does not seem to be opening very strong there has been some increase in buying within the past week or ten days. The tone of the market shows decided improvement, and there is a more hopeful feeling among dealers in relation to prospects for the immediate future. When the first rush of grain to market has subsided, which will be about October 1 or 15, orders from the interior districts are likely to come in freely for manufactured articles of all kinds, thereby stimulating the business of local shops and factories and creating a much greater purchasing power than now exists.

From Des Moines, Iowa, it is reported that the Des Moines Silo Mfg. Company is erecting an additional factory building, 50 x 200 ft., for the production of ensilage cutters.

The Monticello Electric Light Company, Monticello, Iowa, has acquired the site for a dam and hydro-electric power plant. Details of the equipment contemplated have not yet been decided upon and may not be for some time.

The Waterloo Drop Forge Company, Waterloo, Iowa, is making a specialty of forgings and tools used in the manufacture of internal combustion motors, having a heavy demand for its product within a short distance of the plant.

The Cushman Motor Works, Lincoln, Neb., are supplying to the trade a four-cycle gas engine of 3 hp., equipped with an automatic governor, which can be used for driving small electric dynamos or applied to any similar service, including the operation of agricultural machinery.

An electric generating set and other machinery will probably be purchased in the near future for a municipal power plant at Muscatine, Iowa, where the subject is under consideration by the authorities.

The Hart-Parr Company, Charles City, Iowa, has had a very prosperous year thus far in the manufacture of gas traction engines, which can be operated on gasoline, oil or alcohol fuel. The use of these machines is increasing in all parts of the United States, and particularly in the West.

Fairbanks, Morse & Co., through their Denver office, have taken the contract for installing a water works system at Johnstown, Colo.

H. R. Mosnat has been granted a franchise to erect a gas generating plant and distribution system at Belle Plaine, Iowa.

The Wm. Galloway Company, which has a large plant at Waterloo, Iowa, for the manufacture of gasoline engines, is making extensive use of automatic machinery, thereby enabling it, with the purchase of material in large quantities, to bring the cost of production per unit to a very low figure, as compared with that attainable in ordinary shop practice. This is one of the best equipped and managed plants of its kind in the country.

The repair shops, roundhouse, &c., of the Chicago & Northwestern Railway Company, at Chadron, Neb., which were burned some time ago, are being rebuilt.

The United Hydro Power & Electric Company, Georgetown, Colo., will supply current for operating motors in a new 250-ton concentrating plant to be built for the Frontenac Consolidated Mining Company, near Central City, Colo.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, has received the contract for an elevated steel tank to be erected for the city of Charleston, Ill.

Victor Speer & Co., Cedar Falls, Iowa, are putting on the market a cable winding and haulage machine, driven by a gasoline engine, which has been widely sold this season for contractors' service in building, road-making, &c., and for a variety of similar service.

The Davenport Locomotive Works, Davenport, Iowa, will erect a brick and steel power house addition. It is completing two other buildings, a blacksmith shop and a machine shop.

The Muscatine Pearl Company, Muscatine, Iowa, will erect a branch cutting plant at Maquoketa, Iowa; about 50 men will be employed.

The Clinton Brewing Company, Clinton, Iowa, will shortly commence the erection of an extensive bottling plant to be equipped with all modern appliances and machinery.

The old blacksmith shop of the Davenport Locomotive Works, Davenport, Iowa, which was to have been used by the Andrew Chemical Company, together with a part of the carpenter and pattern shop, was destroyed by fire August 29. The loss is estimated at $15,000.

The Chicago & Northwestern Railway Company will extend its roundhouse at Belle Plaine, Iowa.

The plant of the Ottumwa Box Car Loader Company, Ottumwa, Iowa, was destroyed by fire August 31, entailing a loss of about $60,000. It was insured for $20,000. A new plant of modern steel construction will be built. The company employs 150 men. The machinery was badly damaged and most of it will have to be replaced.

The Omaha Structural Steel Works, Omaha, Neb., has increased its authorized capital from $25,000 to $200,000, of which $100,000 is reported paid in. The principal stockholders are John W. Towle, C. A. Pratt and R. A. Leussler of Omaha, and John L. Lichter of St. Louis, Mo. A new plant will be designed and erected by Lichter & Jens, St. Louis, occupying a site of 5 or 6 acres.

The North Pacific Coast

TACOMA, WASH., September 2, 1910.

Increasing activity, as recently foreshadowed, is the principal feature of trade at present all along the North coast; and from interior points, as far as the Panhandle of Idaho, there has been developing of late a steady flow of inquiries for machinery and supplies. To some extent purchases for important projects are still deferred; but a number of these are approaching the stage where contracts for equipment will need to be placed, and, while it may take a month or two longer to force buying on that account, it will be done in proportionately greater volume when the time comes. Meanwhile, current business, based on the ordinary operation and growth of the multitude of local industries, is keeping the market in a healthy condition. All of the machine shops, foundries, structural plants, repair works, &c., are reasonably busy on orders taken during the past month or even earlier. Alaskan trade also continues to be an appreciable factor in the situation.

The West Coast Steel Works, recently organized by interests identified with the West Coast Wagon Works of this city, has established a steel structural and fabricating plant in connection with the latter, but will build shops of the most modern design, electrically operated, on a new site that has been acquired. Definite information can be obtained in due course by direct inquiry.

The timber cutting plant, planing mill, shingle mill, kilns, warehouses and docks of E. J. McNeeley & Co., Tacoma, which burned last week, are expected locally to be rebuilt this fall. As the fire started in the boiler room the power plant was also destroyed, so that entire reconstruction will be necessary. The company will probably install steam turbine units and drive its machinery in future by means of electric motors.

H. H. Plummer, with office in the Pacific Building, Seattle, is in charge of the sales department on the Pacific Coast of Baxter D. Whitney & Son, Winchendon, Mass. For the first half of the year there was a good market in this section for planers of that firm's manufacture, and, with the resumption of buying during the fall, the season will undoubtedly close strong.

The Alaska Treadwell Gold Mining Company is installing the machinery in its new power plant, near Juneau, Alaska. By the opening of another year further purchases on this account will be necessary.

The plant of the Wm. Musser Lumber & Mfg. Company, Spokane, Wash., will probably be rebuilt for extended capacity and a complete electric power and lighting system installed.

An interesting gravity cable system for handling material on steep ground with the aid of a 9½ x 11 in. engine

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built by the Willamette Iron & Steel Works, Portland, was described by F. E. Newby of Hood River, Ore., in a paper read before the Pacific Logging Congress.

The Wheeler-Reese Company, Tacoma, is reported to be having plans prepared for a new timber cutting plant, with electric motor drive, at Lake Head, Wash., to replace the one that burned.

Owing to a typographical error, the capacity of the Coquille River Electric Company's plant at Coquille, Ore., was stated last week as 15 kw. This should be 150 kw.

As the forerunner of more important improvements, an air compressor of larger capacity than the one heretofore in service will be installed at the Juneau, Alaska, mine of the California & Nevada Copper Company. An ore reduction plant of 100 stamps, equipped with the most modern machinery, is to be completed by spring.

The Sumner Iron Works, Everett, Wash., is manufacturing an all-steel carriage for sawmill work. Among recent installations of this apparatus is one made by the Western Lumber Company, Aberdeen, Wash.

The construction of water works has been decided upon at Jacksonville, Ore., but very little equipment will be required, as a gravity system is feasible.

The Heffernan Engine Works, Seattle, Wash., has added to its facilities for large marine work by the purchase of the marine railway of the Seattle Shipyards' Company, which it will move to the East Waterways, a large tract of tide land recently acquired. The company's plans embrace a complete repair and building plant with large modern shops. The floating dock is 100 x 385 ft., having a capacity of 8000 tons and the marine ways is 56 x 250 ft., with a capacity of 4000 tons.

San Francisco

SAN FRANCISCO, August 31, 1910.

A favorable indication regarding the outlook in California is found in the increased earnings of public service corporations. For example, the net earnings of the Pacific Gas & Electric Company for the six months ending June 30, were $1,635,385, compared with $2,812,403 for the entire year ending June 30, 1909, and the net earnings of the United Railroads of San Francisco for the first half of 1910 showed an increase of $92,342 over those of the same period last year. The opening of the Western Pacific Railroad to freight and passenger traffic will mean a considerable increase in the demand for machinery, both for the railroad itself and for the large territory which it opens to exploitation.

A number of railroads in California are completing their new construction for the year and are now getting into the market for additional rolling stock and supplies, orders for which are being placed every day. The United Railroads of San Francisco is preparing to introduce a new type of steel cars, and has placed an initial order for 80 of them, while numerous purchases are being made for interurban roads in the interior.

Machine tools have not begun to move to any extent in the local market, though buying for other parts of the State is gradually increasing. Some dealers are hampered by the impossibility of getting prompt deliveries, though the majority have sufficient stock on hand to meet current requirements of standard types. Local manufacturers of machinery are now feeling the effects of the eight-hour schedule very strongly, and a slight curtailment of output is noted in some lines which have formerly been active. The demand for pumping machinery remains quite strong, but comparatively little new work has been taken on recently by local manufacturers in this line.

Both dealers and manufacturers report a quiet market for mining machinery, though there are some inquiries for gold dredges, and a number of large rock crushing outfits have been ordered within the last few weeks. Road and construction machinery is still in demand. More business is coming up in woodworking machinery. Electrical equipment is fairly active, with a strong demand for motors.

The Geo. E. Dow Pumping Engine Company, San Francisco, is building a large number of Underwriter fire pumps, to be driven by both steam and electricity, for which there is considerable demand at present. Most of these pumps are of 750 to 1000 gal. per minute capacity. This company is shipping a carload of pumping machinery to the Newport News Shipbuilding Company and will make a similar shipment next week.

The machinery is now arriving at the new plant of the Pacific Coast Steel Company at South San Francisco, and the plant is to start work about the first of next year. The principal features of the equipment are two open hearth basic furnaces, an 18-in. mill and a 10-in. mill. Bars and small structural shapes will be rolled.

The opening of the Columbia Steel Company's new plant at Black Diamond, Cal., has been postponed from September 1 to about the middle of October, owing to delay in installing some of the equipment.

The Western Pipe & Steel Company is working on its new plant at Richmond, Cal., which will be ready for operation by September 15. The machinery is being moved over from San Francisco, and in addition new machines are being installed to handle plates up to 1¼ in. thick. The company has new contracts covering its entire output for several months.

The Pacific Portland Cement Company has purchased one No. 9 and two No. 6 McCully crushers for its plant at Cement, Cal., and is putting in a tramway, the entire plant being operated by electric power.

The J. J. Belser Company, Honolulu, T. H., has ordered a No. 7½ McCully crusher, which is the largest machine of this type in the islands. This company is also installing a large set of roll crushers, elevators and screens and a steam power plant.

The Eccles & Smith Company, San Francisco, recently took up the agency for Terry core drills, and is getting them well established in this market.

The Yuba Construction Company, Marysville, Cal., which has built several large gold dredging plants recently, is preparing to double the size of its shops.

The Chico Iron Works, M. L. Mery, proprietor, located for 38 years at Chico, Cal., is to be removed to Oroville, Cal.

The Pacific Hardware & Steel Company has leased an additional warehouse on Seventh street, between Bryant and Brannan. A building at the corner of Townsend and Crook streets has been leased by the Johnson Ball Bearing Water Wheel Company.

The Eureka Well Supply Company has been incorporated at Bakersfield, Cal., with a capital stock of $50,000, by I. Sanderson, H. M. Tomson, G. T. Nighbert and N. McDonald.

T. H. Benton, whose large sawmill at Redding, Cal., was burned recently, is preparing to replace his equipment.

The Visalia City Water Company, Visalia, Cal., is planning to install a new pumping plant.

P. K. Wood of the P. K. Wood Pump Company, Los Angeles, has invented and is putting on the market a new pump for handling crude petroleum.

The Bulger Lock Coupling Company has been incorporated in San Francisco, with a capital stock of $1,000,000, by C. A. Gibson, J. K. Bulger, J. D. Spreckels, Jr., A. L. Gage and W. D. K. Wilson.

The Cyclops Iron Works, San Francisco, has a contract for an ice and refrigerating plant for the city of Sacramento, Cal.

Geo. L. Moselle, representing the United States Iron & Steel Company of Los Angeles, has been looking for a site for a smelter in San Francisco or Oakland.

It is reported that the Pacific Coast Steamship Company may place orders for a new steamer in the near future.

The Associated Pipe Line Company has purchased a tract of land at Los Banos, Cal., where it is preparing to install a large oil pumping station.

The Western Grain & Sugar Products Company has purchased a large building at Crockett, Cal., and will install machinery and equipment to cost about $200,000.

The Choix Consolidated Mining Company, Los Angeles, has placed a $50,000-contract with the Mill & Smelter Engineering Company of New York for a smelter to be constructed at its mines in Mexico.

The Baker-Smith Machine Company has been incorporated at San Diego, Cal., with a capital stock of $10,000, by Robert and Fred Baker and F. and S. Smith.

The San Diego Electric Railway Company has secured a permit to erect a temporary machine shop in San Diego, Cal., pending the completion of its permanent shop buildings.

The R. Bancroft & Sons Company is preparing to establish a factory at Merced, Cal., for the manufacture of gas engines, pumps and agricultural machinery.

The city of Los Angeles will receive bids September 26 for crusher plates for the municipal cement mills.

The Union Dredging Company is planning to build several gold dredges at a cost of about $100,000 each, for working its property near Folsom, Cal.

The Portland Cement Company is installing a 3-mile aerial tramway and other machinery for a new plant near Auburn, Cal.

Government Purchases

WASHINGTON, D. C., September 6, 1910.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids September 10 for additions to power plant and distributing systems, Naval Hospital, Annapolis, Md.

The Isthmian Canal Commission, circular 603, calls for

bids to be opened September 20 for electric motors, punches, dies, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 30 for the following:

Class 11.—One high speed forging press—Bidder 175, United Engineering & Foundry Company, Pittsburgh, Pa., $9075.
Class 91.—One steam locomotive crane—Bidder 15, Browning Engineering Company, Cleveland, Ohio, $12,875; 204, Industrial Works, Bay City, Mich., $11,495.
Class 101.—Electrical machinery—Bidder 75, General Electric Company, Schenectady, N. Y., $12,092 and $12,972; 158, B. F. Sturtevant Company, Hyde Park, Mass., $8239; 167, Terry Steam Turbine Company, New York, $10,615.
Class 181.—One turbo-generating set—Bidder 75, General Electric Company, Schenectady, N. Y., $900.25; 158, B. F. Sturtevant Company, Hyde Park, Mass., $597.50; 167, Terry Steam Turbine Company, New York, $775.

July Exports and Imports of Iron and Steel

According to the July report of the Bureau of Statistics of the Department of Commerce and Labor the total value of the imports of iron and steel and manufactures thereof showed a considerable gain as compared with June, while the exports slightly diminished. The value of the July exports, not including iron ore, was $16,108,102, against $16,503,204 in June, while the value of similar imports was $3,656,395 in July, against $3,068,184 in June.

The exports of commodities for which quantities are given totaled 128,055 gross tons in July, against 120,596 tons in June, 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for July and for the current calendar year ending with July are as follows, compared with the corresponding periods of the previous year:

Exports of Iron and Steel.

	July,		Seven mos. ending July.	
	1910.	1909.	1910.	1909
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	17,504	7,885	59,213	31,782
Scrap	1,090	2,570	12,929	21,321
Bar iron	1,826	992	11,340	8,001
Wire rods	1,024	589	14,625	9,390
Steel bars	10,457	6,691	58,388	39,610
Billets, Blooms, &c.	126	13,971	7,657	74,810
Steel rails	28,568	18,973	219,200	139,567
Iron sheets and plates	7,105	4,675	61,347	38,627
Steel sheets and plates	11,020	7,352	91,648	53,292
Tin and terne plates	372	1,267	7,056	5,596
Structural iron and steel	14,028	8,090	89,042	53,706
Barb wire	5,590	7,068	42,380	39,649
Wire	8,720	7,135	54,651	50,618
Cut nails	560	1,021	3,804	5,383
Wire nails	4,723	1,024	25,568	16,126
All other nails, including tacks	891	683	5,394	4,279
Pipe fittings	14,451	10,759	88,559	2,232
Totals	128,055	100,745	852,801	593,989

The imports of commodities for which quantities are given totaled 42,326 gross tons in July, as compared with 31,010 tons in June, 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of such imports for July and for the current calendar year ending with July, as compared with the corresponding periods of the previous years, are as follows:

Imports of Iron and Steel.

	July,		Seven mos. ending July,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	19,865	17,899	139,918	76,800
Scrap	3,033	2	60,389	2,252
Bar iron	3,517	1,418	25,528	8,563
Billets, bars and steel forms n.e.s.	3,283	2,711	27,594	9,084
Sheets and plates	302	304	4,073	1,943
Tin and terne plates	10,790	5,160	47,010	34,970
Wire rods	1,736	680	12,598	6,368
Totals	42,326	28,174	317,110	139,980

The imports of iron ore in July were 248,810 gross tons, against 193,415 tons in June, 240,833 tons in May, 206,135 tons in April this year, and 172,316 tons in the month of July, 1909. The total importations of iron ore for the seven months ending with July were 1,508,076 gross tons, against 744,863 tons in the corresponding period of last year. Of the July imports of iron ore 93,850 tons came from Cuba, 48,332 tons from Sweden, 38,566 tons from Spain, 10,507 tons from Canada and 57,555 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the seven months ending with July, was $112,519,587, against $86,819,465 in the corresponding period of last year. Similar imports were, respectively, $24,285,898 and $15,597,523.

The Population of Latin America

Consul Frederic W. Goding of Montevideo, has compiled the following statistics from latest available sources covering Latin-American population:

Country.	Population.	Area, square miles.	Population. square miles.
Brazil	19,910,646	3,218,130	6.2
Mexico	13,607,259	767,000	17.7
Argentina	6,805,684	1,135,840	5.99
Peru	4,500,000	679,600	6.5
Colombia	4,000,000	438,436	9.0
Chile	3,249,092	291,500	11.6
Venezuela	2,591,000	593,950	4.4
Bolivia	2,267,935	709,000	3.2
Cuba	2,048,980	45,883	44.0
Guatemala	1,804,000	48,290	38.2
Salvador	1,707,000	7,225	236.0
Ecuador	1,500,000	420,000	12.0
Uruguay	1,111,758	72,210	15.4
Honduras	745,000	46,250	16.1
Paraguay	636,000	196,000	4.1
Nicaragua	600,000	49,200	12.2
Panama	360,542	32,380	11.1
Costa Rica	351,176	18,400	15.2
Totals	67,796,072	8,769,294	*26.05

* Average.

Modern Buenos Aires

Consul-General R. M. Bartleman of Buenos Aires, Argentina, furnishes the following to the Department of Commerce and Labor:

"As nearly 30 per cent. of the population of Argentina live in incorporated places of over 50,000 inhabitants, and as fully 20 per cent. of them live within a 20-mile radius of the federal capital, Buenos Aires, which is to a greater extent than any other capital in the world the concentrated center of commerce, industries, manufactures, population, and wealth of the entire country, some account of the growth of this, the fourth city in the two Americas, during the year 1909 may be of interest. However, it should never be forgotten that Buenos Aires is not the Argentine Republic, and that no one can have a true idea of that republic without a close knowledge of all the more important 24 provinces and territories. While only 12,397 buildings were erected in Buenos Aires in 1909, as against 12,542 in 1908 and 13,148 in 1907, many of them were very large, modern office buildings built of structural steel of a type utterly unknown four years ago.

"The largest hotel and the largest office building in South America were completed in Buenos Aires in 1909, both built by architects and with materials from the United States. Buenos Aires is being transformed by the new skyscrapers and the large, modern apartment houses built in the semi-French style. It is said that six years ago steam heat was almost unknown in Buenos Aires, where the winter season, though short, can be cold and damp, while to-day every new apartment house has a good system of steam heating. The old one-story houses are rapidly giving way to more modern structures. There are not enough houses to accommodate the population of a city which gains some 60,000 inhabitants a year, forming an additional reason for the constantly increasing cost of living."

Trade Publications

Forging Presses.—United Engineering & Foundry Company, Farmers' Bank Building, Pittsburgh, Pa. Circular. Concerned with high speed hydraulic forging presses, which can handle work ranging from 100 to 12,000 tons. All the sizes are controlled in the same way through a single lever and work the metal of the forgings to the center with a squeeze, not a blow. An illustrated description of these presses was printed in *The Iron Age* June 30, 1910.

Valves.—The American Valve Company, Coxsackie, N. Y. Catalogue. This is the company's 1910 catalogue, describing and illustrating the various styles of valves bearing the trade name American. These include bronze gate, globe and angle valves and iron body bronze mounted gate valves. The prices of the different sizes of valves are given in tabular form under the illustrations of the various models, and the prices for the nickel plated valves are printed on different pages from those of the standard finish.

Conveying Machinery. Link-Belt Company, Nicetown, Philadelphia, Pa. Book No. 81. Size 6 x 9 in.; pages 96. Relates to the Peck carrier for handling coal, coke, cement and similar products. The advantages claimed for this carrier are minimum power consumption, ability to elevate and convey material in one machine, discharging material at any desired point, and silent operation. The different parts of the carrier are illustrated and described and there are a number of views of typical installations.

Electric Motors.—Rochester Electric Motor Company, Rochester, N. Y. Pamphlet. Pertains to a line of direct current motors built for constant, varying and adjustable speeds, for either constant or intermittent service. The construction of these motors is described and the text is supplemented by views of the various parts. Other illustrations show applications of these motors for driving machinery of all kinds.

Welding Joints.—Goldschmidt Thermit Company, 90 West street, New York City. Folder. Deals with the welding of butt joints with Thermit in ammonia, steam, hydraulic and compressed air pipe lines. The illustrations show a butt weld made on a 4-in. double extra heavy pipe for hydraulic service and the welding of a 1¼-in. ammonia service pipe line in a trench.

Seamless Tubing.—Ellwood Ivins Tube Works, Oak Lane Station, Philadelphia, Pa. Booklet. Lists the various kinds of seamless brass, copper and aluminum tubing made by this firm, as well as the cold drawn seamless steel variety. The various sizes are from 1-64 to 3 in. external diameter for steel tubing, 1-32 to 1 in. for the copper and brass tubing, and 1-64 to 3 in. for the aluminum tubing.

Silent Chain.—Link-Belt Company, Nicetown, Philadelphia, Pa. Booklet No. 102. Points out the advantages of using the Maximum silent chain for power transmission, which include freedom from slipping, ability to run on short centers, quietness in operation and high speed. This chain is made of stamped links of special form with hardened steel pins, removable bushings and washers. This chain runs over iron wheels having accurately cut teeth. The illustrations show the construction of the chain, its action as compared with the ordinary chain drive and a number of typical applications.

Battery Charging Rheostats.—American Electric Fuse Company, Muskegon, Mich. Bulletin No. 316. Concerned with the Allen-Bradley battery charging rheostats, which operate on the principle of compressible resistors. Regulation of the current is secured through imperfect electrical contact between graphite disks piled one upon another in an insulated dust-proof metal tube and the resistance is varied by compressing or releasing the disks. The special advantages claimed are economy of space, close regulation, wide range of operation and freedom from arcing.

Electric Motors.—Triumph Electric Company, Cincinnati, Ohio. Bulletin No. 391, superseding Nos. 271 and 311. Concerned with the Type F direct-current steel frame motors, which are built in all standard sizes for 115, 230 and 500 volts. Machines smaller than 5 hp. are of the bipolar type, while the larger ones are of the multipolar design. The illustrations show the various parts of the motor, the complete machines and installations for driving various machines.

Concrete Mixers.—Eureka Machine Company, Lansing, Mich. Catalogue No. 10. Concerned with a line of concrete mixers in which it is claimed low initial and operating costs have been combined with satisfactory results. One of the special features of the machine is the possibility of varying the output to suit the conditions of the work in hand. The feeding device is automatic and will handle any kind of material used under engineering specifications. These mixers are made in three sizes, two of which are intended for mixing concrete and the other for mixing mortar. The larger one of the former type is mounted on a truck to make it easily transportable from place to place and is driven by either steam or gasoline engine, or electric motor. The smaller concrete mixer is not regularly supplied with power, and the mortar mixer is driven by a gasoline engine.

Oil Filters.—Pittsburgh Gage & Supply Company, Pittsburgh, Pa. Catalogue. Points out the advantages to be derived from the use of the White Star oil filters and continuous oiling systems, which are high efficiency of lubrication without waste of oil. In this system the oil flows from a reservoir by gravity to the different bearings, and after passing through them is collected in a separating tank and returned to the reservoir after being filtered. The illustrations show the different styles of filters and the ways of installing them in connection with continuous oiling systems, and the fittings used.

Conveying Machinery and Parts.—Link-Belt Company, Hunting Park avenue and P. & R. Railroad, Philadelphia, Pa. Catalogue No. 90. Size 6 x 9 in.; pages 400. This is the company's 1910 catalogue, describing and illustrating the standard articles it manufactures for use with conveying machinery and appliances. The majority of the illustrations are of these different parts, although there are a few general views of typical installations. *The Iron Age*, March 4, 1909, contained an illustrated description of the installation at the plant of the Champion Fibre Company, Canton, N. C., made by this company for handling sawdust, shavings, &c.

Power Transmission Machinery.—Pyott Company, Carroll avenue and Morgan street, Chicago, Ill. General catalogue No. 1. Size 6 x 9 in.; pages 72. Covers a line of power transmission machinery which includes pulleys, friction clutches, flange, jaw and ribbed couplings; pillow blocks, drop hangers, belt conveyor appliances, and shafting. These are all illustrated and briefly described and a complete price-list is included.

Electric Heating Furnace.—Baily Engineering Company, Alliance, Ohio. Pamphlet. Concerned with the resistance type of electric heater for economically heating bars and billets for forgings. The special advantages claimed for this type of furnace over those ordinarily employed are more accurate control, economy in operation, higher thermal efficiency and a lower cost per pound of metal heated. Six sizes of furnace, ranging in capacity from 60 to 1000 lb. per hour, are built, and the power consumed varies from 20 to 200 kw.

Power Hammers.—Dienelt & Eisenhardt, Inc., 1304 North Howard street, Philadelphia, Pa. Booklet. Concerned with the improved dead stroke power and bracket hammer. The ram of the former model is suspended on a flexible belt which is attached to the ends of a semicircular steel spring whose upper part is connected to the crank pin by a rod. This type of construction prevents the shaft bearings and the crank pin from being broken through the rebound of the blow. The bracket type is of the same general construction except that it is supported by a wall bracket, the stroke therefore being shorter and less powerful.

Water Meters.—Standard Water Meter Company, 243 Robinson street, Brooklyn, N. Y. Catalogue. Refers to a line of water meters in which sapphire bearings are used throughout. Four styles of meter in all are made, the disk meter, a current meter of two different kinds, and a frost proof meter. All of the meters are built in accordance with the best practice of the day and the last one is held together with cast iron clamps instead of nuts and bolts. These clamps are said to be capable of withstanding a frost pressure of 200 lb., while the body of the meter will resist any pressure up to 450 lb. In this way all injury to the working parts due to the meter becoming frozen is averted, as the clamps will break first.

Electric Fans and Portable Electric Drills.—Sprague Electric Company, 527 West Thirty-fourth street, New York City. Bulletin and circular. Bulletin No. 235 refers to the motor-driven propeller and disk fans for ventilating purposes. There is a brief description of these fans, their uses and construction, and this is followed by illustrations and tables of dimensions of direct current fans from 18 to 60 in. in diameter and alternating current models ranging from 18 to 42 in., inclusive. Circular No. 234 contains illustrations and descriptive matter about the portable electric breast drills for both alternating and direct current, which have been designed to meet the demand for a light weight tool that would be capable of giving satisfactory service under adverse operating conditions.

Ball Retainers.—The Star Ball Retainer Company, Inc., Lancaster, Pa. Circular. Covers the various sizes of radical and thrust ball retainers, for use in cup and cone and thrust bearings, respectively. These are made in a wide range of sizes, those of the first type varying from a retainer having six ⅛-in. balls to one containing ten ¾-in balls. The thrust ball retainers are designed for use in connection with grooved thrust washers for shaft diameters of from 9-16 to 4 7-16 in. and from 6 to 30 balls.

The population of New York City is 4,766,883, an increase of 38.7 per cent., as compared with 1900. Brooklyn, included in New York, has 1,634,351. Philadelphia has 1,549,008, a gain of 19.7 per cent. Rochester, N. Y., has 218,149; Troy, N. Y., 76,813; Rockford, Ill., 45,401; Auburn, N. Y., 34,668; Alton, Ill., 17,528.

Personal

Charles Kirchhoff, who has been abroad for several months, arrived in this country last week.

Charles F. Kenworthy, furnace engineer, until recently with the engineering department of the American Brass Company and formerly of the Kenworthy Engineering Company, has been engaged by the Rockwell Furnace Company, 26 Cortlandt street, New York, to represent it in the New England States and Canada. Mr. Kenworthy has devoted his entire time for the past 18 years to the design and construction of furnaces and fuel apparatus.

Robert A. Magly severed his connection September 1 with the Bessie Ferrosilicon Company, Columbus, whose furnace is at New Straitsville, Ohio. He had been connected with the operations of the furnace for 12 years, and for the last five was general manager of the company. He has made no definite plans for the future.

Herman E. Beyer, Pittsburgh, representative of the Southwark Foundry & Machine Company of Philadelphia, Pa., has resigned, and is now manager of the Birmingham Machine & Foundry Company, Birmingham, Ala.

August Marx, general manager of the Philadelphia Roll & Machine Company, Philadelphia, Pa., will return this week from an extended European tour.

Robert Field, widely known in the Western pig iron trade, has resigned his position with the Whitney-Kemmerer Company, Cincinnati, Ohio, on account of ill health, and for the present will not attempt any active business.

Horace V. Winchell, who has been spending some time in Sweden, attending the International Geological Congress at Stockholm and visiting Swedish iron mines, will sail from England for the United States about October 1.

The commission authorized by Congress to make an investigation of the question of control of stock and bond issues by concerns engaged in interstate commerce, as announced by President Taft, is to be composed of President Arthur Hadley of Yale, chairman; Frederic N. Judson of St. Louis, Frederick Strauss of New York, Walter L. Fisher of Chicago and Prof. B. H. Meyer, who occupies the Chair of Political Economy in the University of Wisconsin at Madison. The commission will thus be composed of two members of college faculties, two lawyers and one banker, Mr. Strauss, who is a member of the firm of J. & W. Seligman & Co.

Henry I. Lea, consulting gas engineer, Chicago, has been retained by James B. Clow & Sons, for the purpose of recommending alterations and extensions in the producer gas plant in their pipe works at Coshocton, Ohio. A producer plant of 1500-hp. capacity has been supplying all the power and light at the Coshocton plant, but the rapid growth of the business will soon require 3000 hp.

The Ehret Magnesia Mfg. Company, Land Title Building, Philadelphia, Pa., announces that January 1, 1911, it will commence shipments of Ehret's 85 per cent. magnesia products from its new reinforced concrete plant, now rapidly approaching completion on the site of its recently burnt building. It is therefore ready to enter into contract for magnesia requirements for the 12 months ending December 31, 1911.

The Owego Bridge Company, Owego, N. Y., has received contract for the construction of 13 bridges over the Erie Barge Canal on the section near Fairport, N. Y. The amount of the contract was $172,000.

Obituary

THEODORE GILES MONTAGUE, a large stockholder in the Roane Iron Company, Chattanooga, Tenn., of which his brother, D. P. Montague, is vice-president, died at Chattanooga September 2, aged 74 years. He was connected prominently with banking, manufacturing and real estate interests in Chattanooga.

THOMAS F. GRIFFIN, who was connected with Corrigan, McKinney & Co., Cleveland, Ohio, throughout his active business career, died at Colorado Springs, Colo., August 29, aged 42 years. He was at the head of the firm's iron ore department for a number of years and had to do also with its pig iron operations, coming early into a position of responsibility. For the past seven years he had been in Colorado for the benefit of his health.

LOUIS ECKEL, Syracuse, N. Y., died August 30, aged 52 years. He had been engaged in the manufacture of steel for more than 30 years, having begun as a roller in the plant of the Sanderson Brothers Steel Company. He afterward engaged with the Sweet's Steel Company in the same capacity, continuing until 11 years ago when he was one of the organizers of the Eckels-Nye Steel Company, for the manufacture of rolled steel products, which has had a successful career. He leaves a widow, one son and one daughter.

JOHN M. LARMOUR, manager of the small tool department of the Baird Machinery Company, Pittsburgh, Pa., died August 17.

JOHN KELLER HANES died in Chicago, September 2, aged 57 years. He was a native of Pennsylvania, engaged in newspaper work in Philadelphia and became connected with the business department of *The Iron Age* in 1881. In 1885 he was made manager of the Chicago office, retiring from that position in 1898 on account of his health, which he never fully regained.

Judge Smith McPherson of the United States District Court, Red Oak, Iowa, has denied the application of C. W. Post of Battle Creek, Mich., for an injunction to restrain the American Federation of Labor officials and the Buck's Stove & Range Company from entering into a closed shop agreement. The tentative agreement, the ratification of which Mr. Post opposed, the court says, was reached some six weeks ago, but the complainant remained silent until the last few days. The court says every employer of labor has the right to determine for himself whether his business shall be operated as a closed shop or an open shop, adding: "Whether it is for the better to have a closed shop or an open shop, men differ."

The twenty-eighth annual coal report of the Illinois Bureau of Labor Statistics, covering the year ending July 1, 1909, has just been issued. This report gives full statistics of the coal production of the State, based on reports from the 10 inspection districts, covering a very great amount of detail. It also includes the labor and mining laws passed at the last previous session of the Legislature. The volume comprises 487 pages. M. H. Madden, Chicago, is president of the Board of Commissioners of Labor of Illinois, and David Ross, Springfield, is secretary.

The new steel car ferryboat, the Marquette & Bessemer No. 2, that is being built for the Marquette & Bessemer Dock & Navigation Company by the American Shipbuilding Company, was launched at the Cleveland yards of the latter company September 3. The boat was christened by the daughter of John R. Scott, manager of the Cleveland sales office of the Carnegie Steel Company.

The Iron and Steel Institute's Autumn Meeting

The autumn meeting of the Iron and Steel Institute will be held at Buxton, England, September 26 to 30, 1910. The following papers will be presented:

"Electric Steel Refining," by D. F. Campbell, London.
"The Hanyang Iron and Steel Works," by G. Chamier, Hankow, China.
"Manganese in Cast Iron and the Volume Changes During Cooling," by H. I. Coe, Birmingham.
"Sulphurous Acid as a Metallographic Etching Medium," by E. Colver-Glauert, Berlin, and S. Hilpert, Charlottenburg.
"The Theory of Hardening Carbon Steels," by C. A. Edwards, Manchester.
"The Influence of Silicon on Pure Cast Iron," by A. Hague, Birmingham, and T. Turner, Birmingham.
"The Preparation of Magnetic Oxides of Iron from Aqueous Solutions," by S. Hilpert, Charlottenburg.
"The Manufacture of Rolled H-Beams," by G. E. Moore, Loughborough.
"The Utilization of Electric Power in the Iron and Steel Industry," by J. Elink Schuurman, Baden, Switzerland.
"The Briquetting of Iron Ores," by C. de Schwarz, Liége.
"Some Experiments on Fatigue of Metals," by J. H. Smith, Belfast.

The programme includes the following:

September 26.

In the evening a reception and concert will be held in the pavilion by invitation of the president of the Institute, the Duke of Devonshire, and the Reception Committee.

Special performances will be given at the Opera House each evening during the week and the Reception Committee has arranged to provide members and their ladies, on production of their badges, with eight-day tickets of admission free of charge.

September 27.

At 10 a.m., after the reception of the president, council and members of the institute, in the Old Theatre in the Pavilion Gardens, by the chairman of the Urban District Council, W. F. Mill, a selection of papers will be read and discussed.

At 12.20 p.m., a special train, provided by the Midland Railway Company, will leave Buxton for Derby, where the visitors are invited to luncheon by the Midland Railway Company. Alternative visits will then be made to the Railway Company's works and to the Royal Crown Derby Porcelain Works. The excursion is limited to 300 persons, of whom not more than 100 can visit the porcelain works.

September 28.

At 9 a.m., a general meeting for the reading and discussion of papers will be held in the Old Theatre.

At 11.30 a.m., a trip will be taken by the Midland Railway to visit the Devonshire Works of the Staveley Iron & Coal Company, by invitation of C. P. Markham, Mayor of Chesterfield and chairman of the company. The party will be entertained at luncheon at the works, and will afterward visit the Broad Oaks Iron Works of Markham & Co., Ltd., Chesterfield, where tea will be provided. This excursion is limited to 150 persons.

At 8.30 p.m., dinner at the Palace Hotel, Buxton. As the capacity of the dining hall is strictly limited to 150 places, tickets will be allotted in strict order of priority of application. For those who are unable to secure tickets for this dinner, arrangements have been made for an overflow dinner at the Empire Hotel.

September 29.

At 9 a.m., a general meeting will be held for the reading and discussion of papers in the Old Theatre.

At 11.40 a.m., a special train, provided by the London & Northwestern Railway Company, will leave for Crewe, where the party will be entertained at luncheon by the directors of the company at the Crewe Arms Hotel, after which a visit will be paid to the company's works. The number of the party is limited to 200 persons.

September 30.

The members and ladies accompanying them will leave for Chatsworth, where they will be entertained at a garden party by the president, the Duke of Devonshire.

Foundry Flask Standardization Proposed

With the sole object of assisting the foundryman, M. W. Griswold, Highwood, N. J., has submitted to *The Metal Worker* a plan for standardizing or for establishing what may be called a United States standard for foundry flasks. It is somewhat strange, says our contemporary, in view of America's unchallenged leadership in the development of interchangeable systems, that the flasks of one foundry are not interchangeable with those of another for castings of substantially the same size. It is, perhaps, not so much the size of the flasks that is the cause of trouble as it is location of the flask pins. It is, of course, recognized that a small fraction of an inch leeway makes it impossible in many cases for a cope from one foundry to fit the drag of another without running the risk of castings showing too prominently the line of parting. The following is the substance of Mr. Griswold's idea, calculated to apply to flasks of all depths:

"On account of the variation of castings for flasks, all measurements as to list sizes must be made on the inside at the parting line, and the sizes listed at the full half-inch found next below the actual measurement. (To illustrate: Should the actual width be 12⅝ in. and the length, say, 14 3-16 in., it must be listed as 12½ x 14.)

"The locations of the pin holes are not to be made from the actual measurement of the flasks, but from the list size as provided for above.

"In locating the pin holes, the measurements must be made from lines drawn at right angle through the actual center of the flask, and the distance apart along the sides of the flask from center to center of the pin holes must be exactly three-fifths of the list length (or three-tenths from the actual center line). The distance apart, across the flask, must be exactly 2¾ in. greater than the list width, or 1⅜ in. more for the distance from center line to center of pin holes. The distance 1⅜ in. is taken as being practically 35 mm.

"For flasks of less than 500 sq. in. of surface measure, the pin holes must be exactly ½ in. in diameter."

It will be noted that it is stipulated that list sizes of flasks are to be made from internal measurements. It will thus be seen that one having to make a casting of a certain size can determine at the outset what list size flask is suitable to the work. It is important to notice that the location of the flask pins will be identical with all flasks of the same list size, and, incidentally, it may be stated that Mr. Griswold finds that these dimensions show a very close agreement to most of the flasks now in use.

The International Tool Steel Company of Toronto has completed arrangements for a site at Cobourg, Ontario, Canada, on which it will erect a plant this fall for the manufacture of tool steel. The location is on the water front, and an agreement has been entered into with the Town Council giving exemption from local taxation.

The Delaware River Steel Company blew out its furnace at Chester, Pa., September 1, in order to put in a new bedplate and make other repairs to its Southwark engine, which was considerably damaged in the fire at this plant in February. Any needed repairs to the furnace will be made at the same time.

New Head of the Bureau of Mines

Dr. Joseph A. Holmes Appointed Director

The announcement was made at Washington September 2 that President Taft had appointed Dr. Joseph A. Holmes director of the new Bureau of Mines. As is well known, there has been a long controversy over this appointment, and for the past two months George Otis Smith, director of the United States Geological Survey, has been acting director of the Bureau of Mines, which was established by an act effective July 1.

Dr. Holmes has been active for a number of years in government work, particularly in connection with fuel and structural material testing and the investigation of mine explosions. He is 51 years old, and was born at Laurens, N. C. He graduated at Cornell University, class of 1881. In his college course and in the years since he has given special attention to studies in



DR. JOSEPH A. HOLMES.

chemistry (with laboratory courses in the chemistry of explosives and of metals) and to geology, mining and metallurgy. He has visited mining districts and examined iron, copper and other metal mines, coal mines and quarries and plants connected with the treatment and preparation of mineral products in many parts of the United States as well as in Germany, France, Belgium and Great Britain. The investigations in these lines have been with special reference to lessening the loss of life and the waste of resources. From 1881 to 1891 he was professor of geology in the University of North Carolina, and was geologist of that State from 1891 to 1903. In 1903 and 1904 he organized and had charge of the Department of Mines and Metallurgy of the World's Fair at St. Louis. In 1904, when Government fuel investigations were authorized by Congress, Dr. Holmes, who had planned the work, was offered its supervision, but was unable to give it the necessary time, and at his request it was given in charge of a committee consisting of E. W. Parker and M. R. Campbell, of the Geological Survey, and Dr. Holmes. This committee carried on the work through 1904, and in 1905 Dr. Holmes was appointed to take charge of the fuel investigations as enlarged, as well as of investigations of mine explosions. These two lines will constitute the main work of the new Bureau of Mines.

Dr. Holmes is a member of the American Institute of Mining Engineers and other mining societies, also of the Mining Investigation Commission of the State of Illinois, and he represents the United States on an International Mining Commission. The movement for free entry of mine safety and rescue appliances into this country resulted from his initiative, and he planned the establishment of the three State mine rescue stations in Illinois and the 12 Government rescue stations in the important coal fields of the country. On his recommendation in 1907 President Roosevelt secured the appointment by governments of Great Britain, Germany and Belgium of one prominent engineer from each of these countries to visit the United States, and in company with them Dr. Holmes visited various coal fields to determine the extent to which the modern safety practices of other mining countries might be introduced in the United States.

In the past three years, as chief of the technologic branch of the Geological Survey, Dr. Holmes has enlisted the co-operation of miners and mine owners throughout the country. Though just begun, the work of mine accident prevention is bringing results. The number of miners killed in the coal mines of this country, from being 3200 in 1907 and 2450 in 1908, is estimated at 2200 in 1909. The number of tons of coal mined for each life lost was 145,471 in 1907 and 167,545 in 1908, while the estimate for 1909 is 198,000.

Gary Statistics

In a souvenir book or pamphlet issued by the Indiana Steel Company, on the occasion of the visit of the Lake Superior Mining Institute last month, the following figures of estimated production at Gary are given:

	Tons.
Pig iron	1,200,000
Open hearth ingots	2,700,000
Standard steel rails	1,200,000
Blooms and billets	1,200,000
Merchant steel bars	600,000
Plates	240,000
Car axles	100,000
Coke	1,650,000

The eighth blast furnace was completed last spring. The rail and billet mills have been in operation a year and a half. The car axle plant was completed and started last month. The universal plate mill and the 560 coke ovens are nearing completion. Two of the merchant mills were completed last winter, and the three smaller mills included in the above estimate of capacity are nearing completion.

The blast furnaces are operated by 16 2000-hp. gas engines, supplemented by four 3000-hp. steam engines for emergencies. The power for the open hearth plant and steel mills is supplied by 17 3000-hp. gas engines which drive an equal number of electric generators, the engines using gas from the blast furnaces. Part of the excess power is transmitted 5 miles to Buffington and utilized in the plant of the Universal Portland Cement Company. The largest individual electric motors in the world are installed in the Gary mills. The rail mill has three 6000-hp. motors for driving the rolls.

In the first subdivision of the city of Gary, more than 20 miles each of sewer, gas and water pipes have been laid. The water supply is obtained through a 72-in. tunnel 15,000 ft. in length, extending into Lake Michigan beyond the reach of pollution. Individual investors have erected buildings in Gary for business purposes to the value of $1,500,000 and for residence purposes to the value of $1,000,000. The present population of the city is estimated at 20,000.

The Atlantic Deeper Waterways Convention

The Providence Meeting Large and Enthusiastic

The third annual convention of the Atlantic Deeper Waterways Association, which has for its object the purpose of furthering governmental action, to establish a chain of navigable inland waterways along the Atlantic seaboard, was held at Providence, R. I., August 31, September 1, 2 and 3. All previous records of attendance were broken. Morning, afternoon and evening business sessions were held at the Providence Opera House, the seating capacity of which was taxed to the utmost.

President J. Hampton Moore called the convention to order on Wednesday morning, when welcoming addresses were made by Mayor Henry Fletcher of Providence and Governor Aram J. Pothier of Rhode Island. These were responded to by William S. Greene of Massachusetts and John H. Small of North Carolina. A letter from President Taft and a telegram from Richmond P. Hobson, regretting their inability to attend, were read. President Moore then presented a lengthy report reviewing the work done by the association and outlining plans for the future. He referred to the survey now being made under act of Congress for a system of deeper Atlantic waterways, a report on which is expected during the next session of Congress. That at least some of the large Eastern railroad systems are not opposed to the establishment of deeper seaboard waterways was evidenced from a letter received from President McCrea of the Pennsylvania Railroad, in which the project was approved.

The report of the secretary-treasurer, Addison B. Burk, showed an increase of 318 members during the year. The increase was general, scattered along the entire Atlantic seaboard. The financial report showed receipts, $7366.21; disbursements, $7448.65; deficit, $82.44. After the appointment of various committees the opening session adjourned.

Rear Admiral C. S. Sperry presided at the afternoon session and papers were read by Commander Alfred Books Fry, chief engineer of the United States Treasury Service, on "Commercial Canals and Locks to Carry Barges of 600, 1000 and 2000 Tons Capacity." Herbert Knox Smith made an address on "Port Terminals." A paper on "Terminal Facilities Required for the Successful Co-ordination of Rail and Water Traffic" was read by Calvin Tompkins, Commissioner of the Department of Docks and Ferries, New York. L. E. Chamberlain, president of the Massachusetts State Board of Trade, Brockton, Mass., spoke on "New England's Opportunities"; and "Waterway Development in Georgia" was the topic of Joseph F. Gray, State Railway Commissioner, Savannah, Ga.

The evening session was presided over by William W. Cocks, M. C., New York, and was given over to a reception by the Providence General Committee and short addresses by members of Congress and others. The session was concluded with a lantern slide talk by Addison B. Burk, showing the various waterways along the Atlantic Coast.

Anthony Higgins of Delaware presided at the opening session on Thursday and the following addresses on waterway subjects were made: "Atlantic Seaboard Commerce, Inland and Coastwise," by O. P. Austin, Chief Bureau of Statistics, Washington D. C.; "Connecticut's Water Borne Commerce," by Governor Frank B. Weeks of Connecticut; "Relation of the Weather to Rivers," by Willis L. Moore, Chief United States Weather Bureau, Washington, D. C. An address on "Inland Waterways as an Aid to National Defense," by Richmond P. Hobson, who was absent, was presented and read at this session.

The afternoon meeting was presided over by Joseph A. Goulden of New York, and after routine business had been transacted Theodore Kolisher, United States delegate to the International Refrigeration Congress in Vienna, presented a paper on "Freight Movement by Refrigeration Barges." Roswell P. Burchard addressed the delegates on "Rhode Island, Its Commercial Relations to Other Sections, Particularly as They Would Be Affected by an Improved Inland Waterway." Governor J. Franklin Fort of New Jersey spoke on "New Jersey's Experiment in Inland Waterways," while N. B. Broward of Florida referred to "The Florida View of an Intra-Costal Waterway, Connecting with New England." Mayor John F. Fitzgerald of Boston, Mass., spoke forcibly in favor of an inland waterways system. Reports of committees followed. The Resolution Committee presented a lengthy set of resolutions, which, briefly stated, demand of the Government the construction of a deep inland waterway system along the Atlantic Coast, as a measure imperatively required to prevent the strangulation of the transporation business of the millions of people affected by seaboard commerce. In conclusion, the resolution stated that the time for action was the present for the prevention of congestion; not delay until there must be imperative relief from such a condition. The resolutions were unanimously adopted.

The unanimous re-election of President J. Hampton Moore and Secretary-Treasurer Addison B. Burk followed. The Ways and Means Committee presented plans for financing the association, and an additional membership of 500 was pledged by the delegates. It was also decided at this meeting that the next convention should be held in Richmond, Va., about the middle of October, 1911.

The closing session of the most successful, far reaching and educational convention the association has ever held was presided over by Governor Pothier of Rhode Island. Captain J. C. Cantwell of the Revenue Cutter Service and Governor F. M. Ansel of South Carolina made addresses. A brief preliminary report, from correspondence with the Engineering Department of United States America in charge of the survey now under way by the Government for an Atlantic deeper inland waterway system between Boston, Mass., and Beaufort, S. C., was presented at this session. The field work in the majority of instances has been completed, and much of the plotting has been done. Estimates for the various sections have been prepared for waterways of varying width and depth, and routes selected, except from Narragansett Bay to Boston. The principal work remaining is the collection of the necessary data to enable the board to decide upon the depth and width of the proposed canals, after which the final report can be made. This is expected to be ready for presentation during the next session of Congress. The feature of the closing session, however, was an address, illustrated with lantern slides by Commander Robert E. Peary, who made a most interesting address, describing briefly his trip to the far north and the discovery of the pole.

The entertainment provided by the Providence Committee was most lavish. On Thursday evening there was a smoker and a canoe carnival at Rhodes-on-the-Patuset. Friday afternoon the delegates enjoyed one of the famous Rhode Island clambakes. Trips by steamboat to witness yacht and motor boat races and an illumination of the harbor filled the afternoon and evening hours. On Saturday a trip to Newport was made, where the Naval Training Station was inspected, and visits were paid to points of interest in and about the city. The ladies attending the convention were specially entertained.

In the Pittsburgh district 42 blast furnaces were in operation on September 1, or two less than on August 1. No. 3 Isabella, No. 4 McKeesport and Soho were blown out in August and No. 1 Eliza was blown in.

The Republic Iron & Steel Company's Report

Earnings Last Year the Largest Except Those for the Fiscal Year 1907

The eleventh annual report of the Republic Iron & Steel Company, which covers the fiscal year ending June 30, 1910, shows net earnings of $4,227,369, which are the largest ever realized, except for the year ending June 30, 1907. The balance sheet is the first combined financial report issued by the company, the assets and liabilities of all subsidiary companies entirely owned and controlled being included in it. It is as follows:

Assets.

Capital assets:		
Cost of properties July 1, 1909		$54,558,375.36
Additions for the year ending June 30, 1910.		3,654,039.32
		$58,212,414.68
Investments:		
In Potter Ore Company	$401,000.00	
In other companies	405,384.65	806,384.65
Total capital assets		$59,018,799.33
Cash deposited with trustee:		
For redemption of first mortgage 5 per cent. gold bonds in addition to $2,139,000 bonds retired in terms of the trust deed, per contra		4,444.94
Current assets:		
Inventory of manufactured products, material and supplies on hand at or below cost	$6,020,052.30	
Ore contract payments represented by ore at docks	796,844.68	
Accounts and bills receivable after deducting reserve for bad and doubtful accounts.	3,789,193.59	
Cash	5,137,742.33	
Total current assets		15,743,832.90
Deferred charges to operations:		
Expenditure for stripping at mines, advanced royalties, &c., chargeable to future operations		788,195.50
		$75,555,272.67
Net current assets	$12,785,590.54	

Liabilities.

Capital stock:		
Common—273,520 shares of $100 each	$27,352,000.00	
Less—in treasury	161,000.00	$27,191,000.00
Preferred 7 per cent. cumulative 250,000 shares of $100 each		25,000,000.00
Total capital stock outstanding		$52,191,000.00
First mortgage 5 per cent. gold bonds:		
Total issue	$10,000,000.00	
Deduct—Deposited with trustee and canceled	2,139,000.00	
	$7,861,000.00	
Less—Deposited with trustee of the 10-30-year 5 per cent. sinking fund bonds in exchange for bonds of that issue	6,174,000.00	1,687,000.00
10-30-year 5 per cent. sinking fund mortgage gold bonds:		
Total authorized issue	$25,000,000.00	
Authorized for immediate issue	8,164,000.00	
Less—Amount unissued	674,000.00	
Issued and outstanding		7,490,000.00
Haselton property mortgage notes:		
(To retire which a like amount of 10-30-year bonds are reserved)		1,475,000.00
Potter Ore Company Bonds:		
$659,000 outstanding first mortgage 5 per cent. bonds, guaranteed jointly with Tennessee Coal, Iron & Railroad Company, less that company's proportion		329,500.00
Bonds and notes outstanding on the Martin Coke Works property		437,478.00
Funds:		
For exhaustion of minerals	$1,158,568.46	
For depreciation and renewal of plants	1,019,121.13	
For relining furnaces	138,023.16	
For fire and accident insurance	372,783.44	
For contingencies	201,747.58	2,890,243.77
Dividend warrants:		
Payable in equal annual installments from October 1, 1910, to 1915, inclusive		1,142,148.00
Current liabilities:		
Accounts payable	$1,957,194.54	
Ore contract balances representing cash received in excess of the value of ore shipped to customers	310,336.44	
Taxes accrued	112,009.32	
Interest accrued	138,456.31	
Dividends payable:		
1¾ per cent. on preferred stock, payable July 1, 1910 .....$437,500.00		
Unclaimed dividends 2,745.75	440,245.75	
Total current liabilities		2,958,242.36
Surplus:		
Balance June 30, 1910, as per attached statement		4,954,660.54
		$75,555,272.67

It is explained that the large increase in net quick assets since the date of the last annual report is accounted for by the working capital additions from profits of operations and by sales of stocks and bonds. The net balance of quick assets now stands at $12,785,590.54, this amount being considerably in excess of the company's normal working capital requirements. The working capital account will be gradually reduced, however, by charges made on account of construction contracts as they mature. The finances of the company have now been placed on a broad and flexible basis as a result of refunding the first mortgage bonds, of which the outstanding balance is only $1,687,000, subject to call on October 1, 1914. Under the provision of the mortgage securing the sinking fund gold bonds, sufficient reserve is held for the retirement of all outstanding first mortgage bonds and also for the retirement at maturity of the outstanding Haselton mortgage notes, amounting to $1,475,000, so that the balance of bonds available for future corporate uses now aggregates $13,525,000, an amount believed to be amply sufficient to meet any reasonable requirement for the further development of the company's property.

Income Account for the Year

The income account and statement of surplus for the year are as below. The total of profits, $4,227,368.96, compares with $2,769,147 in the preceding fiscal year, $3,046,618 in the year ending June 30, 1908, and $5,027,742 in the year ending June 30, 1907:

Net earnings from operations, after deducting $1,274,580.31 for maintenance and repairs		$4,073,300.09
Interest and dividends received		154,068.87
Total profits for the year		$4,227,368.96
Less—Provision for depreciation and renewal of plants	$607,581.90	
Provision for exhaustion of minerals	294,265.19	901,847.09
Net profits for the year		$3,325,521.87
Deduct:		
Interest on bonds	$422,606.46	
Dividend on preferred stock	1,669,795.75	2,092,402.21
Surplus for the year		$1,233,119.66
Add—Surplus at July 1, 1909		5,920,535.15
Deduct:		$7,153,654.81
Warrants issued July 31, 1909, for arrears of 6¾ per cent. preferred dividend	$1,378,140.75	
Discount and expense on new issue of bonds and preferred stock	765,902.23	
Adjustment of taxes, &c., on undeveloped coal properties.	54,951.29	2,198,994.27
Net surplus carried to balance sheet		$4,954,660.54
Net profit applicable to dividend		2,902,915.41

Commenting on the income showing, Chairman Topping says: "The low prices for iron and steel reached the minimum during July, 1909, but under the influence of improved demand shortly thereafter gradually appreciated during the first half of this fiscal year, and the advance culminated the early part of the calendar year 1910. Present prices for iron and steel show some recession from the high point for the year and are now much below the level of the year 1906-1907. The average shipping value of all products manufactured by this company during the current year is over $4 per ton on finished iron and steel and approximately $2.60 per ton on foundry pig iron below the average shipping prices for the fiscal year ending June 30, 1907. The net profits, however, are the largest ever realized in the history of the company, except for the year ending June 30, 1907, but had the same shipping values prevailed as for the year 1906-1907, net profits would have exceeded by far the earnings for that fiscal year. It is gratifying to state in this connection that, owing to improvements to plant and equipment and to better manufacturing practice, the estimated saving in cost of production for the period was approximately $900,000, notwithstanding higher cost for labor and supplies during the year ending June 30, 1910, as compared with the year ending June 30, 1907; more liberal expenditures for maintenance and repairs, the increase being $386,925.95, and more liberal allowance for depreciation and extinguishment, this item being increased by $175,524.94."

New Construction and Other Comparisons

The additions to property account in the year were $3,654,039.92. The total of new construction and property additions up to June 30, 1910, was $11,506,532.64 for the northern district and $3,587,925.98 for the Southern district—a grand total of $15,094,458.62.

The gross volume of business last year was $28,296,266, as compared with $19,595,944, $18,693,882 and $31,227,424 in the fiscal years ending June 30, 1909, 1908 and 1907, respectively.

The total of net working assets, $12,785,590, on June 30, 1910, compares with $7,809,901, $6,713,820 and $6,731,917, one, two and three years previous.

CONDITION OF PROPERTIES.

The following résumé is made by Chairman Topping of the present status of the company's iron ore, blast furnace, steel works and rolling mill properties:

BLAST FURNACES.

At the furnaces no improvements of consequence were authorized during the year, but all plants have been kept in good physical condition. New hot blast stoves have been installed, replacing old stoves at the Hannah Furnace at Youngstown, and a reconstruction of the filling and distributing apparatus has been made at the three Pioneer furnaces, South. Since making this change a longer life of linings, better practice and grades seem assured. There was also authorized under date of September 28, 1909, an additional blast furnace at Youngstown, which will be known as Haselton No. 4. This furnace will have an estimated capacity of 475 to 500 tons per day. The construction of this furnace is being pushed as rapidly as possible, although it has been subjected to some delay on account of the demand for the product of the three existing furnaces at Youngstown, and the necessity of keeping these furnaces in operation at the expense of the new construction. It is expected, however, that Haselton Furnace No. 4 will be put into blast during the first quarter of 1911. Comparative figures of pig iron production are as below:

	Gross tons.
Year ending June 30, 1907	614,954
Year ending June 30, 1908	494,676
Year ending June 30, 1909	678,799
Year ending June 30, 1910	793,962

There has been no change in the theoretical capacity of the blast furnaces, but when Haselton No. 4 is completed the theoretical capacity will be increased by an additional 170,000 tons per year, and will be as follows:

	Tons.
Northern district	700,000
Southern district	300,000
Haselton furnace No. 4, estimated	170,000
Total	1,170,000

STEEL WORKS.

No expenditures were made in the year at the Bessemer steel works for the purpose of increasing the output, but owing to full demand for the product, good operations and previous improvements, the plant has produced steel considerably in excess of any preceding year's record. The only large expenditure authorized at the Bessemer steel plant was made for additional electric power, consisting of two low pressure steam turbo-generator sets of 600 kw. capacity each, designed to use the exhaust steam from the blooming mill engine at the Bessemer steel works. These machines are now in operation.

Production at Bessemer Steel Works.—Gross Tons.

Year ending.	Ingots.	Billets, slabs and sheet bars.
June 30, 1907	546,645	488,251
June 30, 1908	341,985	303,328
June 30, 1909	483,430	427,531
June 30, 1910	681,884	606,531

OPEN HEARTH STEEL WORKS.

Under date of September 28, 1909, the Executive Committee authorized the construction of an open hearth steel plant on company's property at Youngstown on the south side of the Mahoning River, opposite Haselton furnaces. Construction is being actively prosecuted on this plant, and it is expected that it will be put into operation during the first quarter of 1911. This plant will consist of a mixer, eight 60-ton open hearth furnaces, a blooming and slabbing mill and a combination continuous sheet bar and billet mill. The plant will produce open hearth large billets and slabs, small billets down to 1¾ in. square, and sheet and tin bars, which product will be consumed largely by the existing finishing mills. The estimated production of the above plant is 30,000 tons of ingots per month.

In connection with this plant there is being built a hot metal bridge and track from the hot metal railroad to the open hearth plant. By this means the Bessemer and Brown-Bonnell works, Haselton furnaces and the new open hearth plant will be connected, and interplant movements of raw and semifinished material will be handled over the company's tracks. A large proportion of the power used at the open hearth plant will be generated from blast furnace gas at Haselton blast furnaces, and a power plant for this purpose is being put in at the latter point.

ROLLING MILLS AND FACTORIES.

Early in August, 1909, the 20-in. semicontinuous skelp mill mentioned in the last report was put in operation, and in February, 1910, the 10-in. continuous skelp mill was put in operation. Both of these mills have been operating in a satisfactory manner since that time. The butt weld and lap weld mills of the tube works are substantially completed and the last department put into operation. While not as yet fully up to capacity, the plant has been operated long enough to ascertain that the estimate of 100,000 tons per year is conservative.

The reconstruction of the 60-in. sheared plate mill, referred to in the last report, has been deferred until the new open hearth plant is ready to operate, as the present steel producing capacity is all required to supply existing finishing mills with the necessary raw material. Owing to the restricted demand for bar iron it was decided to dismantle or permanently close down the following bar iron mills: Corns Works, Toledo Works, Birmingham and Gate City Works. Iron bar production hereafter will be confined to the Tudor, Inland and Mahoning Valley works. There will be no loss, however, in merchant bar production, as the increased steel bar output will more than offset the loss in bar iron capacity.

No other important changes have been made to the rolling mills and factories, except there has been a general replacement of hand machinery by automatic machinery for bolt and nut production, and general replacement improvements where better efficiency could be attained. During the current year, however, additional improvements will be made to the Brown-Bonnell finishing mill capacity by replacing four of the iron rolling mills at this plant with modern mills for the production of finished steel bars.

Annual Production of Finished and Semi-Finished Products.

	Gross tons.
Year ending June 30, 1907	804,360
Year ending June 30, 1908	434,230
Year ending June 30, 1909	565,151
Year ending June 30, 1910	827,515

IRON ORE MINES.

Exploration and development of the ore properties of the company, both North and South, has been continued vigorously during the year. A further increase in the company's ore reserves has resulted from this work. All of the ore mines of the company have been and are being maintained in the best possible physical condition. At the Northern ore mines negotiations have been successfully completed for the extension of the Cambria and Lillie leases until 1925,

and a lease of the Hartford property, adjoining the Cambria and Lillie mines, has been secured for the same period. It is believed that the extension of the Cambria and Lillie leases, together with the acquisition of the Hartford lease, will result in a considerable increase in the company's ore reserve and a decrease in the cost of mining the Cambria ore, and offset to a large extent the increased royalties on the extended leases. At the Schley, Bray and Monica properties construction work is practically completed, and these mines are now actively producing ore. At the Onondaga, Mariska and Lillie mines, new shafts have been sunk to reach bodies of ore not otherwise available. At the Kinney, Pettit, Schley, Monica and Mariska mines additional tenement houses have been built during the year. At the Union mine, 50 per cent. of which is owned by this company, stripping operations are actively under way, and when completed will result in increased output and reduced cost.

At the Southern ore mines the same policy of development and improvement has been pursued. At Raimund No. 1 slope new hoist engine and air compressors have been erected. At Raimund No. 3 slope the tipple has been generally overhauled and remodeled. At the Houston brown ore mine a new stripping outfit has been installed, consisting of a steam shovel, locomotive and dump cars. At the Alfretta group of mines operations have been indefinitely suspended. Exploration work developed that these mines were not being operated to the best advantage, as at present arranged and with increased productive capacity at other mines, the Alfretta mine production is not required.

As of June 30, 1910, there was a stock pile at the Pioneer furnaces, South, of 43,904 tons of red ore and 14,324 tons of brown ore, as a reserve supply to insure the regular operations of these furnaces. The capacity of the Southern mines is now sufficient for a three-furnace operation.

The operating efficiency of the ore mines is evidenced by the very large increase in the amount of ore produced, as shown by the following table of production during the past four years:

Year ending.	Gross tons.
June 30, 1907	947,069
June 30, 1908	1,025,460
June 30, 1909	1,451,434
June 30, 1910	2,050,224

Labor and Employment

Further wage advances were made in the past year. The average number of men employed and the amount of wages paid in four years are stated as follows:

Average Number of Men Employed.

	Year ending June 30, 1907.	Year ending June 30, 1908.	Year ending June 30, 1909.	Year ending June 30, 1910.
North:				
Ore mines	863	773	879	1,362
Coal mines and ovens	543	433	492	609
Furnaces	1,219	550	601	904
Works	8,054	4,139	4,199	6,803
Total North	10,679	5,895	6,171	9,678
South:				
Ore mines	674	499	575	690
Coal mines and ovens	1,160	941	1,056	1,122
Furnaces	550	460	503	538
Works	191	720	5	10
Commissaries	41	32	30	28
Total South	3,216	2,652	2,169	2,388
Grand total	13,895	8,547	8,340	12,066

Total Expended for Labor.

Year ending June 30, 1907	$8,686,604.58
Year ending June 30, 1908	5,832,631.62
Year ending June 30, 1909	5,700,805.03
Year ending June 30, 1910	8,652,102.13

Unfilled Orders

The following statement of unfilled orders on hand is given, and the belief is expressed that the producing capacity of the company will be well employed in the coming year:

	Finished and Semi-finished. Net tons.	Pig iron. Gross tons.
June 30, 1907	448,627	74,500
June 30, 1908	283,743	59,196
June 30, 1909	392,420	94,247
June 30, 1910	341,887	82,906

In the above totals of finished and semifinished products nothing is included but fixed contracts, sliding scale contracts with periodical adjustments being excluded.

Ore and Coal Reserves and Coal and Coke Production

The iron ore reserves at Northern properties on June 30, 1910, are estimated at 38,909,693 tons and at Southern properties at 88,451,383 tons, making a total of 127,361,076 tons, an increase of nearly 7,000,000 tons over the estimate of three years preceding.

Referring to coal and coke properties, it is stated that the plant and property of the Woodside Coke Company will be hereafter known as the Martin Works, and 50 coke ovens are now being built at this plant. A general exploration of the Southern coal properties by drill tests is in progress. The coking coal reserves in the Northern district are now estimated at 24,190,440 tons and in the Southern district at 65,048,276 tons—a total of 89,238,716 tons. Steam coal reserves in the Northern district are put at 16,818,210 tons and in the Southern district at 57,974,480 tons—a total of 74,792,690 tons. The coal reserves were overestimated in previous reports; present estimates are based on actual drill records.

The coke production in the last fiscal year was 670,018 tons, as against 592,664 tons in the preceding year. The present coking capacity in the Northern district is 440,400 tons a year for 734 ovens, and in the Southern district 606,000 tons for 1010 ovens.

The limestone production last year was 115,473 tons, compared with 134,001 tons in the preceding year. The limestone reserves are put at 31,287,500 tons, and are practically unchanged.

Express Charges in Illinois.—The Illinois State Board of Railroad and Warehouse Commissioners has issued a maximum tariff of express charges, similar to the maximum freight tariffs which have been enforced by State law for nearly 30 years. Until recently the Illinois commission has made no effort to establish its jurisdiction over the charges of express companies, and it is expected that these companies will carry the matter into court. The new maximum tariff, like the commission's distance tariff of freight charges, is graduated according to distance and the weight of the matter carried. In some cases the express companies would have to reduce their existing charges at least 40 per cent. to comply with the proposed legal rates.

The American Foundrymen's Association.—The secretary, Dr. Richard Moldenke, Watchung, N. J., advises the members of the American Foundrymen's Association that the *Proceedings* for this year will probably make a volume of some 600 pages. Referring to the increase in dues from $5 to $10 a year, decided upon at the Detroit convention, the secretary says that the response of the membership has been gratifying, but three resignations having been received for which the increase is given as a reason. In a number of letters the statement is made that membership in the association has proved one of the best of investments.

The Ajax Auto-Traction Company has been incorporated at Portland, Ore., with $500,000 capital stock, of which $100,000 is preferred, to manufacture four-cylinder gasoline traction engines, auto-trucks and marine engines. A plant is under construction on a tract of 9 acres in Kenton, a suburb of Portland. The first building, now under construction, is 80 x 190 ft. Other buildings to be erected will be parallel to it, all communicating at the end with a general erecting shop which is planned to be 80 x 400 ft. Machine tools have been purchased, amounting to about $25,000. The plant is expected to be in operation in November.

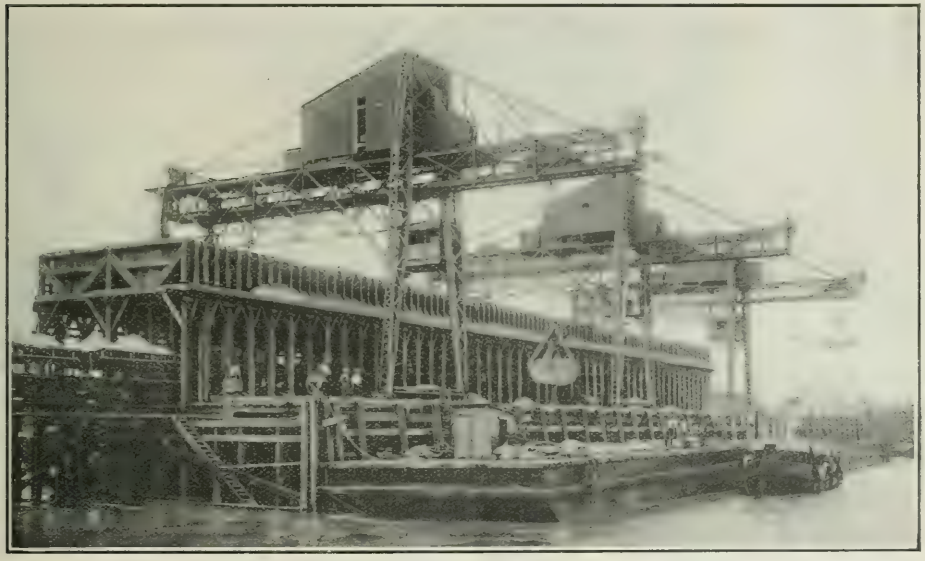
The Metal Trades Superintendents' and Foremen's Club of Cleveland, Ohio, is planning an extensive series of lectures by shop men, starting in October and continuing through the winter, one lecture to be given at each of the monthly meetings. Such subjects as technical education, employers' liability and prevention of accidents will be discussed. The club is also arranging for a clam bake to be held late in September.

Cleveland Sand Unloaders at Panama

In the building of the locks of the Panama Canal and in the related concrete construction enormous quantities of cement, sand and crushed stone are being used and the handling of the sand is an important item in the work involved. The sand is being brought from the two coasts, but the partial failure of the sand-handling plant at the Atlantic side has thrown the bulk of the work on the other plant and most of the sand is now being brought from a bar on the Pacific Coast about 25 miles west of the City of Panama. It is found there in an enormous body, free from loam and vegetable matter, and is very white and sharp. A steam operated ladle or bucket dredge loads the sand into steel barges of 500 cu. yd. capacity. After the sand is raised by the dredge it is delivered through chutes to the barges, enough water being added to cause the sand to flow, and this process continues until the barge is full of sand, the water flowing off over the top of the barge as the sand takes its place. There is a very considerable waste of sand leaking away with the water at this time and later when the sand is conveyed to the storage bins and loaded into the railroad cars. The tracks are now white with sand from the loading point to the discharging stations. It is hoped that this loss may be decreased and the total load necessary to handle reduced by arrangements now being perfected for pumping the water out of the barges.

The sand handling plant of the Pacific division, herewith illustrated, includes three sand unloaders specially designed and installed by the Cleveland Crane & Engineering Company, Wickliffe, Ohio, having a combined capacity of 5000 cu. yd. of sand in 8 hours. This is much in excess of what is at present being used, so that the storage piles are accumulating rapidly. The cranes have a span of 55 ft. from center to center of the rails on which they run, and the trusses are high enough to clear by 4 ft. elevated double storage bins under which cars are hauled by locomotives to be loaded. The barges are brought alongside of the dock by tugs and anchored to the piling while their cargoes are transferred to the bins. The cranes have a cantilever extension of 33 ft. beyond the center line of the rail nearest the water, enabling the bucket of the unloader to reach the most remote parts of the barges. The grab bucket used is a four-line clam-shell type and weighs 1000 lb. empty. Its normal capacity is 3⅝ cu. yd.

All the movements in one machine are controlled by a single operator stationed in a cage on the shear leg toward the water. Here he is able to watch the bucket throughout its movement from the barge to the bins. All of the bucket movements, hoisting and lowering, opening and closing and traveling are independent, as well as the traveling movement of the bridge. When the bucket has reached its highest position it is sustained by an automatic mechanical brake until the bucket has reached the top of the bridge, when a reversal of the hoist motor automatically releases a clutch and allows the load to be taken on the back wheels, which are automatically controlled. These sand unloaders are declared to be the most rapid handling plants on the Isthmus.



The Sand Handling Plant at the Pacific End of the Panama Canal, Installed by the Cleveland Crane & Engineering Company, Wickliffe, Ohio.

The Wells Brothers Company's New York Store

The Wells Brothers Company, Greenfield, Mass., has opened a new store in New York City at 90 Centre street, under its own corporate name. The stock of tools which was formerly carried at 126 Chambers street has been moved to the new store and there installed, with so many additions to it that the entire line of Little Giant tools is now represented on the shelves.

The new store has broad show windows on each side of the Centre street entrance and another large window on Leonard street; these display the handsomely finished tools to the best advantage. Within the store is finished throughout in mission style, the wood and iron work being in perfect harmony.

A full and complete stock of screw cutting tools will be carried in this store. It is the intention of the company to keep everything in the line of tools for cutting threads ready for immediate delivery and preparations have been made to take care of any requisitions that the trade may make, whether for stock or special rush orders. The new store will be managed for the company by Charles H. Coe, formerly with A. Z. Boyd of New York City.

A Large Vertical Nash Gas Engine

An Addition to the Line Built by the National Meter Company

The four-cylinder vertical Nash gas engine recently completed by the National Meter Company, Brooklyn, N. Y., for the Phœnix Tube Company of the same city, is interesting not only for being the largest which its builder has ever turned out, but one of the largest of vertical pattern ever built, and it also has special features applied for the first time. It is the largest engine that has ever been attempted without water cooled heads, being jacketed at that point only around the valves, and it has a forced system of lubricating the main bearings in which the oil is introduced under the shaft making positively certain its presence at the place where it is most needed. The engine also has a dual system of ignition with two spark plugs in each cylinder excited by independent sources of current, both electro-magnetic. One alone is sufficient under ordinary circumstances, but all chance of misfire is practically eliminated with both in use even when operating with very lean gas. Another improvement is a simpler and more reliable form of timer.

Fig. 1 herewith is a view of the engine on the testing bench in the builder's works, taken under rather adverse conditions, but it serves to give some idea of

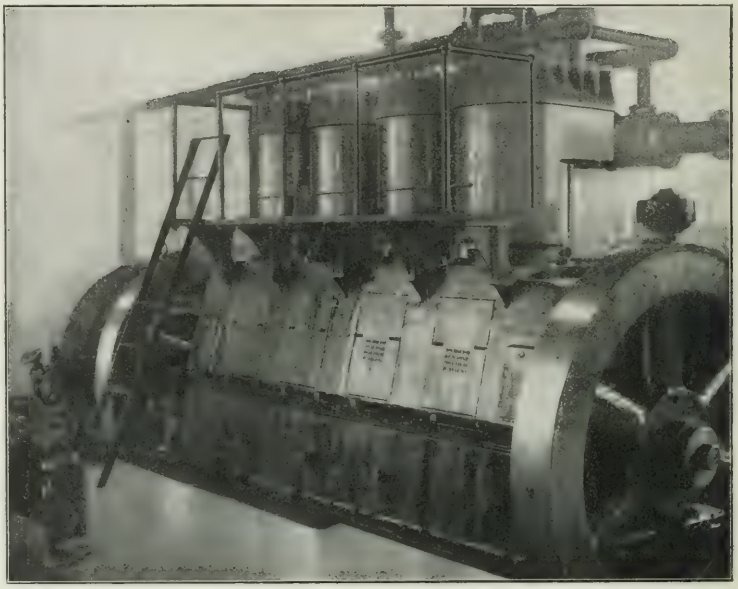


Fig. 1.—An 18 x 18 In. Four-Cylinder Nash Gas Engine on the Testing Floor at the National Meter Company's Works, Brooklyn, N. Y.

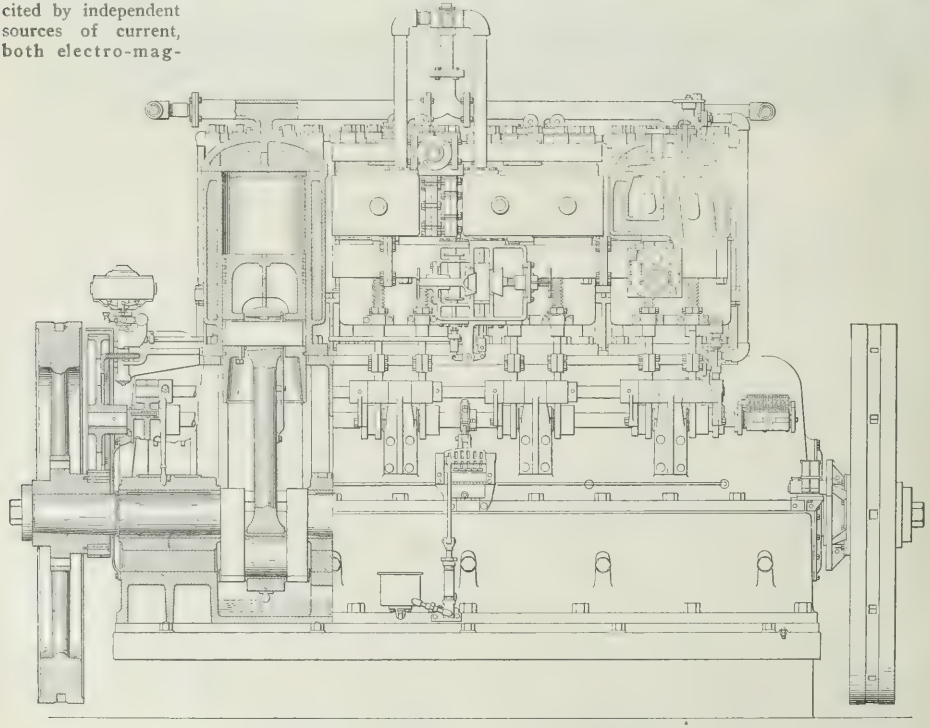


Fig. 2.—Side Elevation of the Large Nash Gas Engine.

the general appearance of the engine, and the details of construction are so well brought out in the side and cross sectional elevations given in Figs. 2 and 3 as to hardly call for further description.

Some facts concerning the building of the engine are worthy of mention. The order for it was taken on a guarantee as to its power and economy, and at the time the order was taken the design was in the rough, no detail drawings having been made. The time within which shipment of the engine was promised was very short, allowing very little time to design the engine, make the patterns and complete the machine work and erecting. Immediately upon receipt of the order work was started in the pattern shop from preliminary drawings, which were followed up later by the finished drawings, and the work was followed along keeping the patternmakers supplied with work continuously until all the parts were completed. Several final details of the engine were not designed until the more important parts had been finished and erected in the shop. Notwithstanding this every part of the engine went together without error and the engine was erected from the drawings. On testing the engine showed exceptionally good operation under all loads, which speaks well for the care taken both in the design and workmanship.

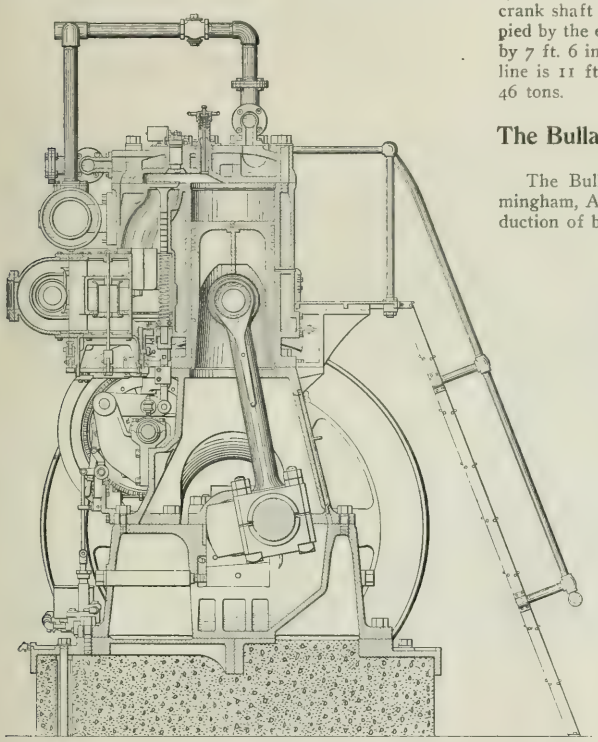


Fig. 3.—Cross Sectional Elevation of the Engine.

A feature of the design of the engine that is largely responsible for the high degree of fuel economy realized is the provision for a high initial compression. The mechanical efficiency is good chiefly because of the exceptional care taken with the lubricating arrangements. Separate systems of forced lubrication are furnished for the cylinders and main bearings. The main bearing pumps are extra powerful so as to force the oil under the shaft, practically holding it from actual contact with the lower bearing boxes and thus insuring adequate lubrication at this most vital point. In the test of the engine this system operated with entire satisfaction and has given no trouble whatever. The arrangements for admitting the charge to the engine and mixing it provide for obtaining an exceptionally good mixture, and the distributing passages are so proportioned that each cylinder does its full share of work. The regulation of the engine is also extremely good.

As can be seen in Fig. 1, the engine is directly connected to an electric generator; it is intended to be used for general lighting and power purposes. The generator supplies direct current at 125 volts and is of 200 kw. capacity. This requires of the engine under normal load about 268 hp. with producer gas with which it is to be supplied. With a richer gas the engine should be able to develop between 300 and 400 hp. Its cylinders are 18 in. in diameter by 18 in. stroke, and the crank shaft is 9 in. in diameter. The floor space occupied by the engine and generator together is 23 ft. 4 in. by 7 ft. 6 in. The hight of the engine above the floor line is 11 ft. 3 in. and the weight of the engine alone 46 tons.

The Bullard Car Door Equipment Company

The Bullard Car Door Equipment Company, Birmingham, Ala., has installed a rolling mill for the production of bars and special shapes for its own use. It is a Belgian mill, having one 12 and one 8 in. train of rolls, and has been in operation about a month. It has a daily capacity at present of 22½ tons. It is expected, however, that the recommendation of President R. G. Bullard will be adopted by the Executive Board of the company and that equipment will be added to increase the daily production to at least 40 tons.

This company manufactures the Bullard patent car door equipment and bolts and other forgings. The equipment factory was completed early this year and has been in operation about five months. The car door equipment consists of a complete combination hood, rail and hanger which clamps close to the top, sides and bottom of the car, so that it is water, spark and dust proof, and it operates on steel balls so that the door is not only easily moved but can always be controlled. The rolling mill rolls the combination hood and hanger, which is a special shape, the company being the only car door equipment manufacturer in the country operating its own rolling mill.

When the rolling mill is enlarged it will have a capacity of about double the requirements of the company's equipment factory and bolt works, and the surplus will be made into merchant iron.

The factory has a daily capacity of 1000 to 1500 complete sets of car door equipments. The equipment has met the approval of a number of the largest railroad systems.

The annual stockholders' meeting of the company was held August 18 and elected the following Board of Directors: E. F. Enslen, G. R. Harsh, O. E. Kenimer, H. M. Pitts, D. S. Wallraven, W. L. Tumlin, Col. John C. Pugh, Judge Peyton Norvell, Walter Moore, Dr. Louis A. Whaley, J. S. Shannon, Col. W. B. Bankhead, O. W. Shelby, R. G. Bullard, B. M. Bullard and J. Y. Hill. The officers of the company are as follows: R. G. Bullard, president; Peyton Norvell, vice-president; W. M. Bullard, Jr., secretary; E. F. Enslen, treasurer; J. R. Peebles, general manager.

The Northwestern Iron Company, Mayville, Wis., now has both its blast furnaces in operation, Furnace A having been blown in August 18.

The Iron and Steel Industry of Mexico

With Iron Ore Abundant, Labor Low Priced and a Market for Much More Than the Domestic Production, a Gradual Expansion Is to Be Expected— Contrasts Between Modern and Early Plants

BY JOHN BIRKINBINE

This month the Republic of Mexico celebrates its first century of independence, also the eightieth birthday of President Porfirio Diaz and the completion of 30 years of his services as chief magistrate of the nation. Our neighbor on the south will therefore be in the limelight for the remainder of the year. As a fitting means of emphasizing this centennial, the President has recommended the inauguration of public improvements by national, state and municipal governments, and efforts are being made to bring to public notice the progress which has been made. Official data are being compiled to show the development of Mexico in various lines of industry, transportation, education, finance and public improvements, and the following sketch is offered as supplementing the brief review, "The Iron Industry of Mexico," which appeared in *The Iron Age* of January 6, 1910.

The intermixture of the ancient and the modern, the crude and the refined, the wasteful and economic methods which add so much of interest to Mexico is as evident in its iron and steel industry as in other specialties, for there one finds in operation the Catalan forge, evidently imported without modification from the original habitat in Spain, cold blast and warm blast charcoal furnaces, some with but most of them without late improvements, and a modern coke blast furnace. The last mentioned is associated with an open hearth steel plant and modern rolling mill, while some of the charcoal blast furnaces puddle their pig iron with wood and roll it into merchant shapes. At some of these smaller plants the castings are made directly from the furnace and in others a part of the pig iron is remelted in the cupola. At other plants gas producers are connected to open hearth steel furnaces or heating



Fig. 1.—Map of Mexico, Showing the Location of Existing Iron and Steel Works, Approximate Coal and Oil Producing Territory and Present Railroad Connections.

1. Blast furnace and steel plant of Compania Fundidora de Fierro y Acero de Monterey, S. A. (Monterey Iron & Steel Company, Ltd.)
2. Compania Nacionale Mexicana de Hierro y Acero (Mexican National Iron & Steel Company) (Durango Iron Works).
3. Ferreria de Providencia (Marta Cristos Iron Works).
4. Ferreria de Tula (Tula Iron Works).
5. Ferreria del Salto.
6. Encarnacion Iron Works.
7. San Miguel Iron Works.
8. Apulco Furnace.
9. Delicias and Elcoro rolling mills.
10. Open hearth steel plant at Chihuahua.
11. Rolling mill at Aguascalientes.
W. Wire drawing plants (at San Luis Potosi, Monterey and Guadalajara).
F. Ferrerias (Catalan forges).

furnaces into which scrap iron is fed. The products of these various plants are fabricated under helve hammers, puddled with wood, heated with wood, coal, oil or gas, or converted into steel in open hearth furnaces, they are passed through rolls ranging from crude design of light pattern to a modern heavy rail train with feed tables, &c., and plans are now being prepared for an electric remelting plant. The output includes merchant bars, castings, standard rail and structural shapes, bolts, nuts, plows, horseshoes, while a considerable quantity of foreign-made material, such as wire rods, also receives finishing in Mexico. The accompanying map, Fig. 1, shows the location of the iron and steel works and of oil and coal fields.

Notwithstanding this range in character of plant and of output, the industry of our neighbor republic is far from meeting its demand for iron and steel products, a condition which may be traced to various causes. The domestic manufacture of this useful metal is remarkably deficient when considered in relation to the area of Mexico (767,276 square miles), its population (15,000,000), its extent of railroads (15,000 miles, to which must be added a large mileage of tram and trolley roads), its manufacturing industries, the extent of its cultivated land and the abundance of desirable iron ores.

A discussion of some of these controlling features may properly precede any detailed reference to the present iron industry of the republic.

The Iron Ore Supply

Mexico has an abundance of iron ores, some deposits being fairly entitled to the use of the word "enormous" as descriptive, and many of the ores are exceptionally rich in iron contents, some being well within the Bessemer limits of phosphorus. There are also many ores which contain iron in moderate amounts, but the number of important deposits which can supply iron ores carrying 60 per cent. of iron or more are sufficient to invite their utilization upon a liberal scale.

Most of these iron ore deposits can be best utilized for domestic iron manufacture, as, to convey the mineral to ports for shipment by vessel, or across the boundary into the United States to localities where fuel could be obtained, would demand long railroad hauls. Some of them, however, are within convenient reach of water transportation, especially on the Pacific Coast.

However, the number and extent of the iron ore deposits of the republic give promise of adding materially to its wealth, as improved processes are perfected, and the opening of known coal bearing areas will also facilitate the utilization of this important resource.

Fuel

Mexico is a country in most of which fuel is scarce and expensive, a condition which has retarded the establishment and operation of iron and steel works. For centuries wood and charcoal were the only fuels available, and continuous drafts upon the forests have depleted these, except in the distant mountains, most of which railroads have not yet reached. The coal obtained from northern Mexico, some of which is coking, is distant from the populous portion of the republic, and one-half of the nation's fuel supply is imported from Europe and the United States. Explorations now progressing in Sonora and in western Oaxaca promise liberal additions to the fuel supply of Mexico, but these coal fields must be developed and connected by railroads to make them available.



Fig. 2—The Blast Furnace of the Compania Fundidora de Fierro y Acero de Monterey (Monterey Iron & Steel Company, Ltd.).

The productive coal fields in Coahuila are located near the Rio Grande, where a gas coal is obtained, and from 100 to 150 miles south of the national boundary, where the Monclova or Sabinas fields are thoroughly exploited in the vicinity of Lampacitas, Esperanza and Baroteran, where slopes extending 1300 ft. and a vertical shaft 950 ft. deep are features of development. This Coahuila coal is geologically in the cretaceous horizon, and carries ash and sulphur in such proportions as to require disintegration and washing, 2 tons of coal as mined being necessary to produce a ton of satisfactory metallurgical coke, for which a liberal market exists at the steel plant at Monterey and at large silver smelting furnaces in northern Mexico. This district supplies over 1,000,000 tons of coal annually.

Low ocean freights for coal in cargoes, brought from Europe or from the United States to Gulf ports, permit foreign fuel to enter the republic at very satisfactory rates, but the topographical conditions demand high freight charges from the Gulf ports to a majority

of the consuming and populous centers, because these are from 5000 to 7500 ft. above sea level and from 250 to 400 miles distant. The ton-mile rate, therefore, must be liberal to give the railroad companies satisfactory earnings. The government controls most of the prominent railroad lines, and favors the coal from northern Mexico by a differential of about 50 cents per ton for the longer hauls as against shorter hauls for the foreign fuel; but, notwithstanding this, most of the coal marketed in the vicinity of Mexico City comes from foreign lands.

The explorations which for three years have been carried on by means of drifts, shafts and diamond drills, have disclosed bodies of coal in western Oaxaca sufficient to encourage a railroad concession to make these available, and surveys for this road are now in progress. As the distance which the Oaxaca coals must traverse to reach the industrial district of Mexico approximates the mileage from Gulf ports, and as these fields are located at an altitude of about 6000 ft. above sea level, the possibilities of fuel from this district becoming an important factor must receive consideration in the future. Coal is also indicated in eastern Mexico, but such developments as have been made fail to demonstrate this in quantity.

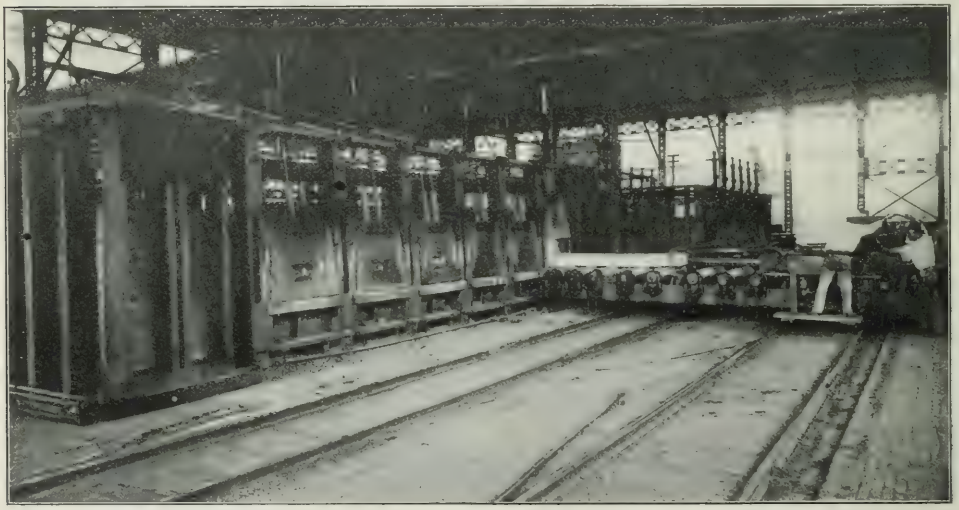


Fig. 3. Heating Furnaces of the Compania Fundidora de Fierro y Acero de Monterey.

Business Possibilities

The topography of Mexico also favors iron and steel industries located at or near the average elevation of important cities and consuming districts, for the product of foreign iron and steel works must be carried inland over adverse grades, at freight rates which aid in protecting domestic manufactures.

The 300 years during which Spain crippled the activities of Mexico were followed by two-thirds of a century of internal troubles, and the real awakening of Mexico covers but little more than three decades. In this relatively short interval 15,000 miles of railroad, many industries and numerous public improvements have transformed the country, and it has changed from a debt-burdened nation to one whose credit is excellent. While the progress of Mexico under the rule of President Diaz is remarkable, it is not surprising that this advance has been more marked in some lines than others, and that iron and steel have not taken a leading position.

The government has been liberal in granting industrial and transportation concessions, but it demands rigid adherence to the provisions granted the concessionaires. It has established tariff rates to protect its manufactures, but has waived these in whole or in part when domestic industries did not economically produce the articles required for the development of the country, and under this policy importations of iron and steel exceed the home production.

Large volumes of foreign capital have been invested in Mexican industries and development, the proportion from the United States being greater than from any other nation. Some of the returns from investments have been so phenomenal as to invite others, upon the supposition that Mexico seeks opportunity to drop her mineral wealth into waiting laps. Other investments have been satisfactorily remunerative, and others still have resulted in failure, for the promoter's promises are not always fulfilled. In Mexico injudicious exploitations, provisions for plant in excess of requirements, and inefficient management are as fruitful sources of disaster as elsewhere.

Our neighbor republic undoubtedly has enormous mineral wealth, great industrial and agricultural possibilities, which will repay judicious investment after full investigation and efficient management, and it is to be expected that much of the financial returns will be to foreigners who are responsible for the improvements.

As a rule the Mexican is imitative rather than originative, hence a large part of the industrial progress of the republic is due to foreigners, and while there are numerous Mexicans of wealth, their investments are chiefly in haciendas and plantations, or such industries as have long been well established in Mexico. So much of the wealth of the nation has been placed in multitudinous churches of elaborate construction and ornamentation, so many drains upon the savings of its people have resulted from numerous civil wars, and so little attention has until late years been given to education, that we may be surprised at the progress which is shown, especially when we recognize the dominating skepticism by which innovations are received. But much of the apparent old-fogyism accredited to Mexico is due to local conditions of labor, fuel and climate, inability to appreciate which by foreigners has resulted in many financial failures.

In a country where labor is abundant and the wage rate far below what is paid in the United States, and where fuel is costly, labor-saving appliances are not always economical, and with few necessities to supply, the Mexican peon, who represents the majority of the

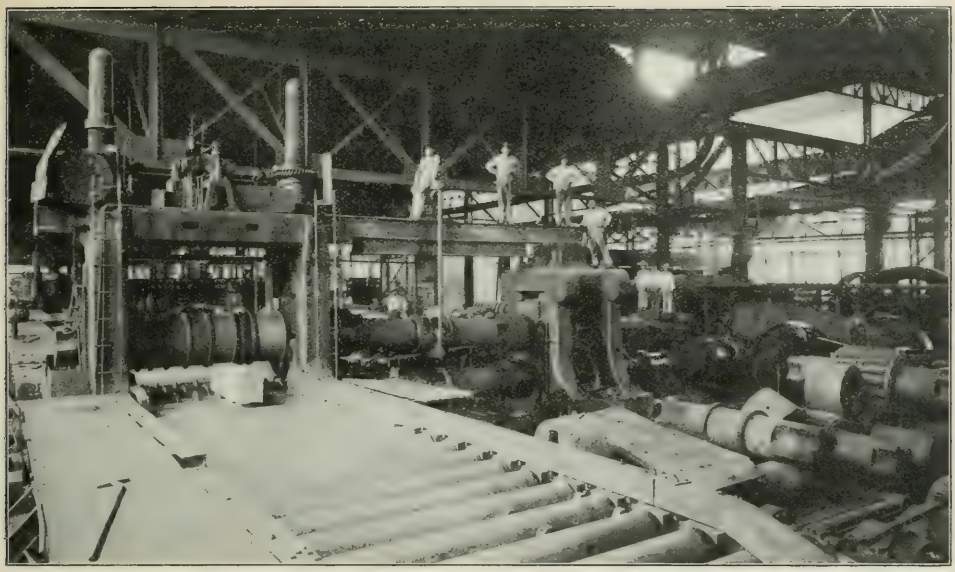


Fig. 4.—The 40-In. Blooming Mill of the Compania Fundidora de Fierro y Acero de Monterey.

population, is not a large consumer of products of mine or factory.

Throughout Mexico a great proportion of traffic is transported upon the backs of peons, burros, mules or horses, and the oxen-drawn "carreto," with its clumsy wheels formed of slabs of cottonwood, held together by wooden keys and revolving on a wooden axle, and whose body is composed of wooden sticks lashed together by cords, is evident in most of Mexico. The capabilities and endurance of Mexican Indians as burden bearers are marvelous, and their aptitude in many lines of industry make them competitors with improved methods which are looked upon as essential in the United States.

Throughout the republic, and occasionally in the capital city, one sees scaffolding formed of poles and slabs held together by ropes instead of nails, and beyond the brazeros, on which food is cooked with charcoal, anything in the line of stoves is unusual. The country has existed so long with iron as almost a precious metal, especially to the predominating peon class, whose requirements are limited by a superb climate and a low wage rate, that the per capita consumption will continue small for years, although it will advance with increased earning capacity.

The value placed on articles of metal may be noted on any market day, when, spread out on the stones of the plaza, scrap iron, spikes, nails, keys, locks, chain links, &c., are offered for sale. Some iron works are inclosed by walls, and employees leaving by the gate



Fig. 5.—Hot Saw of the Compania Fundidora de Fierro y Acero de Monterey.



Fig. 6.—Merchant Mill of the Compania Fundidora de Fierro y Acero de Monterey.

are searched, for the daily wage rate approximates the value of 25 lb. of scrap iron in the cities, and in the country a laborer who receives for each day the value of 15 lb. of this metal is fortunate.

Prevailing Prices of Iron in Mexico

The transportation problem seriously affects local prices in different portions of the country, but to indicate those now prevailing, the following quotations are for various forms of iron and steel sold in the city of Mexico, the center of industrial activity. These prices are given on a gold basis, but in Mexico they are quoted in Mexican currency and would be double the figures given. The quantity of domestic iron and steel being but a small portion of the total consumption, there is little wholesale trade, and there would be small variation between the prices quoted, whether for jobbers or for individual consumption, but it is probable that large consumers could purchase at from 10 to 15 per cent. off the prices named:

Prices in Gold, per Metric Ton, in Mexico.

United States or Scotch foundry pig, employed principally in foundries as a scrap carrier	$28.00
Domestic pig, of which little is sold	40.00
Ordinary cast scrap	9.00
Gray iron scrap	15.00 to 17.50
Ordinary wrought scrap	12.00
Old car wheels	20.00
Bar iron, ⅝ in. or smaller, round or square	77.50
Bar iron, ½ to 3 in. round, and ½ to 4 in. square	72.50
Flats, from ⅝ x ¼ in. to 8 x 1 in.	72.50
Smaller flats	90.00
Angles, ¾ to 2½ in.	75.00
Angles, 3 in.	70.00
Half round, ⅝ to ¾ in.	90.00
Half round, ¾ to 1¼ in.	80.00
Platina, the flat iron, generally ⅝ x 3 in., cut into short lengths and bent to facilitate transportation by burros	75.00

In the enumeration which follows an attempt is made to indicate all of the Mexican iron works of which record has been found, and it is believed that none of any moment are omitted. On the contrary, some are mentioned which are not at the present time active, but the omissions are mostly the ferrerias, whose locations are in the mountain fastnesses, and whose product, being small, is utilized locally. But before discussing the individual plants a statement concerning imports and duties may aid in an appreciation of the status of each industrial establishment.

Iron and Steel Imports Into Mexico

Examination of the statistics of importations demonstrates the extent to which Mexico depends upon foreign iron and steel. In the six fiscal years ending July 1, 1909, importations of iron and steel, not including machinery, aggregated 1,187,413 metric tons, valued at $59,205,382 (gold), an average of about $10,000,000 per annum. In this total the following are included:

Some Mexican Imports in Six Years Ending July 1, 1909.

	Metric tons.
Pig iron and iron turnings or fillings	22,459
Steel ingots or blooms	108
Ferromanganese	2,023
Railroad iron and steel	507,494
Structural steel	125,409
Structural iron and steel for electrical transmission service	9,925
Small shapes, such as tees, ells, &c.	28,128
Merchant bars	15,226
Wire, including fence wire and fastenings	89,103
Wire cable	4,365
Hoop iron	1,796
Corrugated iron	93,554
Tin plate	29,716
Steel springs	743
Iron chains	2,250
Water pipe	145,154
Plows and agricultural implements	18,584
Iron and steel utensils, plated or enameled	41,701
Iron cooking and heating stoves	6,329
Nails, tacks, screws, &c.	36,096

The articles specified are subject to duties ranging from $5 to $150 (gold) per metric ton, but many importations are admitted free under specific concessions, pending the development of domestic industries which can successfully produce the various manufactures.

The construction of railroads was and is still stimulated by concessions which admit free of duty most of the material required for construction and equipment, but as Mexican rails are now produced this privilege will probably be limited. However, many important improvements aiding in industrial developments are now encouraged by concessions which permit of employing foreign made machinery and equipment free of duty.

The duty on rails weighing over 10 kg. per lineal meter (20 lb. per yard) is $12.50 per ton, and lighter rails pay $30 per ton. Iron and steel beams, not cut or punched, pay $17.50 per ton, and those that have received shop work pay $25, while chains pay $55, nails, &c., $60, and stoves $40 per ton. The duty on merchant steel is from $30 to $35 per ton; on iron wire 1 mm. in diameter $27.50, and on smaller wire $45; on fence wire and fastenings $12.50; on plows and agricultural implements $8.25; on wire cables $5.50; on

iron water pipes 15 cm. (6 in.) or less in diameter $12.50; on larger pipes $5 per ton. Ferromanganese pays $7.50; pig iron $10; blooms or ingots $12.50; angles, tees, &c., $30 to $35; hoop iron $40 per ton.

The rates of duty indicate the protective policy of the Mexican Government, but had such duties not been rebated its present railroad system could not have been developed nor many of its industries established. Such concessions are still made, but as the nation becomes more self-dependent they are less readily granted.

The internal revenue is an important source of income, stamps being requisite to legalize commercial paper or official documents, and with the approval of the general government, states may make special levies. Thus it is claimed that the excellent municipal improvements of Merida were paid for by an export tax of 6 cents per hundredweight on henequen (sisal), assessed by the state of Yucutan, in addition to the federal tax of 12 cents per hundredweight.

In all taxes, concession charges, forfeitures, &c., the general government is no more exacting upon foreigners than upon natives, and while there exists a feeling of favoring "Mexico for Mexicans," this is mainly confined to enthusiasts on the one hand and to malcontents on the other. The sentiment may be an honest expression of patriotism, or it may be a convenient shibboleth for demagogues, but in any criticism of it we must remember that prior to the Centennial Exposition in 1876, which opened the eyes of the people of the United States to the true position of other nations, Great Britain, with whom we had twice been at war and had twice defeated, was popularly considered an enemy. Mexico fought with the United States and was not only vanquished but relinquished more territory than it retained. And the interval between the Mexican war and the present day is the same as elapsed between the war of 1812 with Great Britain and our centennial year.

In every country there are those who, while incapable or unwilling to make serious effort to improve conditions, criticise adversely all who attempt advances, but such criticism has little more than passing effect.

The governmental policy, while apparently friendly to foreign capital, is patriotic in efforts to stimulate domestic activity, and, in so far as its own people assume responsibilities, encourages Mexico for Mexicans.

The Monterey Steel Plant

The one modern iron and steel plant is at the city of Monterey in northeastern Mexico (168 miles south of the Rio Grande), 640 miles north of the capital, where the Compania Fundidora de Fierro y Acero de Monterey, S. A. (Monterey Iron & Steel Company, Ltd.), has a blast furnace, a steel plant and rolling mills. The blast furnace is capable of producing from 200 to 300 tons of iron per day. The three 35-ton open hearth steel furnaces are worked on the duplex system in connection with a small Bessemer converter fed with liquid metal from the blast furnace. The open hearth and heating furnaces are connected to a battery of gas producers. A well equipped mill, with soaking pits, blooming, roughing and finishing sections, is arranged to roll structural shapes, rails, &c. A merchant mill, foundry, machine shop and bolt and nut works are other features of the plant. Accompanying illustrations, Figs. 2 to 7, present views of various portions of these works.

Iron ore comes to Monterey by railroad from the steel company's and other mines to the northwest, and from the Cerro de Mercado at Durango, to the west. Fuel is supplied from the Sabinas district in the state of Coahuila, some 200 miles northwest, supplemented by imported coal and coke received at the port of Tampico and transported by rail 320 miles to Monterey.

This enterprise was a bold venture by Mexican capitalists, requiring the opening up of mines and quarries, the construction of railroad connections to assemble the raw materials and the education of labor to operate the plant, besides which it had to demonstrate to the people of Mexico its capabilities. The design of the plant and of most of the machinery is American, the management and most of the employees being Mexicans.

The blast furnace is 18 ft. bosh and 80 ft. high, equipped with four firebrick hot blast stoves, skip-hoist, &c. The blooming train is 40 in., roughing train 32 in. and finishing train 28 in. It has also an 18-in. train for light rails and structural shapes and 12 and 14 in. trains in the merchant mill.

Petroleum is the fuel used in making bolts, nuts and rivets; the oil coming from the state of Vera Cruz commands about 4 centavos a litre, or, say, 8 cents,



Fig. 7.—Machine Shop of the Compania Fundidora de Fierro y Acero de Monterey.

gold, per gallon. The bituminous coal from Coahuila carries 23 and 24 per cent. of ash, and commands about $4.50 per ton, delivered at Monterey. Coke from this coal washed contains about 15 per cent. of ash, and is worth $9.50 per ton. A premium of 10 cents per ton is allowed for each per cent. of ash below 15 per cent., and a penalty at the same rate is deducted for excess of ash from 15 per cent. up to 17 per cent. Owing to the ash and sulphur in the domestic fuel considerable coke has been imported from Europe and from the United States, Pocahontas coke being delivered at figures close to the cost of domestic fuel.

The company is constructing improved washing and coking facilities at its mines, with the expectation of such beneficiating producing desirable domestic fuel.

The Monterey plant has entered into a contract with the National Railways of Mexico (the consolidated roads now controlled by the Mexican Government) for a supply for a term of years of 85-lb. steel rails. Some of these rails are in place and in constant use between the cities of Mexico and Queretaro, which Senor Adolfo Prieto, managing director of the Compania Fundidora de Fierro y Acero de Monterey, proudly characterizes as "the first steel rails rolled in any Latin-American country."

The limit placed upon the composition of these rails as to phosphorus is 0.04 per cent. and as to sulphur 0.06 per cent. The record of tests made by the inspector in March, 1910, shows the following composition:

Analysis of Monterey Steel Rails.

Carbon.	Manganese.	Silicon.	Phosphorus.	Sulphur.
0.72	0.98	0.14	0.030	0.032
0.63	0.75	0.14	0.036	0.056
0.62	0.75	0.12	0.039	0.040
0.62	0.80	0.16	0.033	0.030
0.67	0.75	0.14	0.025	0.036
0.71	0.78	0.14	0.037	0.024
0.70	0.75	0.11	0.035	0.044

Under this Government contract the Monterey plant expects to supply 32,000 tons of 85 lb. rails in 1910, together with the 4000 tons of angle plates, track bolts and spikes. In addition some 18,000 tons of structural steel, an equal amount of merchant iron, light rails, &c., and 3000 tons of steel for reinforcing concrete work make up the contemplated output of the plant for the current year.

The record for the year 1909 was seriously affected by a flood of phenomenal proportions, which was liberally discussed in technical publications because of the abnormal amount of rain which fell in limited time. This flood curtailed the activity of the plant for nearly two months and cost the company fully $350,000. But the report of operations for the 10 months of activity show that production was as follows:

Production of the Monterey Plant in 1909 (10 months).

	Tons.
Pig metal	59,859
Structural shapes	8,190
Merchant iron	8,076
Rails	25,109
Angle plates	1,334
Steel for concrete	2,986
Castings	2,661

And there was used the following material:

Material Used at Monterey in 1909.

	Tons.
Company's iron ore	58,085
Purchased iron ore	49,319
National coke	36,816
Foreign coke	42,145
National coal	41,804
Foreign coal	42,753
Limestone	21,437
Ferromanganese	483
Ferrosilicon	116
Fluorspar	751
Company's scrap	9,949
Bought scrap	7,588
Miscellaneous	726
Total	311,972

The iron ore supply consists of magnetites and red hematites, there being a number of deposits of these minerals in northern Mexico, but some of the more accessible magnetite ores carry high percentages of iron with sulphur in such proportions as to encourage beneficiating the ore. This is now being investigated, but independently of these the furnace burden consists of ore approximating 60 per cent. of iron. With the abundance of limestone in northeastern Mexico, the Monterey plant is able to select a flux satisfactory in quality and in price.

To utilize to advantage its structural shapes, which include sizes up to 15 in. I beams, the works has equipped a structural shop and employed engineering talent to design and undertake the contracts for construction. The steel work of some of the important buildings now being erected in the capital is supplied by the Monterey Iron & Steel Company.

Contrasts

Iron ore, flux, fuel and other supplies arriving by carloads or train loads, finished products shipped away



Fig. 8.—General View of the Now Abandoned Piedra Azul Iron Works on the Tunal River, Near Durango, Mexico. This Shows the Dam and Blast Furnace Stack in the Foreground, the Wall Around the Works, and a Chapel and Residence in the Background.

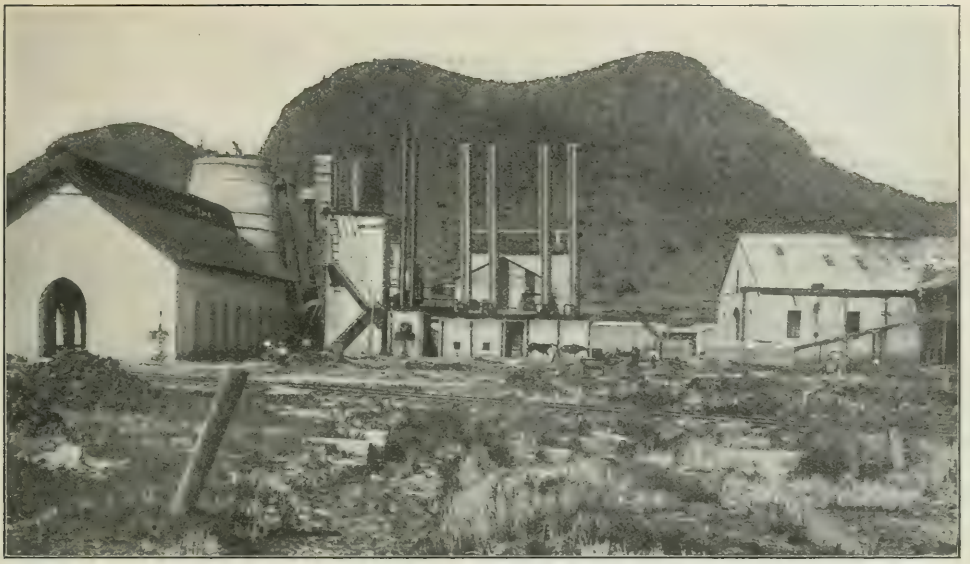


Fig. 9.—View of the Blast Furnace of the Mexican National Iron & Steel Company at the Foot of Iron Mountain (Cerro de Mercado), Just Outside of the City of Durango, Showing That the Furnace Is Close to This Enormous Supply of Mineral.

in the same manner, ponderous steam engines driving roll trains, minor motors moving tables on which ingots, blooms, rails or shapes are carried, power cranes serving soaking pits and blooming train, and all the multitudinous accompaniments of a modern iron producing and steel manufacturing plant cause the Monterey industry to stand out in strong contrast with the other active iron plants in Mexico, sketches of which follow.

Although in some particulars even the older plants have displaced ancient methods, and some later constructions have included modern features, little of the raw materials used in iron manufacture outside of Monterey are received in larger units that a man, burro or mule can carry or a small tram car convey, and most of the product is distributed in mule or ox carts or on backs of pack animals, at least until the railroad is reached.

An Old Mexican Charcoal Blast Furnace—The Durango Iron Mountain

The writer's first acquaintance with the iron industry in Mexico was in 1882, in connection with a visit made to inspect and report upon the Cerro de Mercado at Durango, one of the most remarkable deposits of iron ore known. The impression then made of the magnitude of this deposit has been verified by subsequent visits to it and to most of the important ore exposures or developments in the United States; while a study of the records of the iron ore reserves of other countries fails to demonstrate any more impressive exposure of iron ore above ground. It may be truly styled "a mountain of iron ore," a term often used but seldom verified in prospectuses describing apparently large ore deposits.

About the middle of the sixteenth century this mountain attracted wide attention, having been reported as a mass of gold and silver, and it is claimed that Mercado, after whom it is named, died in his efforts to secure possession of it. Others claimed that it was a great meteorite, basing their opinion probably upon the phenomenally large meteoric masses which have been discovered in northern Mexico, and Ward's "History of Mexico" states that the expedition sent out in 1858 to examine the mountain was the initial cause of settlement of northern Mexico. The Mexican Government has brought to the capital at considerable expense some of the great meteorites which fell in northern Mexico fully 1000 miles distant. One of these weighs 11 tons; another is in two pieces, whose combined weight is about 25 tons. With a knowledge of such terrestial visitors it is not surprising that as the story of the Cerro de Mercado traveled, accompanied evidently by samples of the richer and denser ore, its reputation as an immense meteorite gained favor.

Some of the Cerro de Mercado ore was used locally in Catalan forges prior to 1828, when the governor of the state of Durango contracted with an English company to establish an iron works on the Tunal River.

At the time of the writer's first visit, iron ore was conveyed from this deposit by the typical oxcart with its cumbersome wooden wheels, or in paniers on the backs of animals, seven miles to the Piedra Azul Iron Works, on the Tunal River, Fig. 8, and there smelted with charcoal into pig iron, which was subsequently puddled with pine wood and rolled into merchantable shapes, not kept closely to gauge, and generally sold including fag ends. As at that time the railroad awakening in Mexico was in its infancy (Durango being 600 miles from any operating line) the prices demanded for much of the product were excessive, ordinary bar shapes bringing from 8 to 9 cents per pound, while the larger flats used for tires brought, with fag ends, 12 cents per pound. These prices are all on gold basis, which is used throughout this sketch. A friend writing concerning this plant says: "Did you ever see any of the bars they rolled there on that little old train? Their half-inch rods would be round on one end and square on the other, out of the same finishing pass. Do you know of any mill in this country where they can do that?"

The Piedra Azul Works was a representative of others subsequently visited, of which there were probably 10 in the entire republic, their combined product not exceeding 40 tons per day of castings and merchant iron. Power was furnished by a dam across the river diverting water to a wheel operating two iron blowing tubs, which delivered blast into a stone furnace stack about 30 ft. high lined to a bosh diameter of 8 ft. and blown with cold blast by one open tuyere. Cinder as made was dragged by hand from the open fore-hearth,

which, when filled with molten iron, was tapped and cast into pigs or ladled out for various forms, such as plow points, kettles, &c. Most of the pig metal, however, was puddled by the use of pine wood, the puddle ball passing through a squeezer and then to rolls. Owing to conditions of labor and stream flow, the blast furnace and rolling mill alternated in activity, the former being in blast for probably five months in the year accumulating a stock of pig iron, most of which in the next five months was rolled into desired shapes, and if for an order received after the season's rolling was completed there was no stock on hand, it would not be filled for half a year or more.

It is not surprising that under such circumstances all manufactures of iron or steel commanded exorbitant prices in the city of Durango, although this mountain of iron ore, containing many million tons, was just outside of the city limits. Nails sold at 19 to 22 cents per pound, and a box ordered for the purpose of carrying samples was dovetailed, because the wage of the carpenter at 50 cents per day appeared more economical than the purchase of nails, and the screws for the lid cost 30 cents per pound.

This interesting plant of Piedra Azul suspended operations about 20 years ago, after an American company established a blast furnace and rolling mill plant at the Cerro de Mercado, but the proprietor had the satisfaction of charging his future competitor $75 per ton for pig iron to be delivered in 10 months for use in a foundry which had been unwisely erected in advance of the blast furnace construction.



Fig. 10.—Apulco Furnace, Hidalgo, Mexico, Subsequent to the Destruction of the Cast House and Charging Floor by Fire. Ore and Charcoal Are Received on Upper Level and There Fed Into the Furnace. The Foundry Is Shown in the Background.

Subsequent to the proprietor's ceasing operation at Piedra Azul some Americans attempted to revive it, but 10 years of idleness and decay were too much for their exchequer and it has now gone permanently out of existence.

The Durango Iron Works

Probably no other effort to make iron in Mexico was more promising than that which was located close to the Cerro de Mercado, the mountain of iron ore just outside the limits of Durango, to which reference has been made. For the purpose of any practical industry the supply of iron ore was unlimited, and easily and cheaply mined; in fact, enormous quantities already broken could be shoveled up from the talus of the mountain. A small portion of the deposit would have been ample to maintain a blast furnace for many years, but a large percentage of the capital available by the Mexican National Iron & Steel Company was devoted to the purchase of the property, so as to control it, a procedure which has lately proved to be unnecessary, for ore is now being mined and shipped outside of the limits of purchase. Errors in construction added to the troubles and a considerable amount of money was expended in the purchase of a Clapp-Griffith steel plant, which had been tried and abandoned at Pittsburgh, then put up at Port Henry, N. Y., and finally sent to Durango in advance of the construction of railroad connection there. As a consequence it was hauled 160 miles overland, but was never re-erected and was finally converted into scrap.

With an abundance of ore averaging close to 60 per cent. of metallic iron, which for many years would be delivered at the furnace at 1 cent or less per unit, this plant had an advantage, but no serious effort was ever made, nor was sufficient money applied to secure a fuel supply. Although in late years a branch railroad was built north from Durango for 135 miles, a large portion of which opens up good timbered area, the plant has always been dependent upon the imperfectly burned, dirty and badly broken charcoal made in the woods by Indians, and transported on burro-back to the railroad, except for such time as the furnace was fed with coke from the Coahuila deposits 300 miles distant.

The plant consists of a circular stone blast furnace, Fig. 9, constructed in 1884, topped out by iron extension, its hight being 65 ft., bosh diameter 9 ft. Two steam blowing engines supplied the blast which passed through an iron pipe hot blast stove. There is also a rolling mill with six double coal-fired puddling furnaces with boilers attached, a heating furnace equipped with gas producers using Mexican coal, an 18-in. three-high muck-bar train, and a 10-in. merchant train, which made bar iron for the hardware trade, and a foundry and machine shop well equipped for general business.

Work lately started upon a 125-mile extension of the International Railroad west of Durango will open what is reported to be well-timbered areas, and it may be that the Durango plant will be galvanized into activity.

The property has also been handicapped by disagreement among stockholders and bondholders, a number of whom became such by inheritance, and until the legal procedures necessary to correct this trouble have been perfected the Durango plant remains inactive, but the parties who undertake its rehabilitation must correct the damage due to five years of idleness, or erect part of plant anew, and must meet the unusually favorable ore facilities by providing a satisfactory supply of fuel. Although some individual analyses of the ore from Cerro de Mercado show it to be within the Bessemer limit, the great mass of the ore is high in phosphorus and must be used either for producing foundry iron, pig for puddling, or for conversion in the basic open hearth furnace.

Durango is 540 miles southwest of the Rio Grande, 400 miles west of Monterey, and 860 miles northwest of the City of Mexico. The blast furnace at Durango has produced about 25,000 tons of pig metal, which was transformed at the works into castings, bar iron, &c. With abundant fuel available, this plant in the last 25 years should have made eight times that amount. The Cerro de Mercado has probably contributed two-thirds of a million tons of iron ore for blast furnaces and for flux for silver smelters, but with railroad connections on two sides of the mountain this draft has made but little impression upon the large amount of mineral available.

The Mexican National Iron & Steel Company's original capitalization of $10,000,000 was, on reorgani-

zation, reduced to $5,000,000 and subsequently to $3,000,000, and over $1,000,000 has been expended upon the property in the 25 years of its existence.

Plants in Southwestern Mexico

In the State of Jalisco there are two iron works, one of which is active, the other having lain dormant for a decade or more. This latter, known as the Ferreria de Providencia (Marta Cristos Iron Works), is near Zapotiltec, and about 15 miles from Guzman on the Manzanillo branch of the Mexican Central Railroad, 100 miles south of Guadalajara. The furnace stack is of stone, built in 1875 to smelt red hematites, of which an abundant near-by supply, it is claimed, can be delivered at the plant for $3.50 per ton, while oak charcoal can be obtained in large quantity from the adjacent timber land at a cost of 5 centavos an arroba, or $4.35 per ton. The furnace is 48 ft. high, has 9 ft. bosh, with bottom and top 3 ft. in diameter, equipped with three tuyeres, and has an iron cylinder 25 in. in diameter and 60 in. stroke driven by an overshot water wheel which furnishes cold blast. The rolling mill has one 14-in. train driven by water and one 8-in. train operated by a vertical steam engine. There are two single puddling furnaces, one heating furnace, all wood fired, and six forge fires for producing with charcoal the "platina," a flat bar, bent so as to be transported on burros. This platina is in very general use throughout Mexico, and a ranchman who possesses 50 lb. of it has an asset upon which he lays great store, for he can heat the end of a bar and on a flat stone form it into a point for his wooden plow, a link for a chain, or for any other of the various farm uses to which iron is applicable. This plant cannot be considered as on the active list, although its ore and fuel supplies may encourage its rejuvenation in the future.

The Ferreria de Tula at Tapalpa, Jalisco, is 22 miles north of Sayula, on the Manzanillo branch of the Mexican Central Railroad, and 75 miles south of Guadalajara, and is of modern construction. The blast furnace has a metal shell supported on columns; the bosh diameter is 10 ft., top and bottom 4 ft. diameter, hight 64 ft. It has four tuyeres, the blast being furnished by a steam blowing engine with capacity of 7500 cu. ft. per min. The furnace has two U-pipe hot blast stoves. The ore, which is abundant, is rich red hematite; 15 tons of pig iron per day is obtained with a consumption of 1.2 tons of charcoal per ton of metal. The rolling mill has a 30-in. muck train in one pair of housings; an 18-in. train in four housings, connected to a 10-in. train in five housings; two squeezers, shears, eight double puddling furnaces and two heating furnaces, all wood fired. The power is electricity, developed by a Corliss steam engine and applied to the rolls, &c., the steam being generated in boilers over the furnace. The product of this plant finds a market in Guadalajara, Aguascalientes, Manzanillo and intermediate country, little of it reaching the City of Mexico, about 460 miles distant.

This plant is now owned by Boston capitalists, and the management announces the purpose to erect a new blast furnace capable of producing 100 tons of metal per day, and other improvements, including a railroad to connect the plant with the Mexican Central system, and retorts for producing charcoal. These Jalisco plants are nearly 900 miles from Monterey or Durango by existing railroad connections.

A small blast furnace, producing about 100 tons of charcoal pig annually, was reported as being located some 50 miles west of the city of Toluca. It was recognized as the Ferreria del Salto, employing local hematites and using water as power.

A charcoal blast furnace is now under consideration in connection with a lumber industry in the State of Colima.

The Honey Group of Iron Industries

For 35 years Richard Honey has been prominent in the manufacture of iron in Mexico, having operated in that time eight blast furnaces, four rolling mills and four foundries. These plants were small and the majority of them were located within the populous district of Mexico, the active Honey plants now being confined to the State of Hidalgo and to the Federal district. The Guadalupe, Los Reyes and Trinidad plants in the State of Hidalgo, and the Comanja plant in the State of Jalisco, near the city of Leon, are inactive. The first three works were constructed between 1845 and 1860 and used water power, that of the Trinidad plant having since been diverted for the generation of electricity. It has been claimed that Guadalupe was the first blast furnace erected in central Mexico. The Comanja furnaces were erected in 1865; there were two stacks of cut stone, each 37 x 9 ft.;



Fig. 11.—Interior of a Ferreria (Catalan Forge), Showing the Open Charcoal Fire.

steam power was used, the boiler being fired with wood. This plant has been idle for a number of years.

The Encarnacion and San Miguel furnaces and rolling mills, the Apulco furnace and foundry in Hidalgo, and the Delicias rolling mill, in the City of Mexico, are operating. The Hidalgo plants employ charcoal, largely made from oak, as fuel for the blast furnaces, and in two of them iron is puddled, using wood. Charcoal is purchased by weight, the standard being the arroba, approximating 25 lb. Wood is paid for by the tarea, 1 c. m., or the querda, 1½ c. m. The puddling furnaces consume 3½ tareas of wood per ton; that is, about one cord of wood is necessary to puddle, and about half a cord to heat 1 metric ton of product.

The Encarnacion Plant

At the Encarnacion plant in the district of Zimapan, Hidalgo, is a blast furnace, a masonry structure built in 1892 to replace a former one constructed in 1850, which is 37 ft. high, the bosh having a diameter of 9 ft.; cold blast is supplied by rotary blower operated by steam generated in a boiler which utilizes the waste heat from the tunnel head. The ore is mostly a rich magnetite from the neighborhood, averaging over 65 per cent. of iron, to which sufficient leaner material is added to assist in the furnace operation. An average

of 33 charges per day aggregating 9.46 tons of iron ore, 6.38 tons charcoal and ½ ton of limestone are fed to the furnace, producing therefrom 5.63 tons of pig iron. The rolling mill has two single puddling furnaces, an 18-in. roughing train and an 11-in. finishing train, driven by a steam engine, the steam coming from boilers over the furnaces; also a 1-ton steam hammer This mill produces angle irons up to 3 in., merchant bar and also platina, previously described.

The brand Encarnacion has long been the standard for wrought iron in the Mexican market. A test of ⅞-in. round bar gave an elastic limit per square inch, 45,410 lb.; tensile strength, 55,260 lb.; elongation in 8 in., 21.12 per cent.; reduction in area, 41.1 per cent.; fracture, fibrous.

Originally the product was hauled by team to the City of Mexico, and after railroad connection was made to Pachuca this was the shipping point. A railroad is now being constructel by Mr. Honey which will further shorten the wagon and tram-road haul for the product of the Encarnacion plant.

San Miguel Plant

In the district of Zacualtapan, State of Hidalgo, is the San Miguel plant, consisting of a blast furnace 32 by 8 ft. 9 in., built in 1859, which is operated by cold blast obtained by water power, using local hematite ores and charcoal, the product being 4.65 tons of pig metal per day, which is converted into merchant bars, angles, &c.

To produce this amount of iron there was fed to the furnace 8.54 tons of ore, 1.22 tons of limestone, and 6.62 tons of charcoal. The rolling mill has two wood-fired puddling furnaces, one reheating furnace, one 15-in. train, one 11-in. train and a 1-ton hammer, the machinery being operated by steam generated in boilers over the mill furnaces.

A concession has been granted for a railroad connecting the San Miguel and the Apulco plants, which will open up the timbered areas, giving additional fuel and ore supplies to these two works.

The Apulco Plant

The Apulco plant, Fig. 10, is the only one of the Honey group in Hidalgo which has direct railroad connection. It consists of a blast furnace, foundry and machine shop. The furnace is a stone and adobe stack 45 ft. high, 8 ft. bosh, operated with cold blast supplied from iron blowing tubs driven by a Pelton water wheel. During the month of January the furnace record showed that 287 tons of iron ore, 30 tons of limestone, and 289 tons of charcoal were fed to the furnace, the product being 189.23 tons of foundry pig iron. The local limonite upon which the furnace relies is delivered by burros and is enriched by a high grade hematite from the State of Guerrero, brought by railroad to Apulco.

The advance in iron manufacture in Mexico has been slow, and in the interval of 11 years between two visits to Apulco furnace there was but little change noted, except the substitution of a Pelton wheel under high head for an overshot water wheel under low head, and the addition of modern tools in the machine shop, to fit up some excellent castings made directly from the blast furnace or from a cupola. The buildings were covered with the same long wooden shingles, held in place by wooden pegs; most of the ores, charcoal and flux came to the furnace on the backs of mules and burros, the ore and stone being hand broken to nut size, mostly by women who earned 10 cents per day; all materials were fed by hand into the throat of the furnace by measure, the charcoal in baskets, the other material in boxes. Much of the metal was ladled from the open fore hearth and cast into delicate patterns, such as garden seats, brazeros (charcoal ovens) and plows, and a cupola also remelted the metal which had been run into pigs and cast it into water pipes and other large forms.

The mechanical ability exhibited by the Mexicans argues well for an iron industry, for in this plant, as well as others visited, superior workmanship is evidenced in the castings and in materials passing through the machine shop.

The continued activity of some of these older plants, in spite of the establishment of a large modern steel industry at Monterey, demonstrates the accepted superiority of their products, made at low cost by crude methods, but they cannot be expected long to maintain existence against prospective advances, although it must be admitted that in a country where labor is abundant, so efficient, so cheap, and which can be so well directed as in Mexico, labor-saving appliances prove less important than in the United States. But improved equipment and operation also reduce the consumption of material, and this added to the smaller labor item will be apt to relegate the older plants to the list of the "has beens." Recognizing this condition, Mr. Honey decided upon improvement of his plants, and a fire which destroyed a part of the buildings at Apulco made the time opportune for carrying these improvements into effect. Plans are now being drawn for a modern blast furnace, equipped with iron pipe hot blast stoves at Apulco, in which foundry pig iron will be made, and also for the modernizing of the furnaces at San Miguel and Encarnacion.

Delicias Plant

In the City of Mexico is the Delicias rolling mill, owned by Mr. Honey, which has a gas fired heating furnace, one 12-in. train and one 9-in. train. The material used is scrap iron; the producer fuel is imported coal and the power to operate the rolls, shears, bolt cutting and nut tapping machines, &c., is obtained from motors connected with the electric system which supplies the City of Mexico. The product of the mill is rounds up to 1⅞-in., squares to 1½-in., flats to 3 x ¾ in. and angles and tees 2 in. or under.

Electric Furnace

Mr. Honey has contracted for an induction furnace capable of producing 2½ tons of steel per heat, and is having plans prepared for remodeling the Delicias mill, adding an open hearth furnace, an enlarged heating furnace, and an additional train of rolls. This equipment may form part of a projected industry in the valley of Mexico, which will include a new blast furnace. The electric furnace may be operated with cold metal, such as old car wheels, but the project is to use it in connection with the open hearth furnace, for the purpose of producing special high grade steels for stamp shoes, dies, &c.

The Delicias foundry and machine shop adjoining the rolling mill is owned and operated by Thomas Phillips. It has two cupolas of 3 tons and 1 ton per hour, respectively, and a well-equipped machine shop.

Other Industries

In addition to the rolling mills and foundries connected with Mexican blast furnaces, there are several plants which produce bar iron, and foundries are located in most of the important cities, at the shops of the railroad companies and at some of the prominent mines.

As an evidence of the mechanical skill of the native Indians, the statement is made that at one of the large silver mines machetes have been cast from a cupola, ground to a sharp edge, and are quite serviceable, unless a blow is struck which brings a transverse strain on the metal.

Of the rolling mills, that at Chihuahua, 225 miles south of the Rio Grande, and 1000 miles north from the City of Mexico, consists of a 30-ton tilting open hearth

furnace with gas producers, fed with scrap and ore, producing ingots, which, after passing through a gas fired heating surface, are rolled into merchant shapes by means of a 12-in. and an 8-in. train.

The National Railway maintains a rolling mill and a shop at Aguascalientes, 300 miles from the capital, as a medium of utilizing part of its scrap, and producing some of the material for its own consumption. It has two oil-fired heating furnaces and a 9-in. merchant train.

In the City of Mexico Valentin Elcoro & Sons have two coal-fired heating furnaces and a 16-in. train, producing small merchant bars, angles, &c., from box piles. The output is from 25 to 30 tons per week. There is also a well-equipped foundry and machine shop connected with the plant.

Imported wire rods are converted into nails at San Luis Potosi, Monterey and Guadalajara.

A Mexican Ferreria

The above sketch of Mexican iron works will carry the reader back more than half a century, to the time when cold blast charcoal furnaces were numerous throughout the eastern United States, but in Mexico it is to-day possible to hark much further back and find in the mountains ferrerias, which are really the ancient Catalan forges. An adobe building, generally covered with thatched roof, which in some mysterious manner withstands, and has for years withstood, the showers of sparks from one or more open charcoal fires, is located beside a stream which has sufficient volume and fall to insure the generation of blast in a trompe, and the operation of a helve hammer by a water wheel. The air entrained by the water falling in a box forming the trompe is compressed sufficiently to give blast through the tuyere, which accelerates the combustion of charcoal in the forge fire and partially reduces iron ore fed with the fuel, thus forming a loop which is compacted and from which the cinder is driven off under the helve hammer. Subsequent reheating and hammering produce platina bars or anchovies, which are disposed of in markets in the nearby prominent towns at approximately 3 to 4 cents per pound.



Fig. 12.—Exterior of a Ferreria (Catalan Forge) in the Western Portion of the State of Oaxaca. The Dam in the Background Furnishes Power to Operate the Hammer and Supply the Blast Through a Trompe.

To supply these forges of ancient type, and also most of the charcoal furnaces, the fuel is prepared by Indians who fell trees and form small meilers in the woods where the charcoal is produced. This prevents a good yield from the wood, and the charcoal is much broken in being transported to the iron works in bags, either on the backs of peons or on burros or mules. The iron ores are dug in small quantity, are used as extracted, and are similarly transported, although in some cases oxcarts are employed, but, except in northern Mexico, none of the iron ore deposits have railroad connections. In late years there has been an attempt in modernizing some of the charcoal furnaces; two of these are supplied with hot blast and the rolling mills connected to them are also modern in construction.

To obtain information concerning the ferrerias it is necessary to make long journeys into the mountains, with the chance of finding the owner absent or dead, and no one able or willing to give the information; in fact, most of the ferrerias are operated by remnants of the old Mexican tribes, speaking dialects peculiar to themselves. One of these ferrerias is reported as active on the slopes of Popocatapetl, in the State of Puebla.

The San Rafael has three fires, one of which is used for reducing ore and the others for refining iron; it is located in the central part of the State of Oaxaca, and its annual output is reported as 600 quintals, or about 30 tons. The metal sells at from 9 to 10 pesos per quintal, or 4½ to 5 cents per pound. Figs. 11 and 12 are reproductions of photographs taken at San Rafael.

Another ferreria is located a few miles from the city of Tlaxiaco in western Oaxaca, and two others are near San Miguel Plumas in southern Oaxaca. There is also one in the same state near Zeniza in the district of Zimatlan, consisting of a small blast furnace about 15 ft. in hight, which produces about 3000 lb. of pig iron per week when running, the charge consisting of 200 kg. of ore, 200 of charcoal, and 30 of limestone. The charcoal costs 7 centavos an arroba, or a little over $3 per metric ton. The ore is a rich magnetite and the pig iron is refined with an equal weight of charcoal and hammered into bars weighing about 25 lb., which command about 4 cents per pound. The plant also makes castings, the market for its product being the city of Oaxaca, which is reached by burro trail.

Altitudes of Iron Works

Interesting features in connection with the existing iron works in the republic of Mexico are their elevation above sea level and the influence of dry rarified air upon the amount of moisture carried into the furnace on the boiling point of water and upon the vacuum possible in condensation.

The blast furnace connected with the steel plant at Monterey has the least altitude above sea level of any of the Mexican iron works, it being 1600 ft. above tide. The furnace at Durango is 6300 ft.; that at Tula 7300 ft.; the Encarnacion furnace in Hidalgo 7650 ft.; in the same state, Apulco furnace, 6950 ft.; San Miguel, 5400 ft.; the City of Mexico being 7250 ft.

In the United States the furnaces of the Colorado Fuel & Iron Company at Pueblo are at the greatest altitude, 4600 ft. above sea level, and but few others are at at altitude greater than 1000 ft., the majority being at elevations ranging from sea level to 600 ft.

Conclusions

From the above the following may be assumed:

1. That Mexico awaits improvement in its iron and steel industry.
2. That a market for greatly increased output exists.
3. That the Government favors and assesses customs duties which will protect domestic manufactures and prevent destructive competition.
4. That topographical conditions demand freight

charges in overcoming distance or elevation to reach the centers of consumption, which give additional protection to advantageously located domestic industries.

5. That iron ore is abundant and much of it of superior quality.

6. That labor is plentiful and as a rule easily taught and willing to work.

7. That although the prices paid for mineral fuel are above what prevail in the United States, there are localities where this, or charcoal, can be obtained at costs which admit of the production of metal at satisfactory prices.

This list of favorable conditions, however, is not enumerated with the expectation that a knowledge of them may encourage a "boom" in the establishment of iron and steel industries, for it is fully as important in Mexico as elsewhere to give each suggested improvement and each selected location careful investigation.

The Mexican people are not given to accepting changes readily, and while the per capita consumption of iron and steel products will increase, this augmentation will not be by leaps and bounds. The phrase *"No es la costumbre"* may be applied to the use of metals, as to other features of Mexican life, and notwithstanding the *"pro patria"* sentiment in the republic the abandonment of brands which are known for others which are new is not to be expected to be precipitate.

Neither is it believed that the best results will follow the wholesale importation of foreigners to operate the industries nor the installation of large plants as initiatives. The rehabilitation of some now existing works, or the erection of new ones of moderate capacity, with the provision of future enlargement, seems to offer the best chances for success, and while labor-saving appliances are not as essential in Mexico as in the United States, where the prevailing wage rate is four to six times as great, the environment demands that the equipment should be of high class.

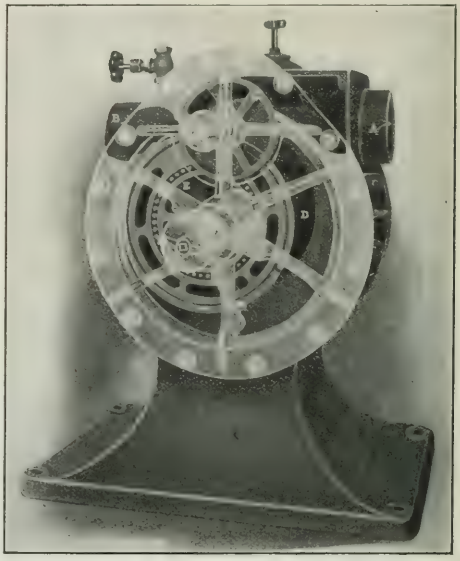
A number of visits, covering a period of 28 years, and which embraced different sections of Mexico, have given opportunity to study the country, its people, its resources, its industries and its possibilities and to note the progress which has been made, to appreciate the causes of failure, to recognize the basis upon which success was obtained, to see improved conditions follow industries judiciously planned and managed. As popular education is extended, as the inborn ability of the workmen is utilized, and as the resources of the country are developed, the manufacture of iron and steel will expand, the per capita demands for such products will be augmented, and the wage rate will be increased.

The Geyser Rotary Pump

A pump which is constructed on an entirely new principle has been invented by George F. Westcott and is being marketed by the Paradox Equipments Sales Office, White Building, Buffalo, N. Y. The accompanying illustration shows the construction and operation of the pump very clearly. It may be used to pump either water or air, and has such special applications as tree spraying and vacuum cleaning.

The principal parts to this pump are the cylindrical casing containing the inlet and outlet, the impeller, an oscillating abutment which for convenience may be called a valve, and an eccentric on the driving shaft for operating the impeller. In operation the water or air enters the cylinder through the inlet A, and is prevented from passing over the impeller by the valve C, which is cylindrical, but cut away on one side to admit the impeller. This valve is fastened to the impeller D and keeps the latter from revolving. The eccentric E, which is fastened to the shaft by a key, transmits a gyratory motion to the impeller with practically no rotation of the latter; ball bearings are interposed between the two parts to reduce friction. The motion of the impeller displaces the air or water forcing it out through the outlet B.

When pumping air the pump is water packed by a small stream which enters with the air into the cylinder, and when pumping water a certain amount of entrained air is carried in which enables the water to be pumped to a greater hight without excessive power. For spraying trees the additional equipment required consists of a tank with pipe connections to the pump



Phantom View of the Westcott Geyser Pump, Sold by the Paradox Equipment Sales Office, Buffalo, N. Y.

and the spray pipe, and it is claimed that with this pump sprayer mixtures can be pumped 40 ft. without drop, and the use of the needle point is done away with as the solution is mixed with air and sprays from the hose. The vacuum cleaner equipment consists of a receiver for the dust, the collecting tools and the necessary hose for making the connections.

Units of this character can be driven by electric motors, gasoline engines, or any other power available. Where increased capacity greater than that of a single pump is required, siamese inlets and outlets are furnished, and two pumps placed side by side with a common driving pulley between them, or they may be arranged in series.

Machinery Exhibition in Berlin, Germany.—A special exhibition of machinery, tools, leather, and all kinds of materials used in the manufacture of belting will be opened October 9 next at the Luisenhof, Berlin. The American Chamber of Commerce at Berlin states that leading German, American and English firms are said to have already secured space. Applications should be addressed to A. Frommeyer, Hanover, Germany.

The new oil-burning torpedo boat destroyer Paulding, at its trial trip September 2 off the coast of Maine, exceeded the contract requirement of 29.5 knots by 3.3 knots, maintaining an average of 32.8 knots an hour during her four-hour run at top speed. This vessel was built by the Bath Iron Works, and has thus been shown to be superior to the new coal-burning destroyers Flusser and Reid, which were also built at the same plant.

The Farwell No. 3 Gear Hobber

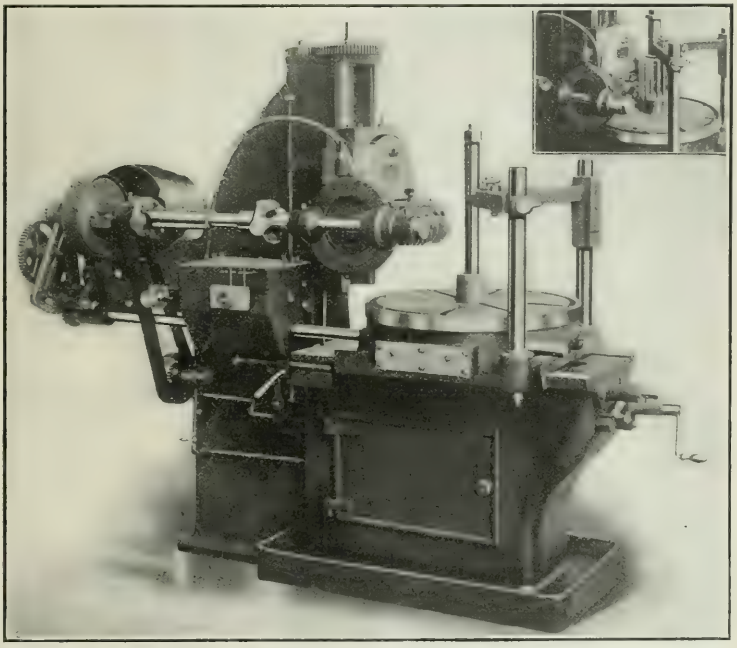
The first of a line of gear hobbers built by the Adams Company, Dubuque, Iowa, was described in *The Iron Age,* June 4, 1908. Now a much heavier machine, known as the No. 3, has been added to the line, which is capable of handling work up to 24 in. in diameter, three-pitch, cutting 12 in. of face at a time. As may be seen from the accompanying illustrations the head has an unusually long bearing on the housing and the spindle has no unnecessary overhang. The spindle has adjustable bronze bearings of liberal diameter and length and is very rigidly secured to the saddle. In fact the compact and rigid support of the spindle is considered a feature of the Farwell gear hobber.

A change in the design of this machine, brought about by the intention of handling coarser pitches than the No. 1 machine, is the providing of a slide in the saddle that carries the hob, making it possible to adjust the hob spindle longitudinally, so that any tooth may be placed exactly central with the work arbor. This adjustment is quite important to the obtaining of perfect gears of coarse pitches, but does not require attention for gears of fine pitches, as the difference in position of two succeeding teeth then is not sufficient for the neglect of adjustment to be noticeable in the gears. The longitudinal movement of the spindle head permits also the shifting of the hob to a new cutting position without resorting to moving the hob or the arbor. Several shifts may be made bringing sharp cutting parts of the hob into action before it is necessary to grind the hob.

An automatic trip on the head stops the downward feed when the cut is finished and the head is raised by power ready for the next cut. This return of the head is necessary only once for each stack of gears cut, and on the smaller machine is accomplished by hand. There are two extra feeds on the No. 3 machine, making 10, all of which are obtained in the gear box. A horizontal feed mechanism is incorporated in the machine for cutting worm wheels and a special support is also furnished for the upper end of the arbor. Use of the latter is necessary only when gears must be swung on centers, or for wide face gears or for cutting a stack of gears of small diameter. A more rigid support can be secured in other cases by using face plates or supporting rings which rest upon the table and support the blanks immediately below the rim.

The spindle is driven by a bevel gear instead of by belt as in the first machine, as the coarser pitches necessitate tilting the hob to a greater angle than the belt drive would allow. This angle and the tooth depth are set with a hardened steel gauge as on the smaller Farwell gear hobber. All important bearings have bronze bushings and the spindle and arbor bearings may be adjusted by loosening a lock ring and tightening an adjusting ring nut.

Exceptional rigidity is insured by the design of the base and column, these and the knee below the table and the oil pan around the machine being a single casting. The weight of the machine is about twice that of the No. 1 hobber, or over 2000 lb. A large tank for lubricant is inclosed in the base and ample passages are provided to conduct the lubricant from the table back to the tank. The lubricant pump is gear driven and has means for regulating the flow of the lubricant. All gears are provided with shields as is also the universal joint shaft.



The Farwell No. 3 Automatic Gear Hobbing Machine, Built by the Adams Company, Dubuque, Iowa.

The Mexican Iron & Steel Company

GUADALAJARA, MEXICO, September 1, 1910.—The iron industry of the Mexican Iron & Steel Company, known as the Ferreria de Tula, at Tapalpa, in this State (Jalisco), is having a steady growth. The company is composed of Boston, Mass., men who acquired the property about a year ago from Daniel Ochoa. In addition to the iron mines, the blast furnace and the rolling mill, the company purchased a large tract of timber and ranch land from Mr. Ochoa. Many orders have been received by the company and the plant is kept constantly running to its full capacity. Recently the Corcuera family, which owns a very large plantation, gave an order to the company for 10,000 forged plow points, which are to be adjusted to the typical Mexican wooden plow. There is talk of engaging in the manufacture of steel tools as well as of erecting a steel plant at the furnace, but no definite step has as yet been taken by the company.

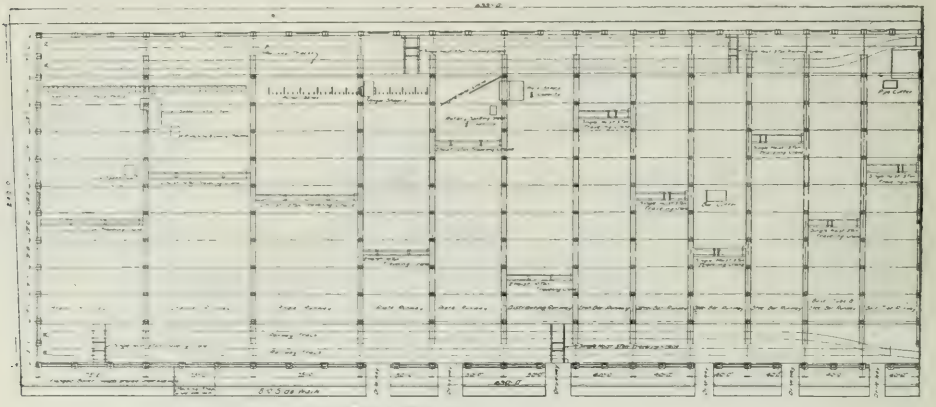
The officials of the Jewell Steel & Malleable Company, Buffalo, N. Y., have finally decided upon the location of its plant, which will be at the southwest corner of Military road and Hertel avenue on a 4-acre site having New York Central Railroad connections. Construction has already begun. The main building will be 130 x 140 ft., of brick and iron.

The Scully Steel & Iron Company's Warehouses

Features of an Important Storage and Handling Plant of the Chicago District

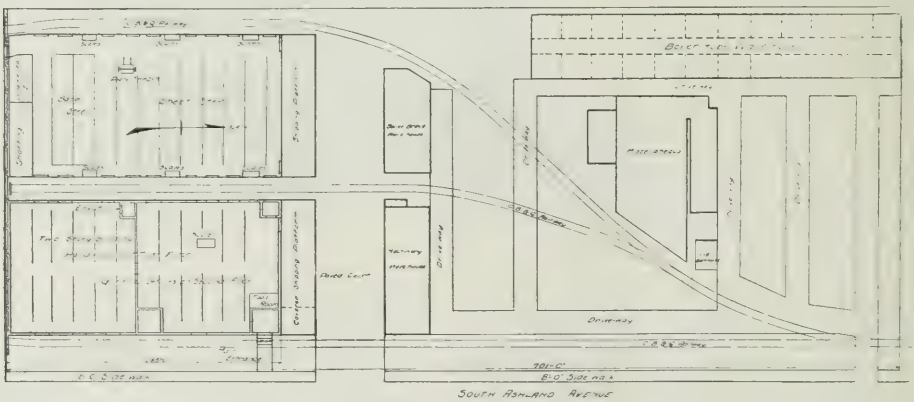
The new plant of the Scully Steel & Iron Company, Chicago, possesses noteworthy advantages for shipping. The property has a frontage of 289 ft. on the south branch of the Chicago River, and a "slip," as it is called locally, an excavated channel, extends 1700 ft. north from the river along the warehouse property, including a vacant portion on which the buildings may be extended to provide for the growth of the loading cars. Two of them, one on each side, extend the full length of the plant, while the third runs through the middle of the north warehouse with platforms on each side for handling material in or out of cars. These tracks are "pulled" twice a day, and the mechanical equipment for loading and unloading is so complete that 57 cars have been unloaded in one day. A carload of pipe has been unloaded and stacked in 23

(Slip 100 ft. wide and 1700 ft. long, navigable for large boats.)



South Half of Plan.

(Slip 100 ft. wide and 1700 ft. long, navigable for large boats.)



North Half of Plan.

Fig. 1.—Plan of Warehouses, Offices and Shipping Yards of Scully Steel & Iron Company, Chicago, Ill. (The Lower Half of the Plan Is the Continuation, to the Right, of the Upper Half.)

business. Any boats which can enter the Chicago River can be taken up to the company's plant, where the freight can be unloaded directly into the main warehouse. Large cargoes of iron and steel were received in this manner the past summer from Eastern mills, as the Eastern railroads favor this traffic by operating their own boat lines and making lower rates than by all-rail routes.

In railroad facilities the plant is equally favored. There are three railroad sidings for loading and unminutes. In handling iron and steel in a large plant the cars often come in bunches, owing to delays in transit in the case of shipments from Eastern points. There is a great commercial advantage in being able to take care of the material as fast as it comes in sight.

For handling outgoing shipments the railroads have established a special service which avoids drayage expense and promotes economy on less than carload lots. These shipments are loaded in local freight cars, one for each road, in such a way that they leave the plant



Fig. 2.—The General Office.

in carloads which often go forward in local freight trains without rehandling the material. This service is only possible in a large shipping center like Chicago, where sales of iron and steel from store run into large figures in daily tonnage. The amount of business done in a day may be inferred from the fact that although this railroad service saves teaming to freight depots, as high as 30 to 40 teams are kept busy on deliveries throughout the city.

The entire plant is laid out in harmony with the idea of economy and prompt service in handling material. There is room to stack all the finished iron and steel products in a systematic manner, so that they can be handled quickly with the best economy in labor. Hand trucks are used only in the sheet and "hardware" warehouses. A shear, operated by electricity, is located conveniently on the sheet floor. It is a regular feature of the store trade that the customer usually wants only a small lot, and is in a great hurry for it. The largest manufacturing plants in Chicago are always running out of something which they want immediately, and a part of the service of store distribution is to get the order ready and a wagon on the way with it within a very sort time after a rush order is received on the telephone. The Scully plant is designed to meet this demand by carrying a very large stock of all gauges and widths of sheets, which can be cut to special sizes on a moment's notice, and an equally complete stock of heavy bolts, spikes, tools and other articles generally classed as heavy hardware.

The new feature of the Scully plant, however, is in the main warehouse, in which are carried the stocks of structural material, tubes, bars, plates and other rolled products. All this stock is piled flat, and is handled by electric cranes. This warehouse is 240 x 639



Fig. 3.—The Bar Bay.

ft., extending north and south, with a railroad track inside the building on each side, and a river dock at the south end. The storage space is laid out in 12 bays, or "alleys," extending east and west the width of the building. Three of these bays are 75 ft. wide, three 50 ft. and six 40 ft. The 75-ft. bays are used for beams, channels and other long, heavy structural material, which usually runs in 60-ft. lengths, while the other bays are used for shorter material and pipe. The stock is laid in piles running north and south, across the bays, stakes being used to separate the piles wherever necessary, as in the case of pipe.

Over each of the 12 bays runs an electric crane, which covers the entire bay and the railroad tracks at each end. The material is unloaded from the cars with these cranes and laid in its proper place in the bay, so that each size and section of stock is kept in order. Three Cleveland cranes of 10 tons capacity are used on the wide bays for heavy structural steel, the others being Whiting cranes of 5 tons capacity. There are also two cranes which run north and south the entire length of the warehouse, on the west side over the railroad tracks. These are used in transferring stock from one bay to another, as well as in loading or unloading cars and carrying material to or from the saws or shears. They are also used in carrying to the north warehouse the lots of material which go out on wagons or in cars which are loaded outside the main warehouse. No fabricating work is done here, but the plant is equipped with a friction saw for cutting heavy stock, as well as a slow saw, a heavy punch, and shears for cutting angles, bars, plates and tubes.

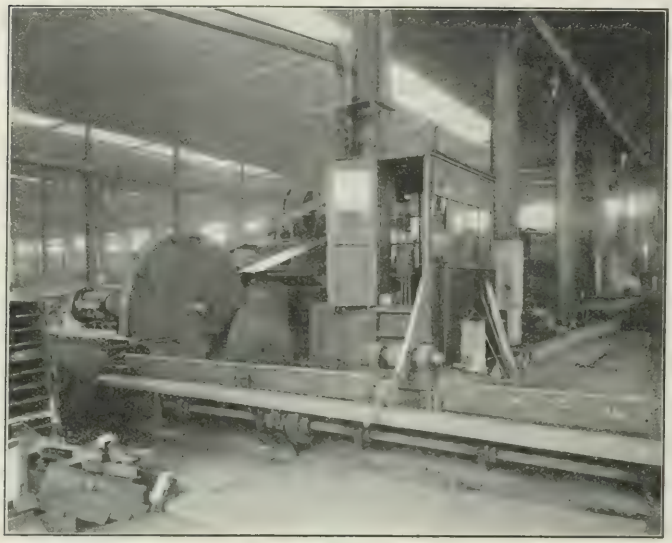


Fig. 4.—The Friction Saw.

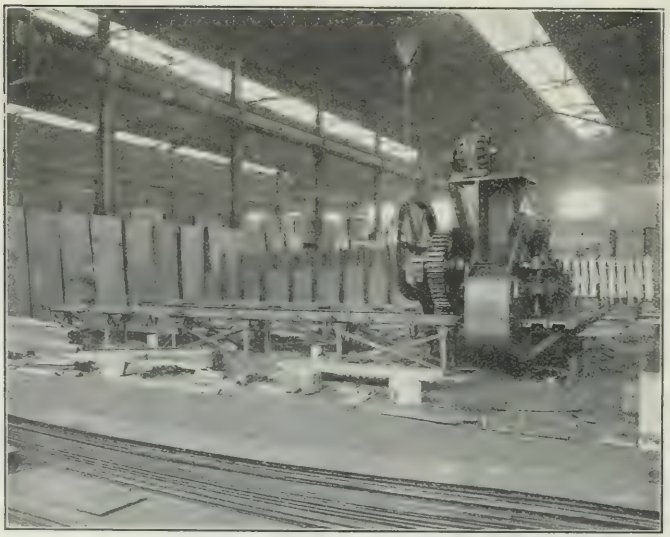


Fig. 5.—The Angle Shear.

An interesting feature in the office of the company is the extent to which steel has been used for furniture and fixtures. The main office is one large room, 100 x 150 ft., divided into departments by low steel partitions of counter hight. The desks, filing cases and other fittings are all of steel, and even the doors and door casings are of steel. The general artistic effect is evidence that the manufacturers of steel furniture and fixtures are making great progress in their art. All the exposed steel surfaces are enameled with a mahogany finish, and it is done so perfectly that one has to look closely to make sure it is not mahogany. The columns are covered with ornamental pressed steel with the same finish, and the general arrangement gives the office an artistic "tone" which is very pleasing. The officers of the company have private offices, opening from the north end of the main office, but emphasis is laid on the fact that the doors of these offices are always kept open, especially to employees.

While there is good light from each side, the general office has a large skylight in which the glass has been given a coat of gray paint, which has the effect of softening the light. At each end of this skylight is a large ventilating fan, one blowing in and the other out. The heated air under the skylight is thus carried out and a constant supply of fresh air is drawn in.

South of the main office are the restaurant, the gymnasium and the lavatories. The same food is served to all the office employees, numbering about 100, but the price is graduated, running all the way from 10 cents for an office boy to 50 cents for a department manager. The company loses a little money in conducting the restaurant service, but every one gets a square meal and the service is appreciated, as there are no outside restaurants worthy of patronage in this part of the city.

Automobile Standardization

To meet the imperative demands of the automobile industry there has at last been set on foot a movement looking to its permanent standardization. This work, inevitable in its necessity to an industry now fifth in the scale of industries, and one growing by leaps and bounds, is to be conducted by the Society of Automobile Engineers, 1451 Broadway, New York, of which Coker F. Clarkson is general manager. Following the decision made at the recent meeting at Detroit, the Standardization Committee of the society has been organized as follows: Howard E. Coffin, president of the society (*ex-officio*); Henry Souther, Hartford, Conn.; James H. Foster, Hydraulic Pressed Steel Company, Cleveland, Ohio; H. S. White, Detroit Seamless Steel Tubes Company, Detroit, Mich.; Charles T. Jeffery, Thomas B. Jeffery & Co., Kenosha, Wis.; Elwood Haynes, Haynes Autumobile Company, Kokomo, Ind.; H. W. Alden, Timken-Detroit Axle Company, Detroit, Mich.; Arthur Holmes, H. H. Franklin Mfg. Company, Syracuse, N. Y.; W. H. Van Dervoort, Moline Automobile Company, East Moline, Ill.; D. F. Graham, New Departure Mfg. Company, Bristol, Conn.; G. E. Merryweather, Motch & Merryweather Machinery Company, Cleveland, Ohio; A. C. Bergman, Simplex Automobile Company, New York; Coker F. Clarkson, secretary, 1451 Broadway, New York. This committee will be enlarged as shall be found necessary. Various subcommittees will be actively engaged throughout the country on component parts of motor cars which can be properly standardized at this time. These matters cover a very broad field, including raw materials, machine tools, semifinished and finished parts, engineering methods and practices.

The work of the committee involves an immense amount of detail. Proper standardization will mean a tremendous saving to the industry and the public, for it spells efficiency, bettering quality, reducing cost and facilitating production. It means interchangeability, highly valuable to producer and user. Persistent application for several years by the most capable automobile engineers working jointly has resulted in the establishment of only a few standards, some of which have not been widely adopted; these are known as the A. L. A. M. screw standard and drill sizes, spark plugs, solid and adjustable yoke and eye rod ends and horsepower formula. Subjects now in hand by the Standardization Committee are as follows: Specifications and heat treatment of automobile materials; indexing and digesting of automobile engineering literature; compilation and publishing of an automobile engineer's hand-book or pocket book; seamless steel tubing; sheet metal; lock washers; limits for screws and taps; round cornered square holes and keyways; brake and clutch lever forgings; practice in plain and anti-friction bearings; wood wheel dimensions and fastenings for solid tires; shackle bolts; carbureters; flanges, outlets, bolt hole center distances, cap screws, gasoline connections, throttle levers and holes, water connections and gaskets; automobile nomenclature; frame sections. The matter of sheet metal alone involves the consideration of the chemical composition; dimensions and standard of measurement of clutch disks, brake drums, body panels, mufflers, radiators, fenders, hoods, sod pans, fan blades, hub caps, dashes, steps, running boards, miscellaneous stampings and many other parts.

The Llano, Texas, Ore Field

AUSTIN, TEXAS, September 2, 1910.—The Wakefield Iron & Coal Land Improvement Company, Milwaukee, Wis., which has just been granted a permit by the Secretary of State to do business in Texas, has been interested in the iron ore fields of the Llano district, 100 miles northwest of here, for several years. It has a large iron ore property near Llano that is in a partial state of development. During the past year the company has conducted extensive exploration work by means of diamond drills, and it is said that it has proved an ore field of such extent and high brade as to warrant the erection of blast furnaces. The company has a capital stock of $250,000. The plans for a furnace are said to have been drawn.



Fig. 6.—The Stock of Beams and Channels.

There is a good prospect of the Llano iron ore field being placed in direct touch with the Thurber coal fields, situated to the north about 150 miles. It is also claimed that there are extensive deposits of good coking coal within less than 100 miles of Llano. Two or three railroads are now projected into the Llano section from the north and west.

President Henry B. Joy of the Packard Motor Car Company, Detroit, Mich., is quoted as follows by the Boston *News Bureau:* "I do not feel that the future is clear for American industry in general. Political disturbance is rife. Two Presidents are too many for one nation. Stability and confidence in the future are prime requisites for industrial development, and these do not exist. So far as the Packard Motor Car Company is concerned it will during the current quarter do the largest business of any three months in its history. We have no specific output, our business depending largely on the nature of the vehicles ordered of us. We have cut in half a factory enlargement programme by reason of the disturbed political outlook."

Steel for Rails

A paper on the above subject was presented at the recent International Congress of Metallurgy at Duesseldorf by Pierre Breuil, a Carnegie medalist of the Iron and Steel Institute and now secretary of the Hainaut Works at Couillet in Belgium. The paper is largely a review of the more recent work on the subject and great prominence is given to American specifications, research and results. Following is an abstract:

On the Continent the amount of carbon rarely varies with the weight of the rail. It is lower than in America and ranges from 0.35 to 0.50 per cent. The phosphorus is usually from 0.075 to 0.080, and the silicon is held generally at 0.10 but varies from 0.05 to 0.20.

In regard to the wear of rails in service, M. Couard has worked out a formula based on the results of many years' observations in service. He believes that the wear of the head is proportional to the average tonnage of the trains, the average speed, the bending of the rails between their supports, to the grade, and finally

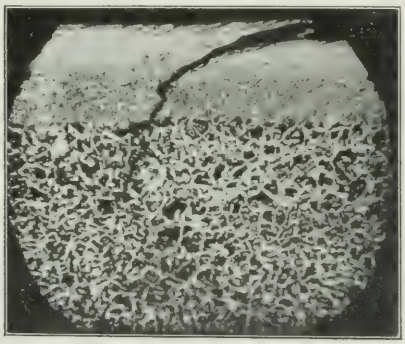


Fig. 1.—Longitudinal Section, Magnified 35 Diameters.

to a coefficient varying with the nature of the steel. His formula is:

$$N = \frac{100}{Tv} \cdot \frac{1}{L^3} \cdot \frac{1}{1 + \frac{AD^2}{}} \times C.$$

N = the number of trains answering to a loss in hight of the head of the rail to 1 mm. (0.039 in.).
T = average tonnage of the train in tons.
V = the average speed, using kilometers, per hour.
I = the moment of inertia of the section in centimeters.
L = the distance between the ties in meters.
D = the grade in millimeters per meter.
A = a coefficient which is 0.023 for an up grade and 0.012 for a down.
C = a coefficient varying with the source of the steel.

The coefficient C was 1.4 for a certain brand of rails on M. Couard's road. For this steel 200,000 trains will give a wear of 1 mm., the average weight being 200 tons. When the brakes are applied the wear is five times greater. The most important causes of wear are the increasingly heavy wheel loads and the greater speeds. Theoretically, the wheel only touches the rail at one point, so that the pressure on this small area is very great, bringing about permanent deformations, tears in the crust of metal which has lost its malleability and various phenomena of flow. Some experiments have been made, which are worthy of mention. Under the heavy wheel loads, applied on a small area, the metal in the rolling surface is subjected to stresses above the elastic limit and tends to flow.

In all cases a crust is formed. It appeared of interest to endeavor to determine to what depth the hardening action extended. A double headed rail was taken, the analysis of the steel being carbon, 0.54; manganese, 1.00; sulphur, 0.08; phosphorus, 0.144. It had been in service 28 years. From the rolling surface successive layers were removed, 1 mm., 0.039 in. thick. On each step three Brinell tests were made, using 3000 kg. pressure, and a 10-mm. ball. The results are given below, that of the lower head being 207:

	Position of Test.		
Number.	On side outside of track.	In center.	On side inside of track.
Rolling surface....	269	277	302
1.....	293	286	277
2.....	277	269	293
3.....	255	241	269
4.....	228	223	228
5.....	228	212	217
6.....	228	217	228
7.....	228	207	228
8.....	223	207	223

In each case the results at the side of the rail are higher than those in the center. The hardness diminishes regularly in the center, and the hardening influence extends to a depth of 6 mm. (0.24 in.).

A microphotograph, Fig. 1, shows the exterior crust to be only about 0.019 in., this method of examination failing to show the mechanical changes the metal has undergone, but it does show the flow to have taken place in a direction contrary to the direction of the track. It also shows a crack following the line of flow, and extending into the unaltered steel below. These cracks may be seen with the naked eye, if the rolling surface is brushed and washed with benzine. A light polishing and etching develops them, as shown in Fig. 2. If the rail is etched in dilute hydrochloric acid, the fissures are eaten away and become very plainly visible.

These facts merit the attention of all those making and using rails. If the rail is bent with the hardened

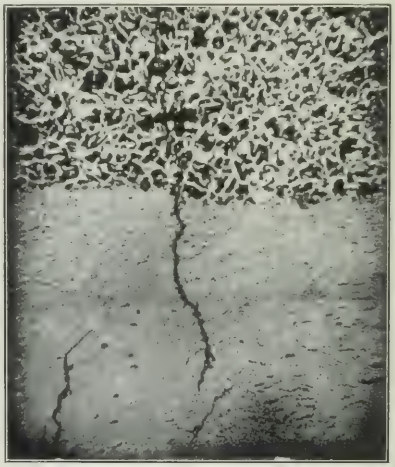


Fig. 2.—Showing Hardened Crust and Fissures, Magnified 35 Diameters.

crust in tension it breaks off short; if the other way it gives a good bending angle. Small tensile tests taken from the surface give no elongation, while those from the center of the head give 18 to 20 per cent.

G. B. W.

The reported locomotive orders for last week comprise but three engines. The Dold Refrigerator Car Line is in the market for 50 steel underframe refrigerator cars, while the Mexico Northeastern is reported to want 200 logging cars and the El Paso & Southwestern 11 cars. The Chicago, Milwaukee & Puget Sound is reported as ordering 250 logging cars from its company shops. New equipment business is exceedingly light.

Buffalo Multistage Turbine Blowers

A large amount of air at pressures ranging from 8 to 16 ounces per square inch is required for cupola blast. To furnish this, most centrifugal blowers are required to run too fast for direct connection to electric motors. By providing two or more stages in a turbine blower, the Buffalo Forge Company, 490 Broadway, Buffalo, N. Y., has succeeded in lowering the speed sufficiently for direct motor operation. Fig. 1 is an exterior view of one of these units, and Fig. 2 is a sectional elevation showing the constructional details. With this blower small capacities at high pressures are easily obtained at moderate speeds, for by using two or three stages the speed can be reduced to that corresponding to one-half or one-third, respectively, of the total pressure. At present a number of these blowers are installed in different foundries, railroad shops and steel plants.

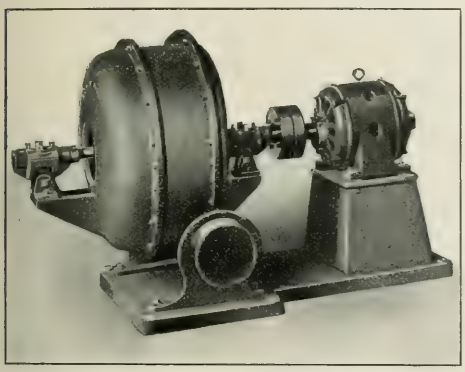
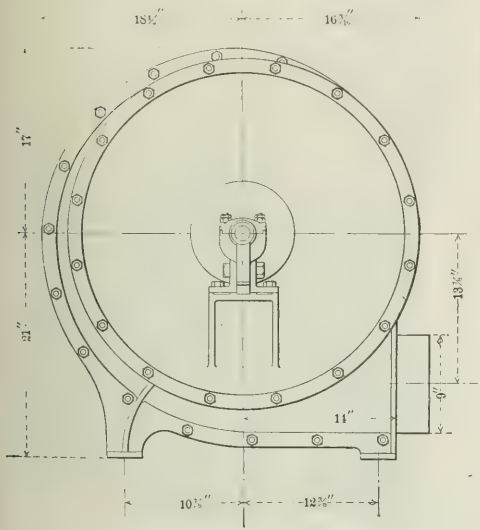


Fig. 1.—A Two-Stage Turbine Blower Built by the Buffalo Forge Company, Buffalo, N. Y.



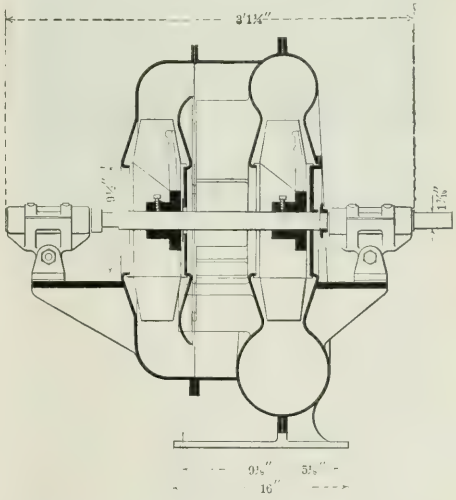


Fig. 2.—Side and Axial Sectional Elevations of a Buffalo Two-Stage Blower.

The blower shown in Fig. 1 is one of a lot of three installed in a railroad repair shop for furnishing the blast to furnaces which have a capacity of 1090 cu. ft. of air per minute at a pressure of 5 ounces per square inch, the operating speed being 1720 rev. per min. As compared with a standard centrifugal blower of the single stage type having the same pressure, the speed is much less, 2880 rev. per min. being the speed required to give approximately the same capacity where only one stage is used. This unit is only one of a large line which the company is prepared to build either regularly or to order. The standard line includes capacities up to 12,000 cu. ft. of air per minute at pressures ranging from 5 to 24 ounces per square inch.

The Coates Automatic Labeling Machine

The Coates Automatic Machine Company, recently incorporated, is successor to the Coates Mfg. Company that was formed August 11, 1909, for the purpose of manufacturing automatic machines for labeling, banding, wrapping and end sealing boxes, tubes, cans or bottles of any size or shape. The company's office and factory are located at 584 Hudson street, New York City. The machines manufactured are thoroughly automatic, requiring but one operator, occupying 3 x 3 ft. of floor space, and taking ½ hp. for operation. The speed of the different models varies from 25 to 100 packages per minute, depending upon the size of the article to be handled. The company states that it has installed its machines in quite a number of the largest concerns of their kind in the country, and these machines were accepted after severe tests and more were ordered. Larger factory room is under negotiation, as the demand for the machines makes it likely that the company will shortly be obliged to turn out at least 25 a month. The inventor of the machines manufactured by this company is Frederick Coates, who is also president. Franklin B. Coates is vice-president and treasurer. Maurice Levi is secretary and attorney.

The Great Lakes Engineering Works.—In connection with the issue of $750,000 of bonds of the Great Lakes Engineering Works, Detroit, Mich., which will be used to retire indebtedness and to build a new plant at Ashtabula, Ohio, a circular has been issued giving earnings in recent years and details of resources. Organized in 1903, the company has increased its capital and surplus from the original $600,000 to $2,750,000. The cost of the Ashtabula plant will be about $400,000. Real estate, plant, &c., are put at $2,577,789. The net earnings were $347,801 in 1905-6, and in the next three years $184,725, $436,792 and $377,531, respectively, the year 1906-7 being a strike year. The estimated net earnings for 1909-10 are $350,000. The sales for the four years 1905-6 to 1908-9 aggregated $14,785,000.

The Metal Dross Economy Process

Apparatus for Recovering Metal and Charcoal from Crucible Skimmings

Brass foundries will be interested in the process for skimming metal drosses patented by the Metal Dross Economy Company, Bristol, Conn. Briefly the process consists of skimming the drosses from the crucible in the usual way, but letting them fall into a pot of water instead of on a skimming heap, keeping them wet until time to separate them through a series of superimposed sieves through which they are washed by water. It is claimed that 60 per cent. more skimmings can be saved in this way than by the use of a stamping mill or crushing barrel, as in the latter all of the smallest shot and thin pieces are ground up and lost, and that 90 per cent. more is saved than by any other way where no crushing machine is used. To show the waste of the old process, 60 lb. of clean metal that had passed a No. 30 sieve was mixed with ashes taken from the casting shop fires and ground. Including the metal that was in the ashes only 21½ lb. of clean metal was recovered, proving that the amount of fine stuff that is ground into powered dust becomes lighter than the hard cinders and is washed away by the water. The Economy process by contrast is claimed to save everything including the oxides.

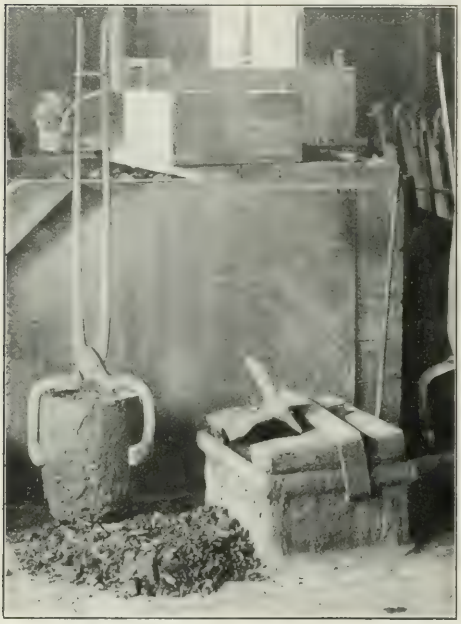


Fig. 1.—The Skimming Tank Used in the Process Patented by the Metal Dross Economy Company, Bristol, Conn.

The skimming tank, Fig. 1, is a cast iron box, 20 x 22 in., 16 or 20 in. deep, with a steel top in which there is a funnel-shaped opening about 8 in. square. Over this is a shield at an angle of about 45 degrees, which protects the caster from the heat, dirt and much of the smoke, which is so objectionable in skimming metal in the usual way. The tank should be set in the floor, so that the top is about 4 or 5 in. below the top of the crucible, and should be kept filled with water to within 2 in. of the top. The skimming of dross into water immediately stops the spelter smoke and does away with the skimming heap, conducing to a clean casting shop. As soon as the dross strikes the water all oxidation of metal ceases, whereas by the old way the brass continues to oxidize even after it has been skimmed and lies on the heap. The zinc oxide immediately separates from the metal upon reaching the water and takes the form of different sized pellets.

At the end of the day or any other convenient time, the tank is cleaned out. The skimmings should not be allowed to dry, as the oxide of zinc will then adhere to particles of the brass and become much harder to clean off, and the very fine shot metal will also be more difficult to save. The skimmings may be put in a barrel and kept wet until a more convenient time for cleaning. A barrel will hold the dross from 500 to 800 No. 30 crucibles, if it is run through a No. 8 riddle and the larger pieces taken out. By the Economy process all the charcoal that remains unburned is saved, and may be returned to the crucibles. The tanks are made in two sizes, No. 1 holding the skimmings from 50 No. 25 crucibles, and No. 2 from 60 No. 70 crucibles. The water will remain at about the same depth in the tanks, no matter how much dross or charcoal may be skimmed into it, due to the oxides taking up some of the water and some of the water evaporating.

The metal dross separator, shown in Fig. 2, separates the oxides from the metal. It is made of cypress wood, and is in the form of a tier of drawers with wire cloth bottoms of different meshes secured with cleats and brass screws, so that they may be easily renewed. The dross from the tank, about a scoop shovelful at a time, is put into the top drawer, and any lumps of coal or sand balls containing brass or large pieces of brass are taken out. The sand balls can be run through a crushing machine or sold as junk in that form. Everything that remains in the other drawers goes back to the casting shop, and can be used either wet or dry. If used wet, it is better to put it in the crucible when the pot is charcoaled, putting it on top of the charcoal, or on top of chips, or in any way so that the water will not get under the metal. It also makes a good flux and helps to stop oxidation, and does not gum or stick up the pot. In most foundries the metal saved one day is used the next, and divided about an equal amount to each crucible. What little brass works through the bottom cloth into the water reservoir of the separator can be rewashed, so that there will be nothing but the oxides that will wash away and they may be saved if de-



Fig. 2.—The Metal Dross Separator, in Which the Charcoal, Metal and Oxides Are Separated by Washing.

sired, although after going through the second process they have little value. One user of the process is reported to have saved from the melting of over 5,000,000 lb. of brass everything that came out of the tanks, except about two-thirds of a hogshead of oxides, which was so low in metal content as to be unmarketable. It takes only about 15 minutes to clean a tank of skimmings. The operation consists simply of turning a hose in the top of the separator and letting the water percolate through, being careful not to overload the apparatus.

The New Edwards Corrugated Steel Roof

Corrugated steel is a very popular roofing, but as ordinarily manufactured it has some disadvantages. These, it is claimed, have been overcome in a new corrugated sheet steel roofing recently placed on the market by the Edwards Mfg. Company, 545 Eggleston avenue, Cincinnati, Ohio. Fig. 1 shows the roofing applied to a building with steel purlins, and Fig. 2 gives some of the details of the special cleat used.

The use of wood for studding or rafters has almost entirely been abandoned and steel substituted, the sheet steel being afterward applied either as roofing or siding. The Edwards patent pressed standing seam corrugated roofing is said to be especially adaptable for use on buildings of this character, as will be seen from the accompanying illustrations. This roof has the advantage of perfectly tight seams, and can be applied to the purlins directly without rivets of any kind. This last feature is one whose importance is sometimes overlooked, as it is well known that practically all forms of iron and steel roofing deteriorate first at the points where the rivets pass through them. These points must, of course, withstand the strain of vibration and wind pressure. Where the sheets are galvanized, puncturing the sheets for the rivets exposes the raw metal, and the broken coating permits the sheet to rust, which is aggravated by the vibration.

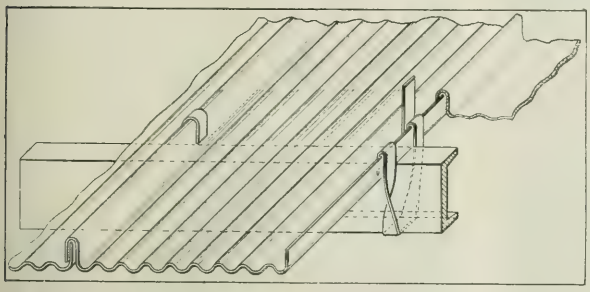


Fig. 1.—Pressed Standing Seam Corrugated Roofing, Made by the Edwards Mfg. Company, Cincinnati, Ohio.

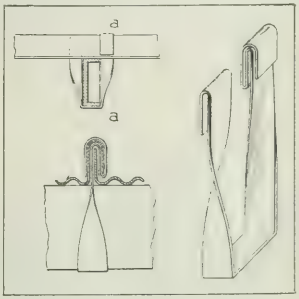


Fig. 2.—Details of Cleat Used to Fasten the Sheets to the Purlins.

Lapping two corrugations of the sheets was formerly considered necessary, but with this new roofing a saving of 11 per cent. in the amount of material required can be effected on the side seams alone. In addition to this saving of material a tighter side lock is secured. It is practically impossible to rivet a cleat tight enough to corrugated roofing to eliminate vibration when the cleat is passed under the purlin. With the type of cleat used in securing this new roofing the vibration is decreased to give just the proper amount, while at the same time the cleat is securely fastened to the steel sheet.

Other special advantages of this roofing are that it can be placed on the roof and worked entirely from above, which is a feature particularly valuable where the roof is high and hard to scaffold, and an entire roof can be put on without using rivets of any kind or puncturing the sheets. It can also be applied more closely to the purlins, and much more quickly, it is said, than any other form of corrugated roofing. While this roofing is primarily intended for use on buildings having steel purlins, it can be applied on wood purlins or sheathing boards equally well, the cleat in this case being nailed to the purlins or sheathing so as to conceal them completely after the roof is complete.

An English View of Our Industrial Companies

The London *Statist* of August 27, in the course of an editorial discussion of the economic situation in the United States, says:

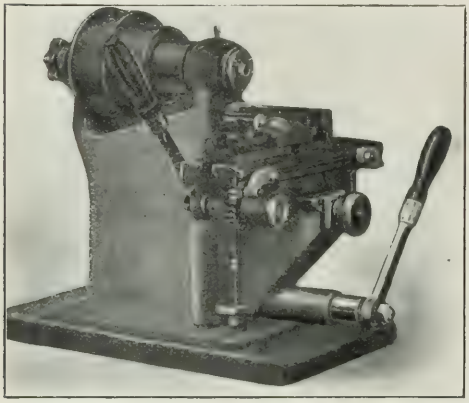
In considering the values of industrials it should be clearly recognized that no government can prevent its manufacturing undertakings from earning a reasonable rate of profit upon their capital. Our studies of the matter have led us to conclude that neither President Taft nor Mr. Roosevelt is likely to propose any measure which would be intended to prevent the industrial companies from earning a reasonable—in fact, a relatively high—rate of profit. Their efforts must necessarily be directed to the prevention of monopolies created for the purpose of securing unduly high prices from the public. Companies having for their object the supply of a product at a reasonable price will make larger profits than undertakings desiring to extort unduly high prices from the public, and statesmen must, and doubtless will, foster enterprises which seek to earn profit by economy of production and relatively low prices of commodities.

The principles of a large turnover and a small profit per unit have long been recognized as those which give the most profitable results. These are certainly the principles which have raised American railroads to their present high degree of prosperity, and they are also those of the more wisely administered and progressive industrial companies. The latter have no cause to apprehend the passage of any legislation which will adversely affect their prosperity. It is not improbable that the existing legislation will be modified in order to render legal undertakings which are willing to trade under these conditions and to justify their existence by selling their products to consumers at a reasonable price. In these circumstances the alarm concerning the future of the industrial companies of the United States is unwarranted, and those persons who place their faith in the good sense of the American people and anticipate a satisfactory solution of the present "trust" difficulty will find it advantageous to purchase the shares of the industrial companies at their current depreciated level of values.

Correction.—In the item relating to the Harriman rotary engine which was printed on page 483 of *The Iron Age* September 1, 1910, the name of the inventor was misspelled. It should have been J. Emery Harriman, Jr.

The New Carter & Hakes Bench Miller

A new bench hand miller which is especially designed for the light work which is made in large quantities by makers of guns, sewing machines, typewriters, electrical work and numerous other lines, has been placed on the market by the Carter & Hakes Machine Company, Winsted, Conn., and is illustrated herewith. This machine is of the same design as the old model of the company, but it has been improved in a number of



The New Bench Milling Machine Made by the Carter & Hakes Machine Company, Winsted, Conn.

details. Among these are a larger and longer spindle bearings, a larger cone pulley and a wider belt for driving the machine and a solid box type of knee with a wider and longer bearing surface on the column instead of the side rib or web model. The carriage and table have both been made longer and wider and in addition sliding stops with a fine screw adjustment have been provided, which also has both a crank and a knob for operating. The screw for the transverse adjustment of the carriage has its index graduated in thousandths of an inch.

The miller is designed with the intention of saving as much floor space as possible and may be set on a bench as its name indicates, while a number of them may be set on a bench or separate platform which takes up comparatively little room. The vertical and horizontal feeds are equipped with the customary rack and pinion operated by hand levers. The spindle is bored to receive a draw-in collet having a ½-in. hole, and if desired a cutter arbor to be used either as a substitute for or in addition to the regular collet can be furnished. The vise is operated by a lever which is different from those ordinarily employed for this purpose, but it is claimed that the vise will grip the work as securely as a screw-operated one and in addition is much quicker in opening and closing.

The following table gives brief dimensions and specifications of the tool:

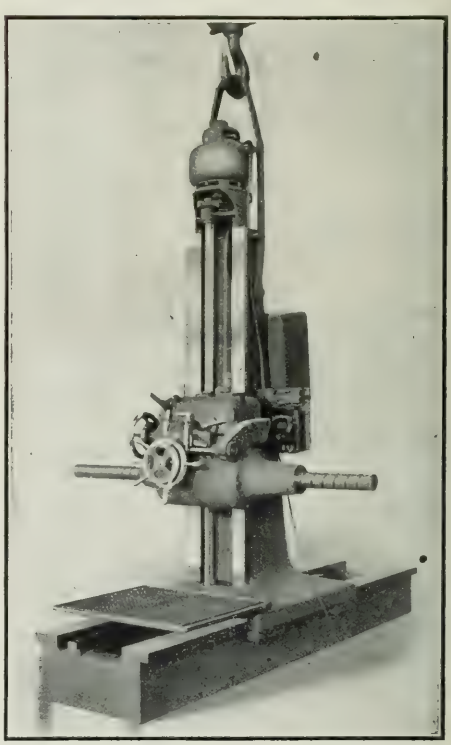
Weight, lb.	100
Total bench space required, in.	21 x 17
Longitudinal feed of table, in.	4
Cross motion in line with spindle, in.	2¼
Vertical movement of knee, in.	4
Maximum distance table to spindle, in.	4¼
Dimensions of table, in.	3 1-16 x 10¼
Speed of countershaft, rev. per min.	240
Total hight, in.	14¾
Dimensions of base, in.	6½ x 10½

The equipment regularly furnished includes an overhanging arm to support the cutter arbor, a taper sleeve for the spindle with hole for the collet, a lever vise, countershaft and the necessary wrenches.

Duralumin, a New Aluminum Alloy.—Announcement comes from Great Britain that a new alloy of aluminum, named duralumin, has been brought out by H. B. Weeks, head chemist at the works of Vicker's Sons & Maxim, Barrow, England. The alloy is described as only a little heavier than pure aluminum, but as strong as steel. The statement is made that this alloy can be rolled, drawn, stamped or forged at suitable temperatures, and that it is much less easily corroded than other aluminum alloys. The firm is building new works at Birmingham for the purpose of manufacturing the metal, on which patents have been secured throughout the world. It is expected that the production of the alloy on a commercial scale will begin in October.

A Portable Rochester Horizontal Boring Machine

A new and somewhat novel use is being made of the Rochester horizontal boring machine, built by the Rochester Boring Machine Company, Rochester, N. Y., which was illustrated and described in *The Iron Age* June 30, 1910. The accompanying engraving shows the machine ready for use as a stationary or portable machine, the change being made by simply disconnecting the column and the column slide from the floor plate. Thus the head and face of the machine can be



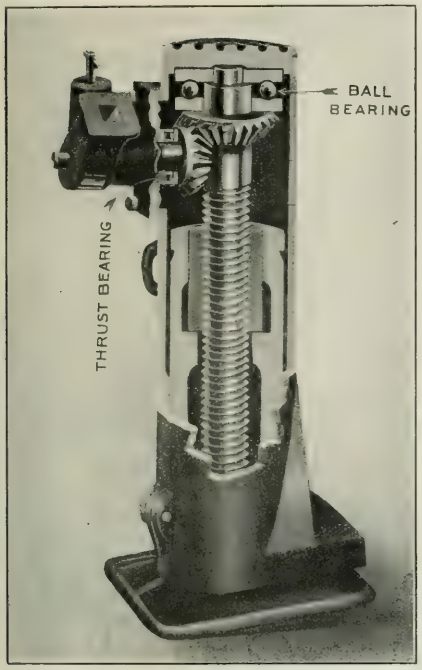
The Horizontal Boring Machine Built by the Rochester Boring Machine Company, Rochester, N. Y., Made Portable.

readily handled by a crane and moved to any part of the shop where this may be easier than moving a heavy piece of work to the machine.

The column slide has screws designed for pushing the head away from the floor plate a sufficient distance to permit the dowel pins which are used to locate the machine on any part of the floor plate to be withdrawn from the plate, after which the crane can pick it up easily. This makes the machine equally applicable for either stationary or portable work and enables it to be used very conveniently in a number of places.

Duff Ball Bearing Screw Jacks

One of the most popular lines of jacks made by the Duff Mfg. Company, N. S., Pittsburgh, Pa., and sold through Fairbanks, Morse & Co., Chicago, Ill., is the Duff ball bearing screw jack. It is made in several types and sizes covering all those used in car shops,



A Ball Bearing Screw Jack Made by the Duff Mfg. Company, N. S., Pittsburgh, Pa.

roundhouses, &c. In its present form it contains an improved ball bearing, having much larger balls than were formerly used, which are consequently stronger as well as easier to operate under load. Special tool steel plates form the raceways for the balls in the main bearing and their wear, even under constant and severe service, is practically inappreciable.

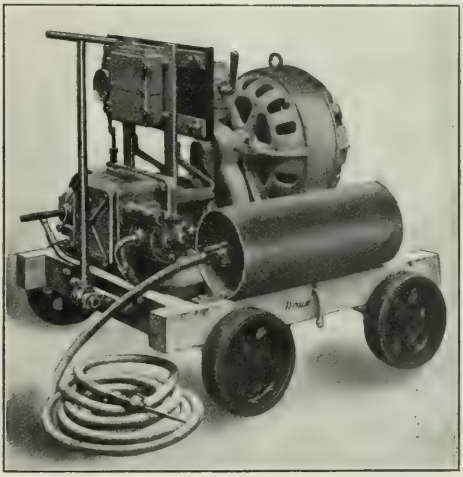
Another improvement is an additional ball bearing on the bevel pinion to take the thrust at that point. This is claimed to be the only jack of its type having a ball bearing at this point, and for that reason to be much easier to operate. The balls in both bearings are separated by bronze cages to reduce friction between balls. The jacks are made in capacities from 10 to 75 tons, and in various sizes and with and without foot lifts. Special sizes are built for handling railroad equipment and for shop work. The gears in the jacks are of high carbon steel, drop forged, and have machine cut teeth. The company also makes a cone bearing journal jack used by car inspectors, which is furnished in capacities of 10 to 15 tons.

Newberry Furnace Improvements.—Ground has been broken at Newberry, Mich., for the erection of a modern retort plant to be operated in connection with the Newberry Furnace of the Lake Superior Iron & Chemical Company. The plant will occupy a building 72 x 300 ft. in size, aside from the cooling houses, and will necessitate the construction of 4 or 5 miles of additional track in the company's railroad yards. With the new works in commission, the present kiln method of manufacturing charcoal will be abandoned and the kilns will be torn down. The new process will not only yield a much larger production of wood alcohol, but will permit the saving of additional by-products. A new policy also has been adopted in regard to the timber operations of the company. All merchantable wood is to be manufactured hereafter and for this purpose a thoroughly modern sawmill is to be erected. The improvements will entail an expenditure of $250,000, and will require nearly a year for their completion.

A Portable Westinghouse Motor-Driven Air Compressor

Very extended use of the electric motor for operating small portable equipments is now being made because of the convenience and economy resulting therefrom. A small portable air compressor equipment recently supplied to the Rio de Janeiro Flour Mills & Granaries Company, Ltd., by the British Westinghouse Electric & Mfg. Company, Manchester, England, who recently also furnished the electrical equipment of the mills, is illustrated herewith.

The outfit is entirely self-contained and is employed for blowing dust out of the 600-hp. motors with which the mills are equipped and for cleaning other machinery. This form of cleaning is considered superior to any other for electrical machinery, as the compressed air issuing directly from the compressor blows out all the crevices and thoroughly cleans the armature windings without affecting the insulation of the coils, which is almost as important as keeping the machinery free from dust. The equipment furnished consists of a



A Portable Motor-Driven Air Compressor, Built by the British Westinghouse Electric & Mfg. Company, Manchester, England

standard Westinghouse airbrake compressor driven by a 3-hp. three-phase Westinghouse squirrel cage motor through single reduction gearing, and together with the control panel, which is of slate on a strap iron frame, is mounted on a wooden base with rubber-tired wheels, so that it can be moved easily from point to point.

A flexible cable with a plug on the end leads the current used to drive the motor from outlet boxes on the wall to a three-pole double-throw switch inclosed in an iron box and then through a unit type fuse box to the motor. By a special arrangement of the connections the fuses are cut out of the circuit when the motor is thrown on the line at starting and after the operating speed is attained the switch is thrown over and the fuses are cut into the circuit.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¼ in. round and square	₰ lb 1.90¢
1¼ to 4 in. x ¼ to 1 in.	
1½ to 4 in. x ¼ to 5-16	₰ lb 2.10¢
Rods—⅝ and 11-16 round and square	₰ lb 2.10¢

Angles:	Cts ₰ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 3-16 in. and ⅛ in.	2.35¢
1½ to 2 in. x ¼ in.	2.20¢
1¾ to 2½ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.20¢
1 to 1¼ x ¼ in.	2.10¢
⅝ x ¼ in.	2.20¢
⅝ x ⅛ in.	2.50¢
⅝ x ⅛ in.	3.35¢
½ x 3-32 in.	3.35¢

Tees:	
1 in.	2.45¢
1¼ in.	2.45¢
1½ to 2 in. x ¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.45¢
3 in. and larger	2.45¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Toe Calk, Tire and Sleigh Shoe	2.30¢@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C R Soft Steel	R. G. Cleaned.
No. 16	₰ lb 2.90¢	3.00¢
Nos. 18 to 21	₰ lb 2.95¢	3.10¢
Nos. 22 and 24	₰ lb 3.05¢	3.20¢
No. 26	₰ lb 3.10¢	3.30¢
No. 28	₰ lb 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₰ lb. 12 @14½¢

Patent Planished, W. Dewees Wood & Co.'s A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₰ lb 3.20¢
Nos. 22 to 24	₰ lb 3.35¢
No. 26	₰ lb 3.75¢
No. 28	₰ lb 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—Galvanized.

Nos. 22 and 24	₰ lb 5.15¢
No. 26	₰ lb 6.25¢
No. 28	₰ lb 7.50¢

Corrugated Roofing—

2½ in. corrugated	Painted	Galvd
No. 24	₰ 100 sq. ft. $4.85	4.80
No. 26	₰ 100 sq. ft. 2.95	4.40
No. 28	₰ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:	
IC, 14 x 20	$5.35
IX, 14 x 20	7.00
A. Charcoal:	
IC, 14 x 20	$5.10
IX, 14 x 20	6.35

American Coke Plates—Bessemer—

IC, 14 x 20	$4.40
IX, 14 x 20	5.10

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908 19¾¢ ₰ lb

High Brass Rods—

List August 1, 1908 14¼¢ ₰ lb

Roll and Sheet Brass—

List August 1, 1908. 14¼¢ ₰ lb

Brass Wire—

List August 1 1908 14¼¢ ₰ lb

Copper Wire—

Base Price. carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity over 1000 lbs) ₰ lb. 8 ¢
Sheet Copper Cold Rolled, 1.7 ₰ lb advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 1¢ ₰ square foot
Sheet Copper Polished over 20 in. wide, 2¢ ₰ square foot
Planished Copper, 1.2 ₰ square foot more than Polished

METALS—

Tin—

Straits Pig ₰ lb 36½@37 ¢

Copper—

Lake Ingot	₰ lb 14¾@15 ¢
Electrolytic	₰ lb 14½@14¾¢
Castings	₰ lb 14¼@14½¢

Spelter—

Wes ern ₰ lb 6¼@6½¢

Zinc.

No. 9, base, casks ₰ lb 5 ¢ Open ₰ lb 8¼¢

Lead.

American Pig	₰ lb 5 @5¼¢
Bar	₰ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed	₰ lb 22½@23 ¢
No. 1	₰ lb 20½@21 ¢
Refined	₰ lb 18 @18½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₰ lb 10¢
Hallett's	10¢
Other Brands	9@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 24¢
Rods & Wire Base Price 31¢
Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₰ lb 10.75@11.00
Copper, Heavy and Wire	₰ lb 10.50@10.75
Copper, Light and Bottoms	₰ lb 9.90@ 9.75
Brass, Heavy	₰ lb 7.25@ 7.50
Brass, Light	₰ lb 5.75@ 6.00
Heavy Machine Composition	₰ lb 9.50@ 9.75
Clean Brass Turnings	₰ lb 7.00@ 7.25
Composition Turnings	₰ lb 8.25@ 8.50
Lead, Heavy	₰ lb @ 3.50
Lead, Tea	₰ lb @ 3.25
Zinc Scrap	₰ lb @ 3.75



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THE IRON AGE

Established 1855

New York, September 15, 1910

Vol. 86: No. 11

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

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Large Inquiries for Pig Iron

The Deadlock Continues as to 1911 Deliveries

A Gradual Shrinkage in Output of Finished Material

Producers and consumers of iron and steel continue to keep in close step, and it is recognized that for some time distributers and buyers will work on a minimum margin of stocks. With some exceptions, chiefly in pig iron, contracting for far-forward deliveries will be avoided until more can be found out of the probable extent of the revolution now under way in politics and business.

Pig iron has had most attention in the past week, but even here it is chiefly inquiry for next year that is reported. Normally heavy buying for the new year would be in order this month, and consumers are showing interest, but furnaces do not want 1911 business at this level. It remains to be seen to what extent this position will change as the month advances. In the East particularly there is talk of blowing out more furnaces, now that the end is being reached of the profitable contracts taken early in the year.

The pig iron buying of the week has been mainly from pipe works. In the Philadelphia district a contract for 18,000 tons of Southern iron, 3000 tons a month, has been renewed, and additional purchases of pipe iron have amounted to 8000 to 10,000 tons. Eastern Pennsylvania and Virginia pipe works are in the market for a total of 11,000 tons for this year. Southern furnaces report that business offered for next year is large, including a lot of 10,000 tons and one of 15,000 tons. Radiator works are inquiring for 40,000 to 50,000 tons for 1911. The general run of gray iron foundries are watching the market closely and taking on small amounts to piece out the year. Southern sellers for the most part hold to $11.50 for No. 2 iron, but $11 sales are still reported.

In basic iron a round lot has been sold for New England delivery, while several 2000-ton inquiries are pending at Philadelphia. Cincinnati reports that a nearby steel plant has asked for 25,000 to 30,000 tons of basic.

The United States Steel Corporation is operating 67 per cent. of its blast furnace capacity, 45 furnaces being now idle, against 42 September 1, 39 August 1, 35 July 1 and 31 June 1.

Steel billets and sheet bars are weak and on the former buyers are able to get concessions from $24.50, Pittsburgh maker's mill.

In the main new business in finished steel is better than in August. Since the operation of steel works is being adjusted closely to demand and the latter is almost wholly from hand to mouth, production shows a gradual shrinkage. The Steel Corporation's announcement of 433,000 tons reduction in unfilled orders

in August is to be interpreted in the light of this fact, though of course the figures furnish no gauge of the rate of shipments or the rate of new bookings last month.

The various steel companies are operating at from 65 to 80 per cent. of their capacity and taking new business at, say, 50 per cent. of capacity, but the new bookings are more dependable than the usual run of contract business.

The wire trade apparently leads in activity. Competition is sharper on some of the heavier products, cuts of $1 a ton being made on narrow and medium width plates.

Low prices continue on fabricating contracts. The subway extensions in New York City will make a large demand on the structural mills, but it will be spread over the next three years. The estimates of steel required, including rails, bars and wire, range from 150,000 to 225,000 tons, depending on the mileage decided on after the bids are received this month on the general contract.

Export rail business is good, sales of 25,000 tons being made by the Steel Corporation for shipment to Australia, besides fair orders to Brazil and other countries. Most of the recent domestic business has gone to the Colorado mill. The Tennessee Company has closed 3000 tons for the Texas Mexican Railway.

Several Lake Superior iron mines have been shut down and the output of others is being curtailed.

In the metal market tin is still the feature. Domestic consumers are buying at the prices fixed by the recent speculation, representing the highest level in three years.

Average Blast Furnace Output 100,000 Tons Per Annum

It is of interest to note that the average output per year of the coke and anthracite blast furnaces of the United States that have been in operation this year has been close to 100,000 tons. In February, when 313 of such furnaces were in operation, their yearly rate of production figured out about 31,250,000 tons. Charcoal furnaces at the same time produced about 400,000 tons additional. Between February 1 and September 1 there was a net reduction of 70 in the number of coke and anthracite furnaces active, so that at 100,000 tons a year the yearly rate of the 243 furnaces in blast at the opening of this month would be 24,300,000 tons. Our statistics showed that the daily capacity of these 243 furnaces, based on their performance in August, was 66,469 tons. Multiplying by 365 gives 24,265,185 tons, or very close to the above figure based on a 100,000-ton yearly average.

Theoretically, the furnaces dropping out of the active list under conditions such as have caused an average decrease of 10 furnaces a month in the past seven months would be those of smallest output and highest cost of production. The fact appears to be, from the maintenance of the same average output with only 243 furnaces running as with 313, that stacks of large capacity and presumably of economic production have contributed to the curtailment in considerable measure. In the case of the Steel Corporation, for example, the idle list includes important furnaces, particularly a number whose product enters into pipe and tubes, as well as the smaller ones at Zanesville and Columbus, Ohio, in the Wheeling district and at Bessemer, Ala.

The high capacity furnaces in blast September 1 far outnumber the small furnaces, 154 producing at a rate greater than 100,000 tons a year, while 89 were below that rate. One factor is to be considered that is not represented in the mere presentation of the figures. The largest furnaces of the steel companies have not been making iron up to their capacity for some months, moderate running being considered preferable, for a number of reasons, among which is the desirability of holding working organizations, to a concentration of production at fewer plants. In August most of the larger stacks made 13,000 to 13,500 tons, or 410 to 425 tons a day, while in but few cases was 14,000 tons reached. At full driving of the largest furnaces an average above 100,000 tons a year would have been recorded September 1. But apart from this consideration, the figures indicate a tenacity on the part of the smaller furnaces that under present market conditions is surprising.

For comparison with the 100,000-ton rate of the coke and anthracite furnaces, in blast this year, we turn to the blast furnace statistics of *The Iron Age* 10 years ago. On March 1, 1900, 264 such furnaces were in blast, with an average capacity of 57,264 tons a year. On June 1, 1900, there were 266 in blast, with an average capacity of 57,572 tons, and on September 1, 197 were active with an average capacity of 59,020 tons a year. The increase represented by an average capacity of 100,000 tons in 1910 is thus seen to be 75 to 80 per cent. in 10 years.

Going back 20 years, or to 1890, another basis of comparison is found. In his well-remembered paper in that year before the American meeting of the Iron and Steel Institute, James Gayley cited the phenomenal record of 113,526 tons in 12 months for the Edgar Thomson furnace which had blown in in 1889, this comparing with the best previous record of 88,940 tons. Thus what was an almost incredible performance 20 years ago is to-day but little in excess of the average of all coke furnaces, great and small. However, for several well-known reasons there is no approach to-day to the average of 1892 lb. of coke to the ton of pig iron, as given in Mr. Gayley's paper.

As another comparison we turn to the report of pig iron production in Great Britain in 1909. The average number of furnaces in blast was 319¾ and the average annual output per furnace was 30,224 tons, as compared with 29,375 tons in 1908 and 27,096 tons in 1907.

Steel Tubes

The manufacture of steel tubing has grown until to-day such tubes constitute one of the large divisions of fundamental forms, comparable with rails, plates, structural shapes and rods. The business is the legitimate successor of the manufacture of wrought iron tubing. But here the change of material introduced two problems not connected with the manufacture, but with the use itself. One of these was quickly solved—that which related to the rather unexpected difficulty of threading tubes of the new and tough material. The other, which has reference to the question of corrosion, is, perhaps, yet to be solved. The question is, after all, a comparative one, whose practical equivalent is, Does steel tubing corrode more rapidly than wrought iron? This would seem to be a really vital question, and yet, in spite of the uncertainty in which

the answer to it has been involved, the substitution of steel for iron goes steadily on. There seems to be no considerable section of the tubing business where this is not the case.

But the steel tube is not by any means engaged merely in taking the place of the iron tube. It is being applied to numberless new uses. This result is, no doubt, largely due to other causes than the change of material. The steel tube is, doubtless, stronger and stiffer and has a greater resistance to wear. These are important considerations, but scarcely sufficient to account for the facts. The wonderful expansion of the tube industry is due more especially, it would seem, to the wonderful development of the methods of manufacture.

Probably the first considerable demand for metal tubes arose in connection with their use as musket barrals and the like. This demand was scarcely large and steady enough to bring about any real mechanical development. But the introduction of gas for lighting purposes supplied the incentive needed to yield an economical process. Lap welding had already been employed in the manufacture of gun barrels. But methods founded on the idea of butt welding and looking to rapidity of production began to be developed. One method employed the rolling mill; another made use of the draw bench and the conical die. Welding processes are in large use to-day, and tubing thus produced has its own extensive and proper field.

But there are two principal difficulties in these modes of manufacture which tend to restrict application. If the weld is imperfectly made, certain uses of tubing will operate to open the joint. Moreover, any hot process carries with it a degree of inaccuracy of dimensions. Now, there is probably no commercial method of producing wrought iron or steel tubing in existence at present that does not involve one or more hot operations. If accuracy is to be secured in the final product, it is a question, then, of using such a hot operation that the inevitable inaccuracy is of such a character as to permit of subsequent elimination. The final operation must be a cold one.

The Mannesmann methods originated a quarter of a century ago and since brought to a high state of perfection supply a hot procedure which meets all requirements. There is no seam and so no possible imperfection of weld. It is sufficiently accurate to permit hot elongation and a final cold drawing to exact size. When to these considerations are added rapidity, certainty and economy of production the system appears to conform in very important particulars to modern ideals.

There is one other question to which a satisfactory answer must be given in order that seamless cold drawn tubing may be all that it should be. That question relates to uniformity and high quality. There is, no doubt, some inequality of stress in the walls of the billet when it leaves the piercing mill—some distortion of fiber. This imperfection is, doubtless, inherent in present methods, and may perhaps be inseparable from them. Still great progress has already been made in this direction, which would seem to indicate that practical perfection may be possible. For the present restorations possible through annealing processes must answer. That a high quality of low carbon steel tubing may be produced by disk perforation of the billet and cold drawing of this rough tube subsequent to its elongation by the rolling mill, if the annealing is well attended to, would seem to be indicated by the deformations to which the product may be subjected without rupture of the walls.

The great variety of forms and sizes which may now be obtained without trouble is a great advantage to the user, and tool steel tubes are also obtainable. The minute varieties are certainly marvels of skill and ingenuity.

Direct Pumping with Gas

Direct acting steam pumps are notoriously inefficient, but their simplicity, reliability, the little attention they require and their relatively moderate first cost have long been considered sufficiently redeeming to hold the field for them in the handling of moderate quantities of liquid. When the quantity is sufficient, as in a city's water supply, to warrant pumping engines, very excellent economies according to older standards have been obtained. The position of the steam pumping engine has been the last to be assailed by the gas engine, for under ordinary circumstances a gas engine driven pumping set does not offer the advantages to commend it. In the straight power field the gas engine has found its place and will continue to grow in popularity, but it comes as rather of a startling proposition that the economy of the latter may be contested by a prime mover in which gas will be used to pump water and the water to drive turbines, either for the direct furnishing of power or the generating of electricity. It has not only been proposed with the Humphrey combustion pump, but there is now under construction in Germany apparatus to test out the commercial possibilities of thus generating power.

A description of the Humphrey pump appears in another part of this issue. One of these pumps at Brussels is now attracting possibly more attention than any other exhibit in the machinery section of the exposition, and at the recent joint meeting of the mechanical engineers in England the demonstration of these pumps was one of the most interesting things witnessed on any of the technical excursions. The inventor of these pumps, an expert in the field of gas power engineering, took up the problem about four years ago of producing a simple, strong pump in which the explosive force would be exerted directly upon the water, going back to an idea that originated about 1868. He avoided, however, what had been the pitfall of the earlier experimenters—the placing of a nonreturn valve in the water line—and instead of seeking to master the difficulties they had encountered in controlling the movement of the incompressible liquid, he turned about and made that movement of actual service in the control of the pump, and with very interesting consequences.

The article above referred to explains the action of the pump, but it is worthy of some emphasis that with his new principle he has obtained so much more nearly the conditions that are ideal for any gas engine. As enumerated in a paper presented by the inventor before the Institution of Mechanical Engineers, these are ability to give four unequal strokes (this to obtain a higher than the theoretical efficiency of an Otto cycle); use of the whole possible range of expansion down to atmospheric pressure; energy delivered direct to the flywheel without intermediate parts; internal cooling

so that the cylinders may be of any size within structural possibility; ignition automatic and depending only on the compression, pressure and elimination of contraction and expansion difficulties. What he has eliminated as unnecessary are a rotating solid flywheel, solid piston, connecting rod, crank, bearing or glands of any sort; in short, moving parts of all kinds except the few inseparable from the operation of the valves. The pump has shown exceptional economy even in the relatively small capacities which have so far been built and tested, but it is not at all unlikely that these will be considerably exceeded by the larger pumps with higher compression, the building of which is now contemplated. In fact, so great a gain in economy is anticipated that even with the mechanical losses that will be introduced in using the pump to develop power through water turbines it is confidently believed that the economy of a straight gas engine will be exceeded. Aside from this prospect there are so many applications possible in the field of pumping alone in which the pump promises greater reliability, greater simplicity and greater economy, that it cannot but demand serious attention from the engineering world.

Germany Close to Great Britain in Iron and Steel Exports

We have already referred to the way in which Germany has been overhauling Great Britain in the race for the world's markets for iron and steel products. From 838,000 tons in 1900, or little more than one-fourth the British total of 3,213,000 tons, German exports of iron and steel had advanced to 3,732,000 metric tons, against 4,233,000 gross tons for Great Britain in 1908, and last year the respective totals were 4,044,000 and 4,380,000 tons. In the first half of this year Germany made a slight further gain, with a total of 2,307,000 metric tons, against 2,371,000 gross tons for Great Britain. Including machinery exports, which were 247,000 metric tons from Germany and 321,000 gross tons from Great Britain, the totals become 2,554,000 and 2,692,000 tons.

The increase in the rate of export from Germany over the record made last year is remarkable, and may well cause serious thought in Great Britain on the position of that country in the international iron and steel trade. As indicating the different lines on which the two countries have developed their foreign trade in iron and steel the London *Iron and Coal Trades Review* has prepared the following table showing the distribution of the exports of each:

Iron and Steel Exports from Great Britain and Germany, First Half of 1910.

	From Great Britain. Tons.	From Germany. Tons (metric).
Pig iron and ferro	618,693	382,362
Scrap	94,000	73,139
Rails	225,371	207,801
Chairs and sleepers	35,672	89,928
Wheels, axles and tires	25,000	31,309
Ingots, blooms, billets, &c.	1,512	250,185
Cast iron pipe	93,727	20,428
Tubes and fittings	80,236	69,352
Galvanized sheets	298,266	11,266
Tin plates	239,309	149
Other plates and sheets	119,333	185,821
Wire and wire products	58,697	258,805
Forgings and wrought manufactures, projectiles, &c.	32,374	48,000
Castings and machinery spares	37,663	43,968
Sections, girders, &c.	250,488	516,322
Hoops and strips	24,663	58,440
Anchors and chains	14,377	5,894
Bolts, nuts, screws and rivets	23,532	23,000
Unenumerated	92,846	31,334

It will be noticed particularly that Great Britain is a large exporter of pig iron, but practically ships no semifinished steel; that Germany is a smaller shipper of pig iron, but an important exporter of blooms, billets, sheet bars, &c., sending considerable of this steel to the United Kingdom. In galvanized sheets and in tin plates Great Britain is particularly active, while Germany does little or nothing. In wire products Germany is far in the lead, and in shapes and fabricated material does twice as much as Great Britain. In rails the two countries are not far apart. Our contemporary is disposed to the view that the race may not be so swift in the coming year, believing that the depressed state of the German iron trade in the first half of this year made competition from that source unusually keen. There is no certainty, however, that the immediate future will bring a reversal of this condition, and the outstanding fact about German iron and steel companies is that their capacity is expanding rapidly, and that the producing cost of the new plants is low. No signs appear of any deviation from the condition which our British contemporary alludes to as the "remarkable fact that as the largest exporters of pig iron, which relatively requires little labor, and of sheets and tin plates, which relatively require a large amount of labor, we are unable to compete successfully with Germany in intermediate products such as billets, sheet bars and sectional iron and steel."

The Steel Corporation's Unfilled Orders August 31

The second of the monthly statements of unfilled orders of the United States Steel Corporation was published September 10. It showed orders on hand August 31 of 3,537,128 tons, or 433,803 tons less than on July 31. The reduction in July was 286,863 tons. The total of August 31 is the smallest since September 30, 1908, and the latter date and June 30, 1908, were the only times in the last depression when unfilled business as published was less than at the beginning of the present month. Below are given the various reports of unfilled orders, beginning with the third quarter of 1902:

August 31, 1910....3,537,128	September 30, 1906..7,936,884
July 31, 1910.....3,970,931	June 30, 1906.....6,809,859
June 30, 1910.....4,257,794	March 31, 1906.....7,018,712
March 31, 1910.....5,402,514	December 31, 1905..7,605,086
December 31, 1909..5,927,031	September 30, 1905..5,865,377
September 30, 1909..4,796,833	June 30, 1905.....4,829,655
June 30, 1909.....4,057,939	March 31, 1905.....5,579,560
March 31, 1909.....3,542,595	December 31, 1904..4,696,203
December 31, 1908..3,603,527	September 30, 1904..3,027,436
September 30, 1908..3,421,977	June 30, 1904.....3,192,277
June 30, 1908.....3,313,876	March 31, 1904.....4,136,961
March 31, 1908.....3,765,343	December 31, 1903..3,215,123
December 31, 1907..4,624,552	September 30, 1903..3,278,742
September 30, 1907..6,425,008	June 30, 1903.....4,666,578
June 30, 1907.....7,603,878	March 31, 1903.....5,410,719
March 31, 1907.....8,043,858	December 31, 1902..5,347,523
December 31, 1906..8,489,718	September 30, 1902..4,843,007

The Western Steel Corporation Buys Nevada Iron Mine.—The Western Steel Corporation, Seattle, Wash., which is now operating a blast furnace and an open hearth steel plant at Irondale in that State, announces its purchase of the Dayton iron mine in Lyon and Storey counties, Nev. The property consists of 240 acres, and the purchase price named is $200,000. It was bought from James Wales Smith, Los Angeles, Cal., and Alfred Merritt, one of the discoverers and developers of the Mesaba range. The ore is hematite, and it is said that much of it runs 63 per cent. in iron with phosphorus under the Bessemer limit. In a report made by R. N. Dickman when the property was optioned to the late E. H. Harriman, the amount of definitely determined ore was put at 14,000,000 tons, and it is considered probable that the deposit will prove much greater than this.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept.14, 1910.	Sept.7, 1910.	Aug.10, 1910.	Sept.15, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$16.00	$16.00	$16.00	$18.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.25
Foundry No. 2, local, Chicago	16.50	16.50	16.50	18.50
Basic, delivered, eastern Pa.	*15.00*	15.00	15.25	18.00
Basic, Valley furnace	*13.75*	13.75	14.25	15.75
Bessemer, Pittsburgh	*15.90*	15.90	16.15	17.90
Gray forge, Pittsburgh	*14.15*	14.15	14.40	15.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	24.50	24.50	24.50	25.00
Forging billets, Pittsburgh	*29.00*	29.00	30.00	29.00
Open hearth billets, Philadelphia	*27.00*	27.00	27.50	27.50
Wire rods, Pittsburgh	28.00	28.00	28.00	31.50
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	16.50
Steel rails, melting, Philadelphia	13.75	13.75	13.75	17.25
Iron rails, Chicago	*16.00*	16.00	16.50	19.00
Iron rails, Philadelphia	18.00	18.00	18.00	20.00
Car wheels, Chicago	*14.00*	14.00	14.50	18.50
Car wheels, Philadelphia	*13.75*	13.75	14.00	17.00
Heavy steel scrap, Pittsburgh	**14.50**	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	13.75	13.75	13.75	17.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.40*	1.40	1.42½	1.52
Common iron bars, Chicago	*1.37½*	1.37½	1.40	1.45
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.50
Steel bars, tidewater, New York	1.56	1.56	1.56	1.56
Steel bars, Pittsburgh	1.40	1.40	1.40	1.40
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	*1.40*	1.45	1.50	1.40
Skelp, sheared steel, Pittsburgh	*1.50*	1.55	1.60	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.15	2.20	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.87½*	12.87½	13.00	13.50
Electrolytic copper, New York	12.62½	12.62½	12.62½	13.00
Spelter, New York	**5.50**	5.40	5.20	5.85
Spelter, St. Louis	**5.35**	5.25	5.05	5.70
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	4.30	4.30	4.30	4.30
Tin, New York	**34.80**	36.20	33.37	29.90
Antimony, Hallett, New York	7.87½	7.87½	8.00	8.37½
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6½ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots on which jobbers charge the usual discounts for small lots from store are as follows: Blue annealed sheets, Nos. 3 to 8, 1.55c. to 1.60c.; Nos. 9 and 10, 1.60c. to 1.65c.; Nos. 11 and 12, 1.65c. to 1.70c.; Nos. 13 and 14, 1.70c. to 1.75c.; Nos. 15 and 16, 1.80c. to 1.85c. One pass, cold rolled box annealed sheets: Nos. 15 and 16, 1.90c. to 1.95c; Nos. 17 and 21, 1.95c. to 2c.; Nos. 22 and 24, 2c. to 2.05c.; Nos. 25 and 26, 2.05c. to 2.10c.; No. 27, 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c.; No. 29, 2.20c. to 2.25c.; No. 30, 2.30c. to 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2c. to 2.05c.; Nos. 17 to 21, 2.05c. to 2.10c.; Nos. 22 to 24, 2.10c. to 2.15c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.25c. to 3.30c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or ⅖ per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	66	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
¼ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	63	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

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Pittsburgh

PARK BUILDING, September 14, 1910.—(*By Telegraph.*)

Pig Iron.—The local inquiry is light and nearly altogether for small lots. It is claimed that stocks in the valleys showed a slight decrease in August. We quote Bessemer iron at $15; basic, $13.75; No. 2 foundry, $13.75 to $14; malleable Bessemer, $14.25, and gray forge, $13.25, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Steel.—Inquiries for billets and sheet and tin bars are not quite as active as a week or two ago. We quote: Bessemer 4 x 4 in. billets, $24.50; Bessemer sheet bars, $25.50; open hearth billets, 4 x 4 in., $25 to $25.50; open hearth sheet bars, $26 to $26.50, and forging billets, $29 to $29.50, all f.o.b. Pittsburgh, Wheeling or Youngstown districts.

Ferroalloys.—There is some inquiry for ferrosilicon in the market, and several small lots have already been closed. This material is somewhat scarce and is bringing higher prices for prompt shipment than for forward delivery. We quote 50 per cent. at $56.50, Pittsburgh, for prompt shipment, and $55.50 for forward delivery. The market on ferromanganese is firmer, and $39.50, Baltimore, seems to be minimum.

Labor Notes.—The bimonthly examination of sales of the Republic Iron & Steel Company and other bar iron makers was made here Tuesday, and showed that average prices on shipments of bar iron in July and August did not warrant any advance in puddling for September and October. The conference held here Tuesday between the Sons of Vulcan and a number of the bar iron makers adjourned without a settlement being reached on the puddling scale. It is probable that some of these employers will now take puddlers belonging to the Amalgamated Association and refuse to treat further with the Sons of Vulcan as an organization.

This morning eight hot tin mills in the Laughlin Works of the American Sheet & Tin Plate Company at Martin's Ferry, Ohio, and five of the hot sheet mills in the Ætna-Standard Works at Bridgeport were started up. It is probable that additional mills in these plants will be started within the next week.

(*By Mail.*)

Signs of encouragement are not lacking. This is especially true of finished iron and steel, the new demand for which is showing betterment in spots, and many orders are coming in to the mills with urgent requests, sometimes by wire, for prompt shipment and even for car numbers, which is taken to mean that stocks held by distributers all over the country are very much depleted. The market, however, lacks the snap that is always present with an active demand, and this is due to the fact that the jobbing trade and consumers are persistently pursuing the policy of limiting their orders to cover actual needs. There is really not much incentive to anticipate future requirements, the market being only fairly steady. It is, nevertheless, a remarkable condition that exists to-day in the iron trade in the matter of prices, which have been quite well maintained in the face of the fact that the demand for the past four or five months has been so largely of a hand to mouth character. There has been no disposition on the part of any of the large steel interests to jump in the market and demoralize prices to get business. Of course there are weak spots here and there, but, on the whole, the market is not showing any signs of distress. The new demand for pig iron in the past week has been very dull and there are no large inquiries out. There is some buying in small lots of basic, Bessemer and foundry iron, but much of this demand is being supplied by dealers who have accumulated some pig iron and are selling it in many cases at lower prices than the furnaces will name. It is admitted on all sides that too much pig iron is being made and until the output is cut down, or consumption increases, there is not much chance for better prices. There is not much new inquiry for steel billets or sheet bars and prices are soft. Steel mills located in districts outside of Pittsburgh are naming about $24 on soft Bessemer billets and about $25 on sheet bars, but with a freight of $1 a ton to Pittsburgh, these prices are higher than the local market. Some steel in the form of sheet and tin bars is in the hands of dealers, and in instances lower prices are made by them than the mills will name. New orders and specifications on finished iron and steel so far this month are about as good as in August, but it is doubtful if September will show an increase over last month, as had been expected. The scrap trade is showing betterment in demand and prices now being quoted by dealers are from 25c. to 50c. a ton higher than a week or two ago. Coke is dull and neglected, with low prices ruling. The coke trade is badly overdone and there does not seem to be much prospect for early improvement.

Ferromanganese.—Some new inquiry has come up in the last few days and we note sales of two small lots, amounting to about 100 tons, on the basis of about $39.50, Baltimore. We quote foreign 80 per cent. at $39.25 to $39.50, Baltimore, for reasonably prompt shipment, the freight rate to Pittsburgh being $1.95 a ton.

Muck Bar.—As no settlement has yet been made on the puddling and muck bar scales with the Sons of Vulcan there is a scarcity of muck bar for prompt shipment, which accounts for the present high prices. Best grades of muck bar made from all pig iron readily bring $29.50 to $30, Pittsburgh, for prompt shipment, a sale of 300 tons being reported by a local mill at the latter price. This producer employs nonunion puddlers.

Rods.—There is some new inquiry in the market and sales of 400 to 500 tons of open hearth and chain rods have been made on the basis of about $28, Pittsburgh. We quote Bessemer, open hearth and chain rods at $28, Pittsburgh, but Bessemer rods are not so strongly held as open hearth.

Skelp.—A local consumer of both iron and steel skelp of the wider sizes has placed 6000 to 8000 tons. We note sales of about 4000 tons of wide sheared steel plates at 1.40c. and 3000 to 4000 tons of sheared iron plates at 1.85c. and 1.90c., Pittsburgh. We quote grooved steel skelp, 1.40c. to 1.45c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c., and sheared iron skelp, 1.85c. to 1.90c., all f.o.b. Pittsburgh, usual terms.

Steel Rails.—The Carnegie Steel Company has received in the past week some new orders for small lots of standard sections and has also booked through the United States Steel Products Company several fair sized contracts for standard sections for export. The new demand for light rails from the coal mining and lumber interests continues active, the Carnegie Steel Company having taken quite a large tonnage in the past week. The three Edgar Thomson rail mills at Bessemer continue in operation to about 60 per cent. of capacity and have a fair amount of work ahead. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—In the past week local fabricating concerns have sent in bids on 2200 tons of bridge work in Ohio, 2000 tons in West Virginia and 800 tons for a store building in Oakland, Cal. No jobs worthy of note have been placed in this market in the past week, and complaint is still being made that prices being named on fabricated work are very low, and in some cases are below actual cost, unless concessions on plain material are being made by the mills. We quote beams and channels up to 15-in. at 1.40c., f.o.b. mill, Pittsburgh district, but in some cases the mills absorb part of the freight at competitive points.

Plates.—The steel car market is practically dead, as there has not been an order worthy of note placed in the last month. It is probable that the Woods Run plant of the Pressed Steel Car Company will be closed down in a month or so, owing to lack of orders, but its McKees Rocks plant is fairly well filled for the remainder of this year. This plant turns out from 60 to 65 steel cars per day. All plate mills are badly in need of work, and there is no trouble whatever in getting prompt shipments. There is some idle capacity among the plate mills, and this will soon be increased unless the demand shows early betterment. We quote ¼-in. and heavier plates in the wide sizes at 1.40c., Pittsburgh, while three or four plate mills in the Pittsburgh district, that make a limited range of sizes, are quoting about 1.35c., at mill.

Sheets.—The American Sheet & Tin Plate Company continues to operate its sheet mills to about 81 per cent. of capacity, but has made no official announcement as yet of the starting up of its Aetna-Standard Works at Bridgeport, Ohio, which contains 23 hot mills. Prices on sheets do not show any betterment, and it is said that some of the mills that buy bars in the open market are selling their product at about cost or lower. Nearly all the mills will accept orders at present prices for delivery over the remainder of this year, but will not book orders into next year at such figures. Box annealed, one pass cold rolled black sheets, No. 28 gauge, are on the basis of about 2.15c. to 2.20c., and No. 28 galvanized at about 3.20c. to 3.25c. at maker's mill in carload and larger lots. Painted and galvanized corrugated sheets are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets will be found on a previous page.

Tin Plate.—Conditions in the tin plate trade continue active, all the leading mills having their output booked up for the remainder of this year and into the first quarter of next. All that is needed to keep up this activity is for the canning and packing interests to specify on their contracts, which they are doing quite freely. The Laughlin and La Belle tin mills of the American Sheet & Tin Plate Company are still shut down, and no announcement has been made when they will resume. Prices are firm, and it is said that

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in some cases premiums of 5c. to 10c. per box are asked by mills on new orders calling for prompt shipment. We quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—The implement and wagon builders are specifying at a fairly liberal rate on their contracts for soft steel bars, while new orders and specifications for hard steel bars for concrete reinforcement are coming in very satisfactorily. The railroads are not doing much new buying in either iron or steel bars, limiting their purchases to small lots to cover current needs. All the mills rolling iron bars are in need of more orders and specifications are only fair. Several conferences have been held in the past week between representatives of the bar iron mills and the Sons of Vulcan. The Amalgamated scale is based on $6.12½ for boiling, but the Sons of Vulcan puddlers want a rate 50c. higher. Another conference was held Tuesday in this city. We quote steel bars at 1.40c. to 1.45c. and common iron bars at about 1.45c., Pittsburgh.

Spelter.—There is a good inquiry, and prices are firm and slightly higher. We quote prime grades of Western at 5.30c., East St. Louis, or 5.32½c., Pittsburgh.

Hoops and Bands.—The demand is confined to small lots to cover actual needs. Specifications against contracts are being received by the mills at only a fairly satisfactory rate. We quote hoops at 1.50c. to 1.55c. and bands at 1.40c. to 1.45c., the latter carrying extras as per the steel bar card of September 1, 1909.

Spikes.—Not much new track laying is under way at present, and the character of the orders being placed for railroad spikes clearly shows that they are to be used in repair work. The demand for small railroad and boat spikes is better than for standard railroad spikes, but all the makers are short of work. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—Only small lots are being bought. Regular prices, which are 1.90c. for structural rivets and 2c. for boiler rivets, continue to be more or less shaded.

Shafting.—Specifications on shafting from the automobile trade, and in fact from nearly all consumers, have fallen off very much, and all the makers of shafting could handle more business. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—The new demand is only fair, being mostly for small lots to cover current needs. Specifications are not coming in at as liberal a rate as expected at this season. The demand for cut nails is light. The La Belle Iron Works, Steubenville, Ohio, which operates a large cut nail mill at Wheeling, W. Va., has turned out 194,682 kegs in the year ending June 30, 1910, against 187,722 kegs in the previous year. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—The pipe trade continues in fairly satisfactory condition, orders being about as heavy as expected at this usually dull season. A great many jobbers and consumers specify prompt shipments in sending in new orders, and this is taken to indicate that stocks are pretty well depleted. The large trade is placing orders for pipe only in sufficient quantities to keep up stock and not anticipating the future, even though a guarantee in prices against decline has existed for some time. No large inquiries for line pipe are in the market, but some very large jobs are on the tapis that will not be out until next year. On the larger sizes of pipe the mills are pretty comfortably filled for some time, but in the butt weld sizes conditions are not so good. It is stated that regular discounts on iron and steel pipe printed on a previous page are being pretty well maintained.

Boiler Tubes.—The demand is slow, being confined mostly to small lots, while prices on steel tubes are pretty badly demoralized. On iron tubes the market is fairly well maintained, but all the mills rolling both merchant and locomotive tubes are badly in need of orders.

Coke.—The coke trade shows no betterment either in demand or prices. Operators continue to restrict output. The Upper and Lower Connellsville regions last week produced 342,775 net tons, against 361,913 tons in the previous week. Shipments are about 10,000 cars per week, but a good deal of coke is piled. An Eastern furnace interest closed last week for its supply of coke for the remainder of this year on a sliding scale, based on the average monthly price of basic pig iron. Another furnace interest has purchased a fairly large tonnage for shipment in September at $1.60 per net ton, at oven, making upward of 20,000 tons it has bought for shipment this month. No large inquiries are now in the market. We quote standard makes of furnace coke at $1.60 to $1.65 per net ton, at oven, for prompt shipment, and $1.75 to $1.80 on contracts for delivery over the remainder of this year. Prompt 72-hour foundry coke is about $2.10 to $2.25 per net ton, at oven, and on contracts from $2.25 to $2.50, at oven. Some grades of both furnace and foundry coke that do not run high in quality are offered at lower prices. The coke regions have had some heavy rains in the past 10 days, and these helped out many plants that were running quite short of water.

Iron and Steel Scrap.—The scrap trade is showing more life than for some time. Consumers have some inquiries out and are more frequently buying, while prices have shown an advance. The scrap lists of the Pennsylvania Lines West closed last Friday, and it is said that the heavy steel scrap offered brought $14.75 or better at the consuming point. The scrap lists of the Pennsylvania Railroad Lines East, the Norfolk & Western and several of the Southern roads closed Tuesday. Two leading consumers have been fairly large buyers of heavy steel scrap and bundled sheet scrap and borings and turnings. We note a particularly active demand for bundled sheet scrap, and several sheet and tin mills in the Pittsburgh district have sold their output in the past week for the remainder of this year. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.50 to $14.75
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.25 to 16.50
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	12.00 to 12.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.75 to 13.00
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	8.25 to 8.50
Machine shop turnings	9.50 to 9.75

Chicago

FISHER BUILDING, September 14, 1910.—(*By Telegraph.*)

The coal mines of Illinois resumed operations Monday and a serious disturbance to business in the West has been settled. The cost of coal to manufacturers who buy on regular contracts will be increased about 10 per cent. by the concessions granted the miners and other conditions affecting the market, but the price in the open market is likely to be higher. Railroad stocks of fuel have been reduced to nominal proportions, and some of the roads announce that they will not accept commercial shipments until they have restored their own reserve stocks. The demand from railroads, industries and the distributers of domestic coal will soon create a shortage of cars, and an early winter may bring a scarcity of fuel in the West. The iron and steel market has quieted down again after the flurry of anticipation two weeks ago. The curious condition which prevailed last summer is becoming even more pronounced. The demand is very good for all the lighter products that go into general consumption, but there is little new business in the heavier forms of finished products which go into construction or railroad work. In the hardware trade, for example, the jobbers in Western cities are doing more business than a year ago, although conditions were then very satisfactory. The wire interests share in this movement of the hardware trade and the demand for wire products is better than in August. In the case of merchant steel the shipments into this territory during August broke all records, both in tonnage and value, running in excess of August, 1907. The demand for sheets is keeping up at a good rate, and specifications for soft steel bars also reflect a strong tone in the market. In plates, structural shapes and railroad material conditions remain unsatisfactory, and this is also true wherever the closing of business depends upon the sale of bonds or mortgages. The scrap market has settled down again, disappointing the dealers who expected a more active demand. The movement of scrap, however, is expected to be restricted somewhat this fall by conditions in the coal trade, which will create a shortage of cars for loading scrap. Complaints are also growing more general of a shortage in box cars.

Pig Iron.—The Western market has settled down into another waiting period. Buyers are generally covered for their requirements to the end of the year and are only interested in the question of purchasing for the first quarter or first half, while the furnaces generally refuse to sell for next year excepting at an advance in price which the buyers consider prohibitory. The local furnaces are selling freely for last quarter and are booking quite a run of orders from

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carloads to 500 tons. In the aggregate, the weekly sales of Northern iron are probably in excess of current production. The stocks which accumulated at furnaces in this district during the summer begin to show a slight decrease. The furnace interests, however, are very firm in their policy of refusing to sell for next year's delivery. The Southern furnaces, with a few exceptions, are also refusing to sell for next year. Buyers in this territory seem to have all the Southern iron they want for last quarter and the trade is therefore very quiet. In a few cases sales for first quarter have been made at $11.50, Birmingham, and one or two well-known brands are offered at $12, but no effort is being made by the furnace interests to close forward business. Old observers of the iron trade in this territory say they have never known a time when buyers were so generally covered for a definite period ahead, with all contract business ending so abruptly at a future date, as in the present case, when practically all pending contracts terminate with December deliveries. This situation creates a strong undertone in the market and the furnace interests are confident of getting better prices for next year, but the buyers meantime are awaiting developments. The following quotations are for September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Southern coke, [illegible] No. 1	17.00 to 17.50
Southern coke, standard, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern gray forge, No. 1	15.35 to 16.35
Southern gray forge, No. 2	15.35 to 15.85
Southern gray forge, No. 3	15.10 to 15.60
Southern coke, No. 1	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.65 to 18.15
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, No. [illegible]	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10	21.40 to 21.90

(*By Mail.*)

Billets.—The market is quiet with only occasional inquiries. The price of forging billets remains unchanged at $29, base, Chicago, for current lots.

Rails and Track Supplies.—The market is very quiet with only a few inquiries pending for standard rails. The railroads, however, have taken the full tonnage which they ordered for 1910 shipment. In a few instances deliveries were held back for a time, but shipping orders were eventually given. The demand for track supplies is falling off somewhat. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Merchant Steel.—One of the leading mills advises that its shipments of merchant and agricultural steel into this territory during the month of August were larger than in the same month of any previous year, both in tonnage and value. August of this year compares very favorably with other large months in the record of this branch of the steel industry. The best record for August in any previous year was in 1907, but the figures for that year were surpassed in 1910.

Cast Iron Pipe.—The leading pipe foundry interest was the successful bidder last week for 800 tons of water pipe at Pella, Iowa. No other important lettings are reported and a quiet market is expected for some time. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Bars.—There have been very good inquiries the past week for concrete bars, on which the trade had been dull for several weeks previous. Soft steel bars are quiet, but the mills are getting full specifications on their yearly contracts. There is not much improvement in the demand for bar iron. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Sheets.—The demand for annealed and light sheets is keeping up at a very satisfactory rate, in view of the dullness in heavier lines of products. Prices are practically unchanged. The local mill has no difficulty in keeping its 18 mills in operation, owing to the general demand from the jobbing and manufacturing trade for open hearth sheets. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Plates.—The market is quiet, awaiting news from the car building industry. The larger mills represented in this market are holding 1.40c., Pittsburgh, as the minimum, but on certain narrow sizes 1.35c., Pittsburgh, or 1.53c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Structural Material.—A fair amount of work is coming forward from the West in view of the unusual conditions which are holding back large enterprises. The Chicago, Burlington & Quincy Railroad has ordered 700 tons of bridge work from the American Bridge Company, this being in addition to the order for 1000 tons given to the same interest a couple of weeks ago. A power house for the North Shore Electric Company, Chicago, 405 tons, was let to George W. Jackson, Inc. A bridge for the Chicago & Northwestern over the Wisconsin River, 1620 tons, went to the American Bridge Company. The Hoffman-Meyer Building, Los Angeles, Cal., 300 tons, was taken by the Western Boiler Works of that city. The John Swett School, San Francisco, 210 tons, was let to the Brode Iron Works of that city. Reports have not been received here as yet regarding important work at Seattle which should have been let by this time. The demand for plain material from mills is running light at present, but there are no reports of concessions in prices. There are several inquiries from car builders for small lots of car shapes. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c., to 1.90c., Chicago.

Wire Products.—Hardware jobbers throughout the West report that their general trade is running from 10 to 40 per cent. ahead of last year. The wire trade shares in this activity and orders received by the mills during September have been running ahead of August, although the August record of the leading interest was only exceeded once in the same month of any previous year. New business from industrial buyers of wire is also improving. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Old Material.—The scrap market has relaxed somewhat without any actual changes in prices. For a time many of the dealers expected a higher market and were disposed to advance their prices, but consumers did not show any haste to purchase, and values have remained practically unchanged. There is a good demand for cast scrap, and it would seem that the gray iron foundries are either more active or wish to accumulate stocks of scrap before winter. The movement of old material is likely to be light during the next two or three months in the territory west of Chicago, especially in the grades of material which are shipped in open cars. Now that the Illinois coal mines have resumed operations the railroads will be compelled to keep in the coal service all their gondola cars, in order to guard against the political consequence of a coal famine in the West. This will curtail very seriously the supply of cars available for loading scrap. This situation, however, will not necessarily mean any shortage of scrap or famine prices. The iron and steel mills, which are the largest consumers of old material, have stocks that would carry them through the winter, and the foundries also have generally taken advantage of low prices this summer to accumulate stocks. The Atchison, Topeka & Santa Fe, which has not sold any scrap for several months, has a list closing this week of about 6000 tons. Included in this is 1800 tons of wrought scrap and 875 tons of malleable. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, relolling	15.25 to 15.75
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 machinery cast	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.50 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

THE IRON AND METAL MARKETS

Philadelphia

PHILADELPHIA, PA., September 13, 1910.

There has been more movement in pig iron, the cast iron pipe interests being the most important buyers. A betterment is also to be noted in purchases by the general foundry trade. Inquiry also seems to be more pronounced, both for the remainder of this year as well as early next year shipment, but aside from sales which have been made on a sliding scale basis, no business for next year has been transacted. Prices as a rule are unchanged, but are more firmly maintained. In finished materials market conditions show no particular betterment. The demand is still irregular, but the disposition is to maintain firmly the present range of prices. In most classes of rolled products business is of a hand to mouth character, although in plates and shapes a somewhat better volume is in sight. Billets are dull; buyers of large lots are apparently not ready to enter the market freely. Refined iron bars are a trifle more active. Several pretty good orders for skelp have been taken by Eastern rolling mills, which are now a trifle more actively engaged. A better undertone is to be noted in the old material market, while coke continues quiet.

Iron Ore.—The market is practically at a standstill. Consumers have already purchased more than can be used this year, at the present rate of consumption, and find it very difficult to store the ore coming in. During the first six days of September importations at this port aggregated 35,732 tons, valued at $106,545, while Government statistics for August show the total importations in that month to have been 147,166 tons, at a value of $444,252.

Pig Iron.—The most important transaction during the week was the closing of a contract for 18,000 tons of Alabama iron by a Delaware River cast iron pipe foundry. This includes Nos. 3 and 4 and gray forge grades, and delivery extends over six months, beginning October 1, settlement based on a sliding scale. This was virtually the renewal of a similar contract expiring at the close of September. One pipe interest will probably take on about 8000 tons of low grade iron for this year's delivery, while another has an inquiry out for 5000 tons for November-December shipment. A Virginia pipe maker is also asking for 6000 tons for early 1911 shipment. Sales of odd lots of low grade iron, both Northern and Southern makes, are also reported, but when any tonnage is involved sellers are inclined to hold prices rather firmly. A better volume of business has been transacted in the higher foundry grades; sales in small lots predominate, but quite a few transactions, covering lots of 300 to 700 tons, for this year's delivery are reported, mostly in No. 2 plain. No further shading of prices is reported and $16, delivered in this territory, appears to be the minimum for standard brands of No. 2 X, with a 25c. differential for No. 2 plain. In a few cases $16.25, delivered, has been done for No. 2 X, but the bulk of the sales are at the inside figure. Sellers contend that no further concessions will be made, and in many instances, rather than take on tonnage at the present basis, they would suspend production. The aggregate movement in Virginia foundry grades has not been large and stocks are understood to be increasing. Prices, however, are being well maintained at $13.25 to $13.50, furnace, equal to $16 to $16.50, delivered in this vicinity, dependent on delivery points. Better buying of forge iron by puddling mills is reported. Sales of several lots of 500 and 200 tons have been made at prices ranging from $14.75 to $15, delivered in this vicinity. No further purchases of basic iron are reported; the larger consumers are pretty well covered for this year's requirements, but several of the smaller mills are feeling around for lots of about 2000 tons for last quarter delivery. While the ruling question of $15 was slightly shaded in the transactions named last week, sellers will not make any concessions from that price for further business. One buyer is in the market for 2000 tons for first quarter of next year, but no business has been done. Further sales of standard low phosphorus have been made in small lots at prices equal to $22.50, delivered here. A sale of 500 tons of this grade, of a less desirable analysis, has, it is said, been made at a lower price. The general range of prices for standard brands, delivered in buyers' yards in this vicinity, shipment extending over the remainder of the year, is as follows:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.75 to 16.00
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.75 to 15.00
Basic	15.00
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—No fresh demand has come out in this territory. Sellers report a small inquiry from the West, together with one for several hundred tons, for shipment over the next six months. Quotations are nominal, at $39 to $40, Baltimore.

Billets.—The situation shows no change. Usual large buyers continue to place orders for small lots for prompt delivery, which, together with specifications on old orders, keep mills operating on a fairly even basis. More demand for forging than for rolling billets continues to be noted. Prices are unchanged. Standard basic open hearth rolling billets are firm, at $27, delivered, as a minimum, with forging billets strong at $29, Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—Business is still quite irregular although, on the average, mills get enough tonnage to enable them to maintain an even productive basis. A few more sizable orders have been placed, principally in boat plates, one order closed running up to 700 tons. Some additional bridge business for railroads, one in the South requiring a considerable tonnage of plates, is being figured on. Some mills have entered a few contracts for requirements over the remainder of the year, but there is no disposition to sell for next year's delivery. Prices are better maintained and we can learn of no shading of the 1.55c. basis for ordinary plates, delivered in this territory.

Structural Material.—Proposals for a bridge in the South requiring, probably, 10,000 tons of structural material, are expected to be opened in the near future. A number of moderate building propositions in this territory are pending, but close slowly. It is stated that the Philadelphia & Reading Railway will require about 2000 tons for bridge work, believed to apply on grade elimination work in this city. Current business is largely of a miscellaneous character, and prices of plain shapes are firm, at 1.55c., minimum, delivered in this vicinity.

Sheets.—Business is still confined to orders for small lots for comparatively early delivery, and, while mills gather enough to keep them engaged on a fairly active basis, a very small proportion of the orders on hand are for forward delivery. Quotations of Eastern manufacturers for ordinary business for prompt shipment range as follows, although concessions for desirable orders are still understood to be available: Nos. 18 to 20, 2.60c.; Nos. 22 to 24, 2.70c.; Nos. 25 and 26, 2.80c.; No. 27, 2.90c.; No. 28, 3c.

Bars.—A better demand is noted, and sales of quite a few moderate lots, running up to 100 tons, are reported. With the improved inquiry comes a tendency toward firmer prices and makers who were willing to shade 1.40c., delivered, for refined iron bars, now hold that price as the minimum. Steel bars have not been particularly active, but are firm at 1.55c. to 1.60c., delivered in this district.

Coke.—The movement has been light and confined principally to transactions in small lots of foundry coke, for which prices, while not higher, have been decidedly firmer, little standard grade being available at $2.25 per net ton at oven. Small sales of prompt furnace coke at $1.60 at oven, are reported, but no large sales for forward delivery are noted. The following range of prices per net ton, delivered in buyers' yards in this territory, is quoted:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—A better undertone prevails in the old material market. Occasional transactions in heavy melting steel are reported, but buyers find it very difficult to get any quantity of strictly No. 1 grade at $13.75, delivered, and in one instance $14 has been offered, but sellers, believing mills to be short, are not letting go. The bulk of the material now going to the mills applies on old orders. Rolling mills also find it difficult to get wrought scrap at the price offered, and in instances $16.25, delivered, has been paid for choice No. 1 railroad wrought. Prices, while unchanged, have a stronger tendency. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

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Cincinnati

CINCINNATI, OHIO, September 14, 1910.—(*By Telegraph.*)

Pig Iron.—An inquiry for 25,000 to 30,000 tons of basic iron from a nearby Ohio consumer is occupying the attention of the trade this week. This is supplemented by a number of requests for prices on smaller tonnages of foundry iron. The foundries in this vicinity are not so well stocked up as was generally supposed, and many small purchases to fill immediate requirements are being made. The two Michigan pump manufacturers who have been in the market for about 500 tons each are understood to be still on the waiting list. Several other moderate sized inquiries are also being held up, but the aggregate amount of carload business booked is very encouraging. Inquiries coming in also help to make the situation somewhat brighter. Southern furnaces are yet holding off on prices for next year. For the remainder of this year we quote $11.50, Birmingham, although some Tennessee irons are obtainable at $11. In the Hanging Rock district $14.50 for the last quarter can be done. While $15 to $15.50 is asked for the first quarter of next year, it is understood that the lower figure might be shaded. Very little malleable has been sold lately, and $14.50 to $14.75 covers the market price. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 15.70
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—With the exception of an inquiry from a Southern furnace there is nothing interesting in the coke situation. This contract would call for about 8000 tons per month, and it is expected to be closed before the end of the month. It is reported that some Wise County furnace coke is yet obtainable for prompt shipment around $1.50 per net ton at oven, and in the Connellsville district a considerable quantity is stated to be loaded on cars and the same figure would probably be acceptable to get this moved. The Pocahontas field shows no changes and $1.75 at oven is understood to be the prevailing contract price. Connellsville and Wise County furnace brands range all the way from $1.70 to $1.80 per net ton at oven for future shipment. Contract foundry coke is moving freely, but only small lots are now being bought. The price for all three fields is around $2 to $2.10, at oven, with a small advance for special brands.

Finished Iron and Steel.—On steel bars and plates both the mill and warehouse demand has been good. Structural material from warehouse also shows some improvement. The mill price is 1.40c. for bars and plates and 1.80c. from local warehouses. Beams and channels, cut to length, are quoted at 1.90c. to 2c., warehouse.

Old Material.—The railroads have large quantities of scrap to offer, but are not willing to accept buyers' bids. Not much improvement is looked for until late in the fall. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Matthew Addy & Co. have been appointed sales agents for this territory for the Southern Iron & Steel Company.

St. Louis

ST. LOUIS, September 12, 1910.

Since the month came in there has been with many foundrymen a marked improvement in the demand for their finished products, according to the reports of returning traveling salesmen. Locally, also, from numerous companies both large and small, similar indications of better conditions in the iron industry are mentioned. A feature of the pig iron trade is numerous inquiries mainly for first half 1911; also a firming up on prices. Shipments on contract are uneven, some concerns asking for postponement and others wishing contract time anticipated. Collections are not as prompt and as small buyers as should be the case. Business is on the increase from country merchants, and St. Louis postal receipts in August show a gain of over 13 per cent. over the figures of the corresponding month last year.

Coke.—With the exception of one round lot the inquiry for coke during the past week was moderate in volume and sales mainly confined to small lots. A leading sales agency reports an inquiry for 25,000 tons, Connellsville foundry. Another office mentions sale of 10 carloads foundry coke, shipment over the remainder of the year. The market is hardly as strong as of late, though no material change in price is noted. There was a large tonnage placed during July and August, and doubtless most of the big buyers have covered for wants. No contracts are being taken to extend beyond July 1, 1911. It is freely predicted that later on there will be a severe car shortage and some buyers are now disposed to lay in coke. We quote standard brands of 72-hr. Connellsville foundry at $2.25 to $2.50 per net ton and furnace coke $1.85, f.o.b. oven.

Pig Iron.—There is renewed inquiry for malleable iron. The sale of 5000 tons over first half 1911 is reported, divided between two offices and going to two local foundries. There is also an inquiry pending for 5000 tons additional. With most brokers, the sale of Southern foundry was confined to moderate lots, one office reporting only 350 tons booked, another 600 tons, while a merchant seller placed a contract for 1000 tons gray forge iron, shipment over February, March and April, 1911. Among the inquiries reported were the following: From an implement concern 500 tons Southern foundry, shipment over the last quarter; from an Illinois company 500 tons Southern foundry, immediate shipment; 250 tons 12 per cent. silicon, remainder of year; another broker mentions 400 tons 80 per cent. ferromanganese; 800 tons low phosphorus iron over the remainder of the year; 600 tons No. 3 Southern foundry, shipment over the first half 1911. For small lots, ranging from 100 to 200 tons, the various offices reported in the aggregate inquiries covering 1500 tons—doubtless duplicated to some extent. It is evident there is an increased interest in the market and some foundrymen note a marked improvement in their business since September 1. The tone of the market, too, is firmer and offerings of $11, Birmingham, for No. 2 Southern foundry are becoming scarce. It is likely there was some business worked that has not been reported that has taken most of the low priced iron off the market. Short selling also is entirely eliminated. Very few furnaces are willing to name prices for 1911 iron, but it is understood some are quoting $11.50. For No. 2 Southern foundry, shipment over the remainder of the year, we quote $11.50, f.o.b. Birmingham; southern Ohio, $15, f.o.b. furnace.

Old Material.—In scrap iron and steel the market is featureless. A very small demand is coming from consumers and even among dealers little is doing. Stocks are moderate in volume and, being in strong hands, there is no disposition to force sales, but await the development of the demand which ere long is expected to set in. There were no railroad offerings the past week. Prices on some items in the list are lower. We quote dealers' prices as follows, per ton, f. o. b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft.	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$12.50 to $12.75
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed irons	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

The company succeeding to the business of the C. A. Stevenson Pig Iron & Coke Company has been organized and the style is now Massot, Romann & Bush, with offices in the Fullerton Building.

The settlement of the Illinois miners' strike is a matter of relief to coal users in this section, the shortage in production to date being 20,000,000 tons. The average increase per ton is 3 cents.

The Baltimore & Ohio Southwestern is contemplating

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large improvements, which will include an extension of terminal facilities at East St. Louis, covering enlargement of terminals and the laying of much additional trackage. Similar improvements will be made in its terminals at Flora, Ill., and Seymour, Ind.

University City has recently equipped its fire department with an automobile fire engine and ladder truck, at a cost of upward of $9000. Tests made with the apparatus were very satisfactory.

Birmingham

BIRMINGHAM, ALA., September 12, 1910.

Pig Iron.—A lot of 18,000 tons of low grade iron for shipment during the next four months has just been sold in this market. In addition, the sale of 2300 tons of low grade iron for last quarter shipment and 500 tons of No. 4 foundry for October delivery is reported. An aggregate of 2500 to 3000 tons for shipment extending over the next 60 to 90 days represents transactions involving from 100 to 500 tons each, and that sold for spot shipment is between 1200 and 1500 tons. The prices received the past week are about in line with those of the week previous. It is probable that a strictly $11.50, Birmingham basis, has not been maintained in all these transactions, but there is no reason to believe that material concessions were made in any case, and sellers are apparently well satisfied with the present status of order books. The market is generally understood to be correctly represented by the $11.50, Birmingham basis, for deliveries up to January 1, but without commitments on the part of sellers in the matter of price for shipments after that time. A leading interest refuses to submit quotations on first quarter deliveries, and such figures as have been elicited from other large concerns are understood to have been prohibitive. The latest stock reports show that the aggregate accumulation in this State, which includes warrant holdings, was reduced some 60,000 tons during the month of August. In some cases furnace yards have been practically depleted of all grades and in others high grades are promised for December shipment only. The additions that are about to be made to the active furnace capacity are necessitated by the scarcity of certain grades for orders already booked and will not add to the surplus stock. It is noted that even as small lots as carloads of favorite brands of No. 2 soft iron recently brought $12, Birmingham, for spot shipment, owing to the inability of purchasers to receive shipments against regular contracts.

Cast Iron Pipe.—No developments of importance have come to the surface in this market the past week and transactions are in the main with small municipalities who demand at this time a fairly attractive tonnage for maintenance work and extensions. Producers generally are more optimistic and have higher prices in mind, although no change has so far been made in authorized quotations and an accurate test of the market's strength is not offered. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12 in. average $20.50 per ton, with $1 per ton extra for gas pipe.

Old Material.—There is a somewhat stronger demand for light cast, and the movement of wrought and steel scrap is more satisfactory. The actual consupmtion of any grade has increased but little and report is made of large stocks in consumers' hands. However, dealers' yards have been kept cleaned of surplus stocks and there is no reason to expect an effort to make a market. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

San Francisco

SAN FRANCISCO, September 7, 1910.

The holidays and festivities in San Francisco this week tend to intensify the dullness in the iron and steel market. Buying is still limited to small orders covering the most pressing requirements, but a change is expected shortly. Local conditions are favorable for an increase of activity in some departments, structural material in particular showing signs of a revival. A general movement of finished materials to the interior is usually expected during September, and as orders from that quarter have been limited for some time the demand is likely to be unusually heavy. While the distributive trade has not improved, it is believed from the nature of inquiries now coming up that some substantial orders will shortly be booked by rolling interests. The uncertainty of the local industrial situation may limit the volume of business in San Francisco, but Los Angeles manufacturers are now working on about a normal scale and the growth of industries at Stockton and Sacramento will materially increase the requirements at those points.

Bars.—The mill representatives are receiving liberal specifications for soft steel bars on old contracts. While the larger buyers have not yet commenced to place new orders to any considerable extent, some good inquiries are coming into the market and a fair tonnage will probably be booked before the end of the month. Local merchants are limiting their purchases rather closely, as the stocks now on hand have lasted longer than was anticipated. The demand for twisted and corrugated reinforcing bars is well sustained, the movement being slightly larger than a month ago, though most orders in this line are for comparatively small lots for immediate delivery. A large volume of concrete construction work is coming out all along the Coast, for which purchases will be made during the next few months. The city of Los Angeles has purchased a large tonnage of reinforcing bars and fabric during the Summer and continues in the market. Bars from store, San Francisco, are quoted at 2.50c. for steel and 2.30c. for iron.

Structural Material.—The San Francisco building record for August shows a slight increase over the preceding month, but is far below that of a year ago. In other California cities building continues fairly active, though the greatest activity is noted in the North, August being one of the best months ever recorded in Portland, Ore. A very fair tonnage has been booked recently by structural fabricators, including contracts for several large buildings, though the majority of recent bookings in San Francisco have been small. A better feeling prevails among local fabricators, who have had a very quiet summer, but are now fairly busy on small work and have a number of good jobs in view. There are indications of a very heavy tonnage all along the Coast, but especially in the North, where inquiries are coming out on a number of large structures. The Pacific Rolling Mill Company's local shop is well occupied with local work and has in addition two contracts at San Diego and one at Pomona, Cal. The Brode Iron Works has taken about 120 tons for the John Swett school, and the Meyer & Hoffman Building at Los Angeles, about 200 tons, has been let to the Western Boiler Works of that city. An award on the Native Sons' Hall is expected at the end of the week, and the Capwell Building contract in Oakland will come out about the same time. Bids have been submitted on the Eagles' Hall, and the contract will be let about September 20. The Masonic Temple contract is also expected shortly. A considerable tonnage is being booked for small steel bridges in various parts of the country. Contracts are to be let within 60 days for three new high schools in San Francisco, all of which will be of steel. Plans have been completed for a building for the London, Liverpool & Globe Insurance Company at California and Liedesdorff streets. It is reported that work will be started about the first of the year on a large Federal building in Alameda, Cal. Plans have been accepted for a steel-frame building in San Francisco for the Knights of Columbus. Plans have been completed for a $500,000 station for the Southern Pacific at Sacramento, Cal. The Rincon Warehouse Company has secured a loan for the erection of a large five-story building on Brannan street. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Rails.—Light rails remain inactive, but a fair tonnage of standard sections is being booked in the North, and a number of new inquiries for moderate amounts are coming out in California. The Board of Public Works has approved the specifications for rails for the new Gary street line, and an appropriation of $130,000 has been asked to pay for the material. Specifications are also about completed for poles and other material for this road. The Oakland Traction Company is making some minor extensions to its lines and the Peninsular Railroad has been in the market for a considerable tonnage. Harriman officials have organized a company to construct a 70-mile road from Grant's Pass, Ore., to Crescent City, Cal.

Plates.—The movement is not yet especially active, but a slight improvement is noted, and there is sufficient inquiry to arouse hopes of a large business next month. Tank plates and material for riveted pipe are the leading features, all fabricators in this line being extremely busy. The Consolidated Gas Company, Long Beach, Cal., has ordered a large gas holder. The Union Oil Company is planning a large plant at Tacoma, Wash., and the Standard Oil Company will erect two large tanks at Klamath Falls, Ore.

Merchant Pipe.—The outlook is a little brighter than for some time, though the volume of business actually in hand is still limited. The jobbing movement has not improved to any appreciable extent, but inquiries from the outside trade are becoming more numerous, and a fair demand is likely to materialize within the next three weeks.

THE IRON AND METAL MARKETS

Most of the local jobbers are inclined to hold off from the market for the present, as stocks are ample for immediate requirements. Business is still very slow in the oil fields and while a number of new projects in that district are talked of it is not expected that much business will develop this season. Pipe and fittings are being purchased for a number of water systems, &c., but these orders are not of much importance. Pipe line privileges on the San Francisco water front have been secured by a number of corporations.

Cast Iron Pipe.—Bookings have been comparatively light so far this month, being mostly confined to small orders, though some fairly important business is in prospect. Bids are being taken by the city of San Francisco for another lot of pipe for the auxiliary fire protection system. The outlook is favorable in the North, where plans are taking shape for a number of extensions to municipal water systems.

Pig Iron.—The amount of work in progress at the local foundries is extremely small, as under existing labor conditions San Francisco concerns are unable to compete with those more favorably located on most classes of work. Operations at Los Angeles are also somewhat hampered by labor conditions and there is very little demand for pig iron at either place. Supplies in the hands of melters are adequate for all immediate needs, and importers find it difficult to dispose of any large lots, either from warehouse or to arrive. There is a fair movement to the interior, as several good foundries have been established at Stockton and other points within the last few years and are now in active operation. In the absence of large marine and mining machinery business, however, the requirements of the California market are much smaller than a few years ago. Values show little change, being approximately as follows: Chinese, $23; Continental, $23; English, $23 to $23.50; Scotch, $25.

Old Material.—The only notable feature is the arrival of 500 tons of mixed scrap from the Panama Canal, which was sold at auction by the Government at $7.55. All descriptions of scrap are extremely quiet. There is little demand for cast iron, but the market is closely cleaned up and the little stock that is coming out is firmly held. The price is still maintained on steel melting scrap, but there is a tendency to weakness in sympathy with the Eastern market. Railroad wrought is featureless, both supply and demand being small. There is no demand for rerolling rails locally, as operations of local mills have been curtailed, but there is no heavy accumulation. A better demand for old material is expected on the Coast within the next few months, in view of the establishment of several new steel manufacturing plants. Prices are quoted as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

Buffalo

BUFFALO, N. Y., September 13, 1910.

Pig Iron.—Inquiry is increasing for first quarter and first half of 1911. A radiator concern having a number of plants is in the market for between 40,000 and 50,000 tons of foundry irons for 1911, but no placements have yet been made on this account. Another consumer is asking for 6000 tons foundry grades for first half delivery. Several other consumers also have inquiries out for 1911 deliveries, but only a small tonnage has been placed. The bulk of the business taken during the week has been for current quarter delivery. Most furnace interests are backward about taking on much 1911 business under present conditions and no very large business has been actually closed. Quotations made by the majority of furnacemen are 50c. to $1 above current schedules, depending upon the period of delivery required. The demand for present quarter delivery in foundry grades is good and a number of orders of fair tonnage for such deliveries have been entered during the week, ranging from 100 to 500 tons, with two or three of 1000 tons each. Basic is dull, but little inquiry having developed during the week. Prices for short term deliveries are nominally unchanged, but manifest a stiffening tendency as compared with the past week or so, the result of additional furnaces going out of blast, and it is extremely doubtful if the very low prices which were until recently obtainable could now be duplicated even for large tonnages. We quote as follows, f.o.b Buffalo, for current quarter deliveries:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Pig iron shipments via the Erie Canal have been interfered with during the past two or three weeks, owing to a break near Mohawk, which tied up the entire tonnage of the canal and has but recently been repaired, and are also restricted by the grain movement, which is exceptionally heavy at the present time.

Finished Iron and Steel.—The situation remains practically the same as last week, with a fairly active market in all finished lines, and some agencies report an increased demand for steel bars and plates, and there is a good inquiry for sheets. For steel bars 1.40c., Pittsburgh, is still being quoted on desirable specifications and 1.45c. for small lots. In plates and shapes 1.40c., Pittsburgh, is ruling for desirable orders for immediate shipment and 1.45c. for small lots. The Canadian export trade is showing great activity, one interest having inquiries pending for over 10,000 tons of finished products, including bars, plates and structural material. In fabricated structural material the local market is a little slower, there being fewer new projects coming up for bids than for several weeks. Bids went in last week for a bridge for the Buffalo & Lake Erie Traction Company, to be erected between Northeast and Ripley, Pa., requiring 600 tons of steel, delivery to be made in November. It is stated that the bids for the new Utica Hotel, Utica, N. Y., were so much higher than estimates that modified plans will be drawn and new bids asked for. The Isawanna Building Company, 200 Fifth avenue, New York City, was low bidder on the general contract and the Buffalo Structural Steel Company for the steel, the original specifications calling for 1230 tons.

Old Material.—The week has shown no particular improvement. Quiet conditions continue, with a limited demand. Dealers are inclined to hold material in preference to letting it go at prices at present obtainable. We quote nominal prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	12.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	14.50 to 15.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.25
Clean cast borings	5.75 to 6.25
No. 1 busheling scrap	11.25 to 12.00

Cleveland

CLEVELAND, OHIO, September 13, 1910.

Iron Ore.—With orders pretty well filled, some of the ore properties in the Lake Superior district are being shut down and the output of others is being curtailed, so that a heavy falling off in the movement is expected the present month. While the total shipments until September 1 greatly exceeded those during the same period of last year, some of the ore men do not look for a larger movement this year than last. The lake movement during 1909 was slightly over 41,600,000 tons. Others predict that the total lake shipments this year will reach 44,000,000 tons. The 1909 movement broke former records, being slightly in excess of 1907. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—A fair volume of quiet buying is going on, and considerable inquiry is pending for small and medium sized lots of foundry iron, both Northern and Southern, mostly for the last quarter and first half deliveries. Many consumers are feeling the market, and if they could place it at current prices for first half deliveries a large tonnage would doubtless be booked. The majority of the furnace interests, however, are still holding off, and are declining to make quotations for delivery after January 1. Others are holding for prices for the first half at 50c. to 75c. a ton above current quotation of $14, Valley furnace, for No. 2 for the remainder of the year. The International Harvester Company, which had an inquiry out last week for 2000 tons of No. 2 foundry and 2000 tons of low grade iron for the last and first quarter, for its Akron, Ohio, plant, has placed the business at a price understood to be about $14 for No. 2, extending through the first quarter. There is an inquiry from a nearby stove foundry for 2000 tons of Northern and Southern for first half. Another 2000-ton inquiry is for low grade analysis iron for delivery to an Ohio pipe plant in November and December. A local manufacturing plant is in the market for 500 tons each of Northern and Southern for the last quarter, and there is an inquiry from the Toledo territory for 800 tons of No. 2 for the first half. There is an inquiry from New York for 500 tons of high phosphorus iron. We note the sale of two lots of high silicon for first half delivery, one of 700 tons and the other of 200 tons. For delivery after January 1 Jackson County silvery is being quoted at $18.50, at furnace, for 8 per cent. silicon. Some Southern iron is being offered at $11, Birmingham,

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for No. 2 for the remainder of the year and $11.50 for the first quarter, but the Alabama furnaces are generally asking $11.50 for the remainder of the year, and are declining to quote prices for delivery after January 1. For prompt shipment and for the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.00 to 14.15
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—The market is generally quiet. A few contracts are reported for foundry grades, but there is no demand for furnace coke. Prices remain stationary. We quote standard furnace coke at $1.60 to $1.70 per net ton at oven for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 per net ton at oven for spot shipment, and $2.25 to $2.50 for delivery extending through the first half.

Finished Iron and Steel.—The demand in finished lines continues generally quiet. Mill agencies report a fair volume of orders, but practically all are for small lots for immediate needs. The demand for steel bars is holding up quite well, but as consumers are about all under contract little new business is coming out. Prices are firm at 1.40c., Pittsburgh. The demand for plates is quiet. The leading mills are adhering to the base price of 1.40c., Pittsburgh, and are booking small orders at that price, apparently not being affected by lower quotations made by small mills that make only the narrow sizes. The demand for structural material continues good and 1.40c., Pittsburgh, is being firmly maintained. Local fabricating shops are filled up for some time and are placing frequent small orders with the mills to replenish stocks. The demand for sheets has improved slightly, but lower quotations are reported. Some contracts for the remainder of the year have been placed at current prices. We quote black sheets at 2.15c. to 2.20c. and galvanized at 3.15c. to 3.20c. for No. 28, and blue annealed at 1.60c. to 1.65c. for No. 10. The demand for iron bars remains light and quotations are unchanged at 1.35c. to 1.40c., at mill. There is a fair demand for rivets, but prices are weak, and the regular quotations of 1.90c. for structural and 2c. for boiler rivets are being shaded $2 a ton.

Old Material.—After a few days of a little more activity the market has apparently settled down to another period of dullness. There was some buying during the week, but only in small lots for immediate needs. Dealers report practically no inquiry from outside points. Prices remain fairly steady. No changes are made in quotations. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

C. H. Lewis & Co., dealers in pig iron and coke, on September 1 closed their Pittsburgh office at 944 Oliver Building. Their business in both the Cleveland and Pittsburgh territories will hereafter be conducted from their Cleveland office in the Rockefeller Building.

The German Iron Market

BERLIN, September 1, 1910.

The new organization of the pig iron trade has been duly constituted. It is in effect a syndicate, but calls itself an association. It has its own capital of 100,000 marks, and has a legal standing before the courts; in other words, it can make binding contracts to buy and sell iron and it can sue and be sued. The organization, however, has not yet assumed the dimensions that its backers hoped for. The negotiations with the Siegerland group have come to a standstill, and it is quite uncertain whether any arrangement whatever can be made with the furnaces there. To gain time for further negotiations with all outside interests the leaders of the new syndicate came to an understanding a week or two ago that neither side would take any contracts for iron for 1911 delivery before September 11; but a dispatch from Siegen of yesterday's date states that the furnaces there have begun to do business for 1911 at 59 to 61 marks for steel-making qualities.

The market has continued to show signs of improvement. Prices are firmly held and are partly tending higher. Consumers have evidently reached the conclusion that they will not gain anything by waiting longer for cheaper prices, and they have shown a greater willingness to place orders. From the Silesian district it is reported that orders in hand have increased in volume.

In semimanufactured steel business is progressing satisfactorily. It is understood that some of the works protested against the recent decision of the Steel Syndicate to leave prices unchanged for the next quarter's business; and there was also some discontent that the price of structural shapes were left unchanged. There has been some increase of orders in the latter on the part of dealers; the trade, however, is still feeling the effects of the big lockout in the building trades of last May and June. Mills running on heavy rails have not much work on hand, but business is much better in light rails and there is a good prospect for bigger orders. Grooved rails are in very active demand, both from home and foreign sources.

In heavy plates business continues good, despite the strike and lockout in the shipbuilding trade. It is reported that the Heavy Plates convention will grant an export drawback or bounty on foreign business to lighten the pressure on the home market. It will amount to 2 marks per ton. In medium qualities business is brisk and it is even more so in the thinner numbers. The foreign demand for the latter has increased, and prices have been lifted a little on foreign orders; the home demand is also better, but is still lighter than the requirements of the mills. There is a better demand for tin plates.

The reports from the Belgian trade are again better. A yesterday's Brussels dispatch stated that the export price of soft steel bars has just been raised 2 shillings the ton at Antwerp; bar iron, 1 shilling; thin sheets of all grades the same advance, and skelp 2 to 3 shillings. According to press reports the iron companies and foundries in France are planning an advance of prices.

New York

NEW YORK, September 14, 1910.

Pig Iron.—Leaving out the business coming from pipe foundries, or under consideration by them, the local pig iron market has had little to stir it in the past week. The possibility of additional curtailment of production in New Jersey and eastern Pennsylvania is discussed in view of the fact that furnaces are getting through with contracts at prices of six and nine months ago and now having nothing ahead except business yielding only cost or but little better. The soil pipe company which had bought 7500 tons up to one week ago has made further purchases, and an eastern Pennsylvania pipe foundry is in the market for 5000 tons of No. 3 and gray forge for shipment in November and December. Buying by Virginia pipe works is reported also. An electric machinery company has bought some high phosphorus iron, but the report that a large pump manufacturer was buying is unfounded, as is also the report of buying by New York State agricultural works. We continue quotations as follows, at tidewater: Northern No. 1 foundry, $16 to $16.25; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.75.

Finished Iron and Steel.—In this territory the past week was not as good as its predecessor, but week by week fluctuations are never a true indication of conditions. It would probably, therefore, not be fair to say that the slight improvement noted in the last few weeks has not continued. However, all lines are still very quiet; most of all plates and least of all steel bars. Bar iron tonnage remains about the same as for the last month. Structural interests have their attention especially centered on the forthcoming New York City subway work. Bids on the main contracts will close September 20 for those on contractors' funds and September 27 for those on city money. It will be two months at least before definite inquiries are in the market for the steel required and perhaps longer. The tonnage is very uncertain, depending on what plan is adopted; but if built with municipal appropriation it is estimated that it will amount to 150,000 tons, while with private capital it may reach as much as 240,000 tons. Among the largest structural contracts recently closed are the Underwood Building, Church and Vesey streets, New York City, nearly 1100 tons, awarded the Hay Foundry & Iron Works; the Mirror candy factory, Hudson and Morton streets, New York City, 1300 tons, and an apartment house at Eighty-second street and West End avenue, 700 tons, both given to Marie Bros.; the John Swett School, San Francisco, 200 tons, awarded the Brody Iron Works; a coaling station for the Lehigh Valley railroad at Weehawken, 400 tons, awarded the Fort Pitt Iron Company. [illegible] station for the Wells-

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Fargo Company on West Twenty-sixth street, New York City, 300 tons, taken by the Metropolitan Bridge Company, and a building for the Ford Motor Company, Long Island City, 350 tons, awarded the Bethlehem Steel Company. A decision on the Sloane warehouse is expected this week; the general contract has been given to Charles T. Wills. The Central Railroad of New Jersey is in the market for a bridge of 300 tons at Bayonne. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Steel Rails.—The Colorado mill has taken some business recently from roads naturally tributary to it. The bookings of the leading producer in the past week were about 6000 tons, of which the largest lot was 3000 tons, taken by the Texas Mexican Railway. Of foreign orders booked by the United States Steel Products Company the largest is 25,000 tons for Australia.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was the lowest bidder on about 12,000 tons of 42-in. pipe at the letting at Portland, Maine, on Monday. The competition was keen and the prices submitted were all very low. The T. A. Gillespie Company, Pittsburgh, was the lowest bidder for the 6300 tons of 48-in. steel pipe. The contractors for the water works extension on Staten Island have purchased from the United States Cast Iron Pipe & Foundry Company the 5500 tons of cast iron pipe required. General business is still phenomenally light. Cast iron pipe manufacturers of very long experience characterize this autumn as the quietest they have ever known. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Old Material.—An eastern Pennsylvania steel company secured about 700 tons of Panama scrap sold here last week, for which $10.55 per gross ton was paid. The scrap was a mixed lot, including 70 tons of uncut boilers. The railroad lists this month are bringing slightly better prices than for some time. Heavy melting steel scrap is wanted, but most dealers are holding their stocks and thus a somewhat uncertain situation prevails with regard to prices. Offers of $12.50 per ton have been made and refused, while, on the other hand, the prices now being offered for delivery at steel works in eastern Pennsylvania will not admit of a higher New York price than $12. The higher offers have been made to secure material needed to apply on old contracts taken some months ago, but these contracts are not large and their influence is likely to be only temporary. The volume of business in cast scrap, some grades of wrought scrap, cast borings and a few other special lines has been somewhat larger than the previous week. The available supply of cast scrap seems to be limited. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

Metal Market

NEW YORK, September 14, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper			Lead.		Spelter.	
		Electro-		New	St.	New	St.
Sept.	Lake.	lytic	Tin.	York.	Louis.	York.	Louis.
8	12.87½	12.62½	35.60	4.40	4.30	5.40	5.25
9	12.87½	12.62½	35.50	4.40	4.30	5.40	5.25
10	12.87½	12.62½	...	4.40	4.30	5.45	5.30
12	12.87½	12.62½	35.70	4.40	4.30	5.45	5.30
13	12.87½	12.62½	35.10	4.40	4.30	5.50	5.35
14	12.87½	12.62½	34.80	4.40	4.30	5.50	5.35

Tin is lower this week and there is a good deal of trading. Copper is inactive and the tone of the market [illegible] Spelter is steadily advancing.

[illegible] the expectations of many, the copp[illegible]ed no decline in production, but [illegible]avorably. It is highly probable, [illegible] will be shown in the [illegible]oing on that some [illegible] electrolytic copper, [illegible] copper, however, [illegible]c. for lake.

[illegible] Works [illegible] the Lake Shore [illegible] the Erie Canal [illegible] two or three weeks,

These prices might be shaded by some holders of outside lots. At the close of the London market to-day spot copper was selling for £55 3s. 9d. and futures for £55 7s. 6d. Sales amounted to 500 tons of spot and 1000 tons of futures.

Pig Tin.—There has been more activity in the pig tin market during the past week as consumers have had to buy. The trading was quite brisk last Thursday and Friday, but most buyers asked for only small lots to tide them over during the existing high market. The London market was down £1 2s. 6d. on this morning's cable, which is equivalent to ¼c. in this market. This afternoon the New York market was quoted at 34.80c., and this was the lowest figure for the week. The London market closed to-day with spot tin selling at £158 and futures at £157 7s. 6d. The sales amounted to 250 tons of spot and 500 tons of futures. The market was weak.

Tin Plates.—Tin plates are selling fairly well, and there is a good call for foreign tin plates from the Standard Oil Company and other large interests who re-export the material in shipping goods abroad. The price for 100-lb. coke plates in New York is $3.84.

Lead.—There is only a fair demand for lead in the East, but there are reports of good sales in the West. Outside sellers are asking five points more in the New York market than the leading interest, whose quotation is continued at 4.40c. The St. Louis market continues relatively higher than New York and the quotation there is 4.30c.

Spelter.—Spelter continues to advance and 5.50c., New York, is now asked. This is a raise of ½c. over the price early in May, when it was announced that producers of spelter would refuse to sell for less than 5c. because they could not make any profit with the market at that price. Even at the present price of 5.50c. the producers show little anxiety to sell, and one consumer who tried to place an order at that price with two different manufacturers was turned down. He succeeded, however, in placing an order elsewhere. It is certain that there is a curtailment in the production of spelter and this is having its effect on the market. The price in New York to-day is 5.50c. for prime Western, and the St. Louis market has advanced to 5.35c.

Antimony.—Buyers are taking no interest in the antimony market. Cookson's is offered at 8.15c. and Hallett's at 7.87½c. Hungarian grades are going at from 7.25c. up, and some Chinese grades are being offered at 7.40c. These prices might be shaded.

Old Metals.—The market is inclined to weakness. While dealers' selling prices, quoted below, are unchanged, the inside prices more nearly represent present conditions:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, September 13.—There has been a fair amount of business in copper the past week, chiefly for nearby deliveries. The course of the tin market is so erratic that the price reported to-day may be ancient history to-morrow. There is general expectation of a collapse of the pool which has been manipulating the price of tin. Spelter is stronger and casual buyers have to pay a considerable advance over recent prices. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13⅛ c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 36½c.; small lots, 37½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.40c. to 5.45c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10⅝c.; copper clips, 12c.; red brass, 11½c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 25½c.; tin foil, 29c.; block tin pipe, 31c.

Metals, St. Louis, September 12.—Lead is steady at 4.30c.; spelter is strong at 5.32½c. to 5.37½c., the demand very active, both East St. Louis. Zinc ore is firm at $42 per ton, Joplin base. Tin is quoted at 35.85c. per lb.; antimony (Cookson's), 8.55c.; lake copper, 13.22½c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals for the five days last week was excellent.

The population of Dayton, Ohio, is 116,577, an increase of 31,244, or 36.6 per cent., as compared with 85,333 in 1900.

Iron and Industrial Stocks

NEW YORK, September 14, 1910.

A condition approaching complete stagnation prevailed in the stock market for the greater part of the past week. Such changes as occurred were usually advances, notwithstanding several occurrences which ordinarily would be expected to have an unfavorable influence on values. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.....	8½	Pressed St., com..	33¾- 34
Allis-Chalm., pref..	30½- 31	Pressed St., pref..	93 - 94
Beth. Steel, com..	26 - 27⅜	Railway Spr., com.	31 - 31¼
Beth. Steel, pref..	57 - 58¼	Railway Spr., pref.....	90¼*
Can, com.....	78½ - 81⅜	Republic, com.....	29 - 31
Can, pref.....	66½- 68½	Republic, pref.....	94 - 94½
Car & Fdry, com..	46½- 48	Sloss, com.....	55 - 57¼
Car & Fdry, pref.....	13	Pipe, com.....	15
Steel Foundries.....	43	Pipe, pref.....	56 - 56⅞
Colorado Fuel....	293½- 306½	U. S. Steel, com...	66¾- 69½
General Electric..	141 -144½	U. S. Steel, pref...	115⅝-116¾
Gr. N. ore cert...	54⅜- 56½	Westinghouse Elec.	59⅞- 60
Int. Harv., com...	95⅛- 97½	Chi. Pneu. Tool...	35¼- 35⅜
Int. Harv., pref.....	119¾	Cambria Steel.....	42 - 43¼
Int. Pump, com...	37¾- 40¾	Lake Sup. Corp...	21 - 22⅛
Int. Pump, pref...	81 - 82½	Pa. Steel, pref.....	108⅝
Locomotive, com...	34 - 36½	Crucible St., com..	117⅞- 123
Locomotive, pref.....	105	Crucible St., pref.	76 - 76¾

* Ex dividend.

Dividends.—Phelps, Dodge & Co., Inc., have declared the regular quarterly dividend of $2.50 a share, payable September 29.

The International Harvester Company has declared its regular quarterly dividend of 1 per cent. on the common stock, payable October 15.

The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

Experience with Ferrotitanium Rails.—A pamphlet entitled "Titanium: A Solution of the Rail Problem," has been prepared by the Titanium Alloy Mfg. Company, Pittsburgh, Charles V. Slocum, special agent. Illustrations, correspondence and data of tests are made use of to show the results of the use of ferrotitanium in the manufacture of steel rails; also the results of actual service on various railroads. The New York Central lines are the most extensive users of ferrotitanium rails, nearly 150,000 tons, mostly Bessemer rails, having been taken in the past two or three years. The illustrations are of sections of track laid with ferrotitanium Bessemer and open hearth rails, a number of these being curves on steam and elevated roads. Full page plates are given, showing the severe drop and bending tests to which ferrotitanium rails have been subjected, these indicating great strength and tenacity. It is stated that while in 1908 two railroads were trying ferrotitanium rails, they are now in service on 43 railroads.

Fencing Material Exhibits Desired in South Africa.—J. S. Minnaar, secretary of the Agricultural Society at Middelburg, Cape Colony, has addressed a letter to the American consulate at Cape Town announcing a competition and exhibition of fencing material, appliances and gates in connection with its annual Agricultural Show in March, 1911. The secretary desires American manufacturers to participate. Vice-Consul-General George L. Foster forwards prize lists of the exhibition, copies of which may be obtained from the Bureau of Manufactures, Washington, D. C.

New York has lost first place, at least temporarily, as the greatest producer of money for the Post-office Department. In the statement issued at the Post-office Department, Washington, D. C., September 12, it is shown that the gross postal receipts in Chicago for the month of August aggregated $1,666,484.15, as compared with $1,610,785.42 in New York, showing a balance of $55,698.73 in favor of Chicago.

The Belting & Machinery Company, Rochester, N. Y., has changed hands. The change went into effect August 1. Homer Strong is the new president and James Taylor is manager. The new management proposes to add to the company's lines as rapidly as possible and is making extensive improvements to facilitate the carrying of stock. The company, in fact, has been entirely reorganized, with additional capital, and hopes to carry the largest stock of supplies in western New York State within the next six months.

The Colonial Steel Company, Pittsburgh, Pa., has just placed a contract for the erection of a steel frame brick warehouse at its work at Monaca, Pa. This warehouse will be of modern design, equipped with overhead cranes for economical handling and having ample shipping facilities. Its capacity will be 1000 tons of tool steel bars. In addition to the storage room, there will be provision made and facilities installed for the thorough testing of all tool steel prior to shipment.

The California Legislature has approved a proposition to amend the State constitution by which $10,000,000 can be furnished to the Panama Pacific International Exposition which San Francisco plans to hold in 1915. As the citizens of San Francisco have subscribed $7,500,000, this will make a total of $17,500,000 as a basis on which the city will make its bid to Congress in December for the official approval of that city as the site for an international exposition to celebrate the completion of the Panama Canal.

Foundations have been completed for the new building to be erected by the Union Drawn Steel Company at Beaver Falls, Pa., on the site of the plant destroyed by fire some time ago. Only one part of the company's plant was burned down, its No. 2 plant having escaped the flames and having since been in steady operation to full capacity. The company practically builds all its own machinery, so that it will need to purchase very little equipment for the new plant.

Raw linseed oil reached the highest point in its history September 9, closing at $1 per gallon on the Chicago Board of Trade, an advance of 58 cents over the high point of September last year, when oil sold at 42 cents. The record price previous to this year was 68 cents in December, 1909. The flaxseed crop is short, falling 15,000,000 bushels below annual requirements. The normal price of flaxseed is $1.35 per bushel, while it is now quoted at $2.84.

The Reading Iron Company, Reading, Pa., is one of the few manufacturers of tubular products adhering strictly to wrought iron. Its plant is one of the largest independent tube works in the country, comprising nine mills, capable of producing 210,000 gross tons annually, and it continues to grow. The Reading *Eagle* of August 28 published an illustrated article descriptive of the plant, which has been completely modernized at great cost.

A press dispatch from Pas Mission, Keewatin, Canada, dated September 9, stated that ground had been broken for the Hudson Bay Railway. While no official decision has been reached it is probable that Fort Nelson on Hudson Bay will be the terminal point of the new road.

The W. F. Robertson Steel & Iron Company, Elm and Second streets, Cincinnati, Ohio, is now operating the Marietta tinplate mill, Marietta, Ohio, under contract with the receiver in bankruptcy of the Union Sheet & Tinplate Company.

The Machinery Markets

The railroads are becoming more active in the West, and a decided improvement is shown in the Chicago market. It is understood that the Chicago, Burlington & Quincy Railroad will close out a list amounting to $150,000 within the week, and the Transcontinental Railroad of Canada is buying freely. The Missouri Pacific Railway has one of the largest lists of the year in the market, while large industrial companies are ordering high-class tools and heavy equipment in good volume. Business has also picked up in the Milwaukee market, where some very good export trade is being received, especially from Mexico and British Columbia. In the Southwest power and heating plants are placing good orders. Business is slowly picking up in Pittsburgh, and in other parts of the country trade is in a healthy condition. Business in New York has quieted down within the last two weeks, but there is good future trading in sight.

New York

NEW YORK, September 14, 1910.

There is an absence of new inquiries, and business has fallen off noticeably in the New York market during the last week. A number of large propositions are in contemplation, however, which give promise of materializing shortly and the tone of the trade is mildly optimistic. The railroads, other than the two companies that are closing out against lists which have been mentioned in these columns, are very quiet, but there are indications that trade in that direction will pick up, as inquiries which are coming in from time to time indicate that the purchasing interests of the railroads are beginning to take some notice of the machinery trade. It is said on good authority that during the last year $200,000 worth of gasoline engines have been sold in Rochester alone for use on aeroplanes. The wide experiments that are being conducted in this new enterprise are creating a good demand for the smaller class of gasoline engines. The second-hand machinery trade has picked up during the last week and it seems a peculiar coincidence that a good demand develops in this trade either when times are very dull or very brisk. In rush times orders are placed for second-hand machinery only when manufacturers are unable to supply their wants with new machines, but when trade falls off it seems that manufacturers who take a pessimistic view of the situation economize by making second-hand equipment fill their wants.

A large part of the plant of the Rubberset Brush Company, Newark, N. J., was gutted by fire September 11. The Rubberset Company was a generous customer of the New York market about nine months ago, when its plant was greatly enlarged, and most of the equipment purchased at that time was destroyed by the fire. The loss is estimated at about $200,000 and is fully covered by insurance. It is stated that the company will rebuild at once and will purchase machinery to equip the proposed new structure within the next few weeks.

Four floors of a five-story brick building, occupied by jewelry manufacturers at 102 Murray street, Newark, N. J., were burned out September 11 and much in the way of machinery was destroyed. The building was owned by the Shiman-Miller Company, which recently established a plant in Newark, and the occupants whose equipment was practically destroyed included that company, the Eastwood-Park Company and the Eckford & Ackley Company. All of these companies will require new equipment.

The McKim Foundry & Machine Company, Lockport, N. Y., is in the market for one engine lathe, to be 24 in. by 10 ft.; one screw cutting engine lathe, one milling machine, one keyseater and one 36-in. open side planer.

The Fay Equipment Company has been organized by J. M. Fay and Clinton W. Koons, both well known in the New York machinery trade. The company has established offices at 120 Liberty street, New York, and will deal in a general line of machinery, extending from valves, gauges, brass goods and mill supplies to heavy engines and boilers and including quarrying and contractors' equipment.

The Crescent Foundry Company, Rochester, N. Y., which was organized in January, 1909, has outgrown its present location and has leased a fully equipped foundry at 26 Brown's Race, Rochester. The company does a general jobbing business in gray iron castings.

The Automatic Platen Press Company, 346 Broadway, New York, is arranging to locate a factory at North Tonawanda, N. Y. The citizens of the municipality have agreed to subscribe to $40,000 worth of bonds for the purchase of a site for the proposed plant. The details as to the size of the plant and the company's product are not available as yet.

The Crucible Steel Company of America, 2 Rector street, New York, is arranging to erect a large addition to its plant at Harrison, N. J. The company will spend about $25,000 on a brick and steel structure. The arrangements regarding the equipment have not as yet been made.

The John R. Keim Mills, Buffalo, N. Y., manufacturer of automobile parts and stamped metal work, has purchased additional land adjoining its plant at Kensington avenue and the Erie Railroad, and will build a large extension as soon as plans can be completed.

The Washburn-Crosby Company is building a one-story brick boiler house at its flour mill plant on South Michigan street, Buffalo Creek Railroad and the City Ship Canal at Buffalo.

The Troy Gas Company has let contract for a transformer house 35 x 67 ft., which it will erect and equip at its plant on River street.

The Lafayette Hotel Company, Buffalo, N. Y., will erect and equip a large power house at 216-222 Ellicott street, adjoining the new addition to the Lafayette Hotel at Lafayette Square, Clinton and Ellicott streets.

The Buffalo Brewing Company will erect and equip a one-story brick transformer house at its plant, Clinton street and the Lackawanna Railroad.

Donald F. McLeod, city engineer, Ithaca, N. Y., is receiving bids until September 24 for the furnishing and laying of 9000 ft. of 24-in. cast iron pipe in connection with the building of the new waterworks reservoir and concrete dam.

The E. U. Scoville Company was recently incorporated at Manlius, N. Y., with a capital of $20,000, to take over and continue the business of the late U. V. Scoville, manufacturer of faucets, &c. Gilbert H. Tripp is president of the newly incorporated company.

The Hydraulic Power & Mfg. Company, Niagara Falls, N. Y., contemplates making extensive additions to its power plant, which will largely increase the power capacity. Funds for this purpose will be available from a mortgage of $3,500,000, recently placed by the company.

The Perry Iron Company, Erie, Pa., will build an addition to the casting room at its plant.

The Mead-Morrison Mfg. Company of Cambridge, Mass., engineer and manufacturer of elevating and conveying machinery and hoisting engines, announces a generally good condition of business in its line, and states that it is at the present time working to the extent of its facilities; in fact, it has 50 more machinists engaged than ever before at one time.

Chicago

CHICAGO, ILL., September 13, 1910.

The machinery market shows considerable improvement in September. There is more business being done and the prospective business is assuming larger proportions. The present trend of the market is somewhat peculiar. Large industrial companies are buying quite liberally and their inquiries run to high class tools, including milling machines, boring mills and other heavy equipment. The check in the automobile business has released a large number of milling machines and automatic tools which were ordered last winter and spring for delivery this fall. In many cases the manufacturers of these tools were sold so far ahead that buyers outside of the automobile industry were discouraged from placing orders on account of the long time they would have to wait for delivery. These buyers are now able to get their orders booked for more satisfactory shipment and they are taking advantage of the opportunity. The general demand for tools is not quite so strong as the inquiries from the larger corporations, but it is believed that the smaller buyers will soon fall in line with the general improvement of business conditions throughout the country.

A very encouraging feature of the market is that the

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railroads are showing more concern in their requirements for their shops. It is understood that the Chicago, Burlington & Quincy will close this week on the tools for its Havelock, Neb., shops. The list of this company has been cut down somewhat, but it is believed that the tools purchased will amount to $125,000 to $150,000. The railroads usually find that their appropriation for a tool list does not go as far as their shop experts expect. The improvements which have been made in this class of tools the past 10 years necessarily place a higher price on each tool.

The Transcontinental Railway of Canada is also closing on the very large list issued last spring for its Winnipeg shops.

The Missouri Pacific Railway is in the market with a large list of tools required for 12 shops on that company's system of railroads, and it is known that other important Western railroads contemplate buying tools this fall on a large scale.

The Atchison, Topeka & Santa Fe Railroad had contemplated getting bids on a large list of tools for its shops, but it was found that the appropriation available would not go far towards covering such a list. This company has, therefore, decided to extend its purchases over a period of several months and will order from time to time the tools that are most urgently needed by its mechanical department.

The Wheeler-Clough Company, Chicago, has purchased property on Elston and Lister avenues, on which it will erect at once a one-story varnish factory at a cost of about $100,000.

The Cochrane Pipe Wrench Mfg. Company, recently incorporated with $100,000 capital stock, has purchased a site at Seventy-eighth street and Woodlawn avenue, Chicago, upon which it is erecting a factory for the manufacture of a pipe wrench patented by J. M. Cochrane, the president of the company. It is expected that the factory for which equipment is now being purchased will be ready for occupancy in about 30 days. Walter W. Taylor is treasurer of the company, which may be addressed at 7800 Woodlawn avenue, Chicago.

Walter E. Olson, Chicago, is having plans prepared by F. E. Davidson, 1448 Monadnock Block, for a five-story factory building 75 x 175 ft. It will be of brick and mill construction, with electric elevators and sprinkler system.

The Wolfe-Craig Company, 2832 South Green street, Chicago, manufacturer of metal specialties, has increased its capital stock from $3000 to $12,000.

The Stover Engine Works, Freeport, Ill., has increased its capital stock from 125,000 to $130,000.

The Meadows Mfg. Company, Meadows, Ill., is erecting a two-story factory building at Pontiac, Ill., which it will occupy about December 1.

The assets of the Wabash River Power Company, located at the rapids, near Mount Carmel, Ill., and formerly owned by Fort Wayne, Ind., capitalists, have been purchased by a syndicate of New York, Illinois and Colorado capitalists, among whom are J. B. Blackman of Harrisburg, Ill., president of the Saline Trust & Savings Bank of that city. The company has an engineer at work making surveys with a view to installing a large hydroelectric plant.

R. B. Baylies, Chicago, is having plans prepared by A. E. Robinson, 84 La Salle street, for a three-story garage and machine shop, 60 x 150 ft., to be erected at 2243-2245 Wabash avenue. It will be of reinforced concrete and brick construction, with steam heating and electric freight elevator.

The Interstate Garage, Chicago, has purchased the property at 2630-2632 Wabash avenue and will immediately begin the erection of a modern garage and machine shop. Plans for the building, which will be a two story brick structure, are being drawn by Shank & Co., 108 La Salle street, and it is understood that the building will be ready for occupancy in about two months.

Bernard Barthel, engineer, 79 Dearborn street, Chicago, is preparing plans for the following equipment to be installed in the Del Prado Hotel, Fifty-ninth street and Madison avenue: Two 200 hp. internally fired Scotch marine boilers, one 250-kw. generator, one 12-ton refrigerating machine, feed water heater, electrical work, steam heating and pumps. The same engineer is also preparing plans for an office and bottling house for the Clinton Brewing Company, Clinton, Iowa, which will require seven electric motors and one 150 hp. boiler.

The Best Mfg. Company, Peoria, Ill., has filed articles of incorporation with $40,000 capital stock. The company has a plant in Peoria, its principal line of manufacture being mill work.

The Fowler Mfg. Company, Alexandria, Ill., is completing negotiations for the erection of a large factory for the manufacture of gasoline motor cars and vehicles. The company at present operates a factory for the manufacture of vending machines, novelties and patented articles.

C. W. Sandell, manager of the brick factory at Hillsboro, Ind., advises that he is in the market for a new cement tile machine of larger capacity than the one now operated, which is 12 in. Machinery for the manufacture of Portland cement may also be purchased later on.

The Healy Engineering Company, Moline, Ill., has awarded a contract to the Leonard Construction Company, Chicago, for the construction of a manufacturing plant, 80 x 400 ft.

G. D. Glaser, 703 Washington Boulevard, Chicago, is having plans prepared by Ottenheimer, Stein & Reichert, architects, for a three-story factory building, 95 x 425 ft. It will be of concrete, brick and mill construction, and will have sprinkler system, steam heating and electric freight elevators.

The Kewanee Foundry & Mfg. Company, Kewanee, Ill., is contemplating the erection of a foundry and machine shop, 60 x 150 ft.

Philadelphia

PHILADELPHIA, PA., September 13, 1910.

While the actual volume of business transacted by machine tool builders, as well as merchants, has not shown any pronounced betterment during the past week, a much more satisfactory inquiry for both tools and machinery undoubtedly developed during the early portion of September. The greater part of the recent demand has been for single tools, although here and there users are looking around for more extended requirements, but nothing in the way of a sizeable list has developed. In a few cases recent inquiries have already developed into orders, but as a rule business closes up rather slowly. Sales of a few heavy tools to industrial plants in this territory are reported, while negotiations for others are still pending. Reports of cancellations of orders occasionally crop out, these have, however, been largely confined to such tools as those on which makers, at the time of their purchase, were unable to make deliveries inside of eight and ten months, or even longer periods, and prospective purchasers have been able either to obtain other tools for earlier delivery or find that conditions have since developed under which they are able to get along without the proposed equipment, and consequently canceled their orders.

Developments as far as the railroads are concerned show no change. The Pennsylvania Railroad has placed orders for a few odd tools, which as a rule have been before the trade for some time, and, while some further inquiries from this road are expected, they seem to be in no haste to make their wants known. Locomotive orders have not been very active, although the local builder is pretty fully engaged. Makers of heavy engines, boilers and general power and transmission equipment do not report any marked improvement in the demand, although they are as a rule pretty actively engaged with work already on their books. Very little movement in the export trade is to be noted in this territory.

Machine tool builders, as well as industrial plants generally, are operating at a fairly even basis; some of the larger concerns are running at about 70 to 75 per cent. of full capacity, with sufficient business coming in to enable them to about maintain that rate for some time ahead. In the foundry trades new business, as far as the requirements from the machine tool field are concerned, has been comparatively light. A fair business is reported in the jobbing foundry trade. In some instances makers of small steel castings are not quite so actively engaged.

Plans have been completed by Stearns & Castor for the erection of a new power plant at the Baron De Hirsch Agricultural School at Woodbine, N. J.

The contract for the addition to the plant of the Arguto Oilless Bearing Company, Berkley street below Wayne avenue, has been awarded to William C. Wright. The building will be 45 x 83 ft.

The United Gas Improvement Company will build a one-story chemical laboratory in connection with its plant at Atlantic City, N. J. The contract for the building has, it is understood, been let to W. W. Lindsay & Co. of this city.

The Camden Ferry Company, Elizabeth City, N. C., will open bids for a Scherzer roller lift bridge on September 26. John W. Hays, Petersburg, Va., is the engineer in charge of the work.

Preliminary plans for a large garage, to be erected by George C. Boldt at 1401-1409 Locust street, have been completed by Hewitt & Paist. Plans call for a building, 103 x 150 ft. It is not yet decided when the erection of the proposed garage will be started.

The C. C. Knight Company has sold its six-story concrete factory building at Sixteenth and Callowhill streets, completed a year or so ago, to Louis J. Bergdoll of the Bergdoll Motor Car Company, which will use the upper floors of the building for automobile construction work. The C. C. Knight Company will continue the merchant iron and steel business at the same location, occupying the first floor of

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the building under a long lease. The size of the building is 100 x 179 ft. 8 in.

The Crook-Horner Supply Company, Baltimore, Md., has acquired a large two-story warehouse at 11 Balderston street, in that city, where it will conduct, after necessary improvements are completed, a general machinery, plumbing and mill supply business.

Announcement has been made in Baltimore, Md., that new bids were being taken for the erection of the Washington County Hospital, at Hagerstown, Md. James Ritchie, architect and engineer, Boston, Mass., is taking proposals.

The Hess Machine Works, Philadelphia, reports a very fair inquiry for file making, as well as general machinery, but notes that orders do not close very satisfactorily. This company continues quite busy and has shipped recently three sets of file making machines to a Western customer, one set to a buyer in New England and five sets for export to Germany.

The Hamburg Boiler Works, Hamburg, Berks County, Pa., is ready to take bids on a steel addition to its works, 20 x 100 ft., one story, to be used as a flanging shop.

Cleveland

CLEVELAND, OHIO, September 13, 1910.

The local machine tool market continues quite dull, although it shows somewhat more life than a month ago. Machinery houses report that the demand at present is mostly from small shops for medium-sized and small tools. No inquiries for good-sized lots of tools are pending. There is a good demand for small second-hand tools, but little call for large tools. Outside of some single tool orders very little business is coming from the automobile trade. The situation in that industry is regarded as more favorable than a month ago. Automobile manufacturers appear confident of a heavy volume of business during the coming year, but with the large plant extensions during the past year or two they are not expected to do much in the way of further additions. Instead of the heavy volume of orders that came from this industry last fall machinery dealers are looking for only about enough small orders to keep present plants up in good shape. That the outlook in this industry is improved is indicated by the fact that some of the orders for machine tools that were held up during the summer have been reinstated. Machine tool builders are generally busy on old orders and some report a fair volume of new business. Among the inquiries pending is one for 32 large portable drills.

Builders of handling machinery are getting a good volume of orders for small cranes and hoists, and some good business is in prospect in the line of coal and ore handling machinery. The demand for locomotive cranes is less active than earlier in the season.

Railroad orders are generally being held back and very little business is coming from that source. The Lake Shore Railroad has placed an order for generators for its new Elkhart shops, and will shortly buy motors to the capacity of about 5000 hp. for the same shops. In electrical equipment the demand for small and medium-sized motors continues fairly good.

The new ore handling plant that is being erected by the New York, Pennsylvania & Ohio Dock Company, at Randall, Ohio, a suburb of Cleveland on the Erie Railroad, is nearing completion and will be ready for operation about October 1. The plant will have a capacity of handling over 1,000,000 tons of ore a year. The equipment consists of a 456-ft. bridge, built by Heyl & Patterson of Pittsburgh, and a car dumper, built by the Wellman-Seaver-Morgan Company of Cleveland. The bridge is equipped with a 12-ton bucket and is capable of handling 500 tons of ore an hour. There is a power plant of 1200 hp. capacity. This has Babcock & Wilcox boilers, two 600-hp. Buckeye cross compound engines and two 300-kw. Allis-Chalmers generators.

The Electric Controller & Mfg. Company, which recently purchased a site for a new plant at Eightieth street and Bessemer avenue in Cleveland, has engaged Geo. S. Rider & Co., engineers, to prepare plans, and expects to begin the construction of its new plant early next spring.

The New Idea Spreader Company, Coldwater, Ohio, has awarded contracts for the erection of a new plant, 60 x 800 ft. Anton Burchard, engineer, Cleveland, has the contract for the electrical installation, power house and transmission machinery; A. DeCurtins, Lima, Ohio, the contract for the building, and Ammerman, McCall & Anderson, Detroit, Mich., the contract for the heating and ventilating. The power plant will be 200 hp.

The A. E. Russ Company, Cleveland, maker of beer pumps and beer pump supplies, now located at 6813 Wade Park avenue, has completed plans for the erection of a new plant on Walworth avenue, S. W., near West Fifty-eighth street, on which work will be started at once. The plant will include a main building, 60 x 200 ft., and a foundry, 40 x 80 ft. The construction will be of brick.

The Tyson Company, Canton, Ohio, has been incorporated with a capital stock of $75,000 to manufacture ice cream freezers, pasteurizers and other machinery of a similar character. The company will erect a new plant, about 50 x 150 ft., and will move its present plant to a new site recently purchased. The incorporators are Frank Tyson, Joseph Biechele, Sr., Joseph Biechele, Jr., Stephen Francis and William Shoop.

The Hinde & Dauch Paper Company, Sandusky, Ohio, will soon begin the erection of a new paper mill, including several one and two story buildings. Plans for the plant are being prepared by Albert N. Allen, consulting engineer, Cleveland.

The Brown Hoisting Machinery Company, Cleveland, reports the receipt of a good volume of small orders for cranes and hoists, and some inquiry for equipment for large handling plants. The company now has enough work on hand to keep its plant running full through the remainder of the year.

The Cleveland Electric Illuminating Company has placed a contract with the General Electric Company for two 15,000-kw. steam turbines for its new plant at the foot of East Seventieth street. Exciters and other equipment will be purchased later.

The City Council of Akron, Ohio, has acted favorably on the question of building a new water works plant in that city and the matter will be submitted to the voters October 25, when a bond issue of $750,000 for that purpose will be voted on.

It is announced from Niles, Ohio, that a new sub-station and car barns will be erected in that city by the Mahoning Valley Street Car Line, involving an expenditure of $100,000. The sub-station will be equipped with two 500-kw. rotary converters.

The municipal water works plant in Canton, Ohio, will be enlarged by the erection of an auxiliary pumping station, with a daily capacity of 2,000,000 gals.

George Westwater & Co., Columbus, Ohio, have secured the contract on a bid of $27,527 for erecting a water works plant in Utica, Ohio.

The City Council of Toledo, Ohio, is planning the expenditure of $200,000 in the enlargement of the municipal water filtration plant.

The Republic Rubber Company, Youngstown, Ohio, has awarded a contract to the Reaugh Construction Company of Cleveland, Ohio, for the construction of a five-story and basement manufacturing plant to be erected at a cost of about $100,000.

Cincinnati

CINCINNATI, OHIO, September 13, 1910.

As compared with nearby previous weeks, a decidedly better condition is to be noted in the machine tool industry. A number of scattered orders have been received from the railroads during the past few days, and business from the general trade is holding up remarkably well. A distinctly encouraging feature is the large number of inquiries being received by machine tool builders, which are coming from all parts of the country. The export trade has also been very good lately and more attention is being paid to this particular branch than probably ever before. A few orders are also to be reported from the automobile industry.

Dealers in machinery supplies, such as valves, packing, hose, &c., note an increase in orders coming in and their salesmen report a better feeling as generally prevailing in this immediate vicinity.

The foundries are running along about as usual, and those who have no large contracts booked ahead manage to obtain enough day to day business to keep a full force at work.

Machinery Hall of the Ohio Valley Exposition, Cincinnati, has been a meeting point for many outside visitors and local exhibitors. Among the local machinery exhibits that are attracting attention are a vertical milling machine made by the Cincinnati Milling Machine Company; a radial drill from the Cincinnati-Bickford Tool Company; an automatic gear cutter, furnished by the Cincinnati Gear Cutting Machine Company, and a 22 in. by 22 in. by 6 ft. planer from the Cincinnati Planer Company. The Lodge & Shipley Machine Tool Company has one of its latest type of 20-in. engine lathes installed, and the Acme Machine Tool Company is showing one of its latest type turret lathes. The J. A.

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Fay & Egan Company's booth contains a number of woodworking machines, and that of the Hisey-Wolf Machine Tool Company a full assortment of its electric drills. The Lunkenheimer Company's exhibit shows a full line of its engineering specialties. The Triumph Electric Company is exhibiting several types of generators and motors and a 30-ton ice machine; it is also furnishing motors for nearly all electrically driven machines throughout the exposition buildings. I. & E. Greenwald have a Corliss engine and a number of large gear wheels in their exhibit. Outside exhibitors include the General Electric Company, the Westinghouse Company and the Allis-Chalmers Company.

The plant of the Cincinnati Punch & Shear Company is one of the local industries which has been very busy all summer. Recent orders received include a large double punch to be shipped the Trans-Siberian Railroad at Amur, Siberia; a deep throat No. 2 punch for the Arecibo Railroad, San Juan, Porto Rico; a 16-in. and a 36-in. double punch for the National Railways of Mexico. Domestic orders have also been good lately and a 60-in. plate shear, to cut ½-in. aluminum plates has just been shipped the Aluminum Company of America, Niagara Falls, N. Y.; two double punching machines each to the Davenport Company and Baker Iron Works, Los Angeles, Cal., and a large triple geared bending roll mill is now being built for Bartlett & Hayward Company, Baltimore, Md.

Work is being pushed rapidly on the new reinforced concrete building of the Ohio Mechanics' Institute on Walnut street, Cincinnati. The auditorium is expected to be ready for use within a few months, but on account of power arrangements yet to be made it is not expected that the institute will move all its departments into the new quarters until the latter part of next year.

The new addition to the plant of the Hall Safe & Lock Company, Cincinnati, is nearly completed, and the company's output of safes will be very much increased.

The new factory building of the Baxter Stove Company, Mansfield, Ohio, to take the place of the structure recently burned, will soon be ready for occupancy. The new plant will be quite an improvement over the one destroyed.

The Rossville Distilling Company, Lawrenceburg, Ind., is building a new boiler house, and the additional boilers to be installed will bring the total capacity of the power plant up to 1500 hp.

The five-story reinforced concrete building that the Lunkenheimer Company is erecting as an addition to its plant at Lawnway avenue and Tremont street, Cincinnati, is nearly completed and the company has already moved its brass foundry to the top floor of the new building. Other departments will follow soon and before January 1 the addition will be in full operation.

The Baldwin Piano Company announces that it has postponed the erection of an addition to its factory on Reading road, Cincinnati. The contemplated extensions called for an expenditure of over $60,000, and it is understood that some time next year the orginal building plans of the company will be carried out.

The Fox Paper Company will commence the installation of machinery in its new plant on Lockland avenue, Cincinnati, some time next month. The new factory is about completed and is expected to be in operation before the fall season is over. All the necessary machinery and equipment has been purchased.

The Seneca Chain Company, Kent, Ohio, has awarded contract to the Mt. Vernon Bridge Company for the erection of a plant to replace one recently destroyed by fire. Work will commence at an early date. The buildings are to be of reinforced concrete construction.

Lynch & Eady, Louisville, Ky., have secured contract for the erection of a filtration plant for Georgetown, Ky. It is stated that L. M. Booth & Co., New York, have contract for the necessary machinery.

The Chas. Boldt Glass Company, Cincinnati, has taken out a permit for the erection of a one-story glass factory at Davis lane and the Pennsylvania Railroad.

The Dayton Electromobile Company, Dayton, Ohio, has been incorporated with $250,000 capital stock. The incorporators, who are all Dayton men, are John L. Baker, William Pflum, H. B. Brentlinger, Geo. L. Baker and C. W. Dale. No building plans have yet been announced.

The Lodge & Shipley Machine Tool Company, Cincinnati, has recently received an order for several engine lathes from the Gunn Motor Company, a new automobile manufacturer, at Utica, N. Y.

The Cincinnati Iron & Steel Company reports a recent sale of seven electric traveling cranes to the R. K. LeBlond Machine Tool Company, Cincinnati, to be installed in the new factory additions now being erected at East End by the LeBlond Company.

Indianapolis

INDIANAPOLIS, September 12, 1910.

The Field Mfg. Company, Bloomington, Ind., has been incorporated with $20,000 capital stock to manufacture cans and other articles. The directors are Leonard S., Frank M. and L. C. Field, J. W. O'Harrow and F. C. Dailey.

The Batesville Electric Light & Power Company, Batesville, Ind., has been incorporated to supply municipal and domestic light, heat, power and water. The directors are J. A. Hillenbrand, A. W. Romweber and Harry Blank.

The Bishop & Babcock Opal Onyx Soda Fountain Company's plant at Indianapolis, Ind., was burned September 7, with a loss of $60,000. E. J. Kane is manager of the plant. The Marietta Glass Company, Indianapolis, owned the building, on which the loss was $65,000. The plant will be rebuilt.

The South Bend Bait Company, South Bend, Ind., has increased its capital stock to $25,000.

The plant of the Furnas Office & Bank Furniture Company, Indianapolis, Ind., was burned September 9, with $30,000 loss. The loss is covered by insurance, and the plant will be rebuilt.

The directors of the Bell Smokeless Powder Company, St. Paul, Ind., have elected Harry Ballard of St. Paul to succeed Dr. J. W. Bell as president. William V. Dorsey of Shelbyville, Ind., was elected treasurer to succeed Mr. Ballard.

The Bedford Stone Setttiug Company, Bedford, Ind., has been incorporated with $25,000 capital stock, to do a stone construction business. The directors are William E. Powers, William S. Holcomb and Louis Roberts.

The Freeman Mfg. Company has been incorporated at Alexandria, Ind., to manufacture gasoline light and heating apparatus. The directors are A. S. Freeman, V. S. Day and V. H. Day.

The Heimberger & Drinkard Veneer Mills has been incorporated at New Albany, Ind., with $50,000 capital stock to manufacture veneers. The directors are Adam Heimberger, Harry E. Heimberger and Clarence L. Drinkard.

The Central Wire & Iron Company, Indianapolis, Ind., has been incorporated with $5000 capital stock to manufacture iron and wire novelties. The directors are Frederick Phillips, Emma Schiffman and D. J. Phillips.

The Jett-White Electric Company, Evansville, Ind., has been incorporated with $10,000 capital stock to manufacture electric supplies. The directors are Charles E. Jett, Elmer S. White and Fred M. Hostetter.

The Oakes Mfg. Company, Tipton, Ind., will make additions to its plant in order to take care of increasing number of orders for its manufactured product—incubators.

The Town Council and Commercial Club of Parker City, Ind., are planning the establishment of a municipal lighting plant, either electricity or acetylene.

The Hoyt Electric Company, Indianapolis, Ind., has been incorporated with $50,000 capital stock to manufacture electrical devices. The directors are E. S. Van Camp, E. V. H. Shockney and E. T. Hoyt.

The Muncie Gas Engine & Supply Company, Muncie, Ind., has found it necessary to enlarge its plant, due to orders for an engine, the invention of one of the employes, that burns crude oil rather than refined oil or gasoline.

At the recent annual meeting of the Indiana Electric Light Association, one of the chief matters discussed was municipal ownership of public utilities. The leaders in the discussion pronounced municipal ownership in the State a failure, in so far as electric light plants were concerned. Several causes were assigned. It was pointed out that the directors of such plants were usually mayors and members of the councils, with no knowledge of electrical matters; under them the city clerk, who acted in various capacities for the plant; next the superintendent, at the beck and call of the council, clerk, fire chief, police chief and mayor—everybody's business, nobody's business. It was said the agitation for municipal ownership was decreasing in proportion to the progress made by private ownership in getting in closer touch with the people and cultivating their good-will.

The Improved Block Railway Signal System has been incorporated at Hammond, Ind., with $50,000 capital stock, to manufacture block signal systems. The directors are Charles D. Anderson, Howard Ross and Cornelia S. Benepe.

J. B. Blackman, banker, Harrisburg, Ill., is trustee for the Wabash River Power Syndicate that has taken over the assets of the Wabash River Power Company, at Grand Rapids, Ill., formerly owned by capitalists of Ft. Wayne, Ind. There is a dam at that point on the Wabash River, constructed by the Government. It is 1185 ft. long and gives a fall of 11½ ft. It is proposed to lower the river bed below the dam so as to get a fall of 17½ ft., and to build a public service plant. The estimated cost is $500,000.

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Two additions, each 300 ft. long, are being built to the plant of the Maxwell-Briscoe Motor Company, at Newcastle, Ind., and plans are being made for a third addition, 20 x 320 ft. With these completed the plant will give employment to 2500 hands. Of the 7000 cars it is proposed to build for the export trade next season, 3000 will be made at this Newcastle plant of the United States Motor Company.

The Southern Veneer Mfg. Company, Louisville, Ky., is receiving bids for the construction of a two-story machine shop.

The Chapman Steel Company, Indianapolis, Ind., has plans in progress for the construction of a one-story factory building, 225 x 300 ft.

Detroit

DETROIT, MICH., September 13, 1910.

Autumn trade has been opening up in fairly good shape. Small orders predominate, but in the aggregate they stand for considerably more business than was obtainable last month, and practically every branch of industry is well represented in current buying. There has developed lately among both manufacturers and dealers a marked disposition to place less dependence upon any one source of business, such as the automobile and auto parts factories, and to cultivate trade wherever it may be found. Committees of the Detroit Chamber of Commerce, both independently and in co-operation with other commercial organizations of this section, are planning to help this idea along, while individual machinery houses will inaugurate systematic sales campaigns, in which advertising is to play a strong part. It is felt locally that conditions were never better for a sustained effort of this kind than they are at the present time.

The erection of a thoroughly modern factory with electric motor drive, at Grand Rapids, Mich., is contemplated by the Crawford Chair Company, Grand Ledge, Mich., but plans to that end have not yet been fully matured.

The Bates & Edmonds Motor Company, Lansing, Mich., is manufacturing a line of gasoline engines adapted to practically every character of service, all being of the open jacket pattern.

The name of the Bailey Motor Truck Company, Detroit, has been changed to the Federal Motor Truck Company.

Smith, Hinchman & Grylls, Detroit, are preparing plans for an addition to be made to the power house of the city's electric power and lighting plant. The work is in charge of the Public Lighting Commission, 40 Atwater street, Detroit.

The Lavigne Mfg. Company, Detroit, is putting on the market an automatic oiler for gas engines which has proven very successful in service, and has sold largely this season in all parts of the United States. An increase of manufacturing facilities has been found necessary, and the first step in this will be the erection of a four-story addition, 100 x 100 ft., to its present plant.

The Ann Arbor Machine Company, Ann Arbor, Mich., is devoting its entire plant to the production of a portable power baler, which is more largely in demand this season than ever before.

Important developments in the purchase of new and heavier equipment may result with the next few months from extensive exportation work now being carried on by the Wolverine Copper Mining Company, Houghton, Mich.

The city of Oxford, Mich., which has a combined electric power and water works station, will purchase in the near future a motor driven centrifugal pump of about 500,000 gal. capacity daily.

The Menominee Saw Company, Menominee, Mich., which has a large established trade in all sections of the country in saws, knives and cutters of various kinds, is looking forward to a good run of fall business and a very active winter.

The Field-Brundage Company, Jackson, Mich., is putting on the market a very simple, compact type of gasoline engine, in sizes from 6 to 15 hp., which has been extensively sold through the United States for a wide variety of service.

The Huron Mining Company, Iron River, Mich., has a new iron ore crushing plant in commission, and it is stated that by the beginning of another season further improvements will be effected, as development work is to be pushed.

A very simple and effective apparatus of the character indicated in its title is manufactured at Vicksburg, Mich., by the Eclipse Oil Pump Company. This has no valves, plungers, cranks, eccentrics or connecting rods, and there is practically nothing to get out of order.

Wm. E. Metzger, president of the Metzger Motor Company, Detroit, stated in a recent published interview that the conservative manufacturer of a good automobile has nothing to fear for the season of 1911, which will, in his judgment, be one of the most substantial the trade has known. Increased purchasing by farmers is certain to be a feature of the trade.

The M. Garland Company, Bay City, Mich., has had a large trade in the aggregate this season with every timber cutting section of the country, including the Pacific Coast. In addition to its standard lines, the company manufactures a good deal of special machinery.

The Charfield Brass & Iron Works Company, Escanaba, Mich., which now constitutes one of the leading industries in its line on the upper peninsula, will erect an addition, 40 x 80 ft., to form a new front for its present plant.

The Arbuckle-Ryan Company, Toledo, Ohio, has been awarded the contract for the delivery and installation of two 72-in. x 18 ft. tubular boilers, tandem compound engine of 300 hp. and a centrifugal pump with 36-in. discharge, for a pumping station to be built in the vicinity of Rushville, Ill., by the Crane Creek Drainage & Levee District, whose headquarters are located there.

Reports persistently circulated lately with reference to the heavy overproduction of the Buick Motor Company, Flint, Mich., and alleged sacrifice of this year's stock at very low prices, are without any basis of fact, as any one will find who tries to buy one of these cars at less than the present regular quotation.

The Ayres Engine & Motor Company, incorporated here not long ago, has had plans prepared by Smith, Hinchman & Grylls, Detroit, for a new factory in Trenton, Mich., the initial unit of which will be 50 x 175 ft. Gasoline engines, principally for motor boat service and driving agricultural machinery, will be the product of the plant.

The plans of the McRae & Roberts Company, Detroit, for a new brass factory, consisting of foundry, finishing shop and power plant, are now complete, and the construction contracts will be let this month. Equipment details are reported to be under consideration.

The authorities at Harbor Springs, Mich., are having plans and specifications drawn for a steam pumping plant and water distribution system embodying features of the most modern design.

The Fennia Mfg. Company, Hancock, Mich., recently incorporated, held the first meeting of the Board of Directors September 2, and elected the following officers for the ensuing year: Joseph O. Ostman, president; Axel A. Immo, vice-president; Wm. Arthur Abramson, secretary; John Olson, treasurer. The company will manufacture dial levels and novelties and act as general machinists. A decision has not been reached as yet regarding the erection of a plant.

The Krit Motor Car Company Detroit, will add two stories to its present plant on the Detroit River front.

The South

NASHVILLE, TENN., September 12, 1910.

In the line of foundry, boiler making and machine shop equipment some fairly good orders have recently developed at various points in the South, plants that make a specialty of repair work being the best buyers. On any standard tool reasonably prompt delivery can now be obtained, so that users do not feel the need of placing orders very far ahead. The large mills and other manufacturing establishments have yet to make up their lists. Most of the officials responsible for their management have been absent on the usual summer vacation trips, and the attention of those now on the ground is occupied mainly by an accumulation of various operating details which will have to be disposed of first before purchases of additional machinery or replacements are considered. Before the end of October, however, there will undoubtedly be a nice line of business obtainable from these plants. Meanwhile, some of the smaller manufacturers and other industrial interests will be giving increasing support to the market, and the situation is most promising.

The Southern Veneer Mfg. Company, Louisville, Ky., whose plans for rebuilding have previously been mentioned, are starting work on the construction of a large plant equipped with power and operating machinery of the most modern design. Two buildings, 50 x 185 ft. and 40 x 80 ft., will be completed first. Some of the equipment needed has already been provided for, and the remainder will be purchased as required.

Funds for the installation of a municipal electric plant and water works system will be available some time this fall at Hartselle, Ala.

The National Blow Pipe & Mfg. Company, Ltd., New Orleans, La., is putting on the market a type of exhaust fan operating at slow speed, which takes comparatively

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little power for its capacity and is very efficient in service. The company makes a specialty of installing these machines in connection with complete systems for removing refuse from planing mills, woodworking plants, &c.

The Carolina & Northwestern Railway, Chester, S. C., is having plans prepared for new shops to replace the plant that was recently destroyed by fire. It has not yet been decided where they will be built, as several points along the line are being considered.

The Chattanooga Roofing & Foundry Company, Chattanooga, Tenn., is starting the fall season with considerably enlarged facilities for production.

Bids on an electric generating set and motor driven pump of moderate capacities will be taken until September 30 by W. G. Raoul, Gould Building, Atlanta, Ga., for one of the State institutions located at Alto, Ga. In operating the dynamo a gasoline or oil engine is to be used.

Among contracts recently taken by the Nashville Bridge Company, Nashville, Tenn., is one for a large steel structure at Link Ford, near Waverly, Tenn.

One of the busiest of the large Southern sales agencies this season is that of the Wilmont Machinery Company, New Orleans, La., which handles such standard lines of equipment as the pumps and hydraulic apparatus manufactured by the Deming Company, Salem, Ohio; timber cutting machinery from the shops of the M. Garland Company, Bay City, Mich.; the various products of the Lambert Hoisting Engine Company, Newark, N. J., and the conveying systems of the Link-Belt Company, Chicago. During the summer trade in all of these lines fell off, as usual, but the closing months of the year promise to be exceptionally active.

The city of Crowley, La., has awarded the contract for a 250-hp. high speed automatic engine, with pump direct connected, to the Skinner Engine Company, Erie, Pa.

In addition to its well-known line of boilers, which are carried in stock for immediate shipment, the Walsh & Weidner Boiler Company, Chattanooga, Tenn., has built up a large trade in related lines, such as the manufacture and erection of steel casings, stacks, breechings, &c.

Plans are under discussion at Dillon, S. C., for the building of a city power plant. The matter will probably be decided this month.

The Turner, Day & Woolworth Company, Louisville, Ky., will henceforth be buyers of electrical equipment and supplies, having installed motors for driving the machinery in its factory.

Work has been commenced on the new pumping station for the city of Chattanooga, Tenn.

The Hazen Power Company, Hazen, Ark., is preparing to establish a large plant. The contract for the machinery calls for one 250-hp. Corliss engine and a battery of boilers of 300 hp. pressure with electric generators in proportion. It is expected that the plant will be completed and ready for operation by March 1. A 10-ton ice plant is to be operated in connection.

The city of Cleveland, Miss., has sold $25,000 worth of municipal water works bonds, and an improvement to the value of $20,000 will be made at once.

Extensive improvements are being made in the Gadsden Car Works operated by the Alabama Great Southern Railroad, at Gadsden, Ala. The plant is now employing about 400 men.

The Southern Shovel Mfg. Company has reopened its plant at Gadsden, Ala. The plant was closed down for some time because of overproduction. About 50 men are employed.

The Panchrome Press Mfg. Company, Inc., has been organized at Corinth, Miss., to manufacture an attachment applicable to printing presses, by means of which printing in various colors can be done with one impression.

The J. M. Barnett Company, Walsh, La., is in the market for a modern ice making plant, and also intends to purchase equipment for a small power station to furnish electric light to the municipalities.

Pittsburgh

PITTSBURGH, PA., September 13, 1910.

The improvement in the market for machinery is rather slow. Inquiries are liberal and in some lines trade has recently been very good, but taking conditions as a whole there does not seem to have been any large volume of actual bookings made thus far this month. Everything points at present to a gradual upward trend, with a noteworthy absence of any abrupt transition from the usual summer dullness to fall activity. The trade is, however, in a healthy condition, and comparatively little stimulus is needed to force autumn production to a high figure. Buying in behalf of certain large interests, which was expected to take place at about this time, has not yet materialized, and a considerable percentage of this may be delayed until after the Congressional campaign is over; but some sizeable contracts cannot fail to come out between now and the middle of October, as other work that will before long be pressing for completion is dependent upon them.

Manufacturers and district office salesmen here are figuring on the auxiliary equipment for the new steam turbine power plant of the Mt. Vernon Railway & Light Company, Mt. Vernon, Ohio, the boilers and generating units for which were recently purchased.

It is reported locally that the Pittsburgh Journal Bearing Company, incorporated for $150,000, has been organized here by D. H. Stewart and Archibald Mackrell, Pittsburgh; Wm. Connor, Braddock, Pa., and Jas. L. Adams, Coraopolis, Pa., to establish a plant for the manufacture of bearings for the journals of car and locomotive trucks.

The Russell Car & Snow Plow Company, Ridgeway, Pa., which is making a specialty of a double truck machine with flanges for heavy interurban service, will be occupied during the fall on orders in hand or pending for early winter delivery, as the roads that put off purchasing equipment of this kind are now buying.

Among prospective builders of power plants for traction service is the Buckhannon Western & Glenville Electric Railway Company, recently organized at Buckhannon, W. Va., by L. H. Morrison and others. The plans of the company have not yet, however, been fully matured.

From Sullivan, Ind., it is reported that the Consolidated Indiana Coal Company is installing electric haulage in two of its mines, one of which is being opened up again after lying idle for several years. The principal equipment has been ordered from representatives of local manufacturers.

Chas. F. Scott, consulting engineer of the Westinghouse Electric & Mfg. Company, has consented to serve as chairman of a board of prominent engineers of this section, who will advise with the faculty of the University of Pittsburgh on all matters pertaining to the engineering courses, thereby giving students the benefit of the best practical experience.

One of the largest electric generating plants to be owned by a commercial power company in this district will be built at Wheeling, W. Va., by the Wheeling Electrical Company, which is planning to furnish current to manufacturing concerns of that vicinity.

The construction of a municipal power and pumping station is under consideration at Shepherdstown, W. Va.

The Westinghouse Electric & Mfg. Company, Pittsburgh, continues to do a very satisfactory business, and it is reported that some new shop equipment has recently been ordered to provide facilities urgently needed in the production department. Shipments during July were larger than for any month in the company's history, and this record was again exceeded in August. The Westinghouse Machine Company is similarly active, among the contracts now on its books being a number for steam turbine units of large capacity.

The Warren Axe & Tool Company, Warren Pa., will be busy during the fall stocking up dealers that sell to the logging trade, which is expected to be very lively in all of the Northern timber cutting districts.

A 3000-kw. low pressure steam turbine, operating on the exhaust from other units in the station, is being installed by the Columbus (Ohio) Railway & Light Company.

Owing to the project that has been developed lately by city officials for supplying commercial power to industrial plants for operating motor driven machinery, the steam turbine plant belonging to the municipality at Columbus, Ohio, may be increased in capacity. It is at present equipped with units of 4500 kw., furnished by the Westinghouse Electric & Mfg. Company, Pittsburgh, and the Allis-Chalmers Company, Milwaukee.

The Jacobson Machine Mfg. Company, Warren, Pa., is building an improved type of gasoline engine, in sizes up to 60 hp., with automatic draining water tank, which can be made readily portable as a complete unit and used for a great variety of service.

Specifications can be obtained from the office of the United States Engineer, Wheeling, W. Va., covering two boilers of 115 hp. each, two steam driven air compressors and other equipment for erection at one of the new dams on the Ohio River. Bids are to be taken until September 29.

The Riblet Heater Company, Erie, Pa., is making rapid progress in the introduction of a feed water heater radically different in construction from anything else of the kind, having a guaranteed efficiency that is claimed to be higher than any apparatus of the same rating sold in competition. Being made entirely from cast iron there is nothing to get out of order, and one of these heaters will outlast several boilers.

Machinery for mining and coking operations, timber cutting and the manufacture of wood products will be required in due course by the Aracoma Coal Company, Logan, W. Va., in which E. B. Hubbard of that place is the moving

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spirit. The company was recently incorporated and has extensive holdings in that vicinity.

The Aluminum Company of America, Pittsburgh, is finding one excellent outlet for its product in the electric railway field, where it has proven practicable to use aluminum feeder lines for power transmission that are less than half the weight of copper wire and of equal strength and conductivity.

The Pittsburgh office of Wickes Brothers is distributing that firm's monthly stock list of boilers, engines, pumps, shop tools and electrical machinery, which are ready for prompt delivery.

Jos. F. Eberly, Westfield, Pa., manufacturer of leather goods, is erecting a factory, 50 x 200 ft., with a wing, 56 x 75 ft., one story, of brick reinforced concrete and structural iron construction.

Milwaukee

MILWAUKEE, WIS., September 12, 1910.

Recent contracts taken in the more remote districts of the United States, British Columbia, Alaska and Mexico, by representatives of several of the larger machinery builders here have brought enough work to local shops to materially swell the expected volume of fall production, and the effect is visible in preparations now being made for an enlarged output. From the industrial centers of the East and Central West few orders of any consequence have been secured lately, but there is a good deal of business in sight, and the situation is nowhere discouraging. The South is also offering better opportunities than for some time past and inquiries from the Southwest, especially Oklahoma, show a decided increase.

Foundries, machine shops and other manufacturing plants that cater to the automobile industry are feeling the effect of the present comparative dullness in that line. In some cases working forces have been curtailed. This condition is, however, not expected to last very long, for, while there has been a great deal of talk concerning lessened production on the part of the principal motor car manufacturers, the new plants that are coming into the field, together with the growth of numerous small concerns, can hardly fail to provide even more work than last year. In Wisconsin the increase of commercial vehicle building will alone afford an appreciable outlet for auto machinery parts.

Shipments abroad have been quite liberal during the summer, and there is a tendency on the part of Wisconsin manufacturers to extend their trade in foreign countries. South America is being particularly looked to for business of a certain class, but even in Europe some good sales have been made by local machinery builders who are represented there.

The new power plant of the Algomah Mining Company at Houghton, Mich., on the upper peninsula of Michigan, including boilers, feed water pump, hoisting engine, air compressor, &c., is near completion, and from this time on development work will be actively prosecuted. The purchase of some additional equipment will be necessitated during the fall and winter months.

The Dornfeld-Kunert Company, Watertown, Wis., is very successfully introducing a type of gas producer which generates a gas free from impurities and is very simple in operation, there being automatic air and water vapor control for different loads and no valves to adjust. Included in the design are also other features of interest that have attracted a great deal of attention from power users in this part of the country.

A new factory is to be erected at Reedsville, Wis., by the Wisconsin Pea Canners Company. Power and operating machinery will be required.

Foster superheaters, manufactured by the Power Specialty Company, 111 Broadway, New York, have come very largely into use in connection with Milwaukee built machinery for electric power plants, particularly steam turbines, the efficiency of which they undoubtedly increase materially when an installation is considered as a whole. Present tendencies seem to lie more than ever in the direction of superheated steam for plants in which operating economy is a factor, and the market for apparatus such as that above mentioned is gradually widening.

The size of the factory to be erected by the Helvetia Milk Condensing Company at New Glarus, Wis., has been decided upon as 180 x 240 ft., and building contracts are now being let. The company's main office is at Highland, Ill.

In spite of delays attendant upon slow deliveries of material, stormy weather, &c., the work on the new plant of the Kempsmith Mfg. Company, Milwaukee, at the site recently secured in West Allis, is now progressing at a very rapid rate under the stimulus of a large construction force. The pattern shop has been erected, the machine shop and power plant are well under way and the foundations for the boilers, engine, generator, &c., are being prepared. It will not be long now before the company is in a position to undertake the largely increased production which the present demand for its milling machines necessitates.

Two new hoisting engines built by the Nordberg Mfg. Company, Milwaukee, are being installed on the property of the Miami Copper Mining Company, at Globe, Ariz. One of these is of large capacity, to be used for handling ore, and the other will serve the men employed in the mine.

One of the docks of the Great Northern Railway Company, at Superior, Wis., which is under lease to the Philadelphia & Reading Coal Company, is to be thoroughly modernized, and new electrically operated rigs for handling installed.

L. R. Felder has opened an office in Milwaukee, at 202 Majestic Building, for the sale of the products of the Chicago Pneumatic Tool Company, Chicago, Ill.

Funds for the purchase of an electric power and lighting plant have been voted at Sun Prairie, Wis.

One of the products of the Western Malleable & Gray Iron Company, Port Washington, Wis., is a line of gasoline engines ranging in size from 1½ to 15 hp., which are designed to be portable, and have come into quite extensive use for operating farm machinery, &c.

J. W. Robisch, who is building a large automobile garage at Jefferson, Wis., will install a machine shop for repair work in connection with it.

The Allis-Chalmers Company, Milwaukee, is building in its shops here a 20,000,000 gal. pumping engine for the city of Wheeling, W. Va.

An election is to be held at Walworth, Wis., to determine whether a pumping plant will be installed by the city.

The Freeman Zinc Company, Montfort, Wis., is planning to erect a new ore reduction plant by or before spring.

Changes in the water system at Ripon, Wis., which may involve the purchase of new pumping machinery, are being considered by the authorities there.

A three-story addition, 26 x 100 ft., is to be made this fall to the factory of the Western Grip & Trunk Company, Milwaukee.

The Racine Stool Company, Racine, Wis., has purchased the property on which its factory is located and has awarded contracts for the construction of two additional stories to its present factory building.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., is erecting an addition to its power plant 80 x 144 ft., at a cost of $80,000, and a substation 40 x 57 ft., at a cost of $25,000. Contracts have been placed for General Electric turbo generator units and Edge Moor boilers which will be installed upon completion of additions.

The Harvey Spring Company, Racine, Wis., is having plans prepared for a one-story factory building, 100 x 400 ft.

St. Louis

ST. LOUIS, September 12, 1910.

THE MISSOURI PACIFIC RAILWAY COMPANY'S LIST.

The general purchasing agent of the Missouri Pacific Railway Company, St. Louis, Mo., is receiving prices on the following list of tools, for delivery f.o.b. St. Louis:

Two horizontal boring machines, motor driven.
Two 84-in., two 54-in., three 37-in. vertical boring and turning mills, motor driven.
Two 84 x 18 in. by 18 ft. planers, with four heads, motor driven, with double belt drive.
Six 36 x 36 in. by 12 ft. planers, motor driven, with double belt drive.
Two 36 x 36 in. by 10 ft. planers, motor driven, with double belt drive.
Two 5 ft. 6 in. universal radial drills, motor driven.
Two 5-ft. semi-universal radial drills, motor driven.
Eleven 42-in. drill presses, motor driven.
One 28-in. drill press, belt driven.
Four sensitive drill presses, 15 in.
Three 90 in. wheel lathes, motor driven, with independent journal turning attachment, complete set of patented driving dogs, single quartering attachment and face plates recessed for long crank pins.
Two 42-in. steel tire turning lathes, with patented driving dogs, motor driven, tailstock to have power movement.
Three 30-in. by 14 ft. engine lathes, motor driven.
Two 28 in. by 12 ft. engine lathes, with taper attachment, motor driven.
Four 24-in. by 10 ft. engine lathes, motor driven.
Four 20-in. by 8-ft. engine lathes, belt driven.
Two 18-in. by 12-ft. engine lathes, with taper attachment, belt driven.
Eight 18-in. by 8-ft. engine lathes, belt driven.
Two 2-in. hollow spindle turret lathes, belt driven.
Four 18-in. brass turret lathes, belt driven.
Three 16-in. by 6-ft. toolroom lathes, belt driven.
Four 16-in. by 6-ft. bolt lathes, with two-step cone, belt driven.
Two 16-in. by 6-ft. motor driven portable bolt lathes.
Two 32-in. railroad draw cut shapers, motor driven.
Four 24-in. heavy duty back geared shapers, motor driven.
Three 15-in. slotting machines, motor driven.
Two universal milling machines, belt driven.
Two double emery grinders, for 20-in. diameter wheels.

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Two No. 2 universal tool grinding machines, 12 x 30 in., belt driven.
Five emery grinders, belt driven.
Three new twist drill grinders.
Three grindstones, 18 x 8 in., on wheels.
Two 100-in. 600-ton hydraulic wheel presses, motor driven.
Two 1½-in. double bolt cutters, with power feed and lead screw, motor driven.
Two No. 2 hack saws, belt driven, with 12-in. blade.
Three portable boring bars, 4½-in. bar 8 ft. long, with attachments for boring piston valve chambers.
Two valve facing machines with 22-in. disks, to finish 25 in. across corners.
Two No. 2, 1 to 4 in. pipe machines, motor driven.
Two combination centering and drilling machines, capacity ⅛ to 4 in.
Two special 2000-lb. single frame steam hammers, with guided rod, 45-in. stroke, 36 in. from center of dies to frame.
Two 800-lb. single frame steam hammers.
Two 2-in. heading, upsetting and forging machines, belt driven.
Two 2-in. double bolt cutters, with power feed, motor driven.
Three blowers, motor driven.
Two single spring tempering furnaces, oil burning.
Two oil burning case hardening furnaces.
Two oil burning bolt furnaces.
Two oil burning forging furnaces
Twenty anvils, 400 in. each.
Twenty-five blacksmith forges, 48 x 48 in.
Two 36-in. automatic cut-off saws, belt driven.
Three rip saws, without self-feed, without countershaft, with saw, belt driven.
Two 36-in. band saws, belt driven.
Three hollow chisel mortisers, with single boring attachments, belt driven.
Two electric motors, 15 hp., 725 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum release starting rheostat.
One electric motor, 5 hp., 975 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum release starting rheostat.
One electric motor, 30 hp., 1025 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum release starting rheostat.
One electric motor, 7½-hp., 975 rev. per min., 220-volt, D. C., constant speed, shunt wound, complete with minimum speed release starting rheostat.
Two single punch and shears, 20-in. throat, to punch 1¾ in. diameter through 1⅜ in. steel, to shear 2¼-in. round iron, belt driven.
Two single shears, 48-in. throat, to shear 1-in. plate and punch 1¼-in. diameter in 1-in. plate, motor driven.
Two oil burning flue welding furnaces.
Two flue welding machines, belt driven.
Two flue cutting machines.
Two single punches with 48-in. throat, to punch 1¼-in. diameter through 1-in. plate, to shear 1-in. plates, motor driven, with jib cranes mounted on top.
Two plate bending rolls, No 2 machine, 10 ft. 2 in. between housings, motor driven.
Four forges, 48 x 48 in.
Two light power single punches, 24-in. throat, with shearing attachment complete, belt driven.
Four boiler makers' lever forges, No. 82.
Seven anvils, 400 lb. each.
Two flue cutting apparatus with No. 2 cutter, without motor.
One 28-in. drill press, motor driven, with geared motor drive.
One 36-in. automatic cut-off saw, belt driven.
Two 15-hp. induction motors, complete with sliding bed plate, pulleys and auto starter, 710 rev. per min., 220-volt, 25-cycle, three-phase.
One 30-hp. induction motor, complete with sliding base, pulley and auto starter, 1430 rev. per min., 220-volt, 25-cycle, three-phase.
One 7½-hp. induction motor, complete with sliding base, pulley and auto starter, 705 rev. per min., 220-volt, 25-cycle, three phase.
One 3500-lb., one 2500-lb. and one 1100-lb. single frame steam hammers.
One 300-lb. belt driven rubber cushioned bevel hammer.
One 5-in. universal forging machine, motor driven.
One 2-in. heading, upsetting and forging machine, belt driven.
One 32-in. draw cut shaper, motor driven.
One 5-ft. semi-universal radial drill, motor driven.
Three 16-in. by 6-ft. bed bolt lathes, with two-step cone, belt driven.
One four-side timber planer and sizer, 14 x 24 in., with 100 hp. D. C. motor.
One No. 3 pipe machine, 1¼ to 6 in., motor driven.
One chain mortiser, for cabinet shop and sash and door work.
Three 24-in. heavy duty back geared shapers, motor driven.
One 32-in. draw cut shaper, motor driven.
Three 42-in. vertical boring and turning mills, motor driven, with two heads.
One 37-in. vertical boring and turning mill, motor driven, with two heads.
Two 24-in. by 12-ft. bed engine lathes, belt driven, one to have taper attachment.
Three bolt driven lathes, 16-in. by 6-ft. bed, with two-step cone, belt driven.
One 5-in. semi-universal radial drill, with motor drive.
One double emery grinder, motor driven, for 20-in. diameter wheels.
One 1½-in. double bolt cutter, with power feed and lead screw, motor driven.
Two No. 2 improved brass turret lathes, belt driven, back geared.
One sensitive drill press, 15-in.
One 72-in. plate bending rolls, motor driven.
One double punch and shear, 36-in. throat, motor driven, arranged with radial crane mounted on top.
One pneumatic clamp, 16-ft.
One 800-lb. steam hammer, single frame.
One 1500-lb. single frame steam hammer.
One 36-in. band saw.
One 3500-lb. double frame steam hammer.
One 100-lb. single frame steam hammer.
One 300-lb. belt driven rubber cushioned bevel hammer.
One 32-in. railroad draw cut shaper, motor driven.
One turret lathe.
One 28-in. turret lathe.
One 50-hp. motor, 220 volts, D. C., constant speed, shunt wound, with low voltage release starting box.
One special 1500-lb. single frame steam hammer.
One 24-in. heavy duty back geared shaper, belt driven.
Two 16-in. by 6-ft. bolt lathe, with two-step cone, belt driven.
One 30-in. by 14-ft. bed engine lathe, with taper attachment, belt driven.
One four-side timber planer and sizer, 14 x 24 in., belt driven.
One 42-in. vertical boring and turning mill, belt driven.
One flat head turret lathe.
One 300-lb. belt driven rubber cushioned hammer.
One 42-in. vertical boring and turning mill, with two heads, belt driven.
Two 16-in. by 6-ft. bolt lathes, with two-step cone.
Three 42-in. vertical boring and turning mills, belt driven.
Two 16-in. by 6-ft. bed engine lathes, with two-step cone, belt driven.
One 42-in. drill press, belt driven.
One 36 x 36 in. by 12 ft. planer, with three heads, belt driven.
One 36-in. by 14-ft. bed engine lathe, with taper attachment, belt driven.
One 24-in. heavy duty back geared shaper, belt driven.
One 36-in. band saw, belt driven.
One No. 310 automatic hollow chisel mortiser, with single boring attachment.
One 800-lb. single frame steam hammer.
One 36-in. band saw, belt driven.
One No. 5 punch, size O, hand power, capacity ⅝ in. for ½-in. plate, 36-in. throat.
One hand power shear, capacity ½-in. plate.
One hand power punch, capacity ⅝ in. for ½-in. plate, 36-in. throat.
One hand power shear, capacity ½-in. plate.
One straight line air compressor, capacity 200 cu. ft. of free air per minute, air pressure 100 lb. per square inch.
One band saw, inclosed type, belt driven.
One heavy duty back geared shaper, 24-in., belt driven.

The Webb Motor Fire Apparatus Company and the Robinson Fire Apparatus Company are both quite busy. The former concern gives its exclusive attention to automobile fire engine outfits and the latter is also devoting much time to this new branch of the industry.

The Lemp Brewing Company has been making some extensive improvements in its plant, including a new boiler house, which is now practically complete.

The Duplex Adding Machine Company has been purchasing new equipment from time to time to keep pace with its growing business.

The Commonwealth Steel Company has under way a new section of building to further increase its foundry floor capacity.

Smith & Davis Mfg. Company, maker of metal bedsteads, &c., now operates a modern foundry for its own exclusive use, the growth of business having made this necessary.

The Wagner Electric Mfg. Company, which is becoming one of the large industries of this section, finds the demand for its single phase motors, &c., particularly heavy, and all other departments of the plant are also well occupied.

The Williams Crusher Company placed an order last week for a heavy milling machine.

The Hall & Brown Woodworking Machinery Company is making some changes in its equipment and among recent orders placed was one for a Kempsmith miller.

A tornado swept the Joplin district September 4, entailing heavy property damage. Galena, Kan., and the country surrounding bore the brunt of the storm and 10 mining plants were destroyed, causing a loss of upward of $150,000.

The St. Louis County Gas Company has purchased 44 acres of land at Shrewsbery Station and will erect a plant on the site which will have a capacity of 730,000,000 ft. a year, and they will also have a storage container with a capacity of 1,000,000 ft

During the present month the erection will be commenced of the buildings at Ottumwa, Iowa, to be occupied by the Ritchie Corrugated Culvert Company. The track connecting with Chicago, Milwaukee & St. Paul Railroad is now in course of construction.

The Central Tire Company will occupy a new factory to be built at Marshalltown, Iowa, for the manufacture of steel and leather tire protectors for automobiles. F. L. Randall of Boulder, Colo., is superintending the establishment of this new company at Marshalltown.

The new Mercer Wheel factory at Burlington, Iowa, which was begun in May has been completed and has been started up and within a few weeks everything will be in thorough order.

The city of Jacksonville, Ill., is advertising for bids for all the material and labor and erecting and installing a pumping plant for the city. Sealed bids will be received up to September 19.

The American Gypsum Company will erect a plant to cost $100,000, on property located near Nashville, Tenn., on the Memphis, Dallas & Gulf Railroad, three miles south of Murfreesboro. The property is known as "plaster bluff" and the company's products will be plaster, fertilizers, &c.

The Appalachian Marble Company, Knoxville, Tenn., will erect a new mill at Concord, Tenn. The company, which was recently incorporated, has secured the plant of the Tennessee Marble Company at Concord.

Mrs. Dakotak Ryan, Leavenworth, Kan., will largely increase the capacity of her ice plant on South Second street. The plant has now a capacity of 75 tons a day. Mrs. Ryan has asked for proposals for machinery sufficient

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to manufacture 150 tons. The cold storage warehouse has now a capacity of 10,000 barrels and it is proposed to increase it to 30,000.

Workmen have begun the erection of the Parker carnival equipment factory on South Fourth street, Leavenworth, Kan. J. V. Kelly is the agent for the company

The Beacon Mining Company, Franklin Playter, president, is contemplating the erection of a 200-ton mill near Galena, Kan. The company has installed a large centrifugel pump in an old shaft and will sink another and deeper shaft nearby.

The Woodcock Mfg. Company, Vinita, Kan., with a capital stock of $20,000, has been granted a charter. The incorporators are J. C. Woodcock, Marshall Stevens, C. W. Day and others.

The Ferguson & Wheeler Handle Company, Marked Tree, Ark., leased and operated by Turner & Hirschmann, burned September 1, entailing a loss of about $50,000.

The Goliad Water & Light Company, Goliad, Texas, is negotiating for an ice plant to be placed in operation next season.

An extensive pumping plant, costing $130,000, will be erected at Eagle Lake, Texas, which will insure the rice-growing section the greatest pumping plant on the Colorado River. The parties interested in the enterprise are as follows: W. T. Eldridge, Sugarland, president; John Lane, Houston, vice-president; John Roeger, Eagle Lake, consulting engineer.

The Center Light & Ice Plant, Center, Texas, will make extensive improvements in its machinery. The capital stock has been increased $20,000. The purpose is to increase the productive capacity of the plant by the introduction of larger machinery, thus enabling the operation of fans and electric motors at all points on the line and supply nearby towns.

G. A. Mellon, 3505 Pine street, St. Louis, Mo., is having plans prepared for a four-story factory building, 130 x 150 ft., which will be occupied by the Regal Buggy Company when completed.

The Automatic Register Company, East St. Louis, Ill., will shortly build a plant at East St. Louis for the manufacture of an automatic passenger indicator for attachment to electric street cars and passenger trains, which will indicate mechanically the exact amount earned by the car. The company has offices in the Metropolitan Building, East St. Louis.

The Missouri Pacific Railroad Company, St. Louis, Mo., is building a locomotive repair shop at Kansas City. The shop will be 153 x 334 ft., and it is estimated it will cost about $136,000.

C. E. Osborn, Alton, Ill., is arranging to incorporate a company to manufacture motor cycles. It has not been decided just where the plant will be located.

The Southwest

KANSAS CITY, MO., September 12, 1910.

It is reported from a number of points that dealers in machinery who have been handling stocks on consignment and were planning on accumulating standard lines this fall for prompt delivery are finding difficulty in carrying out that arrangement, as the builders prefer to ship directly from their factories on individual orders, leaving in the hands of agents only enough apparatus to serve as samples. Just how far there is a tendency on the part of Eastern houses to alter existing customs of the trade it is at present impracticable to state, but conditions are evidently changing to some extent, and the coming season will probably witness a readjustment of many established relations. Quite a number of the larger manufacturers now have their own warehouses at the various trade centers, and it is known that others contemplate building them. District stocks of power and electrical machinery, pumping outfits, gasoline engines, &c., are especially to be increased, and in many instances they will be directly under the control of branch office managers employed by the manufacturers themselves.

Business throughout the Southwest is quietly but steadily improving. Orders for equipment of all kinds follow more closely upon inquiries than they have at any time since last spring, and there is very little haggling over prices. Municipalities are still among the heaviest buyers, with mining companies, timber cutting and woodworking concerns next in line. Sheet metal and fabricating plants will be improved to a considerable degree during the fall, and for many foundries and machine shops replacements or extensions are contemplated, but in these lines buying is not likely to be very brisk until a little later on, except as recently noted.

The contract for installing a new filtration plant has been placed by the Newport Water, Light & Power Company, Newport, Ark., with the Roberts Filter Mfg. Company, Philadelphia, Pa.

Large crushing rolls built by the Taylor Engineering Company, Allentown, Pa., of which there are two sets, and eight sets of fine crushers from the shops of the same company, are being installed in the new concentrating plant of the Miami Copper Mining Company, Globe, Ariz. These are in addition to similar equipment previously used.

A new boiler will probably be furnished this fall for the municipal plant at Shelbina, Mo., which has a capacity of 200 hp. The present equipment was furnished by the Springfield Boiler & Mfg. Company, Springfield, Ill.

The Moore Mfg. Company, whose headquarters are now at Springfield, Mo., will remove machinery to Mammoth Springs, Ark., and remodel mill buildings there for its purposes, if the arrangement recently made with the commercial interests of that place is carried out. It is proposed to use electric power. This concern has at present one of the largest furniture factories in the Southwest.

With the sale of bonds recently issued for the purpose, equipment for an electric plant to be operated by the municipality will be bought at Coleman, Texas.

A new crushing and pulverizing plant, equipped with heavy gravity stamps, tube mills, &c., will be built at Rosedale, near San Marcial, N. M., by the Rosedale Mining & Milling Company, to replace the mill that recently burned.

The Scott Mfg. Company is putting in a new woodworking plant at Helena, Ark. The machinery has been provided, but additional equipment will be needed later.

Plans for the replacement of the power and pumping station recently destroyed by fire are being worked out at Belleville, Kan.

It is the intention of the Salina Light, Power & Gas Company, recently organized at Salina, Kan., by G. H. Smedley and others, to build a gas plant and an electric power and lighting station with which to supply the city, local industries, &c.

The Hackett Mining Company, Joplin, Mo., is installing machinery in a new concentrating plant, which has been especially constructed after the designs of Prof. R. H. Richards of the Massachusetts Institute of Technology, Boston, Mass.

The city of El Paso, Texas, will take bids until September 20 on a refuse incinerator and sewage disposal plant of 30 tons and 3,000,000 gal. daily capacity.

The Missouri Valley Bridge & Iron Company, St. Louis, has been awarded the contract for 24 bridges to be erected for the county in which Okemah, Okla., is located.

A new pumping engine and air compressor for boosting the pressure in the city mains will be installed this fall at Floresville, Texas.

Machinery for a new mill will be installed within the next two months at Benton, Ark., by the Greenville Stave Company, Greenville, Ark.

Arrangements are being completed for the erection of an ice plant of 60 tons capacity to be operated in connection with the Arkadelphia Milling Company, Arkadelphia, Ark. F. Noland of the milling company will be one of the principal stockholders of the company, which will have $25,000 capital.

The Wichita Railroad & Light Company, Wichita, Kan., is having plans prepared for the erection of railroad shops and car barns to be erected at a cost of about $35,000.

The plant of the Belleville Light & Power Company, Belleville, Kan., which was destroyed by fire at a loss of $35,000, will be rebuilt.

The Bailor Plow Company has been organized at Atchison, Kan., to manufacture plows, planters, hay tools and other agricultural implements. The company has taken possession of existing plants, which will be equipped with new machinery and will require no power or transmission equipment. The officers and directors are: President, Henry Clostermeir; vice-president, S. E. Bailor; secretary and treasurer, T. R. Clendinen; P. B. Wagner, C. A. Lierboe.

The Pacific Coast

SEATTLE, WASH., September 9, 1910.

A great deal of interest is being taken here this week by local commercial firms, including men engaged in the iron, steel and machinery trades, in the return from Alaska of Secretary Nagel and Attorney-General Wickersham, who, with Secretary Ballinger, recently expressed a desire to confer with representatives of business on the north coast concerning the possibilities of that territory when properly opened up to industrial development, as well as the best means of effecting the latter. The quantity and increasing variety of the equipment and supplies ordered this season for established industries or development enterprises in Alaska, together with the publicity given the controversy over coal land entries, has opened the eyes of people here to the importance of the question and its bearing upon the

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market for the products of the plants of this section. Henceforth it will be given proper consideration.

The new car shops of the Chicago, Milwaukee & Puget Sound Railway at Tacoma, Wash., which are among the best equipped of any in the United States, are now in full operation, and the repair work for the company's Western lines will be done there. This creates another large and regular customer for the machinery and supply houses of the north coast, and the disposition of the road will be to buy as much of its material as possible from manufacturers and dealers in this section.

In connection with their operations near Arlington, Cobb & Healy, Everett, Wash., are building a machine shop 50 x 125 ft., which will be equipped for heavy work.

It is reported from Loon Lake, Wash., that an electric power plant and water works are to be installed there by Gherke & Sons.

The International Lead & Iron Company, recently organized, of which H. H. Shallenberger, Spokane, Wash., is secretary, has established an office there in the Columbia Block. Plans are now being made to develop lead and hematite iron ore properties in British Columbia. It is proposed to establish blast furnaces and to build a pipe foundry and car wheel plant. Power is to be derived from a hydroelectric development, which is being independently completed at a point near the company's operations.

The Stetson-Ross Machine Works, Seattle, Wash., is introducing among the woodworking plants of the north coast a fast feed outside matcher which is notable for the simplicity of its design when considered in connection with the large output that it renders possible.

The Willapa Harbor Iron Works, South Bend, Wash., is finding one of its best selling lines in the production of jacks, of which it manufactures the Hercules type.

Repairs and improvements will be made in the plant of the Seattle Car Mfg. Company, Renton, Wash., a portion of which was recently visited by fire.

The expenditure of a large sum for remodeling and extending the local water works system is proposed at Snohomish, Wash.

The Alaska-Treadwell Company, Juneau, Alaska, is preparing to complete a large hydroelectric plant in the vicinity of its mines. The water right, however, has recently been contested by another company and this may delay the work.

The Oregon Railroad & Navigation Company has awarded contracts for the erection at La Grande, Ore., of a machine shop 132 x 132 ft. and a blacksmith shop 65 x 95 ft., to cost $160,000.

The Phoenix Iron Works, Portland, Ore., is erecting a two-story frame foundry building 88 x 130 ft., to take the place of its present foundry. The company has a full equipment but expects to install an electric traveling crane in the near future.

The Smith & Watson Iron Works, Portland, Ore., is building a forge shop which will be equipped with modern machinery, including forging presses, oil furnaces, &c.

The Baker-Smith Machine Company has been organized to take over the affairs of the Baker Machine Company, manufacturer of gasoline marine engines, of San Diego, Cal. The company will be expanded by the erection of a foundry and will make a specialty of manufacturing engines of from 3½ to 12 hp. The company is also agent for the Eastern Standard engine and has assumed the California agency of the Pierce Motor Company, Racine, Wis.

The Northwest

MINNEAPOLIS, MINN., September 12, 1910.

Trade during the past week has been about normal for this time of the year, but to those who looked for a general resumption of buying early in September the situation is disappointing. Events attendant upon Mr. Roosevelt's visit, the Conservation Congress, primary elections, State fairs, local expositions, &c., have occupied public attention to a greater extent, it seems, than in any former year, and business is slow in settling down to any definite autumn policy. A general spirit of unrest is also manifested, which makes it difficult to predict what the immediate future of the market will be. Dealers in the leading trade centers are having a fair run of orders, and in the local metal working industries shops are busy on routine work, including repairs, plate work, iron and steel fabricating for various purposes and the production of special machinery to order. Bookings on these accounts are made for enterprises at considerable distances, as well as the ones nearer home.

The capacity of the municipal power plant at Alexandria, Minn., which is now equipped with engine driven generators built by the General Electric Company, Schenectady, N. Y., will be increased by the purchase of an additional unit.

The city authorities at Preston, Minn., have under consideration plans for the construction of a hydroelectric power plant of about 200 kw.

The Coeur d'Alene Iron Works, Wallace, Idaho, which were visited by the recent conflagration there, will be rebuilt for larger capacity and equipped with the most modern machinery electrically operated. Meanwhile, temporary arrangements will be made to take care of the large business which is done by this company in furnishing mining equipment and supplies.

Pumping machinery for Ft. Missoula, Mont., will be built in the shops of the Anaconda Copper Mining Company, at Butte, Mont.

A bond issue to the amount of $30,000 has been authorized at Fairmont, Minn., for the purpose of enlarging the electric power plant, which is at present equipped with alternating current generators of 175 kw., driven by gas engines of the Minneapolis Steel & Machinery Company's build. The extension of the city pumping and water works system is also contemplated.

J. B. Thompson has been granted the franchise for an electric lighting plant at Gilbert, Minn., and is expected to purchase machinery for it in the near future. A battery of boilers, Corliss engine and alternating current dynamo will probably be among the requirements.

The Northern Welding & Mfg. Company, Minneapolis, which has the Northwestern agency for the Davis-Bournonville Company, is installing quite a number of private plants for oxy-acetylene welding, besides doing custom work in repairing broken castings of any size, whether steel, cast iron, aluminum, brass, bronze or any other metal. The outfit furnished is one that enables large factories or mills to do their own repairing, thus not only saving in the expense for the work, but also obviating long and costly delays in operation due to the breakage of vital parts of machinery.

Improvements in its large dock at Duluth, Minn., which include the installation of modern electrically operated handling machinery, will be made by the St. Paul & Western Coal Company, whose headquarters are in St. Paul.

The construction of an electric power plant to be owned and operated by the community is proposed at Bowdle, S. D., but no definite steps to that end have as yet been taken.

The Power Equipment Company, Minneapolis, now maintains a complete machine shop for manufacturing and job work. It is prepared to undertake repairs of any kind, from rewinding electrical machinery to boring engine cylinders or other similar service.

The construction of a water works system has been definitely decided upon at Harlowton, Mont. Purchase of equipment will be considered at some time during the fall and early winter.

The city of St. Paul has ordered two new pumping units with a combined capacity of 25,000,000 gal.

The citizens of the village of Marble, Minn., will vote on the question of issuing $30,000 in bonds for the construction of a water works system.

The Northwestern Insulation Company, St. Paul, Minn., recently organized, has plans prepared for the erection of a factory building, 65 x 240 ft., and a boiler house, 60 x 70 ft.

The White Track Laying Machine Company, Foley, Minn., has filed articles of incorporation with $150,000 capital stock. The company will manufacture a track laying machine, of which J. White of Foley is the inventor, and operations will be commenced as soon as the organization of the company is completed.

The Farther Central West

OMAHA, NEB., September 12, 1910.

Purchases of boilers, pumps, heaters and auxiliary apparatus for power and heating plants have constituted a feature of trade thus far this month, and more buying on this account will be done within the next few weeks, as there is a rush now to get such plants in shape for operating by the time cold weather sets in. For many private plants and large public buildings other mechanical equipment, such as ventilator fans, motors, electric elevators, air compressors, &c., are needed. Fabricated metal is also largely wanted, both for ordinary structural and ornamental purposes, and the shops supplying that class of trade are very busy. In the line of general machinery for factories, mines, contractors' service, &c., the situation is as previously reported, trade being fairly steady but showing no marked gains. Very little machine shop or foundry equipment is being ordered.

An order for two steam turbine generating units of 1000 kw., with condensers, exciters, transformers, switchboard, &c., has been placed by the Federal Light & Traction Com-

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pany, Denver, Colo., with the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

An additional substation will be built and equipped in the near future by the Nebraska Traction & Power Company, Omaha, Neb. Included in the plans for betterments is also a new forge and machine shop for repair work.

The Salt Lake City office of the Allis-Chalmers Company, Milwaukee, has closed a contract for machinery to be used in connection with tungsten mining near Osceola, Nev., carried on for the account of O. E. Turner, Philadelphia, Pa. The comparatively rare occurrence of this mineral renders the installation an unusual one and its operation will be watched with considerable interest.

Machinery for the new electro-chemical ore reduction plant of the Western Metals Company, Georgetown, Colo., which has been principally furnished by the General Electric Company, Schenectady, N. Y., is now being installed. The operation of this mill will be watched with a great deal of interest, and if successful it will lead to the use of a good deal of similar equipment by others.

The Gade Bros. Mfg. Company, Iowa Falls, Iowa, which was one of the earliest concerns in this part of the country to put gasoline engines on the market in any commercial quantities, has brought its present design to a high state of efficiency and operating economy.

The Standard Bridge Company, Omaha, Neb., has been intrusted with the building of a new steel bridge at Spearfish, S. D.

The Ft. Dodge, Des Moines & Southern Railroad, Ft. Dodge, Iowa, has decided upon the installation of transformers and two rotary converters of 400 kw. each in a substation to be erected this fall. Westinghouse machinery will be specified.

The Armstrong-Quam Mfg. Company, Waterloo, Iowa, is rapidly extending its trade in portable drilling machines, and for the coming season a larger output will be necessitated. An interesting feature in the construction of this apparatus is the fact that in the special machines for rock work the drilling motion is obtained by the use of elliptic gears rolling in contact.

Plans are being completed for modern shops of steel construction to replace the factory of the Ottumwa Box Car Loader Company, Ottumwa, Iowa, which was destroyed by fire. The details of the new equipment required have not yet been fully worked out.

An Export Association Formed

The American Manufacturers' Export Association was organized at the Hotel Imperial in New York City September 12. Manufacturers whose capital aggregates more than $250,000,000 were represented by their export managers or other officials. The number actually present was about 50, though the meeting by voice, letter or telegram represented 160 American manufacturers. The officers elected are as follows:

President, W. B. Campbell, secretary Perkins-Campbell Company, Cincinnati, Ohio; first vice-president, J. K. Rodgers, E. I. du Pont de Nemours Powder Company, Newburgh, N. Y.; second vice-president, D. P. Mitchell, Victor Talking Machine Company, Camden, N. J.; third vice-president, D. E. Delgado, Eastman Kodak Company, New Haven, Conn.; directors, I. S. Betts, National Cash Register Company, Dayton, Ohio; E. H. Allen, C. A. Edgarton Mfg. Company, Shirley, Mass.; S. S. Weart, Sun Vapor Light Company; Alfred F. Howe, the Borden Company; L. A. Kimball, Simonds Mfg. Company, Fitchburg, Mass., and Maurice Coster, Westinghouse Electric & Mfg. Company and Westinghouse Machine Company, New York.

It is asserted by those who are back of the movement that patriotism no less than a desire to make more foreign business for American manufacturers is its inspiration, and that united action and interchange of experiences on the part of American shippers will do for American export trade what commercial organizations in Germany have done for German export trade in the last 10 or 15 years.

Sales Managers Visit Cleveland and Pittsburgh District Mills.—Members of the Chicago Managers of Sales Association, United States Steel Corporation, started from Chicago Tuesday night, September 13, on a tour of inspection of plants in the Cleveland and Pittsburgh districts. The Lorain, Ohio, mills of the National Tube Company and Lorain Steel Company, and the Cuyahoga and Newburg plants of the American Steel & Wire Company at Cleveland were visited Wednesday. Thursday and Friday were to be spent at Ellwood City, Ambridge, Vandergrift, Homestead, Monessen, McKees Rocks and Pittsburgh, Pa., at plants of various subsidiaries of the Steel Corporation, the schedule calling for arrival at Chicago Saturday morning.

It is reported there that a large new factory will be built in Omaha by the V. S. Segerstrom Piano Company, Minneapolis, Minn., as the result of an arrangement recently entered into with the new industries committee of the Omaha Commercial Club.

A new electrically operated plant is to be built at Ft. Dodge, Iowa, by the Corn Belt Packing Company.

The contract for constructing a bridge at Lingle, near Cheyenne, Wyo., has been awarded the Pueblo Bridge Company, Pueblo, Colo.

The property of the Warm Springs Iron Works Company, Salt Lake City, Utah, has been sold by order of Judge M. L. Ritchie to Joseph A. Silver of Salt Lake City for $19,800.

The John Z. Evans Mfg. & Supply Company, Albia, Iowa, incorporated with $20,000 capital stock, is having plans prepared for a factory building, the contract for which will be awarded in the near future. The officers of the company are John Z. Evans, president; P. H. Hynes, vice-president; T. B. Dotts, treasurer; Wm. Powell, secretary. The company will manufacture mining machinery.

The city of Blue Hill, Neb., will expend $8000 for the construction of an electric light plant.

Government Purchases

WASHINGTON, D. C., September 12, 1910.

The Bureau of Yards and Docks, Navy Department, will open bids October 1 for completing power plant at the United States Naval Academy, Annapolis, Md.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids September 27, under schedule 2901, for four direct current motors, and on October 4, under schedule 2890, for 30 generators, and under schedule 2905, for one air compressor.

The Bureau of Supplies and Accounts, Navy Department, opened bids September 6 for the following:

Class 32, two turbo generating sets, one motor generating set and switchboard.—Bidder 2, the Bradley-Reese Company, Baltimore, Md., $9560; 48, the General Electric Company, Schenectady, N. Y., $11,900; 116, the Carey Steam Turbine Company, New York, $11,978.

Class 121, one combination paint grinding mill and varnish cutter.—Bidder 77, Manning, Maxwell & Moore, New York, $377; 99, the Charles Ross & Son Company, Brooklyn, N. Y., $550.

Illinois Coal Strike Settled.—The strike of Illinois coal miners which began in April was settled September 8 on a basis which gives the men practically all they asked. The increase in Williamson and Franklin counties is 6 cents a ton and in the northern district 5 cents a ton. Day workers are given an increase of 5.55 per cent. The scarcity of coal due to the strike was beginning to affect a number of industries.

Owing to a scarcity of labor and a deadlock between the Grand Trunk Pacific and the British Columbia Government, which will not permit of the employment of Orientals, the contract for a large section of the new transcontinental is being held up. This may delay the completion of the Grand Trunk Pacific through British Columbia for two years.

Henry E. Pridmore, Chicago, manufacturer of molding machines, has received an order from the International Harvester Company for 34 stripping plate machines and one rockover molding machine for shipment to that company's plant now being erected at Lubertzy, Russia.

Obituary

ISAAC L. ELLWOOD

Isaac L. Ellwood died September 11 at his home in De Kalb, Ill. He was born at Salt Springville, Montgomery County, N. Y., August 3, 1833, and with the advantages of a limited common school education began to earn his own livelihood in early youth. Having driven a team on the Erie Canal and worked as a clerk in a store, he made his way to California in 1851, spending four years in that State, the first year working in the mines and subsequently being a salesman in a Sacramento store. Having accumulated a small capital, he established a hardware store at De Kalb, Ill., in 1855, carrying on the business for 20 years, combining with it the occupation of auctioneer. His daily contact with farmers brought to him a full knowledge of the conditions and opportunities which he was able to improve so well in later years.

When J. F. Glidden invented what is known to-day as the Glidden barb wire Mr. Ellwood assisted him in obtaining patents, securing a half interest in the invention. In 1876 Mr. Glidden sold his interest to the Washburn & Moen Mfg. Company, and that company, together with Mr. Ellwood, after a litigation of some years, granted licenses to various factories. At that early stage of the industry the selling price of barb wire was 18 cents per pound. Through Mr. Ellwood's influence and foresight all the underlying and first patents on barb wire and on machinery for making it were combined, enabling him, with the assistance of others, to build up one of the largest and most successful business enterprises in the history of the country. For a time Mr. Ellwood was associated with Mr. Glidden and afterward with the Washburn & Moen Mfg. Company in the manufacture of barb wire, but later he became exclusive owner and manager of the large establishment at De Kalb, doing business under the firm name of the I. L. Ellwood Mfg. Company, and also of another establishment of considerable magnitude at the same place known as the Ellwood Wire & Nail Company, engaged in the drawing of smooth wire and the manufacture of barb wire, nails and fence staples. In the course of time these interests became constituent parts of the American Steel & Wire Company, of which Mr. Ellwood was second vice-president and chairman of the Executive Committee until it was taken over by the United States Steel Corporation. Soon after this great consolidation Mr. Ellwood retired from active participation in the business.

Mr. Ellwood was always loyal to his home city of De Kalb, where he had resided continuously for 55 years. When his business was merged in the American Steel & Wire Company he insisted as one of the conditions of the merger that the large industries he had built up at De Kalb should be continued in full operation. A large part of his personal fortune was invested in farm lands in that vicinity, and he also had large holdings in Texas and other States. He was active in State politics, and in 1902 was appointed a member of the State Board of Railroad and Warehouse Commissioners. Through his efforts the Northern Illinois Normal School was located at De Kalb. He was married in 1859 to Miss Harriet Miller, who died July 16, this year. He leaves two sons and two daughters. The sons are William L. and E. P. Ellwood, both residing at De Kalb. He amassed a very large fortune, of which in recent years he divided the greater part among his children.

J. FRANKLIN ROBINSON, Pittsburgh, died September 9, in Mercy Hospital in that city, aged 56 years. He was born in Wellsburg, W. Va., and went to Pittsburgh in his early manhood, entering the employ of his uncle, John H. Caughey, and later became a member of the iron firm of Caughey & Robinson, which afterward was succeeded by Robinson & Orr, dealers in rails and scrap material, now located at 421 Wood street. He was an active member of this firm until his death. He was actively identified with religious and benevolent organizations, especially the Young Men's Christian Association, of which he was a director for 36 years, and its president from 1886 to 1901. He was a member of the Duquesne Club, and a director and trustee of the Western Theological Seminary. He leaves a widow.

EDWARD W. ATWATER, for many years president of the Johnston Harvester Company, Batavia, N. Y., and one of Batavia's most prominent citizens, died suddenly of heart disease September 2. He was born at Rochester, N. Y., in 1842, and entered the service of the Johnston Harvester Company in 1886.

Personal

James A. Sherwood, who for five years has filled a responsible position in the sales organization of E. S. Jackman & Co., Chicago, agents for the Firth-Sterling Steel Company, has been appointed Canadian agent for Thomas Firth & Sons, Ltd., Sheffield, England. He will take full charge of the Canadian trade of that firm October 1 and will establish his headquarters in Montreal.

R. E. Turnbull, who has been identified for a great many years with the firm of Henry E. Pridmore, Chicago, manufacturer of molding machines, as special representative in the middle Western territory, has been appointed sales and factory manager by Mrs Pridmore, now at the head of the business.

J. Whitaker, 124 South Sixth street, Connellsville, Pa., formerly manager of the Connellsville Iron Works, is now engaged in business on his own account in furnishing structural steel and plate work and buying and selling new and second-hand boilers, pumps, and contractors' machinery of all kinds.

Ernst Wiener, president of the Ernst Wiener Company, New York, returned from Europe last week after an absence of several months on business.

The report that Frank McDonough, president of the McDonough Mfg. Company, Eau Claire, Wis., had become identified with the Smith & Watson Iron Works, Portland, Ore., is denied by the latter company.

N. T. Truschkoff, general manager of Blogodatny Mines and Smelters of Ekaterimburg Eral, Russia, is now in this country, to remain for 10 weeks, visiting various plants and manufacturers of mining equipment.

Joseph G. Butler, Jr., Youngstown, Ohio, president of the Bessemer Pig Iron Association and Chamber of Commerce of Youngstown and vice-president and general manager of the Brier Hill Iron & Coal Company, has returned from a four months' visit to Europe.

Leo G. Smith, formerly of the Bucyrus Steel Casting Company, Bucyrus, Ohio, and for some time connected with the steel foundry department of the Londonderry Iron & Mining Company, Ltd., Londonderry, N. S., has been appointed general superintendent of the Londonderry plant succeeding William Brown, resigned.

Charles F. Rand, New York, president of the Spanish-American Iron Company, has gone to Cuba and will spend the remainder of September at the company's iron mines in the Santiago and Mayari districts.

Chairman E. H. Gary of the United States Steel Corporation, who has spent the summer in Europe, will arrive in New York September 15.

C. H. M. Atkins, president of the Warner Elevator Company, Cincinnati, Ohio, returned last week from a four months' European tour.

The La Belle Iron Works' Annual Report

The annual report of the La Belle Iron Works, Steubenville, Ohio, presents the following income account for the year ending June 30, 1910:

Net earnings, after deducting $743,000 for repairs, &c.		$2,227,329.04
Less provision for mineral exhaustion, &c.		59,743.45
Profits for the year		$2,167,585.59
Deduct interest on bonds	$137,895	
Dividends paid	892,339	
		1,030,234.00
Surplus for the year		$1,137,351.59
Previous surplus		2,063,218.21
Total		$3,200,569.80
Less appropriation for depreciation		250,000.00
Net surplus		$2,950,569.80

The net surplus for the previous year was $877,563.73.

The balance sheet shows total current assets of $5,780,880.63, and total current liabilities of $560,819.61. In addition to the surplus above stated, the company carries $1,690,803.18 in reserve funds for general depreciation, exhaustion of minerals, extraordinary repairs, &c.

The production for the year as compared with the previous year was as follows:

	1909-'10.	1908-'09.
Pig iron, tons	209,461	130,898
Slabs and billets, tons	347,978	201,686
Plates and skelp, tons	271,783	165,625
Sheets, tons	41,468	36,598
Tubular goods, tons	70,782	51,532
Nails, kegs	194,682	187,722

The dividends paid during the year were at the rate of 8 per cent. per annum for the first two quarters and 10 per cent. for the last two quarters.

From President Isaac M. Scott's accompanying remarks to the stockholders the following extracts are taken:

"The year just closed was in many respects an unusual one, and to some extent disappointing. Twelve months ago the principal transportation companies of the country were making such headway in the shaping up of their finances as to justify them in purchasing equipment on a liberal scale. In fact, at that time the volume of railroad buying had again about reached normal conditions. This satisfactory situation on the part of the country's largest user of steel products, coupled with strong underlying business conditions generally, seemed to warrant the belief that the year 1910 would be an unusually prosperous one for those engaged in the manufacture of steel and steel articles, but during the last quarter of the calendar year 1909 disturbing questions of one kind or another, largely political, began to crop up with such frequency and were of so serious a nature as to render it almost impossible for the railroads to further market their securities, which it was necessary for them to do in order that they might take care of additional obligations. The outcome of all this has been a curtailment, reaching in some instances to almost a complete discontinuance of buying, not only of rails, cars and locomotives, but minor supplies as well. With this falling off in railroad buying, the demand for steel goods was reduced to a point where there was hardly sufficient to go round, prices suffering accordingly. The net result of these conditions has been to discourage the dealers and consumers generally from placing orders ahead, reducing the business to a hand to mouth buying basis, which is not conducive to good mill operations.

"Another disadvantage under which the company labored during the year was brought about by the radical advance in the price of coke, scrap and other like commodities, that took place during the last half of the calendar year 1909, and extending into the first quarter of this year. The advance in the price of materials which it was necessary to buy naturally had an unfavorable effect on the company's costs, and while the market price of finished articles responded to some extent, the advance in these was not in keeping with that shown in the raw materials, nor was the advance in the price of the former maintained for a sufficient length of time to enable the company to reap a proper benefit therefrom. In other words, the year's business suffered the disadvantage of higher costs without receiving a corresponding advantage in the way of increased prices for goods sold. Labor troubles also interfered with the year's business to an extent, but these, we are pleased to say, have now all been satisfactorily adjusted.

"In view of the experiences of the last year it is unsafe to undertake to foretell what may be expected during the coming 12 months, and it is, therefore, to be hoped that before matters go too far, and a good business situation thoroughly spoiled, something will develop to divert the attention of the political agitator, in order that his efforts may be devoted to a line of action which, if not really helpful in itself, may not be of a disturbing nature."

Rogers-Brown Barges on the Erie Canal

The Rogers-Brown Iron Company, Buffalo, N. Y., is planning the construction of a fleet of barges to operate on the present Erie Canal, and adapted also for the new and enlarged canal. The boats will be equipped for use on both salt and fresh water, and fitted with movable hatches, similar to the large lake ore boats. The tugs will have dynamos and electric cranes for handling pig iron to and from the docks, either with magnets or hook hoists as desired. The very latest design of coal-saving machinery will be used.

This new method of shipment will enable the Rogers-Brown Iron Company to make direct deliveries of its furnace products promptly to all points on the Erie, Oswego and Champlain canals, Hudson River, New York harbor, Newark Bay and nearby New Jersey points, East River and Long Island Sound.

The Pittsburgh Foundrymen's Association.—The first fall meeting of the Pittsburgh Foundrymen's Association was held in Engineers' Hall, Oliver Building, Pittsburgh, on the evening of September 12. J. C. Knoeppel of the Jones & Laughlin Steel Company gave a talk on cupola practice, illustrating it by a model of cupola and tuyeres. The meetings of this association will hereafter be held on the first Monday of each month at the above named place.

The Associated Foundry Foremen of Philadelphia and Vicinity have completed arrangements for their first annual dinner to be held at the Hotel Bingham, Philadelphia, on the evening of September 24. Among the speakers will be Rev. John R. Davies, D.D., Dr. Wilmer Krusen, Abram C. Mott, Hon. J. Hampton Moore and Mayor John E. Reyburn. Several novel features are promised in connection with the dinner which, from reports received by the committee, will no doubt be an elaborate affair.

F. E. Fieger, engineer, House Building, Pittsburgh, is taking estimates on the erection and equipment of the new steel plant to be built by the Whitaker-Glessner Company, at Yorkville, Ohio, near Wheeling. Two 60-ton open hearth furnaces, a blooming mill and a bar mill will be built. The steel produced will be consumed by the company's sheet mills at Wheeling.

The blast furnace of the Upson Nut Company, Cleveland, Ohio, was blown out September 3 for repairs and the installation of a pig casting plant. The furnace will go on basic iron when the company's new steel plant is placed in operation, which will probably not be until after the first of next year.

A Nelson Valve Celebration

The Nelson Valve Company, Wyndmoor, Pa., on September 6 held its annual gathering of sales representatives and executive forces. During the day various conferences were held and the plant, to which many improvements and additions have recently been made, was fully inspected. Following a luncheon at the White Marsh Valley Country Club, a lantern slide lecture, covering the detailed manufacture of the company's product, was given.

In the evening a dinner was given to the officers, department executive heads, sales representatives and a number of invited guests, amid novel surroundings. It was served in the new open hearth steel foundry building, 160 ft. long by 50 ft. wide, which is about completed and which was tastefully decorated for the occasion. As a background to the table, which was in the form of a horseshoe and laid with 50 covers, were the open hearth furnaces, ovens and general foundry equipment, while an electric traveling crane and a bull ladle of the usual foundry type took part in the service. Samuel F. Houston, president of the company, presided at the dinner, assisted by Carlisle Mason, vice-president and general manager. The menu was elaborate. The coffee was served by means of the electric crane and ladle, the coffee being tapped into the cups by means of a small stopper valve in the bottom of the ladle. This crane also served as a means of carriage for an elaborate silver loving cup, which was presented to Vice-President Carlisle Mason as a testimonial from the department executives. M. Sims, superintendent of the foundries, made the presentation speech, to which Mr. Mason responded. Impromptu addresses followed by President Samuel F. Houston, Auditor Stockton Bates, C. E. Huxley, George W. Butters, W. J. Spencer and others.

Among others who attended the dinner were M. D. Baedy, treasurer; Russell Bonnell, secretary; H. I. Landis, assistant secretary; George R. Van Dusen, D. A. Morris, H. J. Moyer, J. V. Schmid, T. K. P. Haines, purchasing agent; J. W. Hyppensteel, assistant purchasing agent; W. J. Spencer, general sales agent; H. C. Baynard, assistant general sales agent, and the following sales representatives: R. E. Thomas, Philadelphia, Pa.; John E. Rollins, Chicago; B. H. Hill, Pittsburgh; Geo. W. Butters, Minneapolis; S. P. Wright, Butte; C. W. Pike and R. D. Pike, San Francisco; G. M. Milligan and C. E. Huxley, Canada; Le Roy Gordon, New York; F. W. Rockstroh, Pittsburgh; James Morton, export department. The department heads included C. C. Peck, superintendent; M. Sims, superintendent of foundries; Fred Fiechter, L. L. Eskell, F. A. Babcock, Richard Ryder, P. J. Collins, J. H. Eddleman, John Fiechter, Thomas Greenwood, W. C. Douglass, C. E. Cookson, Chas. T. Greenwood, Wm. B. Fetterman and John W. Mangan. Among the invited guests were M. Vinstchger, C. H. Simmons, H. E. Harrington, J. H. Vandyck and August A. Miller of *The Iron Age*.

As a souvenir of the occasion each participant was presented with a serviceable leather bill fold, the menu and various other data regarding the plant and its officers being printed on imitation banknotes contained therein. Music was rendered during the dinner by an orchestra screened behind palms, while "The Engineer's Song," by T. K. P. Haines, sung by W. J. Spencer to the tune of "The Old Oaken Bucket," was received with enthusiasm. It is as follows:

Expensively dear are the valves of my boyhood
When various old scrap piles recall them to view,
On boilers, on engines, on much tangled pipe lines,
Their cost, like a river, increasingly grew.
How often with Maggie, in blue gown and bonnet
We carried dad's supper which mother had made;
Dad longed for his cot, he could seldom lie on it
For nightly valve fixing was part of his trade.

PAST CHORUS.

The old fashioned globe valves
The stingy old gate valves,
The rust covered check valves
That leaked in the mill.

But now Nelson valves I acclaim as a treasure
For always at morn when returned to the mill,
I find them the source of unlimited pleasure
Tight, easy to open, obeying my will.
When lightly I touched them, they promptly responded,
The fluid sped quickly, it seemed with delight
To take up its task till the whistle resounded
When gently I closed them—the Nelson's were tight.

PRESENT CHORUS.

The new pattern globe valves
The strongly made gate valves,
The superheat steel valves
Much prized in the mill.

Canada Would Check European Dumping

TORONTO, September 12, 1910.—H. S. Scott, until lately the representative of the Canadian Customs Department in New York, has been sent to London in the capacity of the same Department's chief agent for Great Britain and the Continent of Europe. On account of the increasing volume of exports from the United Kingdom to Canada, and because of the large Continental element in much of the merchandise coming from the United Kingdom to Canada, it has been deemed necessary to have a special agent of the Canadian Customs Department in London. The question often arises whether a given shipment from the United Kingdom is entitled to admission into Canada at the preferential duty rates. The product that is finished in Britain may have received all but the final touches in Germany, Austria, Belgium or some other country not entitled to the benefit of Canada's preferential tariff. The rule made by the Minister of Customs is that 25 per cent. of an article's value must have been added by fabrication in the United Kingdom or other British possessions entitled to the preference to make it eligible for admission at the preferential rate.

It is asserted that there has been some sharp practice on the part of Continental manufacturers and their British agents in order to get their goods the advantage of admission into Canada as British goods. The new agent is expected to check this form of customs fraud and also to facilitate the entry of genuinely British goods at preferential rates. His duties have also in some measure been made for him by recent commercial treaties between Canada and some other nations, notably France, Germany, Italy, Belgium and Holland. These countries are to get the benefit of the treaty rates not only in goods shipped directly from their own ports to Canadian ports, but also on goods they send by way of the United Kingdom. To watch this class of commerce will be part of the new agent's business.

John W. Gates and party recently passed through Toronto. They were received by D. D. Mann, vice-president of the Canadian Northern Railway Company, over whose line they proceeded to Moose Mountain to inspect the iron deposits, and to Key Harbor, on Georgian Bay, where the ore docks are. To a reporter Mr. Gates said that while here he would have a talk over Ashbridge's Marsh as a location for a blast furnace. C. A. C. J.

Southern Iron & Steel Company Financing.—A Baltimore dispatch says that the Southern Iron & Steel Company has completed financial arrangements which have been pending for some time and has secured $800,000 working capital. Of this amount $600,000 was realized from the sale of one-year 6 per cent. notes and the remainder from the sale of debenture bonds. Other measures are under consideration for strengthening the company's position.

Recent contracts secured by the Penn Bridge Company, Beaver Falls, Pa., include two additions to the Ingram-Richardson plant and an addition to the Standard Gauge Steel Company's plant, Beaver Falls; a 400-ft. bridge to be erected at Solong, Maine, and a heavy girder bridge at Butler, Pa.

British Iron Trade Outlook

While the pig iron market has been unsatisfactory, the finished iron and steel trade in Great Britain has shown some improvement this month. In the first week of September prices of Cleveland pig iron were about 6 pence lower than in the preceding week. Warrants showed 5 pence decline, or from 49 shillings 10 pence to 49 shillings 5 pence. Shipments of Cleveland iron in August were 100,066 tons, against 84,541 tons in July. Connal's stores showed an increase of 12,820 tons from July 31 to August 30, when the holdings were 457,601 tons. The increase in July was 8732 tons and in June 1452 tons. The possibility that some demand for pig iron might develop from Russia received some attention. A number of Russian furnaces shut down because of the spread of cholera and prices there advanced, leading to a request from consumers that the Government reduce the import duty. A conference of producers and consumers was held to consider the matter.

In the British steel trade there is a better feeling, partly because shipbuilding orders have been on a better scale. In August 35 vessels with a gross tonnage of 41,545 were launched on the Clyde, and new orders were booked for about 50,000 tons. Three new battleships are also planned, and Canada may soon make a beginning in providing a navy. Rail business is rather better. Mills are still holding to £5 10s. for standard sections. On gas pipe skelp an advance of 5 shillings has been made by the Gas Strip Association. In plates there is a firmer market, and angles, sheets, hoops and rivets are more active. Steel makers in the west of Scotland have had some inquiry for steel for the new Quebec bridge. The Cleveland Bridge & Engineering Company is the one British firm bidding on this bridge. There are three competitors—one each in Canada, the United States and Germany.

August Copper Production and Stocks

The August statement of the Copper Producers' Association shows a decrease in stocks of copper in the United States in that month of 1,759,433 lb. The statement in full is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, August 1	170,640,678
Production of marketable copper in the United States from all domestic and foreign sources during August	127,803,618
Deliveries of marketable copper during August:	
For domestic consumption	67,731,271
For export	61,831,780
	129,563,051
Stocks of marketable copper of all kinds on hand and at all points in the United States September 1	168,881,245

The August, 1910, production and deliveries compare with August, 1909, as follows:

	Production.	Deliveries.	Surplus.
August, 1910	127,803,618	129,563,051	Dec. 1,759,433
August, 1909	120,597,234	107,996,911	Inc. 12,600,324

As compared with July, the production in August increased 9,433,615 lb.; the domestic deliveries increased 11,023,096 lb., and the deliveries for export increased 2,424,613 lb.

James McLean of Phelps, Dodge & Co., Inc., has been elected chairman of the association. R. L. Agassiz of Calumet & Hecla takes Mr. McLean's place on the Executive Committee.

The fortnightly bulletin of the American Railway Association shows that on August 31 there were 50,729 idle freight cars on the railroads of the United States and Canada, compared with 73,679 on August 17 and about 140,000 at the opening of July. The number of idle cars August 31 was less than 2½ per cent. of the total equipment.

The Koppel Car Plant to Be Doubled

F. G. Ross, engineer, Farmers' Bank Building, Pittsburgh, is preparing plans for new buildings that will double the capacity of the Orenstein-Arthur Koppel Company's plant at Koppel, Beaver County, Pa., in the production of steel and wood industrial cars, portable track, &c. M. F. Howley, Berger Building, Pittsburgh, has the contract for leveling and filling in the site for the new extension, furnishing the concrete floors in the buildings and building the concrete piers for the support of the steel frame. The additions consist of an extension to the present erecting shop, 75 x 200 ft., having an electric traveling crane; machine shop, 75 x 80 ft., with full line of machine tools; blacksmith shop, 50 x 75 ft., to contain steam hammers, &c.; heavy car shop, 75 x 125 ft., with electric traveling crane; wood shop, 50 x 100 ft., and a yard crane runway about 25 x 250 ft., with a 10-ton electric traveling crane. The buildings are to be of steel, with corrugated iron siding and composition roofing. Other equipment required includes water tube boilers of 250 hp.; a 150 to 200 kw. generating set having high speed engine, switchboard, &c., a two-stage air compressor, a number of motors from 5 hp. up for driving the machinery and the necessary wiring from the power house to all electrical equipment. Bids for this work will be taken about October 15, and as soon as the weather opens up next spring the erection will be started.

The Use of a Mixer in Electric Refining of Steel

William R. Walker, in charge of the technical investigations of the United States Steel Corporation, was granted a patent recently on a method of employing the electric furnace in connection with the Bessemer converter or the open hearth furnace in the manufacture of steel. The application for the patent was filed April 21, 1906. The following details of the process are taken from the patent papers.

For the initial treatment of the pig metal an acid lined open hearth furnace or a Bessemer converter is employed. The metal is thus desiliconized and in part decarbonized, from 0.04 to 0.30 per cent. carbon being left, to prevent an oxidized condition and permit of more readily maintaining a fluid condition. It is then introduced into a mixer, preferably basic lined. On its way to the mixer it passes through a spout provided with a skimmer and the floating acid slag is removed to prevent damage to the basic lining of the mixer. In this mixer a basic slag aids in dephosphorizing the metal or neutralizing the acid slag which may be mixed with it. From the mixer from time to time charges are withdrawn and introduced into basic lined electric furnaces, wherein the metal is treated with additions of oxide of iron, together with burnt lime or limestone to dephosphorize and desulphurize it. In the electric furnace silicon, manganese, vanadium, nickel or other elements required to modify the character of the resulting steel may be introduced.

The Standard Scale & Supply Company, Pittsburgh, reports that its Eclipse concrete mixer is having an extensive sale among contractors, and that the volume of business booked so far this year on scales is the largest in its history. Its Standard scales are being used to a large extent in the weighing of coal, and many of the larger Western railroads have also commenced to use them. The plant at Beaver Falls, Pa., is being operated to nearly full capacity. Prospects for business in the concrete department are so encouraging that the company contemplates making an addition to its assembling department, but no decision has yet been made as to the details.

The New York Electric Drill

A new line of electric drills is being brought out by the New York Electric Tool Company, 136 Liberty street, New York, which have many interesting features. Announcements of these tools appeared under New Tools and Appliances in *The Iron Age*, September 1 and 8, 1910. The smallest size is 10½ in.

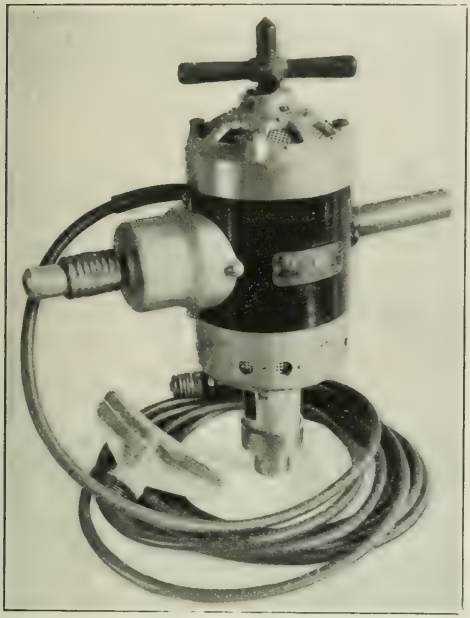


Fig. 1.—The Largest of the New Electric Drills, Made by the New York Electric Tool Company, New York City.

high by 4 in. in diameter, weighs 6½ lb., and can drill ¼-in. holes in steel and ½-in. holes in wood. Its normal speed is 1000 rev. per min. The next larger has a capacity of ½-in. holes in steel and 2-in. holes in wood, and the largest shown in Fig. 1 will drill ¾-in. holes in steel and 3-in. holes in wood, weighs, complete, 22 lb., is 14½ in. high by 5 in. in diameter, and has a normal speed of 200 rev. per min. All the drills contain specially designed motors, whose armatures drive the chuck spindles by hardened steel and phosphor bronze gears. They also are all of the air cooled type, and are equipped with fans which draw air in at the top through grated openings and discharge it through others on the sides.

Referring to Fig. 1 it will be noticed that the switch controlling the electric current is on the cross bar, and by sliding it the current is turned on or off. The ends, one containing the gears and the other the commutator, are made of a special aluminum alloy for lightness, but are strong enough to withstand hard

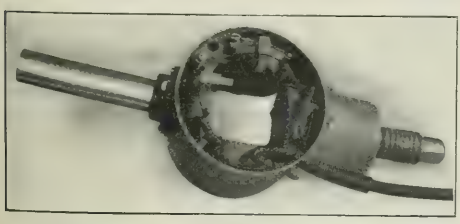


Fig. 2.—Interior View of Drill Frame, Showing Poles and Winding.

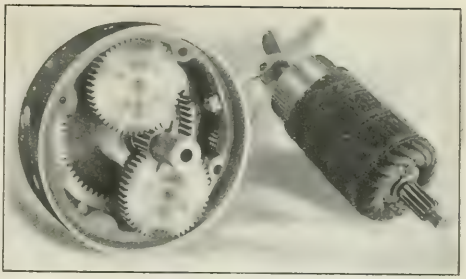


Fig. 3.—The Phosphor Bronze Driving Gears and the Armature and Fan

usage. The frame or body portion, forming a protection to the armature, is of crucible steel and thoroughly annealed to give the maximum permeability. An interior view of the frame with its four series wound poles and two heavy self-feeding carbon brushes set radially 90 degrees apart is shown in Fig. 2. The front and rear heads and the body are connected together by four long bolts, which can be removed by taking off the nuts on the rear head. On the top of the rear head is the screw for feeding the drill that can be replaced if desired by a breast plate.

The armature, Fig. 3, is built up of soft steel laminations insulated with a coating of special japan and mounted on a hollow steel shaft. The coils are form wound, which makes them easily replaceable and consist of silk insulated copper wire taped with silk and dipped in oil and a moisture proof compound. Around the coils are wound three separate bands of piano wire, which prevent any tendency of the windings to fly apart due to the high speed of the armature. The commutator is made extra large, thus insuring long life, and has three bars per slot in the armature. On one end of the hollow shaft is an aluminum fan, with six blades designed to draw the air through the rear head past the motor, thus keeping it cool. On the other end of the shaft is a hardened steel pinion with cut teeth. This is shown in Fig. 3, the two cross arms acting as a key setting into a slot on the shaft. The pinion is subjected to more wear than any other part of the drill, and consequently even when made of the best material will in time have to be renewed. The renewal can be made by running a rod through the shaft to force the pinion off, when another can be readily put on.

Through the steel pinion the armature drives two hardened and tempered steel gears, that in turn internally drive a large phosphor bronze gear to which is attached the drill socket. A thrust bearing in the front head takes the entire thrust of the working load and distributes it through the frame to the breast plate in the rear head or the cross arms, depending upon which is used for drilling. Thus none of the load is carried on the rotating parts. The armature shaft has independent ball bearings.

An assessment of 15 per cent., or $150, on each $1000 bond of the Passaic Steel Company, Paterson, N. J., was payable September 8. The total of outstanding bonds is about $2,000,000. The committee of bondholders which bought in the property at foreclosure sale and is now operating it made the assessment for the purpose of paying $70,000 to $80,000 in taxes and receivers' and court fees. The operation of the structural plant is carried on in the name of the Passaic Structural Steel Company.

The Sloss-Sheffield Steel & Iron Company is blowing in one of its City furnaces at Birmingham, Ala., making five stacks now active.

Seamless Steel Tube Manufacture

With Special Reference to the National Tube Company's Processes

BY J. F. SPRINGER.

One of the first needs of tubes followed the introduction of gunpowder, but the tubes used were short, and their production seems to have led to no great and fundamental development of the industry. With the introduction of gas for lighting came a strong demand for tubing. So expensive were the tubes which were then mechanically possible that the attempt was seriously made of using old gun barrels. A thread was formed on the outside at the smaller end of such a barrel and one on the inside at the larger end. With the joints thus made a gas pipe could be constructed quite reasonably for the time, owing probably to the great number of useless guns in the world at the close of the Napoleonic wars.

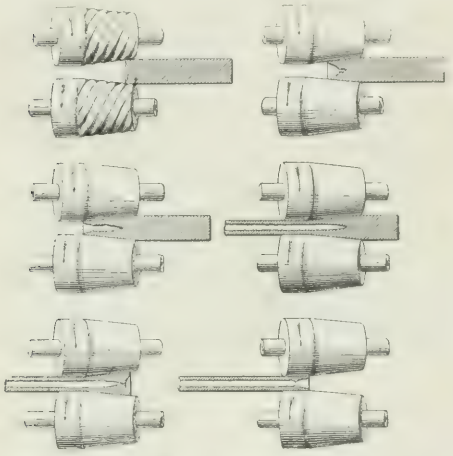


Fig. 1.—Successive Stages in the Rolling of a Tube by the Mannesmann Process.

The demand for tubes thus begun has been greatly augmented by the enormous use of tubing in steam boilers and for the piping, and the tremendous demand for tubing during the hight of the bicycle's popularity and continued to the present time by the development of automobile construction. These latter uses require a tube that is light, strong and approximately perfect, while tubing for boilers and the transmission of steam must be not only sufficiently strong to withstand high pressures, but uniformly perfect everywhere. Such tubes can be made by the boring process, but this is slow, wasteful of metal and expensive to perform.

Tubes can also be made by rolling flat strips to cylindrical form and welding the overlapping edges, but the weld is likely to be uncertain and uneven. One or more of the recent butt welding processes may make thoroughly reliable pipe, but inventors earlier sought to accomplish the object in a speedy and commercial way by a rolling process. There are rolling mills which perform practically all the operations from the ingot or billet to the finished product for large sizes of tubes, and rolling processes which perform the initial operation of piercing the billet, but, so far as the writer is aware, there is no rolling procedure which accomplishes for all sizes the whole of the work. The piercing of the billet is the crucial matter in the production of seamless tubing.

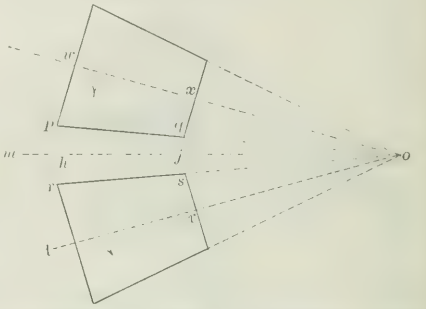


Fig. 2.—Diagram of the Stiefel Roll Arrangement to Prevent Twisting of the Tube Fibers.

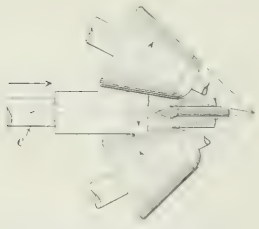


Fig. 3.—Stiefel Arrangement with the Roll Axes in the Same Plane.

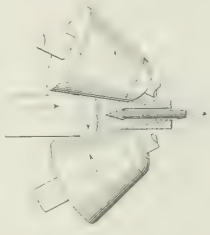


Fig. 4.—Stiefel Arrangement with the Roll Axes Skewed.

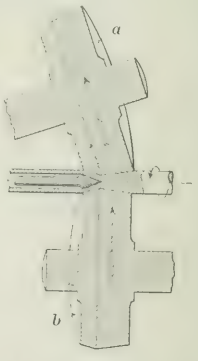


Fig. 5.—Charnock Tube Rolling Arrangement.

The Mannesmann Process

In *The Iron Age* August 29, 1907, an account was given of the Mannesmann process of producing an axial rupture in a cylinder by rolling it under pressure between two rolls, whose neighboring surfaces move in opposite directions. Two difficulties attend the use of parallel cylindrical rolls, the first being that the rupture is not symmetrical; and, however, the forms of the rolls may be modified or their relative disposition changed, it is impossible to obtain a straight, round and perfectly central perforation. This difficulty has been met very effectively, although not perfectly, by using

a forming mandrel. The second difficulty relates to the continuity of the process, for very long cylinders cannot be pierced and formed with parallel cylindrical rolls. To continue the process some means are necessary to start and stop the work alternately, as by interrupting the roll surface longitudinally, or by removing and replacing the work. To subject the surface of the bar to the two mutually perpendicular movements of a rolling and a longitudinal forcing would, apparently, be out of the question. It is practically necessary, too, that the longitudinal pass between the rolls shall be wider at the entrance than further on, so as to permit a more or less gradual reduction of the diameter. And so, even with the Mannesmann devices, the stage of advancement was reached where the rolls were made conical, and with their axes inclined to the plane of the pass. By referring to Fig. 1, a Mannesmann arrangement may be seen. The billet enters the pass from the right. It will be noticed that the axes of the rolls are at an angle with the pass, and that the pass converges. The object of the arrangement of the axes is to produce a drawing effect on the heated billet and thus force it through. The peripheral speed of the rolls varies through the pass, increasing from the entrance where their diameters are smallest. The billet growing smaller in diameter for that reason also rotates faster between the larger diameters of the rolls. The result of this variation in the angular rotation of the various parts of the billet in the pass causes a twisting of the fibers. For a while this was thought to be advantageous, and perhaps for certain qualities of material it may be. Ordinarily, however, the metal which it is desired to use has been worked but little, and so cannot be assumed to have the uniformity and ductility necessary for so severe an ordeal. At any rate even in the Mannesmann development, an effort was made to offset the twisting effect at the entering end by a second opposite twisting in the outgoing portion. This was accomplished by so shaping the rolls that the pass assumed an elongated hour glass form. While this might restore the twisted fibers to their original straightness, it had the defect of acting too violently upon the metal.

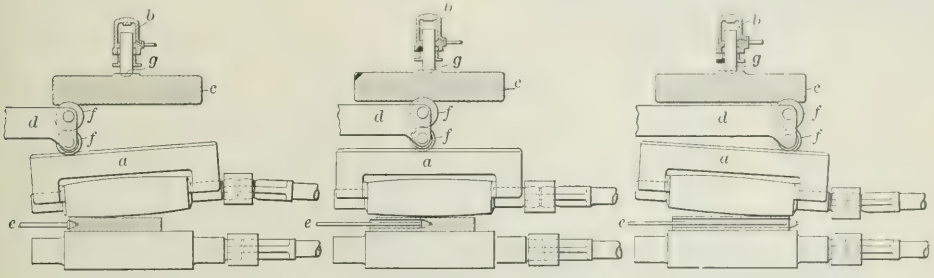


Fig. 6. Fig. 7. Fig. 8

Successive Stages in the Diescher Billet Piercing Process.

Stiefel's Development

Next a rearrangement of the conical rolls was effected. In Fig. 1 the axes of the two rolls, while not parallel themselves, do lie in parallel planes perpendicular to the plane of the pass. Instead of this arrangement, by converging the axes on the side of the smaller ends of the rolls it was sought to harmonize the action of the various rates of peripheral speed. This is made clear in Fig. 2, where for simplicity the skewed arrangement is omitted. The conical rolls prolonged would have a common vertex at *o*. The pass between the rolls is symmetrical about the axis *o m*. If the two rolls are rotated in the same direction and at the same angular velocity, the peripheral speeds at the points *p*, *r*, *s* and *q* will be proportional to the arms *w p*, *t r*, *v s* and *x q*, respectively. A billet occupying the pass will have these peripheral speeds communicated to its surface, and if they are proportional to the arms *h p* and *j q* the angular velocities will be equal. In other words, if the arms *w p* and *x q* are proportional to the arms *h p* and *j q*, and they are, as can be easily proved by geometry.

The same is true of all points lying between *p* and *q* and likewise between *r* and *s*. Therefore by arranging conical rolls with the vertices of the complete cones coinciding, the various peripheral speeds throughout the pass are reconciled so that the billet will have the same angular velocity at all points and there will be no twisting of the steel. This advance in the art was due to R. C. Stiefel, Ellwood, Pa. Figs. 3 and 4 show the principle of the common vertex in two applications. In Fig. 3 the rolls have their axes in the plane of the pass. The forward movement of the billet through the pass is obtained by the hydraulic ram *e* operating upon its rear, which did not prove very satisfactory. In Fig. 4 the axes of the rolls are inclined to the plane of the pass and lie on opposite sides of it, but the vertices of the complete cones lie in the same plane perpendicular to the billet axis. In both procedures the smoothing and forming mandrel has its head where the most pronounced grip to the pass is secured. The entrance to the pass is at the larger ends of the rolls, precisely the opposite of the Mannesmann arrangement. By skewing the rolls properly the forward movement of the billet is obtained and the process of rupturing the center made continuous.

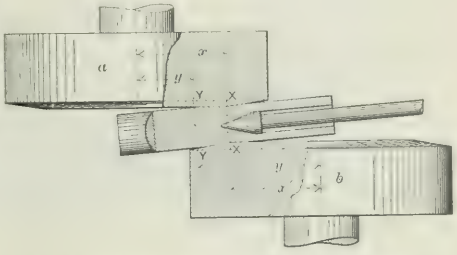


Fig. 9.—The Stiefel Billet Piercing Disk Arrangement.

The Mannesmann form of rolling rough tubes has since been superseded by such modifications as the one just described, but the fundamental idea of rupturing the center by operating on a billet with two rolls rotating in the same direction is still adhered to. It is the germ from which practically the whole industry of manufacturing seamless tubes from solid billets has grown.

Charnock's Arrangement

About the time Stiefel was working to eliminate the torsional effect by unifying the peripheral speeds, Charnock invented the arrangement shown in Fig. 5,



Fig. 10. Centering Billets Before Heating for Piercing.

from which it is evident he had no thought of harmonizing surface velocities. The rolls *a* and *b* are rotated in the same direction, but are by no means identical.

of the operation of piercing a billet. The lower cylindrical roll is vertically adjustable, but remains fixed during operation. The upper roll remains in its vertical plane, but may be tilted, or rocked, during the progress of the work. This roll is rotatably mounted in a yoke, *a*. At *b* is a hydraulic cylinder, which operates against a pressure plate, *c*. Between this pressure plate *c* and the yoke *a* is a reciprocating arm, *d*, carrying rollers *f*, *f*, which advances in unison with the piercing mandrel *e* and transmits the pressure of the plunger *g* from the plate *c* to the yoke *a*. Ultimately this pressure is communicated to the billet at a point just above the head of the mandrel. Three actions may simultaneously be performed upon a billet—the rotative effect producing progressively the initial rupture along the axis, a varying pressure exerted through the rolls by the hydraulic plunger upon a small portion only of the billet at a time, and the piercing and forming operation of the mandrel following the moving point where the rupture is continually forming. The billet is not passed through the mill. The material pressed out in the process of forming the perforation goes to extend the length of the tube

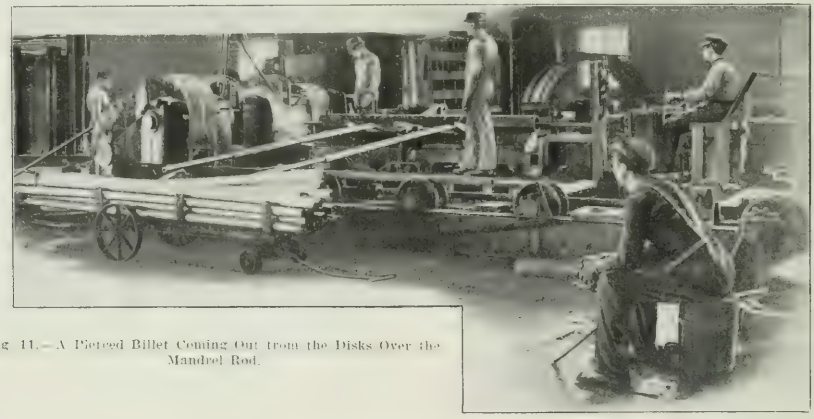


Fig. 11.—A Pierced Billet Coming Out from the Disks Over the Mandrel Rod.



Fig. 12. A Pile of Pierced Billets

the two conical surfaces on roll *a* both tapering in one direction, while those on roll *b* taper in opposite directions. These two rolls are so disposed that, apart from the skewed relation to the plane of the pass, the axis of one is parallel to the axis of the pass. The axis of the upper roll, however, is inclined to the axis of the pass. The pass converges and then expands. The position of the mandrel head is in the final expanding portion.

Diescher's Cross Rolling Process

At about the close of the last century a Pittsburgh inventor, Samuel Diescher, developed a modification of the Mannesmann process of rupturing the center of the billet by cross rolling. Figs. 6, 7 and 8 are views representing the beginning, the middle and the close

beyond that of the original billet. No twisting motion is imparted to the billet, as the axes of the rolls are parallel and in the same plane with that of the pass.

The Stiefel Billet Piercer

The process now used by the National Tube Company employs the Stiefel billet piercing system, but instead of rolls disks are substituted, arranged so as to overlap each other, as may be seen in Fig. 9. They are substantially alike and rotate in the same direction at the same angular velocity. Between the overlapping portions is a pass wherein a billet may be rotated. The faces of the disks are centrally planar and somewhat beveled toward the periphery. The plane portion of each disk is opposed, in the pass, to the beveled portion of the other. Consequently the

pass is in section of hour-glass form. As the two disks are moving at the same rate at this locality, precisely the same angular velocity is impressed upon the billet at this point. At the entrance of the pass the surface velocity impressed by the disk *b* is greater than that imparted by the disk *a*, because of the corresponding long and short arms of rotation. This will produce a want of harmony, one side of the billet at this point being rotated at greater angular velocity than the other. Nor is the angular impulse communicated at Y Y the same as that communicated at X X. For the lower disk, the arms of rotation x' and y' are proportional to the corresponding radii of the billet, and the angular impulse of the two ends of the pass is the same, but for the other disk the long arm x corresponds to a short radius of the billet and a short arm, y, to a long radius. However, as the sum of y and y' is the same as the sum of x and x', the average surface velocity imparted at Y Y will be the same as that imparted at X X. Upon the lower side of the pass, at Y Y, the metal is hurried faster peripherally than at X X. But at the upper side this is compensated for by a corresponding retardation. So the surface speeds at the two ends of the pass, and, indeed, throughout it, on the average are the same. Equal surface speeds along elements of a conical surface will not produce equal angular velocities, but experience seems to imply that any inequality of this kind is not very great.

By skewing the axes of the disks a forwarding movement is imparted. The rotation between disks is effective in producing the axial rupture, and the mandrel head, shown in position in Fig. 9, forms the rupture into a substantial and fairly well rounded hole.

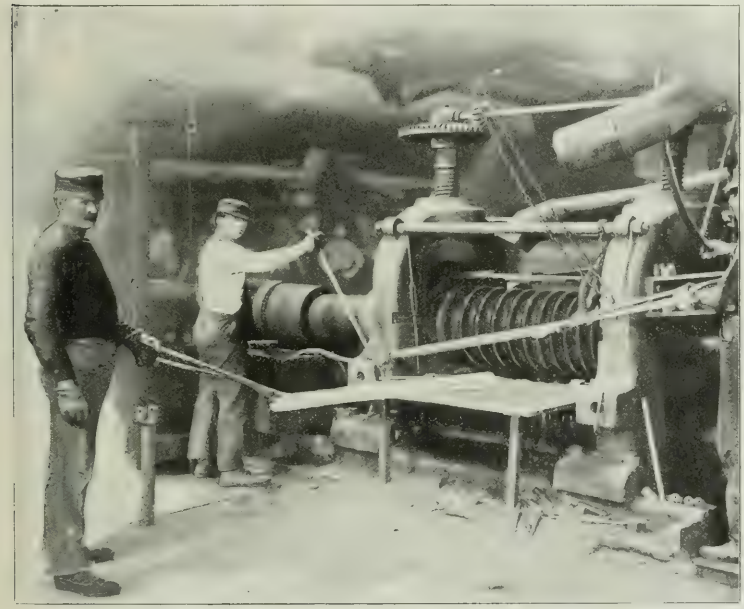


Fig. 13.—Rolling Tubes Hot After the Piercing Operation.

The National Tube Company's Other Processes

As typical of the manufacture of seamless steel tubes may be taken the processes employed by the National Tube Company in making Shelby tubing. To begin with, the steel must be of a character suited to the rather severe requirements of the process. This process includes not only the deformations and reformations due to compression while being rolled, and the movement back and forth of the fibers occasioned by the nonharmonization of rotational speeds, but also to the subsequent operations of cold drawing. The carbon content may be quite low, at 0.17 per cent., or it may range higher, between 0.35 and 0.50 per cent. There may be a nickel content of 3.50 per cent. Whatever the precise analysis of the steel, it is received by the tube mill in billets or bars about 10 ft. long and ranging in diameter from 2½ to 6 in. These bars have previously been rolled down from square blooms, 7 x 7 in., about 6 ft. long, weighing about 750 lb. Before being passed through the rolling mill any apparent superficial irregularities are chipped off with pneumatic hammers. Then, after being annealed, they are rolled to the round bar form, cut into convenient lengths and sent to the tube mills. The pieces may be as short as 5 ft. or as long as 10 ft., according to the tube to be produced, and are now termed billets.

The piercing is done when the metal is nearly white hot and the perforation must be exactly central, as subsequent operations cannot be depended upon to correct any eccentricity. The billet is centered by drilling and while cold, as shown in Fig. 10. Billets thus centered are fed into a heating furnace having an inclined bottom, and roll down toward the exit where the temperature is high. Having acquired the proper heat, they are fed into the piercing machine, the centered end being presented to the disks, which grasped the billet rotates it and draws it on to encounter the malleable iron head of the mandrel. In Fig. 11 the billet is shown coming from the disks. There is no great noise. The billet moves on turning all the time and growing in length as the metal is forced from the center and gives rise to a corresponding longitudinal expansion. The mandrel remains absolutely fixed. The billet pierced and lengthened becomes a tube. Fig. 12 shows a pile of these tubes in the first stage of their completion. Seamless brass or copper tubes can be made from billets cast hollow, but with steel this has not been found commercially practicable. It is possible, however, that such billets of steel may yet be produced by some process of centrifugal casting.



Fig. 14.—Pointed Tubes Ready for the First Cold-Drawing Operation.

After the pierced billet is cut in two by a hot saw, the next operations are performed by a rolling mill of the usual design, such as is shown in Fig. 13. The billet is heated to the proper temperature, and a round bar of tool steel inserted into its perforation. It is then passed a number of times between rolls with semicircular grooves of varying size. By this means the pierced billet grows into a rather long tube with thinner wall, but it is not yet perfectly round nor accurately uniform in thickness. These qualities appear to be commercially impossible by any hot process, so cold drawing is resorted to after the tube is first pointed hot by a machine hammer and put through an acid bath to remove the scale and render it ready for drawing. In Fig. 14 are seen a quantity of the pointed rough tubes.

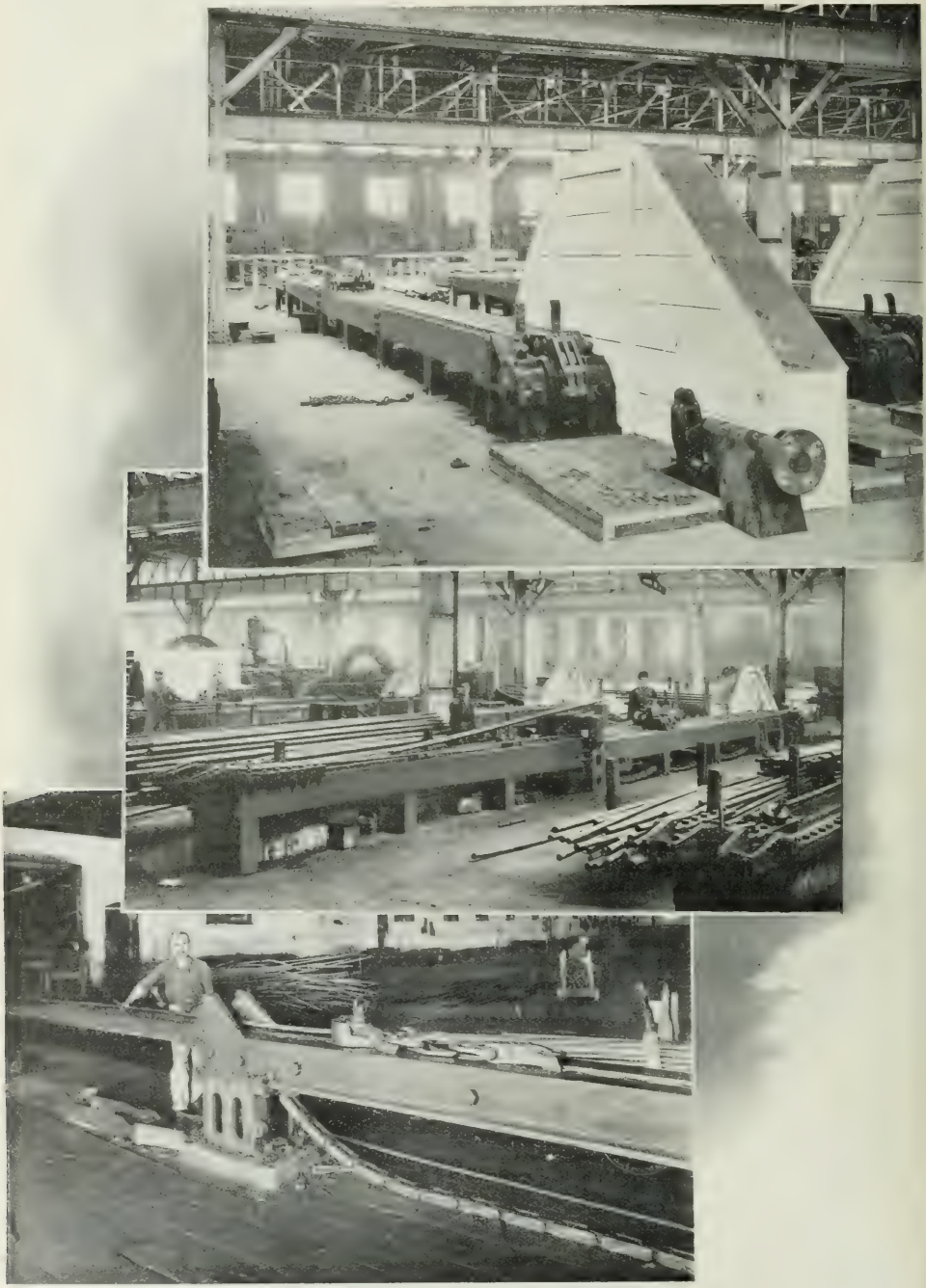


Fig. 15.—Three Views of the Cold Drawing Benches in the Standard Plant of the National Tube Company at Ellwood City, Pa.

The draw bench is not peculiar to the steel industry as precisely similar machines are used in manufacturing brass and copper tubing. It consists essentially of a long frame within which an endless strip of chain is operated, passing over a wheel at each end of the bench. In Fig. 15 are seen three views of the cold drawing machines. In the upper view may be seen the great chain as it comes over the sprocket at one end of the bench. At the right hand of the middle view the slack returning chain is disclosed beneath the bench. In the bottom view is seen the griping mechanism. A general view of a portion of the cold drawing bench room is given in Fig. 16. With its pointed end secured in the grip of the tongs, the tube is powerfully drawn along to force the cold steel through a reducing die. If the interior diameter is ½ in. or more, a mandrel is used inside the tube. This is held in place, even with the die, by a long rod extending through the tube. This operation of cold drawing may have to be performed but twice, or it may have to be performed a score of times. On account of the hardness and brittleness which are consequences of cold drawing, the tube must be annealed between drawings. As this annealing process gives rise to scale, there must be a repetition of the pickling process also. It will be seen, then, that any considerable reduction of steel tubes by cold drawing is attended by a multiplicity of operations. Happily, certain of these may be accomplished wholesale. And so the cost is kept down.

Unless the requirements are such that the greatest rigidity must be preserved there is a final annealing. This is performed to suit the requirements of the consumer. In Figs. 17 and 18 are examples of the deformation specially annealed tubes will stand without rupture. These tubes were of low carbon steel, about 20-gauge and of about 1 in. in diameter. At the last operation the point is removed, and the whole tube cut to such lengths as desired.

The uses to which seamless steel tubing are being put are very numerous—about 700 having been tabulated. Some of these relate, however, to large tubing produced by a different process.

Two of the most extensive uses are for the frames of bicycles and certain parts of automobiles, which consume great quantities of seamless steel tubing. The application of this type of tube to steam uses has been productive of an immense demand. The steel used for steam boilers is of a low percentage of carbon (about 0.17 per cent.) and the tubes are annealed very soft. It is hard to tell just where the application of steel tubing will leave off. There are so many uses for long and short pieces of steel with a hole through it that it will not be surprising if the number of them increases for a long time to come and if the extension in recognized fields goes on steadily.

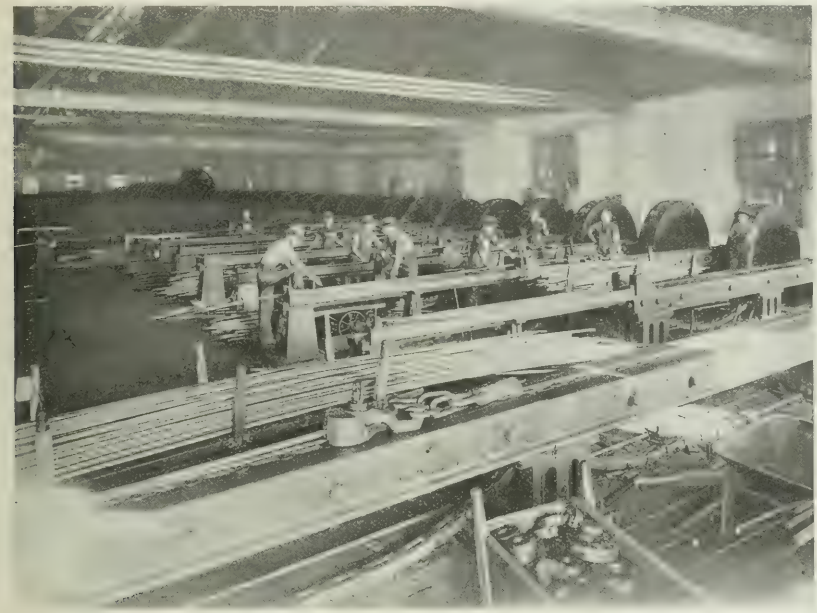


Fig. 16.—A General View in the National Tube Company's Cold-Draw Bench Room.

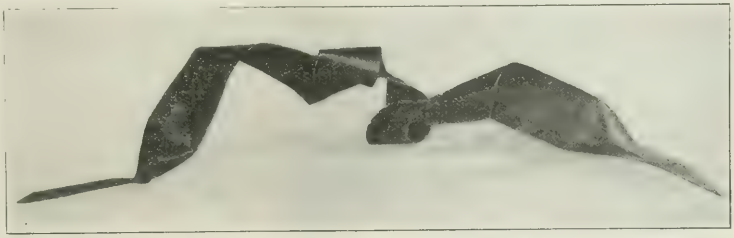


Fig. 17.—An Annealed Seamless Steel Tube Flattened, Twisted and Bent Without Rupture.

Ellwood Ivins Tiny Tubes

There are three limitations, however, which have operated to keep the product of nearly all the manufacturers out of certain fields. It is sometimes desirable to have tubes that are true to size within a very small limit of accuracy, but for most uses this is not essential; there are many uses which demand a tube of

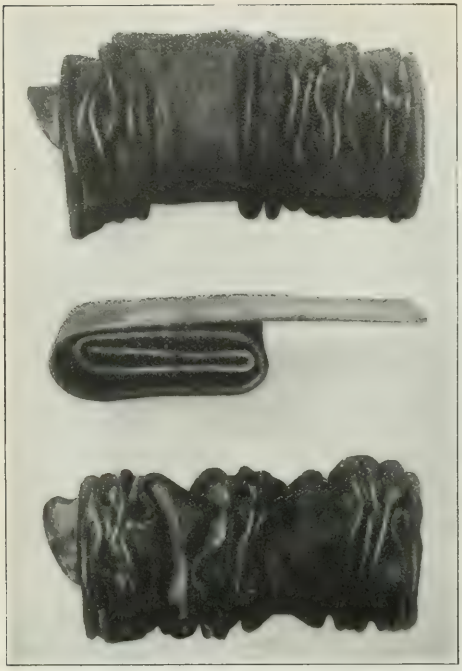


Fig. 18.—Other Examples of Annealed Tubes Deformed Without Sign of Surface Failure.

very small outside diameter and bore, and there are a very great many uses to which tubing of high carbon steel might be put if obtainable at reasonable prices. All these special requirements are met in the product of the Ellwood Ivins mill, Philadelphia. There are manufactured, so far as the writer has learned, the only tool steel tubes commercially produced in the world. Further, tubing may be obtained, both of high and low carbon, that is very close to gauge. And very minute tubes are produced. Thus there is manufactured, not for experimental purposes, but for sale, little tubes no larger than 1-64 in. in outside diameter. Mr. Ivins has produced a tube whose outside diameter was 0.005 in. The bore was probably never measured; it was so small as to be undiscernible with the naked eye. The tiny tubes made of tool steel find an application in the manufacture of physicians' hypodermic needles. Tool steel tubes of larger diameter find uses as bits for rock drills. There is quite a demand for small tubing of mild steel having an external diameter of 3-16 in. for shafts in the manufacture of electric meters. Such shafts are quite light for their stiffness and so are adapted to the delicate service. Very small tool steel tubing is used in the works of watches, although the amount can scarcely be considerable.

The Allentown Iron Mfg. Company, Allentown, Pa., which began the manufacture of cold blast charcoal pig iron in September, 1909, is now building a second furnace, which will be 8 x 30 ft., and will also produce charcoal iron. The new furnace will have a capacity of 2000 tons a year, while the present furnace makes 1000 tons a year. J. K. Bowen is president and H. B. Weaver is treasurer and manager. The selling agents are Rogers, Brown & Co.

The Central Iron & Coal Company's blast furnace at Holt, Ala., which was blown out June 17 for repairs, will probably be put in operation again by October 1.

A Belgian Ratchet Tapping Wrench

In the shops of H. Bollinckx, Brussels, Belgium, holes that cannot be tapped on a Pearn machine are tapped by hand in the manner indicated in Fig. 1. The wrench used is one of ratchet type, which makes it unnecessary for the workman to lift the wrench from



Fig. 1.—A Ratchet Tapping Wrench as Used in the Shops of H. Bollinckx, Brussels, Belgium.

the shank of the tap. The advantages which result are greater rapidity of working and avoidance of giving to the tap a back and forth movement which deteriorates it, and is what the workman is inclined to do with the ordinary wrench. The ratchet is reversible, which permits withdrawing the tap with the same rapidity.

Fig. 2 gives a detail of the wrench showing its construction and principle of action. The wrench hold revolves in the handle, and is provided with teeth which are prevented from rotating in one direction or

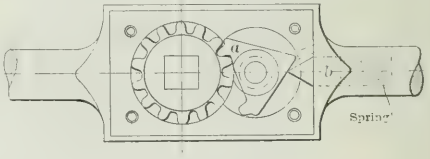


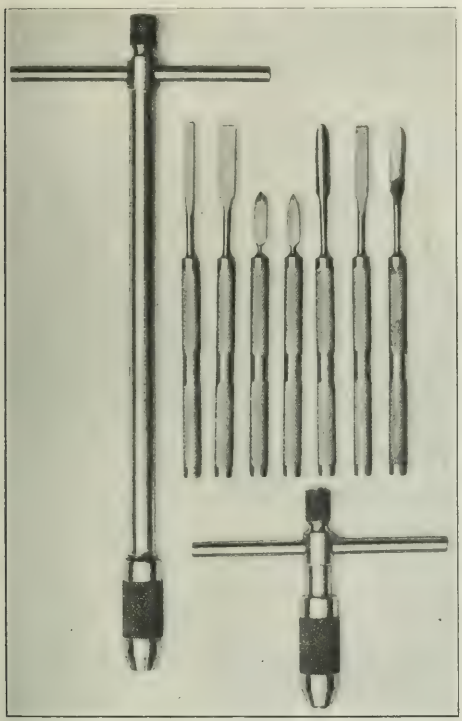
Fig. 2.—Detail of the Ratchet Mechanism of the Wrench.

the other with reference to the wrench handle by the reversible pawl *a*, which is reversed by throwing a lever, shown in dotted lines in Fig. 2, so that the pointed rear end of the pawl piece comes on the other side of the spring actuated plunger *b*. This plunger tends to keep one or the other of the teeth of the pawl in the ratchet according to the way in which it is set, but permits the pawl to retract from the ratchet teeth on the idle stroke of the wrench handle.

The Tariff Board will begin in Washington September 21 a scientific investigation of schedule K of the tariff, the woolen schedule. It is stated that the cotton schedule and the metal schedule will follow.

New Poorman Machinists' Tools

Two new products in the way of small tools manufactured by the J. E. Poorman Company, Inc., 1825 Bristol street, Philadelphia, Pa., are illustrated herewith. The high speed tap wrench fills a need in that class of tools, as with the knurled head a tap can be backed out of the work with the thumb and finger, it is claimed, in one-quarter the time required with the old style wrench. Also, by resting the head or thumb piece in the palm of the hand in starting a tap, a better hold on the wrench is secured, resulting in materially better work and fewer broken taps. The



Long and Short High-Speed Tap Wrenches and Toolmakers' Scrapers, Made by the J. E. Poorman Company, Inc., Philadelphia, Pa.

jaws of the wrench are broached square on the inside, thus giving them a firm grip on any tap within the range of its capacity. The wrenches are made of the best material, well finished and furnished in three sizes, Nos. 4, 5 and 6, taking in taps ranging from 1-16 to 3-16 in., ⅛ to ¼ in. and 3-16 to 7-16 in., respectively. To reach work located at deep and difficult points conveniently, these wrenches are made in three different lengths of shank, varying from 2¾ to 12¾ in. in the No. 4; 3½ to 13 in. in the No. 5, and 4⅝ to 13¼ in. in the No. 6 size.

As was announced under New Tools and Appliances in *The Iron Age,* June 30, 1910, the Poorman Company has also placed before the trade a set of seven toolmakers' scrapers, which are for use in place of the customary makeshifts used in many instances. The handles of the scrapers are of steel tubing, and the cutting points are of the finest grade of tool steel, properly tempered, ground and polished. These are particularly designed for lathe workers for scraping centers, metal patternmakers, electricians, coppersmiths, tinsmiths, automobile mechanics, as well as any of those engaged in any branch of the tool or machinery trade. The seven scrapers include No. 1, having a triangular hollow ground blade; No. 1-A, triangular extra slim hollow ground blade; No. 2, half-round curved blade for use in small bearings, &c.; No. 2-A, with a half-round straight blade; Nos. 3, 3-A and 3-B have flat blades, 5-16, ¼ and 3-16 in. wide. The various tools manufactured by this company are distributed in England through Buck & Hickman, Ltd., Whitechapel Road, London, England.

The Philadelphia Foundrymen's Association

The regular meeting of the Philadelphia Foundrymen's Association, the first after the usual summer recess, was held at the Manufacturers' Club on the evening of September 7. Vice-President Elmer E. Brown occupied the chair. Reports of the various officers and committees were presented.

The committee having charge of the arrangements for the dinner to be held at the October meeting, celebrating the two hundredth meeting of the association, reported progress. From plans under way, this promises to surpass all previous dinners given by the association. The New England, Pittsburgh, Pa., and Newark, N. J., foundrymen's associations have been invited to attend as special guests.

August A. Miller of *The Iron Age,* delegate of the association to the third annual convention of the Atlantic Deeper Waterways Association at Providence, R. I., August 31 and September 1 to 3, made a report in which an outline of the work accomplished by the association both during the year and at the convention was given.

Paul Kreuzpointner, chairman of the Committee on Industrial Education of the American Foundrymen's Association, was the principal speaker of the evening, his subject being "The Establishment of Industrial and Trade Night Schools for the Youth of the State." He urged the members of the association to ask their representatives in the State Legislature to have manual training inserted in the new School Code to be presented at the next session, as part of the elementary education of the common schools of Pennsylvania as a necessary preparation for industrial and trade education. A vote of thanks was extended Mr. Kreuzpointner, after which the meeting adjourned and luncheon was served in the dining room of the club.

The Harris-Smith Coal & Coke Company's Operations

The Harris-Smith Coal & Coke Company, with offices in the Machesney Building, Pittsburgh, and the First National Bank Building, Uniontown, Pa., has recently purchased 143 acres of coal land, underlaid with 5-ft. and 9-ft. veins of coal, in the well-known Connellsville district, in Fayette County, Pa., near several plants of the H. C. Frick Coke Company, with Pennsylvania Railroad connections. Within the near future the company contemplates opening a mine and erecting a steel tipple, houses for workmen, &c., and an initial plant of 100 coke ovens. The machinery in the mine and on the surface will be operated by electrical equipment.

This company has for some time operated a coal mine in another part of Fayette County, on the Pittsburgh & Lake Erie Railroad, in the Pittsburgh district, which produces Youghiogheny gas coal. The production of this mine has recently been increased from 5000 to 8000 tons per month. In Westmoreland County, Pa., along the Pennsylvania Railroad, the company also has 120 coke ovens.

The Humphrey Internal Combustion Pump

An Interesting Exhibit at the Brussels Exposition

One of the technical excursions enjoyed by those who attended the joint meeting of the Institution of Mechanical Engineers and the American Society of Mechanical Engineers in England last July was that to the Pump & Power Company's testing station, at Dudley Port, Tipton, near Birmingham. The report of the meeting which appeared in *The Iron Age*, August 18, gives a brief account of the Humphrey internal combustion pumps, which were there seen in action. A pump similar to these is installed in the machinery section of the Brussels Exposition and attracts a great deal of interest, being probably the most novel exhibit. All of the pumps invented by H. A. Humphrey are remarkable for their elimination of so many parts usually to be found in an internal combustion prime mover. There is no piston, or, at least, no solid one; no piston rods, connecting rods, crank shaft nor flywheel of the revolving type. The functions of piston and flywheel are performed by a moving column of water, the oscillation of which controls the timing of events in the cylinder or explosion chamber. Strictly speaking, the only mechanism about the pump is that which controls the ignition and so interlocks the inlet and exhaust gas valves as to prevent their opening or closing at any but the proper times. These valves and the water suction valves complete the moving parts. The water further accomplishes in the most desirable way—that is, internally—the cooling of the metal parts of the pump and, washing the walls, carries away any deposit that might be a source of pre-ignition. Lubrication troubles are eliminated; no oil is required except a very slight amount for the ignition and interlocking gearing.

Figs. 1 and 2 are views of the exhibit at Brussels and Fig. 3 an elevation and plan of a precisely similar plant, with the addition of a gas producer, for the pump is normally intended to be operated with producer gas. It happens that at Brussels illuminating gas is used, but an inactive producer of a size corresponding to the pump capacity is shown, and the small amount of space it occupies with respect to that of the pump is a striking contrast, as is well brought out in Fig. 3. Fig. 4 is a diagram of one of the earlier Humphrey pumps which has been tested by Prof. William C. Unwin, and Fig. 5 a detail of the latest type of valve gear.

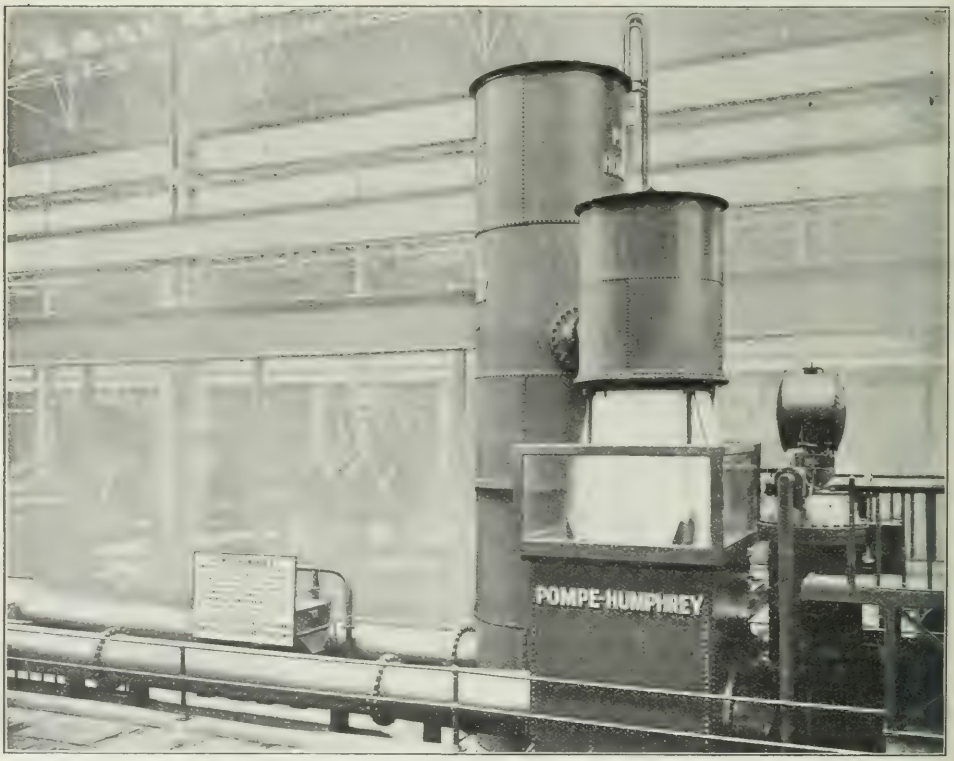


Fig. 1.—The Humphrey Internal Combustion Pump—Exhibited by the Pump & Power Company, Ltd., London, England, at the Brussels Exposition.

Fig. 4 will serve best to make clear an understanding of the principle of the action of the Humphrey pump. The thermo dynamic cycle on which the pump works has a greater efficiency even than the Otto cycle, for the reason that it provides that which is theoretically required, four unequal strokes. The longest stroke is that which occurs during combustion and expansion while the liquid is forced through the delivery pipe to the elevated tank. On the return oscillation the gases are exhausted. With the next reversal

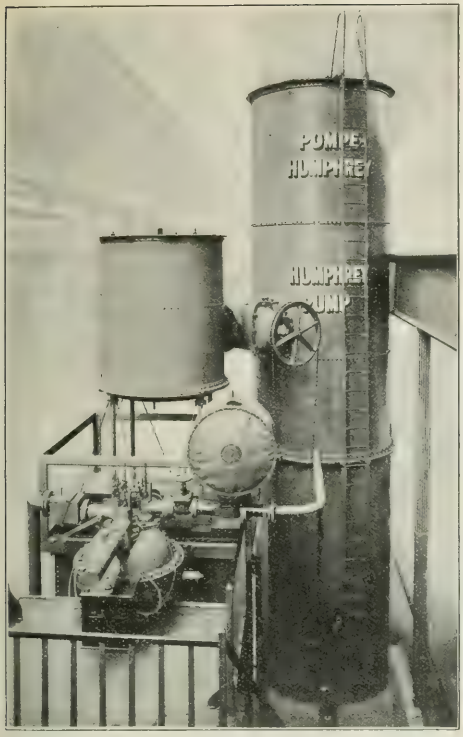


Fig. 2.—Another View of the Humphrey Pump at the Brussels Exposition.

a still shorter stroke occurs, during which a fresh combustible mixture is drawn in, and on the fourth and shortest stroke this mixture is compressed ready for firing and the repetition of the cycle. There is no valve in the discharge line, so that the water has a free passage from the explosion chamber to the high level tank.

The action of the pump more in detail is as follows: Assuming that it is to be started for the very first time, it is necessary to get the water in motion before the pump will take up its regular cycle of operations. For this reason compressed air is introduced in the combustion chamber, forcing the water to a certain hight in the elevated tank; then the exhaust valve is suddenly opened by hand and the surging of the water established produces the necessary suction to admit a charge through the gas inlet and compress it ready for firing. Following an explosion, the gas expands, forcing the liquid out and toward the elevated tank. When the gas has expanded to atmospheric pressure the moving column of water has attained a velocity which causes it to continue to move until the static head in the discharge pipe brings it to rest. As soon as the pressure is below that of the atmosphere the exhaust gas valve and the suction water valves open, admitting water from the low-level tank, part of which follows the column in the discharge pipe, and the remainder fills the combustion chamber part way or nearly to the level in the low-level tank. This has partly exhausted the burnt gases, and when the column of liquid returns the water suction valves are closed by their springs and the exhausting of the combustion chamber continues until the liquid rises to the level of and closes the exhaust valve. There is still pocketed a small amount of burnt gas in the cushion space under the inlet valve. A further movement of the column of liquid compresses this, causing the second outward movement of the liquid, and when this has created a suction in the explosion space the first charge of gas is drawn through the inlet valve, is compressed by the next return of the surging column and is fired at the point of maximum compression. When the pump is stopped a charge of gas is always left in the explosion chamber and subsequent starting is effected simply by closing the ignition circuit.

While it is not necessary to the operation of the pump to insure that the pocketed gas should be removed entirely on the exhaust stroke, it has been thought best to add a scavenging valve, not shown in Fig. 4, which opens at the instant that the exhaust valve opens and allows air to be drawn in above the exhaust gases, so that when the exhaust is completed only practically pure air is pocketed in the explosion chamber. Ordinarily with a scavenging valve in use a nonreturn valve is provided in the exhaust, so that no burnt gases will be drawn back through the exhaust valve when the latter is open, but only fresh air be drawn in through the scavenging valve. Even without the use of the scavenging valve the pump explodes with absolute regularity and certainty.

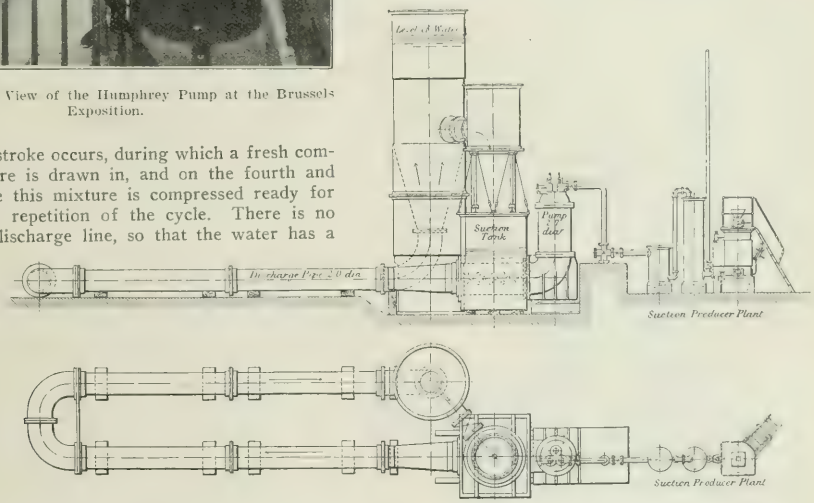


Fig. 3.—Elevation and Plan of a Humphrey Pumping Plant Complete with Gas Producer.

As the opening and closing of the gas valves depends entirely upon difference of pressure on their two sides, it will be seen that some special means is necessary, so that both will not open and close at the same time. Each must open and close before the other is opened and not open again until the other has opened and closed. One form of valve gear by which this is accomplished is shown in Fig. 5, which, however, shows the admission and exhaust valves only and not the scavenging valve. It will be noticed that the admission valve is near the top of the chamber, while

the exhaust valve is considerably lower. In the position shown it may be taken that the exhaust valve has just opened by its own weight and that the products of combustion are being driven out. In the meantime the inlet valve must be held closed. This is effected by a steel plate or bolt, which is free to slide sideways. One end of it projects beneath a nut on the inlet valve spindle and prevents that valve from opening. The plate, under the influence of the one of the two springs which is in tension, tends to return to the right, but cannot do so until the exhaust valve has been returned

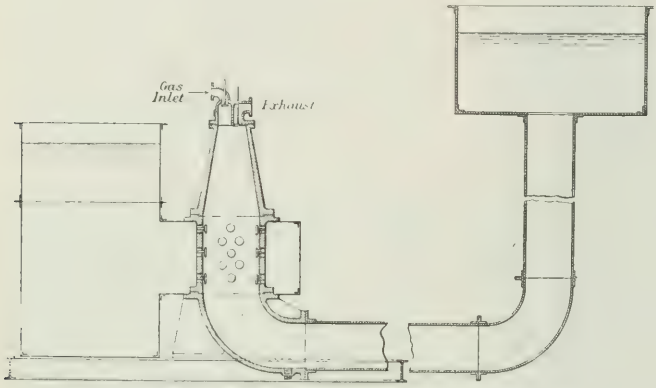


Fig. 4.—Diagrammatic Elevation of One of the First Humphrey Pumps.

to its seat by the returning water. As soon as the nut on its spindle is high enough the plate will be pushed under it by the tension of the spring to hold this valve up, and at the same time the inlet valve will be left free to fall the next time the pressure in the chamber is below that of atmosphere—that is, when the water retires. During its fall the lever will be pushed over to place the other spring in tension, so that the plate will shoot back under the nut on the inlet valve stem

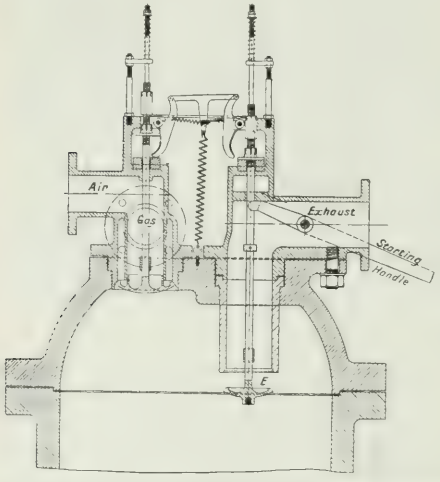


Fig. 5.—Detail of the Latest Form of Interlocking Gas Valve Gear.

when that valve is again raised, which occurs on the compression stroke. The exhaust valve will then be free to open, but cannot do so until the charge in the chamber has expanded to atmospheric pressure.

Since it has been found that water on the spark plug causes no trouble, an ordinary type of plug, as used on automobiles, is now provided, and the spark is produced by a sparking coil and battery similar to those ordinarily employed. The timing gear is very ingenious and yet simple. Its function is to fire the charge at the instant when compression has reached its maximum. It comprises a small piston and cylinder connected to the pump chamber wall so that the piston will move according to the pressure within the chamber. The piston is connected to a steel band passing around a pulley having its other end attached to a spring. Attached to the pulley is a contact lever which plays between two stops, one of which is idle, while the other is alive and closes the ignition circuit. As this piston moves outward, due to compression in the cylinder, it holds the contact against the idle stop, but, with the first slight decrease of pressure within the cylinder, the contact is thrown to the other stop and closes the ignition circuit.

It is evident that the discharge pipe must be of sufficient length to obtain the surging of a certain mass of water, which depends on the head pumped against and the periodicity required. The larger the pipe, and, therefore, the shorter its length, for a given mass of water, the more frequent will be the strokes of the pump and the greater the mass of water the greater can be the head pumped against for a given capacity. In the test of the pump shown in Fig. 4 Professor Unwin found the coal consumption per pump-horsepower-hour to be 1.06 lb., which corresponds to 83.1 cu. ft. of gas per pump-horsepower-hour. A still better performance was obtained with the pump at Dudley Port, which is a counterpart of the one at Brussels. It was tested by Prof. Eugen Meyer. The figures from this test are not yet available, but the builder, the Pump & Power Company, reports that the best results so far obtained have been 73 cu. ft. of gas per pump-horsepower-hour, the thermal value of the gas being 150 B.t.u. per cubic foot, which is equivalent to an anthracite coal consumption of 0.95 lb. per pump-horsepower-hour. The head pumped against was 35.6 ft. and the discharge 3150 gal. per minute. All of these pumps are of relatively low lift, but the inventor has means for increasing the delivery pressure by what is called an intensifier.

An interesting application is now being worked out by German licensees, who are constructing a 1000-hp. pump to show the possibilities of using the principle in the production of power. The pump is designed to put 1¼ tons of water per second under a pressure of 7 atmospheres and the water will be used through a turbine to generate electric current. The plant as a whole, it is declared, will occupy less space than one of the same output run by an ordinary gas engine. Mr. Humphrey has also worked out the problem of compressing air to any required pressure needed in engineering operations and also for the low pressures required in blast furnace blowing engines. The compressor is even simpler than the pump; no water valves are needed, as a constant volume of water is reciprocated between the pump and compressing chamber. It is confidently believed by many who have witnessed the performance of the Humphrey pump that its possible applications for useful purposes are many and that it marks the beginning of a new engineering development, due to the remarkable economy it promises.

The population of Boston is 670,585, as compared with 560,892 in 1900. It retains its position as the fifth American city.

The Fox Two-Cycle Motor

A Unique Engine Having Four Ports

A new type of internal combustion engine has been placed on the market by the Dean Mfg. Company, Newport, Ky., which is known as the Fox two-cycle gasoline motor with fourth port accelerator. This engine as its name indicates has double the number of ports found in the earliest models, but the principal change is the addition of the fourth port as two-cycle engines with three ports are now common. Fig. 1 shows the exterior of the three-cylinder engine, while details of its interior construction are given in Fig. 2.

When first introduced the two-cycle engine operated with only two ports, the fuel being admitted to the crank case from the carburetor through a check valve, which prevented the return of the mixture when under compression. The next improvement was the addition of a third port, which has met with such success that it has been generally adopted. The fourth port added on the side of the Fox motor cylinder is intended to admit fresh air, and is so arranged as to be uncovered near the end of the compression or upward stroke of the piston. This air is deflected into the cylinder, while at the same time the fuel charge is deflected into the lower port of the crank case. On the downward stroke of the piston, the fourth and third ports are covered in the order stated and the fuel in the crank case is compressed. The piston has now traveled to nearly the end of the down stroke, and at this point the by-pass between the crank case and cylinder is uncovered by the top of the piston. The fresh air admitted is deflected into the cylinder in advance of the fuel charge, and as the exhaust port is uncovered and the exhaust gases rush out of the cylinder, this air serves to scavange the cylinder. If any of the charge passes through the exhaust, it will be a portion of the fresh air before the fuel charge is admitted, and it is claimed that this arrangement effects a saving of at least 10 per cent. in fuel over the regular two-cycle, three-port motor.

It is further claimed that with the fourth port extreme flexibility of control is obtained, due to the fact that the amount of air passing the needle valve in the carburetor gives a constant mixture under all conditions. Provision is made for throttling this mixture and for the addition of air before it is admitted through the third port. The engine is generally brought up to speed before the fourth port is opened. The levers connecting the throttle and those regulating the carburetor are all attached to one handle, and when once properly regulated it is not necessary to change their relative positions.

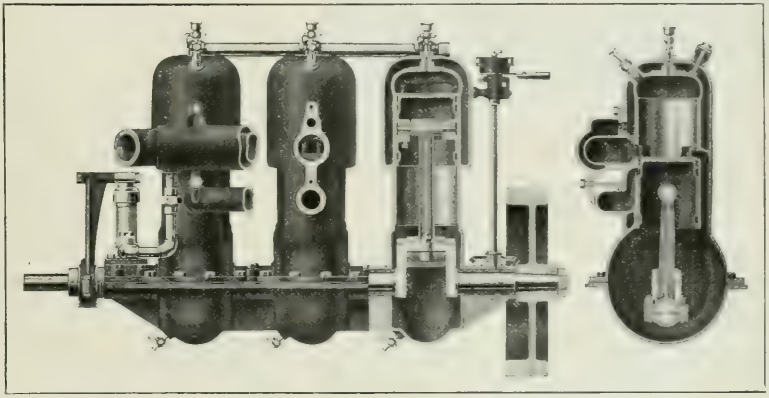


Fig. 2.—Side Elevation of the Engine with One Cylinder in Section and Cross Sectional Elevation.

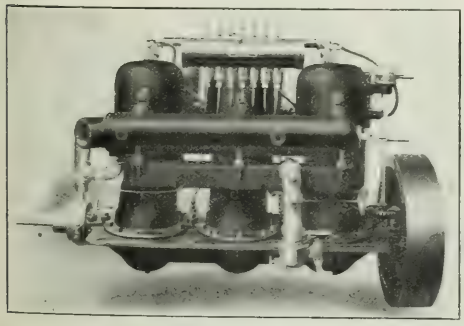


Fig. 1.—A Three-Cylinder Fox Two-Cycle Motor with Fourth Port Accelerator, Built by the Dean Mfg. Company, Newport, Ky.

The Dean Mfg. Company is also building a four-port aero motor, which develops a speed of 2400 rev. per min., and has four 3½ x 3½ in. cylinders. The total weight is 178 lb., of which 134 lb. is the engine, while the balance is magneto, radiator, fan and 12 lb. of cooling water. The Scientific Aeroplane Company of New York is now arranging to test this motor in one of its Bleriot planes. The average weight per horsepower for marine motors of the four-cycle type is about 48 lb., and that for a two-cycle motor is only 30 lb., which would give a reliable two-cycle engine a distinct advantage for aeroplane use.

The Hamburg-American Line is having an 8000-ton motor driven ship built for it by the Hamburg firm of Blohm & Voss. A new device will render the exhaust almost silent and the fumes of the gases will be invisible and odorless. The two three-cylinder engines, which will give the ship a speed of 12½ knots, are the joint product of the Maschinenfabrik Augsburg-Nürnburg and of Blohm & Voss. The residue in the process of the refinement of the oil only will be used as oil fuel. Only 27 persons will be needed for the oil engines, while in steam vessels of similar size about 250 stokers and coal drawers would be employed. Moreover, the motor liner, by space conservation thus obtained, can carry 2000 tons more cargo than her steam rival of similar dimensions.

The International Vanadium Company, Ltd., 49 and 51 The Albany, Liverpool, England, whose American agent is the General Vanadium Company of America, 1502 Continental Building, Baltimore, Md., is distributing a reprint from the London *Iron and Coal Trades Review* on "The Selection of Steel for Locomotive Construction." The article is by W. L. Turner, a director of the company, who writes most interestingly regarding the possibilities of vanadium in the manufacture of alloy steel, giving the results of tests which have recently been made.

Steam Turbines for Both High and Low Pressure

Details of the De Laval Mixed Flow Type

There are remarkable possibilities in the use of exhaust steam or other low pressure steam for producing power in steam turbines. The temperature ranges between steam at ordinary boiler pressures, as 150 or 175 lb. gauge, and steam at atmospheric pressure, and between steam at atmospheric pressure and steam under a 28-in. vacuum, are approximately equal, as are also, therefore, the percentages of heat which can be converted into work between the two sets of limits. Consequently if a high pressure noncondensing engine and a low pressure turbine operated within these two



Fig. 1.—Nozzle Used in the High Pressure Turbines Built by the De Laval Steam Turbine Company, Trenton, N. J.

ranges are equally efficient, each will develop about the same amount of power per pound of steam.

If expansion ratios are taken into consideration the same relations appear. When steam expands adiabatically from 150-lb. steam gauge pressure to atmospheric pressure, the volume increases about 8.3 times, while

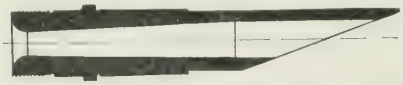


Fig. 2.—De Laval Steam Nozzle for Low Pressure or High Pressure Noncondensing Service.

in expanding from atmospheric pressure to 28-in. vacuum, the volume increases about 11.65 times. These ratios do not hold exactly for steam expanding in a cylinder on account of condensation and reevaporation, but the agreement is close enough for the purpose of the present illustration. Each 3 degrees F. added to the temperature range at the condenser end increases the power obtainable from a pound of steam by about 1 per cent. In expanding from 28 in. to 29 in. vacuum (referred to a 30-in. barometer), the volume is approximately doubled.

The reciprocating engine is not capable of realizing the fullest advantage of expanding steam through the lower range of pressure, since to turn the heat of the steam into work as efficiently in the range below atmospheric pressure as above, the ratio of expansion of the engine would need to be squared. In other words, if this ratio of a compound engine is 10 when exhausting to atmosphere, it would be over 100 when exhausting to a 28-in. vacuum, which would call for cylinder volumes that are practically impossible. On the other hand, a high ratio of expansion is easily attainable in the steam turbine, which, as it is also free from losses due to alternate heating and cooling of metal surfaces, is a most efficient low temperature heat motor.

A realization of the above facts has drawn the attention of engineers to the steam turbine and its possibility of increasing the capacity and efficiency of existing steam engine plants by using their exhaust, or, in other cases, of using the vapor, which can be generated by reheating furnaces, kilns, &c., or the exhaust from various processes where water vapor is produced in large quantities at a low temperature and pressure.

To produce the high pressure steam required by the reciprocating engine, boilers, chimneys and furnaces are expressly installed, usually having nothing else to do, and can be depended upon to supply steam uninterruptedly. On the other hand, low pressure steam is usually a by-product from other processes and may be either continuous or intermittent. The discontinuity in the supply may vary from the pulsating exhaust of reciprocating engines to the periodic exhaust of rolling mill or winding engines, the erratic delivery of air compressors and steam hammers, the occasional blowing off of digesters, and so on to cases where low pressure steam is available only one-half the year, as where the exhaust of the engines is wanted for steam heating during the winter, and it is desired to improve the economy of the plant by utilizing the exhaust steam for power production during the summer.

As the power which the low pressure turbine will produce is generally wanted continuously, some means

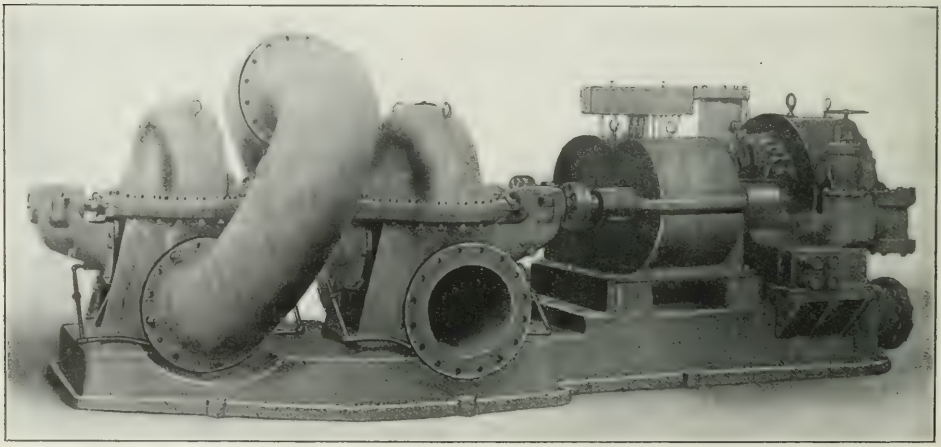


Fig. 3.—Low Pressure De Laval Turbine Direct Connected to Two 16-In. Centrifugal Pumps.

must be found for supplying steam to the turbine during the periods when the waste low pressure steam is not at hand. For short periods this difficulty may be overcome by using regenerators, while for longer ones recourse must be had to live steam. This can be used in two ways; either the pressure of the live steam can be reduced to that at which the turbine is intended to operate, or the turbine can be so designed that both high pressure and low pressure steam can be used in it efficiently.

It is one of the peculiarities of all types of steam turbines that the nozzles and passages in which expansion of the steam takes place can be designed for efficient operation at only one ratio of expansion. In the compound reaction turbine the number of rows of blades and the pressure drop per stage must be proportioned to the range of pressure within which the turbine is intended to operate. If it is desired to operate with two pressure ranges, two ratios of expansion must be provided for. This is generally done by admitting the low pressure steam at an intermediate stage, allowing it to expand through the long blades of large area at the low pressure end of the turbine, while when high pressure steam is used it is introduced at the high pressure end of the turbine and is allowed to expand through the entire series of blades. With this arrangement, the high pressure end of the turbine runs idly in the steam during the periods when no high pressure steam is being used, and thereby wastes considerable power. Moreover, a mixed flow turbine of this type is practically as costly and complicated as a high pressure turbine, whereas otherwise the low pressure turbine should cost much less, due to the fewer rows of blades required for the expansion of low pressure steam. If the turbine is of the graduated velocity type, the same considerations hold. To utilize high pressure steam efficiently, a high pressure section must be provided, which, so long as no live steam is being used, is only a drag on the remainder of the turbine. The expedient of reducing the pressure of live steam through a reducing valve for use in a low pressure turbine is not profitable if it must be supplied for any length of time. It might even be better in such cases to have two turbines, one for the live steam and one for the exhaust steam.

These difficulties in connection with using two steam pressures are avoided in the single stage impulse turbine, built by the De Laval Steam Turbine Company, Trenton, N. J., which is illustrated herewith. In this turbine the complete expansion of the steam takes place in a single nozzle. Steam entering at full pressure expands in the nozzle to the final or condenser pressure, thus converting all the heat energy available between the two temperature limits into energy of velocity. In correctly designed nozzles the efficiency of this conversion may exceed 95 per cent.

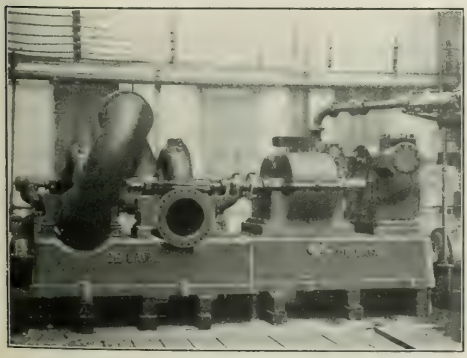


Fig. 4.—A De Laval Mixed-Pressure Turbine Connected to Two Centrifugal Pumps, Arranged for Series or Parallel Operation.

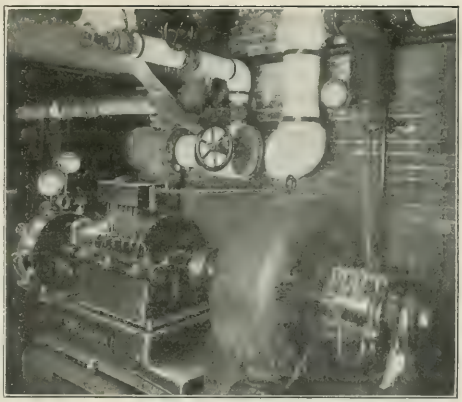


Fig. 5.—A 55-Hp. Low-Pressure Turbine Used for Generating Electricity from Exhaust Steam in a Large Ice Plant.

A nozzle designed for receiving high pressure steam and exhausting into a condenser is shown in Fig. 1, while a nozzle for receiving exhaust steam and discharging into a condenser, or for receiving live steam and discharging against atmospheric pressure, which involves about the same expansion ratio, is shown in Fig. 2. A nozzle of which the minimum diameter of throat opening is ½ in. will develop 75 hp. when receiving steam at 125 lb. pressure and exhausting into a 27-in. vacuum. It is thus possible, by utilizing the full periphery of the wheel to place a sufficient number of nozzles of various ratios of expansion to suit a variety of conditions.

It might seem that a mixed flow turbine of this type would be a compromise and that the efficiency when operating on either high or low pressure would be sacrificed, since the velocity of steam issuing from the nozzle would be different in the two cases, while the velocity of the wheel must remain the same. However, the proportion of the total work abstracted from the steam is not much different in the two cases. The heat set free by a pound of steam expanding from 150-lb. gauge pressure to 2 lb. absolute is 225,620 ft.-lb., corresponding to a steam velocity of 3710 ft. per second. If the periphery of the wheel runs 1500 ft. per second and the angle of entrance and exit of the steam is 20 degrees, the velocity of the steam leaving the bucket will be 1330 ft. per second, and the proportion of the total energy converted into useful work 81 per cent. Taking steam at 15 lb. absolute pressure expanded to 2 lb. absolute, the available work is 101,900 ft.-lb., which gives a steam jet velocity of 2480 ft. per second. With the same rim velocity and angles as before, this gives an absolute velocity of the steam leaving the buckets of 846 ft. per second and the conversion into work of 88.7 per cent. of the energy originally in the steam. The above comparison is based upon unit efficiency of nozzles and blades, and in practice the figures are reduced somewhat by eddy and friction losses, but the relative values remain substantially the same. Thus a wheel speed suitable for one ratio of expansion will serve fairly well for all other ratios encountered in high or low pressure work, it being necessary only to modify the nozzles to obtain the best conditions.

A machine in which all these possibilities have been utilized is shown in Fig. 3. This turbine, which develops 150 hp. for two 16-in. centrifugal pumps, was installed in a large steel mill to receive the exhaust from a number of hydraulic pressure pumps and other auxiliary machines, all exhausting into a common header. The turbine exhausts into a large central condensing plant, serving a number of rolling mill engines,

where the vacuum varies from 18 to 27 in., the average being about 22 in. There is also a possibility of losing this vacuum entirely at times, due to engine troubles or to air leaks, making it necessary to operate the turbine noncondensing. The requirements of the specifications, which were fully met under test, were to carry full load when using steam at atmospheric pressure, exhausting into a vacuum of 22 in., and also when receiving steam at 120 lb., and exhausting into a vacuum of 22 in.; also to operate condensing with steam at 90 lb. pressure, exhausting into a vacuum of 22 in., and in an emergency to operate noncondensing with steam at 90 lb. pressure, all changes to be carried out automatically by the turbine itself, with the exception of the change to the noncondensing condition.

The turbine is fitted with two governor valves and two governors, one for high pressure and one for low pressure steam, the former being set at a few revolutions below normal speed and keeping the high pressure valve tightly closed above this speed. The low pressure governor is set for normal speed, but on the failure of the low pressure steam supply, the machine will drop a few revolutions, whereupon high pressure steam is admitted to the high pressure nozzles. At the same time the low pressure nozzles continue to utilize any exhaust steam available, the pressure limits varying in practice from 2 lb. above atmosphere to a 5-in. vacuum. To guard against the turbine running away, in case the high pressure valve should leak when the turbine was lightly loaded, an emergency stop is provided, consisting of a butterfly valve in the exhaust pipe controlled by a piston, but normally held open by a spring. In case of excessive speed air is admitted behind the piston, closing the butterfly valve. As soon as the speed is normal again the governor closes the air valve and air leaks into the vacuum, the butterfly valve in the exhaust pipe again restoring normal conditions. As will be seen, this involves no interruption of the condenser service, as does the usual vacuum breaking device.

Another machine, adapted to a wide range of conditions, is shown in Fig. 4, the pumps in this case being arranged for use on two different water systems, as desired.

The steam consumption under various operating conditions is given in the following table:

Steam pressure.	Vacuum in inches.	Pounds of steam per brake hp.-hr.
1½	26	32
1½	28	30
120	26	19.2
120	28	17.5

The turbine is also required to run with 100 lb. steam pressure noncondensing. It drives two pumps delivering 7300 gal. at 140-ft. head or 14,600 gal. at 70-ft. head with a pump efficiency of over 76 per cent., corresponding to a duty of 86,000,000 ft.-lb. per 1000 lb. of steam when running under full steam pressure and vacuum and to a duty of 47,000,000 ft.-lb. when using exhaust steam. The De Laval Steam Turbine Company is building two more units with the pumps arranged for series operation only.

An interesting application of low pressure turbines is illustrated in Fig. 5. This little machine is installed in an ice plant, receiving the exhaust from the ammonia compressors and driving a 35-kw. Crocker-Wheeler direct current generator supplying current for lighting and for operating two elevators, a machine shop and a coal elevator. The load is very fluctuating. The turbine develops 30 kw. with steam at atmospheric pressure when exhausting into a 25-in. vacuum, the steam consumption not exceeding 45 lb. per brake horsepower-hour. The poor vacuum obtainable in this case is explained by the fact that the circulating water used in the condenser serving the turbine has already been warmed to a certain degree by passing over the ammonia condensers. When receiving steam at 95 lb. pressure and exhausting into a 25-in. vacuum the unit is able to develop 35 kw. with a steam consumption of 28 lb. per electrical horsepower-hour. When running noncondensing the steam consumption is 43 lb. per brake horsepower-hour. Incidentally the exhaust from this turbine after condensation is used for ice making, the absence of oil rendering it perfectly suitable for such purposes.

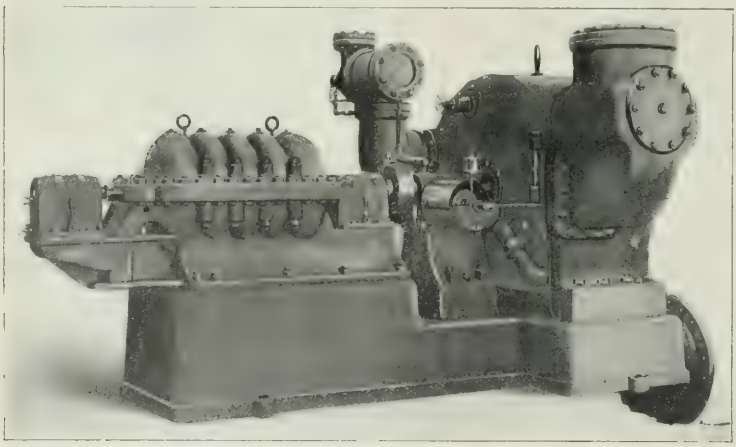


Fig. 6.—De Laval Turbine Connected to a Pump Delivering 500 Gal. Per Minute Against a 1400-Ft. Head.

The turbine shown in Fig. 6 differs from the others described as the impellers of the directly connected centrifugal pumps run at the same speed as the impulse wheel of the turbine itself. This unit operates with steam at atmospheric pressure, exhausting into a 24-in. vacuum, or with 120 lb. of steam, exhausting into the same vacuum, or running noncondensing. The pump delivers 500 gal. per minute, against a 1400-ft. head, and is used in connection with the hydraulic system of a steel plant.

Another interesting machine has recently been installed in the power station of a manufacturing plant. It is a mixed pressure turbine, designed to develop 350 hp. when receiving exhaust steam at 2-lb. gauge pressure and exhausting into a 27-in. vacuum, under which conditions the steam consumption does not exceed 31 lb. per brake horsepower-hour when receiving steam at 140 lb., and exhausting into a 27-in. vacuum on a steam consumption of 18.5 lb. per brake horsepower-hour, 300 kw. is developed, which, considering the size of the unit, is very good.

A mixed flow turbine of this type is especially advantageous where it is desired to increase the output of an existing plant, and where steam is required for heating or drying purposes as well as for power production. A manufacturing plant, for instance, of moderate size may at present be running noncondensing, using the exhaust steam for drying purposes and for heating the shops during the winter. If more power is

required, two courses are open; either the present power equipment can be increased by adding boilers, stacks and engines, or a low pressure turbine can be installed to use the exhaust of the present engines, thereby increasing the output of power even to double the original amount. This, however, would deprive the plant of all or part of its exhaust steam, but if the exhaust steam turbine is of the type herein described it can be arranged to take only the surplus of exhaust steam from the heating system during the winter months, drawing upon the boiler for the live steam required to make up its full quota of power. Or, if the demand for exhaust steam during the winter is greater than the engine can furnish the turbine can be converted to back pressure service, receiving live steam from the boiler and exhausting into the heating system. This would be more economical than operating the turbine on the exhaust steam and drawing live steam through the reducing valve for the heating system.

The auxiliary power required for the condensing plant of an exhaust turbine is small, the current consumed by the electrically driven auxiliaries amounting to not more than 3 per cent. of the current developed by the turbine itself. Due to the possibility of shutting off nozzles as the load decreases, the above type of turbine has a flat efficiency curve, giving remarkably good performance even at quarter load. This efficiency is retained indefinitely, as there is no leakage past valves or piston rings due to wear.

Connellsville Iron Works Under New Management

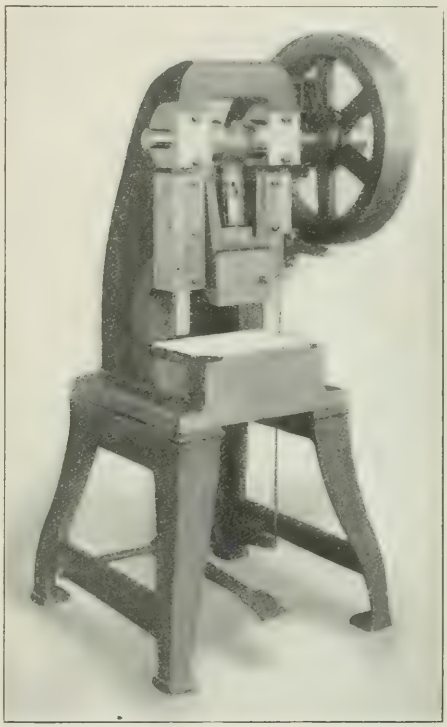
W. E. Kelly has recently been appointed general manager of the Connellsville Iron Works, Connellsville, Pa., succeeding J. Whitaker, resigned. J. T. Miller, the former superintendent of the company, is again with the Scottdale Foundry & Machine Company, Scottdale, Pa., having charge of its structural shop. The Connellsville Iron Works is completing two coke works machines, consisting of an electrically operated leveler and pusher, for the Pittsburgh-Westmoreland Coal & Coke Company's plant at Bentleyville, Pa., comprising 400 new rectangular coke ovens. The company states that it will continue the manufacture of iron and steel plate work for coal and coke plants and mills, steel cars for mines and industrial uses, tanks and stacks, and in addition will also make a specialty of repairing boilers of all kinds. It will also continue its business of repairing castings, such as rolls, pinions, gear wheels, pump parts, &c., by its own secret process of brazing that has proved very satisfactory, one recent contract being the repairing of several large housings for a sheet mill which are in regular use at this time but that ordinarily would have been scrapped after becoming broken.

The E. & G. Brooke Iron Company, Birdsboro, Pa., has resumed operations in several departments of its plant. Six scrap furnaces and two puddling furnaces, which had been idle since May, were recently put in operation. The plate mill department, with three heating furnaces, resumed at the same time, after being idle for a month. This company has recently taken orders for a considerable quantity of wrought iron grooved skelp, which will keep it actively engaged for some time.

According to calculations of Henry Steinzer, official statistician of the New York Produce Exchange, crops of corn and oats will be the greatest on record, although corn will fall just below the coveted 3,000,000,000 mark. Spring wheat has made a rapid recovery, so that the total crop will be a fair average and almost 45,000,000 bushels greater than the July estimate.

The Baird Open Back Press

A new and heavy design of press with an open back has been placed on the market by the Baird Machine Company, Oakville, Conn., to meet the demand for a machine for doing heavy blanking and stamping. Some of the special features embodied in the design of this press are the long slide, the strong support provided for the bearings, the heavy balance wheel and the convenient location of the foot treadle and the hand lever for operating the clutch mechanism.



The New Heavy Blanking Press, Built by the Baird Machine Company, Oakville, Conn.

Although the machine shown is a plain press, several unique attachments have been designed that can be applied when necessary. With this end in view finished seats have been provided which make the application of the attachments comparatively easy. In this way a purchaser can first obtain a plain press, and if later on either the back or side roll feed attachment or the dial attachment is found desirable, these can be applied at that time without the necessity of shipping the press to the factory, as the attachments are regularly carried in stock. Four sizes of press are built, that shown in the illustration being known as the No. 3H.

A German edition of Thomas D. West's "American Foundry Practice" and a French edition of Mr. West's "Molders' Text Book" have recently been published. The former is 7 x 9 in. and contains 625 pages. The translation is by Ernst A. Schott and the publisher is Hermann Meusser, Berlin. The latter is 5½ x 8½ in. and has 209 pages. It is translated by Par P. Aubie and published by Gauthier-Villars, Paris. The French work contains only the portions of the "Molders' Text Book" treating of cupola practice.

The Elastic Limit of Bronzes*

The Danger of Confusing It with the Yield Point

BY J. A. CAPP, SCHENECTADY, N. Y.†

To keep up with the demands upon the laboratory for more work in a given time, testing machines have been speeded up and the slow extensometer has largely been displaced by dividers, used either unchanged or with some means of magnification. To represent castings and forgings the short test piece ½ in. in diameter and 2-in. gauge length is almost universal. As a consequence, while reports of tests usually include a statement of elastic limit, the property of the material actually determined is in reality that more or less vague value called the yield point. It is the object of this paper to show that while the yield point for steel is so well marked in properly conducted tests, and bears a sufficiently definite relation to the true elastic limit to warrant the dependence placed upon it by the engineer, there is no equally well defined point found in testing bronzes, and the value commonly obtained from rapid commercial tests as the elastic limit or yield point on bronze may be quite misleading.

Manganese bronze was selected as the metal to be subjected to the series of tests here recorded because, of the modern alloys, it is one of the strongest and is readily obtainable in the market. This metal is used as a type and the results, so far as behavior under a tensile test is concerned, may be taken as typical of brasses and bronzes in general, at least so far as they have come under the observation of the author in some 17 years of testing materials. Specifications issued by the Navy Department for manganese bronze, March 30, 1909, required the following approximate composition:

	Per cent.
Copper	52
Iron	1
Zinc	46
Tin	1
Manganese	Trace
Aluminum	0.5

The specification further required:

Tensile strength	65,000 lb. per sq. in.
Elastic limit	30,000 lb. per sq. in.
Elongation	15 per cent. in 2 in.
Reduction of area	25 per cent.

They state "the elastic limit is to be the yield point, measured by the drop of the bar."

Manganese bronze castings in the form of cylindrical bars about 1½ in. in diameter by 24 in. long, were ordered from several foundries supplying this alloy; the orders were placed through the regular channels, bars of about this size being required in ordinary production. In this way it was hoped that commercial material would be obtained, such as might be expected in castings of more intricate shape. The results on these specimens, ordered without reference to intended use, checked very well with those upon samples submitted previously by the same parties, especially for the purpose of showing the qualities of their material. To indicate the effect of working upon the metal, there were also ordered two bars of the same dimensions hot rolled to size, and two bars hot rolled and cold drawn. The effect of the cold drawing was lost to a great extent by the necessary turning off of the surface in preparing the specimen for test. Much of the cold drawn metal is used in this way, however, when screw threads are required to provide means of fastening the part in place in the structure. From the bars so obtained, specimens were turned which provided a test section 1 in. in diameter by 8 in. between gauge marks, and which had, for the purpose of gripping, ends 1½ in. in diameter threaded to fit the nuts required by the testing machine.

Some of these specimens were pulled in the laboratory of the General Electric Company at Schenectady, some in the testing machine at the United States Arsenal at Watertown, and others in the laboratory of the Halcomb Steel Company at Syracuse. The tests in the Halcomb laboratory were made to obtain autographic strain diagrams; the other tests were made with an extensometer.

In the tests with the extensometer, after the instrument had been placed, an initial load of 1000 or 2000 lb. per square inch was applied and the first reading taken; readings were then obtained at successive loads applied in equal steps. In some cases, the readings were continued regularly until the increase in extension per increment of load was so great that there was no doubt that the strain diagram had departed markedly from the straight line demanded by Hook's law; in other tests, the normal succession of readings was continued only until the first positive increase in extension per increment of load was noted, when the stress was reduced to the initial load for the measurement of permanent set, after which the load was returned to the value just left, a new reading taken and the test continued with further determinations of set intervals. The values of stress and corresponding strain obtained were plotted, and the elastic limit

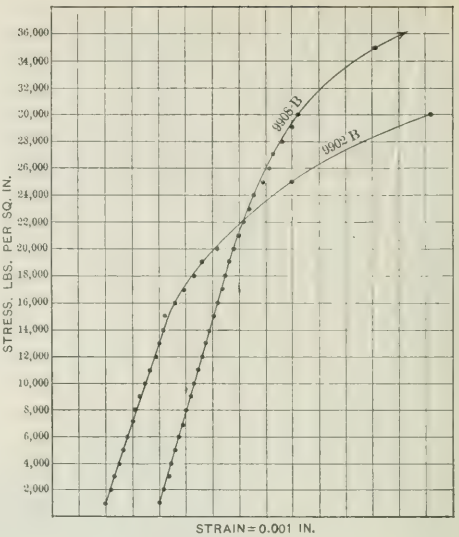


Fig. 2.—Curves of Results of Test at the Watertown Arsenal.

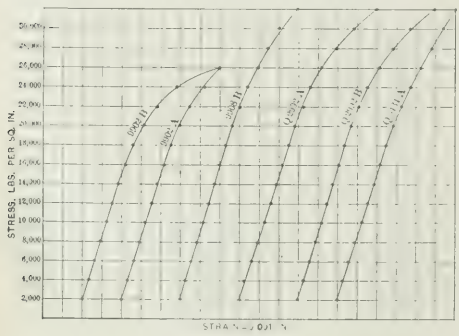


Fig. 1.—Curves of Results Obtained from Tests Made at Schenectady.

* Presented at the Spring meeting of the American Society of Mechanical Engineers, Atlantic City, May 31-June 3. For discussion of this paper see the report of this meeting printed in *The Iron Age*, June 9, 1910.

† Chief of Test Laboratory, General Electric Company.

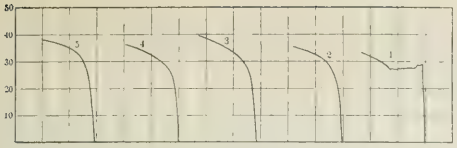


Fig. 3.—Autographic Strain Diagram Corresponding to Results of Tests Made at the Halcomb Steel Company's Laboratory, Syracuse, N. Y.

recorded as the stress at the point of inflexion of the curve drawn through the points.

The specimens subjected to these tests were about 12 in. long over all. From the remainder of the 24-in. bars, the usual ½ x 2 in. test pieces were turned and tested in the customary commercial way, using a pair of multiplying dividers to indicate the point of increase in rate of stretch or yield point.

The curves for all the tests made at Schenectady are assembled on Fig. 1. The curves from the tests at the Watertown Arsenal are given on Fig. 2, and the results of the work at the Halcomb laboratory are shown in Fig. 3; the scale of the diagram is so small that the location of the point of inflexion is uncertain within about 2000 lb. actual load. The multiplying dividers used in the commercial tests here recorded magnify the movement of the gauge marks about 10 times, and are a much more sensitive instrument than the machinists' dividers for locating the yield point; hence, the yield points recorded are lower than are usually reported.

In text books and elsewhere, the limit of elasticity is defined as that value of stress beyond which there is not full recovery of the initial dimensions or shape of the specimen after release of the load, or as the maximum stress that can be applied without producing permanent set. In other words, it is the value of stress beyond which Hook's law no longer holds, and it is sometimes spoken of as the limit of proportionality of stress to strain. Accepting this definition it is seen that its value in the bronzes tested is from 16,000 lb. per square inch to 23,000 lb. per square inch, whereas the yield points found for the cast metals ran from 25,000 to 29,000 lb., and for the worked metals, from 30,000 to 44,000 lb. per square inch. Had ordinary dividers been used, the values for the cast metals would have been placed between 30,000 and 40,000 lb. per square inch. The strain diagrams from the extensometer tests show the general shape of the elastic curve of the metal, and permit the accurate fixing of the point of inflexion of the curve; the autographic diagrams, however, show not only the actual shape of the curve, but also why there is the uncertainty in the locating of the yield point or point of rapid increase in rate of stretching.

For comparison, the autographic diagram of a piece of commercial "structural medium" steel is shown as No. 1 in Fig. 3. At the scale of the diagram, no inflexion of the curve is seen until it suddenly breaks sharply, actually drops and remains practically horizontal until it finally picks up again. This jog is entirely characteristic of mild steel, and is found to a more or less marked extent in all steels, save perhaps the very hard varieties. There is, however, no break of any sort in the curves obtained from bronze; they are entirely smooth. Somewhere along the knee of the curve, the tester notes that the material is stretching faster; just where he notices it will depend upon the sensitiveness of the means employed to indicate stretch, and upon his skill and sharpness in observation. The jog in the steel curve is indicated simultaneously by the slipping of the dividers and by the dropping of the scale beam of the testing machine driven at constant speed. The scale beam does not drop when testing bronze; the operator finds the poise gradually traveling more slowly to maintain balance, but who can say when the change in rate began?

Halcomb Steel Company Tests.

Autographic Tests All Specimens 1-in. (Approximate) Dia. by 8 In. Long.

Number on curve sheet	1	2	3	4	5
Sample	Steel.	Cast.	Cast.	Hot Rolled	Cold Drawn.
Reduction of area, per cent.	53.6	8.3	14.1	53.2	38.6
Elongation, per cent.	36.3	27.2	6.6	34.4	25.2
Elastic limit, lbs. per sq. in.	38,000	21,400	22,900	22,800	25,200
Tensile strength, lbs. per sq. in.	60,140	69,700	63,940	71,820	68,500

It is customary to find the yield point in mild steels, and, in fact, in annealed steels generally, at about 50 per cent. of the maximum strength. The yield point in mild steels corresponds, for all practical purposes, with the elastic limit. As the steel becomes harder, due to increase in carbon or the addition of alloying metals, or to heat treatment, the yield point rises rather more rapidly than the elastic limit, although the difference between the two is not so great, but that the former may be used in calculations, and the yield point itself is less sharply marked, though still observable if sufficient care is taken. The yield point in steel is accepted as a safe guide to the engineer, in deciding upon the maximum stresses that may safely be permitted in parts designed to carry load.

That no such dependence can be placed upon the so-called yield point, as it is determined upon bronzes, is evident; rather, recourse must be had to the slower but more accurate determination of the true elastic limit if safe data are desired. It is especially noteworthy that the sets found at the minimum values of yield point as usually reported are a very considerable proportion of the total stretch that has taken place in the metal at those stresses, and that sets are found at stresses which are but 40 to 50 per cent. of these reported yield points. Under certain conditions of dead load, a stress of 75 per cent. of the elastic limit is sometimes considered at least not unsafe; if such a load were calculated for bronze, upon the basis of the usual commercial test for yield point, instability of the part so designed would be inevitable.

Hot working of the metal has not materially improved its elastic properties, but has greatly increased its toughness, and probably in an extended series of tests, would have been found to impart uniformity. It is well known that this particular alloy is relatively difficult to handle in the foundry because of its sensitiveness to temperature of pouring and to changes in composition, at least in the sense of impurities in the constituent metals, and because of its great shrinkage, requiring large feeders and sink heads. As in other copper alloys, many of the ill-effects of this sensitiveness may be largely overcome by hot working. The data here presented are too meager to warrant lengthy discussion of the effects of cold working of the metal; it is shown that in the case of bars of 1½ in. in diameter, the effects of the cold drawing may have largely disappeared when ¼ in. of metal is removed, except as shown in a lessened elongation. Neither hot or cold working cause any change in the elastic curve of the metal; it remains a characteristically smooth curve. In other cold drawn copper alloys, when tested without removal of surface, the elastic curve usually presents a much sharper bend at the knee than is found in the cast metal, or in the same metal when annealed; the same would probably be found with manganese bronze if tested as drawn, without turning. Cold drawn metal, except wire, is seldom used without removal of the surface to provide means of fastening, and it surely is safer to test it as it is used rather than in the perhaps fictitious condition of strength due to skin hardness.

These results do not constitute a new discovery. In the literature of testing engineering, references may

be found with direct bearing on the subject; but in these days of rapid progress and short cut methods, much that is old, or that may be found only by search, is apt to be forgotten or overlooked. Comparatively few laboratories have autographic machines, and the use of the extensometer with a specimen only 2 in. long is not very satisfactory because of the small extension of so short a length of material under stress. Many otherwise well equipped laboratories have no extensometer. So much of experience in testing materials is based upon work done upon iron and steel that it was perhaps a natural assumption that the characteristics of these metals would also be found in bronzes and similar alloys and hence that methods of testing used successfully with one would yield equally safe results when applied to the other. Test results which are misleading are exceedingly dangerous; they induce a false sense of security which may result in the failure of structures and lead to the condemnation of a material which would be perfectly satisfactory if properly applied and not unwittingly abused.

The Garvin Four-Spindle Vertical Indexing Attachment

For use in milling the wrench holds on spark plugs and similar work the Garvin Machine Company, Spring and Varick streets, New York City, has placed on the market a four-spindle indexing attachment. Fig. 1

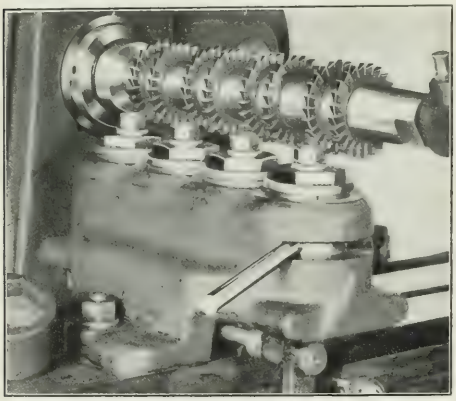


Fig. 1.—A Four-Spindle Vertical Indexing Attachment for Milling Machines, Made by the Garvin Machine Company, New York City.

shows the attachment applied to the company's No. 21 plain back geared milling machine, which was illustrated in *The Iron Age* May 16, 1907, while Fig. 2 gives some of the details of the construction of the attachment.

The hexagons are milled on the spark plugs before they are threaded and while they are held by the smooth end, in a double cone tapered collet which is tightened by a wrench. The spindles on the lower end are all geared together so that one indexing by the lever projecting from the base of the fixture is sufficient for all four. When the work is completed the collets are loosened, and returning the table operates the ejecting lever, shown at the lower left corner of Fig. 2, forcing the pieces from the fixture. Any dirt or chips which may pass down through the holes in these bushings falls through the ejector plug, which is hollow, to the recess just above the slide; this construction is clearly shown at the right of Fig. 2.

The way in which the spring collet is tightened and loosened is also illustrated in Fig. 2, where the right spindle is shown sectioned. The handle shown broken in the upper left corner is the one which indexes the spindles simultaneously and in Fig. 1 projects from the base of the fixture. The boss, a little to the right of this lever and under the left spindle, exposing a screw head, contains the spring and lock pin plunger which works into the next spindle to the right. This contains as many holes for the plunger to enter as the number of divisions to be made. This attachment is bolted to the table of the milling machine and can be applied to one of any make.

The Osborn Core Sand Washing Machine

In every foundry considerable is spent for core sand, not so much because of the quantity required as due to the fact that after it has been used it is generally discarded as unfit for further use. To reduce this item of expense would be very desirable, and with this end in view the Osborn Mfg. Company, 5401 East Hamilton avenue, Cleveland, Ohio, has developed a machine for washing the core sand and rendering it fit for indefinitely repeated use. This washer, which is illustrated herewith, is said to be the only one of its kind on the market at the present time.

The machine, known as the No. 13 core sand washer, consists of a cylindrical drum 48 in. long by 34 in. in diameter where the sand is washed, together with a feeding hopper and an outlet. Sand is fed into the drum, which has a capacity of 16 cu. yd. of black sand per day, and mixed with the wash water in the proportion of 10 gal. to 1 cu. ft. of sand. The drum is

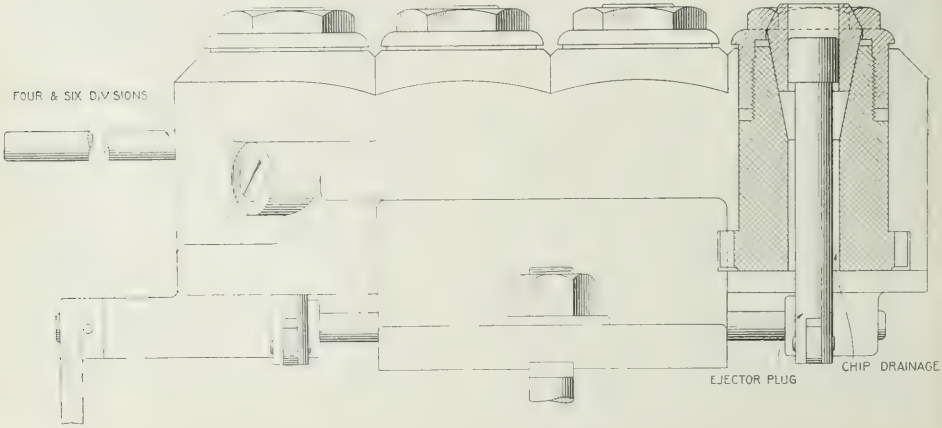
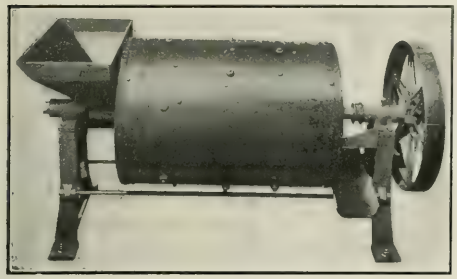


Fig. 2.—Elevation Partly in Section of the Garvin Four-Spindle Vertical Indexing Attachment.

rotated through the pulley at the end of the shaft until the sand has become thoroughly cleansed, and about 12 cu. yd. of washed sand is recovered, the difference being largely the other ingredients which are washed out.

The savings effected by the use of this machine include not only the cost of the new sand, but the eliminated expense of hauling it to the dump. In the H. B. Smith Company's plant at Westfield, Mass., where the



The No. 13 Core-Sand Washer Made by the Osborn Mfg. Company, Cleveland, Ohio.

core sand washer was originated, very satisfactory cores have been made using from 50 to 100 per cent. of washed sand. In one test, out of 140 cores set, only one was lost. In another test recently made with radiator cores, using all washed sand and Osborn No. 1 core oil, 38 to 1, 90 cores produced 87 good castings. It is claimed that no more oil is required with the washed sand than with new sand.

Lake Ore Shipments to September 1

The August movement of Lake Superior iron ore by water was slightly more than that for July—6,964,381 tons against 6,945,289 tons—though a decrease was expected. It is now the expectation that after a fairly full movement this month there will be a pronounced curtailment in October. The policy of the United States Steel Corporation is to clean up its shipments early and thus avoid the risks of late trips which in a number of recent years have been attended with very considerable losses. Estimates of shippers in position to gauge fairly the situation now put the probable movement this year midway between the 41,683,599 tons shipped by water in 1909 (903,270 tons additional going by all-rail routes) and the 50,000,000 tons of the optimistic estimates made for 1910 at the opening of the year.

The following table, giving the ore movement, shows that the total lake shipments to September 1 were 28,827,029 gross tons, as against 22,588,549 tons to September 1, 1909, an increase of 6,238,480 tons, or 27.61 per cent.:

Port.	August, 1909.	August, 1910.	To Sept. 1, 1909.	To Sept. 1, 1910.
Escanaba	1,037,341	697,412	3,053,845	3,162,271
Marquette	542,607	525,898	1,413,568	2,249,774
Ashland	639,981	645,107	1,790,769	2,878,971
Superior	1,110,213	1,332,284	3,686,323	5,227,687
Duluth	2,279,242	1,382,156	7,713,377	9,823,644
Two Harbors	1,584,215	1,381,524	5,020,667	5,484,682
Totals	7,193,199	6,964,381	22,588,549	28,827,029
Increase, 1910		*228,818	6,238,480	

* Decrease.

The Appalachian Exposition, a demonstration of the resources and progress of the South, opened September 12 in Knoxville, Tenn., to continue one month to October 12. The buildings cover about 100 acres. The main exhibit building alone contains 80,000 sq. ft. of exhibit space. It will house the displays of commerce, manufactures, railroads, the Federal Government, educational institutions and fine arts. It is a permanent structure, built entirely of materials produced in the Appalachian Mountain regions.

New Tools and Appliances

Duplex Vacuum Cleaning Machine.—The Keller Mfg. Company, Twenty-first street and Allegheny avenue, Philadelphia, Pa., is making a new vacuum cleaner similar in principle to other machines of its type, but having two diaphragm air pumps driven by a single motor making it smaller for a given capacity. The pumps are mounted one above the other, the lower on a cast iron base and the upper on four pipe columns. A ¼-hp. driving motor is mounted on a bracket midway between the pumps, and the shaft is extended at both ends and carries two ball-bearing eccentrics and a flywheel. Each pump is driven by two links which are run from the proper eccentric. The operating mechanism is inclosed in a sheet steel cylinder and above this is the dust collector comprising a sheet steel shell with a heavy felt bag inside, both of which inclose a drill dump bag. The machine is not portable and is connected to the house piping by a 5-ft. length of rubber hose. The dust-laden air enters the upper chamber and is there relieved of its burden. It then passes directly to the upper pump in part, while the balance goes down the pipe columns to the lower one. After passing through the pumps, the strained air is blown out around the motor and escapes through an opening in the casing. No special foundation and no water nor sewer connections are required. The size of the motor is limited so that it can be operated from lighting circuits through ordinary push buttons or snap switches and conform to the Underwriters' requirements without using special wiring.

Speed Controlling Rheostats.—The General Electric Company, Schenectady, N. Y., has brought out a line of speed controlling rheostats in which an effort has been made to combine in a single box both armature and field regulating rheostats, and to effect all speed changes by the movement of a single arm, which is held in any position by a mechanical device. Rheostats for machine tool service where the full load current is taken at low speeds in order that the motors may maintain a constant torque, and others for fan service where the load increases with the speed are included. A no voltage release is provided to prevent damage from the current being turned on without any resistance in series with the motor armature. The contact segments are of liberal size and are so designed that they may be renewed easily and quickly, and the resistance units are of an improved design, so constructed as to be nonbreakable and thoroughly ventilated.

Safety Stop-Clutch.—C. F. Heinss of the Queen City Punch & Shear Company, Cincinnati, Ohio, has recently designed and patented a new automatic safety stop-clutch for punching and shearing machinery. The clutch is engaged and disengaged automatically, is so designed as to provide safety for the operator while the punches and dies are being adjusted without it being necessary to throw off the belt, as is commonly done, and is said to be positive in action. The operation of the clutch is controlled by foot treadle, which acts through cams and a spring plunger to force the clutch into engagement with the driving gear. If desired the clutch can be entirely disengaged by throwing a small hand lever on the top of the frame.

Device for Transferring Prick Punch Marks.—The E. C. Bliss Mfg. Company, 91 Sabin street, Providence, R. I., is making a handy little device which is intended to transfer prick punch marks accurately from one side of a piece of work to the other. Two punches are utilized, the lower of which is spring actuated. The piece is brought under the upper punch, which is centered in the punch mark. When this has been done the lower punch is pulled down and released, the spring providing enough force to mark the lower face directly under the one on the upper surface.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1 1/4 in. round and square ... ₩ lb 1.90¢
1 1/2 to 4 in. x 1/4 to 1 in. ... ₩ lb 1.90¢
1 1/2 to 4 in. x 1/16 to 3/16 ... ₩ lb 2.10¢
Rods 5/16 and 11-16 round and square ... ₩ lb 2.10¢

Angles:

3 in. x 3 in. and larger ... 2.10¢
3 in. x 2 1/2 in. and 3 in. x 2 in. ... 2.35¢
2 1/2 to 2 in. x 2 in. ... 2.30¢
2 1/2 to 2 in. x 3-16 in. and thicker ... 2.40¢
1 1/2 to 1 3/4 in. x 3-16 in. ... 2.30¢
1 to 1 1/4 in. x 1/8 in. ... 2.30¢
5/8 x 1/8 in. ... 2.40¢
4 x 1/4 in. ... 2.50¢
5/8 x 1/8 in. ... 2.60¢
5/8 x 3/32 in. ... 2.65¢

Tees:

1 in. ... 2.65¢
1 1/4 in. ... 2.45¢
1 1/2 to 2 in. x 1/4 in. ... 2.45¢
1 1/2 to 2 in. x 3/16 in. ... 2.35¢
3 in. and larger ... 2.15¢

Beams ... 2.10¢
Channels, 3 in. and larger ... 2.10¢
Rounds—1 to 6 in. x 5/16 to No. 8 ... 2.90¢
"Burden's Best" Iron, base price ... 3.15¢
Burden's "H B & S" Iron, base price ... 2.95¢
Norway Bars ... 3.60¢

Merchant Steel from Store—

per lb.

Bessemer Machinery ... 1.90¢
Toe Calk, Tire and Sleigh Shoe ... 2.50@3.00¢
Best Cast Steel, base price in small lots ... 12¢

Sheets from Store—

Black	One Pass, C R No. 1 Steel	R G Cleaned
No. 16	₩ lb 2.90	3.00¢
Nos. 18 to 21	₩ lb 2.95	3.10¢
Nos. 22 and 24	₩ lb 3.00	3.20¢
No. 26	₩ lb 3.15	3.30¢
No. 28	₩ lb 3.20	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ... ₩ lb 12 @14½¢
Patent Planished, W. D. Wells Write ... ₩ lb A, 13½; B, 9½ net

Galvanized.

Nos. 14 to 16 ... ₩ lb 3.30¢
Nos. 22 to 24 ... ₩ lb 3.75¢
No. 26 ... ₩ lb 3.75¢
No. 28 ... ₩ lb 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

	Gauged
Nos. 22 and 24 ... ₩ lb	5.75¢
No. 26 ... ₩ lb	6.25¢
No. 28 ... ₩ lb	7.50¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24 ... ₩ 100 sq. ft.	$3.85	4.80
No. 26 ... ₩ 100 sq. ft.	2.95	4.00
No. 28 ... ₩ 100 sq. ft.	2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A." Charcoal:
IC, 14 x 21 ... $6.35
IX, 14 x 21 ... 7.60

A. Charcoal:
IC, 14 x 21 ... $5.10
IX, 14 x 21 ... 6.35

American Coke Plates—Bessemer—
IC, 14 x 21 ... 67 lb ... $4.10
IX, 14 x 21 ... 5.40

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating ... $8.50
IX, 20 x 28 with an 8 lb. coating ... 10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ lb

Brass Wire—

List August 1, 1908. 14½¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz., quantity lots ... 18 ¢
Sheet Copper Cold Rolled, 14 oz. ... 22 ¢
Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ... ₩ lb 36½@37 ¢

Copper—

Lake Ingot ... ₩ lb 14¾@15 ¢
Electrolytic ... ₩ lb 14½@14¾¢
Casting ... ₩ lb 14¼@14½¢

Spelter—

Western ... ₩ lb 6¼@6½¢

Zinc.

No. 9, base, casks ... ₩ lb 8 ¢, Open ... ₩ lb 8½¢

Lead.

American Pig ... ₩ lb 5 @5¼¢
Bar ... ₩ lb 6¾@6½¢

Solder.

½ x ½, guaranteed ... ₩ lb 22½@23 ¢
No. 1 ... ₩ lb 20 @21 ¢
Refined ... ₩ lb 18 @18½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₩ lb @10¢
Hallett's ... @10¢
Other Brands ... @9½¢

Bismuth—

Per lb. $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ... Base
Rods & Wire ... Base Price 40¢
Sheets ... Base Price 35¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible ... ₩ lb	10.75@11.00
Copper, Heavy and Wire ... ₩ lb	10.50@10.75
Copper, Light and Bottoms ... ₩ lb	9.50@9.75
Brass, Heavy ... ₩ lb	7.25@7.50
Brass, Light ... ₩ lb	5.75@6.00
Heavy Machine Composition ... ₩ lb	9.50@9.75
Clean Brass Turnings ... ₩ lb	7.00@7.25
Composition Turnings ... ₩ lb	8.25@8.50
Lead, Heavy ... ₩ lb	@3.50
Lead, Tea ... ₩ lb	@3.25
Zinc Scrap ... ₩ lb	@3.75



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THE IRON AGE

Established 1855 — New York, September 22, 1910 — Vol. 86: No. 12

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Branch Offices

Philadelphia, Real Estate Trust Building — Chicago, Fisher Building
Pittsburgh, Park Building — Cleveland, American Trust Building
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No Wide Open Cuts in Prices

Steel Market Conditions Little Changed

There is little basis for the widespread predictions in the past few days of a "wide open cut in steel prices," implying that the market is to be taken forcibly in hand and made active. In spite of the newspaper and speculative clamor for something spectacular, finished materials have not departed from the course that has been followed for weeks. Our market reports have noted from time to time that prices maintained by the largest manufacturers have been shaded by others, chiefly the smaller producers, but this feature has not been accentuated this week.

It needs to be recalled again that the present scale of operations at mills and furnaces is close to that of the record years 1907 and 1909 and that the shipments from mills are going directly into channels of consumption. The demoralization heralded as impending would be remarkable under such conditions.

The statement of Chairman Gary, of the Steel Corporation, called out by the reports of the past few days, indicates that the large manufacturers are disposed to continue the policy of recent months. The situation to-day is very different from that which led to the price cutting of February, 1909. Then the shrunken volume of steel buying was due largely to the exceptional price policy pursued by the manufacturers, separating their industry from all others. To-day buyers are holding off because of conditions outside the industry itself. It is plain that the present hand to mouth buying cannot be galvanized into liberal contracts for forward delivery by a slaughter of prices.

The 1.40c. Pittsburgh price for plates, structural shapes and bars is maintained by the Steel Corporation and by nearly all its competitors. For bars this is minimum. The shading on plates is on narrower widths. In structural material the chief departures from 1.40c. have been in connection with fabricating contracts which have gone in some cases to as low a level as at any time last year.

The volume of new wire business is exceptional, and wrought pipe and tubes stand second in amount of new business taken. In sheets competition has been sharp for some time, but with nothing approaching demoralization.

The authorized statement that the Steel Corporation exports of steel products have been for some time 25,000 tons a month more than those of last year confirms what has been known in a general way as to the expansion of trade in outside markets. A considerable sale of rails has been made to a Chilean railroad.

Domestic rail business includes two orders from the St. Paul road for this year, one for 5500 tons placed at Chicago, and one for a less amount, placed at Buffalo. The Colorado mill has closed a good tonnage, including 13,600 tons for the Denver & Rio Grande and

12,000 tons for the San Pedro, Los Angeles & Salt Lake.

The Long Island Railroad inquiry for steel for bridges to abolish grade crossings is the largest now up, apart from the Quebec bridge and the New York subways. The work will take two years and the present inquiry is for 12,000 tons of steel or half that.

South Chicago mills will furnish the plates and shapes, about 2500 tons, for the new Pere Marquette car ferry.

One encouraging feature of the Western bar trade is the full specifications coming from implement manufacturers. The troubles they had last winter in getting bars led to the placing of very liberal contracts, larger in some cases than seemed necessary. Prospects are excellent for a very large output from agricultural works.

The irregularities in prices of semifinished steel in the Pittsburgh district are due chiefly to sales of billets and sheet bars held by dealers, at 25 to 50 cents a ton under mill prices.

In pig iron the aggregate of small orders for shipment this year has been more in some markets than for weeks. Some furnaces have been willing to sell at close to current prices for shipments beginning in November or December and running over the first quarter of next year. Southern sales of this sort have been at $11.50, Birmingham, for No. 2 foundry. For the most part the deadlock on 1911 deliveries continues.

Several sales of basic iron were made at Philadelphia, including a lot of 5000 tons and one of 4000 tons, at less than $15, delivered. In the Central West basic iron has declined further, a sale of 4500 tons for the last quarter being made at $13.45, at Valley furnace. A sale by a dealer was made at a still lower price.

The Tariff Board and Manufacturing Costs

A Washington writer points out that the plans of the Tariff Board for gathering data as to costs of production in the United States and other countries have reached a stage at which some authoritative ruling must be had as to just what the board is to undertake to get. The doctrine was laid down at the time the Executive programme for a Tariff Board was presented to Congress, that our protective tariff should be just high enough to represent the difference between domestic and foreign cost of manufacture plus a "reasonable profit." The utterances of the President, while never going beyond generalities, have indicated his belief that the determination of the two sets of costs as well as what a "reasonable profit" is would not be difficult. That the magnitude of the work grew upon the Executive mind as its actual execution pressed upon him appears in the following from a letter he recently wrote:

> When we understand that the cost of production differs in one country abroad from that in another, and that it changes from year to year and from month to month, we must realize that the precise difference in cost of production sought for is not capable of definite ascertainment and that even the most scientific persons who do this investigation is, after consideration of all facts which he learns, to exercise his best judgment in reaching a conclusion.

It will be seen that the ideas now entertained, as to the possibilities of tariff making on information secured by "scientific persons," are far from being dogmatic. Moreover, confidence in the value of the Tariff Board's work will be less when it begins to dawn upon these cost investigators that the differences in production cost, not alone between foreign countries, to which the above extract refers, but between different sections of our own country, are really important factors in such an inquiry. The fact may not be known to the so-called experts who are to do the investigating, and they may even miss it in their probing, but there are differences in cost between certain steel works in the United States, that are greater than the duty on the products common to these works. There is a greater difference than $2.50 a ton in the cost of pig iron made at certain blast furnaces that could be named and the cost of pig iron at other furnaces which have modern equipment and low priced raw materials. Similarly there is a greater difference than $3.92 a ton between costs of making steel rails at different domestic mills. Other iron and steel products could be named on which the duty does not cover the gap between low cost and high cost plants at home. It is not unlikely that a similar condition exists in other industries.

We have pointed out on other occasions the difficulties which the Tariff Board experts will encounter in pursuing their quest both at home and broad. There is no reason to expect that they will come any nearer to foreign costs than the special agents who went abroad to get information for Chairman Payne's committee. Furthermore, judging from some of the figres on steel making costs in the United States submitted to the last Ways and Means Committee, the different ideas of what "cost" should include will also represent greater differences than the amount of the tariff on a given article.

Manufacturers should not fail to recognize the popular demand for information as to the need of present protective duties—a demand more insistent than it has ever been. Just as the day of large corporations calls for greater publicity as to their operations, and particularly as to their effect on the prices of their products, there is no gainsaying the justice of the demand for facts as to the relation of tariff schedules to new industrial conditions—progress in invention, in manufacturing economies and in methods of doing business. But much depends on the sort of intelligence that is brought to bear on the inquiry. It is not so many years since the American people were persuaded that tariff schedules turned on "a study of markets rather than maxims." Just now the advocates of the "scientific" method need to be reminded that what is needed is more a study of markets than of costs. There are signs, too, that this is beginning to be appreciated. It is even suggested at Washington that perhaps the Tariff Board's inquiry might better concern itself with market prices of foreign products as laid down at various points of consumption, including the ports of the United States, and a comparison with prices of domestic products in the light of labor conditions at home and abroad. Concerning these things reliable data are abundant and their meaning would not be hid.

The Stock Market and the Iron Trade

It is unfortunate for the iron trade that the speculation in the stocks of industrial corporations carries with it the assiduous gathering of all sorts of rumors regarding market conditions on iron and steel products. No rumor is too wild to secure publicity through some one of the agencies supplying information to speculators. This may be a good thing for the holders

of industrial stocks in flush times, as the values of stocks are then enhanced. On the other hand, when the iron trade is quiet or a degree of depression prevails, the circulation of these rumors has an adverse double effect, as then the values of industrial securities are depressed, and consumers of iron and steel products are led to believe that trade conditions are worse than is actually the case.

The copper market for years presented a condition of this character. The speculation in stocks of copper companies carried with it the apparent desirability of securing and publishing the greatest amount of information possible regarding the operations of the companies and the condition of industries consuming copper. For this reason copper has long been considered as a highly speculative metal, its price being strongly influenced by the publication of all sorts of rumors regarding the increase or decrease in the consumption of the metal, gathered for the purpose of influencing the values of copper companies on the stock exchanges rather than for the purpose of guiding consumers in their purchases of the metal. For this reason it has always been necessary for those who consume copper in any considerable quantity to watch the developments on the stock exchanges while bringing their best judgment to play relative to conditions in their own branches of trade, so that they might form some opinion relative to the value of the metal for at least a reasonable time in the future.

When the large consolidations were formed in the iron and steel trade and the stocks of such corporations were listed on the stock exchanges the likelihood of the conditions existing in the copper trade developing in the same manner in the iron and steel trade was pointed out. We are now realizing the truth of this surmise. In the present condition of the trade the utmost diligence is shown by the gatherers of news for the use of speculators in securing everything likely to have an effect on the securities of industrial corporations. If a blast furnace is blown out for repairs or a steel plant is closed because of a breakdown, or some iron and steel establishment is forced to cease operations on account of a shortage of water supply through drought, the fact is not only published but commented upon in such a way as to carry the impression that trade is not only bad but steadily growing worse or some means would have been found to keep such plants in operation. If a concession is made on the price of some iron and steel product, this information is given the widest publicity. If even a rumor secures circulation that some steel manufacturer is making a little more strenuous effort than usual to secure orders this is given the color of an actuality and a general lowering of prices is heralded to the country. All this has the effect of causing buyers to withhold their orders in the expectation of securing lower prices, and, consequently, a worse condition of depression develops. It is time that consumers of iron and steel should carefully discriminate regarding the information being published relative to the developments in the iron and steel trade. They should understand that the purveyors of so-called news for the use of speculators do not have such intimate relations with manufacturing interests that they are able to give reliable information regarding any policy which manufacturers are contemplating. Statements of this character should be simply looked upon in their true light and not be accepted as correctly representing conditions. The speculative interests should not be permitted to influence the iron and steel market.

Our Adverse Balance of Trade

The preponderance of imports over exports continues to characterize our foreign commerce. The balance of trade for the month of August showed $3,563,425 on the wrong side of the international trade ledger. It had been hoped that either our exports would show an increase or our imports a decrease long before this time, so as to turn the balance of trade in our favor, but the August imports were the largest ever reached for that month, totaling $138,357,780, and also were larger than those of immediately preceding months. For the eight months of this year ending with August the value of imports exceeded the value of exports of merchandise by $913,569. These figures indicate the very great change which has come over our international trade, as it is many years since our imports exceeded or even equaled our exports in more than a single month at a time. We have usually enjoyed an annual balance in our favor running into hundreds of millions.

Evidently our foreign trade is out of joint. This is partly due to the very high prices for food products and cotton, which have checked our exports of such commodities. These products had long constituted the mainstay of our exports. While it is probable that the fall months will see a sufficient increase in the exports of food products and cotton to swing the balance of trade to the right side, yet it seems probable that this will only be temporary and that, unless something is done to increase our exports generally or to reduce our imports considerably, the unfavorable state of affairs in our foreign trade now existing is likely to reappear. It is not clear as to whether the new tariff is responsible to any extent for this great change in our international trade. An earnest inquiry, however, should be instituted either by the proper department of the Government or by commercial bodies for the purpose of ascertaining the cause and pointing out a remedy.

Asking for Catalogues

A thoughtless imposition that is practiced on manufacturers and dealers is that of writing for catalogues, after learning of them through the advertisements or catalogue reviews in technical and trade papers, without specifying either before or after their receipt whether or not the writer is in the market for any of the products covered in the catalogue. Like the usual neglect of courtesies over the telephone, it is the fact that we are not face to face with the individual receiving our message which makes us careless. It needs but the realization of the offensiveness of the act to have it corrected.

Most houses issuing catalogues, and especially those issuing the kind worth having, regard them as the first step in their selling campaign. Often the catalogues represent considerable expense to prepare and not infrequently the printing alone costs as much as 50 cents a piece. Naturally that they may derive the most good from this expenditure, it is their custom to follow up requests for catalogues with letters any way and

quite generally with visits from salesmen. The latter especially is a considerable added expense. It does seem as though those that are not in the market at the moment should say so at least when they acknowledge the receipt of the catalogue, and common courtesy requires the acknowledgment.

There are three classes of people who request catalogues—prospective buyers, those seeking information, and the idly curious who have no special reason for wanting the catalogue except that it is free. All houses issuing catalogues are glad to supply the first class, and most of them are willing to supply the second and even the third on the chance that they thereby sow seed for future business. If, therefore, the request for a catalogue is accompanied by a frank statement by the writer that he is not at the time contemplating purchase, or that there is no occasion for a representative to call, it is not likely that it will mean the refusal of the request for the catalogue. Most manufacturers are justifiably broad gauge enough to fill the request even though there is no immediate prospect of business, and it would save them the unnecessary added expense of following up the request with further correspondence or a salesman's visit. In fact, the evidence of consideration shown when the writer does make his position plain is certain to be appreciated by the publisher of the catalogue, for it saves him expense and trouble. An added reason for its being included with the request, is that it is likely to save the writer himself some annoyance and inconvenience. Certainly those who themselves issue catalogues should be the first to adopt the practice with others, and when the public generally become alive to the fact that it is a benefit even to themselves, it will mean a permanent lessening of the expense involved in selling machinery, and also mean a higher efficiency of trade and technical paper advertising.

The sustained interest taken by market reviewers in the Steel Corporation's statement of unfilled orders on hand is as noteworthy as the perspicacity of some of their interpretations. For example:

> September's showing of unfilled orders will undoubtedly be *much better* than August's, because of the heavier bookings and also *because shipments are running lighter*. These two factors mean a smaller loss on the total tonnage on the books.

And if all the Corporation's plants were shut down for the entire month of September shipments would run still lighter and the September 30 showing of unfilled orders would be better still.

Correspondence

Ferrotitanium in Iron and Steel Castings

To the Editor: In *The Iron Age* of August 18, pages 378 and 379, you give an abstract of the paper which I published in *Stahl und Eisen* of July 13. Referring to several critical remarks in your review, I should like to state:

1. I followed in every detail the prescriptions given by the firms which sold the ferrotitanium. The very low temperature at which the molds were poured in the first test did not interfere with proper pouring, as intimated in the criticism. The first test at the low pouring temperature and the second at the much higher temperature both show clearly that the claims of the firms selling the alloys—*i. e.*, that ferrotitanium, &c., raise the temperature—are not correct. This has been shown in our foundries by a great number of tests in actual service.

The readings were taken, as stated, with the Wanner pyrometer, an instrument rightly considered to be the best and most correct pyrometer for foundry use if properly controlled and kept adjusted. The low temperature of the first test for the pouring of the molds was chosen on purpose, as well as the higher temperature of the second test.

2. The dimensions of the test bars varied from 20 to 100 mm. square, because I wanted to find out if the statement of the different firms that the alloys produce a finer structure was right. Therefore the distance of the supports was of no account, having been arranged to suit our testing machine. One thing the fracture photographs do show, and that is that the claims of the firms regarding the structure are not correct.

3. The temperatures were given according to the table furnished with the Wanner pyrometer. Another claim for the alloys is that they reduce the sulphur. To show that this is also not correct I gave the analyses showing a reduction in sulphur of 0.0046 per cent. Every one of the analyses is an average of at least three. This will explain the third and fourth decimal.

4. I followed strictly the instructions given by the firms which induced the foundrymen to use the alloys in question and found that their claims were not correct. If your reviewer thinks that the additions of titanium were too small I would be highly interested to know what amount he considers efficient, though I am now firmly convinced that at the present market price of the alloys they are not economical in comparison with other purifiers, as, for instance, aluminum

LEONHARD TREUHEIT,
Foundry Superintendent of the G. & J. Yaeger Iron & Steel Works.
ELBERFELD, GERMANY, September 9, 1910.

No General Cut in Steel Prices

Reports were generally circulated in New York financial districts Tuesday, said to be based on telegrams from Pittsburgh and elsewhere, that announcements of cut prices in steel products would be made this week by the United States Steel Corporation. Chairman Gary, in answer to inquiries concerning the truth of these reports, gave out the subjoined statement following the regular meeting of the Finance Committee:

"There is no justification for the statement purporting to originate in Pittsburgh that a wide open cut in prices of steel is likely to occur before the end of the week. It is well known that the new business offered at the present time, though quite large, is less than the total producing capacity. If the railroad companies were buying as much as usual or up to their necessities the mills would be crowded.

"There has been a shading of prices of some of the commodities by a few of the smaller producers. However, the principal manufacturers are disposed to maintain fair prices and to co-operate so far as they may legally and properly do so. As usual, there has been an effort, for stock jobbing or other improper purposes, to greatly exaggerate if not misrepresent the facts. On the whole, the steel business should be considered satisfactory, and I see no reason to expect any change in this respect. Indeed there has been a slight improvement during the last few days. Our export business is exceedingly good, being at the rate of at least 25,000 tons per month in excess of the export business of last year."

The population of Canton, Ohio, is 50,217, an increase of 19,550, or 63.7 per cent. over the figures for 1900.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept.21, 1910.	Sept.14, 1910.	Aug.17, 1910.	Sept.22, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$16.00	$16.00	$16.00	$18.25
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	*16.25*	16.50	16.50	19.00
Basic, delivered, eastern Pa.	15.00	15.00	15.00	18.00
Basic, Valley furnace	*13.50*	13.75	14.00	16.00
Bessemer, Pittsburgh	*15.90*	15.90	16.15	18.40
Gray forge, Pittsburgh	*14.15*	14.15	14.25	16.40
Lake Superior charcoal, Chicago	*18.25*	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	24.50	24.50	24.50	25.00
Forging billets, Pittsburgh	29.00	29.00	30.00	29.00
Open hearth billets, Philadelphia	*26.50*	27.00	27.50	27.60
Wire rods, Pittsburgh	28.00	28.00	28.00	31.50
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	16.50
Steel rails, melting, Philadelphia	**14.00**	13.75	13.75	17.50
Iron rails, Chicago	16.00	16.00	16.00	19.00
Iron rails, Philadelphia	18.00	18.00	18.00	20.50
Car wheels, Chicago	*14.00*	14.00	14.50	18.50
Car wheels, Philadelphia	*13.75*	13.75	14.00	17.00
Heavy steel scrap, Pittsburgh	**14.50**	14.50	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	**14.00**	13.75	13.75	17.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.40*	1.40	1.42½	1.55
Common iron bars, Chicago	*1.37½*	1.37½	1.40	1.50
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.50
Steel bars, tidewater, New York	1.56	1.56	1.56	1.56
Steel bars, Pittsburgh	1.40	1.40	1.40	1.40
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	*1.40*	1.40	1.50	1.40
Skelp, sheared steel, Pittsburgh	*1.50*	1.50	1.60	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.15	2.20	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.75*	12.87½	13.00	13.50
Electrolytic copper, New York	*12.50*	12.67½	12.62½	13.00
Spelter, New York	**5.60**	5.50	5.20	5.85
Spelter, St. Louis	**5.45**	5.35	5.05	5.70
Lead, New York	4.40	4.40	4.40	4.38
Lead, St. Louis	4.30	4.30	4.30	4.30
Tin, New York	**34.55**	34.80	33.85	29.15
Antimony, Hallett, New York	7.87½	7.87½	7.95	8.30
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ½-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots on which jobbers charge the usual discounts for small lots from store are as follows: Blue annealed sheets, Nos. 3 to 8, 1.55c. to 1.60c.; Nos. 9 and 10, 1.60c. to 1.65c.; Nos. 11 and 12, 1.65c. to 1.70c.; Nos. 13 and 14, 1.70c. to 1.75c. Nos. 15 and 16, 1.80c. to 1.85c. One pass, cold rolled box annealed sheets: Nos. 15 and 16, 1.90c. to 1.95c.; Nos. 17 and 21, 1.95c. to 2c.; Nos. 22 and 24, 2c. to 2.05c.; Nos. 25 and 26, 2.05c. to 2.10c.; No. 27, 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c.; No. 29, 2.20c. to 2.25c.; No. 30, 2.30c. to 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2c. to 2.05c.; Nos. 17 to 21, 2.05c. to 2.10c.; Nos. 22 to 24, 2.10c. to 2.15c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.25c. to 3.30c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	53	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	43
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $28.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, September 21, 1910. (*By Telegraph.*)

Pig Iron.—The very low prices ruling on iron for delivery over the remainder of this year are attractive to consumers and some sales have been made. An open hearth steel interest has bought from a Valley furnace 4500 tons of basic iron, to be shipped 1500 tons a month, for October, November and December, at $13.90 delivered, carrying a freight rate of 45c., the iron netting $13.45 to the furnace. We also note sales of 1250 tons and 1000 tons of basic at $13.50 at furnace, the freight on this iron for delivery in the Pittsburgh district being 60c. a ton. We also note sales of about 2000 tons of Bessemer at about $15, Valley furnace, and 500 tons of No. 2 foundry at $14, Valley furnace. We quote Bessemer iron at $15; basic, $13.50; No. 2 foundry, $13.75 to $14; malleable Bessemer, $14.25, and gray forge, $13.25, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Steel.—There is not much new inquiry for billets, sheet or tin bars, consumers being inclined to hold off in the belief that prices may be lower. A good deal of steel is in the hands of dealers who are offering small lots of billets and sheet or tin bars at 25c. to 50c. a ton less than the mills will accept. We quote: Bessemer 4 x 4 in. billets, $24.50; Bessemer sheet bars, $25.50; open hearth billets, 4 x 4 in., $25 to $25.50; open hearth sheet bars, $26 to $26.50, and forging billets, $29 to $29.50, all f.o.b. Pittsburgh, Wheeling or Youngstown districts.

(*By Mail.*)

The quietness in the iron trade seems to have increased and to have spread to several lines not heretofore affected, among these being tin plate. Small lots of Bessemer, basic and foundry pig iron are being sold right along, but many of these sales are by dealers and at lower prices than the furnaces will name. A good deal of steel in the form of billets and sheet bars is in the hands of dealers, who secure it by putting pig iron into steel plants and taking steel in exchange for it. In some cases these dealers are able to offer fair sized lots of billets, sheet and tin bars at lower prices than the larger steel mills will name. Specifications so far this month as compared with August are the same, but on some lines show a falling off. Prices are being remarkably well sustained in view of the light new demand. Prices on sheets seem to be more erratic than on any other lines of finished product, and it is said that in some cases sheets have been sold at cost or less by mills that buy bars in the open market. The coke trade is still dragging, but there has been some little betterment in the scrap market of late, the demand from consumers being better and prices somewhat higher.

Ferromanganese.—Some inquiry is noted for small lots from consumers who are not entirely covered for the remainder of this year, and several such lots have recently been sold, running from 50 to 100 tons, for delivery over the remainder of this year. We quote 80 per cent. foreign at $39.50, Baltimore, the freight to Pittsburgh being $1.95 a ton.

Rods.—There is a fair amount of inquiry, mostly for small lots, the large consumers of rods being covered by contracts against which they are specifying at a fairly liberal rate. We quote Bessemer open hearth and chain rods at $28, Pittsburgh.

Muck Bar.—Best grades of muck bar rolled from all pig iron are scarce and continue to bring $29.50 to $30, Pittsburgh, for prompt shipments.

Ferrosilicon.—Some new inquiry is in the market, but prices continue very low. We quote 50 per cent. at $56.50, Pittsburgh, for prompt shipment, and $55.50 for forward delivery. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—There have been further sales of 3000 to 4000 tons of grooved and sheared iron skelp in the wider sizes. We quote grooved steel skelp, 1.40c. to 1.45c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c., and sheared iron skelp, 1.85c. to 1.90c., all f.o.b. Pittsburgh, usual terms.

Steel Rails.—A fair amount of new tonnage in light rails was booked by the Carnegie Steel Company last week, and specifications against contracts continue active. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c.? at mill.

Structural Material.—The McClintic-Marshall Construction Company has taken three new buildings for the International Harvester Company at Springfield, Ohio, about 1200 tons. Inquiries in the past week or two are reported as a little better and a considerable amount of new work is under way. We continue to quote beams and channels up to 15-in. at 1.40c. f.o.b. Pittsburgh.

Plates.—The new demand is very dull and all the plate mills are in need of work. Several were shut down last week waiting for orders to accumulate. We continue to quote ¼-in. and heavier plates in the wide sizes at 1.40c., Pittsburgh, but for delivery at certain competitive points, and for desirable tonnage, a slightly lower price is sometimes named. On the narrower sizes of plates 1.35c., Pittsburgh, by three or four of the outside mills is being done.

Sheets.—The new demand for sheets is reported slightly better, probably largely due to the low prices that are being named by some mills for delivery over remainder of this year. Box annealed, one pass cold rolled black sheets, No. 28 gauge, are on the basis of about 2.15c. to 2.20c., and No. 28 galvanized at about 3.20c. to 3.25c. at maker's mill in carload and larger lots. Painted and galvanized corrugated sheets are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets will be found on a previous page.

Tin Plate.—The tin plate trade, which has stood alone in activity for some time, is commencing to feel the effects of the depression in other lines, and specifications against contracts are not being received as freely as they were some time ago. The partial failure of the tomato crop in Maryland is responsible for the falling off in specifications from some of the canning companies in the Baltimore district. Prices are firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—New inquiries for soft steel bars and iron bars are quiet, but specifications against contracts are being received in a fairly satisfactory way. Inquiries for hard steel bars for concrete work are coming in quite freely. The bar iron mills report specifications from the railroads against contracts as only fair. We quote steel bars at 1.40c. and common iron bars at 1.45c., Pittsburgh.

Spelter.—The spelter market seems to have got well controlled, with the result that prices have advanced sharply. New inquiry is reported as a little better, and we now quote prime grades of Western at 5.40c., East St. Louis, equal to 5.52½c., Pittsburgh.

Hoops and Bands.—Several makers report that specifications against contracts for hoops and bands have been coming in better so far this month than in the corresponding period in August, and are often accompanied with requests for prompt shipments, showing that stocks held by consumers are very light. We quote hoops at 1.50c. and bands at 1.40c., in carloads and larger lots, the latter subject to extras as per the steel bar card adopted September 1 last year.

Spikes.—New orders for railroad spikes are light, and in many cases railroads are holding up their specifications against contracts. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—The new demand is mostly for small lots to meet current needs, but specifications against contracts are coming in at a fairly satisfactory rate. Regular prices of 1.90c. on structural rivets and 2c. on boiler rivets continue to be shaded.

Shafting.—Specifications against contracts for shafting from the implement makers have fallen off a great deal lately, while from the automobile makers they have almost entirely stopped. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Buyers of wire and wire nails continue to limit their purchases to small lots to cover current needs. It is believed that stocks held by jobbers and the retail trade have been pretty well depleted, as, in a great many cases, new orders for nails and wire carry with them urgent requests for prompt shipment. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—Specifications and orders so far this month are reported fully as heavy as in the corresponding period in August, and on the larger sizes the mills are pretty well filled for the remainder of this year. The new demand for merchant or butt weld sizes has been dull for a long

THE IRON AND METAL MARKETS

time, and the mills have not much tonnage on the smaller sizes on their books. About the only large active inquiry in the market for line pipe is that of the Busch-Everett Syndicate, which proposes to pipe natural gas from Shreveport, La., to St. Louis, but, as it is so late in the year, it is not likely anything will be done with it until next year. It is stated that regular discounts on iron and steel pipe are being fairly well maintained.

Boiler Tubes.—There is a moderate demand for railroad tubes, on which the mills have a fair amount of business booked, but merchant tubes are very dull, discounts being more or less shaded.

Coke.—There is no betterment to note in the coke market, either in demand or prices. The output in the Upper and Lower Connellsville regions last week was 341,734 tons, showing a falling off as compared with the first week of this year of more than 100,000 tons, and there is still too much coke being made. No large inquiries are in the market for either furnace or foundry coke. We quote standard makes of furnace coke at $1.60 to $1.65 per net ton, at oven, for prompt shipment, and $1.75 to $1.80 on contracts for delivery over the remainder of this year. Prompt 72-hour foundry coke is about $2.10 to $2.25 per net ton, at oven, and on contracts from $2.25 to $2.50, at oven. Some grades of both furnace and foundry coke that do not run high in quality are offered at lower prices.

Iron and Steel Scrap.—It is stated that prices bid by dealers on the scrap lists of the Norfolk & Western, Pennsylvania Railroad Lines East and two of the Southern roads, which closed last week, were from 25c. to 50c. a ton higher than the bids on the same lists a month ago. There is more inquiry for scrap from consumers and dealers are firmer in their ideas as to prices. However, it is not believed that prices on scrap can advance very materially until there is some betterment in the pig iron market, these two commodities usually advancing or declining together. We note a particularly active demand for bundled sheet scrap, borings and turnings. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.50 to $14.75
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.25 to 16.50
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	12.00 to 12.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.75 to 13.00
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	8.25 to 8.50
Machine shop turnings	9.50 to 9.75

Chicago

FISHER BUILDING, September 21, 1910.—(*By Telegraph.*)

Physical conditions throughout are very favorable for business. The corn crop is so far matured that it is beyond danger of serious frost damage and the yield promises to be very large. It is generally estimated that crops this year of all kinds have reached a higher average value than ever before in the history of the West. The distributing trade is very active in all articles of general consumption like hardware. Railroad earnings show an increase over last year. The iron and steel business, however, continues to drag along. The steel mills report a moderate improvement the past week in the amount of new business, but buying is still short of the usual volume at this season, especially in heavier finished products. There are more inquiries for rails and one order for 1000 cars was given by a Western road last week, but railroad purchases are generally restricted to the minimum or urgent requirements. Car repairs are limited to patch work instead of the thorough overhauling of equipment which is customary at this season. Another depressing feature in the market for structural plates and shapes is that builders have been unable for some time to obtain satisfactory loans for the construction of large buildings, making large contracts of this character few and far between. Important railroad terminal work in Western cities involving large amounts of steel is also delayed by inability to place bonds. Outside the range of these depressing influences business is generally satisfactory, and the improvement is working up slowly from the foundation of favorable agricultural conditions. There are no pending labor troubles of any moment; the coal strike is settled at last and general confidence is expressed in a gradual improvement in the steel industry. The scrap market remains weak and featureless, reflecting no change in the current demand.

Pig Iron.—The refusal of the furnace interests to sell for next year has had a dampening effect on the iron market, and trading is not so active as it was two or three weeks ago. One Southern interest has made a few sales for first quarter or first half at $11.50, Birmingham, but only to hold customers who wanted to cover their commitments on their finished products. With this exception both the Northern and Southern furnaces selling in this territory are holding firm in refusing to quote for next year except at figures which are nominal, representing usually $1 over the current price. Southern iron is a little weaker for current shipments than two or three weeks ago. There are more furnaces willing to take business for last quarter at $11, but sales at this price are closely confined to high phosphorus iron from Tennessee furnaces. If a buyer wanted a large lot of Southern iron for last quarter it is probable that $11 could be shaded, but there are no inquiries reported of this character for foundry iron, except one from a manufacturer at Kenosha, Wis., which has been withdrawn. While this weakness exists it is due to the fact that there is so little demand for last quarter. Sales of a few thousand tons would probably relieve the pressure. In Northern iron the local furnaces insist that $16, at furnace, is their minimum for the current lots which they are selling. This price might be shaded on a large tonnage for prompt shipment, but no inquiries are reported except for small lots of a few hundred tons. Current prices, however, are quoted 25c. lower. The foundries in this district appear to be well covered for the last quarter, except for the small lots which they buy to even up their mixtures. The malleable foundries are insistent in their effort to buy for next year, owing to the fact that they sell their castings on long term contracts, but are unwilling to pay an advance of $1 a ton, which is asked by local furnaces on inquiries for the first half. The following quotations are for September shipment, Chicago delivery:

Lake Superior charcoal	$18.25 to $18.75
Northern coke foundry, No. 1	16.75 to 17.25
Northern coke foundry, No. 2	16.25 to 16.75
Northern coke foundry, No. 3	16.00 to 16.25
Northern Scotch, No. 1	17.25 to 17.75
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.25 to 16.75
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—There are only occasional inquiries for small lots. On any desirable tonnage a buyer could probably obtain forging billets at $28, base, Chicago, but on current lots the market is quoted at $29, Chicago.

Rails and Track Supplies.—The Chicago, Milwaukee & St. Paul has placed an additional order with the Illinois Steel Company for 5500 tons of standard rails. This road is the only one that has had new construction of any moment under way the past year. The additional orders from this company which have been placed during the past summer are on account of branches and feeders of its line to the Pacific Coast. A few other orders were taken in Chicago the past week for small lots of 500 to 1000 tons. There have been good orders in the past 10 days for light rails, most of them coming from coal mines which resumed operations last week. On small lots the mills have generally obtained $1 more for light rails than the prices quoted below. The market for track supplies is quiet, but there is still a fair amount of new business. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—Although only a few construction contracts of any moment were closed last week in the West, the mills are getting more orders for plain material. These orders come chiefly from the smaller bridge companies. In some cases, however, the larger fabricating interests have placed mill orders for fair sized lots, up to 500 tons. The smaller shops are carrying very little material in their yards and the stocks of the larger companies are becoming broken, necessitating new mill orders to complete work in hand. Only two building contracts were reported closed last week. One was the Amos Brown office building at Seattle, Wash., 400 tons, which went to the American Bridge Company. The other was the Bankers Life Building at Lincoln, Neb., 300 tons, which was taken by the Decatur Bridge Company. The American Bridge Company also booked 355 tons of turn-

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tables for the Chicago, Milwaukee & St. Paul. The authorities at Eureka, Cal., have decided on reinforced concrete for the Eel River bridge, although it will cost $50,000 more than bids submitted for a steel bridge. It would have taken 1500 tons of structural shapes and will probably require 1200 tons of reinforcing steel. There are rumors of concession in prices of fabricated material, but on plain material from mill the prices are apparently firm in this territory at 1.40c., Pittsburgh. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The Illinois Steel Company will furnish about 2500 tons of plates and shapes for a new lake boat to take the place of the Pere Marquette car ferryboat, which sank recently in Lake Michigan. The Atchison order for 1000 refrigerator cars is the first car order of any size that has been reported from a Western railroad in several months. There is a fair run of small orders for plates, and the principal mills in this market are holding 1.40c., Pittsburgh, as the minimum, although concessions are reported occasionally on narrow plates. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—New sheet business is keeping up at a very satisfactory rate, especially on open hearth sheets. Concessions are only reported on very desirable orders. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—The yearly buyers of soft steel bars are generally specifying the full monthly allotments on their contracts. Owing to the trouble that they had last winter in getting deliveries, the agricultural implement manufacturers generally contracted this year for very liberal amounts, acting on the theory that they could call for the tonnage if they needed it, but could refuse to furnish specifications if their trade fell off. One of the encouraging features of the market is that these buyers are not discounting the estimates made last spring of their requirements. The implement people report that the demand from their retail agents for their product is running larger than last year, but they will not be able to increase their output materially, as they operated their shops 12 to 16 hours a day last winter and worked their men to the limit. The rail stock mills are getting a fair run of orders for concrete material and other hard steel bars, and are operating at a comfortable rate, although they could do more business. The bar iron market remains stagnant, as the railroads are buying only in small lots for immediate delivery. The railroads appear to be doing only makeshift repair work on their equipment, requiring smaller lots of bars than if they were making thorough repairs. Prices on all grades of bars are practically unchanged in this market. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Merchant Steel.—Specifications from manufacturing buyers are keeping up at a very satisfactory rate. There is a good demand for tool steel from store, and there is also a normal store demand for the general run of merchant mill products. The abnormal orders from automobile manufacturers, who were short of material last spring, are no longer a feature of the market, but the regular demand from store is holding about even.

Cast Iron Pipe.—The letting of 1200 tons of water pipe at Miles City, Mont., went to the American Cast Iron Pipe Company, Birmingham, Ala. The United States Cast Iron Pipe & Foundry Company booked 500 tons of water pipe at Russell, Kan., last week. There is a fair amount of routine inquiry. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Rods and Wire.—A stocking up movement on a moderate scale is still in progress among jobbers and dealers. The demand is especially good for nails, but orders for plain wire are keeping up at a good rate. Industrial buyers of wire are specifying larger quantities than a month or six weeks ago. The fall trade in barb wire is about over and sales for spring shipment have not begun, making this branch of the trade relatively quiet. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Old Material.—There is a stronger undertone in the demand for steel scrap, confined chiefly to special lines of material like railroad springs and couplers and knuckles, which are favored by malleable and steel foundries. Recent bids on railroad lists brought out prices about 50c. higher than this material has realized for several months. In other lines of old material, however, the market is quiet and dull, and would probably be much weaker if receipts were as large as they usually are at this season. Cars are scarce for loading scrap, as everything that will carry coal is being used in the coal trade, and this condition may continue several months, making a lighter movement of old material this fall. The foundries are steady buyers of cast scrap, and railroad malleable is also in a little better demand. Railroads have been offered a little better price for rerolling rails than the mills are paying for prompt delivery from dealers, but the material offered on railroad lists usually does not arrive for 30 to 60 days. On the whole the scrap market has failed to reflect any improvement in business conditions. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.75 to 12.25
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.25 to 11.75
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Philadelphia

PHILADELPHIA, PA., September 20, 1910.

While there has been a better movement in pig iron, transactions in finished materials have been less active. Both foundry and steel making grades of iron figure in the week's sales and an improved inquiry, both for near future and forward delivery, is to be noted. Prices have been comparatively well maintained, but no open quotations for 1911 delivery are reported. The situation in finished materials is rather hard to define. There have apparently been no deflections in this territory from recent prices for plates and shapes, even though business is lighter. Billets are lower, ordinary open hearth rolling steel being easily 50c. under last week's quotations. Sheets have also been marked down a tenth, and for round lots this week's quotations could probably be shaded. Refined iron bars are dull and prices are easier. The old material market is a trifle stronger on moderate sales of steel and wrought scrap at slightly higher prices. It is stated that the recent buying arrangement of a number of the Eastern rolling mills, to get their supplies through a central purchaser, has fallen through; the leading consumer, at least, is now making inquiries and some purchases in the open market. Indications that the purchasing arrangement of the steel mills will be discontinued are also to be noted.

Iron Ore.—Arrangements have been concluded in several instances by which postponements in deliveries of foreign ores, recently asked for by consumers and tentatively agreed upon by sellers, have been definitely decided. As a result of this shipments from two foreign districts, aggregating 150,000 tons, sold for this year's delivery, will be postponed. This ore will be taken by the purchasers during the first half of next year. Very little interest as far as purchases of fresh supplies of ore is to be noted, although a sale of a cargo of about 5000 tons of low phosphorus ore to a furnace in this district is reported. Importations at this port during the week have been light, aggregating 10,257 tons, valued at $17,726.

Pig Iron.—Purchases during the week have been on a somewhat larger basis and buying has become a little more general, particularly for requirements for the remainder of the year. In the foundry grades there have been more sales in 200 and 300 ton lots, both of No. 2 X and No. 2 plain, for the greater part at unchanged prices, although one or two sellers have accepted the old differential of 50c. a ton between those grades when competition has been sharp. For standard brands of eastern Pennsylvania No. 2 X foundry $16, delivered, appears to continue to be the minimum, and, while the majority of sellers refuse to sell No. 2

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plain at less than $15.75, sales have been made at $15.50, and other sellers now express their willingness to accept the lower figure for desirable orders. A very fair volume of small, prompt lot sales is reported, on which most sellers firmly maintain quotations. The cast iron pipe foundries have purchased several moderate quantities. A sale of a mixed lot of 2000 tons is reported at $14.50 to $15.75, delivered, according to grade. A sale of 3000 tons of Virginia low grade iron to a pipe foundry in that territory, for first quarter of 1911, is also reported at a price about equal to $10.50, Birmingham, for forge iron. Moderate sales of Virginia No. 2 X and No. 2 plain have been taken by consumers in this territory at prices ranging from $16 to $16.50, delivered, for No. 2 X, and $16 for No. 2 plain. While the greater proportion of these sales have been for prompt shipments, they have in some instances extended over the remainder of the year. The majority of the producers of foundry grades still hesitate when it comes to naming prices for early 1911 delivery. Consumers, however, are feeling around more extensively, largely for moderate lots, on which sellers refuse to commit themselves. Transactions in forge iron have been light, small lots selling for this year's shipment at unchanged prices. As a rule sellers are not anxious to take much business at the present level, which they contend is below cost, and now that something definite in connection with the postponement of deliveries on certain foreign ores has been decided upon, they find themselves in better shape to consider the curtailment of production during the remainder of the year. Further sales of basic iron for last quarter shipment are to be noted. One lot of 4000 tons was sold at $15, delivered, while something over 5000 tons was taken by another consumer on a readjustment basis in connection with an existing contract at higher prices. A sale of 1500 tons of Virginia basic for the first quarter of 1911, for Western delivery, is also reported at a price said to be around $13.75, furnace. For new business $15, delivered, appears to be the minimum quotation for standard eastern Pennsylvania brands of basic iron. Sales of low phosphorus iron have been light, at unchanged prices. An Eastern consumer is in the market, however, for 5000 tons for this year's delivery. The general range of prices for the different grades of standard brands, delivered in buyers' yards in this vicinity, during the remainder of the year, is about as follows:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.50 to 15.75
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.75 to 15.00
Basic	15.00
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—The first sale of any importance which has been made to consumers in this district was announced to-day, an Eastern steel mill taking 500 tons for delivery during the first half of 1911 at $39.50, seaboard. A fair amount of small lot buying is also reported in the West.

Billets.—More inquiry for rolling billets is reported, but prospective buyers are endeavoring to get further price concessions and little business has been placed. Inquiries for one 6000 and one 1500 ton lot, as well as smaller tonnages, are before the trade, and while $26.50 has been done for moderate lots of ordinary rolling billets, delivered in this territory, further concessions for large lots could no doubt be had. A fair volume of business is being offered in forging billets, which are quotable at about $28, Eastern mill, to which the usual extras for high carbons and special sizes must be added.

Plates.—A smaller volume of new business has been coming out and that closed has been mostly of the miscellaneous lot class. While rumors of price concessions are heard of, producers in the East are holding recent quotations and contend that reports of concessions are without foundation. Under the circumstances, however, buyers await further developments before placing business. No particularly large inquiry is in sight, although moderate lots of tank and boat plates are being figured on. Quotations are unchanged, 1.55c. for ordinary plates, delivered in buyers' yards in this territory, representing about the minimum.

Structural Material.—The demand has been less active and confined closely to small lots. Pending business for fabricated structural work which has recently been figured on for several additions to hotels and buildings is still unclosed, and no further large work has come out. Mills are about able to maintain their recent rate of production, but are cutting into orders on their books pretty sharply. No price concessions are reported, 1.55c. being the minimum quotation for plain shapes delivered in this district.

Sheets.—The demand is rather ragged and in the majority of instances mills have little tonnage on their books. Price cutting in the West has influenced the situation in this territory and lower figures are named by producers in the East, and even at the present level are not strong. The demand is entirely of a hand to mouth character, consumers waiting more stable conditions before placing orders for any large quantities. For ordinary business Eastern makers name the following range for prompt shipment: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Irregularity continues to characterize the market. Occasional fair sized orders come out, but competition keeps prices weak and uncertain. While 1.40c., delivered here, is the minimum open quotation for refined iron bars, this figure can no doubt be shaded for desirable specifications. Steel bars are in fair demand with prices unchanged at 1.55c. to 1.60c., delivered in this vicinity.

Coke.—Sales of small lots of foundry coke continue to be made for both prompt and forward delivery, but the market is not active, although prices remain firm. Furnace coke shows but little movement. The following range of prices per net ton, delivered in buyers' yards in this territory, is named:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—The arrangement by which a number of the Eastern rolling mills purchased their supplies through a central buyer is somewhat disarranged; at least the most important consumer is now asking for prices and making purchases in the open market. It is also rumored that the arrangement of the steel mills is not working as satisfactorily in some directions as was anticipated. The buyer for the latter advanced the offering price for No. 1 heavy melting steel to $14, delivered, at which figure it is claimed that 10,000 to 15,000 tons were purchased. Sales to outside mills have been made at $14.25, delivered. No. 1 railroad wrought has been more active, sales being reported at $16.25 and $16.50, delivered. In instances consumers would take tonnage of some grades, but holders of scrap refuse to let go at the present price levels. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton.

No. 1 steel scrap and crops	$14.00 to $14.25
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	14.75 to 14.25
No. 1 railroad wrought	16.25 to 16.75
Wrought iron pipe	13.25 to 13.75
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

The purchasing arrangement of the Eastern steel mills, by which their supplies of scrap were bought through a central buyer, has been quietly investigated by the Government, and while no official announcement has been made it is said that the findings have been such that they will be advised to discontinue it.

* Nominal.

Cleveland

CLEVELAND, OHIO, September 20, 1910.

Iron Ore.—Inquiry from consumers as to whether ore prices will not be reduced 50c. a ton next season has brought a reply from merchant ore firms that the matter of consideration of next year's prices has not been given any consideration and is not likely to be taken up for several months. The buying for next season's delivery is expected to start late next spring, as present indications point to large stocks of heldover ore. Shipments are becoming lighter and will show a further falling off next month. Additional ore properties will be shut down October 1. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—A better volume of inquiry is reported from the Central West and some fair sized sales of basic, malleable and foundry are reported for first quarter and first half delivery. The general asking price of furnaces willing to take on tonnage for delivery after January 1 is 50c. above the last quarter prices, but a large share of the sales are being made at not more than 25c. above the current prices. The local situation shows no change. Both buyers and sellers are playing a waiting game. Local furnaces are not quoting for delivery beyond January 1, and consumers, with few exceptions, are taking no interest in the market. The latter are practically covered for the remainder of the year and feel that, with the possibility that first half prices may settle

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to the present last quarter basis of $14, Valley furnace, for No. 2 foundry, there will be no advantage in buying at the present time at an advance in price for next year's delivery. Producers, on the other hand, are still looking for improved conditions that will enable them to get better prices by holding off until later in the year for opening their books for 1911 business. A very limited inquiry is reported and the few sales that have been made have been mostly for last quarter delivery. For prompt shipment and the remainder of the year we quote, delivered Clevelend, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—There is no inquiry for furnace grades and little activity in foundry coke, consumers of the latter now being about all under contract for either the remainder of the year or through the first half. Prices are steady. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 per net ton, at oven, for spot shipment, and $2.25 to $2.50 on contract.

Finished Iron and Steel.—The reports from the East that a price reduction would become effective October 1, which appeared in the daily press, have had a depressing effect on the market and some business that was about to be closed has been temporarily held up. Before this disturbance appeared conditions were looking somewhat brighter. Specifications on contracts are fairly good and some new orders for plates and structural material for last quarter delivery have been placed. Actual orders, however, have nearly all been for small lots of 50 tons and under. The demand for steel bars and structural material has been quite active, but plate orders are light. Prices on steel bars and shapes are firm at the 1.40c. basis, and the only shading reported on plates is by some of the smaller mills that make only the narrow sizes. The Great Lakes Dredge & Dock Company, which has taken the contract for concrete docks for the Pennsylvania Railroad in Cleveland, has divided the 725 tons of reinforcing bars required between two of the leading steel companies. In addition to grade crossing elimination work in this city the Pennsylvania Railroad is figuring on some similar work just outside the city that will take about 2500 tons of steel. A fair amount of small structural work continues to come out. Plans will soon be out for the Y. M. C. A. building in this city, which will require considerable tonnage. The sale of 1500 tons of forging billets is reported to a Cincinnati concern. The demand for sheets is fair, but the shading in prices continues. Orders for iron bars are light and prices are stationary at 1.35c. to 1.40c., at mill.

Old Material.—The market continues dull. No outside inquiries are coming in and the only local demand is for carload lots for present needs. Mills are not contracting for future requirements. Sellers have received orders to hold back some shipments. Prices are weaker. Quotations, however, are unchanged with a few exceptions. Some of the dealers have large stocks on hand which they are holding for better prices. Dealers' prices per net ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 6.75
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Buffalo

BUFFALO, N. Y., September 20, 1910.

Pig Iron.—There has been increased inquiry during the week for deliveries running into next year. The inquiry for the present quarter continues at about the same rate as a week ago, aggregating not over 10,000 tons outside of inquiries by radiator manufacturers, being principally for small lots of foundry grades, although including two for 1000 tons each, one of which was for delivery beginning in December. Sales have been comparatively small, but shipments on contracts have gone forward in good volume. The situation would be more encouraging from the producers' viewpoint if it were not for the low prices at which orders for first quarter and half of 1911 are being negotiated, and which in some instances are practically below cost of production. Some furnace interests are declining to take business for deliveries extending into next year except at prices 50c. to $1 above current schedules, and sales from the Buffalo district for extended deliveries have not, it is stated, aggregated as large a total as from other producing districts. Of 25,000 tons estimated to have been sold at New England points during the week, only a small proportion came to Buffalo furnaces. The market in basic has been very quiet, with no sales reported. B Furnace of the Buffalo Union Furnace Company, which was blown out for repairs August 28, was blown in again September 18. We quote prices for deliveries over remainder of year, f.o.b. Buffalo, as follows:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.50 to 14.75
No. 2 plain	14.25 to 14.50
No. 3 foundry	14.00 to 14.25
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.25 to 18.75

Finished Iron and Steel.—Market conditions are very quiet, with little snap perceptible in any line except so far as the Canadian export trade is concerned, in which the inquiry continues exceedingly good for practically all lines, especially bar material from agricultural implement makers, and good sized tonnages are being negotiated. There appears to be a feeling among domestic buyers that prices will not soon advance, and as the mills are in shape to make reasonably prompt deliveries, they do not care to obligate themselves for large stocks, but will await developments. Present buying is in consequence of a hand to mouth character. There are apparently no surplus stocks, and shipments from mills on tonnage under contract continue heavy. Present consumption being large, it is probable that as soon as buyers feel they can go ahead with any degree of certainty there will be a considerable buying movement. In structural material the demand is good, and fabricating shops and erectors are busy. The Lackawanna Bridge Company has been awarded contract for the fabrication of the 2500 tons of steel required for the new additions to the plant of the New Jersey Zinc Company, at Hazard, Pa.; also for fabrication and erection of the steel for crane runway addition at the plant of the Gould Coupler Company, Depew, N. Y. Larkin & Sangster, St. Catherines, Ont., were the successful bidders for Erie barge canal contract No. 67, for two locks and other canal structures, at Lockport, N. Y., for which 1700 tons structural steel and 100 tons metal reinforcement will be required. The steel contract has not yet been sublet. The Buffalo Dredging Company has been awarded work for barge canal contract No. 50, for a dam and storage reservoir for preserving canal levels, located at Hinckley, N. Y., north of Syracuse, and which includes structural steel and iron work for the regulating gate structures, gates, valves, &c. The general contract for St. Vincent's Hospital, Erie, Pa., taking 300 tons of steel, has been let to Constable Brothers, Pittsburgh and Erie, but the steel contract has not yet been sublet. Figures are being taken this week for steel for a large machine shop at the new plant of the Niagara Machine & Tool Works, Buffalo, and revised bids are to go in on Saturday of this week for steel for the new Utica Hotel, Utica, N. Y. Mosier & Summers, Buffalo, have the contract for two New York Central Railroad freight houses at Utica, for which the steel, 100 tons, will be sublet at once.

Old Material.—The market continues to drag, with limited demand and few sales. Prices are unchanged and nominal, as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	14.50 to 15.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.25
Clean cast borings	5.75 to 6.25
No. 1 busheling scrap	11.25 to 12.00

The Buffalo offices of the Jones & Laughlin Steel Company have recently been materially enlarged to accommodate the increased force made necessary by the manufacture of new products, tin plate and wire. The office quarters, which are at 1021 to 1027 White Building, have been completely and handsomely refurnished.

THE IRON AND METAL MARKETS

Cincinnati

CINCINNATI, OHIO, September 21, 1910.—(*By Telegraph.*)

Pig Iron.—While the inquiry is holding up fairly well no large contracts are being placed, but many sales of small lots for immediate shipments are to be noted and one prominent interest reports more of this kind of business since September 1, divided up practically into carload quantities, than it has enjoyed for the previous three months. A canvass of local foundries shows they are melting about 15 per cent. more iron now than for the corresponding period of August. Local agencies are working on an inquiry from northern Ohio for 1000 tons of No. 3 and 500 tons of No. 4 Northern and 500 tons of No. 4 Southern iron. A southern Ohio firm is also said to be in the market for 1000 tons of Northern and 500 tons of Southern, all for first half delivery. For Southern irons prices remain the same. For No. 2 foundry $11.50, Birmingham, is quoted for the remainder of the year, with some of the high phosphorus brands available at $11. It is understood that some Southern furnaces are willing to accept business at $11.50 for first quarter shipment, but generally insist that the contract shall include the purchaser's requirements for the remainder of the year. For this year's delivery Northern iron can be bought at $14.50, Ironton, and it is stated that contracts can be made for shipments extending into the first quarter at the same figure. Most of the leading interests, however, are holding out for an advance of 50c. to $1 for first quarter delivery, and are even indifferent as to taking business on that basis. The Lawrence Iron Company's furnace near Ironton, formerly operated by the Bird Iron Company, blew in last week on chilled basic iron. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Shipments on contracts are moving freely, but there is little new business. It is reported that the Southern contract, mentioned last week, for about 8000 tons of furnace coke per month has been closed, but this has not been confirmed. There does not seem to be as much coke for spot shipment in the different districts that is available at the very low figures quoted for the past two weeks. Contract prices on 48-hour furnace coke for Connellsville, Pocahontas and Wise County are between $1.70 and $1.85 per net ton, at oven. The average contract price for foundry coke is $2.10, with slight advances or reductions for different grades. No change in the situation is anticipated for several weeks.

Finished Iron and Steel.—The cut in the mill price on some sizes of plates to 1.35c. has not affected the local warehouse figures which are about 1.80c. to 1.85c. Most of the mills, however, are understood to be holding out for 1.40c. Only small lots of structural material are being sold, but the total tonnage is fairly satisfactory. We quote an average warehouse price of 1.90c. for beams and channels, cut to length.

Old Material.—Some medium sized lots of No. 1 cast scrap have gone to the foundries lately, but contracts for large tonnages are scarce. Practically nothing more than a day to day business is being done so far as either buying or selling is concerned. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

St. Louis

ST. LOUIS, MO., September 19, 1910.

While with some offices inquiries for pig iron are more numerous than for some time, other brokers complain of dullness. Measured by sales, the past week ruled quiet. The coke market, with the exception of one large inquiry still pending, has not been active. It is noted that the number of idle cars is being rapidly reduced and local railroad men state that the traffic is increasing from week to week. Railroad buying of material and equipment is growing larger. The demand for cement is exceptionally great, and all other classes of building material are active. The demand for money is strong and rates are firm.

Coke.—Though there is some business passing, its volume, for a comparatively large coke market, was small during the past week. A large inquiry (25,000 to 30,000 tons) for foundry coke already reported, is still pending. One office reports sale of 20 cars of Connellsville foundry coke for immediate shipment, and another sold 600 tons of Virginia coke for shipment over the remainder of the year. It is also reported that an inquiry is out for 5500 to 6000 tons of Connellsville foundry for shipment up to July, 1911. There is also a moderate demand from small consumers. Complaint is made of delay in getting out coke at the ovens. We quote the market steady and fairly firm on Connellsville and easier on Virginia. Connellsville 72-hour foundry, for prompt shipment, is offered at $2.25 to $2.50 per net ton at oven, on contract, six or nine months, but for quick shipment these figures are shaded. Virginia is quoted at $2.25 for foundry and $1.75 for 48-hour, f.o.b. oven.

Pig Iron.—With some of the leading brokers the past week ruled quiet, so far as sales are concerned, but they were in receipt of a fair number of inquiries for pig iron, mainly for shipment over the first and second quarters of 1911. One of the leading offices reports the following inquiries: 300 tons high silicon, 100 tons ditto, 450 tons No. 2 Southern foundry, 500 tons ditto, shipment over the remainder of the year; 750 tons No. 2 Southern foundry, 200 tons high silicon, shipment over the first quarter of 1911; 2000 tons Northern iron, 500 tons No. 2 Southern foundry, shipment over the first half of 1911, together with about 1000 tons of various grades for shipment over the remainder of 1910. Another office reports inquiries for the following: 3000 tons No. 2 Southern foundry, shipment over the first quarter; 500 tons malleable, shipment over the first quarter, and 1000 tons ditto, shipment over the first half, together with numerous smaller lots of Southern iron of different grades, aggregating about 3000 tons. A third office mentions an inquiry for 500 tons No. 2 Southern foundry, shipment over the first half. A merchant seller reports sale of 300 tons No. 2 Southern foundry, shipment over the remainder of the year. While it is claimed that it is still possible to buy No. 2 Southern foundry for shipment over the remainder of the year at $11, the leading brokers are holding at $11.50. This price is also quoted by at least one office for this iron for the first half of 1911, though some brokers are holding at $12 and others have no price for 1911 iron. Southern Ohio is quoted at $15, f.o.b. furnace.

Finished Iron and Steel.—The leading interest reports the demand for standard rails very moderate, but there is an excellent inquiry for light rails, coming mainly from coal interests. The inquiry for structural material is light, both from city and country fabricators. There is a moderate demand for steel bars, coming both from the trade and from manufacturers. The demand for track material has improved.

Old Material.—While the leading dealers in scrap iron and steel are busy, they state that it is almost entirely with old contracts and some small current transactions, new business still being limited. There were two small lots on the market last week offered by railroads—the Wabash about 350 tons and the St. Louis & San Francisco about 250 tons. There still continues to be a good demand for relaying rails, particularly standard 56s and 60s. Some items in the list are lower. We quote dealers' prices as follows, per gross ton f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.25 to 12.75

The following quotations are per net ton:

Iron fish plates	$12.00 to $12.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	9.00 to 9.50
Railroad grate bars	9.00 to 9.50
Machine shop turnings	8.00 to 8.50

One of the largest reinforced concrete and steel office

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buildings of the South is now being erected at El Paso, Texas., by W. L. Stevens & Co. The building runs half a block and is 12 stories high. It is especially of modern construction, in that no brick or terra cotta is being used on the exterior.

The Louisville & Nashville Railroad is reported to be in the market for 100 ballast cars.

St. Louis brokers report good activity in the demand for fluorspar.

Birmingham

BIRMINGHAM, ALA., September 19, 1910.

Pig Iron.—The question of price for the first quarter and first half of 1911 seems to be the rock on which buyers and sellers of pig iron are about to split. The buyer is thus far refusing to pay any premium for such deliveries, while the seller argues that present prices barely represent the cost of production, save to those furnaces most favorably located as to sources of raw material. If present prices yield no profit, it would seem sound logic to argue that there is nothing to be gained by selling now into next year. There have been a few sales made running into next year, with a premium of 50c. per ton for the first quarter. The sale of 18,000 tons to an Eastern water pipe manufacturer is understood to be a renewal for six months from October 1 of present contract—based upon the ruling price as reported from month to month—so that this particular sale is not to be classed as in any way fixing a market or as a guide in any sense other than the removal of that tonnage from the market for the period mentioned. It is true that the principal maker of soil pipe has covered a considerable tonnage for forward deliveries, while other makers of water and gas as well as soil pipe makers have covered their requirements in a large measure for the remainder of 1910. The radiator inquiry for 42,000 tons is still before the trade, but as this iron is for 1911 delivery it is not believed that Southern makers will offer any inducements whatever for the buyers to close up now. Prices are without doubt firmer, with the $11.50 basis practically settled as the minimum figure at which any tonnage of any grades could be had for prompt or fourth quarter, 1910, shipment.

Pig Iron Stocks.—While no systematic reports are made to any one source here as to stocks of iron on hand from month to month, yet these statistics are, as a rule, very carefully compiled from the best evidence obtainable by several interested parties, and such statistics are generally approximately correct. It has developed, however, that the information sent out early in September showing a reduction in Alabama stocks on furnace yards of as much as 100,000 tons for the month of August, were seriously in error. This came about, so it is stated, by a confusion of the Alabama stocks with the Tennessee State stocks. As a matter of fact, Alabama had on hand July 1 about 267,000 tons, while August 1 showed approximately 247,000 tons. Now the most careful estimates show there remained on yards here September 1 about 213,000 tons, of which 62,000 tons were foundry iron in warrant yards and approximately 16,000 tons were basic iron, the remainder being foundry iron free on furnace banks.

Cast Iron Pipe.—The pipe makers continue to run along with a fairly steady production, with prices unchanged. Prices f.o.b. Birmingham remain nominally on the following schedule for water pipe: 4 to 6 in., $22 to $22.50; 8 to 12 in., $21 to $21.50; over 12 in., $20 to $20.50, with the usual difference of $1 per ton extra for gas pipe.

Old Material.—The scrap iron market shows no material signs of any early revival. The railroads have been putting out lists of scrap for disposal, but prices offered them have apparently not been attractive. The demand in this district is relatively very light, and we quote as follows:

Old iron axles	$15.00 to $15.50
Old iron rails	13.50 to 14.00
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	8.00 to 8.50
No. 2 country wrought	7.50 to 8.00
No. 1 machinery scrap	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.00 to 8.50

New York

NEW YORK, September 21, 1910.

Pig Iron.—More inquiry is reported, most of it, as was the case in the preceding week, being for delivery in 1911. Comparatively few foundries seem to be in need of iron for the last quarter, though several New Jersey firms have been in the market the past week—in one case for 1000 tons and in another for 500 tons—part of which will be wanted in November and December. A large Connecticut jobbing foundry has asked for prices on 3000 tons of No. 2 foundry iron and about an equal amount of soft irons, deliveries to run over the first half of 1911. Another New England buyer has made offers below the market for several thousand tons, giving the maker the privilege of shipping at any time, but the prices are not attractive to sellers. The leading cast iron pipe manufacturer is expected to buy early in October, its bid being the lowest on the Portland, Maine, contract for 21,600 tons of 42-in. water pipe. The soil pipe company, whose purchases have been made in different quarters in the past two or three weeks, took something over 20,000 tons. In connection with New York district business done by Buffalo furnaces the advance in canal freights due to the recent break in the channel is figuring to some extent. While $1 to $1.25 a ton to New York harbor was the basis of charters a few weeks ago, boat owners have been asking $1.60 to $1.75 of late, which figures out a very low Buffalo price on iron sold delivered at $15.50, for example. Prices in this district are a shade lower, Northern furnaces rather than Southern making the latest concessions. We quote as follows for iron at tidewater: Northern No. 1 foundry, $15.75 to $16.25; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.50.

Steel Rails.—The Colorado Fuel & Iron Company has taken two considerable rail orders recently, one from the Denver & Rio Grande for 13,600 tons and one from the San Pedro, Los Angeles & Salt Lake Railroad for 12,000 tons. The Illinois Steel Company has booked 5500 tons from the St. Paul road for shipment this year, and the same road has placed an order with the Lackawanna Steel Company. The Tennessee Coal, Iron & Railroad Company has sold 500 tons to the Chattanooga Railway & Light Company and 500 tons to the Louisiana & Pacific Railway Company. Recent foreign business includes a round lot for a Chilean railroad and 6000 to 7000 tons for Brazil.

Finished Iron and Steel.—The improvement that was expected to have begun by this time has not manifested itself as yet, and by some is not looked for before the first of next year. Some shading of prices is reported, but it appears to be confined to plates in the narrower widths, or only very desirable contracts for beams and shapes. Railroad buying in bridge material continues to be a feature of the structural transactions. The Long Island Railroad will receive bids September 24, but it is yet to be decided whether the awards will be for 12,000 tons or half that amount. The work is for bridges and grade elimination. The Erie is in the market for a 600-ton bridge at Paterson, N. J., and the Chicago & Western Indiana has asked bids on about 2500 tons for bridges. The Philadelphia & Reading is in the market for a boiler house in the mining regions of Pennsylvania, which will require 350 tons of shapes. Railroad contracts which have been closed are 900 tons for a lift bridge at Cleveland for the Lake Shore, awarded the Pennsylvania Steel Company; 700 tons in a number of small bridges for the New York, New Haven & Hartford, given to the Boston Bridge Company, and 800 tons for a bridge at Harrison, N. J., for the Pennsylvania, awarded the Phoenix Bridge Works. In New York territory contracts for structural material have been taken by Milliken Bros., 700 tons, for a loft building on East Sixteenth street; Hinkle Iron Works, 400 tons, for a loft on West Twenty-sixth street, and the American Bridge Company, 1200 tons, for a factory for the Bush Terminal on East Twenty-sixth street. Outside of New York building contracts closed include a plant for the Jacob Ullman Packing Company at Pottsville, Pa., 150 tons, taken by the Eastern Steel Company; the Brown Building, Seattle, Wash., 400 tons, taken by the American Bridge Company, and the Bankers' Life Insurance Building, Lincoln, Neb., 300 tons, taken by the Decatur Bridge & Iron Company. Several large matters are in sight, principal among them the Government post-office at the New Pennsylvania Terminal in New York City, which it is anticipated will require about 14,000 tons; inquiries are expected to come out next month. Bids close this week and a decision should be reached promptly on the 2500 tons for the Masonic Temple in San Francisco. A high school building will come into the market shortly in New York, which will need about 3000 tons. The Western Electric Company is asking bids for another building in Chicago, requiring about 1400 tons, and the International Harvester Company is in the market for 700 tons for a building at Auburn, N. Y. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Ferroalloys.—Ferromanganese is in fair demand and the market is stronger. It is quoted in New York at $39.50, seaboard. A better demand for ferrosilicon exists and there are some inquiries out for small lots. Some sellers here have turned down bids at less than $56, seaboard, and that seems to be the prevailing price.

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Cast Iron Pipe.—The successful bidder on 900 tons of water pipe on which proposals were opened by New York City September 14 was a Philadelphia firm, whose price was $22.60 per net ton. A New York firm was also a bidder on the pipe, naming $22.20, but the contract was awarded to the first named on account of the lower tender for the specials and valve boxes. No public lettings of importance are coming up in the near future in this vicinity, but pipe manufacturers report a much better inquiry from private buyers. Prices are being asked not only for fall delivery, but also for deliveries in 1911. Many consumers of pipe have bought practically nothing this year, having been influenced by the decline in the price of pig iron, and are now in such position that they need material for necessary work this fall. At the same time quite a number are inclined to take advantage of existing low prices if possible and make contracts for next year's delivery. It is hardly likely that any of the pipe founders will be willing to make extended contracts on the basis of present prices. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater.

Old Material.—Most of the offerings in this month's railroad lists were taken at higher prices. Not much was secured by dealers, but the great bulk was picked up by rolling mills and steel companies. About the only articles in these lists for which no demand has appeared were old car wheels, of which heavy quantities were offered. The general market is in better shape. Consumers have been buying from hand to mouth for so long that when any of them receive even fair orders for their own products they are almost immediately compelled to seek for scrap to cover their increased requirements. Inquiries for rolling mill stock are now coming out, which seem to indicate early buying by mills which have for some time ignored the dealers. The foundries are purchasing more than they have recently been taking, and evidently the demand for castings has been growing somewhat heavier. Steel scrap, cast scrap, malleable scrap, cast borings and rerolling steel rails are especially wanted, but almost anything can be sold now, with the exception of old car wheels and wrought turnings, for which practically no demand exists. Another cargo of Panama scrap, about 1200 tons, was sold Monday at $10.61 per ton on lighter at Hoboken, N. J., the buyer being a dealer at Elizabeth. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

The Fechheimer Steel & Iron Company, old material, will remove its offices October 1 from 2 Rector street, New York City, to the company's yards at 231 North Front street and the Lehigh Valley Railroad, Allentown, Pa. The removal of the offices to the yards has been for the purpose of getting in closer touch with the consuming trade.

Metal Market

NEW YORK, September 21, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper. Lake.	Copper. Electrolytic.	Tin.	Lead. New York.	Lead. St. Louis.	Spelter. New York.	Spelter. St. Louis.
Sept. 15	12.87½	12.62½	35.20	4.40	4.30	5.50	5.35
16	12.87½	12.62½	35.15	4.40	4.30	5.50	5.35
17	12.87½	12.62½	....	4.40	4.30	5.60	5.45
19	12.75	12.50	35.10	4.40	4.30	5.60	5.45
20	12.75	12.50	34.80	4.40	4.30	5.60	5.45
21	12.75	12.50	34.55	4.40	4.30	5.60	5.45

A good consumers' demand for pig tin has existed during the week, but prices have gone lower because of a sharp break on the London market. Copper has receded ⅛c. Lead is quiet. Spelter continues to advance despite a light demand.

Copper.—Nominal prices on both lake and electrolytic copper have receded ⅛c., as a result of a decided falling off in the demand for the metal. It is conceded that buyers have about stocked up for their immediate needs, while the opinion is current that many consumers overbought in June when they were practically sure that curtailment of production would take place. Notwithstanding that consumers are letting the market alone, there are many in the trade who are optimistic as to the future. They predict that a restriction in production will be noticed in the next report of the Copper Producers' Association and that this will strengthen what now seems to be a rather sensitive market. Exports of copper so far this month have been heavy, amounting to 20,097 tons. An indication that this export demand is a healthy one is contained in the review of the market issued by Henry R. Merton & Co., Ltd., London, which states that there is no abatement in the activity of all the European metal consuming industries, the electrical trade being still the most flourishing. In New York to-day electrolytic copper was offered at 12.50c. and lake could be bought at 12.75c. There were some reports that offerings of outside lots of lake were made at 12.62½c., but these offerings did not include any of the best known brands. The London market closed to-day with spot copper selling at £54 15s. and futures at £55 10s. The sales amounted to 400 tons of spot and 900 tons of futures. The market was quiet.

Pig Tin.—A good business has been done in pig tin, but in the face of this the market has a downward tendency. This is due to the fact that there has been a sharp break in the London market and it now appears as though the operators who succeeded in cornering the spot supply there have lost their grip or decided that they have taken all they can out of the manipulated movement. This morning's cable from London showed that the market there had dropped £2 10s. within two days, and if the London market goes any lower this market will cease to be so sensitive to the fluctuations in the foreign quotations. Late last Wednesday afternoon there was good trading in tin in New York and fully 500 tons were bought by consumers. The market on the following day went to 35.20c., an advance of 40 points over the previous day. There was good buying on the next two days of the week, but regardless of this the market slowly fell off from 5 to 10 points a day. Yesterday the demand abated and tin could be had for spot shipment at 34.80c. This morning, as the result of the lower London cable, it receded 30 points more. The arrivals of tin this month have been light and stocks are none too plentiful here. So far this month only 1939 tons have come into American ports and there are 1850 tons afloat. A report that a leading pig tin consuming interest had shipped 500 tons of metal to England on the steamer Minnetonka last Saturday has been substantiated. It is thought that this was done for the purpose of depressing the London market. The London market closed to-day with spot tin selling at £156 10s. and futures at £156. The sales amounted to 150 tons of spot and 700 tons of futures. The market was weak. In New York this afternoon pig tin was sold for 34.55c.

Tin Plates.—Foreign tin plates advanced 1½d. this morning and the price at Swansea, Wales, is now 14s. 1½d. This advance, it is declared by American representatives of London houses, has been caused by the heavy demand and not by the London corner in pig tin. As the advance comes in the face of a sharp reduction in quotations on the raw material, this view seems to be the proper one to take. Foreign tin plate mills are nearly as far behind in their deliveries as the leading mills here, while the demand is said to be increasing. In New York the market remains as noted last week and the price for 100-lb. coke plates is $3.84.

Lead.—Little interest is being taken in lead by consumers, but the market remains firm. Outside sellers continue to ask 5 points more in the New York market than the leading interest. The metal can be had here at 4.40c., and the St. Louis market is quoted at 4.30c.

Spelter.—There has been a further advance in spelter, and sellers are now asking from 5.60c. to 5.65c., New York. It is conceded that the spelter market is being manipulated, the available metal being largely in control of producers and some large operators. The output of smelting plants has been curtailed and it looks as though the producing interests are planning to take larger profits with smaller sales. Spelter can be had in New York to-day for 5.60c. and in St. Louis for 5.45c. The Western market is said to be even stronger than the market here.

Antimony.—The market is weak and listless. The nominal prices are as follows: Cookson's, 8.15c.; Hallett's, 7.87½c.; Chinese, 99½ per cent. guaranteed, 7.40c. to 7.50c.; Hungarian grades, 7.20c. to 7.30c. It is possible that a careful buyer might be able to shade the above prices on Hallett's and Cookson's.

Old Metals.—Dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

The Machinery Markets

A brighter view of the machinery outlook is taken in most manufacturing centers, and from some quarters reports are unusually optimistic. An established New England machinery house reports that its year's business up to September 1 showed an increase over the largest business done during the corresponding months of any previous year. Machine tool builders generally show confidence in the future in making equipment for stock awaiting the fall demand. A better demand is coming from the automobile trade. In Philadelphia engine builders note renewed demand, and heavier buying is being done in Pittsburgh, Cleveland, Cincinnati and Detroit. Some railroads are quietly buying tools in Chicago, and in both that market and in Milwaukee there is a notable movement in agricultural implements. In the Northwest and the farther Central West light and power enterprises are attracting attention, and the demand for power machinery is especially good on the North Pacific Coast.

New York

NEW YORK, September 21, 1910.

New enterprises that will bring about an increased demand for machinery when they mature are coming forward in greater volume, but there is no appreciable increase in inquiries and the actual business being done is not very heavy. There is a good steady demand for equipment, especially in the machine tool line, but quotations are invariably being asked for on small lots. Some prospective buyers seem to be under the impression that machinery prices will reach a lower level because of the uncertainty in the markets for raw materials. Dealers and manufacturers give the assurance that this is not probable, as the equipment now in stock was made when both labor and material were costing high prices. It is apparent that manufacturers in this vicinity have more faith in the situation than some of their customers, as they are going right ahead making equipment for stock and are placing orders with the foundries for machinery castings in a fair volume. The New York Central Railroad continues to contribute rather generously toward holding up the market, but instead of sending lists out the company is making frequent inquiries for small lots and closing out without much delay. The Pennsylvania Railroad is inquiring for a few tools, but it does not appear from the specifications the company is putting out that it intends to spend any great amount of money. Manufacturers and dealers are watching the movements of the Boston & Maine Railroad closely, as it is declared on good authority that since the affairs of that company came under the management of the New York, New Haven & Hartford Railroad plans have been made to replace some of its machine shop equipment. Those in control of the railroad are seriously considering the advisability of practically doing away with the Boston & Maine shop and centralizing the repair works of that company in one or two plants of the New York, New Haven & Hartford Company's line. The equipment in the Boston & Maine shops has not been added to in a long time and those who are familiar with its affairs declare that some generous machinery purchases will have to be made in order to adequately take care of the company's repair work.

The trade in this vicinity is likely to hear shortly of requirements for electrical equipment to be used on the Pennsylvania main line through and beyond Newark, N. J. The company has completed plans to electrify its system as far as Waverley, and it is said that the company is planning to extend its electrical zone perhaps 30 miles further into New Jersey. Work on the electrification of the line to Newark, it has been announced, will be completed by April 1, 1911, and the Hudson & Manhattan Railroad Company, which operates the McAdoo tubes, will put in operation during 1911 a rapid transit line from Newark to connect with the McAdoo tubes at Jersey City. This line will be in operation by the autumn of 1911, and as the two companies are working in conjunction it is expected that when the Pennsylvania Railroad is relieved of some of its Newark traffic its plans for extending its electrical zone will be carried out.

The Bosch Magneto Company, 223-225 West Forty-sixth street, New York, has arranged to purchase about $25,000 worth of machine tools to be installed in the first unit of its proposed large shop at Brightwood, Springfield, Mass. It is understood that orders for the equipment will be given through a German machinery selling house dealing largely in American machine tools, but machinery manufactured in this country will be purchased.

The International Nickel Company, 43 Exchange place, New York, has purchased about 110 acres of ground at Roosevelt, N. J., which is near Elizabethport, where it is understood a new plant will be erected. The company has not as yet selected an architect to design the proposed building nor will any announcement be made for some time as to just what branch of manufacture the proposed plant will be devoted to. It is reported that the Orford Copper Company, which is controlled by the International Nickel Company and which is now exploiting Monel metal, composed of copper and nickel, will be in charge of the new enterprise.

The Corn Products Refining Company, 26 Broadway, New York, is arranging to make extensive additions to its large Argo works in the suburbs of Chicago, Ill. The company has 100 acres of land there and about 25 acres of property is now taken up with buildings. E. T. Bedford, president of the company, is authority for the statement that the plant will be enlarged to occupy all of the company's property. The architects are now working out the specifications and the machinery details, which include the arranging for much in the way of special machinery, in addition to a large amount of power equipment, have not been gone into as yet.

The Hilliard Clutch & Machinery Company, Elmira, N. Y., purchased about $5000 worth of additional machinery for its shops during the past week.

The Lansden Company, 54 Morris & Essex Railroad avenue, Newark, N. J., which manufactures electric wagons and trucks operated by storage batteries, has been placing orders for machinery in this market during the last week. It has been rumored in the trade for the last two years that the company expected to change the location of its plant, but because of the heavy demand for its equipment was unable to make the necessary arrangements. The property it occupies has now been sold and it is said that the company has decided to move to larger quarters.

The United States Indestructible Gasket Company, with main offices in the Hudson Terminal Building, 50 Church street, New York, is building a new plant in Brooklyn which will have an inside floor space 100 x 500 ft. The building is to be of semi-fireproof construction with steel sashes and well lighted. The new plant will afford greatly increased facilities for the manufacture of the company's products, which include gaskets, washers, multiple disk pumps, valves, stampings, formings, punches and metal specialties of all kinds. The company also makes composition gaskets of fiber felt, rawhide, &c.

The F. H. Ogden Company, consulting engineers, 9 Clinton street, Newark, N. J., are preparing plans for a factory and power house to be built at 364-368 Jelliff avenue, Newark, for Charles Oppel's Sons, manufacturers of cigar boxes. The factory will be a two-story structure, 35 x 40 ft., and the power house will be one story, 32 x 33 ft. The structure will cost about $12,000.

The Ford Motor Company, 1723 Broadway, New York, has awarded a general contract to the Industrial Engineering Company, 30 Church street, New York, for the erection of a new garage and repair shop on Jackson avenue, Long Island City. It will be a three-story brick and concrete structure, 75 x 224 ft., and a large part of the plant will be used for assembling cars and for general repair work. It is probable that the machinery details will be arranged from the Detroit plant of the motor company.

The Scott & Bowne Company, Bloomfield, N. J., manufacturers of Scott's emulsion, with New York offices at 419 Pearl street, is making alterations to its plant, which will include the erection of a new boiler and engine house. Plans were also filed in Bloomfield last week by the Simms Magneto Company, 1780 Broadway, New York, for the erection of a two-story building, which is estimated will cost $90,000 and will be 177 x 231 ft. in dimension.

The Elizabethtown Smelting Company is arranging to build and equip a small smelting plant for jewelers' refuse, &c., at 503-505 Mulberry street, Newark, N. J. The plant will include a two-story building, 35 x 40 ft., and a one-story building, 40 x 45 ft.

The Eastman Kodak Company, Kodak Park, Rochester,

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N. Y., is making an addition to its plant which will include the installation of a 1000-kw. power plant. The company is now getting bids on the necessary boilers, engines and other power accessories.

The Board of Water Commissioners of Roslyn, N. Y., will receive bids until September 26 for constructing new water works. Plans and specifications for the needed equipment can be procured from W. E. Sexton, Mineola, L. I., who is the engineer in charge.

The Behringer Radiator Works has been incorporated at Ticonderoga, N. Y., by H. Behringer, C. Lynn of New York City and E. Behringer, Brooklyn, to manufacture sectional radiators for automobiles. Capital stock $100,000.

The New York State Training School for Girls, Hudson, N. Y., Chas. H. Strong, president Board of Managers, is receiving bids for power house equipment, including trunk steam mains, steam equipment, plumbing and electrical work.

The M. D. Knowlton Company, Rochester, N. Y., is erecting a two-story addition to its paper box factory, 100 x 142 ft., at Elizabeth and Hill streets.

The Buffalo Fertilizer Company has plans in progress for a one-story addition, 90 x 650 ft., to its plant at William and Kennedy streets and the Lehigh Valley Railroad, East Buffalo.

The city of Niagara Falls will take bids for the superstructure of its new filtration plant, which will be 100 x 180 ft. in size, two stories, constructed of sandstone, with concrete floors. Work has been started on the concrete foundations for the plant, which will cost $210,000. W. D. Robins, Niagara Falls, is engineer.

The Harrison Radiator Company, Lockport, N. Y., has been incorporated by Herbert C. Harrison, W. H. Upson, Byron V. Covert and Oscar A. Loosen of that city, with a capital stock of $50,000, and will engage in the manufacture of radiators, machinery and appliances.

Chicago

CHICAGO, ILL., September 20, 1910.

Conditions have improved somewhat the past week in the Chicago machinery market, but the trade still presents a peculiar erratic tendency. Some of the dealers report a good run of orders and inquiries, while others complain of dullness and inability to move their stocks. There are more inquiries from the smaller manufacturing industries which use machine tools and this is looked upon as a very favorable indication, as the general trade was pretty dull through the summer months. The machine tool people, however, feel the effects of the depressing influences which emanate from the financial centers. The industries which are identified with large financial interests do not seem altogether sure of the future and are backward in making improvements or extensions. Trade which depends upon general consumption or on agricultural conditions, like hardware or agricultural implements, is very good and the manufacturers in these lines are running at full capacity, but in the industries which handle heavier work there has been no actual revival in trade. The machinery dealers also feel the effects of the reaction in the automobile industry, which has taken out of the market some of the best buyers who contributed to their order books a year ago. The railroad situation also makes its influence felt. Some of the railroads are quietly buying tools for urgent necessities, but the business placed in this way does not reach large proportions. Railroad buying was suspended last summer because the roads were defeated in their efforts to obtain an immediate advance in freight rates. Since this matter went before the Interstate Commerce Commission the purchasing departments have been held down until the railroad officials could get some line on their prospects for a favorable decision from the Commission. It has become apparent in the past few weeks that the Commission is not likely to decide on the proposed advances in rates for a long time, probably not until some time next year, so that no political advantage can be gained by holding the purchasing power of the railroads in leash at the present time. The roads need new tools for their shops and this need is becoming more urgent each month. Machinery men who follow the railroad trade closely are becoming more and more mystified at the failure of the railroads to make necessary purchases.

The new machinery building of Joseph T. Ryerson & Son, Chicago, will make an important addition to the resources of the Chicago market for the display of machine tools. This will be the largest building in the United States used by any one house for the display of machinery, and it will undoubtedly attract a great deal of attention among buyers who visit this market. Unusual facilities are being provided for the demonstration of tools under actual working conditions. It has become a common practice among large machinery dealers to have demonstration rooms in which they have electric motors or other power to operate some special machine. The new Ryerson Building is not only wired with two lines of electric mains, so that motors can be set anywhere to operate a machine, but steam and high pressure water are also provided to demonstrate steam and hydraulic machinery. The buyer who wishes to take the trouble can test different machines for any work that he has in view under actual working conditions, and thus obtain very valuable information to guide him in selecting new tools. The entire floor of this new building is covered by a 15-ton electric traveling crane, which also covers a wagon platform and a railroad siding. The Ryerson plant is becoming quite a market in itself for buyers who visit Chicago, and while it is located some distance from the old machinery market on Canal street the company's line of automobiles which leave the downtown office every hour make it convenient for customers and guests of the company to visit the Ryerson market.

L. M. Oberndorf, 206 Market street, Chicago, is having plans prepared by A. S. Alschuler, 39 Jackson boulevard, for a five-story factory building 106 x 125 ft. It will be of brick and mill construction and will be equipped with electric elevators and automatic sprinkler system.

The Pyott Company, 955 Carroll avenue, Chicago, advises that it is in the market for one 32-in. lathe, with 14 or 16 ft. bed.

The Triner Scale & Mfg. Company, 2714 West Twenty-first street, Chicago, has increased its capital stock from $35,000 to $70,000.

The Central Steel & Supply Company, Railway Exchange Building, Chicago, has increased its capital stock from $10,000 to $15,000.

The Portable Elevator Mfg. Company, Bloomington, Ill., has plans drawn for an addition to its plant, 63 x 100 ft., three stories, to be equipped with an electric freight elevator. The company is in the market at present for a multiple punch 4 ft. between housings.

Alvord & Burdick, 140 Dearborn street, Chicago, are preparing plans and specifications for three 125 hp. tubular boilers to be installed in the water works plant at Richmond, Ind.

The Durand Steel Locker Company, Chicago, which recently purchased the plant of the Monarch Motor Car Company, Chicago Heights, Ill., advises that it has purchased all the machinery required for the present. It is understood, however, that an additional building will be erected in the near future.

The International Voting Machine Company, Elgin, Ill., has plans prepared for a factory building 55 x 145 ft., two stories and basement, to be erected on a site recently purchased by the company. The plant will be operated with electric power, and the only boilers used will be those required for heating purposes. The company advises that it has sufficient equipment for its present requirements.

The Star Miter Machine Company, Rockford, Ill., has filed a petition with the Secretary of State, changing its name to the Rockford Miter Box Company and increasing its capital stock to $25,000. The company has recently completed patterns for a full line of miter boxes which will more than double its capacity.

The Victor Electric Company, Chicago, has increased its capital stock from $16,100 to $330,000. Part of the additional capital will be used for the purchase of ground and the erection of a four-story factory building, having approximately 50,000 sq. ft. of floor space, more than double the space now occupied by the company.

The Rockford Tool Company, Rockford, Ill., is erecting a new factory building 64 x 120 ft., one story, which is expected to be ready for occupancy in about 30 days. The plant will be operated by electric power, and all motors and necessary equipment has been purchased.

The Decatur Railway & Light Company, Decatur, Ill., is installing in its power house at that city a 1000 kw., 2300 volt alternating current generator, direct connected to an Allis Corliss engine, a 500-kw., 550-volt, 2300-volt reversible motor generator set, a 500-kw. rotary convertor and two 500-hp. Gary boilers, together with necessary piping and connections, switchboards, &c.

The Standard Company, Chicago, manufacturer of ornamental iron, has plans prepared for the erection of a three-story factory building, 75 x 124 ft., for the construction of which Emory Stanford Hall, architect, 153 La Salle street, is receiving bids.

The Shank Company, 108 La Salle street, Chicago, builder, is erecting for its own use a manufacturing building, 104 x 216 ft.

The Brodin Mfg. Company, 2420 West Sixteenth street, Chicago, is erecting a three-story addition to its plant, 24 x 124 ft. The company manufactures metal vents and patterns and does a general supply business.

The U. S. Packing Company, Wichita Falls, Texas, is receiving bids through D. I. Davis & Co., engineers, 315 Dearborn street, Chicago, for a packing plant comprising 12 buildings, two to be six stories, to be erected at a cost of $300,000.

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Philadelphia

PHILADELPHIA, PA., September 20, 1910.

While betterment in the demand is to be noted from time to time, there is little snap to the movement, and the market for both machinery and tools has been rather spotty. Inquiry during the week has again been less pronounced and the volume of business placed against previous inquiries rather unimportant. The absence of lists covering any material tool or machinery requirements is pronounced. The railroads, while going forward with several projects in connection with repair shops, do not appear to be ready to do anything regarding the proposed equipment, and the demand from that source of buyers has been light, confined, to a large extent, to odd tools for replacement. From present indications the trade scarcely anticipates any extended tool programme from roads in this immediate vicinity until after the first of the year. There have been some preliminary inquiries from shipyards to cover cost of the machine tool equipment specified in figuring costs in order to make bids for the construction of vessels, particularly battleships for the Government, but inquiries of this character usually require considerable time before developing into orders. Engine builders note a freshening demand for their products; there has been some further inquiry for equipment of moderate horsepower and it begins to look as if some of the business which has been held up during the summer months would soon develop into orders. Builders still have considerable business on their books.

The situation regarding the activity of makers of machine tools is unchanged, an occasional cancellation of an order crops out, but plants have been going at about the same productive rate, and from work in hand can so continue for periods running from 60 days to the end of the year.

Outside of an occasional order for equipment of a special nature, nothing of interest has developed in the export trade.

The foundry trade reports unchanged conditions; new business in the way of machinery castings is light, and neither gray iron nor steel casting plants are operating, as a rule, up to normal capacity.

A fair run of business in second-hand machine tools is being done, the demand being confined to no particular line, but rather of a general nature.

Joseph Wainwright, who for some time has been connected with the local selling force of Manning, Maxwell & Moore, is now associated with the Fairbanks Company, machine tool department, calling on the trade in this district, but giving particular attention to the northern portion of Pennsylvania.

The Light Mfg. Company, Pottstown, Pa., is operating on a very satisfactory basis, although not to the top capacity of the plant. Sufficient work is on hand, however, to keep them fully engaged for six or eight months. A fair portion of new orders is coming in. This concern contemplates enlarging its foundry department approximately 50 per cent.

R. S. Newbold & Son Company, Norristown, Pa., is fairly busy in all departments. A fair run of orders comes out, but mostly small individually, which in the aggregate reach a fair total. The plant is being operated on a comparatively even basis, with sufficient work on hand to keep it so engaged for some time.

City permits have been granted to Horace H. Oler for the erection of a two-story concrete addition, 45 x 100 ft., to the machine shop of Scott & Williams, Inc., Cumberland and Amber streets.

The Wilbraham-Green Blower Company, Pottstown, Pa., has recently shipped a number of blowers for export and has further orders for foreign delivery on its books. Business during August was comparatively good, but that during the past month has been less active; the plant, however, is fully engaged.

The Royersford Foundry & Machine Company, Royersford, Pa., reports rather quiet general conditions, with inquiries a shade less numerous. There has been no particular improvement so far this month, but a better volume of business is anticipated. This company has under construction an additional story to its shipping department.

The contract for the erection of the new power plant, locomotive and car repair shop for the Pennsylvania Railroad Company at Orangeville, Md., comprising a group of brick and concrete buildings, in connection with that company's improvements at Baltimore, Md., has been awarded to Irwin & Leighton of this city.

The Midvale Steel Company will shortly begin the erection of an addition to its steel casting department, which will be located on Wissahickon avenue, below Roberts avenue. The building will be a one-story steel frame structure, 54 x 174 ft., for which the Riter-Conley Mfg. Company has the contract.

The Board of Awards, Baltimore, Md., has awarded contracts, mention of which has been previously made, for sanitary sewer contract No. 55 to B. F. Sweeten & Son for $67,671.25, and No. 56 to the Dietz Engineering Company, New York, for $17,360. The same board has awarded a valve contract for the Water Department, Baltimore city, to the Darling Pump Company.

The Southwark Foundry & Machine Company notes a better demand for general equipment, and various propositions which have been under consideration for some time show prospects of closing up at an early date. The plant continues fairly busy on business already in hand, supplemented by recent orders for condensers and engines, mostly of moderate power.

The Corrugated Bar Company, St. Louis, Mo., has placed a contract for a group of buildings for warehouse purposes to be erected at Front and Kaighns avenue, Camden, N. J., with Turner & Stewart, contractors, in the latter city. The structures will be of iron and wood, the main building measuring 90 x 285 ft. It is understood that a traveling crane and power shears are to be installed.

The Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., notes an improved inquiry during September, particularly in the finished machinery lines, some satisfactory orders for which have been placed. Quite a nice business in electrically driven pressure pumps is reported, including one for three large pumps weighing over 100,000 lb. each. Desirable business for blast furnace and rolling mill work is also in hand. The demand for steel castings is reported rather quiet. This company is now installing an electric welding outfit for use in its steel foundry department.

The Bath Motor Mfg. Company, York, Pa., has been chartered under the New Jersey laws with a capital of $300,000, and will manufacture, as one of its lines aeroplane engines for the trade. The company will work in conjunction with the K. C. K. Motor Car Company, York, Pa., which will also have motors built by the Bath Company. The manager of this company, Mr. Kirkhan, has, it is stated, built a complete aeroplane in which he has made many successful flights.

The Pennsylvania Shafting Company, Spring City, Pa., reports current tonnage and shipments fully up to the high water mark of the first half of the year. Contracts for future delivery are very good and the outlook for fall specifications is considered excellent. Immediate orders and specifications are not more than 60 to 75 per cent. of what they were prior to July first, but about equal to those of July and August. Orders and specifications on hand are sufficient to keep the company's plant in full operation for some time to come.

New England

BOSTON, MASS., September 20, 1910.

The machinery market is not active. Inquiries and orders are for small lots and single tools. The large buyers are going slowly, including the automobile people. Manufacturers and dealers agree in the opinion that the period of aggressive expansion of the latter business has passed, and that from now on, while it will be an important factor in the market, its influence will be that of an established industry, of large proportions, buying steadily and consistently. The smaller newer automobile manufacturers are holding back, especially with pleasure vehicles, and probably a large number of projected companies will be permitted to die.

In spite of complaints as to conditions the average business in the metal industries of New England is very good. The hardware and brass people are making no complaint. Those houses whose interests are closely related to the automobile industry have been affected unfavorably. The cotton mills are suffering because of the high prices of their raw materials. But striking an average reveals a volume of production not very far from normal. Individuals may criticise the statement, but with many of them the complaint is based on the fact that their business is not operating at maximum speed. Judgment is affected by outside influences, notably the political unrest. It is significant that the labor market shows little if any improvement.

An important Boston house, dealing in machine tools and mill supplies, states as its experience: "Business seems to be in very good condition with us. The month of August, which is supposed to be one of our quietest months, showed a better result than the average of our best year and in the supply end of the business we find that we have had but two months showing larger results. There was no one item in the business which was particularly large, and when we obtained the results of the month's business we

THE MACHINERY MARKETS

were very highly gratified. The year's business up to September 1 shows an increase over our largest year, and it looks now as though this would be the banner year in our business. The machine tool end has not grown as fast as the supply end, but still is showing a good, healthy condition. There are no large memoranda in the market that we know of, but a great many inquiries for a few tools. The automobile line is quiet and we find them buying but small amounts either in machinery or supplies. We are not looking for any great increase during the fall, but believe that by the first of the year general business will be in good shape."

The experience of the machine tool builders of New England in the present market varies greatly. A manufacturer of lathes and drilling machines states: "The business situation at present is very difficult to analyze. While we are receiving reports that the machine tool business is not very brisk, at the same time we are receiving quite a number of orders and a great many inquiries. We are running our full force of men on full time and have from two to three months of unfilled orders on hand. We find, however, that the demand is wholly for the very best class of machines that we build. There are very few concerns considering the purchase of old style machines."

A manufacturer of planers says: "Business was very fair up to the first of August; then it dropped right off short. According to our opinion there are certain conditions which indicate a good trade this fall and winter. There are other conditions which indicate a very quiet business. It is very difficult for us to establish in our own minds what the trade will be in the near future. In the past we have been able to make a very satisfactory calculation, but we are at a loss at the present time to formulate a satisfactory opinion. We shall keep manufacturing a small stock of planers, so that we can deliver promptly, in anticipation of orders."

A builder of speed lathes, grinding and polishing machinery puts it: "At the present time we find business very satisfactory. July and August were far above last year, and the outlook seems to be quite promising." A manufacturer of special and automatic machinery, &c., states: "Business seems to be normal." A manufacturer of mechanics' tools says: "We find business slowly improving." A builder of brass working tools says that he "would certainly welcome an improved demand for machine tools." A builder of engine lathes and other machinery is of the opinion "that business will remain quiet though not extremely dull through the rest of this year and for a month or two into next year, and then I think there will be a moderate revival and fairly good business." An expression from the shaper trade is: "We were very fortunate in the spring to get orders enough to carry us through the summer months, and we still have business enough for two months. We have not, however, found business very good through July and August. We thought the first 10 days in September that there was a noticeable interest in machine tools by possible purchasers. We have been a little disappointed in direct results from the inquiries that led us to think that business was going to be better this fall. We are not at the present time able to make good deliveries excepting on machines that are coming along, which simply means that up to the present time we have had our output taken care of. But from now on we shall accumulate stock unless business picks up."

The Katahdin Iron Works property in Maine is being examined with the purpose of operating the deposits, providing the ore proves of sufficient value. J. S. Morris & Co., Portland, Maine, bankers, and Jasper Wyman, Millbridge, Maine, are interested in the development, and have employed Prof. Chester G. Gilbert to make a thorough examination of the property. In two months of labor just completed he found but little of the bog iron or any of the oxides. However, he discovered millions of tons of nearly pure pyrrhotite, which would run much more than 50 per cent. iron and 30 to 34 per cent. sulphur. Hitherto this has been regarded as valueless, but it is hoped that with the Wedge furnace the sulphur can be eliminated down to less than ½ of 1 per cent., or, in other words, to a commercial basis. It was also found that the ore gave indications of yielding three or more per cent. nickel. Professor Gilbert has not completed his laboratory tests, and a detailed statement is awaited before a decision is made as to the next step in the undertaking.

The Heft Motor Company, 149 Cannon street, Bridgeport, Conn., has been incorporated with a Connecticut charter and will manufacture internal combustion motors for marine and automobile purposes and for special motor cars. The company is now outlining its policy and will not be in the market for machinery for some time. Temporary arrangements have been made for machine work with one of the large local shops, the idea being to give the management ample time in which to decide upon equipment and methods in its own works. N. H. Heft is the president, O. S. Platt vice-president and G. Stanley Heft secretary and treasurer.

The Gillette-Vibber Company, New London, Conn., manufacturer of electric specialties, will erect a machine shop 30 x 80 ft. on Maple avenue. The company will move its present equipment to the building and does not expect to be in the market for new machinery at this time. Electric power will be purchased from the local company.

The New Home Sewing Machine Company, Orange, Mass., will rebuild an old structure, converting it into a brick factory 50 x 110 ft. It will be devoted to the box making department and its machinery will be driven by electric motors. A new building, 32 x 62 ft., two stories, will be given up to lavatories, pattern storage and office.

The Weld Mfg. Company, Bridgeport, Conn., manufacturer of buckles and safety pins, will occupy a new factory building to be erected by Frank Brandegee and others on Cedar street. The building will be 50 x 98 ft., one story.

The Winchester Repeating Arms Company, New Haven, Conn., will build a new power house, 70 x 135 ft., of brick, steel and concrete, with concrete roof. The Westinghouse, Church, Kerr Company, New York, prepared the plans.

The Boston Fire Department has made no purchases of machinery to replace that destroyed by the fire which burned the repair shop recently. The City Council adjourned without making the necessary appropriation, and nothing can be done until such action is taken. A large amount of equipment was rendered useless.

The Maine Central Railroad has purchased the Sebasticook & Moosehead Railroad, a line 15 miles in length, connecting Hartland and Main Stream, Maine.

The Boston & Maine Railroad has announced officially that it will electrify the Hoosac Tunnel, the purpose being to abolish the smoke nuisance. The plans of the engineers call for an expenditure of about $1,000,000, including the cost of electric locomotives. Both passenger and freight trains will be hauled by the new power.

The New London Ship & Engine Company, now in process of organization, is planning to occupy the works at Groton, Conn., formerly operated by the Eastern Shipbuilding Company. According to the published statement the new corporation is closely identified with the Holland Torpedo Boat Company and the Electric Boat Company, Quincy, Mass. New buildings will be constructed, including large shops, with boiler house and electric generating plant, together with an office building 70 x 100 ft., and two stories, which will be the first to be erected.

Joseph P. Landry, Uxbridge, Mass., is planning to establish a machine shop in that town which will be used in developing new textile machinery.

The Corbin Screw Corporation, New Britain, Conn., has purchased the plant and business of the Mt. Carmel Bolt & Nut Company, Mt. Carmel, Conn. The machinery is being removed to New Britain. The new owners will conduct the business on a more extensive scale.

The H. B. Smith Company, Westfield, Mass., manufacturer of heating boilers, radiators, &c., will erect a large addition to its foundry, details of the plans of which are not yet completed.

Cleveland

CLEVELAND, OHIO, September 20, 1910.

The local machinery market shows but little improvement in actual business as compared with the summer months. Some machine tool dealers note a little better volume of business, but taken altogether the change is very slight. The outlook, however, is regarded as brighter and some of the machinery houses are looking for a very good volume of business during the latter part of the fall. The better feeling is due largely to the fact that some of the railroads are getting their lists in shape and are expected to come into the market within the next few weeks. With buying once started by the railroads a good volume of business is looked for from that source, as most of the lines in this territory have purchased practically no new machinery during the past two years. The feeling in the automobile industry also shows an improvement, and additional orders that were held up by some of the Michigan plants during the summer have been reinstated. During the week no good sized inquiries came out and purchases were nearly all small tools, lathe being mostly in demand. The buying was largely scattered.

While several manufacturing concerns in this territory that have planned new plants and extensions are going ahead with these improvements, other projects, both large and small, requiring machine tool equipment, on which figures have been submitted by engineers, are being held back until general conditions become more active. This is particularly true of a number of concerns that are planning the establishment of small plants in various metal working

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lines. The plants of local machine tool builders in practically all lines are still comfortably filled with old orders.

In the foundry trade the demand for light gray castings is holding up well, but there is complaint from some of the steel foundries that orders for steel castings have fallen off somewhat.

The Cleveland Engineering Society will hold its opening meeting of the year at the Chamber of Commerce library Tuesday evening, September 27. A paper on the extensive grade crossing elimination work which will soon be started in the city will be presented by City Engineer Robert Hoffman. Copies of the paper have been sent to the engineers of all the railroads in the city that will take part in the work and they will be in attendance with written discussions of the subject. Everybody interested in this matter is invited to attend the meeting.

The Peerless Automatic Machine Company, Cleveland, that was located in a power building on West Third street that recently burned, has secured a site at West Seventy-seventh street and the Nickel Plate Railroad and has started the erection of a new plant, 55 x 117 ft. and one story. Power will be supplied from a 30-hp. gas engine which has been purchased. The plant will be equipped with a 3-ton traveling crane. It will be ready for operation about October 15. The company will make screw machine products in addition to the Peerless automatic screw machines. The company's machinery that was damaged in the fire is being repaired, so that little new equipment will be required.

The Ohio Glass & Porcelain Company is the name of a new concern which plans the erection of a large plant in West Newark, Ohio, for the manufacture of glass and porcelain products used in electrical insulation. The Newark Board of Trade has agreed to donate a 3-acre site for the plant. Five buildings of steel construction are proposed. They are a glass plant, 80 x 120 ft.; a porcelain plant, 10 x 50 ft.; a Sherrodizing plant, 25 x 75 ft.; a machine shop, 20 x 40 ft., and an assembling, packing and shipping room, 50 x 100 ft.

The Vulcan Gear Works has commenced the erection of a new plant in Pontiac, Mich., and when it is completed about January 1 the present plant in Detroit will be moved to Pontiac. The new plant will consist of a main building 55 x 200 ft., a power house, forge shop, hardening department, &c. Some new machinery equipment will be purchased. The plant will have a capacity about 200 per cent. larger than the present one. Additions will be made to the present line of products, so that a very general line of gears will be made. The concern recently secured a 4-acre site, on which the plant is being built.

The Trustees of Public Affairs of Berea, Ohio, will receive bids September 24 for the following equipment for the municipal lighting plant: One 325-hp. engine, 200 rev. per min., for direct connection to 250-kw. generator; one 250 one 150 and one 75 kva. generator, and one switchboard.

The contract for the new plant to be erected at Niagara Falls by the National Carbon Company has been awarded to the Hunkin-Conkey Construction Company, Cleveland. There will be eight buildings, one five stories and the remainder one-story structures.

The Vickers Motor Car Company is being formed in Coshocton, Ohio, to make automobiles. It will have a capital stock of $10,000. A plant is being equipped at Chestnut and Second streets. The incorporators and prospective officers of the company are E. H. McMasters, president; Carl B. Vickers, general manager; H. H. Kline, first vice-president; F. E. Watson, secretary, and William C. Meyers, sales manager.

The Board of Trustees of Public Affairs of Port Clinton, Ohio, will receive bids September 22 for the erection of a filtration plant in that village. Plans provide for a plant with a daily capacity of 1,500,000 gal. William G. Clark, Spitzer Building, Toledo, Ohio, is the consulting engineer.

The International Harvester Company will erect large additions to its plant at Springfield, Ohio, some of the contracts for which have been let. The extension plans provide for a foundry, 150 x 671 ft., and a forge building, 150 x 350 ft. The construction will be of brick and steel.

The Quad Stove Mfg. Company, Columbus, Ohio, has completed the erection of an addition to its plant, 58 x 160 ft. and two stories. This will be operated under the name of the Columbus Tinware & Camp Equipment Company, which will make a large line of tinware for household, field and camp use.

The Toledo Web Press Mfg. Company, Toledo, Ohio, has been incorporated, with a capital stock of $30,000, by J. G. MacKenzie, Charles C. Chapman, C. E. Williams, J. M. Geasser and Ben D. Vail.

The Auto Supply Mfg. Company, Cleveland, has been incorporated, with a capital stock of $10,000, to make automobile supplies. The incorporators are B. L. Wilson, T. F. Wilson, W. McStrath and C. B. Wilson.

Pittsburgh

PITTSBURGH, PA., September 20, 1910.

While the stimulating effect of fall buying in all parts of the country, particularly of general merchandise, fuel, supplies, &c., is being felt in this district to a greater extent by manufacturers other than those of the machinery building or metal working industries, the effect of increasing activity will be apparent before long in the closing of orders for additional equipment to be installed in the factories that are now operating to capacity. Despite the unevenness of the market a large volume of business in staples of all kinds is actually being transacted, and there has also been for the past few weeks a steady run of small orders, requisitions for repair parts, sheet metal work, &c., which have kept local shops fairly busy. Of the specifications covering material and machinery in considerable variety, which are known to have been prepared during the summer by the engineering departments of large industrial plants or other enterprises, only a small percentage appears to have thus far come before the trade for estimates or bids; but its submission is only a question of time, and with the quantity of work that must be done before cold weather interferes there is little danger of any collapse of the business now in prospect.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has been awarded the contract for the additional power equipment of the Wheeling Traction Company's electric generating station. It will consist of a low pressure steam turbine unit of 1800 kw., operating on the exhaust from the Cooper engines in the plant and almost doubling its capacity. Two motor generator sets of 500 kw. each are also included in the order.

In order to take care of the increase in its business, the Greenville Metal Products Company, Greenville, Pa., has more than doubled its capital stock, which is now $600,000.

The Toms River Coal Company is reported incorporated by H. M. McHenry and Alex. S. Neuowich, Pittsburgh, and P. C. Perkins, Stoney Creek, N. Y., with headquarters at Pittsburgh, to engage in mining and handling coal. No further particulars have been made public.

The Citizens' Light, Heat & Power Company, Johnstown, Pa., will install an additional steam turbine and alternating current generator of 2000 kw., with exciter unit, condenser, &c., to double the capacity of its plant. The set will be ordered from one of the companies that has previously supplied equipment for the station.

In connection with its reconstructed plant at West Huntingdon, Pa., the Huntingdon Mill Work & Lumber Company has installed a number of large motors for driving the new machinery recently provided. Power with which to operate them is taken from the lines of the Penn Central Light & Power Company. The electric system of the plant will be enlarged as the needs of the business develop further.

The Wellston Furnace Company, Wellston, Ohio, is carrying on extensive exploration work on the Menominee iron range in northern Wisconsin, through the Spring Valley Mining Company, and it is probable that by the opening of next spring considerable equipment for starting operations at one or more mines will be required, as the showing thus far made is reported to be very favorable.

It is reported that steam turbine builders here will submit estimates shortly on units aggregating 4000 kw. for an addition to the main generating station of the Connecticut Company, Bridgeport, Conn.

A four-valve engine for the new municipal electric plant at Opelika, Ala., has been ordered from the Erie Engine Works, Erie, Pa. The generator will be furnished by the Ft. Wayne Company, Ft. Wayne, Ind., and power transformers by the Westinghouse Electric & Mfg. Company, Pittsburgh.

An issue of bonds to the amount of $3,100,000 is proposed by the Pittsburgh authorities for improvements to be effected in the municipal water supply system. If favorably acted upon at the November election the expenditures contemplated will include the purchase of a great deal of machinery.

Plans are stated to have been prepared by the engineering department of the American Locomotive Company for a new power house 50 x 65 ft., to be erected at Allegheny, Pa., and equipped with the best modern machinery. Further particulars can be obtained in due course by direct inquiry. Bids on the building, which is to be of brick and iron construction, are now being taken.

Builders of water works machinery are preparing tenders covering two new pumping engines or centrifugal pumps of 12,000,000 gal. daily capacity each, to be installed by the city of Evansville, Ind., for the filtration plant recently decided upon there. Any type of pump that can be guaranteed to meet the requirements of the service will be considered. There is, however, an excellent prospect that the standard

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machines of one of several manufacturers of this district will be purchased.

Plans have just been completed by the W. G. Wilkins Company, Westinghouse Building, Pittsburgh, for a five-story factory building 64 x 166 ft., to be erected by the National Casket Company, Pittsburgh.

Machinery for a power and heating plant to be installed in the new municipal building at Duquesne, Pa., will be required some time this fall.

The Weinman Machine Works, Columbus, Ohio, has been awarded the contract for two heavy duty deep well pumps, each direct connected to a Reeves vertical engine, for the water works system at Utica, Ohio. Natural gas will be used in the engines.

A pumping plant is to be installed at Morgantown, W. Va., by the Lockview Land Company. The equipment required does not appear to have been as yet purchased.

Arrangements are now being made by the American Sheet & Tin Plate Company for a new shop building, 40 x 50 ft., at Kensington, Pa.

The Greer Filter Company, Pittsburgh, will furnish the filtration equipment for the new water supply system at Miles City, Mont.

A new electrically operated plant, equipped with the most improved types of machinery, has been put in operation at Wheeling, W. Va., by the Morgan Lumber Company. All of the equipment required at present has been purchased, but more will probably be needed later on.

Boiler manufacturers represented here expect to bid on a new battery for the municipal power plant at New London, Ohio, the original equipment of which was for 125 hp.

The Homestead Valve Mfg. Company, Homestead, Pa., near Pittsburgh, has completed and placed in operation an addition to its new foundry. Both the foundry and machine shop are being operated to capacity. The company manufactures the Homestead self-locking straightway, three and four way balanced plug valves, Homestead locking cock, locomotive blow-off, angle valves, &c., and reports excellent business booked. It recently established an Eastern office at 1135 Park Row Building, New York City, in charge of Frank Boyle.

Thomas G. McBride, formerly with the James C. Lawrence Plumbing Company, E. E., Pittsburgh, recently resigned and is now general manager of the Homestead Heater & Mfg. Company, Homestead, near Pittsburgh, succeeding Myles McConnon, who recently resigned to devote more time to his personal business. The company manufactures the Homestead and Victor gas water heaters, small gas heaters, thermostatic valves, &c.

The J. S. McCormick Company, Twenty-fifth street and Allegheny Valley Railway, Pittsburgh, manufacturer of foundry facings, supplies and equipment, reports that it has recently increased the production of its Vulcan blacking or core wash to care for the growing demand, its sales being larger every year. The company is operating its manufacturing departments nearly to their capacity. A local contract recently filled included a dust arrester, McCormick sand blast, ladles from 10 tons down, cupola linings, &c., for the new foundry of the Best Mfg. Company, Oakmont, Pa.

Cincinnati

CINCINNATI, OHIO, September 20, 1910.

Machine tool builders generally have so much faith in the future that they are working their plants now on full time and the surplus tools turned out are being placed in stock. As the rule not to ship out stock tools to agents is adhered to in some quarters, the local accumulation of tools is probably more noticeable than during former years when the distant agents' warehouses were well filled up and those of the manufacturer were almost empty. The total figures, however, will show a much smaller number of tools carried by the maker now than for some previous corresponding seasons. The inquiry from the general trade continues good, and some orders are being received; but for the past few days both the railroads and automobile interests have been light purchasers. Medium sized lathes seem to have been better sellers lately than any other class of tools.

The foundry people are practically all infected with the optimistic feeling prevailing in other lines. An estimate made by several prominent local foundrymen places the working average of the Cincinnati foundries at about 75 per cent. of capacity, which is probably 15 per cent. higher than the last week of August showed.

The prevailing opinion seems to be that if politics would only simmer down the coming 12 months would be a very profitable period for all manufacturers in the Central West.

Recent announcements by the Cincinnati Union Depot & Terminal Company would indicate that preliminary work on the plans for the proposed union station will be begun in a short while. This will be one of the largest structural material jobs let in this section of the country for a number of years.

The foundations for the machine tools in the new shop of the Cincinnati-Bickford Machine Tool Company have been completed and work of installing the machinery will be pushed as rapidly as possible.

It is reported that a new coated paper company is to be incorporated at Hamilton, Ohio, with $200,000 capital stock, to erect a factory near Franklin, Ohio. J. W. Moloney, John Fisher and Walter Symes, all of Hamilton, are said to be principal interested parties.

The Christian Moerlein Brewing Company will tear down the old Elm Street Club building at 1916 Elm street, Cincinnati, and will erect on the site a three-story beer bottling plant, 107 x 220 ft., of brick, steel and concrete construction. E. F. Glafer, Cincinnati, is the architect in charge of the plans.

The new automobile plant of the Schacht Mfg. Company on Spring Grove avenue, near Mitchell street, Cincinnati, is nearly completed and work of installing the machinery has been begun. The factory is expected to be in full operation before January 1.

The Payne & Joubert Foundry Company, Birmingham, Ala., and New Orleans, La., is erecting for the Clifton Springs Distilling Company, Cincinnati, five large cast iron evaporators, each measuring over 9 ft. in diameter by 26 ft. high. The large addition to the Distilling Company's plant necessary for housing this extra equipment is of concrete and steel construction and is being built by A. Colter, contractor, Cincinnati. Five Bundy steam traps will also be installed.

The Cincinnati Lathe & Tool Company, Cincinnati, has recently received some nice export orders for lathes to be shipped to Australia and Europe. Its Australian representative, M. T. W. Eady, located at Melbourne, was a visitor last week at the company's Spring Grove avenue plant.

The Cincinnati Grinder Company, occupying the second floor of the new brick building at Colerain avenue and Alabama street, Cincinnati, and M. L. Andrew & Co., who have the lower floor, have completed the installation of their machinery and are working on full time. Business is reported by both firms as being very satisfactory.

It is reported that the Buckley Steel Castings Company, Columbus, Ohio, contemplates some further additions to its plant.

The Union Gas & Electric Company, Cincinnati, is installing an additional large generator in its plant on Plum street.

The Lagonda Mfg. Company of Springfield, Ohio, announces that it has bought out the Enterprise Machine Mfg. Company, acquiring the rights and patents for the full line of water strainers and tube cleaners manufactured by the latter company. Special attention is being paid to the development of the Lagonda-Enterprise water strainer, which has been on the market for several years and is well beyond the experimental stage. It is suitable for removing impurities from boiler feed water, circulating water, &c.

Indianapolis

INDIANAPOLIS, IND., September 20, 1910.

Artemus N. Hadley, Indianapolis, inventor of a sugar cane cutting machine, has gone to Louisiana and Cuba to make final tests of four machines he has shipped there. The machine cuts the cane, straightening it where it has been blown down, strips the leaves and tops the stalks, loading the cane into one cart and the stalks into another. The tops are thus preserved for silage, an important factor where cattle feed to mix with molasses is scarce. The present machine is the sixth model and contains all the improvements suggested in tests in the South with the previous models. He is confidence of its success and expects to build a factory for its manufacture on his return to Indianapolis. The machine does the work of 100 men.

The property of the Crozier Mfg. Company of Muncie, Ind., manufacturer of washing machines, has been sold by order of the court to George Millikan.

The International Steel & Iron Construction Company, Evansville, Ind., has been incorporated with $100,000 capital stock, to take over the business of a partnership bearing the same name.

The Bedford Foundry & Machine Company has been incorporated at Bedford, Ind., with $100,000 capital stock, to do a foundry and machine business. The directors are E. A. Sohn, J. T. Krementz and Charles Sohn.

The Ft. Wayne Trunk & Leather Company has been incorporated at Ft. Wayne, Ind., with $10,000 capital stock, to manufacture trunks. The directors are A. J. Keller, C. A. Keller and E. S. Raymond.

Thomas J. Delahunt has been appointed receiver for the

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Rider-Lewis Motor Car Company at Anderson, Ind. Suspension of operation of the plant was ordered, pending a meeting of creditors. Officers of the company say there is $90,000 of unfinished material on hand and orders for 1000 cars for 1911. The liabilities are placed at $179,000; assets at $238,000.

The Young Men's Business Club of La Fayette, Ind., has closed a deal with the Motsinger Device Mfg. Company, Pendleton, Ind., whereby it will remove its factory to La Fayette. Plans for four new buildings, with a total floor space of 25,000 sq. ft., are now being prepared, and the work of construction will be commenced at once with a view to having them completed and ready for occupancy by January 1. The company manufactures magnetos and other devices.

The Helfrich Sanitary Pottery Company, Evansville, Ind., is erecting a three-story factory building, 195 x 296 ft., but advises that it is not in the market for new equipment at the present time.

The Vulcan Plow Company, Evansville, Ind., is erecting additional floor space to its foundry, but advises that no new equipment will be installed.

The Globe Furniture Company, Evansville, Ind., is erecting a new factory building, 60 x 300 ft., three stories, a warehouse and an administration building at a cost of about $45,000.

William Harding of Connersville, Ind., has purchased the Cambridge City Carriage Works, Cambridge City, Ind. Mr. Harding was for eight years with the Rex Buggy Company of Connersville.

Among the applicants for workmen at the free employment agency of the Indiana Bureau of Statistics at Indianapolis is the Oliver Chilled Plow Works of South Bend, which needs hammermen, pressmen, temperers and assemblers.

Burton J. Westcott, president of the Westcott Motor Car Company, Richmond, Ind., says that the automobile industry, more than any other, is responsible for improvements in the quality of steel, the requirements of modern automobile construction being most drastic. Steel that proves satisfactory in service in axles or springs of motor cars, he says, will stand about anything else that may be required of it. The industry has particularly developed and demonstrated the usefulness and value of vanadium in the manufacture of steel.

The Brazil Gas Company, Brazil, Ind., is considering improvements to its plant which will provide for an ultimate increase in its capacity of about 200 per cent. Henry I. Lea, People's Gas Building, Chicago, Ill., has been retained as consulting engineer to recommend the alterations and extensions made necessary by the growth of the company's business.

Detroit

DETROIT, MICH., September 20, 1910.

The interest of machinery houses here and in the surrounding territory still centers in the demand from the general industrial field, where plans for improvements and increased facilities, as well as the starting up of entirely new enterprises, are bringing out a nice line of inquiries. The automobile trade is responsible for some buying, particularly of machinery with which to equip plants that are not yet under roof; but for the present this has been relegated to the background. While caring for the needs of motor car and truck builders, as well as auto-part manufacturers, dealers are devoting particular attention to cultivating trade with foundries, machine shops, mills and factories engaged in other branches of production; and there is evidence that the fall and winter demand from these sources will be widespread in its character.

The Gray Motor Company, Detroit, is in receipt of information concerning one of its 4 hp. gasoline engines made four years ago, which had been completely submerged in water for three months, partially dismantled, prior to being secured by its present owner. With cleaning, however, and crude makeshifts for the missing parts, it was put in operation again and ran steadily without missing.

Plans are now being completed for the new auto parts factory in Detroit of the Bower Roller Bearing Company, the initial unit of which will be two stories, 90 x 220 ft. Albert Kahn, whose office is in the Trussed Concrete Building, has charge of the plans.

Plans have been completed and contracts are being let for the new fabricating plant 115 x 200 ft., to be erected by H. B. Lewis, Detroit, the structural iron work being undertaken by the owner. Most of the equipment needed has also been provided for.

The Detroit Engine Works, Detroit, are putting on the market in considerable quantity, this fall, an internal combustion engine in sizes from 2 to 24 hp., which operates on kerosene. It is particularly adapted to the operation of pumps, sawing outfits, grinders, farm machinery and the like. It is very simple in construction, there being only three moving parts, and the design is covered by basic patents.

Bids will be taken until September 27 on the construction and equipment of a sewage pumping station at Cadillac, Mich.

Plans are being drawn for a large two-story addition to be made to the plant of the Detroit Sulphite Fiber & Paper Company, Detroit. Motors will be used throughout. Albert Danielson, Kalamazoo, Mich., who has designed many of the most modern mills of this section, is in charge of the work.

A light manufacturing plant, equipped with machinery for pulverizing, bolting and sifting toilet powders, is to be built in Grand Rapids, Mich., by the Marietta Stanley Company.

The Cass Motor Truck Company will have its new plant completed and in operation this fall at Port Huron, Mich.

Contracts are now being let for the erection of a five-story factory building, 70 x 248 ft., for the Universal Motor Truck Company, Detroit, and purchases of equipment will also be completed in the near future. The Sterling Engineering & Construction Company, Milwaukee, is in charge of the work on the plant itself.

The Canadian branch of the Linderman Machine Company, Muskegon, Mich., will build a factory at Woodstock, Ontario, equipped for the same line of production as the home company.

The installation of pumping machinery for a high pressure fire service system is under consideration at Toledo, Ohio.

Among the metal working industries of western Michigan which have been doing a good business this year are the Grand Rapids Malleable Works. For the fall and winter season an excellent trade is in prospect, and the facilities of the company may be increased.

The New Way Motor Company, Lansing, Mich., has increased its capital stock from $100,000 to $350,000, in order to provide properly for the large growth in its business. The company manufactures a very light, air-cooled gasoline engine, which is self-oiling and has all of its working parts inclosed, making a very efficient machine.

Thos. S. Walter and E. B. Barnhill, Detroit, have been granted a patent on an improved blower for cleaning water tube boilers.

A new manufacturing plant is to be established in Grand Rapids, Mich., by the Architectural Woodworking Company, whose headquarters are stated to have previously been in Philadelphia, Pa. A factory formerly in use has been secured and no additional equipment will be needed for the present.

Two steam turbines of 500 kw. each, or larger, with alternating current generators direct connected, condensers, exciter sets, &c., will probably be furnished for the municipal power plant at Grand Rapids, Mich., by the Allis-Chalmers Company on a bid submitted through its office in the Union Trust Building, Detroit.

A new factory building 100 x 142 ft., one story, will be erected at Muskegon, Mich., by the Wright-Coales & Hood Company.

The repair shop of the Duluth, South Shore & Atlantic Railway at Marquette, Mich., which was destroyed by fire, will, if continued in that location, be rebuilt along the most modern lines. The main structure was 100 x 200 ft.

Work will begin next month at Grand Rapids, Mich., on the new four-story manufacturing plant of the Imperial Furniture Company, which is to be electrically operated.

Manufacturers of this district are reported to be figuring on equipment for a new foundry to be built by the Wheeler-Langenkamp Brass Works, Indianapolis, Ind.

It is reported from Muskegon, Mich., that the Muskegon Iron Works has been organized there to establish a foundry and machine shop. Further particulars are lacking.

According to information from Escanaba, Mich., the Escanaba Traction Company will buy materials and some equipment for its new hydroelectric plant this winter, so as to be able to rush construction work in the spring. Some of the preliminary work will be done this fall while the open season lasts.

The Whipple Electric Company has been incorporated at Saginaw, Mich., for $10,000.

The Detroit Steel Products Company, Detroit, has made noteworthy progress this season in the introduction of its solid steel Fenestra window frames which are now used on many of the largest industrial plants of this city, as well as elsewhere through the country.

The Marshall Furnace Company, Marshall, Mich., is having plans prepared for a new factory building 125 x 215 ft., one story, and an office building 40 x 50 ft. Equipment to be installed has not been determined upon as yet, but estimates are now being prepared by the company.

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The Metal Products Company, Detroit, has increased its capital stock from $200,000 to $300,000. The additional capital will be used for the installation of new machinery and extra working capital.

Milwaukee

MILWAUKEE, WIS., September 19, 1910.

Buying on the part of companies engaged in the manufacture of agricultural implements has been a noticeable feature of the market lately, with prospects of a steady demand from this source throughout the fall. Electric generating sets and exciters, motors, controllers, pumps, compressors, &c., are wanted, together with various details of operating machinery. Some of this apparatus is intended for branch plants or affiliated interests abroad. The same tendency toward shop additions and betterments is also to be observed among the firms that make a specialty of gasoline or oil engines for use with farm machinery, all business in this line having received the impetus usual to the marketing of the crops.

Local shops are generally busy, while from other industrial centers of the State, such as Racine, Kenosha, Oshkosh, Eau Claire and La Crosse, come reports that manufacturing plants which have been working shorthanded are again starting in with full forces, orders in prospect being plentiful enough to justify steady production.

Orders from furnaces, mills and structural plants in the iron and steel districts are expected to follow close upon inquiries now in hand, and there will undoubtedly be some scattered buying on the part of Western railroads whose recent reports have made a favorable showing. Business in the northern part of Wisconsin and upper Michigan, which has been very slow since spring, is also showing signs of renewed activity, and local houses have some of the best salesmen on the ground, with a view to taking advantage of the first favorable openings.

The West Allis Iron Works Company, West Allis, Wis., whose organization was reported in *The Iron Age* of July 28, is about to let contracts for a new foundry, 85 x 100 ft., of brick and steel construction.

The woodworking plant of Alden Brothers, Ladysmith, Wis., which recently burned, will probably be rebuilt and somewhat extended.

The water works system at Appleton, Wis., will be purchased by the city and extensively remodeled to provide both for greater capacity and a better supply.

J. B. Sando, one of the engineers of the Allis-Chalmers Company at Milwaukee, recently read a very exhaustive paper before the Western Society of Engineers at Chicago on high pressure pumping systems for fire protection.

The Racine Mfg. Company, Racine, Wis., will soon be in the market for machinery, including electric motors, with which to equip the four-story addition to be made to its present plant, the exact dimensions of which are still to be decided upon.

The new factory building for which plans were recently made by the Ahnapee Veneer & Seating Company, Algoma, Wis., will probably not be erected until next spring.

The Appleton Chair Company, Appleton, Wis., has completed the purchase of boilers, engine, electric generators and motors for its new group of factory buildings. Some additional equipment will, however, be required before the plant is put in operation.

The Wisconsin Motor Mfg. Company, North Milwaukee, is completing its new factory building and will have all of the machinery installed before the close of the coming month.

With the co-operation of the Neenah Industrial Association, a three-story factory building, 40 x 60 ft., also dry kilns, warehouse, &c., will be erected in Neenah, Wis., by the Hardwood Products Company. A separate power plant is to be built and electric motor drive will probably be used. Among the company's principal requirements will be woodworking machinery.

It is reported from Platteville, Wis., that the large power station of the Interstate Light & Power Company at Galena, Ill., is now operating to its full capacity. The demand for commercial electric power has become so insistent, however, all through the mining districts of southwestern Wisconsin that immediate steps must be taken to enlarge the output of the plant.

A number of electric motors may be purchased this fall by the Waite Grass Carpet Company, Oshkosh. Wis.

The Petrel Motor Car Company, Milwaukee, which is headed by Thos. J. Neacy, president of the Filer & Stowell Company, announces that it has established a repair shop in connection with its automobile factory, which has all of the advantages of the large plant, being equipped for work on both motor cars and commercial vehicles.

The Worden-Allen Company, Milwaukee, has received an order for 160 tons of structural steel from the Copper Range Railway.

The installation of a new pumping unit of 5,000,000 gal. daily capacity is under consideration at Superior, Wis.

The capital stock of the Rhinelander Refrigerator Company has been increased to provide for the growth in its business, and the factory is being extended.

The Stowell Mfg. & Foundry Company, Milwaukee, is putting on more molders for both malleable and gray iron castings, having begun the fall season with a nice line of business.

The Edgerton Wagon Company, Edgerton, Wis., is completing the installation of machinery in its plant, which will be placed in operation about November 1.

The Racine Brass & Iron Company, Racine, Wis., has an addition to its plant in course of erection by the Worden-Allen Company, Milwaukee.

Castings to be used in the manufacture of agricultural machinery will be one of the specialties of the Dickson Malleable Iron Company, Milwaukee, which now has its new foundry in regular operation.

From Houghton, Mich., it is reported that operations at one of the principal shafts of the Tamarack Mining Company have been suspended in order to give opportunity for making extensive betterments, which may necessitate the purchase of a new hoisting unit and other machinery.

Two boilers of 150 hp. each, to generate steam for manufacturing and heating purposes only, and a line of electric motors, will be required in the equipment of the Ashland Paper Company's new plant at Ashland, Wis. Bids on the buildings are to be taken the latter part of this month. An engine and generator will not be needed, as power is to be purchased.

A machine designed for stripping the bark from pulpwood in the large mills will be manufactured on an extensive scale at Green Bay, Wis., by the Green Bay Barker Company, recently organized there. A factory is to be built or leased in the near future. Electric motor drive will probably be used on the shop tools and for other purposes about the plant, current being taken from the lines of the Northern Hydroelectric Company.

The contract for a steel tower, with tank of 35-000 gal. capacity, has been awarded by the city of Barron, Wis., to the U. S. Wind Engine & Pump Company.

The J. Thompson & Sons Mfg. Company, Beloit, is putting out a gasoline engine for shop and general service which has features similar in design to those of the best automobile motors and is very simple and reliable in operation.

The new ore dock of the Great Northern Railway at Superior, Wis., which is of steel construction, will be in readiness late this fall for the installation of the electrically operated handling machinery that has been ordered. This structure is 1800 ft. long, and will increase the storage and loading capacity of the road at this point to 1350 pockets.

The Mechanical Appliance Company, Milwaukee, is featuring in its sales this fall the motor-driven buffers and grinders which it manufactures, also a line of Ajax electric riveting machines, which can be operated either from a belt or direct connected motor. These machines will punch the hole, drive the rivet and head it with one pressure of the pedal, and they have features of exceptional interest to anyone concerned in this class of work.

The contract for a line of single-phase motors to be installed in the plant of the Burlington Brass Works, Burlington, Wis., has been let to the Wagner Electric Mfg. Company, St. Louis, Mo.

From Hankow, China, it is reported that representatives of one of the large machinery building companies here are supervising the erection near that city, for the provincial government, of furnaces to be used in the treatment of antimony ores, in which the viceroy has a monopoly. An attempt has been made on the part of the authorities to avoid giving publicity to the present enterprise, but it has suggestions of value to American manufacturers interested in the trade of the Orient.

Local manufacturers of power machinery are submitting bids on the equipment of an electric power and lighting plant to be built by the city of Crawfordsville, Ind., which will involve the largest contract of this kind now under consideration by any municipality.

The Marienette Iron & Metal Yards, Marienette, Wis., has erected a general machine shop to be used for overhauling second-hand machinery and repairing sawmill machinery, engines, boilers, &c.

St. Louis

ST. LOUIS, September 19, 1910.

The Victor Motor Car Company, St. Louis, which recently increased its capital stock from $30,000 to $150,000, will soon begin to enlarge its plant at the corner of Boyle avenue and Papin street to eight times its present capacity.

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The structure will be completed January 1. J. F. Harrington is president; J. L. Boogher, vice-president, and H. C. Ochterbeck, secretary.

The Century Electric Company, St. Louis, has filed a notice of an increase of its capital stock from $75,000 to $250,000.

The Glencoe Lime & Cement Company, St. Louis, has ordered a 25-hp. gasoline motor engine of the Milwaukee Locomotive Mfg. Company, Milwaukee, Wis.

The Union Sand & Material Company, St. Louis, has just installed at its Kansas City, Mo., plant, a 35-ton traction steam shovel manufactured by the Ohio Steam Shovel & Dredge Company, Cincinnati, Ohio.

The Anderson Electric Tool & Machine Company, St. Louis, manufacturer of electric grinders and drills, finds its line taking hold in satisfactory shape and the prospects quite good for this winter.

Washington University is installing about $20,000 worth of machine shop and foundry equipment. Some departures from the steretoyped lines of small tools have been made in this equipment that make the outfit unusually interesting among educational institution shops.

The various large stove manufacturers are well occupied at present and one of them has a large new plant well under way, and two other prominent ones are preparing to build new plants to supersede entirely their present quarters.

The Reuter Jones Mfg. Company, St. Louis, which gives much of its attention to its line of coffee and peanut roasting machinery, finds the general outlook very good and is getting a very fair run of business.

The St. Louis Screw Company finds business a trifle dull in the bolt line, though the screw machine department is well occupied. This plant has been growing steadily since its inception and now occupies a large steel frame modern factory building in the northern part of the city.

The Standard Railway Equipment Company, whose manufacturing department is located in East St. Louis, finds the demand for its pneumatic hammers, drills, &c., very fair. Another department of this concern specializes on patent freight car features.

The Corn Products Company, Granite City, Ill., is becoming a big industry. This concern now operates one of the most complete can making plants in the country, all processes being automatic.

The progress of Belleville, Ill., as a foundry town is one of the most interesting developments of this section. This small city has now in full operation no fewer than 15 distinct foundries. Most of these specialize on stove work and some of them manufacture stoves complete. Others make a specialty of machine castings.

The C. Hager & Sons Hinge Mfg. Company, St. Louis, Mo., is erecting a two-story addition to its factory, but advises that all necessary machinery and equipment has been contracted for.

At a recent meeting of the City Council of Guthrie, Iowa, it was voted to build a new brick pumping station. The building will be erected on the site of the old one, adjoining the city electric light and power company building.

M. Comer, 116 Gaines street, Davenport, Iowa, announces that he will begin operations in the manufacture of mattresses as soon as he can put his factory, which was recently destroyed by fire, in condition to do business. New machinery will have to be installed.

Gilmore City, Iowa, has secured the $2,000,000 mill which the Fort Dodge Portland Cement Company plans to erect. The company has already established its offices. Dr. F. D. Brandenburg is the president.

A $30,000 gas works has been secured at Clinton, Iowa, the company financed, franchise obtained and bids will soon be let. The plant will be of the most modern form of water gas.

Smith & Son's flouring mill at Tama, Iowa, was totally destroyed by fire September 7. The Kenton Pump factory, situated nearby, was on fire several times, but was not materially damaged.

The Corn Belt Packing Company, Fort Dodge, Iowa, has decided to rebuild its plant.

The Lincoln Bindery, Springfield, Ill., has been incorporated, with a capital stock of $5000. The incorporators are Frank Leeder, M. E. Penniwell and Alice Dorthirt. The plant will be at Third and Monroe streets.

The sum of $38,900 has been subscribed by the citizens of Pittsburg, Kan., towards a guarantee fund and now the steel rolling mill is practically assured.

The West Wichita Custom Mill, West Wichita, Kan., was destroyed by fire September 12. The mill is owned by E. O. Ruckles and U. G. Tuders.

The Topeka Foundry & Machine Shop, Topeka, Kan., has been sold by its former owner, Roy L. Bone, to M. Masching of St. Joseph, Mo., who will continue the business.

The city of Jellico, Tenn., has voted to issue bonds for $90,000 for the construction of a water works system and for sewerage. The commissioners elected are R. B. Baird, W. T. Lewis, A. B. Mahan and J. L. Rose.

The Dickson Air Blast Cotton Cleaning Company will establish a plant at Memphis, Tenn., in the near future for the manufacture of apparatus for the cleaning of cotton. J. G. Dickson, president of the company, states that the original investment will be $20,000, but the company will acquire land enough to admit of expansion.

A cottonseed oil factory will be built at Jackson, Tenn., by the newly organized Madison Cotton Oil Company, capital stock, $60,000, fully paid. A. C. White, T. B. Carroll and C. E. Pigford of Jackson are stockholders of the company.

The O'Neill-Bruce Light Company, Memphis, Tenn., has been incorporated with a capital stock of $50,000, to engage in the manufacture and sale of lamps. The incorporators are H. T. Bruce, C. W. Churchill, Eugene Sutcliffe and others.

The Ashdown Flour Mill & Elevator Company is being organized at Ashdown, Ark., with a capital stock of $10,000.

The Iron Mountain Railroad will build a new roundhouse at the Baring Cross, Ark., shops, to cost upward of $100,000. It will have a machine shop and about $35,000 worth of machinery will be installed. The round-house will handle 82 engines.

J. L. Lockaby, Murfreesboro, Ark., will erect a planing mill on a site donated by the Citizens' League.

The Hubbard Mfg. Company, Texarkana, Ark., has been organized with a capital stock of $6000. The company will manufacture barrel hoops, boxes, crates, &c. The incorporators are G. M. Hubbard, Gus Ney and J. R. Thompson.

The city of Mannsville, Okla., has voted $20,000 worth of bonds, for the purpose of putting in water works.

The contract for the building for the Woodcock Mfg. Company, Vinita, Okla., has been let and the factory is to be completed within 40 days. It is 50 x 100 ft. and of brick construction.

A system of water works will be erected at Granfield, Okla., at a cost of $44,000. The water will be brought from Red River Valley, a distance of 4 miles, where an underground river of pure water was found.

Arrangements are being made at San Marcos, Texas, to establish a gas plant.

J. T. Cameron, owner of the Cameron stock yards in El Paso, Texas, has applied for a permit to erect a packing house to cost $225,000.

The Greenville Broom Mfg. Company, Greenville, Texas, has been incorporated. The incorporators are P. P. Dransfield, F. H. McGuire and A. J. Cuming. The brick building near the fair grounds formerly used as a foundry building is being used for the new broom factory site.

A. H. Taylor, Huntsville, Texas, will erect a grist mill near the electric light and power plant.

P. E. Blalock, Courtney, Texas, is erecting a cotton seed oil mill, which will be equipped with the most modern machinery.

The Lone Star Cotton Mills, Weatherford, Texas, has been incorporated, with a capital stock of $50,000. Incorporators: C. R. Littleton, W. R. Woodhouse, Geo. C. Poston and E. H. Martin.

The Riesel gin, Riesel, Texas, was destroyed by fire September 11, entailing a loss of $12,000, on which there was $10,000 insurance. The gin was a nine-stand plant and it is expected that the new plant will have the same capacity.

The Quanah Hotel, Quanah, Texas, will be remodeled and provided with steam heaters, elevators, &c. The contemplated improvements will cost $20,000.

Work has been commenced on the paper mill building at Sugarland, Texas, formerly operated by the Cunningham Sugar Company. The plant will be taken over by the Sugarland Pulp & Paper Company, which will thoroughly rebuild and equip it with modern machinery.

The Galveston Brewing Company, Galveston, Texas, will erect in that city a thoroughly modern and complete ice plant.

Toronto

TORONTO, September 17, 1910.

The launching of new undertakings and the extending of old ones do not sustain so large a part of the Canadian demand for plant and equipment as they did at the beginning of the revival, which may be said to be still in progress. New manufacturing and other enterprises requiring machinery are still being started here and there, but the principal basis of the market for equipment is the demand on renewal account. By the end of last year the great absorption of construction contractors' outfit, of mining plant, of power works equipment, of factory machinery, &c., began to show less activity. The numerous new ventures for which these were required, having been put on a footing for opera-

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tion, the demand for machinery became somewhat less vigorous.

The Hydroelectric Commission for Ontario has a great part of its transmission line in the southern portion of the province well on the way to completion. This week it began to deliver power to the town of Berlin from the generators of the Ontario Power Company at Niagara Falls. Of the 17 municipalities that have entered into contracts to take power from the commission and of the 16 others that have passed by-laws authorizing such contracts to be entered into, several have yet to build their local distribution plants, and in the course of the next year or two there should be a considerable demand for equipment on their account.

Notice has just been given that the City Council of Winnipeg will install a high pressure water system, the engines, pipes, hydrants, &c., for which are to cost $230,858.

The City Council of Fort William has passed a by-law to raise $100,000 to be expended in street railway construction.

The formation of the Dominion Dry Dock Company was completed at Montreal September 15. It is made up largely of parties representing the Canadian Pacific Railway and Allan Line interests. It is to build drydocks at various points in Canada. Sir Robert Perks, who is prominently connected with the company, says that the works at Levis will be the first constructed.

The F. H. McGuigan Construction Company of Toronto has obtained the contract for building a high level bridge in this city at a cost of $193,000.

A gas plant is being erected at Prince Rupert, the Pacific terminus of the National Transcontinental Railway, at a cost of between $200,000 and $300,000. Interests represented by Raymond Brutinel of Edmonton, are constructing the works.

The City Council of Medicine Hat has arranged to submit to the ratepayers a by-law containing an agreement between the city and the Alberta Rolling Mills Company.

The Hudson's Bay Company will, it is stated, build a department store in Winnipeg to cost $2,000,000.

The Port Arthur City Council has given an extension of time to the Port Arthur wagon works. Construction is to be commenced within 30 days, and operation by the first of September next. The company has now a strong board of directors, and will go into the wagon making business on a large scale. The rate payers of Port Arthur also voted approval the other day of an arrangement for the granting by the city of a site for the works of the Enamel Company, in which not less than 200 men are to be employed. Up-to-date machinery is to be installed.

The directors of the Lake Superior Corporation, Sault Ste. Marie, have decided upon an expenditure of $12,000,000 in the course of the next year or two upon the steel plant, the railroad and the mines in the corporation's system.

Certain parties are in negotiation with the Collingwood Board of Trade for the establishment of rolling mills. It is proposed to lease the lands formerly held by the Cramp Steel Company and other concerns, to obtain a bonus of $50,000 from the town, and to have the assessment on the rolling mills fixed at $100,000.

Works for the manufacture of salt on a very large scale are about to be established in Sarnia by J. I. Carter of that town.

Clare Bros. & Co., one of the large manufacturers of stoves and furnaces in Canada, will build a big addition to the plant at Preston, Ontario.

The international Tool Steel Company is negotiating for the establishment of works in Port Hope, Ontario. Fifty men are to be employed.

At Sulphide, in Hastings County, Ontario, the Nicholls Company is doubling the capacity of its sulphuric acid works.

S. McLaughlin, president of the McLaughlin Carriage & Automobile Company of Oshawa, Ont., speaking at a banquet given in Winnipeg this week, stated that his company employs 700 men, and has lately increased the number. Three large additions are being made to the factory.

The Customs Department of Canada has just issued a stringent regulation in respect to Canadian-owned automobiles re-entering Canada from Detroit. The department is advised that many of these machines have been repaired and certain of their apparatus replaced in Detroit shops without any report being made to the customs collector, who should receive duty on the new equipment. Henceforth car owners will have to present a complete record of their machines, itemizing every section of the car. This record will have to be exhibited to the inspectors and left with them when the car crosses to Detroit. When it returns the customs inspector will be enabled by the record to detect any changes that have been made in the machine.

The Eureka Smoke Consumer Company of Rochester, N. Y., will establish a branch factory at Hamilton, Ont., to care for its Canadian trade. The cost of the new plant will be about $25,000.

The Canadian Westinghouse Company is preparing plans for a number of extensive buildings which will be added to its manufacturing plant at Hamilton, Ont., the estimated cost of which is about $100,000.

The Chemical Laboratories Company, Ltd., of Toronto, will erect an extensive plant at Welland, Ont., on a site of 32 acres recently secured.

The Lundy Shovel & Tool Company, Toronto, has been granted a charter with a capital stock of $200,000, and will engage in the manufacture of shovels and special tools. The directors are Douglas Lundy, Ernest Jackson and James D. Lundy.

The Hamilton Bridge Works Company, Hamilton, Ont., has purchased a site for a new plant in the manufacturers' annex district, Hamilton, Ont. On this site a small initial plant will be built at once for the storage and handling of general structural work and supplies, including a traveling crane extending the length of the property. The expectation of the company is that large extensions will be required in the near future.

The McKinnon Dash Company, St. Catherines, Ont., manufacturer of carriage and saddlery hardware, is completing extensive additions to the malleable iron departments of its plant.

The South

BIRMINGHAM, ALA., September 19, 1910.

With the commencement of fall activity has come the publication or private announcement of plans for important new industrial enterprises, factory, shop or foundry enlargements, &c., than the trade has known since hot weather set in, and a good deal of estimating on the requirements of prospective customers is now being done. Jobbers who cover large sections of the South and dealers in the principal buying centers have again begun to follow up business closely, while local manufacturers and representatives of Northern houses are also making a thorough canvass of their respective fields. This autumn finds all concerned in a better position to take hold vigorously than they were at the same time last year, not being handicapped by the relative unpreparedness that then existed or the necessity of hedging on promises of deliveries which developed before the season's business had fairly started. In contrast to that period conditions now are favorable for a sustained selling campaign.

Automatic stokers for the furnaces under Babcock & Wilcox boilers in one of its generating plants were recently ordered from the Underfeed Stoker Company of America, Chicago, by the Georgia Railway & Electric Company, Atlanta, Ga.

A new plant is expected to be built this fall in the vicinity of Birmingham or Corey by the Senn Pressed Steel Hoe & Tool Company, which has been organized at Birmingham, Ala., by J. R. Peebles, A. C. Bruce and Edw. Senn, the last named being a Northern capitalist.

The Birmingham Machine & Foundry Company, Birmingham, Ala., which has a large quantity of business booked and in prospect for the coming year, recently secured as manager, H. E. Beyer, Pittsburgh, Pa., who is well known to the trade through his previous connection with the Southwark Foundry & Machine Company and other leading concerns.

The pumping plants and water supply system of Birmingham, Ala., may be taken over and enlarged by a private corporation. Whether or not this is done, however, considerable additional machinery and other equipment will be needed before a great while.

Contracts are now being let for a large cement plant to be erected in the vicinity of New Orleans, La., by the Mobile Portland Coal & Cement Company, Mobile, Ala. Work on the buildings will probably begin next month.

The Virginia Bridge & Iron Company, Memphis, Tenn., has been awarded the contract for building the new steel frame saw mill of Lee Wilson & Co. of that city, which will be located at an Arkansas point.

The Ayer & Lord Tie Company, whose main office is in the North, will install equipment at Paducah, Ky., for repairing the steamers and barges used in its business. Dry docks are also to be constructed for the purpose.

The firm of Ewing & Hooper has been organized at Nashville, Tenn., and secured a factory building for the production of trunks at 121 Second avenue.

Plans are reported to have been completed by the Acme Box Company, Chattanooga, Tenn., for the erection of a large box factory, and work is to be started this month.

It is announced by the authorities at Troy, Ala., that the city will purchase two tubular boilers of 150 hp. each, and engine-driven generating units for 250 to 300 kw. for alternating current, three phase, 60 cycles, 2300 volts, together with a switchboard and auxiliary equipment.

The contract for a steel standpipe to be built in connec-

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tion with the new municipal water works system at Opelika, Ala., has been awarded the Chattanooga Boiler & Tank Company, Chattanooga, Tenn.

A wagon factory is to be built at Demopolis, Ala., by the Mitchell-Kervin Company.

Machinery for a pumping plant will be purchased in the near future at Ft. Myers, Fla., an appropriation for the purpose having recently been made.

The J. M. Robinson-Norton Company, Louisville, Ky., is arranging for the construction of a new power house.

The project of installing pumping machinery at Timmonsville, S. C., has been favorably acted upon by the voters, and plans for a complete water works system will be ready in the near future.

A new three-story factory building, 100 x 100 ft., and one-story power plant, 25 x 80 ft., equipped with modern machinery, will be erected late this fall or early in the winter at New Orleans, La., by the American Chicle Company. It is to be of brick and steel construction.

The Elmer Iron Works, New Orleans, La., has been incorporated with $40,000 capital stock. The company will manufacture iron and brass work and general machinery. The incorporators are Charles Elmer, C. C. Elmer, J. A. Elmer, F. W. Elmer and J. F. Droube.

The Mobile Portland Cement & Coal Company, Mobile, Ala., will commence work early in October on the construction of a cement plant of 3000 barrels capacity at St. Stephens, Ala., where it owns large cement deposits and coal fields. The company is also developing 10,000 acres of coal land on the Warrior River.

Wadill Catchings, receiver of the Central Foundry Company, Anniston, Ala., advises that a definite decision has not been reached regarding erection of proposed addition to the plant.

The Northwest

ST. PAUL, MINN., September 19, 1910.

Announcements made thus far this month of factories and other industrial plants to be newly erected, extended or improved have kept the salesmen of machinery houses in this territory busy on estimates, with some good orders already booked. Plans held in abeyance during the summer are now maturing, and by the middle of the coming month, if not before, the purchase of a large quantity of equipment for a great variety of purposes, including the generation, distribution and application of power, will be inevitable. Nearly all public utility corporations that have not recently provided for the enlargement or modernizing of their plants are considering ways and means of doing so. For the account of municipal improvements bond issues continue to be made, and the best engineering firms of this section have in hand numerous plans for electric power stations, pumping plants, &c., to be erected during the fall or early next spring.

A great deal of electric motor driven machinery for hoisting, pumping and other service will be required within the coming year by the Anaconda Copper Mining Company for its various properties in the vicinity of Anaconda, Mont. A beginning has already been made in the installation of the new system and it will be gradually extended as the necessary facilities can be provided, current being obtained from the hydroelectric plant of the Missouri River Power Company, Great Falls, Mont.

Plans are reported to be under way at Willow Lake, S. D., for the installation of a municipal water works system.

The Crookston Gas Company, Crookston, Minn., has let contracts for the erection and equipment of a new plant.

The Dakota Metal Granary Company, Mitchell, S. D., has been incorporated with $250,000 capital stock, to manufacture metal grain bins. Work will be commenced at once on the erection of a factory to be completed by the first of the year. The officers of the company are I. O. Brock, president; Alexander McQuarters, vice-president; H. R. Beyer, treasurer; N. A. Wing, secretary.

The Homestake Mining Company, Lead, S. D., has awarded a contract to the Westinghouse Electrical & Mfg. Company of Pittsburgh, Pa., for the equipment to be installed in its new power house being constructed in Spearfish canyon. The power house and its accompanying tunnel work will give the company 4500 hp. for use in its mines and mills and is being constructed at a cost of over $1,000,000.

The Fall Lake Company, Duluth, Minn., has been incorporated with $10,000 capital stock for the purpose of mining, smelting, reducing and refining ores and other minerals and the manufacture of iron, steel, copper and other metals. The incorporators are W. D. Bailey, A. G. Gillette and C. M. Van Norman, all of Duluth.

Clinton Morrison, Guaranty Building, Minneapolis, has had plans drawn and the construction contract awarded for a four-story building, 40 x 100 ft., to be leased for light manufacturing.

Equipment for a cooperage plant will be required in the near future by the North Star Barrel Company, Minneapolis, Minn., whose factory recently burned.

The project of installing pumping machinery for municipal service at Chisholm, Minn., is now being actively taken up by the authorities.

A steel tower and tank of 150,000 gal. capacity may be contracted for this fall by the city of Worthington, Minn.

Plans will probably be drawn in the near future for a new three-story factory building to be erected by the Minneapolis Furniture Frame Company, Minneapolis. Electrical operation of machinery by means of motor drive is contemplated.

The demand from Northwestern points for the automobile manufactured by the Motor Buggy Company, Minneapolis, has been so extensive that some additions will probably be made before spring to the manufacturing facilities of the company, whose plant is located on Columbia Heights.

The contract for a new steel structure spanning the Cannon River at Randolph, Minn., has been let to the Hennepin Bridge Company, Minneapolis.

A manufacturing plant consisting of five large buildings is to be erected at Owatonna, Minn., under the auspices of the Business Men's Association, and leased to builders of machinery. Negotiations with a company producing traction engines for heavy service are reported to be now in progress.

The proposed municipal power and pumping station at Hecla, S. D., will not be built this year. Adverse action on the project has been taken by the voters.

The Southwest

KANSAS CITY, MO., September 19, 1910.

A marked improvement in trade conditions is now beginning to be felt in Kansas, Arkansas and Texas, with a further increase of activity in Oklahoma and very encouraging progress all through the mining and irrigated sections of the far Southwest. Selling agencies located in El Paso, as well as the local machine shops and foundries, are also doing a fairly good business with companies operating in Mexico, particularly those in which American capital has been invested. With all this, however, the market has not yet reached the level that was anticipated for the beginning of the fall term; and while it looks now as though there could be nothing further to hinder a general resumption of buying, the gain will probably come gradually rather than by any sudden spurt.

The authorities at Kansas City, Kan., are considering plans for a municipal station to generate electric power, not only for city lighting, pumping and other service, but also to furnish current to industrial plants. The project has not yet, however, passed beyond its preliminary stages.

An automatic high-speed engine and single phase alternating current generator of 35 kw. will be purchased shortly for a lighting plant at Talihina, Okla.

Two new tubular boilers, increasing the capacity of the plant 1000 hp., will be installed by the Topeka Edison Light, Heat & Power Company, Topeka, Kan., either this fall or early in the coming winter.

A new tubular boiler is being installed in the power house of the Green Dog Mining Company, Joplin, Mo., and a number of improvements, which will be followed by others later on, are being made in the operating department in order to provide for a larger output of ore.

Plans for a new and thoroughly modern system of water works, including pumping machinery of demonstrated economy, have been outlined at Conway, Ark., and the matter will be definitely acted upon in the near future.

The Bartlesville Interurban Railway, Bartlesville, Okla., is completing an electric power house equipped with Babcock & Wilcox boilers and Allis-Chalmers generating unit, the prime mover of which is a cross compound condensing engine. It is probable, however, that the requirements of the service will necessitate adding to this plant by next spring.

The Omaha-Petersburg Company, Galena, Kan., is well along with the building of a new 1000-ton ore reduction plant, and the machinery will be installed this fall. Most of the equipment required has already been provided for, but more will need to be purchased later on.

An additional plant is to be built at Benton, Ark., by the Greenville Stave Company, Little Rock, Ark.

A bond issue has been voted by Caney, Kan., in support of the Cherryvale, Oklahoma & Texas Railroad for a line southwest through Oklahoma, on condition that the shops of the road are to be located at that place.

A new two-story factory building is to be erected in

THE MACHINERY MARKETS

Kansas City by the Kansas City Vehicle & Automobile Company.

It is reported from Warren, Ark., that the flywheel on the 1200-hp. engine in the plant of the Arkansas Lubricating Company, which supplies electric lighting for the town as well as power for its own plant, recently burst, necessitating the renewal of some of the machinery.

The plant of the Sapulpa Electric Company, Sapulpa, Okla., which is equipped with three alternating current generators of 450 kw., driven by Bessemer and Allis-Chalmers gas engines, will probably be enlarged and greatly improved, being now under the management of H. M. Byllesby & Co., Chicago.

The Guthrie Mfg. Company has been organized at Guthrie, Okla., by Wm. H. Bruner and others to establish a plant for machinery building and repair work.

A new hydroelectric power plant is being completed by the Helen Mining Company, Mogollon, N. M., which will henceforth be in the market for motors and other machinery additional to that now in service, as the output of the property is increasing.

The Haynes Copper Company, Jerome, Ariz., is putting in electrical machinery for operating its mines, including a large motor-driven pump, and as soon as this can be placed in service extensive development work will be entered upon, leading to the purchase of still further equipment by spring.

The Board of Trade of Texarkana, Texas, has closed a contract with the Texarkana Seating Company for the construction of a factory to cost $200,000, for the manufacture of school desks, opera chairs and other public building furniture. The company will commence at once the erection of a modern factory and foundry, plans and specifications for which have been prepared. The company has established temporary headquarters in the Huckins House.

R. M. Patterson, Independence, Kan., has closed a contract with the Board of Trade of Texarkana, Texas, for the erection of a glass manufacturing plant to be erected at a cost of $75,000. Work upon the construction of the plant will be commenced in the near future and it is expected that the plant will be completed and ready for operation by December 1.

The United Well Works, Stuttgart, Ark., has been incorporated with $50,000 capital stock. The company has purchased the shop and buildings of the Stuttgart Machine Works, which it will combine with the J. L. Tindall Machine Company and the firm of Sickel & Pennington. The company will manufacture screen, centrifugal irrigation pumps, and will handle all irrigation machinery and install complete irrigation outfits, including the drilling of wells and setting the engines. It will also handle steam engines and boilers, gasoline engines, gas producer plant, automobiles and all varieties of rice machinery. New machinery to be purchased and for which the company is now in the market includes one bending roll, capacity ¼-in. steel plates 16 in. wide, a power punch to punch ¼-in. holes in this plate, pipe machines for cutting and threading pipe in sizes from 3 to 16 in., and a cold cut-off saw, all machines to be direct connected with 220 D. C. belt motors. The officers of the company are Ray O. Burks, president; J. L. Tindall, vice-president; H. B. Allen Sickel, secretary; J. I. Porter, treasurer, all well-known business men of Stuttgart.

George C. Christopher & Son, Wichita, Kan., are erecting an addition to their plant 100 x 120 ft., two stories, to be used for the manufacture of concrete stone machines and mixtures and for structural steel shops. It is expected that the new building will be completed in about 60 days.

The contract for the two air compressors required in the city water works service at Dallas, Texas, mentioned some time ago, has been let to the Ingersoll-Rand Company, New York City.

The Farther Central West

OMAHA, NEB., September 19, 1910.

Purchasing by large interests, especially of power machinery, has lately been the most pronounced feature of the market, but these orders are being placed mainly with the representatives of Eastern manufacturers, so that local dealers find little to interest them except in the sale of auxiliary machinery and appliances, including piping, valves, controllers, separators, &c. Among the products of the shops of this section, hoists, compressors, crushing, grinding and mining or ore reduction machinery are selling to the best advantage, owing to the demand from the mountain districts. A steady volume of output is, however, also being maintained by the manufacturers of concrete and other construction machinery, agricultural implements, field, road or ditching tractors, farm engines, boilers, tanks, reservoirs, &c., so that the aggregate volume of production remains heavy and the general industrial condition is strong.

The Ottumwa Iron Works, Ottumwa, Iowa, is building an electric hoist, equipped with an alternating current motor of 100 hp., for the Hercules Mining Company, Burke, Idaho. This is designed to replace a pneumatic hoist now in service and will operate to a depth of 1000 ft.

A very light gasoline engine of 1 hp., which is intended especially for domestic service, is being manufactured by the Wilson Machine Company, Des Moines, Iowa. In all essential details this engine is as well built as motors of high power, and the company has established a large trade in the machines.

The Ritchie Corrugated Culvert Company is starting work on the erection of its new plant at Muscatine, Iowa.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, which has been established for nearly 18 years and has a present capacity of 15,000 machines yearly, is making extensive sales this season of its engine known as the Waterloo Boy. This possesses features covered by exclusive patents which render it particularly desirable for certain classes of service.

Some improvements are to be made in the equipment of the municipal water works station at La Motte, Iowa.

The Geo. P. Smith Company, Charles City, Iowa, is adding to its working force and will probably be obliged to enlarge the facilities of the woodworking plant which it operates.

An addition is to be made this fall to the factory of the Guttenberg Pearl Button Company, Guttenberg, Iowa.

New generating units, with auxiliary apparatus, will be required in the spring by the Pueblo & Suburban Traction & Lighting Company, Pueblo, Colo. The boiler plant is now being added to and improved.

The Denver Engineering Works Company, Denver, Colo., will furnish a new ore crushing plant, including 20 stamps of 1250 lbs. each, for the Rincon Mining Company, Temascaltepec, Hidalgo, Mexico.

K. Seemann, Georgetown, Colo., is providing electric motors for use in the mine of which he is manager; and further improvements, including the use of machine drills and enlarging the capacity of the ore reduction mill, will be undertaken shortly.

Funds for the construction of a water works system will be available in the near future at Boulder, Colo.

The Monticello Electric Company, Monticello, Iowa, which recently purchased 15 acres of land on the Maquoketa River for the location of a dam and power house, advises that the work of construction will not commence until next year.

The American Safe & Vault Company, recently organized with a Colorado charter and an authorized capital stock of $500,000, is looking for a site in Denver for the erection of a plant to manufacture a new type of burglar and fire proof safe. Richard D. Ewing, Denver, Colo., who is secretary of the Colorado Irrigation Construction Company, is president.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, has secured the following contracts for structural steel: Des Moines East High School Building, 260 tons; Dakota Portland Cement Company, Chamberlain, S. D., 600 tons; 300,000-gal. steel water tank and tower for the War Department, United States Army, Ft. Missoula, Mont.

San Francisco

SAN FRANCISCO, September 14, 1910.

Negotiations are now in progress which afford some hope of relief from the oppressive labor conditions which have recently existed in San Francisco foundry and machine shops. It is admitted that the strikes at other Coast cities have failed, and a committee of arbitration is now discussing the matters at issue locally, both employers and workmen having agreed to abide by its decision. The committee consists mainly of prominent men who are not directly interested in the iron and machinery trade, and a decision is expected which will enable the local shops to hold their own in the Coast market.

Since the first of the month the machinery market has been interrupted by two holidays and a week of festivities in San Francisco, and conditions are not yet quite normal, though a fair volume of business has come out in the last few days. Nothing has been done on a few inquiries for large metal working tools, and altogether the market remains extremely slow, though a fair volume of business, consisting mostly of single tools, has been booked for shipment to the interior. Several shops at outside towns are preparing for an active fall season and are likely to put in considerable new equipment within the next two months. Local plants are buying on a very small scale, but if the labor trouble is satisfactorily disposed of there should be an active movement between now and the end of the year.

THE MACHINERY MARKETS

Many of the local machinery dealers took an active interest in the annual convention of the lumbermen's order of Hoo Hoo, which met here September 8-10. Pacific Coast lumbermen are now discussing the outlook for 1911, and in view of the material improvement in conditions during the last few months a period of great activity is expected. Logging and woodworking machinery has been in fair demand of late, but from now on some curtailment is expected, as operations in many districts are suspended during the winter. The local planing mills have purchased very sparingly, but wood finishing equipment finds an active market in the interior.

There has not yet been any decrease in the demand for road machinery, though no important business in crushers or concrete equipment has come out since the first of the month. The past year has been an extremely good one in steam shovels and large dredging machinery of various kinds, and there are still a few inquiries for such equipment, though few additional sales are expected this year. Eastern manufacturers have sold several large dredging plants for Alaska and the export trade through their San Francisco offices, one Bucyrus outfit having gone to South America and one to Burmah, India. New railroad construction in the coast district will probably require a number of steam shovels during the coming year.

Electric and hydro-electric machinery is fairly active at present, several large installations being in progress in various parts of California, as well as in the North. One of the largest plants is being installed by the General Electric Company for the Pacific Light & Power Company at Los Angeles, and includes several Curtis steam turbines and generators.

The Bucyrus Company anticipates a large business through its San Francisco office in the Heyworth-Newman drag-line excavator, for which it secured manufacturing and selling rights some time ago, as this machine promises to give excellent service in the construction of irrigation ditches and for double tracking. This office has taken a number of orders for ballast plows recently.

The American Steel & Wire Company is taking figures on an addition to its warehouse and offices at Folsom and Sixteenth streets, San Francisco.

The Wagner Azurite Copper Company, Tonopah, Nev., is planning to install a new boiler and air compressor.

The Phillipps Construction Company will shortly install a crushing plant near Corona, Cal., with a capacity of about 500 tons daily.

The San Dimas rock quarry, recently installed in Los Angeles County by Henshaw, Bulkley & Co., San Francisco machinery merchants, is now in operation with a daily output of 2000 tons. Both Santa Fé and Pacific Electric railroads are constructing branch lines over 20 miles long to this quarry.

The Best Mfg. Company of San Leandro, Cal., is meeting with great success in the manufacture of gasoline traction engines and harvesting machinery. Plans are being completed for increasing the output, and orders have been placed within the last few weeks for another large lot of Buffalo gasoline engines.

California hydro-electric power companies are extending their distribution lines into the oil fields, and motors have been installed for pumping at a number of wells. An active demand for motors for this purpose is expected during the next year.

The over-production of oil in California has resulted in a sharp decline in prices, accompanied by an extension of the market for fuel oil and a strong demand for oil-burning equipment. The oil producing interests are beginning to recover from the recent depression, and are coming into the market to some extent for machinery for drilling operations, as well as for handling the present output.

The Standard Oil Company is preparing to increase the capacity of its water pumping plant near Richmond, Cal.

Chas. C. Moore & Co. have taken a contract for installing an electric power plant, including boilers, engines and generators, for the Government on Alcatraz Island. This company will also furnish a boiler for the Pasadena, Cal., electric light works.

The machine shop of G. G. Bennett, Lancaster, Cal., was destroyed by fire recently.

The town of Santa Ana, Cal., has purchased a Monarch steam roller.

It is reported that construction will be started shortly on the machine shops and roundhouse at Roseville, Cal., for which plans were made some time ago by the Southern Pacific Railroad.

The Beltson Copper Company is installing a hydroelectric plant on Latouche Island, Alaska, for which Pelton turbines and Westinghouse generators have been ordered.

The Nevada Wonder Mining Company, Wonder, Nev., has given a contract to the Mill & Smelter Engineering Company of New York for the installation of a 100-ton mill and a water system.

The Butte Engineering & Electric Company, 683-687 Howard street, San Francisco, is making a specialty of electric traveling cranes, a number of which have recently been installed in local steel warehouses, foundries and machine shops.

The San Diego Electric Railway Company, San Diego, Cal., is preparing to erect a power station and machine shops at San Diego, which will call for expenditures aggregating $265,000. According to A. Ervast, chief engineer in charge of the construction, it will take several years to complete the project. The machine shop will be 125 x 200 ft., and its construction will be commenced very shortly. The building will be equipped with a general line of car building and repairing apparatus and when completed the machinery now in use in an existing car plant will be installed in the structure, together with new equipment. The power plant will be built in sections, and the first building, 75 x 160 ft., will be erected so that additional power equipment can be installed and put into use as soon as possible. The entire power plant will, when completed, be 200 x 300 ft. in size and machinery capable of developing 35,000 kw. will be installed.

North Pacific Coast

PORTLAND, ORE., September 16, 1910.

The demand for power machinery, including boilers, heaters, pumps, engines, steam turbines, condensers, hydraulic turbines, generators, exciter units, transformers, motors, switchboards and detail apparatus of various kinds, has again become the most prominent feature of the market. The electrification of industrial plants on the north coast has progressed so far that new construction of almost any kind means the purchase of some of this equipment, and nearly all improvements effected in the older manufacturing establishments include a remodeling to the new system; hence the dominating influence which it exerts. Accompanying this, however, is also a widening market for the operating machinery used in foundries, shops, factories and mills, including both metal and woodworking tools. Sales of such have thus far not been heavy; but the volume of the trade is expanding, and most salesmen feel that they are doing a fair business for the season.

A new plant is being put in operation at Montesano by the Onn Lumber & Shingle Company, Tacoma, Wash., and plans for rebuilding the mill at Tacoma which burned not long ago are under consideration. Both will be among the most modernly equipped of any on the Coast.

The Pacific Exploration Company, headed by N. G. Hall, Nelson, British Columbia, in which American capital is principally interested, has been organized to build a power plant of 20,000 kw. capacity on the Pend d'Oreille River near Waneta, Wash., to supply electric current to mines and smelters in the vicinity.

Machinery for the manufacture of wood pipe is to be installed by the Byrne-Turner Lumber Company, Bellingham, Wash.

The foundry and machine shop of the J. P. Symons Company, Centralia, Wash., have had a busy year thus far in the manufacture of machinery for mining and saw mill service. Repair work is also a substantial feature of the business, and there promises to be a good deal of it offering this fall.

With the encouragement of the Seattle Chamber of Commerce, in whose care he may be addressed, Chas. B. Pride, formerly of Tomahawk, Wis., is planning to build a large paper mill on the Coast. The project has not yet advanced to the stage where machinery requirements can be determined upon.

The A. H. Averill Machinery Company, Portland, Ore., is handling the boilers and engines built by the Russell Engine Works, Massillon, Ohio, of which numerous installations have been made in this part of the country. A very complete line of the machines is carried in stock.

Some additional pumping machinery will probably be required by or before winter at Spokane, Wash., for municipal water service, in accordance with the recommendation of the officials in charge.

The plant of the Acme Mfg. Company, Tacoma, Wash., which was destroyed by fire about three weeks since, is to be rebuilt and extended. Electric motor drive will probably be used throughout.

The construction of a substation for the electric power system of the municipality, at a cost estimated to exceed $100,000, has been decided upon at Tacoma, Wash.

Iron and Industrial Stocks

NEW YORK, September 21, 1910.

Transactions in stocks continue light. The market has almost been stagnant on some days and fluctuations have not been important. The stock market appears to be marking time like the iron trade. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	8¼- 8½	Nat. En. & St.,com.	14 - 15
Allis-Chalm., pref....	36 - 38	Pressed St., com...	34 - 34⅞
Beth. Steel, com...	26⅞ - 28⅜	Pressed St., pref..	93½- 94⅝
Beth. Steel, pref...	56 - 59⅜	Railway Spr., com.	30¾- 31⅜
Can, com.....	7⅞- 8¼	Republic, com.....	30 - 30⅞
Can, pref.....	66 - 69	Republic, pref.....	91¼- 91½
Car & Fdry, com..	46 - 48⅜	Sloss, com.....	54 - 55
Car & Fdry, pref..	110⅜-113¾	Tipe, com.....	15 - 16
Steel Foundries...	42⅛- 44	U. S. Steel, com...	69⅜- 70⅛
Colorado Fuel.....	29⅜- 30⅛	U. S. Steel, pref...	115⅞-116⅝
General Electric..	142⅝-144½	Westinghouse Elec.	59 - 61
Gr. N. ore cert....	54⅛- 57	Am. Ship. com....	74 - 76
Int. Harv., com...	97 - 98⅝	Chi. Pneu. Tool...	35 - 35½
Int. Harv., pref.....120		Cambria Steel.....	41¼- 43¾
Int. Pump, com...	39 - 40½	Lake Sup. Corp....	22 - 23
Int. Pump, pref...	82⅞- 83⅝	Warwick	10 - 10⅝
Locomotive, com..	36 - 37¼	Crucible St., com...	11⅜- 12⅛
Locomotive, pref..104½-106		Crucible St., pref...	73¼- 77⅜

A special meeting of the Ingersoll-Rand Company has been called for October 4, to consider resolutions adopted by the directors proposing to retire the outstanding preferred stock and redeem it with common stock on a share for share basis; also to sell, for not less than par, 3452 shares of the common stock shares received in exchange for the preferred stock, to employees, other than directors, and at such times as the directors may determine. The company has outstanding $4,800,000 preferred stock and $3,000,000 common stock. Since organization, semiannual dividends of 3 per cent. have been paid on the preferred stock. A first dividend of 5 per cent. was paid on the common stock in April last. It is proposed that it remain optional with the preferred stockholders to surrender their certificates in exchange for common stock, and that they may determine for themselves what exchange, if any, they desire to make.

Dividends.—The Boston Belting Company has declared the regular quarterly dividend of $2 per share, payable October 1.

The Otis Elevator Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable October 15.

The Washburn Wire Company has declared the regular quarterly dividend of 1¾ per cent. on its preferred stock, payable October 1.

Manning, Maxwell & Moore, Inc., have declared the regular quarterly dividend of 1½ per cent., payable September 30.

The Westinghouse Air Brake Company has declared the regular quarterly dividend of 2½ per cent., an extra dividend of 1½ per cent. and a special dividend of 1 per cent., payable October 2. The previous quarter the company declared a special dividend of 2 per cent.

The Walpole Rubber Company, Boston, has declared the regular quarterly 1 per cent. on its common stock and 1¾ per cent. on its preferred stock, both payable October 15.

The Crucible Steel Company of America has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable September 30.

The E. W. Bliss Company has declared the regular quarterly dividends of 2 per cent. on the preferred and 2½ per cent. on the common stock, payable October 1.

The American Brake Shoe & Foundry Company has declared the regular quarterly dividends of 1¾ per cent. on the preferred and 1¾ per cent. on the common stock, payable October 11.

Population of Chicago and Other Lake Cities.—The population of Chicago as announced by the Census Bureau is 2,185,283, an increase since 1900 of 486,708, or 28.7 per cent. The Chicago claim has been 2,400,000. The rate of increase in the decade 1890-1900 was 54.4 per cent. A bulletin of the Census Bureau shows that the average increase in the past decade of 29 cities with a population over 100,000 was 31. Chicago's gain is thus 2.3 per cent. below this average. Chicago's gain in the last decade of the nineteenth century was greater than that of any other lake city, Cleveland showing 46 per cent. gain, Buffalo 37, Detroit 38 and Milwaukee 39. In the past decade all these cities but Buffalo had a greater percent of gain than Chicago, the figures being: Cleveland, 46.9; Buffalo, 20.2; Detroit, 63; Milwaukee, 31.

The Spelter Syndicate.—At a meeting held at Cologne, Germany, September 5, spelter manufacturers are reported to have reached an understanding on the main points relating to output, and therefore the publication of a notice of dissolution of the present spelter syndicate has been postponed from October 1 to November 15. The prospects of a successful outcome of negotiations for renewing the syndicate are considered improved. Five years is the period talked of for the new agreement, though in some quarters a three years' arrangement is preferred in view of the possibility of the erection of new works meantime. The difficulties in securing another agreement are due chiefly to the differing interest of unmixed and mine owning works.

The Hunter Saw & Machine Company, Fifty-seventh and Butler streets, Pittsburgh, will shortly commence erecting an addition to its plant, to be built of brick and steel, two stories, and to serve as an addition to its grinding department. The equipment needed will be manufactured in the company's own machine shop. Its general business is good, while its export trade on grinding machines to Germany, Spain and the Panama Canal is satisfactory. Its products are circular saws for cutting hot and cold metals and saw grinding machinery.

The Bessemer Gas Engine Company, Grove City, Pa., is building a 260-ft. addition to its foundry, in which a 20-ton Whiting cupola will be installed, which will about double the present melting capacity and will enable the company to make all its own castings. It has recently made sales of 20 gas engines for mining installations in the vicinity of Joplin, Mo., with an aggregate of 1735 hp., making over 700 Bessemer engines sold in that district, in addition to numerous sales of 35 to 70 hp. engines in other localities.

The Duquesne Steel Foundry Company, Arrott Building, Pittsburgh, Pa., works at Coraopolis, Pa., has added five annealing furnaces and three Whiting cranes to its plant, which will largely increase its capacity for the manufacture of rolling mill and steel works machinery of all kinds, including rolls. It recently shipped two steel castings, weighing about 65,000 lb. each, to the Cambria Steel Company, Johnstown, Pa., to be used for roll housings in a new mill now being built.

The S. Keighley Metal Ceiling & Mfg. Company, Locust street, Pittsburgh, with plant at Follansbee, W. Va., has been awarded a contract for 1200 Phœnix metal lockers by a Cleveland high school. Its business on Keighley lock joint, dust proof metal ceilings is fair, but the aggregate of orders booked will enable the plant to be operated to nearly full capacity for some time.

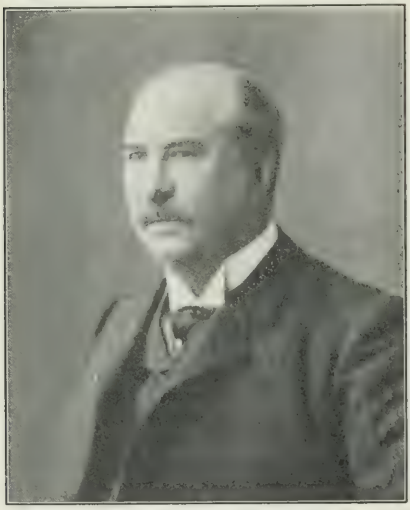
The Riter-Conley Mfg. Company, Pittsburgh, has been awarded a Government contract for about a mile of 26 and 36 in. riveted steel pipe for use in irrigation work in the Uncompahgre Valley, Colo. Contracts in hand for plate work, structural buildings, tanks, &c., will keep its two plants—Leetsdale, Pa., and the North Side, Pittsburgh—operating to about full capacity.

The United States Cast Iron Pipe & Foundry Company has recently completed improvements at its Superior, Wis., plant which have increased its capacity about 30 per cent. This foundry now has a capacity of 1250 tons of pipe a month.

The Hicks Locomotive & Car Works, Chicago Heights, Ill., has gone into receivers' hands. The Continental & Commercial Trust & Savings Bank, Chicago, was appointed receiver by the United States Circuit Court September 19.

Obituary

Col. Alexander Gordon, chairman of the Board of Directors of the Niles-Bement-Pond Company and for a number of years prominent in the machine tool trade as president of the Niles Tool Works Company, Hamilton, Ohio, died September 11 at London, England. He had been abroad for nearly a year for the benefit of his health. He was born in Belfast, Ireland, December 16, 1839, and was trained at Marshall College, Aberdeen. He and his brother, Frederick, operated a machine shop at Ironton, Ohio, in the early eighteen sixties. Going to Cincinnati, Alexander Gordon became associated with G. A. Gray, another machinist, and they interested James W. Gaff, a well-known Cincinnati merchant, in a plan to take over the machine shop which had been operated there by John S. Niles, whose name was perpetuated in the well-known Hamilton works. The firm of Gaff, Gray & Gordon was formed and for four years carried on the manufacture of machine tools in the original Niles



ALEXANDER GORDON.

shop which in 1871 made way for the Pennsylvania Railroad depot at Cincinnati. Hamilton, Ohio, offered 15 acres of land to move the plant to that city and in 1872 the firm took possession there of a modern shop with a capacity of $300,000 worth of product a year. Mr. Gray retired in 1877 and later Col. R. C. McKinney, now president of the Niles-Bement-Pond Company, came into the Hamilton concern as secretary. Under the presidency of Colonel Gordon the business of the Niles Tool Works Company was greatly extended, particularly in the line of railroad shop tools.

Frederick Merian Wheeler, a resident of Montclair, N. J., died September 15 at his summer home, Westhampton, L. I., from heart disease, aged 62 years. He was born in Brooklyn, was graduated at Summit Academy, New Jersey, and attended the Polytechnic Institute at Brooklyn. He studied mechanical engineering and then took up hydraulic and marine engineering, and for more than 34 years was associated with the George F. Blake Mfg. Company. He was a director and secretary of the company and later a director of the International Steam Pump Company. He was the inventor of the Wheeler patent surface condenser, which has been adopted by the United States navy. He was one of the charter members of the American Society of Mechanical Engineers and the Society of Naval Architects and Marine Engineers. He leaves a widow, two sons and two daughters.

John M. Hartman, Philadelphia, died September 4, aged 70 years. Born in Chester County, Pa., in 1856, he entered the I. P. Morris Company's shops in Philadelphia, where he learned mechanical engineering. At 25 he formed a partnership with Louis Taws as Taws & Hartman, machinists and brass founders. This partnership continued for 33 years, when Mr. Taws withdrew, and the business has since been conducted under the name of the Hartman Company. Mr. Hartman was an authority on blast furnaces and for many years was actively engaged in building or remodeling furnace plants. He served for three years in the Philadelphia Common Council, where he was noted for his independence in advocating the interests of the city. He was a pioneer in the movement to abate the smoke nuisance and worked hard to obtain laws toward this end. He was a member of the Franklin Institute, the Academy of Natural Sciences and other scientific and engineering organizations and wrote much on technical and historical topics. He leaves a widow and a daughter.

The Crucible Steel Company's Affairs

At a meeting of the Board of Directors of the Crucible Steel Company of America, held September 17, Chairman Du Puy stated that, owing to the fact that the end of the fiscal year, August 31, was so close to the meeting of the board, it was only possible to make a preliminary financial statement. The profits during the past 12 months were $4,140,000, against which the board has set aside $500,000 for depreciation and renewals, and reserved $109,000 for contingencies, leaving a net profit for the year of $3,531,000, or 14.14 per cent. on the company's preferred stock. Had the company at the end of the previous year charged off the same amounts for depreciation and reserve, $609,000, leaving a profit of $1,505,000, it is readily seen that the profits during the past year more than doubled those of the previous year.

The chairman further stated that the orders of the company seem to be keeping up reasonably well, though during the past few days a noticeable falling off has been experienced. It is hoped, however, that as soon as the railroads settle their troubles with the Interstate Commerce Commission, and come into the market to make purchases, the business of the company will become normal. As it is, the books show that the tonnage of orders and contracts is heavier than it has ever been in the history of the company. Many of the departments have more orders than they can take immediate care of, though there are spots where some slackness is felt. Taking it as a whole, the company is doing a reasonably profitable business, and everything concerning it is in a healthy condition.

Railroad Equipment Orders.—The Santa Fé is reported to have ordered 1000 refrigerator cars, the Colorado & Southern 250 dump cars, and the Havana Central 250 freight cars and 140 cabooses, all from the American Car & Foundry Company. The L. & N. is in the market for 100 ballast cars, the Solvay Process Company for 50 gondola cars, the Niles-Bement-Pond Company for 20 gondola cars, and the B. & O. for 75 passenger coaches. A South American road is reported to be inquiring for 50 box cars. Three industrial companies have ordered a total of 15 locomotives, and the Pere Marquette and the Union Railroad 10 locomotives each.

Argentina is suffering seriously from an invasion of grasshoppers, and the Government has authorized the purchase of 65,616,666 ft. of metallic fence for protection. American manufacturers were requested to cable bids on this fence by September 20.

Personal

A. J. MacEwan, formerly with T. H. Lewis & Co., Pittsburgh, is now employed in the sales department of Eaton, Rhodes & Co., dealers in pig iron and steel, Oliver Building, Pittsburgh, Pa.

Dr. G. W. Sargent, formerly with the Carpenter Steel Company, Reading, Pa., has resigned, and is now connected with the Crucible Steel Company of America, Pittsburgh, for the purpose of developing a research department. He has been elected a member of the Board of Directors and fourth vice-president of the latter company.

Harry E. Zaring, formerly private secretary to President C. C. Ramsey, has been appointed assistant secretary of the Crucible Steel Company of America, Pittsburgh.

William Lodge, president of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, returned last week from a several months' business and pleasure trip through Europe.

T. I. Crane of Pilling & Crane, Philadelphia, Pa., returned September 16 from a two months' trip in Europe.

Thomas Devlin, president of the Thomas Devlin Mfg. Company, Philadelphia, Pa., returned September 6 from a two months' trip abroad.

C. L. Gulick has resigned as vice-president of the American & British Mfg. Company, Bridgeport, Conn., to accept the position of vice-president and general manager of the Enos Company, New York.

Wiley Alford has been appointed assistant general manager of the Coosa Pipe & Foundry Company and Gadsden Pipe & Fittings Company in charge of their operations at Gadsden, Ala.

T. L. Powell, resident manager for Hickman, Williams & Co., and E. B. Barnes, sales manager of the Republic Iron & Steel Company, have returned to Birmingham, Ala., from a vacation trip of several weeks in Michigan.

H. Lee Morrow, formerly with the local office of Rogers, Brown & Co., has become associated with the firm of the Hammond-Byrd Company at Birmingham, Ala.

Arthur Fritsch has been appointed manager of the Chicago office in the Monadnock Block of the Pawling & Harnischfeger Company, Milwaukee, Wis., builder of electric traveling cranes and hoists, succeeding W. E. Kreamer, resigned. Mr. Fritsch was formerly connected with the engineering and sales department of the Allis-Chalmers Company.

H. K. Behn, manager of the Phoenix Warehouse Company, Phoenix, Ariz., has been visiting the trade in New York arranging to represent manufacturers of heavy hardware and specialties.

Frederick Kuppersbusch, of Kuppersbusch Söhne, Schalke, Germany, manufacturers of stoves, ranges and sanitary equipment, is spending about two months in this country visiting machinery houses and manufacturers.

Hollinshead W. Taylor of the N. & G. Taylor Company, the Philadelphia tin plate house, returned from a foreign trip September 13.

Frank H. Tuthill, president of the Tuthill Spring Company, Chicago, is expected to return October 1 from Europe, where he has been spending the summer.

A. E. Borie has resigned from the New Jersey Zinc Company, New York, to accept a vice presidency of the Taylor Iron & Steel Company, High Bridge, N. J., which has New York offices at 100 Broadway.

Theodore O. Vilter, Vilter Mfg. Company, Milwaukee, president of the American Association of Refrigeration, has sailed for Europe to attend the convention of the International Association of Refrigeration at Vienna. Mr. Vilter and other representatives from this country will invite the association to hold its next convention in the United States.

P. T. Laws has been appointed manager of the Anniston, Ala., plant of the United States Cast Iron Pipe & Foundry Company.

T. Frame Thompson, London, England, chairman of the Board of Directors of the Otis Steel Company, Ltd., Cleveland, Ohio, is now in the United States.

L. V. Woerner, Jr., manager of the Fairbanks Company's supply department, Buffalo, N. Y., has tendered his resignation, effective October 1.

President Schwab and Vice-Presidents Archibald Johnston and H. S. Snyder of the Bethlehem Steel Company are in San Francisco visiting the Union Iron Works, but denial is made of the report that a contract for vessels and armor is about to be closed with Prince Tsai Hsun, Minister of the Chinese Navy, whom the party met at San Francisco and will accompany on his trip across the continent.

John B. Milliken, controller of the Crocker-Wheeler Company, Ampere, N. J., has accepted the position of treasurer of the Yale & Towne Mfg. Company, Stamford, Conn. His headquarters will be in New York.

F. F. Prentiss, formerly president of the Cleveland Twist Drill Company, Cleveland, Ohio, returned September 19 from a tour of the world lasting over a year.

A Yale & Towne Reception

About 30 of the dealers and salesmen in New York and vicinity handling the Yale & Towne Mfg. Company's chain blocks and hoists, at the invitation of that company, visited its factory at Stamford, Conn., September 16, and about an equal number from the same territory will be similarly entertained September 23. Last week's party left the Grand Central Station at 2 p.m. and arriving at Stamford was taken in automobiles to the factory, where it was divided into three sections and under the guidance of R. T. Hodgkins, manager; H. C. Spaulding, district manager, and A. J. Regan, superintendent, respectively, of the hoist department, was shown through the factory, where all of the processes, particularly those entering into the manufacture of the Triplex and Differential chain blocks and electric hoists, were explained.

The inspection completed, the guests were taken to the Stamford Yacht Club, where they enjoyed an elaborate shore dinner. In the speeches which followed, General Manager W. C. Allen and Messrs. Hodgkins, Spaulding and Regan explained something of the purposes of the visit and the organization and advertising campaign which have been instituted to further the sales of hoists and chain blocks. It can hardly be doubted that this method of grounding those who come into direct contact with purchasers, in the reasons for the constructional and operating excellence of the company's product, will be of mutual benefit to the company and its agents, and quite as much will it be an advantage in facilitating the business transactions between them to be better acquainted personally. The whole scheme may well commend itself to other manufacturers of whatever line, providing that the line is one that will warrant it.

Passenger arrivals at New York from Europe have been very heavy this month. Up to September 17, the number of first class passengers arriving in 1910 was 68,230, a gain of 5,953 over 1909 to the same date; second class, 174,885, a gain of 32,449; steerage, 802,670, a gain of 107,839. Of eastbound passengers the number in the same period was 182,927 first and second class and 224,167 steerage, a gain of 23,617 in first and second class and 37,460 in steerage.

Opening the New Maas Iron Mine

Other Old Range Operations on Lake Superior

MARQUETTE, MICH., September 17, 1910.—George J. Maas of Negaunee, Mich., and his associates, who for more than three years past have been exploring a tract adjoining M. A. Hanna & Co.'s American mine on the Marquette range, where hard magnetic and soft hematite ores have been encountered, are organizing the North Range Iron Mining Company, with capital of $500,000. Mr. Maas and his associates have expended over $100,000 in their drilling operations and have thoroughly explored 40 acres of the property. As indicated in the detailed account of this new find given in *The Iron Age* of February 24, 1910, page 457, it is estimated that this one forty contains 15,000,000 tons of hematite, with more than 200,000,000 tons of mixed ore, which can be made marketable by concentration. The material for a steel lined shaft has been ordered, and shaft sinking will be started before winter sets in. It is Mr. Maas' plan to sink the shaft to a depth of 700 ft. before attacking the ore bodies. In the expectation of adding a number of new mines to its Upper Michigan group of iron ore producers, the United States Steel Corporation has started the exploration of a large tract of mineral bearing land in the vicinity of Clowry, in the western portion of the Marquette range. Two diamond drills have been put into commission, and they will be kept at work indefinitely. A small portion of the area is known as the North Champion mine. This property was opened on a limited scale some years ago by the Champion Iron Company, now controlled by the Steel Corporation, and a few thousand tons of ore were mined from surface workings. The area to be tested is in direct line with and apparently on the same formation as the Barnes and North Lake mines, which the Cleveland Cliffs Iron Company is opening a few miles to the east.

In the territory to the east of Republic and to the south of Michigamme, within the limits of the Marquette region, the Cleveland Cliffs Iron Company is preparing to explore the Fence Lake district. The Fence Lake country was partly tested 25 years ago. An iron bearing formation was proved, but no ore of commercial grade was found and the work was abandoned. The Cleveland Cliffs Company will make use of a diamond drill. It is not improbable that ore of merchantable quality lies at greater depth than was attained in the comparatively shallow pits put down years ago. The Cyr property in the southern part of the Marquette region is being provided with railroad facilities. The Cyr is the latest Swanzy district mine, the development of which has been started by the Cleveland Cliffs Company.

The Traders property of the Antoine Ore Company, at Iron Mountain, Menominee range, is to be tested at depth. A contract for extensive diamond drill exploration has been awarded.

The old Indiana mine, a pioneer Menominee range property in the Lake Fume district, between Iron Mountain and Norway, is being explored by the Independent Iron Company of Detroit.

There has recently been taken from Escanaba the largest cargo of ore ever loaded at any Great Lake port. This was when the steamer Norman B. Ream departed with 13,410 net tons consigned to South Chicago. The ore was taken on at the C., M. & St. P. docks. The largest cargo previously carried out of Escanaba was slightly over 12,000 net tons, and was shipped to South Chicago two years ago.

The Iron & Steel Products Company's Affairs.—The detached material of the several subsidiary plants of the Iron & Steel Products Company, Philadelphia, Pa., will be sold by the receivers, W. Vernon Phillips and Jacob M. Schenk, as follows: That at the Lebanon Chain Works, Lebanon, Pa., October 6, at 12 o'clock; on the same day, at 2 o'clock, that at the West End Iron Company's works, Lebanon; that at the Bristol Iron & Steel Company's works, Bristol, Pa., October 7. By order of court, the Hollidaysburg Iron & Nail Company, Hollidaysburg, Pa., another subsidiary concern, will be offered for sale at that place September 30, to satisfy two mortgages, one of $25,000 and one of $10,000. The receivers are unable at this time to give any information as to the ultimate solution of the company's affairs.

The Inland Steel Company's Good Year

The Inland Steel Company, Chicago, has issued its report for the year ended June 30, 1910, showing the following financial results:

Sales, less discount and exchange	$9,816,093
Cost of production, &c.	8,184,130
Gross earnings from operation	$1,631,963
Other income	2,174
Total income	$1,634,137
Interest	168,750
Net income	$1,465,387

From the net income there were deducted for the year dividends of $404,577, and depreciation reserve $150,000, leaving a surplus for the year of $910,810; previous surplus, $1,505,607; total surplus, $2,416,418.

Brass Manufacturers' Meeting.—The National Association of Brass Manufacturers held an important meeting at the Hotel Pfister, Milwaukee, Wis., September 14. A number of new members were taken in. The question of the adjustment and equalization of freight rates came up for consideration. A committee was appointed to investigate and report results of the best methods of modern foundry equipment and the most satisfactory way of melting metals. The matter of costs was extensively gone into and a committee appointed to take this question up in detail. A committee was appointed for the standardization of sizes, threads and openings in lavatories. The several committees are to report at the next meeting, which will be the annual meeting of the association, and will be held in New York City, December 14.

Munroe & Sons' New Boiler Shop.—The R. Munroe & Sons Mfg. Corporation, Twenty-third street, Pittsburgh, is erecting a new steel building, 70 x 200 ft., to be equipped with a 25-ton electric traveling crane, not yet purchased; a 200-ton Wood hydraulic press for heavy flanging; punches, toggle presses, &c. This is an addition to the present building, and will be used as an erecting shop, more than doubling the present capacity. It will be ready for operations about October 15. The company manufactures Munroe patent water tube boilers, large oil and water storage tanks, riveted steel pipe, plate work for iron and steel works, &c.

The Crucible Steel Company of America, Oliver Building, Pittsburgh, has received an order from the Government for 1200 12-in. armor piercing projectiles; also for a large number of 8 and 10 in., and for a number of 5 and 6 in. All this material will be made at the Atha Steel Works, Harrison, N. J., operated by the above-named company.

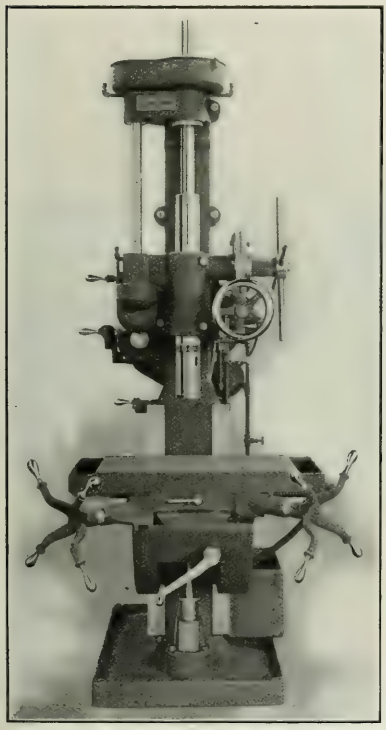
The time for receiving bids for the building of two battleships for the Chilean Navy has been extended to October 15. It is possible that specifications which now require that guns and other equipment be of English design and manufacture will be modified so that American shipyards may make bids for the contracts.

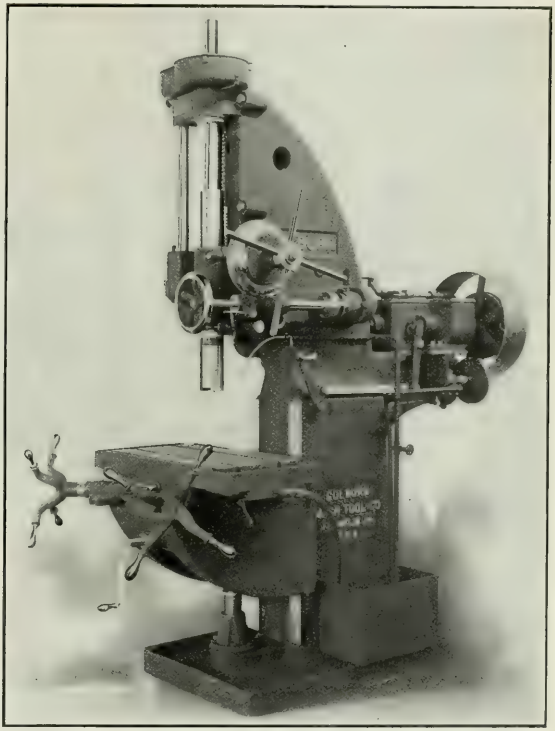
The Colburn High-Duty Drill

With the Improved Compound Table

At the convention of the American Railway Master Mechanics' and Master Car Builders' associations at Atlantic City last June, the Colburn Machine Tool Company, Franklin, Pa., exhibited a heavy duty drill that was of unusual interest, not only because of its constructural features, but also by reason of the results in the way of rapid drilling which it makes possible. An improvement which tends to increase the usefulness of the tool is the new compound table, and two views of the tool equipped with it are given herewith.

As will be noticed from the engravings, this table





Two Views of a High-Duty Drill with Improved Compound Table as Built by the Colburn Machine Tool Company, Franklin, Pa.

is very different from the ordinary type and is a valuable adjunct to the machine. The table has a working surface of 16 x 30 in. and is provided with a rapid movement of 20 in. longitudinally and 8 in. transversely through worms and racks. The operator standing directly in front of the table can manipulate it forward or back or longitudinally without moving from his position. This table possesses all the advantages of the older circular type and at the same time the disadvantages, such as springing, are eliminated, as it is supported by a heavy bracket or knee underneath and an elevating screw as well, which it is claimed prevents the slightest springing. A much quicker adjustment is obtained with this table than with the older style. A large chip pan is provided at each end, as well as an oil groove running lengthwise at each side, arranged so that all the lubricant running into the chip pan at the farther end is drained back through a cored opening in the table to the pan nearer the supply tank. The lubricant is taken from this pan to the tank through a hose and connection, and no matter how large a stream is used all the lubricant drains back to the supply tank.

The machine is built on the unit system—that is, the speed changing mechanism is in one separate box, the feed change gears are inclosed in another separate case, and the head is a third unit entirely independent of the other parts. All the gears used on this machine either run in a bath of oil or are made of steel and hardened. The main driving gears transmitting power to the spindle are of the helical type, which is comparatively noiseless in operation. These are made of steel and the teeth are ground to insure smooth running. The gears connecting the speed box with the shaft passing through the feed box at the side of the column are also helical and hardened.

Power is transmitted to the speed box, which is located between the driving pulley and the column of the machine itself and contains all the gearing required for the eight spindle speeds, all of which are made by two levers at the front of the machine. Four of these changes are effected by engaging a hardened dive-key with different gear combinations, while the remaining four are obtained through back gears. From the speed box the drive goes to the upright shaft and from there to the drilling spindle itself by spur gears which are 10 in. in diameter.

The spindle is 2½ in. in diameter in the sleeve and the nose is 3 13-16 in. in diameter and has a No. 5 Morse taper. The spindle speeds vary from 45 to 520 rev. per min. when the driving pulley is making 500 rev. A power feed of 16 in. is provided for the spindle, which is 12½ in. from the face of the column.

Six changes of feed, varying in approximately geometrical progression from 0.009 and 0.06 in. per revolution of the spindle, are provided and are obtained through positive gears encased and running in an oil bath. These changes are made by a dive-key and back gears and the feeding movement is trans-

mitted to the spindle through a large diameter worm gear. A dial graduated in thirty-seconds of an inch is mounted on this gear, thus enabling the operator to measure the depth drilled accurately. This dial is adjustable and has a pawl which may be set to trip the feed at any point in the spindle travel, or the feed may be tripped by hand from the operator's position. A safety shear pin placed on the worm shaft protects the mechanism from injury.

In a series of tests made using Celfor high speed twist drills, cutting speeds as high as 200 ft. per min. in cast iron were obtained, although 125 to 150 ft. per min. were used in most cases, which was undoubtedly due to the fact that the nature of the work was the limiting factor rather than the drill or the machine itself.

Converted Steel Castings

During the past few years many foundries have been turning out semi-steel castings. These semisteels vary greatly in mixture and quality, and should not, therefore, be confounded with converted steel, which is the name given to a new metal, recently placed on the market by the General Foundry Company, Bradford, Pa.

Details are withheld as to the manufacture of this metal, the materials used in the mixture as well as the process of annealing being kept secret. However, the mixture is melted in an air furnace, charcoal pig iron being the principal item of the mix. The most important part of the manufacture is the annealing process which is done in a muffle furnace and differs radically from the annealing process used by malleable iron foundries. It is much shorter, taking but three days from the time the metal is placed in the annealing oven until it is taken out.

The properties of this metal resemble very closely the open hearth steel casting, the tensile strength being from 10,000 to 20,000 lb. in excess of malleable iron. The elongation, however, will greatly exceed that of either the malleable iron or the average steel casting. This metal being soft is very easily machined. It is claimed to be uniform all through, containing no hard spots, such as are usually found in the larger sections of malleable iron, and does not contain blowholes so prevalent in cast steel. Any defect in converted steel will show on the surface, so there is not a large labor loss by encountering blowholes when machine work is nearly completed.

The segregation in this metal, it is said, does not affect the casting as in cast steel, and castings with sharp corners and deep pockets can be made perfect as a solid piece, thereby making these points as strong as any other part of the casting. Castings can be made from this metal weighing up to 1200 lb. and of up to 6-in. section. Owing to the short annealing process, deliveries can be made within one week from receipt of patterns.

The following table gives the average result of actual tests made with several bars of this metal:

Tensile strength, pounds per square inch	50,000 to 70,000
Elastic limit, pounds per square inch	32,000 to 40,000
Elongation, per cent	7 to 17
Reduction in area in 3 in., per cent	10 to 16

The sulphur, phosphorus and manganese in this iron run considerably lower than malleable iron, the sulphur being especially low, running less than 0.031. The silicon will average about 0.5 per cent., but this is varied somewhat in order to suit different weights of castings.

That the metal is extremely tough can be seen by the illustrations. Fig. 1 shows a ¼-in. piece bent cold in a circle, Fig. 2 shows a piece of the same size twisted cold, Fig. 3 shows a piece of ½-in. metal with several ⅝-in. holes punched through it cold, and Fig. 4 shows a piece of this metal 5 in. square with a ¾-in. hole drilled through it. From the above it can be readily seen that this material can be used for any purpose for which malleable or cast steel is at present used, and it is also to some extent superceding the use of drop forgings. It is being placed on the market at about the same prices as are being asked for ordinary malleable iron.

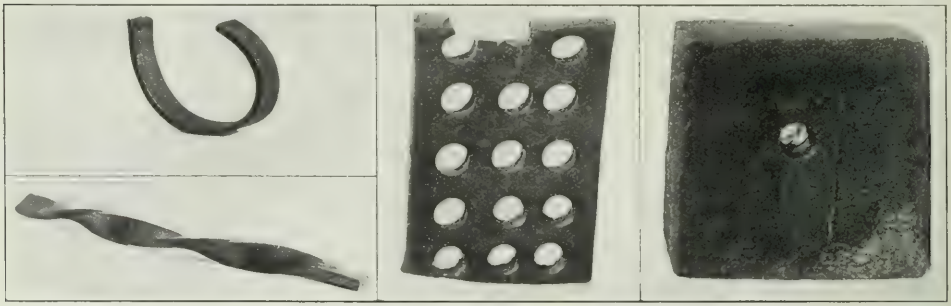


Fig. 1.—A ¼-In. Piece Bent Cold in Circle.
Fig. 2.—Same Stock Twisted Cold.

Fig. 3.—A ½-In. Piece with ⅝-In. Holes Cold Punched.

Fig. 4.—Piece 5 In. Square with ¾-In. Hole Drilled Through It.

Specimens of the Possibilities of Converted Steel, Made by the General Foundry Company, Bradford, Pa.

Coal Dust as a Cause of Mine Explosions.—George S. Rice, chief mining engineer of the Bureau of Mines, Washington, has made a series of experiments from which he concludes that the great coal mine disasters are due chiefly to coal dust and not to fire damp. While it has been supposed that explosions of coal dust follow those of fire damp, the experiments at the testing station at Pittsburgh have shown that coal dust alone will explode. Details are given in a bulletin issued by the bureau of a number of coal mine disasters in which the loss of life is said to have been due to the effects of coal dust, which if not the initial cause in all cases was an agency of destruction. Fire damp, it is stated, carries its own warning. Whenever gas is present in a mine in dangerous quantities a blue flame rises from the safety lamp to notify the miner, but coal dust, though visible, does not attract attention unless present in large quantities.

Work has begun at Gary, Ind., on the construction of 150 concrete houses for employees in the mills of the American Sheet & Tin Plate Company, now building there. Most of the new houses represent a cost of about $2500 and, as in the case of other concrete buildings at Gary, the cement will be furnished by the Buffington plant of the Universal Portland Cement Company.

Earnings of British Iron and Steel Companies

Two important British steel companies have had their annual meetings recently and their statements of earnings are interesting as showing the condition of trade in Great Britain in the past year. For the year ending June 30, Bolckow, Vaughan & Co., Ltd., earned £286,135 after providing for depreciation, this amount comparing with £241,675 for the previous year. The capital account was reported at £3,979,239. The chairman said that in the opinion of the board the production of Cleveland iron is now in excess of the world's demand. He thought that producers of pig iron in Great Britain should consider whether it is wise to allow output so far to exceed demand. Their reserves of coal and iron ore cannot be replaced and care should be taken to conserve these stores. One remark of the chairman will cause a smile to readers connected with the American iron trade. He said that in the United States production is better controlled by agreement than in Great Britain and oversupply of any product is prevented. The company declared a dividend at the rate of 6 per cent. a year.

At the annual meeting of Guest, Keen & Nettlefolds, Ltd., the chairman, Arthur Keen, said that for a considerable part of the year ending June 30 trade conditions were uncertain, causing much anxiety to the management. The total sales were 10 per cent. below those of the fiscal year 1907, which was the company's best year, while wages were 6 per cent. more than in 1907, the increase being mainly in the colliery department. The company, he said, had a long road to travel upward before reaching again the business and profits of 1906 and 1907. Increased labor cost is a constant factor and the company has had considerably increased charges for income tax. The products are sheet bars, angles, plates, bars, wire, nuts and bolts.

The London *Iron and Coal Trades Review* in analyzing the statements of five important iron and steel companies in Great Britain for the past six or eight years, says of Guest, Keen & Nettlefolds that the company's serious decline in profits in recent years, which in the last financial year carried them below those of the years 1903-05 (a period of depression) is somewhat disquieting. In the past year the profits were £348,093, against £371,724 in the preceding year, and £454,716 and £470,511 in the financial years 1908 and 1907, respectively. However, in the past four years the company has paid 15 per cent. dividends on its ordinary shares.

In the case of Bolckow, Vaughan & Co. (pig iron, billets, rails, plates and bars) the 6 per cent. dividend on ordinary shares last year compares with 5 per cent. in the preceding year, 6 per cent. in the fiscal year 1908 and 10 per cent. in 1907. The earnings of the company in 1907 were £607,322. In the last nine years the book value of the company's property has increased by over one million sterling and now stands close to four millions. The debenture debt, however, which was very slight in 1901, is now £826,000.

John Brown & Co., Ltd. (rails, plates, shapes and bars), made a gross profit of £236,000 last year, against £239,000, £252,000 and £262,100 in the immediately preceding years, respectively. The dividend on ordinary shares has been 7½ per cent. in each of the past two years, against 10 per cent. in each of the three preceding years. The plant of this company is valued at £4,000,000.

The Ebbw Vale Steel, Iron & Coal Company, Ltd., has plant valued at £1,100,000. Its main business is coal, the output being 1,750,000 tons, while that of steel is about 175,000 tons. The gross profits last year were £90,000, against £77,300 in the preceding year and about £161,000 in each of the years 1908 and 1907. The ordinary dividends in 1910 and the three preceding years were 5 per cent., 2½ per cent., 10 per cent. and 10 per cent., respectively.

The Consett Iron Company (pig iron, bars, plates and shapes) has been exceedingly prosperous and in the years 1900, 1901 and 1907 paid a total of 140 per cent. in dividends. In the past 13 years £365,000 has been set aside for new construction and £471,000 for depreciation and for special purposes. The earnings of the company were £202,000 last year, against £229,000, £363,00 and £486,000, respectively, in the three preceding years. The dividends for the past year and the three preceding years were 22½ per cent., 20 per cent., 33 1-3 per cent. and 40 per cent., respectively.

The five companies referred to above have an average capital of £3,000,000. Leaving out bonded indebtedness, their combined capital, ordinary and preference, is £10,923,000. The combined profit on last year's business was about £1,100,000, or a little over 10 per cent.

Customs Decisions

Sheet Steel Stamped Wares

A. & H. Veith, New York, were successful before the General Board in obtaining lower duty on importations of steel articles shaped or formed from sheet metal with the use of dies by the process of stamping. Duty was assessed on the merchandise at 45 per cent. as manufactures of metal, whereas the importers alleged the merchandise to be dutiable properly at the appropriate rate under paragraph 135 as "pressed, sheared, or stamped shapes" of steel. After a review of the testimony submitted the board reaches the conclusion that the articles are entitled to the lower specific duties as claimed by the importers.

Lace Machines

A protest by F. L. Roberts & Co., objecting to the assessment of a 45 per cent. duty on parts of Gothrough lace-making machines, comprising certain bobbins and carriages composed in part of steel, was overruled. The importers claimed that the articles are exempt from duty under the provisions of paragraph 197, tariff act of 1909. The record shows that the metal articles assessed with duty are extra parts of the machines and are, therefore, not entitled to the free entry claimed by the protestants.

Metal Washers

The General Board, in sustaining a protest filed by S. Hoffnung & Co., New York, has decided that metal washers with an improved device to prevent the nut from slipping after it has been properly fastened are dutiable properly as "washers" under paragraph 162 of the tariff act of 1909, rather than as manufactures of metal not specially provided for under paragraph 199 of the act. The merchandise was invoiced as "fast-nut" washers, and was classified by the custom house authorities as manufactures of metal, whereas the importers claimed that the articles are "washers" and properly dutiable at three-quarters of 1 cent per pound under paragraph 162, which specifies "washers of wrought iron or steel." The question was raised at the hearing of the protest whether the articles are in fact "washers," and, second, whether if in fact "washers" they are not designed for use on automobiles and dutiable as parts of automobiles. On this point General Appraiser Fischer rules that a patented metal washer, though it be used on automobiles, having no adaptation for that purpose, and, in fact, commonly and practically used otherwise, is dutiable as a "washer" rather than as "parts of automobiles."

The Rockwell Furnace Company, 26 Cortlandt street, New York, has opened a branch office in the Fisher Building, Chicago, Rooms 718 and 719, in charge of A. L. Stevens, an experienced furnace engineer. This will place the company in closer contact with the Western trade.

Twinvolute Turbine Pumps

The Line Built by the Watson-Stillman Company

The special feature of the latest addition to the line of turbine and centrifugal pumps built by the Watson-Stillman Company, New York City, is what is known as the Twinvolute waterway. This, as distinguished from the ordinary concentric waterway, is of gradually increasing cross sectional area both ways circumferentially from the point opposite the discharge outlet to the outlet. The principle is to increase the volume of the passage as the volume of water increases, so that the velocity may be practically constant instead of constantly increasing, as must be the case in a concentric passage or one of uniform cross section. Theoretically, in a concentric waterway pump, the water flows in equal volumes, both ways toward the discharge, but it is claimed by the builder of this pump that by test it has been proved that the parting is seldom at the midpoint—that is, diametrically opposite the pump discharge outlet—and that no two pumps show the dividing point in the same place due probably to inaccuracies and varying smoothness of the inside surface of the pump shell. It is, therefore, claimed that the water must do more work on one side than on the other in reaching the discharge outlet with a resulting drop in the pump efficiency. In the Twinvolute pump there is a constriction at the mid-point of the passage that compels the water to part at the correct center and flow in equal quantities in both directions.

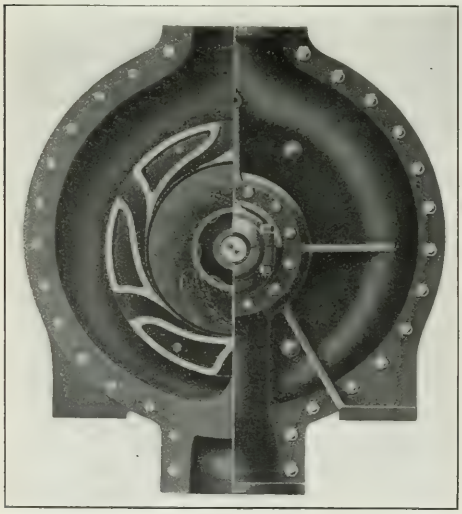


Fig. 1 End Elevation and Section of a Watson-Stillman Twinvolute Turbine Pump.

A further advantage of the Twinvolute waterway over the ordinary concentric waterway is that it enables the pump to be made somewhat smaller and more compact for a given duty, so that its original cost is less, and it is also claimed to take less power and give less vibration. A reason for the latter is that the center of gravity of the pump is lower and the shaft center nearer the base. Having uniform pressure and velocity in the waterway, the Twinvolute form practically eliminates eddies and so increases the efficiency. The efficiency is further favored by the proper proportioning of the diffusion vanes through which the water passes from the impeller to the waterway, these vanes being so designed in cross section and curvature as to convert the velocity of the water into pressure, leaving only that which exists in the volute. Fig. 1, showing an end elevation of the pump half in section, reveals the form of the waterway and diffusion vane passages, and shows by white dotted lines the form of the passages in the impeller. Fig. 2, an axial section of a single stage balanced suction Twinvolute pump, shows additional details of the construction.

The Complete Line

The builder's line includes sizes and types of pumps suitable for all kinds of service, including that for city water works, boiler feed, fire protection, irrigation, drainage, &c., there being both horizontal and vertical types of single and multi-stage pattern. Fig. 3 shows an 8-in. single-stage Twinvolute turbine pump driven by a 50-hp. General Electric variable speed induction motor. This pump operates against a constant head with a variable delivery, and is one of two sets used in the heating system of the United States Navy Yard at Norfolk, Va. The overall efficiency has been found to be 70 per cent., which is about 20 per cent. higher than was called for by the Government specifications.

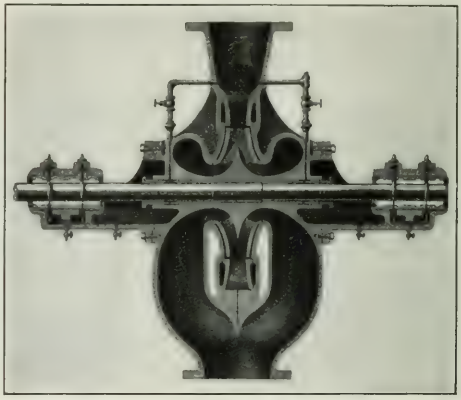


Fig. 2. Axial Section of a Double Suction Single-Stage Twinvolute Pump.

Fig. 4 shows 16-in. single-stage tandem Twinvolute turbine pumps driven by a Kerr steam turbine. This outfit is used in connection with a condensing plant for pumping water to a barometric condenser and cooling tower. It has a capacity of 22,000,000 gal. per day. Sectional views of a two-stage Twinvolute turbine pump with bearings on the casing are given in Fig. 5 (the pump is also made with outboard bearings), and Fig. 6 is an elevation partly in section of a vertical three-stage Twinvolute turbine pump, built for a municipal water works. The water supply is obtained from 7-ft. wells, in which the water level is 100 ft. below the surface. The wells are about 24 ft. in diameter, and the pump in this case runs submerged. The street mains are 10 ft. under the surface, and are kept under a pressure varying from 40 to 125 lb. The pump shown has a capacity varying from 770 to 2500 gal. per minute, and is driven by a three-phase variable speed vertical alternating current motor.

The Twinvolute pump is considered an especially good form for house tank service, and when electrically driven and operated in connection with the com-

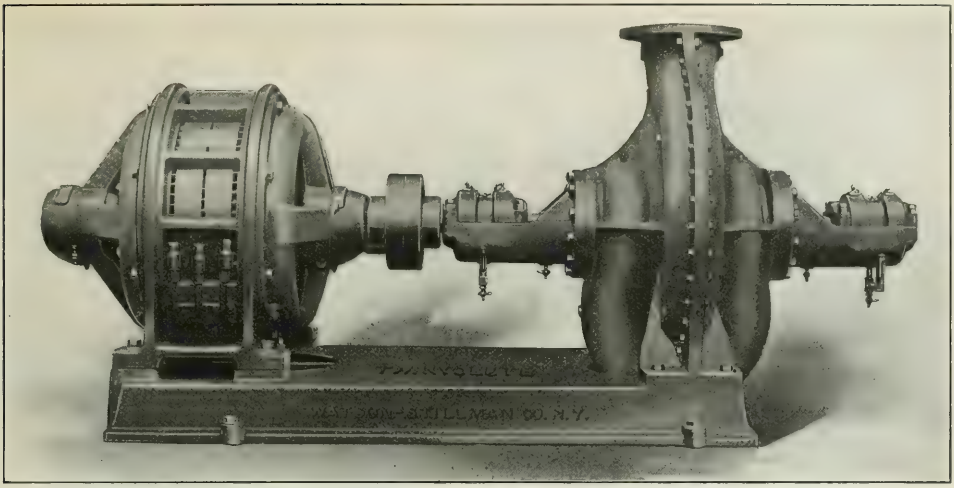


Fig. 3.—An 8-In. Single Stage Twinvolute Pump Driven by a 50-Hp. General Electric Induction Motor.

pany's automatic tank switch, requires substantially no attention. The tank switch is a simple device operated through a float to start or stop the pump at certain set low and high water levels in the tank. Twinvolute turbine pumps for house tank service may be obtained with capacities ranging from 500 to 5000 gal. per hour and are suitable for buildings of any hight.

In general the pumps are designed according to the requirements of any individual case, as it is not practical to use the same pump for widely varying heads, capacities or suction lifts. The company builds pumps with discharge outlets of from ⅜ to 72 in. in diameter for capacities of from 2 to 150,000 gal. per minute for suction lifts of from 1 to 25 ft. for heads of from 1 lb. up to discharge pressures of 500 lb. for speeds of from 50 to 3000 rev. per min., and for operation by gearing, belt, silent chain or direct connected electric motor, gas engine, steam engine, steam turbine or water turbine. The vertical pumps are especially suitable for pumping sewage, for reclamation service, mine drainage, emptying dry docks, &c.

Balanced End Thrust

As shown in Fig. 2, where the suction inlet is at the bottom and the discharge at the top the water in the suction pipe must divide in the Y-passage of the single stage Twinvolute pump and flow in equal amount into each side of the impeller. There is, therefore, no unbalanced end thrust where this double or opposed suction impeller is used. The same idea of symmetry is embodied in the impeller design, so that as the water enters the eyes on each side there is equal pressure in opposite directions. The divided suction is also especially desirable in high speed and large sized pumps, since the double openings allow the impeller to be made smaller in diameter than where the water must all flow into one set of openings. This means a smaller pump and a consumption of less power.

The two-stage Twinvolute pump is balanced in much the same way although the construction is somewhat different. To make the pump compact it is necessary to introduce water into the suction of each impeller on one side only, but good balance is obtained by placing the impellers back to back. The openings are of equal area and the surfaces exposed to pressure are about equal at each pressure chamber, which tends to maintain the balance.

Single-Stage Twinvolute Pump

A single-stage pump should be used only when the head is less than 100 ft. It consists of two nearly similar castings which when bolted together form a case or shell in which a single impeller wheel rotates. The pump body also carries the flanged suction and discharge openings, the shaft bearings and the stuffing boxes. It is provided with two or four feet and is mounted upon and bolted to a strongly ribbed bed plate which also provides support for a motor, engine, or whatever may be used for the drive.

Its operation may be understood from Figs. 1 and 2. Water enters the suction opening and passes in equal volume through the Y-branch channels to the inlet openings at the center at each side of the impeller. Passing through the impeller eyes the water comes into

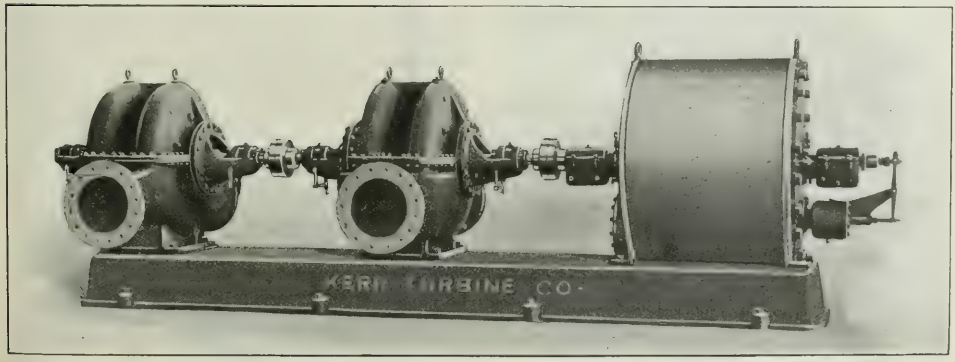


Fig. 4.—Two 16-In. Single Stage Tandem Twinvolute Pumps Driven by a Kerr Steam Turbine.

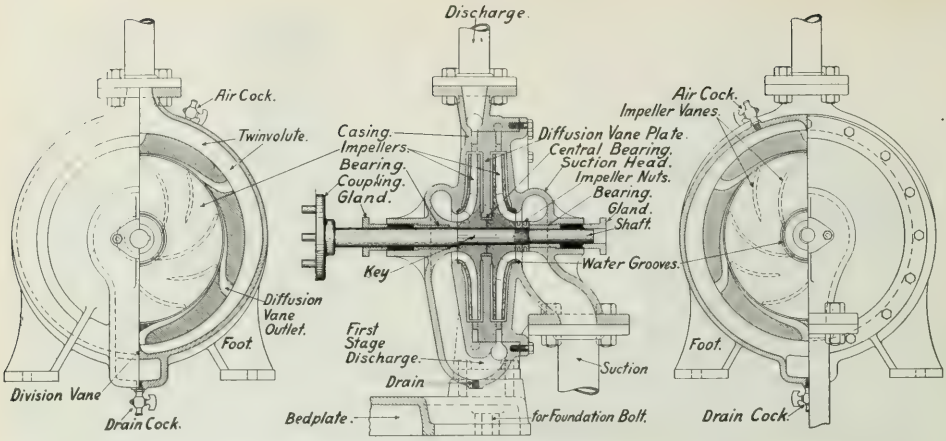


Fig. 5.—End, Axial and Sectional Elevations of a Two-Stage Twinvolute Pump with Shell Bearings.

contact with the impeller vanes which impart velocity to the water. Passing through the outlet openings at the outer rim of the impeller wheel the water comes in contact with the diffusion vanes which change the kinetic energy of the fluid into pressure gradually and without shock. The water then enters the Twinvolute chambers and passes out at the pump discharge.

Two Stage Twinvolute Pump

These pumps should be used for obtaining higher pressures, or delivering against greater heads than is practical with the single stage pump. It consists of two separate turbines inclosed in one shell and arranged so that the water passes successively through them before it enters the discharge outlet. The water enters the second pump under a pressure corresponding to the discharge pressure of a single stage pump, so that practically double the pressure results from passing through the second stage. The pump shell differs from that of the single stage Twinvolute in that it consists of a casing machined to receive the two impeller wheels and the central or diffusion vane plate which separates them, and is closed by a cover plate that bolts on the suction side.

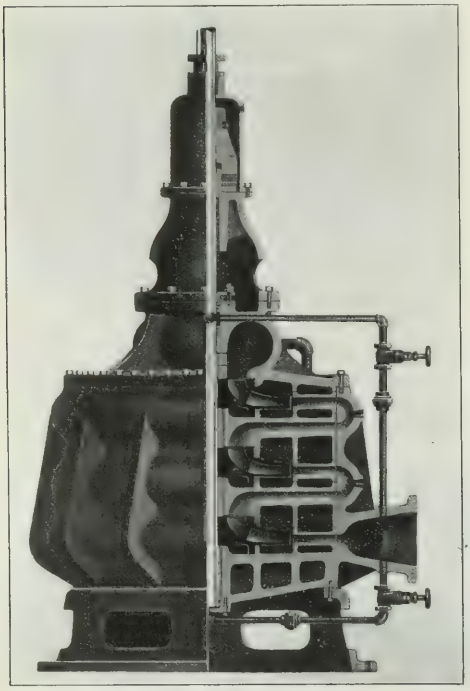


Fig. 6.—Elevation Half in Section of a Vertical Three Stage Twinvolute Turbine Pump.

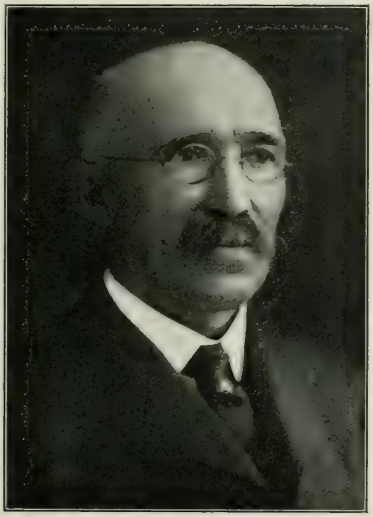
The operation can be understood from Fig. 5. Water enters through the suction opening in the elbow and enters the eyes or inlets of the first impeller where it comes in contact with the impeller vanes. These vanes impart velocity to the water, and the latter passing through the impeller outlets meets the diffusion vanes which change the velocity into pressure. The water then passes through the diffusion vane openings into the Twinvolute chamber, and through the first-stage discharge passage into the eyes of the second impeller. The water, which has a pressure due to the first impeller, is again acted on as in the first operation, and when it leaves the second set of diffusion vanes its pressure has been correspondingly increased. The water then passes into the second Twinvolute chamber and out through the discharge opening.

Vertical Pumps

Where a pump must run partly or completely submerged, or where the water contains mud, slime or trash that will clog up the foot valve, a vertical type is practically necessary. These in the Twinvolute style are made so that they can be placed in a damp pit or among dirty surroundings, while the motor, being more delicate, can be located somewhere above where it will be out of the reach of destructive influence. Suitable shafts and couplings are provided, so that the motor may be placed at any practical distance above the pump where it is easy of access to the attendant. Vertical pumps running submerged need no priming, but start to work the minute the power is applied. The Twinvolute pumps of both single and double stage pattern are made in the same sizes for vertical operation as for horizontal. The vertical type is usually made with the suction on the bottom, and with feet which may be bolted to a floor or foundation. This type gives excellent service when running partly or completely submerged. It is, therefore, used widely where the water level varies, being at times above and at other times below the pump. For use where the liquid pumped contains too much solid matter to pass through a turbine pump, the company also builds vertical centrifugal pumps, which are especially adapted to draining cellars, pits, excavations, coffer dams, &c., and for use where the sewer level is higher than the floor line.

Death of Chester F. Wickwire

Chester F. Wickwire, president of Wickwire Brothers, Cortland, N. Y., died of apoplexy September 14, aged 67 years. He was of New England parentage and was born on a farm in the vicinity of Cortland, in which he located in 1865, starting a grocery store. After about a year he sold his grocery stock and started a hardware store in the same location, under the name of C. F. Wickwire & Co., his father being his partner in the business. Upon the death of the latter about a year later his younger brother, Chauncey J., took the father's interest in the concern. The brother died October 14, 1872, and the youngest brother, Theodore H., was admitted to partnership, the firm name being changed to Wickwire Brothers, which it has continued to this day. They bought the Rose block across the street, into which they moved their store. Soon after that an old loom came into their possession, having



CHESTER F. WICKWIRE.

been taken in some way in the course of trade. This led to the development of an entirely new business as narrated by the Cortland *Standard*:

Chester F. Wickwire, who was possessed of a very exceptional mechanical and inventive mind, began examining the loom, which had been considered as so much junk, and fixed it up to see what it would do. He conceived the idea of its weaving wire into cloth for screens and other purposes and worked upon it till it would operate perfectly. In 1873 the firm began the manufacture of wire cloth and wire goods in a little building in the rear of the store. The business increased and the factory was constantly added to till it occupied all the available open space within that square. In 1876 the hardware business was disposed of and in 1881 the drawing of fine wire was begun in the large brick building erected for that purpose on South Main street. In 1884 the wire weaving and wire goods department was also moved to that location.

In 1892 the firm incorporated under the same name, Chester F. being the president of the company and Theodore H. the treasurer. The business has steadily increased in volume and in scope until now it includes a rod mill and an open hearth steel plant, in addition to the wire drawing and wire weaving departments, with several side lines of production. It is the leading industry of Cortland, and its plant occupies 36 acres of ground which are nearly covered with buildings. It is also known as the largest and best equipped factory for the manufacture of this line of goods in the United States.

The machinery used in weaving, spooling, painting and finishing wire cloth has been largely invented by Mr. Wickwire and nearly all has been built under the special orders of the company. There was not a machine in the whole that he could not personally operate. He used to spend a large share of his time out in the mill watching the machinery and planning what improvements could be made upon any particular machine that would save time or labor or add to its effectiveness. And the men liked to have him about; in fact, there was a very close bond of sympathy between him and all the operatives, and to the last man they were loyal to him in the highest degree. Labor troubles which affect some factories were never in evidence at the Wickwire mills, for the men well understood their employers' reasonableness and fairness.

In 1907-8, under the name of the Wickwire Steel Company, they built a blast furnace on the Niagara River near Buffalo, for the purpose of supplying their own pig iron. A second furnace has been completed this year.

Mr. Wickwire was a public-spirited citizen, finding time from his business for much attention to civic matters. He was a member of the Sewer Board, now the Board of Public Works; gave the city a hospital, costing about $100,000, now nearing completion, and was prominent in all charitable and benevolent movements, as well as in the support of religious institutions. His sagacity being widely recognized, his advice was freely sought and as generously given. He leaves a widow and two sons, Charles Chester and Frederic Rouse Wickwire. These sons, two of the sons of his brother and the two sons of his older sister, now deceased, are all connected in a responsible way with the Wickwire Brothers industry.

A Gas Engine for Bessemer Blowing

A gas blowing engine installed at the basic-Bessemer works of the Haspe Iron & Steel Works, Haspe, Westphalia, by the Siegener Maschinenbau A. G. (Oechelhauser) is of the two-cylinder, two-cycle type, with 6-ft. stroke. The engine cylinder is 31 in. in diameter and the blower cylinder 48 in., the maximum volume of blast being 16,000 cu. ft. per minute. In order to start or stop the blast suddenly a by-pass is provided in the blast cylinder head, connecting the cylinder with the suction chamber, and operated by an auxiliary motor controlled by the driver, so that the volume of the blast can be reduced by one-half without slowing down the engine. The latter can also be run at speeds varying between 85 and 20 rev. per min. Instead of switching off the ignition when the maximum permissible speed is exceeded, thus allowing unconsumed gas to escape into the exhaust, where it is liable to explode on restarting, the governors simply close the gas pump valve and prevent any gas entering the working cylinder. The machine is controlled by two hand levers, and both admission valves are operated from a single eccentric on the main shaft. The engine is of 1800 hp., and the efficiency 77.4 per cent. The pump consumes only 91 hp., or 5 per cent. of the total, and the consumption of power by the machine when running empty is only 3.8 per cent. of the total. Starting is facilitated by the low weight of the flywheel —21 tons.

The report of the Canada Iron Corporation, Ltd., Montreal, T. J. Drummond president, for the fiscal year ending May 31, 1910, shows earnings of $265,837 and bond, interest and administration charges of $246,843, leaving net earnings of $18,994. The amount carried forward is $2683, making the total of undivided profits $149,427. The statement of assets shows plant valued at $2,939,613; mining properties, not operated, $5,175,219; investments, $955,232; accounts receivable, $1,458,718; materials, supplies, &c., $1,501,608; good will, $1,041,000, and other items, including $102,833 cash, bringing the total to $13,439,349. The preferred stock is $2,909,000; common stock, $4,832,300; bond issue, $2,920,000; accounts and bills payable, $2,533,490.

Joseph T. Ryerson & Son's Additions

Joseph T. Ryerson & Son, Chicago, Ill., have, in course of erection, additions to their already large plant which will give them an increase of floor space of approximately 85,000 sq. ft., making a total building floor area of over 800,000 sq. ft.

The new buildings are two in number, one to be devoted to machinery warehousing and display and demonstration rooms; the other to the storage of structural shapes and specialties. Both new buildings follow out the same general engineering and architectural design adopted throughout the plant, as typified in the broken plan and elevation given in the accompanying illustration. The addition to the machinery demonstration and display rooms is located north of the present machinery warehouse on Rockwell street, extending north to Fourteenth street. This building is 350 ft. long and 75 ft. wide, of steel and brick construction with tile and glass roof. The floor is 3-in. planking crossed with matched hard maple over concrete. This building will be served by a 15-ton crane, spanning the full width of the building, the runways of which will extend over double switch tracks and a wagon runway at the south end of the building.

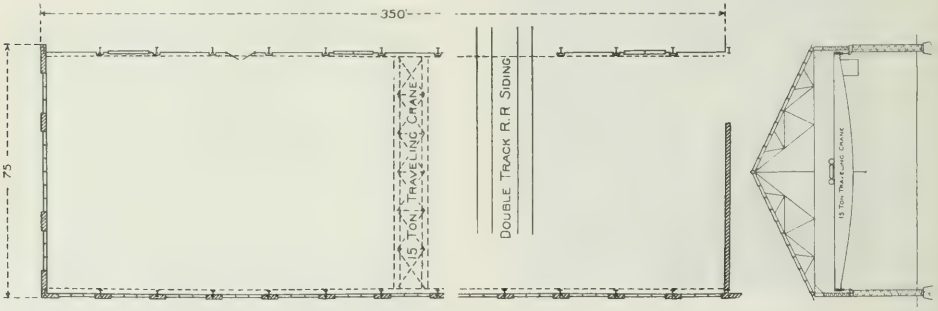
The building will be piped for compressed air and steam and both alternating and direct electric current will be available in all parts. The building is of fireproof construction throughout and when completed will be the largest machinery display and demonstration room in the world, maintained by one company.

Heretofore, the machinery department of the Ryerson company has maintained merely warehousing rooms. The advantages of a building wherein machinery might be displayed in operation, or tested in view of the prospective customer, became apparent and it was decided to erect a special building, which would not only afford space for the display of the machinery in operation, but which would afford facilities for testing such machinery under the actual conditions which would be met in service.

With this end in view the new building is supplied with four kinds of electric current, and compressed air, steam, and high-pressure water, permitting the operation of steam hammers, hydraulic machinery and pneumatic machinery and tools, as well as belt and motor-driven tools. Concrete testing pits are provided, fitted with foundation bolts which are adjustable to receive all of the heavier class of machinery where substantial foundations are necessary in testing.

The structural specialty building is immediately south and adjacent to the present structural warehouse and extends 500 ft. from Rockwell street east to the Pennsylvania Railroad tracks. The building is 100 ft. wide and of steel construction throughout. This building will be served by two cranes, each of 5 tons capacity and of 100 ft. span. Double switch tracks extend across the east end, while in the west end there is a wagon runway.

These extensive additions to the Ryerson plant, coming at this period of general dullness and unsettled business conditions are significant as representing the progress which that company has made in the steel department store idea and as further exemplifying the success which has attended such concerns as are in position to supply the entire wants of steel users.



Plan and Elevation of the Machinery Demonstrating Shop of Joseph T. Ryerson & Son, Chicago, Ill.

Removing the Quebec Bridge Wreck

The *Engineering Record* of September 17 has an interesting article on the manner in which the wrecked superstructure of the Quebec Bridge is now being removed. In the collapse of this bridge, August 29, 1907, about 17,000 tons of steel fell in the St. Lawrence River, a considerable part of it, some 9000 tons, being in shallow water or exposed at low tide. A large amount of this steel has been cut up by the oxyacetylene apparatus supplied by the Linde Air Products Company, Buffalo, N. Y. Up to date about 4500 tons has been removed, clearing up nearly all of the material adjacent to the main pier, where the heaviest and largest members were concentrated. So far the members have been cut up and dislodged entirely by the use of the oxyacetylene torch and by dynamite, and rivets have been cut out of the removed pieces by hand. The application of dynamite consists substantially in attaching a continuous row of sticks of dynamite to the member on the line in which it is desired to cut it and then exploding them in the usual manner by a battery.

Sections of both of the main vertical posts over the river piers, the heaviest members in the bridge, were driven deep in the ground. Their weight is estimated at about 50 tons, but they are so firmly held in the hard ground that all efforts to dislodge them by dynamite have proved unsuccessful, as has the application of four tackles operated by a hoisting engine. It is planned to make another effort by using a pair of powerful hydraulic jacks engaging the upper ends of the members and reacting against the ground. It is believed that with these the pieces can be started and afterward withdrawn more easily. It is estimated that it costs about $1 per ton to cut out the rivets in the large compression members and reduce them to merchantable scrap, which is said to be sold in Montreal for $12 per ton. Charles Koenig & Co. are the contractors for removing the steel.

Negotiations for the arrangement of a reciprocity agreement between the United States and Canada will be opened next month. Ambassador Bryce has assented to the negotiations being carried on directly between Canada and the United States without the formality of being conducted through the British Embassy. Sir Wilfrid Laurier, Canadian Premier, has declared in favor of an agreement.

An Efficient Labor Bureau

How the National Metal Trades Association Does This Work

One of the most important problems of shop management is not only the securing of workmen as they are needed but also the procuring of competent men for the places to be filled. During dull times there are usually plenty of good men available, but, with business conditions very good or even normal, shop superintendents and foremen have their difficulties in getting skilled workmen, and various methods are followed in finding men possessing the desired qualifications.

In solving this problem a large number of manufacturers in metal working lines, who are members of that organization, are relying largely on the assistance of the labor bureau of the National Metal Trades Association. Conducting an employment bureau was not one of the original purposes of the organization but this department of the association, without being formally planned, was forced into being and gradually developed to meet the needs of its members who asked for its assistance in securing help. The bureau originated about five years ago and has become a very important part of the association. It had its origin in requests from foremen to find places for good men, whom they were forced to lay off because of lack of work.

The National Metal Trades Association has 15 branches in the leading manufacturing centers in the Eastern and Central States, and at present has about 800 firms on its membership roll, the bulk of its members being large employers of labor. The system of conducting the labor bureau is doubtless familiar to most members of the association, as there are probably very few of them who have not been given assistance by the bureau in securing workmen.

Each Branch Has a Labor Bureau

Each branch of the association maintains an employment bureau, all being conducted along similar lines. Each member makes a daily report of the number, names and addresses of men hired, laid off, discharged or quit. When new employees are put on, the class of work they are doing is specified as well as the places where the men worked last. When a man leaves the concern's employ the cause is given. In this way a complete daily record is kept of each shop that belongs to the association. The card index system is employed, a separate card being sent in for each man employed or leaving his employment. These cards are carefully classified for future reference.

When a member makes a request on the bureau for workmen the list of the reported unemployed is gone over and postal cards are sent to a sufficient number in the trade needed, asking them to call at the office if they are still out of work or desire to make a change. This method of bringing employers and men seeking work quickly in touch operates very satisfactorily, although, as is to be expected, a portion of those written to have secured other satisfactory employment with concerns outside of the association or have left the city and are not heard from. Some who have taken employment with concerns not belonging to the association often respond to the postal cards and secure places more to their liking or more remunerative.

Good Men Specially Looked After

The association aims to keep its good men in shops of its members and if a competent employee is laid off in one shop, efforts are always made to place him in the shop of another member, rather than allow him to go to work for a concern not belonging to the association. A large number of the men, who appreciate the services of the association in providing places for them without any charge, through the labor bureau remain loyal to the organization. In providing places for workmen no distinction is made between union and non-union men, an applicant for work not being asked whether he belongs to a labor organization. A large share of the members of the association do not look to the labor bureau so much for workmen as they do for reports on the character and qualifications of the men they employ. They hire men who come to their shops seeking work and then ask the bureau for reports regarding them. Some employers, however, refuse to hire a man until they have his record from the labor bureau, and in case the man has come from a distant city and has no local record the bureau, when requested, goes to considerable trouble in securing this record from the place where the man was previously employed.

The bureau not only furnishes skilled workmen in various branches of the metal working industry but finds places for foremen and superintendents. It also aids a man already employed by a member in finding different work more to his liking. One of the unwritten rules of the association is that members will respect each other by not taking into their employ apprentices who are learning their trade in the shops of other members.

Co-operation with Other Cities

Each branch not only conducts its labor bureau in the interest of its members but co-operates with the business of other branches in other cities. There may be a scarcity of skilled mechanics in a certain trade in one city and a surplus in one or more other cities. The branch needing men will send out a call through its employment bureau to the other branches, and unless there is an unusual scarcity the desired number of men is secured. In case a sufficient supply of the kind of men needed is not readily procured from lists on hand, advertisements for men are inserted in the local newspapers. When men are sent to other cities to fill positions their transportation is paid for and they turn over their baggage and tools as security. These are forwarded to the concern for which the men are to work and their transportation charges are paid back in installments out of their wages.

In case of a strike against the shop of a member the labor bureau becomes a recruiting office for workmen. In emergencies of this kind and when a sufficient number of men is not available members loan some of their employees to another member in the same or another city who is suffering from a scarcity of labor because of the strike. These loans of workmen are usually for 90 days or some other stated period, at the expiration of which time the men are sent back to their former employment.

The National Foundry & Machine Company, Connellsville, Pa., is building a core oven truck, 10 ft. by 45 in., for the J. S. McCormick Company, Pittsburgh, to be used by the Valley Iron Works, Williamsport, Pa. This company is fairly busy in its foundry, filling orders for castings for glass houses, mills, &c. It is also excellently equipped for machine work. Its shop is operated by motors. One of its products is the Springer patent mine pump, which has an improved valve mechanism.

The Highland Chemical Products Company has moved its office from the plant at South Connellsville, Pa., to the First National Bank, Connellsville, Pa., which is centrally located and where the concern can conduct its business to better advantage. J. L. Schick, manager, has charge of the company's affairs there. It makes an anticorrosive coating for iron and steel pipe used in mines, &c.

Portable Autogenous Welding Equipment

The Oxi-Carbi Company's Latest Apparatus

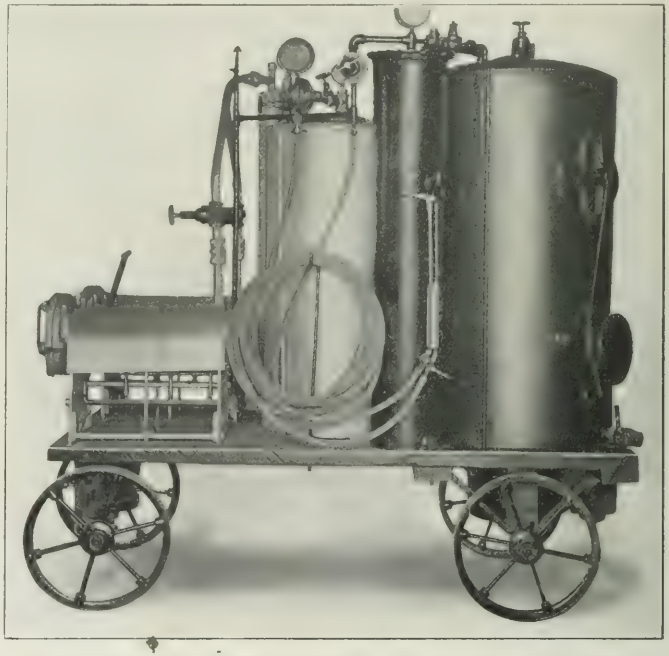
In its latest type of portable oxy-acetylene welding apparatus, herewith illustrated, the Oxi-Carbi Company, New Haven, Conn., claims to have perfected a most satisfactory process of generating the acetylene gas by which a high quality is obtained. With the peculiar construction of the generating chamber, it is possible to entirely slack the carbide without obtaining a highly discolored sludge, which is the common fault of the water feed generator from overheating in generating the gas. Among its features of safety is the impossibility of opening the carbide chamber without dropping the chain. This automatically closes the feed water valve, so that no water can enter the chamber and generate gas should there be carbide left in the chamber. This company builds both the water feed and the carbide feed generators and states that it is unable to distinguish any difference in the quality of the two gases. The generators are built of extra heavy steel and as all joints in it are welded this makes it impossible for any part of the generator to be melted, even if it is placed carelessly near a hot furnace.

As this generator is entirely automatic, and there is no odor of escaping gas (even in a close room with no connection with the open air) from the safety valve, there is declared to be absolutely no danger of an explosion from the mixture of gas and air under any of these conditions. In moving the machine the feed water valve may be closed and no water admitted to the carbide chamber; also if the machine is carelessly overturned very little water could reach the carbide.

The oxygen is generated under pressure, but as this company has used this process for several years and believes that it has had all the accidents which could arise from this source of generation, it firmly believes that a generator of this kind is as safe, or safer, than a steam boiler. If ordinary care is used in preventing organic matter from becoming mixed with the chemicals, there is very little danger of an explosion from this source. An explosion might occur if the valve between the retort and storage tank was closed, and no provision made for escape of the gas in the way of a safety valve. An ordinary safety valve is of little use, for in blowing the oxygen carries considerable chlorine, which will cut a channel in the valve seat, making it worthless after it has blown a few times. It is then likely to be removed and a plug put in its place, which ends the safety appliance on that machine. The Oxi-Carbi Company has perfected a safety disk which bursts with undue pressure and can be quickly renewed, and a tight connection may be always maintained and still be safe.

For those, however, who are prejudiced against this type of machine, the company is always ready to supply the compressor type of oxygen generator and the purchaser may carry the oxygen to the work in tanks if he so chooses. The same can be done with acetylene, but it is not often that the consumption of gas warrants so expensive an installation and the cost would be prohibitive. The greater the distance from the source of supply of compressed gases the more expensive these gases become, while with a machine that generates the gases as they are required the builder of this quipment argues that many valuable pieces may be saved with very little cost and often work can be done without dismounting. Another argument made is that it does not cost as much to move a keg of potash and a drum of carbide as it does to move six tanks of gas, and the gas does not cost as much as when it is procured from compressing plants owned by others.

In the generation of oxygen with this machine all guesswork is eliminated by a double gauge arrangement, through which it may be determined at any moment whether the retort in use has exhausted its gas or not. This saves much useless heating of the retort, which is always done when no way is provided to determine the condition, or else the heat is shut off before it is out, causing a waste either way. This is an exclusive feature of this apparatus, as well as providing special alloy valves on the storage tank by which oxygen may be retained in the tank without fear of its leaking out over night.



The Latest Portable Oxy-Acetylene Welding Outfit, Built by the Oxi-Carbi Company, New Haven, Conn.

Brown & Co., Inc., operating the Wayne Iron & Steel Works, Pittsburgh, are making some improvements to their plant, and have placed an order with N. C. Davison & Co., Keenan Building, Pittsburgh, for a 250-hp. steam engine to operate shears. Davison & Co. have also made a sale of a duplex Yeoman pump for the Weisser-Lowe Building on Liberty street, Pittsburgh; a deep well pump for the Nixon Hotel, Butler, Pa., and a 5-ton refrigerating plant for the Hotel Lowry, Butler.

New Cutler-Hammer Alternating Current Crane Controllers

In steel and iron industrial plants traveling cranes perform important service. The electric motor has helped to make possible the speed, flexibility and convenient operation now obtained, and until recently the direct current motor was used almost exclusively and left little to be desired. However, the introduction of alternating current systems in all parts of the country has often made it desirable to use alternating current motors providing satisfactory service could be assured.

This has led the Cutler-Hammer Mfg. Company, Milwaukee, Wis., to develop a new line of alternating current crane controllers, two of which are illustrated herewith, front and rear views of each model being given. Fig. 1 is the radial arm type of controller, while Fig. 2 shows the self-contained type arranged for rope operation. In the design and construction of these controllers, an effort has been made to secure a model capable of giving long and highly efficient service. The contact segments are arranged to secure accurate control and speed adjustment, and can be easily renewed or interchanged without interfering with the connections on the back of the face plate.

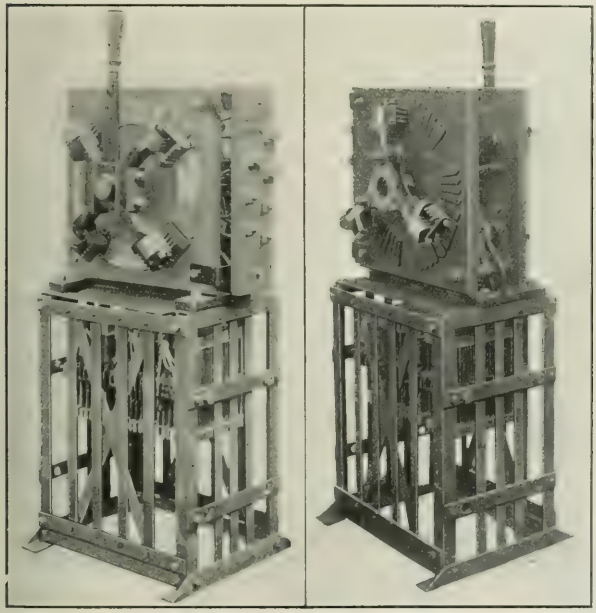


Fig. 1.—Front and Rear Views of the Radial-Arm Alternating Current Controller Made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

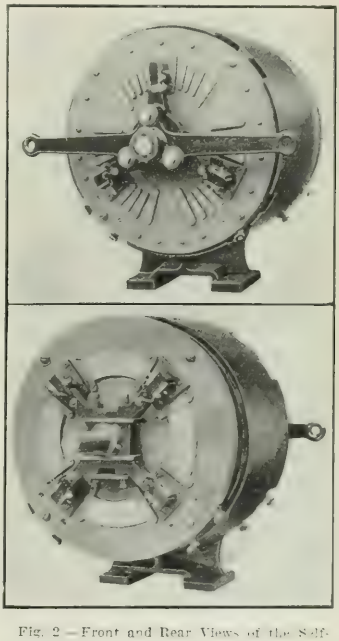


Fig. 2.—Front and Rear Views of the Self-Contained Type of Crane Controller.

The appearance of these new controllers is similar to that of the direct current face plate controllers made by the same company. The fronts are Vermont slate, carefully inspected and tested for traces of iron. The larger or radial-arm type shown in Fig. 1 has the resistance grid mounted below the face plate, and is operated by a straight motion of the lever which permits the installation and easy operation of several controllers side by side. The structural steel frame combines strength and lightness, and permits of easy access to the internal parts of the controller. The smaller controller, Fig. 2, is self-contained, having a unit type resistance, mounted on the rear of the face plate. This is adapted for use with small cranes, and can be operated from the floor by ropes. For reducing the wear on the brake mechanism single phase and polyphase brake solenoids which also cut down the starting current have been developed, and form a part of the regular equipment of both types.

In addition to these two styles, a special form of controller for use with squirrel cage induction motors has been designed, although this type of motor is seldom employed for crane operation.

Chairman Gary on the Iron Trade Situation

In an interview given to the newspapers on his return from Europe last week, Chairman E. H. Gary of the United States Steel Corporation said of conditions in the iron trade:

"Dullness is naturally to be expected at this time of year, but I think iron and steel manufacturers have no reason to complain of their business. You must remember that for six months previous to March 1 we were booking almost 50 per cent. more per month than our total capacity, with the result that orders accumulated rapidly. Such a condition of things naturally leads to a falling off of new orders, and we have an opportunity to work off the accumulation to some extent. Nevertheless we still have on the books from three and one-half to four months' business, and if we get only half our capacity per day in new orders it will be a long time before we have much right to complain. The reason why at times an apparently large percentage of business falls off is that business is not entirely regular in some lines. But I am convinced that there will be no trouble whatever threatened in industrial conditions in America unless it is as a result of uncertainty caused by political agitation. What we need is more stability in the United States.

"There is a noticeable tendency on the part of the steel people of this country and those of foreign countries to co-operate. I should like to explain that this co-operation does not mean a definite agreement with reference to prices nor with reference to a division of business or anything of that sort, but such friendly co-operation as results in an interchange of information regarding business."

The Iron Ore Resources of the World*

Some of the Factors Determining Availability—Vast Stores That Will Be Drawn Upon in Countries Now in the Background

BY L. DE LAUNAY.

The very interesting question before the present Geological Congress is an indication of a new condition of affairs which will command more attention as the years pass. In the last quarter of a century industrial civilization has, with marvellous rapidity, taken possession of the entire earth, and has gradually spread over and united even the most inaccessible lands with bands of iron. There has thus been a tendency toward the establishment of a kind of general equilibrium, which will undoubtedly become characteristic of the future; an equilibrium in which each type of production will tend more and more to become centralized in the regions where conditions are most favorable to its development and also where it is largely consumed.

It is natural, therefore, that man, as the owner of a property recently acquired, should make an inventory of its value, with a general survey of the localities which under the most favorable circumstances may furnish him with this or that material whose need he anticipates.

An Economic as Well as Geologic Question

It is with this conception that we shall consider the question of the source of the iron ore which will be required for the future iron industry. For, if we view the problem from only one standpoint, if we ask only whence mankind in the most distant ages can derive its iron there is nothing difficult about the answer. The entire crust of the earth contains an average of 4.70 per cent of iron. A most elementary selection easily raises this amount to 10 per cent. in the case of almost any rock; and there is no techincal impossibility connected with the extraction of the iron, although no one would dream of calling it ore.

With iron, as with every other metallic substance, the question of ore is purely conventional and depends as much upon economic conditions as on geologic facts. To be an iron ore it must be profitably workable under the conditions surrounding it where it occurs. These conditions vary at different times with means of transportation, local demand, metallurgical processes, &c. Since each of these factors is susceptible of modification, with a rapidily constantly increasing with scientific and industrial development, it is not only a delicate matter but economically dangerous to predict far ahead, and by a consideration of the statistics of the past half century to attempt to establish conclusions as to future requirements. It may serve a good purpose, therefore, to say a few words as a preface to approximate deductions from the great international investigation so admirably conceived and carried out by the Bureau of the Congress [which resulted in the publication of the two volumes, with atlas, entitled, "The Iron Ore Resources of the World."—EDITOR].

"Known" and "Potential" Supplies

What do we find if we limit ourselves to the figures summarily presented by Mr. Sjögren? They give us actually in reserve about 10,000,000,000 tons of iron, contained in 22,000,000,000 tons of ore; they also show five to six times as much in "potential reserves." If the production of pig iron continues to increase at its present rate we have in sight an estimated iron ore supply for 60 years. But are we to understand from this statement that, in these 60 years, we shall begin by the exhaustion of the known ores and pass from them to the more questionable supplies embraced under the heading of "potential" ores? Certainly not; because in assuming that the production must continue to increase at the present rate we should be compelled to attach some importance to ores not known to-day. Furthermore, it is probable that we should be led to discard important supplies of ore now counted as reserves.

In order to realize the changes likely to occur, it is necessary to consider successively some of the principal factors, such as : 1, Metallurgical treatment; 2, Changes in methods of transportation; 3, Shifting of commercial centers and the creation of new ones.

I. Possible Metallurgical Improvements

In spite of our constant experience with the evolution of every industry we have a tendency to judge the future by the present, and to imagine that the needs of our descendants will be identical with our own. The basis of the social scheme, which we call the patriarchal, consists in storing up for future use that class of riches which we suppose will always be indispensable because they are so to-day. It is, however, unnecessary to go very far back in the metallurgical history of any metal—iron, for example—to discover that the ore so much sought for to-day was once despised. Nor do we realize that ores formerly esteemed are to-day of ordinary value. It was possible, for instance, to attach great importance to easy fusibility when only rudimentary means of fusion were available; and purity may have been indispensable when it was impossible to eliminate harmful elements like phosphorus.

Evidently pure high grade ores may always be worked by amateurs; but one need not be a great prophet to understand that many kinds of ores, to-day neglected, may be valuable to-morrow, either because of better methods of treatment or because they may be mixed with ores more recently discovered or made valuable. Thus we see France becoming again, as it was many hundreds of years ago, an important producer of gold through the recent advances in gold metallurgy. Likewise, in the great iron ore basin of Lorraine the enormous development of the siliceous ores possible in connection with the calcareous ores of the basin of Briey has hardly been realized and certainly not taken into account in the calculations cited. In other places we shall learn how to handle large bodies of ore now worthless because of the presence of arsenic, titanium, &c. And among the coming revolutions which can be foreseen to-day we cannot overlook the changes which will come in the metallurgy of iron by the more general introduction of electirc smelting. It can hardly be doubted that the direct treatment of iron ores by electricity, which as yet seems Utopian, will be accomplished, and that it will bring about a change in the character of the ores used, as well as the location and distribution of iron and steel plants. Just as the principal gold production of the world is furnished by the low-grade

* A paper read before the International Congress of Geologists, Stockholm, Sweden, August 22, 1910. Translated from the French by Horace V. Winchell.

but uniform and abundant ores of the Transvaal, so it may happen, through one cause or another, that our descendants may utilize for the manufacture of iron masses of rock far too low in iron content for us to dream of considering them as ore to-day.

II. Changes in Means of Communication

For a substance of as little value as iron ore for a material whose selling price at the mine is often, even in a region of industrial activity, but a few cents, the expense of transportation becomes of prime importance, and in many cases determines the availability of the ore. It is not enough to have ore and good ore; there must be within an area of moderate diameter a grouping, or a trinity of ore, fuel and consumer. The problem of exploitability involves three quantities; of these the consumer is the most fixed and less easily influenced factor, for to him must be brought as cheaply as possible the iron produced by the association of the ore and the fuel. In early days ores were reduced where they were found, there being enough wood fuel at hand for immediate use. Later years have seen the concentration of immense plants, and those ores have become supreme which occur in an industrial, coal-producing region or near water transportation the ideal method of economical transportation, involving, however, the problem of return freight. If electrical metallurgy becomes general it may to a certain extent alter the distribution and location of iron furnaces, establishing them near the water powers which produce the white coal, and creating metallurgical and mining centers quite different from those previously in existence.

Aside from these considerations, the increasing development of railroads is constantly bringing within reach mineral localities which at the outset seemed to be entirely too remote to be taken into account. Often the railroads are induced to build by the ore deposits themselves. This happened in the case of the vast deposits of Gellivare and Kiirunavaara. It will also soon be true of our own fine Algerian deposit at Djebel Quenza. In other instances the railroads profit by the deposits without having been built exclusively for their exploitation. Look, for example, at the railroads which penetrate into China, which traverse Africa and are multiplying in Brazil. At Chansi, at Katanga and at Minas Geraes, the iron ores which were known, but not deemed of any importance for immediate use, may come into the field of exploitation much sooner than is generally believed.

III. Commercial Revolutions and New Centers of Manufacture

The demand for iron has been hitherto confined to a few localities. In the successive stages of civilization, as in legendary lore, the age of iron always comes last, after the age of gold, of copper and of other metals such as lead, tin, and zinc. Widespread demand for iron came with the period of extensive railroad building and the substitution of iron for wood in architectural construction, and with the period of those great and expensive armaments which are deemed, perhaps rightly, a surety for the preservation of peace by making war ruinously expensive. Thus again, as we remarked at the beginning, the location of great coal fields has influenced the selection of iron ore deposits for exploitation. In this respect the results of the splendid investigation made by this Congress are strikingly characteristic. Can it be imagined, for instance, that there is really almost as much iron ore in the small continent of Europe as in America, and that these two continents are almost the only ones which contain important deposits of iron ore? In America, even, can we believe that all the iron ore is really located in the East, to the exclusion of those metalliferous zones of the West so important and so predominant in the production of the other and more valuable ores? The reason for this apparent anomaly lies solely in the fact that the search for these ores has been prosecuted most vigorously in those places where the ores are needed; while as to those localities where exploitation seems impossible or unprofitable we have only a brief approximate estimate without definite figures. It is for this same reason, that in the table of summaries given at the end of the work referred to above, the average iron content of the European ore is only 37 per cent., as against 52 per cent. for America. The European ores are not of lower grade than those of America, but they are on the average exploitable with lower iron content.

Industrial conditions have been such hitherto that the world's production of iron has as a matter of fact been furnished by a few countries, and in these countries by some particularly favored centers. It is the location of the latter which has influenced the practical choice of the iron ore deposits to be worked; and these as a result have been the subjects of estimates based upon the more extensive information available. A Bilbao situated upon the coast of Siberia would remain neglected. We have hardly begun to think seriously of iron ores on the coast of China or the Indian Ocean.

Centralization has gone so far and metallurgical establishments already in existence have become, by reason of their powerful commercial and financial organization, so deeply rooted in their original locations that it is possible for them, contrary to the logic of the situation, to perpetuate themselves and carry on their operations in the face of newly arisen conditions favoring location elsewhere.

This condition of affairs and the present day necessity for working on a large scale in order to realize a profit, often result in a surplus of production at many plants in the countries previously mentioned, compelling a search for new markets at great distances. Herein arises the great difficulties which is encountered in the development of new metallurgical centers even under the most favorable conditions, such as the plant of Wakamatsu in Japan, or that of Hankow in China. Asia also contains, at Kouznetsk in Siberia, iron ore deposits associated with fuel, which cannot possibly be utilized on a large scale in spite of their extent and enormous value that they would have if located elsewhere than in Siberia.

It would be easy to multiply examples of this sort. It is sufficient, however, to draw the conclusion that the world's production of iron ore will appear in the near future under a different aspect from that which it presents to-day. We may say, without hesitation, that if we consider the matter a quarter of a century hence, the problem will be governed on the whole less by geological conditions which guarantee the existence here or there of rich ores, than by a combination of local conditions, powerful enough to permit competition with the plants of Europe or the United States. In fact, this change may come about much more rapidly than is generally expected. The old industrial countries will have constantly less need for extending their network of railroads, while in the new countries will be seen an inverse evolution. As soon as the unnatural influences resulting from the force of accumulated capital cease to have a predominant influence, there will be developed in the natural course of events, in Asia, in China, in India, then in South America, then in South Africa, and so on, metallurgical centers which will progressively extend the radius of their activities by discarding ancient methods and having recourse to the ores favorably located from their own point of view and not from ours.

If we consider also the advantage of cheaper labor in Asiatic countries, and the constantly increasing de-

mand which will arise in these ancient countries where superabundant capital loses part of its purchasing power we may expect rapid development of ores as well as blast furnaces. Wherever iron ore resources exist, which on the basis of present production is sufficient for hundreds or thousands of years, it is natural to increase production in every possible way. It is actually possible that within a half a century instead of a scarcity of iron ore in Europe, as is now predicted, there may be a very large amount for which there is no demand.

Probable New Iron Ore Development

Before reaching this comparatively remote period, we may expect that for several years at least, the present conditions of affairs will continue on an increasing scale. We may thus begin by largely exhausting the reserves actually in sight. Of these some appear to be limited; others, on the contrary, are of considerable importance. In rich iron ores of more than 60 per cent. Northern Sweden holds the first place. In accordance with the geological law, which I have had occasion to emphasize elsewhere, we may compare it with other countries surrounded by analogous conditions in relation to a succession of geological folds, and notably with North America. It is only recently that there have been discovered the iron ores of Lake Superior, known to contain 2,000,000,000 tons of metallic iron, and with 36,000,000,000 tons possible. When Canada is explored, there also, without doubt, will be made important discoveries. Already under slightly different conditions Newfoundland appears to have almost 2,000,000,000 tons of iron ore in the form of enormous bodies containing 65 per cent.; and the same kinds of ore are equally abundant in the Adirondacks. The Southern hemisphere, where are found homologous tectonic conditions, will be found equally rich in high grade ores. We have already mentioned Minas Geraes which must soon be taken into account.

In regard to ores of lower grade France, with its supplies in Lorraine, Normandy, and Algeria, may take the most prominent position. The resources of the Lorraine basin in that portion still belonging to France already place us in the first rank, and this supremacy will become more and more marked on the part of France, and especially also Germany, through the possession of greater ore reserves than are found in other countries. There remain in the Lorraine basin entire strata of ores of still lower grade which have been almost entirely neglected in its development. In Algeria, likewise, the two principal deposits—those of Quenza and Bou-Kadra, of which mention has hitherto been made, are far from being the only ones which may add to its production when means of transportation have been provided. France will thus be constantly callel upon to export more iron, either in the form of ore, or, to the extent permitted by its comparative poverty in coal, in the condition of finished products.

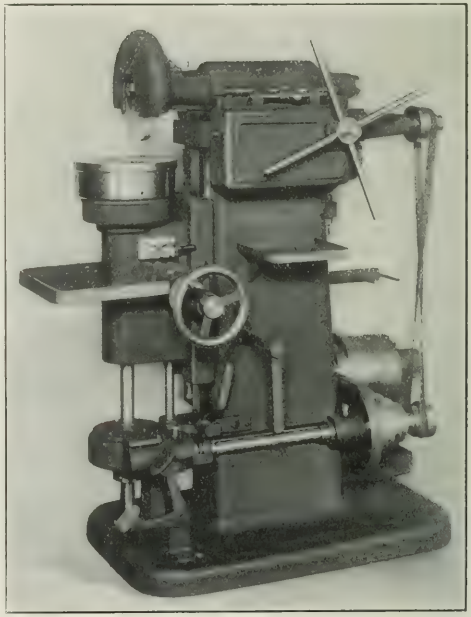
Coal Briquetting in the United States

According to a report prepared by E. W. Parker and published by the United States Geological Survey, Washington, D. C., more briquets were made in the United States in 1909 than in any preceding year. Sixteen briquetting plants were in operation, but five of them were only working experimentally and two of these were making briquets from peat. The total product in 1909 was 139,661 net tons, valued at $452,697, an increase over the output of 1908 of 49,303 tons in quantity and of $129,640 in value.

This output is insignificant compared with that of Germany, where 18,000,000 tons of briquets are made every year, but it shows that the briquet industry is at last getting started in the United States. The conditions in Germany, however, are very favorable to the success of the industry. Labor is cheaper, coal is dearer, and the wasteful beehive coke oven is unknown, for coal is coked in retort ovens supplied with by-product recovery equipment, which yields a large output of coal-tar pitch that is available for use as binding material for making briquets. In the United States the briquet industry is held back by the large supply of cheap natural fuel, by the high cost of labor and by attempts to exploit secret processes, for which extravagant claims are made, but which have failed to make good.

The Bay State Piston Ring Grinder

The piston ring and surface grinder shown in the illustration has been brought out by the Bay State



New Piston Ring Grinder, Built by the Bay State Grinder Company, Worcester, Mass.

Grinder Company, 186 Union street, Worcester, Mass., to meet the exacting requirements of the builders of gas engines, as well as for general surface grinding. It contains several interesting features, among them a pedal clutch operating mechanism, which enables the operator to start and stop the rotation of the chuck with his foot, giving him the free use of his hands for feeding the work to the machine.

A Walker magnetic chuck is used, attached to a vertical spindle, which is driven by spiral gears from the cone shaft, the gears running in an oil bath. The head, which carries the wheel, has three feeds for roughing and finishing, and is adjustable for concave and convex grinding, a necessary function for sharpening saws and cutters. A hand feed is furnished, and a special crank feed specially adapted for piston ring work can be provided. Other accessories are a vertical spindle for use with cup wheel; a valve face grinding attachment, with draw-in chuck, and an attachment for grinding single cams. The spindles and shafts are ground and have adjustable bushings protected from dust. The design embodies ample weight and stiffness.

Russian Labor Legislation

Workingmen's Compensations and Pensions

Consul-General John H. Snodgrass, Moscow, furnishes the following statement to the Bureau of Manufactures, Department of Commerce and Labor:

Considerable influence has been manifested before the Duma to alter the workingmen's compensation act which became a law January 1, 1904, it appearing to be unsatisfactory to both employer and employee. The law defines the employers' liability for accidents, and in comparison with former measures is said to be far more comprehensive and stringent, it being estalished upon the basis that the compensation shall not exceed two-thirds of the earnings in case of a total loss of earning capacity.

Compensations and pensions are granted upon the earnings for 260 days where work is carried on during the entire year, while in manufactories where there is a cessation of labor for part of the year the reckoning is made on the earnings of the actual working days existing in such shops plus the average wage of an ordinary laborer for the difference between the 260 days and the actual time employed in the particular branch of industry. If the employee receives, in addition to his salary, free lodging and board, 20 per cent. is added to the amount of pension for lodging and the actual cost of board.

Compensation for accidents is awarded as follows: For temporary disablement, one-half of the normal wage during the time the workman is prevented from laboring. For partial disablement, compensation sufficient to bring the workman's income up to two-thirds of his normal wage must be paid. For complete disablement, a pension of two-thirds of the normal wage is required.

In case of death resulting within two years from the date of accident, one-third of the normal wage must be paid to the widow for life and one-sixth to each child up to 15 years of age. In no case, however, is the compensation to exceed two-thirds of the wage earned. Dependent parents, brothers, and sisters must also receive compensation, but never so that two-thirds of the wage is exceeded. The employer is also obliged to contribute for funeral expenses $15.45 for adults and for minors from 15 to 17 years, inclusive, and $7.73 for minors from 12 to 15 years of age. In addition to the above-named compensation, the employer is obliged to refund the employee an amount covering any expenditure for medical treatment, unless the latter received such from the employer.

A widow who concludes a marriage is entitled to a lump-sum compensation equivalent to a three-fold yearly pension. In the event of the death of both parents by accident, the children receive the combined pensions.

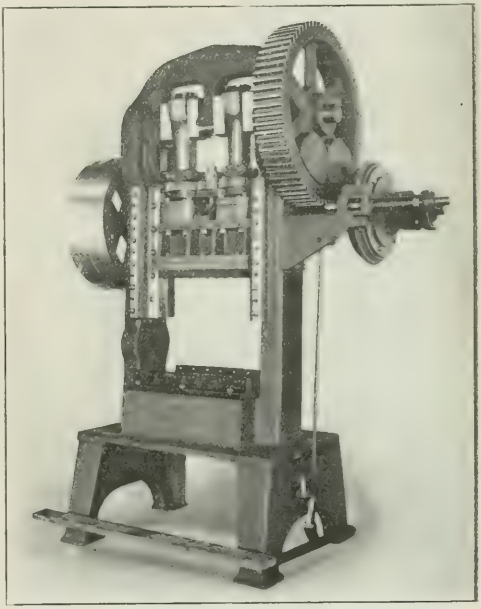
As a result of the new law, it is said that the rates have been raised most appreciably by the insurance companies, and, in some instances, the latter have refused to accept the risk at any normal premium, so that many manufacturers are assuming the risk themselves.

The employers are objecting to the measure for the reason that they claim it is too general; that the working men receive sympathy from the courts; that there is a lack of uniformity in the courts' decisions; that it is an unjust burden upon the employer with no real benefits to the employee; that the rates are abnormal, and that it bears unequally upon the small employer. The workingmen state that too few are protected; that the pensions are too small, and that older and married men are restricted.

Through the courtesy of the Sawyer Belting Company, Cleveland, Ohio, we have received a copy of the new standard stitched canvas belting list which is to take effect October 1. This list runs from 1 to 48 in. in width. Taking the 12-in. width, the new price on 4-ply is $1.20; 5-ply, $1.50; 6-ply, $1.80; 8-ply, $2.40; 10-ply, $3. On all belts 12-in. wide or under, 3 ft. is the minimum charge for a splice on endless belts. On belts over 12-in. wide, the charge is to be the equivalent of three times the width of the belt.

A Special Walsh Press

A recent addition to the line of power presses made by the Walsh Press & Die Company, 4709 West Kinzie street, Chicago, Ill., is illustrated herewith. This new machine is a straight-sided, double crank press and, like the double crank power press illustrated in *The Iron Age*, August 11, 1910, was designed to meet the requirements of one of the firm's customers, the particular work for which it will be used being the production of horseshoe magnets.



A New Straight Sided Double Crank Power Press Built by the Walsh Press & Die Company, Chicago, Ill.

The machine is driven by a friction clutch fitted with a band brake on its rim and can be stopped at any angle of its stroke by simply removing the foot from the treadle, which controls absolutely the transmission of power to the slide. Pressure on the treadle causes the friction clutch to engage and the band brake to release, and when the treadle is released the compression spring shown in the engraving disengages the clutch. This spring is mounted on a rod which is connected with the band brake and, disengaging the clutch, compresses the brake and stops the machine instantly.

The population of Cleveland, Ohio, in 1910, which has just been published by the Census Bureau, is 560,663 as against 381,768 in 1900, a gain of 46.9 per cent. Cleveland thus ranks above Pittsburgh, which has 533,905, though below St. Louis and Boston. Cleveland has now nearly 200,000 greater population than Cincinnati, the latter at 364,463, having gained 58,561 since 1900.

Allen-Bradley Rheostats

The Use of Compressible Resistance in the American Electric Fuse Company's Line

Current controlling devices have long been designed to secure resistance through banks of coils, grids or ribbons and reduce it by successive steps. Varying the resistance in this way is said to have disadvantages both in theory and practice. A starting device built on this principle draws current from the line in a peaked wave, the altitude of which varies from 75 to 150 per cent. of the full load current, according to the movement of the controlling lever and the acceleration of the motor. Fig. 1 shows two curves of this character, No. 1 being that of the Allen-Bradley induction motor starter, made by the American Electric Fuse Company, Muskegon, Mich., and No. 2 that of an ordinary auto-transformer starter. The peaks in the latter curve represent wide potential differences between the contacts of the face plates. These differences greatly increase the tendency to arc and flash and as a result segments, contacts and brushes are burnt out frequently.

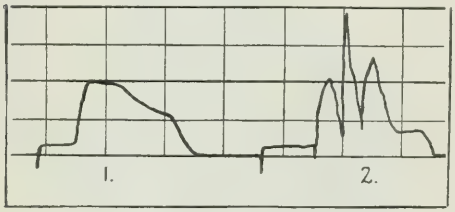


Fig. 1.—Starting Curves of (1) an Allen-Bradley Induction Starter and (2) an Ordinary Transformer Starter.

The Allen-Bradley rheostats operate on an entirely different principle. An indestructible resistance is secured by making use of the imperfect electrical contact between graphite disks, shown in Fig. 2, which are stacked, as shown in Fig. 3, within an insulated metal tube. The latter is mounted as shown in the central part of Fig. 4, which is a side view of a compressible resistor motor starter. These disks are constantly in more or less intimate contact with one another. The more perfect the contact the less the resistance, and by compressing the disks the resistance is decreased at will. The starting lever of these rheostats operates a spring which compresses the disks gradually and evenly with the result that the initial starting current is only about 25 per cent. of the full load and increases gradually as the lever is moved across the contact plate and the resistance reduced.



Fig. 2.—Graphite Disks Used in the Allen-Bradley Rheostats.

By referring to the first curve of Fig. 1, it will be seen that this starting current rises gradually and quite uniformly to a maximum slightly above the full load value and then recedes as the motor comes to full speed to the normal level maintained by the motor while running. This results in the elimination of peaks and the motor is accelerated evenly and smoothly. The low starting current and the even decrease of resistance during the process of bringing the motor up to speed is said to eliminate all arcing or burning at the short circuited segment on account of the slight difference of potential at the point of minimum resistance, and consequently there are no burnt out parts to be replaced.

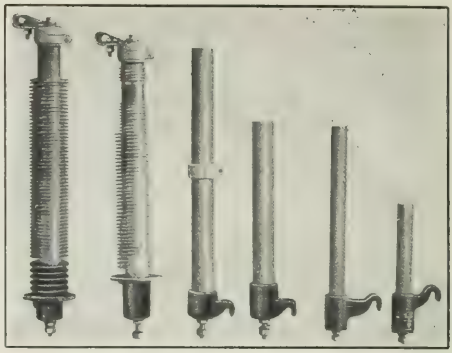


Fig. 3.—Allen-Bradley Resistance Tubes.

These rheostats are regarded as much simpler than those of the segment type, and by using the compressible resistors, the same result is attained as would be secured by increasing the segments and banks of resistance to an infinite number. This does away with a complicated mass of wires, coils and grids and substitutes a single small compact tube containing all the resistance elements and at the same time reduces the weight due to this reduction in the number of parts. Motor starters of the segment type are not only rather complicated, but many of the parts are difficult to reach because of this complexity. This is not experienced with one of the Allen-Bradley type, as every part is in full view and easily accessible.

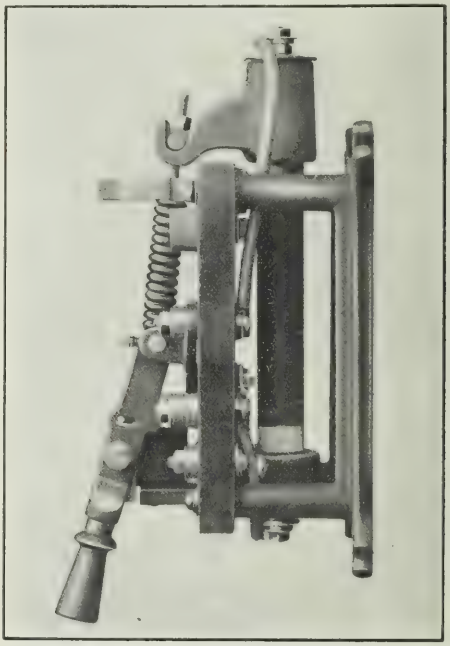


Fig. 4.—Side View of an Allen-Bradley Compressible Resistor Motor Starter Made by the American Electric Fuse Company, Muskegon, Mich.

The Grant Adjustable Boring Tool Holder

A Device Especially Useful in the Tool Room

For use principally on milling machines to produce accurate jig and die work, form tools and light experimental and machine work, the Grant Mfg. & Machine Company, Bridgeport, Conn., has brought out the adjustable boring tool holder shown in Fig. 1. The holder is fitted with a No. 7 Brown & Sharpe taper shank and is adapted to boring all sizes of holes up to 2 in. in diameter. Tools of various sizes and lengths may be inserted and held with the set screws. Larger and smaller sized holders having shanks of any required taper are also furnished. The smaller size with a No. 4 Brown & Sharpe taper shank, used in connection with a high speed attachment, is declared to be the most economical for very small jig work and is adapted to boring holes up to about ½-in. diameter.

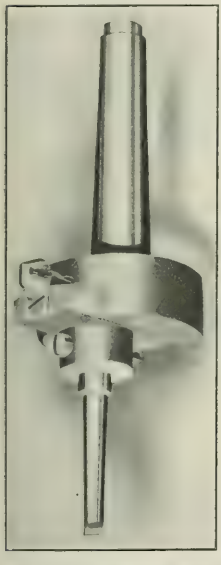


Fig. 1.—An Adjustable Boring Tool Holder, Made by the Grant Mfg. & Machine Company, Bridgeport, Conn

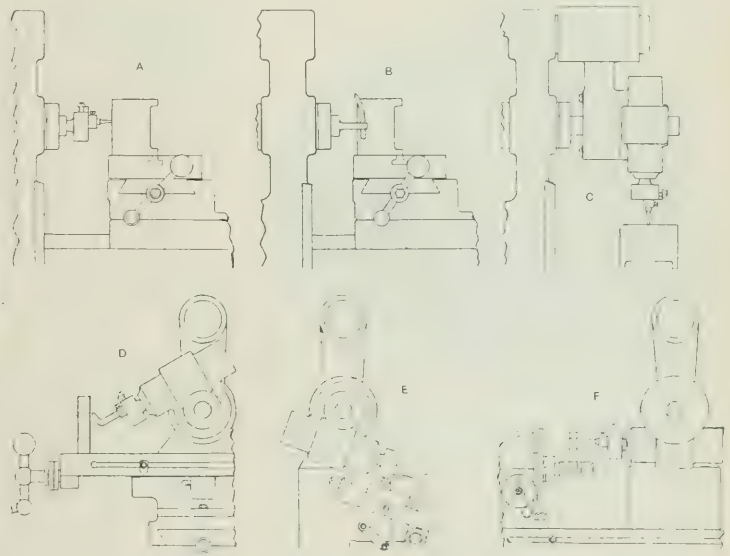


Fig. 2.—Some Typical Uses of the Grant Adjustable Boring Tool Holder.

Fig. 2 shows some of the uses to which the holder may be put. At A the tool is shown at work boring the bushing holes in a drill jig. The jig after machining is clamped on the platen of a milling machine and the bushing holes are then drilled slightly smaller than the required size with a drill held by a chuck in the milling machine spindle. The spacing between centers is made by turning the lead and vertical feed screws and noting the reading on the graduated dials, or vernier, if the machine is so equipped. After all the holes are drilled the boring tool holder is put in the spindle of the machine and the holes are bored to finished size. The spacing between centers of holes is made as before and their diameter is exactly determined by turning the adjusting screw on the boring tool holder which is graduated to read in thousandths of an inch. Turning this screw positively moves the slide carrying the boring tool in or out toward or away from the center of the hole. The slide has a movement of about 1 in. and is rigidly fitted in the head of the holder.

B, Fig. 2, suggests means of getting the exact location for the first hole. A true running plug is placed in the spindle and revolves while a slip of tissue paper is held between the plug and the end of the work. The work is then gradually moved toward the work until the latter begins to grip the paper and pull it from the fingers. The saddle screw is then turned drawing the work out of the way of the plug. The platen is then moved toward the center of the spindle a distance equal to one-half the diameter of the plug plus the thickness of the paper. This brings the center of the spindle in line with the end of the work. The distance to the center of the first hole can then be accurately spaced. In the same way a location from the top of the platen, or other working points may be obtained.

C, Fig 2, shows the adjustable tool holder held in a vertical attachment at work on the top side of a jig. D shows the tool held in a vertical attachment boring an elliptical hole in a die. This is accomplished by setting the vertical attachment at the required angle to produce the necessary difference between the major and minor axes of the ellipse. The hole is bored by moving the platen longitudinally.

E, Fig. 5, shows the tool generating a form tool that can be ground without changing its shape. The tool blank after being roughed out is held in the universal vise swung up to an angle of about 22 degrees to give the proper clearance. The vertical attachment is then swung to the same angle so that the point of the tool while revolving describes circles in planes parallel to the base of the tool blank. The tool is then passed through the blank by moving the platen longitudinally and thus circular forms of any required diameter or depth may be generated by moving the saddle to get the proper location. Forms may be sunk in to any required depth by using the vertical feed screw. Any additional milling may be done at the same holding of the work. In making a concave formed tool this method saves making a master concave and convex tool, as the concave tool with clearance can be generated direct.

F, Fig. 2, shows the tool at work on a job mounted in the dividing head. Jigs with bushing holes having a circular layout can be bored advantageously in this way by clamping them to a face plate mounted on the dividing head. The combination of the saddle and vertical feed screw with the indexing mechanism

offers facilities for boring holes on any required radius and any number of degrees or any distance apart. Bell crank levers and other light machine parts can be conveniently bored in this way, and many other uses of the tool will readily suggest themselves from the few examples given in the foregoing. Its adaptability to the general run of toolroom and machine shop work is extensive.

The Sturtevant Turbo-Undergrate Blower

The new type of turbo-undergrate blower, built by the B. F. Sturtevant Company, Hyde Park, Mass., is designed especially for electric light and railroad

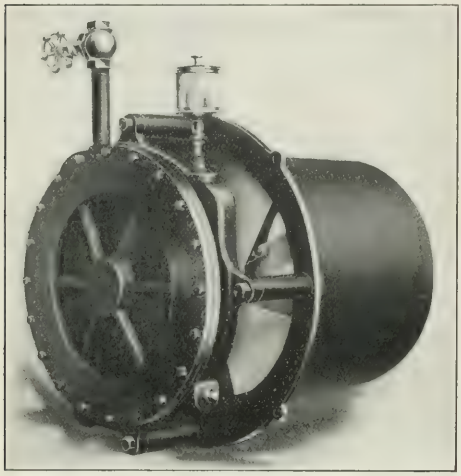


Fig. 1.—The New Turbo-Undergrate Blower, Built by the B. F. Sturtevant Company, Hyde Park, Mass.

power plants which need increased draft during the peak of their load; for power stations that have outgrown their stack capacity and need 25 to 50 per cent. increase in boiler horsepower and for heating systems in hotels, department stores, and other large buildings. The outfit is simple and strong and, as shown in Fig. 1, consists of a single-stage impulse steam turbine directly connected to a propeller type fan. The bucket wheel of the turbine, which may be seen in Fig. 2, is a solid steel forging, carefully machined, the steam buckets being milled on the periphery of the bucket wheel. The steam nozzles are of Tobin bronze, held in place by composition draw-up nuts. The construction of the steam case gives accessibility for inserting, removing and cleaning the nozzles. The dust-proof phosphor bronze bearing and thrust washers are furnished with oil cup lubrication.

The built-up fan is of the propeller type, consisting of six polished sheet aluminum blades, rigidly fastened by hard-drawn copper rivets into a bronze hub, which is finished all over to secure the balance necessary in the high rotative speed of the set. The materials insure corrosion resistance as well as mechanical strength. The stationary members consist of cast iron parts.

The blower is practically silent in operation. Being controlled by hand-damper regulation or by regulating valves operated by boiler steam pressure, small attention is required. The exhaust steam from the turbine contains no oil and consequently may be used directly for any work in which low-pressure steam may be utilized, such as in feed water heaters and building heating systems. The blower discharges into the ashpit and secures satisfactory results from coals that would ordinarily cause serious trouble by clinkering. The method of installation is simple. The wall thimble, which forms the anchorage for the set, can be placed with equal ease at the front, back, or side wall of the brick work of the boiler setting.

Theisen Blast Furnace Gas Washer Contracts.—R. D. Wood & Co., Philadelphia, Pa., who control the Theisen patents for this country, have secured a contract from the Bethlehem Steel Company, South Bethlehem, Pa., for a full equipment of five Theisen washers and wet scrubbers for the new blast furnace plant which the company now has in course of construction. This will be the largest Theisen equipment in this country aside from that of the Indiana Steel Company's installation at Gary, Ind. The Pennsylvania Steel Company, Steelton, Pa., is also installing an equipment of Theisen washers for a furnace which will go into blast in December.

To guard against any possibility of a shutdown from shortage of natural gas, the Union Switch & Signal Company, Pittsburgh, has placed an order with Tate, Jones & Co., Inc., Pittsburgh, for equipping all its furnaces, forges, &c., with the Kirkwood auxiliary oil burning system. The change from natural gas to oil can be made almost instantly whenever necessary.

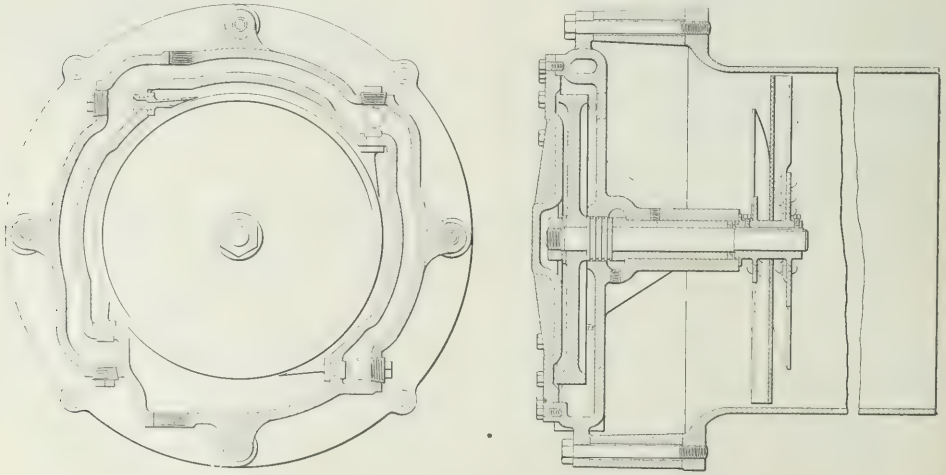
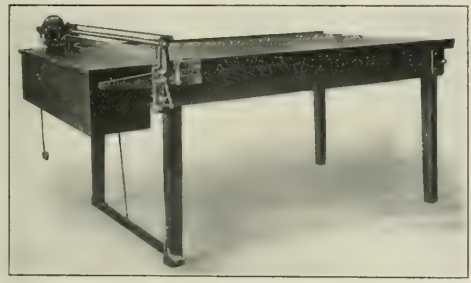


Fig. 2.—End Elevation and Axial Section of the Blower.

The Pease Motor-Driven Blueprint Trimmer

A motor-driven cutting and trimming table arranged with a lightproof box for blueprint paper has recently been placed on the market by the C. F. Pease Company, 167 Adams street, Chicago, Ill., and is illustrated herewith. While this table will be of great convenience and utility to all those making blue prints, which is the special work it is designed for, it can also be used for cutting tracing paper or cloth, detail paper, &c. A parallel clamp operated by a foot treadle is provided to hold the paper, or other material being cut, securely, while the revolving knife is used. The knife



A Motor Driven Cutting and Trimming Table for Blueprints Made by the C. F. Pease Company, Chicago, Ill.

is motor driven, and is rotated positively by mechanical means, so that it will cut the thinnest paper, or 5 to 10 sheets of heavier paper, at once. The knife is operated in either direction at will, and is stopped or started at any point by a specially designed wrist controlled switch which leaves both hands free to handle the paper or blue prints.

The table is constructed of hardwood with metal trimmings, and can be easily knocked down for shipment. The electrical equipment is complete, and can be connected to any incandescent light socket by the attachment plug furnished. The table top is scored in inches, and figures along the front edge enable any size of sheet to be cut instantly. If desired a sizing diagram can be furnished for the top of the table, which gives at a glance the dimensions and square foot measurement of any tracing or print without calculation. Where the table is to be used for cutting prints after they have been made in an automatic, continuous printing, washing and drying machine, a basket is furnished on the end of the table instead of a lightproof box.

The regular size table is 4 ft. wide by 6 ft. long, but any width up to 8 ft. can be supplied. For hand operation of the cutting knife, the table is furnished in widths up to 42 in. The cutting machinery can be furnished separately if desired, either with or without the parallel clamp.

The Engineering Contractors' Convention.—The American Society of Engineering Contractors has issued the programme of its first annual convention, to be held at the Coliseum, St. Louis, Mo. The proceedings will begin on the morning of September 26, when the usual formalities will occur. In the afternoon a paper on "The Construction of the New Croton Dam" will be presented by Edward Wegmann and J. B. Goldsborough of New York City. On September 27, at the morning session, a paper on "Sewers and Sewer Construction in St. Louis" will be presented by H. R. Fardwell, Sewer Commissioner of St. Louis. In the afternoon session a paper on "Work Preliminary to Road Construction and Street Pavement Maintenance" will be presented by George C. Warren, Boston, Mass. In the evening a banquet will be held at the Jefferson Hotel, the headquarters of the convention. At the morning session, on September 28, reports will be received from committees, including one on "Uniform Specifications, Contracts, Cost Keeping and Cost Analysis." Much will be done to entertain the members socially and in sight seeing.

Johnson's Combination Rule

A rule combining the functions of a number of useful devices which has been recently placed on the market by the E. P. Johnson Rule Mfg. Company, 553 Monroe street, Chicago, Ill., is illustrated herewith. The device is a combination of a 6-in. rule, a protractor, try square, bevel and caliper.

It consists of two parts pivoted at one end to form a protractor, while a portion of the stationary part contains a sliding piece, which can be used for calipering outside diameters. The movable part can be adjusted to any angle or bevel desired, and the center joint is so made that the rule will remain firm wherever it may be set. A vernier reading to half degrees is provided for obtaining fine measurements of angles. When the movable arm is swung around and its edges coincide with those of the stationary part a 6-in. rule, graduated on one edge in sixteenths and on the other in



A Combination Rule Made by the E. P. Johnson Rule Mfg. Company, Chicago, Ill.

thirty-seconds is obtained. When the caliper is extended to its full length round stock not exceeding 2½ in. in diameter can be measured. The tool is made of German silver and is accurately graduated.

A Foundry Strike at Baltimore.—A strike has been on in the past three weeks at four Baltimore, Md., foundries, which are connected with the National Founders' Association. Demands for advances in wages were presented in the latter part of August by molders and coremakers in the foundries of the Baltimore Malleable Iron & Steel Casting Company, Bartlett, Hayward & Co., Stuart R. Carr & Co., and the Montford Machine Casting Company. About 120 men are involved. The basis of wages in these foundries heretofore has been $2.65 a day for coremakers and $2.90 a day for molders. The demand was for an advance to a flat rate of $3.25 a day, which would mean an increase of 60 cents a day for coremakers and 35 cents a day for molders. The proprietors offered as a compromise $3 a day for coremakers and $3.10 a day for molders, with an advance for all workers, including those heretofore receiving more than the minimum, but the offer was refused. New men are being brought in by three of the foundries involved in the strike, but for the present Bartlett, Hayward & Co. are letting out the manufacture of their castings.

New Publications

High-Speed Steel. By O. M. Becker. Size, 6 x 9 in.; pages, 360; illustrations, 273. Cloth bound. Price, $4 net. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York City.

The book deals with the development, nature, treatment and use of high-speed steels, together with some suggestions as to the problems involved in their use, and is in a measure an amplification of a series of articles by the author which appeared in the *Engineering Magazine* about five years ago. Such of the original matter as has proved fundamental has been retained and brought into accord with present knowledge and practice, and much has been added touching the historical and theoretical aspects of high-speed and other tool steels. The object has been to include all that might be of interest in connection with the subject and to present an accurate résumé of the present state of knowledge concerning new steels. In the chapters dealing with the practical handling of new steels, the author has endeavored not only to cover all the points likely to come up and to indicate clearly just what is believed to be the best practice at the present time, but to describe all practical methods shown to yield satisfactory results where there is a diversity of opinion.

The volume is divided into six sections, five of which deal with some phase of the problem and the other contains a number of appendices. The first is historical and covers the development and nature of high-speed steels from the earliest days up to the present time. The second division is devoted to the making of the steels and the tools, and the various processes of making the steel and forging, hardening, tempering, annealing and grinding the tools are all described. The tool at work and the requirements of the design of both tools and machines are discussed in the next two sections, and the fifth is given up to the problems which arise from the use of these steels. The appendices include analyses of high-speed and special steels of various makes, an extract from the report on the "Art of Cutting Metals" by Fred W. Taylor made to the American Society of Mechanical Engineers in 1906, a reference table for determining cutting speeds, a diagram for determining the time of turning operations, a summary of the amount of metal removed and the cost, and a series of tables of practical cutting speeds for standard tools ranging in size from 1¼ in. down to ½ in.

Compressed Air.—By Elmo G. Harris. Size, 6 x 9¼ in.; pages, 123; 14 illustrations and 5 plates. Cloth bound. Price, $1.50, net. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York City.

This book is designed to present a mathematical treatment of the problems in the production and application of compressed air and is intended especially for college bred men who have had a thorough training in mathematics and the mathematical sciences, which the author considers is prerequisite to a successful study of compressed air. Consequently no attempt has been made to adapt this volume to the use of the self-made mechanic, except in the insertion of more complete tables than usually accompany a work of this character. Special effort has been made to give examples of a practical nature illustrating some important points in the use of air or bring out some principles or facts not usually appreciated.

The book is divided into seven chapters, of which the first deals with formulas for work and the work done by the air, the second with the measurement of air and the third with friction occurring in air pipes. Chapter IV is given over to discussion of the hydraulic and centrifugal air compressors, while chapter V deals with special applications of compressed air, and chapter VI is devoted to a general discussion of the theory and operation of the air lift pumps. The concluding chapter contains a number of exercises and examples and is followed by a number of plates and tables. These give general information relating to the various properties of air under different conditions of temperature and pressure. A table of the capacity of air drills and one giving data on friction occurring in air pipes complete the book.

The McCaslin Conveyor Catalogue

An unusually handsome specimen of catalogue work is presented in catalogue 16 of the Mead-Morrison Mfg. Company, Cambridge, Mass., manufacturer of coal handling machinery, hoisting engines, cableways, &c., and contractor for coal handling and reclaiming plants. This particular catalogue covers the McCaslin overlapping gravity bucket conveyor, for conveying coal, ashes, cement, clinker and similar materials. It comprises 156 pages, 8½ x 16 in. Of these pages, no less than 144 present either one or two photographic reproductions showing plants in which the McCaslin conveyor has been installed. These plants embrace paper making, ore nodulizing, cement, wire rope, fiber, rock drill, meat packing, coke, electric and ice works and a very large number of power plants scattered all over this country, with a few in England. The engravings are highly artistic and are splendidly brought out on the excellent quality of paper used.

The plants referred to in the book represent over 28 miles of McCaslin conveyor, which in turn represents 112 miles of conveyor chain. If all these conveyors were in operation at one time they would have a capacity in coal of 12,000 tons per hour. At 50 tons per car this would be equivalent to a capacity of 240 modern steel coal cars, or six solid freight trains of 40 cars to the train.

The catalogue was written, arranged by and designed and printed under the direction of Ray D. Lillibridge, Inc., 192 Broadway, New York. The compiler states that the book was produced, including the collection of 90 per cent. of the photographs, within the present calendar year. As advance copies were received from the press June 29, it can conservatively be claimed that the book was produced in its entirety in six months. Those familiar with catalogue compilation will undoubtedly appreciate this as a real achievement.

Rail Orders from British Colonies.—British rail manufacturers have found recently that competition is keen from the United States and Canada for rail business coming up in British colonies. The United States Steel Corporation recently secured the Victorian Government order for 19,000 tons of 80-lb. rails besides other Australian business, while the Dominion Iron & Steel Company, Sydney, Nova Scotia, has made low bids on South African and South Australian business. The London *Ironmonger* reports a cable from Sidney, New South Wales, saying that the Government has accepted the bid of the Lithgow Iron Works in that country to furnish 70,000 tons of steel rails at the rate of 20,000 tons a year. This arrangement "has come as an unpleasant surprise to the British rail makers who find themselves thus face to face with increasing colonial competition, and this, too, just when they had been expecting to book important colonial orders."

The Standard Crucible Steel Casting Company, Milwaukee, Wis., has filed articles of incorporation, with $10,000 capital stock. The incorporators are Fred Weis, Henry M. Koosch and Mollie M. Koosch.

Trade Publications

Tool Holders.—Hill-Standard Mfg. Company, Anderson, Ind. Booklet. Size, 3½ x 6 in.; 32 pages. Treats of tool holders for turning, planing, boring and cutting-off metals. The holders are said to embody all the essential points of the old hand-forged tools and in addition have some good features of their own. With these holders no forging is necessary, as commercial shapes of tool steels can be used directly and are then in the best possible condition, consequently savings are effected in time, labor and money. In the design of the holders the proper rake is always given, the tool can be brought close to the work and largely increased speeds and feeds can be obtained. The holders illustrated in the booklet include all of the standard forms of tools.

Induction Motors.—Burke Electric Company, Erie, Pa. Bulletin No. 7. Relates to a line of motors whose distinguishing features are claimed to be reliability, rugged construction, ample use of material and conservative performance and rating. These motors embody the substantial features of the builder's direct current machines, and in most cases are interchangeable as regards shape and size of bases, shaft extension, hight, &c. Details of the construction of these motors are described and the text is supplemented by a number of illustrations.

Turret Lathes and Boring Mills.—The Bullard Machine Tool Company, Broad street and Railroad avenue, Bridgeport, Conn. Catalogue and circulars. The former calls attention to the vertical turret lathe illustrated in *The Iron Age*, October 3, 1907. In the design of this tool the good features of both the horizontal turret lathe and the vertical boring and turning mill are combined to the best advantage to produce a developed machine tool of a distinctive type which has many structural and operative features which insure a maximum output and a minimum cost, due to the elimination of wasted time. Two sizes of machine, 24 and 36 in., are illustrated and described, and the working parts are illustrated separately with large detail halftone engravings. Details of setting the tools to perform various operations are illustrated with line drawings and a set of complete instructions is included. The circulars cover a line of boring and turning mills which are made in sizes ranging from 30 to 86 in.

Cold Rolled Strip Steel.—Elliott-Blair Steel Company, New Castle, Pa. Booklet. Describes the various kinds of steel made by this company, which include dead-soft bright, cold-rolled, open-hearth and crucible strip steel, plain stamping and punching steel, dead-soft or stiff untempered spring steel, fine machinery steel, key and lock steel and typewriter and sewing machine steel. A table of the weights per lineal foot of bars 1 in. wide and of thicknesses corresponding to the various gauge numbers is appended.

Gasoline Engines.—Trebert Gas Engine Company, Butler, Ind. Catalogue. Describes and illustrates a line of marine gasoline engines which includes a two-cylinder 10-hp., four-cylinder 35-hp. and 25-hp. motors, a six-cylinder 40-hp. model for marine and automobile purposes, a two-cylinder 25-hp. and a four-cylinder 55-hp. engine; also a canoe motor and propeller wheels, clutches, couplings, crank shafts, &c.

Lighting Conduit.—Safety-Armorite Conduit Company, Bailey-Farrell Building, Pittsburgh, Pa. Booklet. Size, 7½ x 9¼ in.; 81 pages. Contains a number of illustrations of buildings in which this company's Loricated and Galvaduct conduits have been installed. The processes by which these conduits are manufactured are described, and there are a number of diagrams showing the comparative sizes of double braided wire and the different conduits, the exact outside and approximate inside diameters of the different sizes of conduits and a list of the standard symbols for wiring plans. In addition to the buildings illustrated there is a list of a number of others in which these conduits have been installed.

Injectors.—Schutte & Koerting Company, Philadelphia, Pa. Catalogue 1, section A. Devoted to the Koerting universal double tube injector which is a combination of two jets. The lower is proportioned for extreme temperature and for quick and strong action, and the discharge is into the upper jet where the water receives the additional strong impulse to carry it into the boiler. The various styles of injector are illustrated and tables of dimensions are included.

Tubing and Insulating and Textile Machinery.—John Royle & Sons, Straight and Essex streets, Paterson, N. J. Two catalogues. Illustrations and descriptive matter in the first explain the operation of a line of machines for making rubber tubing of all sorts and sizes, ranging from tiny artificial flower stems up to hose of large sizes. Although this is the work for which these machines are designed, at the same time they are also applied to the production to solid cords, rods, variously shaped druggists' and stationers' sundries, stock for molded articles, the straining of reclaimed rubber and working other plastic materials such as compounds of gutta percha and celluloid. The insulating machines are described in the same catalogue as the tubing machines, since they are really a special type of the latter. There are a number of illustrations showing the different sizes and styles of machines, as well as the different classes of work done by them. The other catalogue deals with the line of textile machines made by this company and treats mainly of the Jacquard card cutting, lacing and repeating machines supplied to that trade.

Rock Drills.—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletin No. 4102. Pertains to the Sargent line of rock drills which are constructed to combine successfully the independent air-thrown valve of the spool type with an improved modification of the tappet action. The valve chests of the different styles of drills are shown as well as the chucks and shells. There are also a number of illustrations showing drills in use. A table giving the dimensions and specifications for the different sizes of drills and a list of the duplicate parts are appended.

Steam Engines.—Trenton Engine Company, Trenton, N. J. Catalogue R. This is the company's 1910 catalogue describing and illustrating the Reeves steam engines for belted and direct connection. The compound engines range from 15 to 600 hp. and the single engines from 5 to 300 hp., and altogether there are 15 distinct frame sizes of patterns and drawings permitting over 100 combinations of cylinder sizes and strokes to suit the varying conditions of horsepower and steam pressure found in modern engineering practice. The illustrations not only show the engines complete but also serve to supplement the detailed description of the differnt parts. Tables of dimensions and test curves of the different engines complete the catalogue.

Motor Aneroid.—Short & Mason, Ltd., London, England; Taylor Instrument Companies, Rochester, N. Y., sole United States agents. Folder. Devoted to an elevation indicator and barometer for automobiles. This instrument is designed for use on the dash board of automobiles and is fitted with scales showing elevations and depressions of 2000 ft., the scales being in contrasting colors. Each division of the scale represents 20 ft., but by careful observations readings of 10 ft. can be taken. It can also be used in connection with an odometer for giving grades.

Gears and Gear Cutting Machine.—Fawcus Machine Company, 2820 Smallman street, Pittsburgh, Pa. Catalogue and circular. The former contains a number of illustrations showing the various kinds of gears which this company is prepared to cut. These include rawhide gears and pinions which in the larger sizes have cast iron centers and bronze flanges, brass-faced rawhide pinions and bevel spur and worm gears, which are furnished in steel, cast iron and phosphor and gun bronzes according to the work they are intended to do. A table of pitch diameters for 1-in. circular pitch for all customary numbers of teeth from 10 to 130 and a table of the horsepower transmitted by cast iron cut pinions are included. The circular refers briefly to the double axle cutting-off and centering machine, an illustrated description of which appeared in *The Iron Age* December 7, 1905.

Electrical Machinery and Appliances.—General Electric Company, Schenectady, N. Y. Four bulletins. No. 4754, superseding No. 4562, describes in considerable detail the types MD, MI and MDS mill motors and contains dimension diagrams of these types. *The Iron Age*, October 7, 1909, contained an illustrated description of the MI motor. Nos. 4758 and 4764 illustrate and describe the Mazda lamps for sign and low-voltage use and contain diagrams of connections and data on the cost of operation. No. 4762, superseding No. 4527, is concerned with the Thomson polyphase watthour meter for measuring energy in two-phase, three-phase and monocyclic circuits, which may carry mixed loads of lamps, motors or other translating devices. The meter, it is claimed, will record accurately irrespective of unbalanced load conditions.

Gear Cutting.—The Adams Company, Dubuque, Iowa. Booklet No. 804, entitled "Gear Cutting Speeds." Relates to the advantages of cutting gear teeth by hobbing as compared with milling on one and three teeth or planing on three teeth, and contains a number of formulae for determining the proper rates of speed and feed for this class of work. These formulae, while relating especially to the Farwell gear hobber of this company, are nevertheless applicable to all hobbing machines, and in addition rules for standard spur gears are given.

Tool Steel.—Vanadium-Alloys Steel Company, Latrobe, Pa., McKenna Bros. Brass Company, Pittsburgh, Pa., general sales agent. Booklet. This lists the different kinds of Red Cut and Vasco steels, which are made for a number of different purposes in bars, disks and various special shapes. Each of the different steels is described briefly and lists are given of the different sizes in which the steel is made.

Tooth Chamfering Attachment.—The Long-Arm System Company, Cleveland, Ohio. Pamphlet. Illustrations and descriptive matter explain the operation of the "Long-Arm" automatic tooth chamfering attachment for use in the manufacture of sliding gear transmissions. The results obtained through its use are said to be superior to those secured by the use of a special milling cutter and file. A description of the construction and operation of the attachment is included, and this is followed by a partial list of users. *The Iron Age*, February 27, 1908, contained an illustrated description of the attachment.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square ..... ¢ to 1.90¢
1½ to 4 in. x ½ to 1 in. ..... ¢ to 2.10¢
1 to 4 in. x ¼ to 5-16 ..... ¢ to 2.10¢
Rods, ⅜ and 11-16 round and square ..... ¢ to 2.10¢
Angles— Cents per lb.
3 in. x ¼ in. and larger ..... 2.00¢
3 in. x ⅜ in. and larger ..... 1.90¢
1½ to 2 in. x ¼ in. ..... 2.00¢
1½ to 2 in. x ⅜ in. and larger ..... 2.00¢
1 to 1¼ in. x 3-16 in. ..... 2.00¢
1 to 1¼ in. x ⅛ in. ..... 2.00¢
⅞ x ⅛ in. ..... 2.00¢
¾ x ⅛ in. ..... 2.00¢
⅝ x ⅛ in. ..... 3.75¢
½ x 1-32 in. ..... 4.35¢
Tees:
1 in. ..... 2.05¢
1¼ in. ..... 1.95¢
1½ to 2 in. ..... 1.85¢
1¼ to 2 x ⅜ in. ..... 2.05¢
3 in. and larger ..... 1.85¢
Beams ..... 2.10¢
Channels, 3 in. and larger ..... 2.10¢
Bands—1 to 6 in. x No. 6 to No. 1 ..... 2.50¢
"Burden's Best" iron, base price ..... 3.75¢
Burden's "H. B. & S." iron, base price ..... 2.95¢
Norway Bars ..... 4.00¢

Merchant Steel from Store—

per lb.
Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.50 to 3.00¢
Best Cast Steel, base price in small lots ..... ¢

Sheets from Store—

Black

	One Pass, C. R. Soft Steel	Box Annealed Cleaned
No. 16	¢ to 2.80¢	2.90¢
Nos. 18 to 21	¢ to 2.85¢	3.00¢
Nos. 22 and 24	¢ to 2.90¢	3.10¢
No. 26	¢ to 3.00¢	3.20¢
No. 28	¢ to 3.10¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ¢ to 12 to 16¢
Patent Planished, "W. Dewees Wood" ..... ¢ to 8, 10¢; 15, 9½ net.

Galvanized.

Nos. 14 to 16 ..... ¢ to 2.95¢
Nos. 22 to 24 ..... ¢ to 3.30¢
No. 26 ..... ¢ to 3.50¢
No. 28 ..... ¢ to 3.85¢
No. 30 and lighter 30 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ..... ¢ to 5.75¢
No. 26 ..... ¢ to 6.25¢
No. 28 ..... ¢ to 6.50¢

Corrugated Roofing—

2½ in. corrugated.

	Painted	Galvanized
No. 24	¢ to 1.90¢	4.80
No. 26	¢ to 1.95¢	5.10
No. 28	¢ to 2.00¢	5.75

Tin Plates—

American Charcoal Plates (per box.)

I.C., 14 x 20	$5.75
IX., 14 x 20	7.00

A. Charcoal:

IC., 14 x 20	$5.10
IX., 14 x 20	6.50

American Coke Plates—Bessemer—

IC., 14 x 20	$4.50
IX., 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.00
IX, 20 x 28 with an 8 lb. coating	10.00

Seamless Brass Tubes—

List November 13, 1908 ..... per cent off

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 ..... per cent off

Copper Tubes—

List November 13, 1908 ..... per lb. 21¢

Brazed Brass Tubes—

List August 1, 1905 ..... per lb.

High Brass Rods—

List August 1, 1905 ..... per lb.

Roll and Sheet Brass—

List August 1, 1905 ..... per lb.

Brass Wire—

List August 1, 1905 ..... per lb.

Copper Wire—

Base Price, ... Carload lots mill, 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity lots ..... ¢ to 18 ¢
Sheet Copper Cold Rolled, 1¢ per lb. advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ per square foot.
Sheet Copper Polished over 20 in. wide, 2¢ per square foot.
Planished Copper, 1¢ per square foot more than Polished.

METALS—

Tin—

Straits Pig ..... ¢ to 37 to 37½¢

Copper—

Lake Ingot ..... ¢ to 14½ to 15 ¢
Electrolytic ..... ¢ to 14½ to 14¾¢
Casting ..... ¢ to 14¼ to 14½¢

Spelter—

Western ..... ¢ to 6¼ to 6½¢

Zinc.

No. 9, base, casks ..... ¢ to 5 ¢. Open ..... ¢ to 5¼¢

Lead.

American Pig ..... ¢ to 5 to 5¼¢
Bar ..... ¢ to 6¾ to 6¾¢

Solder.

½ & ½, guaranteed ..... ¢ to 22½ to 24½¢
No. 1 ..... ¢ to 20¾ to 21¢
Refined ..... ¢ to 18 to 18½¢

Prices of Solder regulated by private brand vary according to composition

Antimony—

Cookson ..... ¢ to 10¢
Hallett ..... 10¢
Other Brands ..... 9½¢

Bismuth—

Per lb. ..... $2.00 to $2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	¢ lb. 10.75 @ 11.00
Copper, Heavy and Wire	¢ lb. 10.50 @ 10.75
Copper, Light and Bottoms	¢ lb. 9.50 @ 9.75
Brass, Heavy	¢ lb. 7.25 @ 7.50
Brass, Light	¢ lb. 5.75 @ 6.00
Heavy Machine Composition	¢ lb. 9.50 @ 9.75
Clean Brass Turnings	¢ lb. 7.00 @ 7.25
Composition Turnings	¢ lb. 8.25 @ 8.50
Lead, Heavy	¢ lb. @ 3.50
Lead, Tea	¢ lb. @ 3.25
Zinc Scrap	¢ lb. @ 3.75

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NICHOLSON

NICHOLSON U.S.A. TRADE MARK

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NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 | New York, September 29, 1910 | Vol. 86: No. 13

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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No Serious Test of Prices

More Inquiry for Sheets with a Firmer Market

Pig Iron Sales for 1911 at Close to the Basis for 1910

The developments of the past week have not been calculated to stimulate demand for iron and steel products. The uncertainties in the outlook are such as the conference of several large manufacturers of steel and the assuring statement which followed it are not sufficient to remove. Buying for immediate needs is the policy of consumers all along the line, and producers are adjusting operations accordingly. It is a condition under which much of the business going will flow in the usual channels, few cases arising in which tonnage will be tempting enough to prompt a clash that would provoke retaliation.

The total of September shipments from steel mills will come closer to that for August than has been credited in some quarters, the average decrease being estimated at little over 5 per cent.

The heavy lines with which last week's rumors of a price war were chiefly concerned have been quietest, and the 1.40c. basis for plates has been maintained. The lighter products are fairly active. More inquiry has appeared for sheets, and prices are firmer than in recent weeks, manufacturers more generally quoting 2.20c. for No. 28, whereas 2.15c. has been considered the market recently. The American Sheet & Tin Plate Company is now quoting on the following basis: No. 28 gauge American Bessemer, 2.20c.; No. 10 blue annealed, 1.65c.; No. 28 galvanized, 3.20c.—all f.o.b. Pittsburgh. These prices apply to sheets for prompt shipment.

Rail orders include 10,000 tons for the Duluth, Rainy Lake & Winnipeg. In addition to the recently reported buying by the St. Paul for 1910 delivery the reinstatement by two or three roads of business for this year, previously postponed or canceled, is of interest. Export rail business continues good. Among late contracts is 10,000 tons additional for the National Railways of Mexico.

The increase in all iron and steel exports noticed for several months, and particularly in heavy lines, continues and is more marked.

Bids lately opened on fabricated work have been so close in some cases as to suggest more uniformity in minimum quotations on plain material. Contracts closed include 2200 tons of bridge work for the Chicago & Western Indiana Railroad and 2200 tons for the New Jersey Zinc Company's new construction at Palmerton, Pa. The Philadelphia & Reading will require 2500 tons for the improvements at its Port Reading terminal.

Billets and sheet bars are weaker at $24, Pittsburgh, for Bessemer billets and $25 for Bessemer and open

hearth sheet bars. Some contracts for sheet bars have been adjusted to the above basis. A sale of 2500 tons of narrow steel skelp is reported at 1.40c., Pittsburgh.

Pig iron is sagging and the persistence of some high cost blast furnaces under the continuance of prices which mean a loss to them is surprising. More business is being done for 1911 and the important development here is that the advance recently asked over prices ruling for early delivery is fading away. Some Northern furnace companies have sold for the first quarter and first half of next year at very close to to-day's prices.

Inquiry for foundry iron for 1911 is increasing. A Western stove foundry has asked for 5000 tons; a central Ohio implement maker for 10,000 to 12,000 tons; an Eastern foundry for 8000 tons, and Western malleable foundries for round amounts. At Buffalo inquiry for the first quarter and half, chiefly from New York State points, amounts to 30,000 tons.

The recent low prices on basic iron in the East and the accumulation of stocks in the past two weeks due to held-up shipments on contracts with steel works, are bringing further curtailment of output in New Jersey and the Lehigh and Schuylkill valleys. As low as $14.50 was done on basic in eastern Pennsylvania.

At Pittsburgh the market for Bessemer and basic iron is more active. Sales of Bessemer for fourth quarter in 1000 to 2000 ton lots have been made at $15, Valley furnace, and 1500 tons of Bessemer for the first quarter of 1911 sold on the same basis.

The falling off in ore shipments on the lakes has sent more boats into ordinary. October shipments, it is estimated, will show a falling off of nearly 50 per cent. from the summer rate.

The control of the pig tin supply in this market is again in few hands, and prices have advanced in the week to 35.15c. Electrolytic copper has been sold below 12.50c., and is weaker.

Steel Trade Conditions and Prices

The flurry of last week over prices of steel products raised several questions for which satisfactory answers were not at hand. For example, it was said that Wall Street was disposed to consider the statement given out by Chairman Gary on Tuesday afternoon, September 21, as "unconvincing" and "not entirely satisfactory" because it contained no prophecy regarding the course of prices beyond the immediate future. The idea that steel manufacturers are gifted with such insight that they might become sponsors for the behavior of the market seems to be behind this skepticism. That would be a very large claim even for the present "era of good feeling."

We do not understand that the statement referred to, or the later one relative to the conference of several steel company presidents, was intended as a guaranty that prices will be any better maintained in the next three than in the past three months. The market, having gone up in the second half of 1909 on heavy forward buying, has been for several months slowly receding. If leaders in the trade, in conference over the situation, found that in view of the decline that has taken place, and considering the amount of new business coming in from week to week and the shipments still due on term contracts, prices are not likely to go down sharply in the near future, their judgment will naturally be given weight. There is less reason, it would seem, to take exception to this feature of the published statement than to the declaration that, "on the whole, the steel business should be considered satisfactory." Consumption considerably short of producing capacity and new orders steadily less than shipments have not heretofore been considered "satisfactory." Granting that the periods in which mills are weeks behind orders and when consumers pay premiums for early shipment should no more be called "normal" than times like the present, the habit of the trade is to expect the former and the reverse condition brings disappointment.

A question always raised when the market has been declining and contract buying has practically stopped is whether a sharp cut in prices would bring large contracts to the mills. The theory of the relation between the price and the use of an article of general consumption is that higher prices restrict and lower prices promote buying. Practically the theory is subject to modification. The fact that business in the iron trade comes and goes in waves has an important bearing on all situations like the present. Those who were insisting last week that the steel trade was verging on a sharp break in prices, recalled that in February, 1909, after more than 18 months of hesitant buying for immediate needs, prices were cut deeply, and in the next three months declined further, with the result that a buying movement started which broadened into the buoyant market of the final quarter of 1909. They have seen another period of halting buying in 1910 and have quickly written the same prescription.

The feature of the buying in the second half of 1909, little appreciated by many at the time, was the restocking it represented in every avenue of consumption of iron and steel. The railroads contributed very moderately to it. For two years, or from the middle of 1907, the country had been drawing on stocks—reducing to the lowest point the working margin of iron and steel of all descriptions in the hands of jobbers and consumers. In the revival in all industry last year it was found that what was a proper working stock in the beggarly consumption of 1908, had to be much increased. There was a movement all along the line—in foundries, machine shops, blacksmith shops, repair shops, in hardware and mill supply stores, and at all the jobbers' warehouses dealing with any form of metal products—to rebuild stocks to the proportions required by steadily expanding business. There came in also the feature always noticed when the country's dammed up demand of months breaks loose—the inability of the producing machinery to speed up to the new pace. Consumption seemed overwhelming because the restocking factor could not be measured. For six or seven months the inflow of new business was greater than the output of the mills. Following has come eight or nine months of a reversal of that condition. But meantime we have had nothing comparable with the two years of stock starvation that preceded the restocking movement of 1909. Consumption has been all this year, and is still, on a scale calling for the carrying of vastly greater stocks in every metal working line than were needed in 1908 and the months of 1909 preceding June. Stock reduction must go much farther before the country becomes so bare of steel as to make any large response to the stimulus of cut prices; or, on the other hand, before the mills will feel driven to make such cuts as in 1909. Capacity meanwhile has been notably increased. With railroad buying absent, it is greater than the country's

consumption, or its probable consumption in 1911. Buyers will naturally want more light on the ultimate effect of this condition on prices. Political and economic questions of importance are up and will not be settled for months. They have much to do with iron and steel consumption and values. Steel prices have declined several dollars a ton since the beginning of the year, representing more of a readjustment than in many other industries. The case is not, as in 1909, one of waiting on the steel manufacturers to do what all other lines have done.

The conditions named and those which have been given greater emphasis by repeated comment suggest that the iron trade lacks much of presenting the parallel to early 1909 that has been so readily assumed.

Public Unrest and the New Doctrines

It is generally recognized that a feeling of extreme unrest pervades the people. To define it, to state precisely what it is directed against, is impossible, for we are considering what is in the minds of individuals and that presents a wide variety. One thought is common to all and that is that the cost of living is too high. It is the general conviction that something should be done to reduce it. One of our premises to what is to follow is, therefore, that the people want the cost of living to be reduced.

The other premise is that a certain set of propaganda is being preached throughout the country, Colonel Roosevelt being the chief exponent, but having much company. The propaganda comprises chiefly: (1) A higher standard of business morality; (2) a crime done through the medium of a corporation is personal; (3) the "new nationalism." It is unnecessary to expatiate upon the meaning of these terms, but since the "new nationalism" as a term was born so recently as the last day of August, in Colonel Roosevelt's Osawatomie speech, it may not be inappropriate to repeat his definition: "The new nationalism puts the national need before personal or sectional advantage and is impatient of the impotence from the over-division of government powers, the impotence which makes it possible for local selfishness, or for legal cunning, hired by wealthy special interests, to bring national activities to a deadlock."

One may have never so good a thought, and may express it never so clearly, yet the impression created in the mind of the hearer may be tinctured, may even be permeated, with a spirit which is entirely foreign to that thought as it lay in the mind of him who gave it utterance. Were practical psychology centuries old, instead of in its infancy, it would still be impossible for any one so to define, explain and guard his thought as that the recipient should have only the giver's conception, neither more nor less. These propaganda fall upon fertile soil, and are so broad and so susceptible of application that it is unavoidable that some of their fruits shall be bad fruits, and that some of their applications shall be improper.

We started with two premises: the desire of the people for a reduction in the cost of living and the propaganda being preached. What more natural than that the people should couple the one with the other? That there are relations no one can deny, but we are dealing with what is in the minds of many people, probably, indeed, more than half of the 90,000,000 people in this country. Beyond doubt, the greater number of these people have in mind a closer connection than really exists between what these propaganda are directed against and the high cost of living. That it would be well for the cost of living to be reduced all will grant. That what is good in the propaganda should be carried out will be granted with equal freedom. For either, action is necessary, and action can only be in detail. The Government cannot put R. G. Dun & Co. under bonds to reduce their index number; it can come down only by the owners of the individual commodities whose prices make up that index number accepting less money for the commodities. Business morality, personal responsibility for corporate acts, love for national rather than special advantage, cannot come through one sweeping act, but must come to individuals. Action leading to direct results must be action in detail. In the nature of the case, then, many of the actions incited by the preaching may be ill-timed or wrong, although the preaching in itself is wholly good. The fault will lie in the application, largely because so many of the 90,000,000 people in the country will take it upon themselves to apply the preachings farther than the nature of their knowledge and experience warrants them in doing.

Apparently the concept in the minds of millions of people is that the high cost of living is due largely to the "trusts," and that Government regulation of the trusts and the railroads promises the most important remedy now conceivable for the high cost of living. The propaganda as to regulation of business deal exclusively, so far as we are able to observe, with such regulation as can be practiced by the Federal Government, and hence applies only to interstate commerce, and, therefore, business interests engaged in it. The regulation in mind, then, is of the great or interstate commerce trusts, a conception which it is important to emphasize, and of the railroads.

The greatest of all "trusts" in point of capitalization and prestige is the United States Steel Corporation. Quantitatively, its annual gross receipts amount to about $5 per capita for the 90,000,000 people in this country. Include its competitors, and include also the ore and blast furnace interests serving the foundry trade, and the total annual receipts of the entire iron and steel industry as thus defined do not amount to $10 per capita. Regulation does not touch the cost of living except by reduction. How would the cost of living be affected by a reduction amounting to a fraction—necessarily a small fraction—of $10 per annum?

So much for a quantitative concept of great trusts. The burden of the railroads, which are already being regulated, is easily assessed. The total passenger income of the railroads in the last fiscal year was $6 per capita, and the total freight income $19, a total of $25 per capita. A reduction of 12 per cent.—$3 per capita—would wipe out every dollar of dividends paid, other conditions being unchanged, while a like increase would permit the doubling of all dividends. What is $3 in the annual per capita cost of living?

These items are simply nothing at all to the individual. Let us take a glimpse of what is important to him. Merely to live decently involves, using rough but we believe sufficiently accurate estimates, an annual consumption per capita of $15 to $25 worth of milk, eggs of about the same cost and butter of half as

great cost—total expenditures, on the basis of present values in centers of population, of, say, $40 to $60 per capita per annum, for only three of the many items which go to make up the cost of living.

Now there are certainly few who upon investigation would deny that there is more room for a reduction, by this means or that means, in the cost of these and many other articles which are really important in making up the cost of living than there is in all the subjects which in the popular mind are associated with the propaganda which are being so lustily preached. With no part of the propaganda, properly understood, do we here take issue; we are merely illustrating the distorted view which millions of people are likely to take of them.

Following Instructions in Installing Equipment

A manufacturer of a standard metal working machine, which may be classed as special, has adopted a system of requiring customers to bear the expense of putting machines in working order, if the fault proves to be theirs and not the builder's. This subject is an old one. Machinery men are constantly annoyed by complaints of customers, and many times are put to large expense, which would have been avoided had the users thoroughly followed instructions.

In the case in question the machines are by no means complicated, and any ordinarily intelligent master mechanic should be able to set them up and start them. The company sends a copy of carefully prepared instructions in the box with the machine and a duplicate by mail. Nevertheless, extraordinary results are occasionally obtained. A common source of trouble is in the speeds. For example, the builder sent out a machine, and complaint came that it was valueless; that it broke down almost immediately after being started up; that parts must be replaced, and unless these conditions were complied with immediately the machine would be shipped back to the factory. The manager wrote back, asking the trouble in detail. The answer was that the machine was "no good." He wrote again, insisting upon information, and, getting none, stated that a man would be sent to the customer's works if the latter would bear the expense should he prove to be in the wrong. This was agreed to. An expert from the factory found that a large and, from its nature, somewhat frail reciprocating part, designed to operate at 60 rev. per min., had been belted at 180, and breakage of a serious nature followed inevitably. Other almost equally gross examples of disregard of instructions were discovered. The machine was put in shape and operated so well that it was duplicated several times over, almost immediately. The customer acknowledged the fault and paid the bill, amounting to something over $50. In several other such cases the cost has been apportioned in the same way.

Many machinery houses take it for granted that the buyer will not do the work of installation satisfactorily and send a man with the machine to set it up. The cost is considerable, but, of course, it enters into the price of the machine and the customer pays it. Where machines are expensive, the additional price is not conspicuous. With low-priced equipment a manufacturer cannot afford to send a man, nor would the customer be willing to pay the additional price. Therefore, it must be a case of printed instructions. Probably no one will dispute the justice of apportioning the cost of remedying such troubles according to the degree of blame as between the manufacturer and the customer.

Highest Production of Wire Rods Reached in 1909

The statistics of the production of iron and steel wire rods in the United States in 1909 have been collected by the American Iron and Steel Association. The total, estimating the production of two plants, is found to be 2,335,685 gross tons, or considerably the largest 12 months' output on record. It compares with 1,816,949 tons in 1908, an increase of 518,736 tons, or 28.5 per cent. In 1909 no iron wire rods were reported, but in 1908 the steel wire rods rolled amounted to 1,816,440 tons and the iron rods to 509 tons. Small quantities of steel copper clad wire rods are included in the totals for the two years. The following table gives the production since 1907 by groups of States:

	1907.	1908.	1909
Massachusetts, Connecticut, Rhode Island, New York and New Jersey	233,687	200,113	280,191
Pennsylvania, Kentucky, Georgia, Alabama and Ohio	1,176,278	1,047,243	1,388,237
Indiana, Illinois and Colorado	607,618	569,593	667,347
Totals	2,017,583	1,816,949	2,335,685

Wire rods were rolled in 1900 by 32 works in 11 States as follows: Massachusetts, 1; Rhode Island, 1; New York, 3; New Jersey, 2; Pennsylvania, 11; Kentucky, 1; Georgia, 1; Ohio, 6; Indiana, 2; Illinois, 3, and Colorado, 1. Connecticut and Alabama, which have wire rod mills, did not roll wire rods in 1909 or in 1908, but in 1907 both were producers. In 1908 there were 29 aetive works in the same States. In 1909 Pennsylvania rolled over 36.9 per cent. of the total for the whole country, as compared with over 32.4 per cent. in 1908. The following table gives the production of iron and steel wire rods from 1889 to 1909 in gross tons:

	Tons.		Tons.		Tons.
1889	363,851	1896	623,986	1903	1,503,455
1890	457,099	1897	970,736	1904	1,699,028
1891	536,607	1898	1,071,683	1905	1,808,688
1892	627,829	1899	1,036,398	1906	1,871,614
1893	537,272	1900	846,291	1907	2,017,583
1894	673,402	1901	1,365,934	1908	1,816,949
1895	791,130	1902	1,574,293	1909	2,335,685

At the close of 1909 two wire rod mills were in course of erection—one at Woodlawn, near Aliquippa, Pa., by the Jones & Laughlin Steel Company, and one at Johnstown, Pa., by the Cambria Steel Company. At the same time the Southern Iron & Steel Company was removing its rod mill from Ensley, Ala., to Alabama City, Ala. Since January the American Steel & Wire Company has begun the erection of a large rod and wire plant at Wylam, near Ensley.

The Glacier Metal Company, Richmond, Va., has placed on the market a new ribbonized plastic metallic packing for steam, air, gas, water, ammonia, &c., which is described as follows: This packing is manufactured from the finest alloy of white metal, which can satisfactorily be made into fine shreds or ribbons; is very pliable, will not score the rods, shows no corrosion when it comes in contact with acids, and cannot rot as many packages do which are made from fiber. No sizes are required to be carried in stock, as a rope can easily be made with the hands of the size required for packing the rods.

The iron ore explorations on the Wisconsin end of the Menominee range, referred to in these columns recently, are not being carried on by the Wellston Steel & Iron Company, as stated, but by the Spring Valley Mining Company; nor is the former company interested in the work.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept.28. 1910.	Sept.21. 1910.	Aug.24. 1910.	Sept.29. 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$16.00	$16.00	$16.00	$18.50
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	*16.25*	16.25	16.50	19.00
Basic, delivered, eastern Pa.	15.00	15.00	15.00	18.50
Basic, Valley furnace	*15.50*	15.50	14.00	16.50
Bessemer, Pittsburgh	15.90	15.90	15.90	18.40
Gray forge, Pittsburgh	14.15	14.15	14.15	16.90
Lake Superior charcoal, Chicago	*18.25*	18.25	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*24.00*	24.50	24.50	25.00
Forging billets, Pittsburgh	*29.00*	29.00	29.50	29.00
Open hearth billets, Philadelphia	*26.00*	26.50	27.50	27.60
Wire rods, Pittsburgh	28.00	28.00	28.00	31.50
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	**14.00**	14.00	13.75	17.75
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	*14.00*	14.00	14.50	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.00
Heavy steel scrap, Pittsburgh	14.25	14.50	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.75
Heavy steel scrap, Philadelphia	**14.00**	14.00	13.75	17.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.40	1.40	1.40	1.57
Common iron bars, Chicago	1.37½	1.37½	1.37½	1.55
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.55
Steel bars, tidewater, New York	1.56	1.56	1.56	1.56
Steel bars, Pittsburgh	1.40	1.40	1.40	1.40
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	*1.40*	1.40	1.45	1.40
Skelp, sheared steel, Pittsburgh	*1.50*	1.50	1.55	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.15	2.20	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.75*	12.75	13.00	13.50
Electrolytic copper, New York	*12.50*	12.50	12.62½	13.00
Spelter, New York	**5.60**	5.60	5.35	5.85
Spelter, St. Louis	**5.45**	5.45	5.20	5.70
Lead, New York	4.40	4.40	4.40	4.38
Lead, St. Louis	*4.27½*	4.30	4.30	4.25
Tin, New York	**35.12½**	34.35	34.50	30.75
Antimony, Hallett, New York	7.87½	7.87½	7.87½	8.30
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c.,; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16 in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.55c. to 1.60c.; Nos. 9 and 10, 1.60c. to 1.65c.; Nos. 11 and 12, 1.65c. to 1.70c.; Nos. 13 and 14, 1.70c. to 1.75c.; Nos. 15 and 16, 1.80c. to 1.85c. One pass, cold rolled, box annealed sheets: Nos. 15 and 16, 1.90c. to 1.95c.; Nos. 17 and 21, 1.95c. to 2c.; Nos. 22 and 24, 2c. to 2.05c.; Nos. 25 and 26, 2.05c. to 2.10c.; No. 27, 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c.; No. 29, 2.20c. to 2.25c.; No. 30, 2.30c. to 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2c. to 2.05c.; Nos. 17 to 21, 2.05c. to 2.10c.; Nos. 22 to 24, 2.10c. to 2.15c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.25c. to 3.30c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	48
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $28.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days net cash, f.o.b. mill.

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Pittsburgh

PARK BUILDING, September 28, 1910.—(*By Telegraph.*)

Pig Iron.—A more active inquiry has developed for Bessemer iron and some fair sized sales have been made. One sale of about 3000 tons is reported at a price somewhat below $15, Valley furnace, but it is stated the transaction was really a trade, the buyer giving other material in exchange. Actual sales of Bessemer iron have been made of 2000 tons for October, November and December; 1000 tons for October, November and December, and 1500 tons for January, February and March, all at $15, Valley furnace, and 1500 tons for November and December at $15.25, Valley furnace, this iron to be used in making ingot molds, and a special analysis was involved. New inquiry for basic and foundry iron is rather quiet, but we note two sales of basic iron, about 2000 tons, at $13.50, Valley furnace, and a sale of 600 tons of No. 2 foundry for October, November and December at $14, Valley furnace. We quote Bessemer iron at $15; basic, $13.50; malleable Bessemer, $14 to $14.25; No. 2 foundry, $13.75 to $14, and gray forge at $13.25, all at Valley furnace, the freight rate for delivery in Pittsburgh being 90c. a ton.

Steel.—The market on open hearth billets and sheet and tin bars is being disturbed to some extent by offerings from several small open hearth plants at lower prices than the larger steel mills have named. Several lots of open hearth sheet and tin bars have been sold at a price equal to slightly less than $25 delivered, Pittsburgh. We also note that several consumers who buy sheet and tin bars on a sliding scale have had their contracts adjusted to the basis of $25, Pittsburgh, for last quarter. We quote Bessemer 4 x 4 in. billets, $24 to $24.50; open hearth billets, 4 x 4 in., $24.50 to $25; Bessemer and open hearth sheet and tin bars, $25; forging billets, $29 to $29.50, all f.o.b. cars Pittsburgh, Youngstown or Wheeling district.

Skelp.—We note a sale of 2500 tons of narrow width grooved steel skelp at 1.40c., Pittsburgh.

(*By Mail.*)

A disposition is now shown by buyers to place contracts, especially for pig iron, sheets and a few other finished products. The conference of the steel interests in New York recently and the announcement from the Steel Corporation that no wide open cut in steel prices is contemplated have done much to quiet the fear of a demoralization in prices. It is the feeling of the large producing interests that prices on steel commodities are on a fair basis, and nothing would be gained by making a horizontal cut. There will be a material increase in capacity for rolling sheet and tin bars in the Pittsburgh district in the near future. The mills being erected by the Jones & Laughlin Steel Company at Aliquippa will likely be ready to operate about November 15. The Republic Iron & Steel Company expects to have its new open hearth plant in the Youngstown district in operation early in 1911; it will have eight 60-ton furnaces, blooming and sheet and tin bar mills and will have a capacity of upward of 1000 tons of steel per day. No changes are noted in prices on finished iron and steel with the exception of sheets, which have been a little firmer in the last few days, and specifications are reported a little better. The scrap and coke trades continue to drag a good deal with prices ruling about the same. A more hopeful feeling exists.

Ferromanganese.—Reports are that two sales of about 500 tons each of foreign ferromanganese have been made for delivery over the remainder of the year at about $39.25, Baltimore, and also a sale of about 500 tons for deliveries running into first half of next year, at the same price. We quote 80 per cent. foreign at $39.25 to $39.50, Baltimore, the rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—No new inquiries of moment are in the market, but some small lots are being sold for prompt shipment. We quote 50 per cent. at $56.50, Pittsburgh, for prompt shipment, and $55.50 for forward delivery. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent, $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—The scarcity in iron plates that has existed for some time, due to the shutdown of a number of puddling mills on account of failure to settle the Sons of Vulcan boiling scale, will probably soon be relieved, as an agreement on this scale was reached last week. One of the independent pipe mills has recently placed contracts with local mills for about 6000 tons of grooved and sheared steel skelp and about 2000 tons of grooved iron skelp, deliveries running over the remainder of this year. We quote grooved steel skelp, 1.40c. to 1.45c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c., and sheared iron skelp, 1.85c. to 1.90c., all f.o.b. Pittsburgh, usual terms.

Rods.—Some inquiry is coming out, but mostly for small lots for prompt shipment. Large consumers are pretty well covered by contracts, on which they are specifying at a fairly liberal rate. The new rod mill of the Jones & Laughlin Steel Company is running very successfully. We quote Bessemer, open hearth and chain rods at $28, Pittsburgh, but on a firm offer for Bessemer rods this price might be shaded.

Muck Bar.—The puddling plants of A. M. Byers & Co., at Girard, and the Youngstown Sheet & Tube Company, at East Youngstown, started up this week, having been idle since July 1. We quote best grades of muck bar, rolled from all pig iron, at $29 to $29.50, Pittsburgh.

Steel Rails.—The demand continues quiet, only small lots being placed with the local mill. New buying of light rails from the lumber and coal mining interests continues quite active, and the Carnegie Steel Company has a good deal of tonnage booked for delivery over the remainder of the year. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—The Jones & Laughlin Steel Company has taken about 1000 tons of steel for the new machine shops and foundry of the Treadwell Engineering Company, Easton, Pa., also a refinery building for the Spencer-Kellogg Company at Edgewater, N. J., 200 tons, and the steel for a freight station for the New York Central Railroad at Utica, N. Y., about 150 tons. The American Bridge Company has taken some bridge work for one of the lines of the Erie Railroad in New York State, about 1000 tons. New inquiries in the past week have been better, but there is still much complaint over the low prices that are being named for fabricated work. We quote beams and channels up to 15-in. at 1.40c., Pittsburgh, in large lots, and 1.45c. in small lots.

Plates.—There is a complete dearth of car orders and, in fact, very little work is being placed in which plates are used. All the plate mills are badly in need of orders and are being operated at greatly lessened capacity. We quote ¼-in. and heavier plates in the wide sizes at 1.40c., Pittsburgh, but for delivery at certain competitive points, and for desirable tonnage, a slightly lower price is sometimes named. On the narrower sizes of plates 1.35c., Pittsburgh, is being done.

Sheets.—Specifications on contracts have been better and prices are a shade firmer. It is not believed that the very low price named on sheets for some time by part of the mills has brought out the desired tonnage. One leading sheet mill, under date of September 26, advanced its prices on open hearth steel sheets, one-pass cold rolled, box annealed to 2.20c., and announces that it will take contracts for delivery up to May 1, 1911, at above price. It also announces that all outstanding quotations must be accepted or withdrawn not later than September 30. It is stated that one or two other mills have recently withdrawn some low quotations that were not accepted. Box annealed, one-pass cold rolled black sheets, No. 28 gauge, are on the basis of about 2.15c. to 2.20c., and No. 28 galvanized at about 3.20c. to 3.25c., at maker's mill, in carload and larger lots. Painted and galvanized corrugated sheets are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets will be found on a previous page.

Tin Plate.—Conditions in the tin plate trade are fairly satisfactory, but specifications against contracts are not coming in as freely as they did some time ago. The McKeesport Tin Plate Company will add two more hot mills to its plant at McKeesport, Pa., giving it a total of 22 hot mills. We quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Encouraging reports are received from the mills as to the way specifications against contracts for steel bars are coming in and which are reported to be quite as heavy as anticipated. New buying is rather light, as nearly all consumers covered some time ago and when one needs some bars he is content to order only what he will require in the near future. Conditions in the bar iron trade are quiet, and specifications are not coming in very freely, especially from the railroads. We continue to quote steel bars at 1.40c. and common iron bars at 1.45c., Pittsburgh.

Spelter.—The spelter market has quieted down, and as a result prices are easier in tone. We continue to quote prime grades of Western spelter at 5.40c., East St. Louis, equal to 5.52½c., Pittsburgh, but on a firm offer and for large tonnage this price might be slightly shaded.

Hoops and Bands.—Specifications against contracts have been coming in more freely, and September shipments will show an increase over August. New orders are usually for small lots to cover current needs, but the increase in specifications is taken to mean that dealers' stocks are lower than for some time. Prices are quite firm and we quote

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hoops at 1.50c. in large lots and 1.55c. in small lots; bands. 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

Spikes.—Reports are that prices are being pretty badly cut and there is more or less demoralization. The demand for railroad spikes has been very dull for some time, but a fair amount of new business is being placed in small railroad and boat spikes. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots. We note that on some orders recently placed on small railroad spikes a local maker has made a price of 1.55c., Pittsburgh, but several other makers refuse to meet it.

Rivets.—There is a fair amount of new business, but mostly in small lots. Several local makers of rivets state that specifications against contracts have been coming in a little better this month than during August. Regular prices of 1.90c. on structural rivets and 2c. on boiler rivets continue to be shaded from 10c. to 15c. per 100 lb., depending on the order.

Shafting.—The market is quieter now than probably at any previous time this year. Specifications from implement makers are coming in at only a fairly satisfactory rate, while from automobile makers very little new business is being received. All of the shafting makers are pretty well caught up on back contracts and there is no difficulty in obtaining prompt shipments. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—The demand is almost entirely for small lots to meet current needs, both jobbers and retailers not desiring to anticipate. It is stated that stocks of wire nails and wire are lower now than at any previous time this year; in some cases jobbers in placing orders specify prompt shipments. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—The present condition of the merchant pipe trade is reported by the mills to be quite satisfactory, in view of the quiet conditions ruling in other lines of finished products. The new demand has been fairly active and shows an increase over last month. The Imperial Window Glass Company has placed an order with a local mill for 10 miles of 6-in. line pipe, and a local pipe concern has received a contract for 50 miles of 3 and 4 in. iron line pipe for immediate delivery. On the larger sizes the mills are pretty well filled for several months. It is stated that regular discounts on both iron and steel pipe, printed on a previous page, are being well maintained. Prices on iron pipe are particularly strong, due to high prices and scarcity of iron plates.

Boiler Tubes.—The trade in both locomotive and merchant tubes is very unsatisfactory, and has been for some time. There is little or no new demand for merchant tubes, while for railroad tubes only small orders are being placed. The market on tubes is absolutely open, each mill making its own prices.

Coke.—A local pig iron interest has bought in the past week upward of 20,000 tons of furnace coke for delivery to its various furnaces for October shipment at about $1.60 per net ton at oven. Several makers of standard furnace coke have refused to meet this price and are holding their coke at $1.75. No large inquiries for foundry coke are in the market, but prices are fairly strong. We continue to quote standard makes of furnace coke at $1.60 to $1.65 per net ton at oven for prompt shipment and $1.70 to $1.75 on contracts for delivery over balance of this year. Prompt 72-hour foundry coke is held at about $2.10 to $2.25 to consumers and for the remainder of the year at $2.25 to $2.50 per net ton at oven. The usual allowance of 15c. per ton on these prices is made to dealers. The output of coke in the Connellsville region last week was 343,630 tons, an increase of about 2000 tons over the previous week.

Iron and Steel Scrap.—There is slightly more activity, consumers being more disposed to take in material when the prices are right than they were some time ago. Bundled sheet scrap, heavy steel scrap, borings and turnings are the active items in the scrap list and a fair amount of tonnage in these lines is moving. It is not believed, however, that prices can show any material advance until the pig iron market improves. Basic iron at close to $14, Pittsburgh, will serve to keep down, more or less, prices on scrap for open hearth purposes. A new user of scrap in the Pittsburgh district is the Standard Steel Car Company, whose open hearth plant at Butler, Pa., started to make steel last week. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.50 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	14.00 to 14.25
Grate bars	12.00 to 12.25
Low phosphorus melting stock	18.00 to 18.50
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.75 to 13.00
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	8.25 to 8.50
Machine shop turnings	9.50 to 9.75

Chicago

FISHER BUILDING, September 28, 1910.—(*By Telegraph.*)

There is a general feeling of satisfaction among business men that the corn crop is beyond danger of any serious frost damage. This places the West in a very strong position financially and insures a good foundation for business. No immediate results have appeared thus far in the way of improvement in the iron and steel market. The rumors of lower prices which were given such wide publicity in the daily press last week have encouraged many buyers to hold off in the hope that there might be some foundation for these reports. The market has held very firmly in view of these rumors and there are no indications of weakness or lower prices in any important line of finished products. The leading interest and all the larger independent mills are holding their quotations firm at 1.40c., Pittsburgh, on structural material and plates. For some time smaller mills have been selling plates on the basis of 1.35c., and in some cases such mills have sold light sections of structural shapes at this price. Fabricators have been shading prices on small jobs, but quotations are firm on any large contracts for structural work. The fabricating interests took contracts in Chicago last week for work requiring about 6000 tons of steel, and other contracts closed bring the total for Western territory up to nearly 10,000 tons, a very satisfactory improvement over the record of recent weeks, with important new business pending this week. A new rail order for 10,000 tons was closed for a road under construction from Duluth to Winnipeg, but it is understood that the Western railroad systems will not place their heavy orders for 1911 until late in the year. The railroad policy of restricting purchases is accumulating an enormous amount of business which must come out eventually, and the fact that this business is steadily banking up is giving tone to the market even though current business is light. The scrap market is weak and dealers are discouraged.

Pig Iron.—The largest interests in this market report only a nominal volume of sales of pig iron the past week, consisting usually of small filling in orders for the remainder of the year. This applies to both Northern and Southern iron. Practically all the buyers in this territory have covered their requirements to the end of the year at their present rate of consumption and are not willing to pay any higher prices for first quarter or first half. The railroad policy has had an appreciable influence in decreasing the melt. An active demand from the railroads for malleable and gray iron castings would bring many foundries into the market for additional lots of prompt or last quarter iron, but otherwise the furnace interests expect a dragging market until something occurs to start a buying movement for next year. A few of the Southern furnaces have taken orders from old customers for the first quarter at $11.50, Birmingham, but with these exceptions are discouraging inquiries for next year and some flatly refuse to make quotations. The Northern iron in this territory is practically all sold for the last quarter and some business has been done for first quarter at a slight advance in price, but the local furnaces are reluctant to take any deferred business at present values. The most persistent inquiries come from malleable foundries. These foundries sell a large part of their product on yearly contracts which run from July to June, and they have bought very little iron to cover the second half of their fiscal year. Aside from the malleable interests, the foundries in this territory show a tendency to buy iron for shorter delivery periods. In buying for deferred delivery they pursue a cautious hedging policy, contracting for only a part of their estimated requirements and covering the remainder by later purchases. The furnace interests favor this policy, as it eliminates speculation. Just at present, however, the market is so dull that no sales are reported of any

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magnitude to justify special mention. The following prices are for September shipment, Chicago delivery:

Lake Superior charcoal	$18.25 to $18.75
Northern coke foundry, No. 1	16.75 to 17.25
Northern coke foundry, No. 2	16.25 to 16.75
Northern coke foundry, No. 3	16.00 to 16.25
Northern Scotch, No. 1	17.25 to 17.75
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.25 to 16.75
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets. Current sales of open hearth forging billets are made at $28 base, Chicago. This price might be shaded on round lots, but there are only a few buyers in this district whose requirements run into any large tonnage.

Rails and Track Supplies.—The only rail business of any moment reported in this market was the sale closed last week of 10,000 tons of Bessemer rails, for early shipment, to the Duluth, Rainy Lake & Winnipeg. There are good inquiries for light rails and a fair run of current business in track supplies. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—New contracts taken by the fabricating interests on large jobs last week represent nearly 10,000 tons of material. This is the most satisfactory showing in a long time. It is stated that on large jobs prices are firm. In one of the important contracts closed in Chicago last week there was a difference of only 20c. per ton in the two best bids. On another important job the successful bidder had a margin of only 10c. per ton below the next bid. This information is given as evidence that prices are firm on mill material going into these large contracts. On small fabricated jobs prices are more irregular. The new power house in Chicago for the Commonwealth Edison Company, with an approach and trestle, requiring 3200 tons of material, was let to George W. Jackson, Inc., who also took a 550-ton contract for shop buildings in Chicago for the American Brake Shoe & Foundry Company. The Chicago & Western Indiana Railroad has closed a contract with the American Bridge Company for 2200 tons of track elevation. The Corbett Building, at Portland, Ore., 1900 tons, was let to the Northwest Bridge Company, Portland. The Capwell Building, at Oakland, Cal., 1000 tons, was let to the Judson Iron Works of San Francisco. The same fabricating interest booked 175 tons for additions to the City Hospital at San Francisco. The Virginia Bridge Company has taken for its Memphis plant the contract for locomotive shops of the Kansas City Southern Railway, at Shreveport, La., amounting to 300 tons. The principal sellers in this market report that they are holding firm at 1.40c., Pittsburgh, for plain material. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The plate mills have been depending on the car shops in recent years for their principal tonnage and the absence of new car orders is felt severely in this line of finished product. The steel car builders, however, still have a considerable amount of uncompleted work on hand from contracts taken last spring and the plate mills have not finished supplying the material specified for these cars. The larger interests represented in this market are holding 1.40c., Pittsburgh, as their minimum, but lower quotations are noted from eastern mills. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—While there is sharp competition for any desirable tonnage of sheets, prices are fairly well maintained on current lots. The Inland Steel Company has kept its enlarged mill in steady operation this fall, going along at a comfortable rate without forcing production. At the present time the mills are running about 75 per cent. of full capacity. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—New business in bars consists principally of orders for concrete reinforcement. Specifications for soft steel bars are very satisfactory. The plow manufacturers report that they have had a larger fall trade this year than they ever had before and they are planning to operate their factories this winter to the fullest capacity. The bar iron market, however, remains quiet, as the leading mills are still limiting their purchases to small lots for immediate shipment. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Sales of wire products by the leading interest during September have reached a very satisfactory total, without breaking any records. Owing to the fact that jobbers have had no assurance of an advance in prices this fall, on which they might make a profit by purchasing heavily, as they did last year, the business done has been of a strictly consumptive character. For this reason September sales are considered especially satisfactory. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Specifications continue on a very satisfactory basis, especially from the manufacturers' of agricultural implements. Sales from store are at about the same rate that has prevailed during the past two months and represent a fair volume of business.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was the successful bidder on a letting last week on 800 tons of water pipe at Austin, Minn. The same interest was also awarded 400 tons at Waverly, Ohio. Routine orders are keeping up at a fairly satisfactory rate. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The reports of lower prices for finished steel products, which were given such extensive circulation in the daily press last week, have had their effect on so sensitive barometer as the scrap market, even though these reports did not have any substantial basis in fact. The movement of scrap is very small for this season. Railroad sales have been light and only a part of the material that has been actually offered by the railroads has been sold. There is a close sympathetic connection between the scrap market and the movement of securities and financial affairs, and dealers do not expect much improvement in the demand for old iron and steel until more confidence is expressed in the future by financial leaders. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.75 to 12.25
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.25 to 11.75
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Philadelphia

PHILADELPHIA, PA., September 27, 1910.

The demand for pig iron is probably a trifle less active, with sales slightly smaller than during the previous week. The movement in finished materials continues light; consumers have not yet adapted themselves fully to the position taken by the mills regarding prices, and business placed has been almost entirely for immediate requirements. Billets are quiet. No definite information regarding the dissolution of the present scrap buying arrangement of the steel and iron mills in this territory has developed.

Iron Ore.—A few inquiries are reported, but these are believed to be more for the purpose of fixing a price than with any intention of making purchases. Importations at this port during the week ending September 24 aggregated 31,971 tons, valued at $125,554. Available data show the classification of importations during August to have been as follows: Spanish and Mediterranean, 49,049 tons; Cuban,

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28,280 tons; Swedish, 39,435 tons, and Newfoundland, 24,691 tons. August importations of Cuban ore at the port of Baltimore totaled 111,450 tons.

Pig Iron.—A fair volume of business has been transacted in the foundry grades, although in steel making irons less activity has been shown. Consumers are still inquiring for quotations on first quarter deliveries, and, while some sellers will accept to-day's prices for deliveries beginning next month or so and extending into the first quarter, quotations for strictly next year delivery do not come out freely and such as are made range about 50c. above the present market. Reports of the recent meeting of the Eastern Pig Iron Association indicate, unless a better market develops, practically all the producers in this territory will curtail production after the first of the year. Owing to orders on hand and the difficulties in connection with the storage of ore still to come in this year, it will be necessary for them to be governed largely in this matter by individual circumstances. The status of unfilled orders is understood to be practically unchanged, although stocks on hand show a moderate increase, and from recent curtailments in delivery, particularly in basic iron, promise to show a further increase in the near future. Sales during the week have been principally in the foundry grades. One sale of 2000 tons for general foundry use for this year's delivery, at private terms, is reported. Prices for standard brands of eastern Pennsylvania No. 2 X foundry are, as a rule, flatly on a $16, delivered, basis, for shipment this year, although in a few instances may extend into the first quarter. Reports of occasional prompt lot sales at 10c. to 15c. under that figure, made in close competition, are heard, while now and then small sales at $16.25, delivered, are reported; special circumstances, however, surround such transactions. The cast iron pipe makers have taken on further tonnages for this year's delivery, in which Southern iron has principally figured. One sale of 4000 tons and two of 1000 tons of low grade Southern iron have been reported at the $11, Birmingham, basis for No. 2 foundry. Small lots of high grade iron have also been taken by pipe makers, while several are understood to still be in the market for low grade. There has been little movement in Virginia foundry grades; sales of moderate lots of No. 2 X and No. 2 plain have been made in this territory at unchanged prices, equal to $16 to $16.50, delivered, for No. 2 X foundry. Forge iron is quiet; occasional small lots for rolling mill purposes are sold, but no large inquiries are reported; $14.50 to $15 would about represent the full range of the market, dependent on tonnage and delivery point. The demand for the steel making grades has again quieted down. Makers are inclined to hold basic firmly at $15, delivered, although it develops that that price was cut 50c. in one instance several weeks ago, but subsequent sales were made at $15. Melters of this grade are pretty well taken care of as far as this year's needs are concerned and are now asking shippers to defer deliveries. Little interest is shown in low phosphorus iron. The recent inquiry for 5000 tons of this grade has been withdrawn. For delivery during the remaining portion of the year quotations for standard eastern Pennsylvania brands, delivered in buyers' yards, are as follows:

Eastern Pennsylvania, No. 2 X foundry	$16.00
Eastern Pennsylvania, No. 2 plain	$15.50 to 15.75
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 15.00
Basic	15.00
Standard low phosphorus	22.50

Ferromanganese.—Sellers note a light demand for small lots in New England and the West. Prices are nominal, $39.50 to $40, seaboard, about representing the market for both prompt and forward shipments.

Billets.—Some large lot business is still pending, but current orders are small and principally for prompt delivery. Specifications on orders enable local mills to operate on a restricted basis. For desirable lots of standard open hearth rolling billets $26, delivered in this territory, can be done, although small lots command 50c. advance. Forging billets, which are in better demand than rolling billets, are comparatively firm at $28, Eastern mill, with the usual extras for high carbons and special sizes.

Plates.—Buyers have not yet begun to come into the market, the tendency being to await further assurances that the mills will maintain their determination not to make price concessions. Eastern mills have not cut the 1.55c., delivered, quotation, which has been the minimum carload for some time. On miscellaneous business 1.60c. has been held by a number of mills. While specifications have come out freely, new business is light.

Structural Material.—Several building propositions, mostly in nearby territory, are expected to be placed shortly. Very little in the way of new projects of any size have come before the trade recently. Prices of plain shapes are being firmly maintained at 1.55c., minimum, delivered in this vicinity. Low prices, however, are reported for fabricated work.

Sheets.—A slightly better volume of business has enabled mills to operate on a trifle larger basis, but the demand is still quite irregular and usually for small prompt lots. There does not seem to be as much disposition to make further price concessions, although for attractive business some mills might go lower. For ordinary business Eastern makers name the following range for prompt shipment: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—A few fair inquiries are reported, but the bulk of the trade is in small lots. Competition for what little business is offered is pretty sharp, and while some makers are firm at 1.40c., minimum, for refined bars, others would take orders on which specifications are considered desirable at a shade under that figure. Steel bars are firm at 1.55c. to 1.60c., delivered here.

Coke.—The demand has been mostly for small lots of foundry coke for early delivery, with an occasional inquiry for requirements in the early part of next year. Prices are firmly held at $2.25 to $2.50 per net ton, at oven. There is no demand for furnace coke, on which sellers name $1.65 to $1.85, at oven, as about representing quotations for that grade. The following range of prices per net ton is named for delivery in buyers' yards in this territory:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—Business moves slowly, the trade awaiting developments regarding the purchasing arrangements of the associated buyers. Transactions in the mean time are along narrow lines. Sentimentally the market is stronger, but it has not been substantiated by increased buying. Strictly No. 1 heavy melting steel is hard to get at $14, delivered, and $14.25 has been paid, while brokers in some cases are holding for higher prices. Stove plate at $10, delivered, is scarce, owing to the movement of this grade to other districts at higher prices. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$14.00 to $14.25
Old steel rails, rerolling	15.75 to 16.25
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.25 to 16.75
Wrought iron pipe	12.25 to 13.75
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.75 to 12.25
Stove plate	10.00 to 10.50

* Nominal.

St. Louis

ST. LOUIS, September 26, 1910.

Foundries closely allied with the railroad interests report very little new business, and state that until the rate question is adjusted they cannot reasonably look for much improvement. In other lines there is a seasonable demand, which appears to be gaining in volume with the improved crop outlook. Fear is being expressed concerning car shortage, and fifty Illinois coal field operators recently met in this city for the purpose of coming to an understanding as to the division of coal cars.

Coke.—Only a moderate business is going in coke, although a few quite large inquiries are still pending, of which one at least is expected to be closed within a day or two. One leading broker mentions the sale of 250 cars 48-hour coke, for shipment over a year beginning with October 1; also the sale of 35 cars Connellsville foundry coke, for shipment in equal monthly quantities to July 1, 1911. There is an inquiry out for 1500 tons foundry coke, for shipment from date to May, 1911. With most brokers, sales were confined to small lots, mainly for prompt shipment. There is a firmer tone to the market, owing to a growing apprehension of car shortage in the coke producing districts. Sellers claim this is liable to cause an advance in distributing markets in the near future. We quote best grades Connellsville 72-hour foundry at $2.35 to $2.50, according to time of shipment, with second quality offered at $2.10 to $2.25;

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Virginia foundry coke, $2.15 to $2.25, all per net ton at oven.

Pig Iron.—The past week witnessed more interest in pig iron than for some time, but prospective purchasers are slow in closing. The inquiries are principally for shipment over the first half of 1911. Consumers appear to be unwilling to pay the premium demanded for next year's delivery. Among the inquiries reported are the following: One house enumerates an inquiry for 1800 tons, 45 per cent. silicon, shipment over last quarter; 1000 tons No. 2 Southern, 1000 tons Northern foundry, 800 tons No. 2 Southern and another inquiry for the same quantity. For sales the following were reported: 750 tons No. 2 Southern, 250 tons high silicon, three sales of 100 tons each No. 2 Southern and smaller lots for shipment mainly prior to January, 1911, with some for first quarter 1911. Another broker reports sales of 1000 tons malleable iron, 1000 tons gray iron, 200 tons high silicon. A third office mentions sale of 1000 tons Lake Superior charcoal iron to a local foundry, shipment over remainder of year; also 200 tons malleable for same delivery. For inquiries the following were received: From a local stove company 1000 tons Northern No. 2 foundry, 1000 tons Southern No. 2 foundry, 700 tons soft No. 2, shipment over the first half of 1911; also inquiry for 500 tons No. 2 Southern for same delivery. Another leading broker mentions an inquiry for 6000 tons No. 2 Northern and Southern foundry, shipment over first half of 1911, and 500 tons analysis iron for shipment over the remainder of year. A merchant seller reports sales agregating 900 tons Southern foundry for shipment over remainder of year, Another merchant seller mentions inquiry for 300 tons Southern coke and 300 tons charcoal iron. The irregularity in the market price is still noted. In case of No. 2 Southern foundry, $11, Birmingham, is named for prompt and $11.50 for shipment over the remainder of year. For shipment over the first half of 1911 $12 is asked by some furnaces, while others quote $11.50. There has been some business worked for malleable and for foundry iron on offers below current quotations. The sale of 5000 tons basic to a local foundry was made by an Ohio furnace on private terms. We quote Southern Ohio at $15, f.o.b. furnace.

Old Material.—There is no improvement in the demand from consumers. Leading dealers state that, while busy, it is mainly with old contracts, new business being of small proportions. As a result the market shows a further decline on several items in the list. There were no railroad offerings the past week. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.25 to 12.75

The following quotations are per net ton:

Iron fish plates	$12.00 to $12.50
Iron car axles	18.00 to 18.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.00 to 16.50
No. 1 dealers' forge	10.00 to 10.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.75 to 8.25

Six hundred flat cars have been built and equipped by the Texas & Pacific Railroad for handling the Louisiana cane crop this season and 300 more are to be on the rails before the sugar crop is well advanced.

During the last forty-two days, the Union Electric Light & Power Company has changed at its Ashley street plant another 5000 kw. turbine generator to one of 12,000 kw. capacity. This is the third 12,000 kw. or 16,000-hp. capacity turbine electric generator the lighting company has installed since September, 1909. The company has also recently installed 12 new boilers, with a total capacity of 10,000 hp. The total hp. capacity of the entire plant is 80,000, making the generating plant one of the largest in the United States.

Architect Link has prepared the plans for the Barnes Hospital, which will be a new structure having a frontage of 850 ft. along Kingshighway and will extend 400 ft. back toward the Wabash tracks. The cost of the building will be close to $1,500,000. There will be a group of ten buildings in all.

Birmingham

BIRMINGHAM, ALA., September 26, 1910.

Pig Iron.—It is now generally understood that a basis of $11.50 per ton, Birmingham, would be accepted by the majority of producers for shipment during the first quarter of next year. The amount sold for such delivery is comparatively small, and no unusual efforts are being made by sellers to increase it, although all inquiries are given serious consideration and even first half commitments are not objectionable to all sellers. It cannot be said at what figures shipments for the entire first half could be had. Quotations made within the week show a difference of 50c. per ton in first and second quarter shipments, but no sales are known to have resulted. A sale of 4000 tons for delivery during the remainder of this year has just been made and the smaller lots sold for comparatively early shipments are attractive in the aggregate. Nothing is heard of a lower price than $11.50 per ton, Birmingham, even for spot shipments and, as is always the case when the market is firm, favorite brands would probably bring a still higher price where the tonnage is small. One of the large producers has announced that orders booked for the remainder of this year exceed the probable make for that time and accordingly has a prohibitive asking price for deliveries prior to January 1, 1911. Another large interest has advanced quotations to $12 per ton, Birmingham, on deliveries during the last two months of this year and for the first quarter of 1911, and still another has announced that only low grades are available for first quarter shipment. From present indications the production for October will be about equal to that for this month, but it is not likely that capacity will be increased about November 1. There is no reason to believe that the actual consumption will now continue at the present rate which in this district is better than normal.

Cast Iron Pipe.—The situation in this market as a whole is not so encouraging, owing to the failure of large contracts to materialize as expected. Business placed in the past fortnight is very small comparatively, and it is not unlikely that concessions have been made in the matter of price even for the small lots offered. Published quotations have not been changed and it is understood that the leading interests are not solicitous for business where lower prices are necessary, but the market is not in a satisfactory condition and all quotations are nominal. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., average $20.50, with $1 per ton extra for gas pipe.

Old Material.—There are no indications of heavier movement and dealers' views on prices are unchanged. All trading for some weeks past has been on the hand-to-mouth order and all parties concerned are apparently willing to continue that conservative course. Dealers' stocks have probably increased this month, but the aggregate accumulation in this district is comparatively small. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

Cincinnati

CINCINNATI, OHIO, September 28, 1910.—(*By Telegraph.*)

Pig Iron.—A little more interest is manifested on the part of prospective buyers, but few actual sales of any size can be reported. For first quarter shipment 500 tons of Southern No. 2 foundry was sold at $11.50, Birmingham, and for prompt delivery 1000 tons of high phosphorus Southern Nos. 2 and 4 foundry was taken on a basis of $11 for the No. 2 grade. For first quarter shipment a southern Ohio melter is said to have bought about 700 tons each of Northern Nos. 2 and 3 foundry at $14.50, Ironton, for the first named grade, and for the same delivery 1000 tons of Northern malleable was sold a Western consumer at $14.75, furnace. A number of small orders for foundry irons are coming in and some of these are understood to be from large consumers, who are filling their immediate requirements with present low priced iron in preference to using that already contracted for at higher figures. The 30,000 tons of basic wanted by a nearby Ohio steel manufacturer has not yet been purchased. An Eastern inquiry for 8000 tons of Nos. 2, 3 and 4 foundry is being figured on, but the business is expected to go to the Valley furnaces. A Western stove company is in the market for 5000 tons of about equal quantities of Northern, Southern and high silicon. A cen-

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tral Indiana melter is asking for 800 tons of either Northern or Southern, and an Ohio pipe maker wants 500 tons each of Southern Nos. 2 and 4. Prices are unchanged for the remainder of this year, $11 to $11.50, Birmingham basis, being quoted for Southern irons, and $14.50, Ironton, for Northern. No well defined figures are available for next year, but it is known that some interests will accept business for first quarter delivery at $11.50 for Southern and $14.50, at furnace, for Northern foundry No. 2. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(By Mail.)

Coke.—The Connellsville district is reported to have some furnace coke that can be bought, for spot shipment, at from 5c. to 10c. below market quotations. A large foundry coke producer and consumer in Pennsylvania is said to have decided on dampening down its own ovens and purchasing its requirements in the open market. The regular contract prices remain the same and Connellsville, Pocahontas and Wise County furnace coke ranges between $1.70 to $1.85 per net ton, at oven. Probably as low as $1.50 could be done for spot shipment in the first named field. There is no change in foundry coke, $2.10 to $2.15 representing the average contract price for standard grades, with the usual slight advance or reduction for a special brand.

Finished Iron and Steel.—The carload business, with direct shipment from mill to customer, is fairly good. Steel bars and structural material are quoted at 1.40c., Pittsburgh. Local warehouse prices are from 1.80c. to 1.90c. Although the narrower sizes of plates can be bought at 1.35c. mill, not much business in this line has been obtained in this immediate vicinity.

Old Material.—The railroads do not seem to be willing to accept present prices offered and are selling sparingly. Some good sized stocks of scrap are piled up in dealers' yards, and consumers appear to be buying merely to fill immediate requirements. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Rogers, Brown & Co. have been appointed exclusive sales agents for the charcoal and coke iron produced by the Silver Creek Furnace Company, Rome, Ga. The furnace at Rome has been producing charcoal iron for some time, but is expected to go on coke iron early in October.

Buffalo

BUFFALO, N. Y., September 27, 1910.

Pig Iron.—The inquiry for first quarter and half deliveries of foundry and malleable continues in considerably heavier volume than reported last week, aggregating about 30,000 tons, principally from New York State points. Only a comparatively small tonnage has been placed, as furnace interests are not quoting for the 1911 deliveries asked for except at prices above those for present quarter. New business coming in for fourth quarter deliveries is light, comprising carload and 100-ton lots, chiefly foundry and malleable, with a limited amount of small buying in basic. The Wickwire Steel Company expects to have its new furnace ready to blow in early next week. There is no quotable change in fourth quarter prices. Most furnaces are maintaining a slightly firmer attitude and one interest reports it is naming prices 25c. per ton higher for foundry grades than those shown in the schedule given below, which we quote as fairly representing the market, for prompt shipment and remainder of year, f.o.b. Buffalo:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.50 to 14.75
No. 2 plain	14.25 to 14.50
No. 3 foundry	14.00 to 14.25
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.25 to 18.75

Finished Iron and Steel.—The market has shown a decided lull in buying the past week, affecting nearly all lines of finished products, attributable undoubtedly to the press reports of price reductions, the counteracting influence of the contradictions given out by producers and sales agencies having apparently not had time to take effect. A few agencies, however, report a fair volume of orders and it is believed the check in the placing of new business will be only temporary, although in some instances purchasers' stocks are accumulating on account of heavy mill shipments now going forward on orders placed some months ago, and, consequently, there is not the same need of buying in such cases as there otherwise would have been. Prices on bars, shapes and plates are still being held at 1.40c., Pittsburgh, on large lots, and 1.45c. for less desirable business, and sellers are announcing that no concessions will be made. The Canadian export trade continues brisk, and the local agency of the leading interest reports the closing of a considerable portion of the large tonnages of bar products and structural material mentioned in these reports two weeks ago as being under negotiation and that it is expected the bulk of the remainder will be closed this week. In structural lines there has been a fairly active inquiry, but only a limited amount of business has been closed. Bids are being received this week for a small tonnage of steel for the Allen E. Klopp garage building, West Mohawk and Genesee streets, Buffalo, and revised plans will also be out for figuring this week. Contract for 400 tons for the Buffalo & Lake Erie Traction Company's 885-ft. viaduct over Twenty Mile Creek, near Ripley, N. Y., has been taken by the American Bridge Company.

Old Material.—The market remains dormant in most lines, although some activity is reported in iron car axles, malleable cast and old car wheels, transactions in the last named, however, being at a lower price level. There is practically no demand for scrap from the steel mills in this district and the price for heavy melting steel quoted in the schedule is based on the market price of other districts, with freight taken into consideration. The general situation shows no indication of a forward movement for the near future. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.25 to $12.75
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.25 to 10.75
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.25
Clean cast borings	5.75 to 6.25
No. 1 busheling scrap	11.25 to 12.00

A hearing before a representative of the Interstate Commerce Commission is to be held in Buffalo October 5 to hear arguments and receive testimony to be presented by the iron and steel manufacturers of the Buffalo district, who are contending that the proposed increase by the railroads in the freight rate on coke between the Connellsville district and Buffalo is "discriminating and in restraint of trade," as the rate on coke to other iron manufacturing districts has not been increased.

New York

NEW YORK, September 28, 1910.

Pig Iron.—The principal transaction of the past week in foundry iron is reported from New England and was the purchase by a jobbing foundry of 4000 tons, of which one-half was 1.50 to 1.75 per cent. and the remainder 2.75 to 3.25 per cent. silicon. Deliveries extend over the first half of 1911. Competition was close and represented a number of producers in the Central West and Western New York districts. In some cases considerably higher prices were asked than the basis prevailing for delivery this year, but the business was evidently taken by a furnace willing to make a concession to secure a certain amount of back log for the new year. In New York City territory a railroad supply company having a number of foundries and a soil pipe company have been inquiring for iron for delivery this year. In one case from 1500 to 2500 tons is wanted, divided among No. 2 foundry, gray forge and high silicon grades. One New York interest bought 450 tons for a Southern plant. In another case 300 tons was bought by a New Jersey machinery foundry which is also in the market for 2500 tons for shipment through the last quarter. Eastern pipe foundries have continued to buy in moderate lots, paying around $14.25 for low grade iron delivered at works. Several furnaces included in the Eastern Pig Iron Association will probably blow out in the near future—one each in New Jersey, Lehigh Valley and Schuylkill Valley. While some producers still maintain the position of holding for a higher price for iron for 1911, a case has

THE IRON AND METAL MARKETS

cropped up here and there in which a seller has been willing to take close to to-day's prices for deliveries sixty or ninety days over the line. If a sufficient number of furnaces blow out the tendency to carry over 1910 prices into 1911 may be checked. We quote as follows for iron at tidewater: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry is quoted, $15.75 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—Conditions, if no better, are no worse and apprehension seems to have disappeared, although no marked improvement is anticipated for weeks and perhaps months. The trade appears confident that the low level has been reached and that no more business will be secured by any further reduction of prices. The mills have quite generally adjusted themselves to the diminished demand and can comfortably await a turn of the tide. Prices are a trifle firmer, but there is still some shading of the quoted price for narrower plates and large orders for plain material. An increased number of fabricated contracts were closed last week, mostly of moderate average tonnage, but making a considerable total. Conditions in other lines remain practically unchanged. Among contracts closed are two apartment houses in New York City, one at Eighty-ninth and the other at Ninetieth street and Broadway, requiring together about 2000 tons, taken by the American Bridge Company. Levering & Garrigues secured 800 tons for a loft on Centre street and 600 tons for the Shanley Hotel. The Kansas City Southern shops at Shreveport, 300 tons, went to the Virginia Bridge & Iron Company. For the Philadelphia & Reading engine house in the mining regions Lewis F. Shoemaker & Co. will fabricate 350 tons. The Utica Hotel, 1100 tons, was taken by the Buffalo Structural Steel Company. The Central Railroad of New Jersey bridge at Bayonne, 300 tons, was awarded the Phœnix Bridge Works, and the New Jersey Zinc Company's work at Palmerton, 2200 tons, to the Lackawanna Bridge Company. The Michigan Central's bridge work at Detroit, 500 tons, and the Howard Car Company's building at Galion, Ohio, 350 tons, are reported awarded. An office building on West Twenty-second street, 550 tons, went to the Irving Structural Steel Company; an apartment on West 112th street, New York City, 300 tons, to the Hudson Structural Steel Company; a loft on West Twenty-third street, 575 tons, to the Hay Foundry & Iron Works; a car barn for a Connecticut electric railroad company at New Haven, 600 tons, to the Berlin Construction Company, and a bridge for the Cape Cod Canal, 600 tons, to the Pennsylvania Steel Company. No decision has been reached on the bids recently closed for the Long Island Railroad work, nor is it known whether 6000 or 12,000 tons will be taken. The Philadelphia & Reading will shortly ask bids for about 2500 tons for improvements at Port Richmond. Bids were reported as closed September 26 on a 12-story apartment house at Seventy-sixth street and Park avenue, New York City, requiring 600 tons. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Old Material.—No large sales have come to light, but quite a volume of business has been closed in moderate quantities of various classes of material. Heavy melting steel scrap is in fair demand, with some sales made at ruling prices. A few of the rolling mills have made purchases of wrought scrap and such grades as are suitable for busheling. The demand for wrought pipe appears to have been filled and this material has latterly been quite dull. Cast scrap is not in as good request as a week ago, buyers having apparently satisfied their requirements for the present. Cast borings and wrought turnings are exceedingly quiet, while old car wheels seem to be completely friendless. Relaying rails are accumulating, but it is difficult to find any buyers for them. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	19.00 to 20.00
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

Steel Rails.—The National Railways of Mexico has closed for 10,000 tons of rails in the past week. The previous order was for 12,000 tons. The Carnegie Steel Company has booked 2000 tons for the Fostoria & Fremont trolley line in northwestern Ohio, 500 tons for the Ashland Coal, Iron & Railway Company, Ashland, Ky., and 500 tons for the Berwind-White Coal Mining Company.

Cast Iron Pipe.—The most important letting in sight at present is that of Croton, N. Y., October 11, 900 tons. An inquiry is in the market through export houses for 1200 tons for Havana, Cuba. A Boston firm is also in the market for 1800 tons for the requirements of a number of small New England companies. The prospects for business with private companies have improved of late, but such buyers are slow in closing negotiations, especially when they find a higher price asked for spring delivery. Carload lots of 6-in. are still quoted at $23.50 to $24 per net ton, tidewater.

Cleveland

CLEVELAND, OHIO, September 27, 1910.

Iron Ore.—Ore firms are rapidly finishing up their shipments and it is estimated that the October movement will show a falling off of nearly 50 per cent. September shipments are placed at about 6,000,000 tons. More boats are going out of commission for want of cargoes. There is an occasional inquiry for a small lot of ore for a mixture, one sale of 7000 tons being reported during the week. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—There is a fair volume of inquiry for foundry grades for the first quarter and first half deliveries, but prices are low, consumers being unwilling to pay little, if any, above last quarter prices, for delivery after the first of the year. Some furnace companies that are eager for first half tonnages have shaded their asking prices until they have reached the last quarter basis, on which some sales are reported. Among these is the purchase by a northern Ohio consumer that had an inquiry out for 1000 tons of No. 2 for the first half. This buyer is understood to have succeeded in getting his iron at $14, Valley furnace. Previous sales have been reported at this price, but they have included fourth quarter requirements at the same price. The largest new inquiry is from a central Ohio implement plant for 10,000 to 12,000 tons of foundry iron for the first half—7000 to 9000 tons of No. 2 and 2000 to 3000 tons of No. 3. A northern Ohio stove foundry is in the market for 4500 tons for the last and first quarter—1000 tons of No. 2 Northern, 1700 tons of No. 2 Southern and 1800 tons of silvery. A Cleveland concern is in the market for 1500 tons of No. 2 foundry and malleable for the last quarter. An inquiry from Detroit territory calls for 1500 tons of malleable for the last and first quarter. There is also considerable inquiry for lots of foundry iron ranging from 200 to 500 tons. A number of Ohio furnaces are still refusing to quote for next year's delivery, and others are not meeting present prices. There is considerable activity in silvery iron. The usual asking price of $18.50 for 8 per cent. silicon for delivery after January 1 is being shaded. For prompt shipment and the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—The market is very dull. Foundries are nearly all under contract and there is little inquiry for that grade. Prices remain about stationary. Some foundry coke is being offered at $2, per net ton, at oven, for spot shipment, but the general quotation for the 72-hour foundry grade is $2.10 to $2.25 for prompt shipment and $2.25 to $2.50 for contract. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment and $1.70 to $1.80 on contract.

Finished Iron and Steel.—Specifications on contracts are fairly good and mill agencies report that tonnage booked in September will be somewhat larger than in August. While a good volume of orders is coming in they are generally for small tonnages, few being for over carload lots. The effect of the recent rumors of expected price reductions is still being felt and new orders are nearly all for immediate requirements. The demand is most active for steel bars. There is a fair demand for structural material, but plate orders are very light. The price situation in respect to steel bars, plates and shapes show no change, the 1.40c., Pittsburgh, price being firmly maintained except on plates that are being shaded by some of the smaller mills. The contract for the new building for the Cleveland Telephone Company, 500 tons, has been taken by the National Iron & Wire Company. Bethlehem sections will be used almost entirely. Plans are expected out shortly for the new Cleveland Art Museum. The demand for sheets is quite active and some of the smaller mills are now filled up for 4 or 5 weeks. While prices are no better the market appears to be slightly firmer, particularly on galvanized, because of the advance in spelter. Minimum quotations on No. 28 are 2.15c. for black and 3.15c. for galvanized. The

demand for iron bars continues light. Prices are stationary at 1.35c. to 1.40c. a. mill. Local mills, however, are getting reports of lower quotations in the West. The demand for shafting has picked up somewhat but prices are weak for prompt shipment. There is a fair demand for light rails, but mills making rerolled rails are getting nearly all the business; makers of new rails have held quite firmly to prices recently, but may decide to meet competition.

Old Material.—The demand is very light and existing conditions lead some dealers to believe that there will be little or no increase in activity or improvement in prices before the first of the year. Mills are buying only in small lots for early requirements, not being disposed to contract for future delivery. The demand from the foundry trade is light, orders being closely confined to carload lots. The market is generally weak, although no changes are reported in prices. Dealers' prices per net ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 6.75
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Metal Market

NEW YORK, September 28, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Sept.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
22	12.75	12.50	34.75	4.40	4.30	5.60	5.45
23	12.75	12.50	34.90	4.40	4.27½	5.60	5.45
24	12.75	12.50		4.40	4.27½	5.60	5.45
26	12.75	12.50	34.85	4.40	4.27½	5.60	5.45
27	12.75	12.50	35.15	4.40	4.27½	5.60	5.45
28	12.75	12.50	35.12½	4.40	4.27½	5.60	5.45

The immediate supply of pig tin in New York is concentrated in the hands of a few parties and prices for spot stock are high. Copper is weaker. Lead is weaker in the West. Spelter holds its own, with possibly an upward trend.

Copper.—A better inquiry from consumers exists in the copper market, but regardless of this the metal is a shade weaker in price than it was a week ago. The leading interests have been quoting electrolytic as low as 12.50c. for delivery over the next 30 days, and some spot stock has been sold at slightly under that price. From the way consumers are asking for quotations it appears that many of them have not bought enough to carry them over October and they will be obliged to come into the market soon. Some consumers have already placed a few orders for small lots, but they are moving very cautiously and appear to be feeling the market out. Most sellers continue to quote electrolytic at 12.50c. and lake at 12.75c. It is probable that in some quarters these prices might be shaded to good advantage, but that seems the general quotation, and if the report of the Copper Producers' Association, which is due October 7, is in any way encouraging the market will undoubtely stiffen at once. The exports of copper have been large so far this month, amounting in all to 28,215 tons. At the close of the London market to-day, spot copper was sold for £55 2s. 6d. and futures for £55 17s. 6d. The sales amounted to 400 tons of spot and 200 tons of futures. The market was steady.

Pig Tin.—There has been some good trading in spot tin and a fair part of the demand has come from consumers, although the greater volume of the business was done between dealers. While it is generally conceded that the London corner, which sent the market up of late, has been dissolved, there are plenty of speculators on the other side who are still following the bull movement and in consequence prices have not receded to any extent. For the second time within the last three months the larger part of the tin in New York available for early use has been concentrated within the hands of a few people, and what practically amounts to a corner now exists in this market. The market here is bare of stock and during the week the price for spot advanced 60 points. There was a Banca sale of tin in Holland to-day and the metal brought a price equal to about 34.62½c. c.i.f. New York. This low figure did not seem to affect the local price which was being well maintained this morning at around 35.15c. All things considered, prices asked for spot tin during the week have been fictitious and not consistent with the actual situation. Although the arrivals during the month have been small, amounting in all to 2781 tons, there should be enough spot tin on hand to take care of the consuming demand. A leading tin consuming interest shipped 100 tons of tin to London last Saturday. This was probably done with a view to depressing London prices. In New York this afternoon spot tin was sold for 35.12½c. The London market closed this afternoon with spot tin selling at £159 and futures at £158 15s. The sales amounted to 140 tons of spot and 220 tons of futures. The market was easy.

Tin Plates.—There was a drop in the price of foreign tin plates in the London market this morning and sales were made at 14s., which was 1½d. lower than the price asked at the same time last week. It is figured here that recent reductions of pig tin in the London market may have influenced the change in price. A good demand for domestic tin plates exists in the New York market and the price for 100-lb. coke plates continues at $3.84.

Lead.—The lead market is sagging in the West, and in St. Louis quotations have been reduced to 4.25c. to 4.27½c. This price is made by outside selling interests, but the American Smelting & Refining Company continues to maintain its quotation in East St. Louis at 4.32½c. This practically puts it out of the market and outside sellers are doing most of the trading there. The New York market remains firm and very little interest is being taken in the situation here. The American Smelting & Refining Company is making the lowest price in this vicinity, offering the metal at 4.40c.

Spelter.—The spelter market continues strong, but it is rather inactive. The general quotation in New York is 5.60c., but there are reports that some large producers have refused to sell at that price. There has been no great amount of stock held in New York for several months and the prices quoted are for prompt shipment from the West. To-day's prices are: New York, 5.60c.; St. Louis, 5.45c.

Antimony.—The antimony market continues stagnant. Prices are nominally as follows: Cookson's, 8.15c.; Hallett's, 7.87½c.; Chinese, 99½ per cent. guaranteed, 7.40c. to 7.50c.; Hungarian grades, 7.20c. to 7.30c.

Old Metals.—The demand is light but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, St. Louis, September 26.—Lead is slow, at 4.25c. to 4.30c.; spelter is quiet and easier, at 5.40c. to 5.42½c., both at East St. Louis. Zinc ore is quoted at $43 to $44 per ton, Joplin, base. Tin is offered at 35.35c. per pound; antimony (Cookson's), 8.50c.; lake copper, 13.10c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals was better than for the previous week and there was some railroad buying.

Metals, Chicago, September 27.—There is a fair amount of buying of copper, which is considered satisfactory in view of general business conditions. Tin has dropped 1c. in this market, but its course is still very erratic. Lead is quiet. Spelter is growing stronger and it is stated that shipments are now in excess of the rate of production. The gas supply in the Kansas field is becoming unsatisfactory and enough smelting capacity has been closed down to make a considerable difference in the market. The galvanized sheet mills have been using less than their usual rate of consumption and this has about offset the decrease in production. Experts who watch the spelter market closely believe that any increase in the demand for sheets and other galvanized products would create a temporary shortage of spelter, with a corresponding upward movement in price, until the smelting interests are able to replace the smelting capacity which has been lost by the shortage of gas in Kansas. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13c., in carloads, for prompt shipment; small lots ¼c. to ⅜c. higher; pig tin, carloads, 35½c.; small lots, 36½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.45c. to 5.50c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10⅝c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6s.; lead pipe, 4¼c.; zinc, 4¼c.; pewter, No. 1, 25½c.; tin foil, 30c.; block tin pipe, 32c.

The Machinery Markets

In some manufacturing centers the machinery trade is quite brisk, while in other quarters, conditions are rather dull. In most of the markets catering to the export trade the demand from that source is keeping up well. The American Steel & Wire Company has issued a large list of machine tools to be purchased for its new plant at Corey, Ala., which has been put before the trade in Cleveland, and that is about the only list of any size reported during the week. An increase in inquiries is noted in Pittsburgh, where prices are being well maintained, although there seems to be no snap to the market. Jewelry manufacturers in New England are more busy than they have been at any time within the last two years, and that condition is expected to result in some trade there. The export business is attracting more attention in Cincinnati, but there is not a strong domestic demand. In Detroit the automobile industries are becoming busy again and some purchasing is being done. Manufacturers of power plant equipment are doing a good business in Milwaukee and there is an excellent demand for second-hand machinery. Fine crop reports have created an optimistic sentiment in Chicago and an improvement in trade is noted. The railroads are doing a little business in the Northwest and that is about the only part of the country where there is any noticeable demand from the railroad interests. On the North Pacific Coast there is an increased evidence of business expansion in all lines of manufacture. A good business is noted in Texas, where many new projects are being planned and a good buying movement is expected in the near future.

New York

NEW YORK, September 28, 1910.

Business is rather quiet in the New York market and the trade is devoting most of its attention to following up projects which promise to develop into business later on. Inquiries have, if anything, fallen off of late and the business now being done is largely in small lots. The New York Central Railroad has a list of about a half dozen tools now before the trade, but outside of that there is practically no business in sight from the railroads. The demand from the automobile trade is more quiet than it has been in some time. While the automobile supply business seems to be on a better footing than it was four weeks ago, collections from that source are rather slow. There is a fairly good export demand and the call for mining equipment from Mexico is contributing largely toward the support of that branch of the trade. Foundries that make a specialty of turning out machinery castings are busy and the trade in that line seems to be well distributed. This is largely due to the fact that many machinery manufacturers have, instead of making long time contracts, been giving their orders in small lots, and consequently they have been doing business with several foundries where on other occasions they have placed their entire contract with one casting concern.

J. G. White & Co., Inc., engineers and contractors, 43 Exchange place, New York, have been awarded a contract by the New York, Ontario & Western Railway Company for the erection of railroad shops at the Mayfield yards, Mayfield, Pa., near Carbondale. The work to be carried out consists of the erection of a 10-stall roundhouse, with a 75-ft. turntable; machine shop, carpenter shop, with complete power plant; storehouse, office building, oil building, sand storage, drier and loading house, and a complete coaling station, with a storage capacity of approximately 1000 tons. The buildings will be of the usual type of brick and steel construction. The estimated cost is approximately $150,000.

Sealed bids will be received until October 19 by the Borough Clerk of Allentown, N. J., for the construction of a municipal electric lighting plant. The equipment will include one 25-kw., direct connected three-wired generator, one 30-hp. internal combustion engine, one 15-ampere eight-hour storage battery, switchboard, shafting and other power accessories. Plans and specifications may be obtained from W. W. Young, consulting engineer, who has offices at 220 Broadway, New York, and 1002 Drexel Building, Philadelphia, Pa.

Bids will be received October 5, by the Department of Water Supply, Gas and Electricity of the city of New York, at its offices, 13 Park Row, for furnishing a coal crusher and eight mechanical stokers with coal chutes and other appurtenances for the Ridgewood north side pumping station at Atlantic avenue, Brooklyn.

The W. L. Crow Construction Company, 103 Park avenue, New York, has been awarded the general contract for the construction of an addition to the plant of the American Type Founders' Company on Communipaw avenue, Jersey City, N. J. The company has not yet decided on the equipment to be installed in the structure.

A contract for the erection of a pulp mill of reinforced concrete construction for the Union Bag & Paper Company at Cap de la Magdaleine, Three Rivers, Quebec, Canada, has been awarded to Frank B. Gilbreth, Inc., 60 Broadway, New York. George F. Hardy, 309 Broadway, New York, is the engineer.

The Shaughnessy Knitting Company, Watertown, N. Y., has completed plans for the erection of a knitting mill, 50 x 150 ft., three stories.

The Syracuse Malleable Iron Company has work under way on its new malleable foundry buildings on Geddes street, brick and steel construction, to cost $40,000.

The Railway Roller Bearing Company, Syracuse, is making arrangements for the erection of its manufacturing plant in that city.

The Beaver Company, manufacturer of Beaver board and wall panels, Wm. F. MacGlashan, president, has let contracts for two additional buildings, each 60 x 220 ft., one story, to be erected at its new manufacturing plant, Beaver road and New York Central Railroad, North Buffalo, N. Y.

The Imperial Metal Polish Company, Edw. Fulton, president and manager, has leased a factory building and established its manufacturing plant at Buffalo, N. Y., with offices at 409 Mutual Life Building, that city. The company's specialty will be polishes for automobiles. It will also manufacture stove polishes.

Factory No. 2 of the Salisbury Wheel Company, Jamestown, N. Y., a four-story frame building containing much expensive machinery used for the manufacture of automobile axles, was destroyed by fire September 21, causing a loss of $90,000. The company will in the spring replace the burned building with a large fireproof structure adjoining its factory No. 1, making temporary arrangements meanwhile for carrying on the work to which the burned factory was devoted. The company's power house adjoining, leased to Frederick Sprague and used for street lighting of the suburb of Falconer, was also destroyed and will be replaced at once.

The Menig Sheet Metal Works, 118 Ash street, Buffalo, N. Y., has completed plans for a two-story brick addition to its plant on Ash street, near Genesee street, which it will build and equip this fall.

Bramley Bros. are having plans prepared for an iron foundry building to be erected at Lockport, N. Y., on a 4-acre site in proximity to the new factory of the Simonds Mfg. Company. The members of the firm, Julius W. and John H. Bramley, formerly operated a foundry in Lockport, but for several years past have been operating a foundry connected with the Herschell-Spillman Company's plant at North Tonawanda, N. Y.

The Telechronometer Company of Rochester, N. Y., and the North Electric Company of Cleveland, Ohio, are to be consolidated in a new corporation to be known as the Telephone Improvement Company, which will incorporate under the laws of the State of New York. The new company will manufacture telephone message and time meters and improved switchboard apparatus under patents which it controls. Frederick C. Stevens, State Superintendent of Public Works, is to be president of the new company.

Chicago

CHICAGO, ILL., September 27, 1910.

Dealers report a gratifying improvement during the past week or 10 days in the volume of current business. The general trade is growing slowly and more inquiries are received each week from manufacturers, machine shops and

THE MACHINERY MARKETS

other users of machine tools. Railroad buying is still on a small scale, the only large list which has been closed recently among Western railroads being that of the Chicago, Burlington & Quincy. Other roads are generally buying a few tools at a time for their most urgent needs in their shops. The automobile trade has dropped out of the calculations of the machinery dealers. A year ago the sales to automobile manufacturers were very heavy and represented a large share of the going business, but this fall there have been more orders canceled than new ones received in this line. It has required a considerable growth in the general trade to make up for the loss of so large a line of business, but the market is responding slowly. Some of the dealers report that they have already worked up a satisfactory volume of general trade, although others are not taking such a cheerful view of the situation. Business conditions in the West, however, have turned out very favorable and this will tend to sustain the business of machine tool users. The wheat crop proved much better than early reports indicated, the oats crop broke all records for yield and now the corn crop bids fair to surpass all former years. These favorable agricultural conditions have an irresistible influence in promoting good business conditions in Western territory, and the machinery market is beginning to feel the good effect of returning confidence.

The American Ladder Company, Chicago, is preparing to move its plant and business to Momence, Ill., where it has purchased the property known as the American factory building. The company is enlarging the building by the erection of an addition 64 x 112 ft. and will install a power plant purchased from the Erie City Iron Works. It is expected that the plant will be in operation by January 1.

The Commercial Club of Peoria, Ill., is considering plans for the removal to that city of a factory which manufactures cranes. A definite decision has not yet been reached.

The M. M. Rogers Company, Chicago, manufacturer of journal packing for locomotives and cars, formerly located 234 Sixty-third street, has removed to 900 West Lake street, Chicago.

Lord & Burnham, 829 Rookery building, Chicago, greenhouse designers and builders, have plans prepared for the construction at Des Moines, Ill., of a wood working shop 100 x 140 ft., an iron working shop of the same dimensions and an engine and boiler house 42 x 42 ft. Later on there will also be erected a foundry and boiler shop, plans for which have not been decided upon. It is understood that orders have not been placed for the equipment to be installed.

The International Smokeless Furnace Company, Peoples' Gas Building, Chicago, manufacturer of furnaces for steam and power plants, arches, grates and annealing and tempering furnaces, has increased its capital stock from $15,000 to $50,000. The company has recently completed the installation of new and modern machinery in its plant at 719 Quincy street and is now in position to take care of its rapidly increasing business.

The Hawley Down Draft Furnace Company, Chicago, has sold to the American Steel Foundries for installation in its foundry at Indiana Harbor, Ind., a Schwartz furnace of the largest size which it manufactures.

The Crescent Company, Chicago, manufacturer of the Loxon lamp guard, has changed its name to the McGill Mfg. Company and removed its sales offices from Chicago to Valparaiso, Ind., where it has just completed an addition to its plant. With these increased facilities the company now has a capacity of a half million lamp guards.

S. F. Bowser & Co., Fort Wayne, Ind., have increased their capital stock from $600,000 to $1,800,000. The additional capital will be used for factory extensions and extra working capital, it being the intention of the firm to erect a large three-story addition to their present factory and a six-story office building to take the place of the one now in use. They advise, however, that these improvements will not be made until next year.

The Wayne Oil Tank & Pump Company, Fort Wayne, Ind., has awarded the general contract for the construction of a one-story 60 x 200 ft. and a one-story 40 x 60 ft. brick and cement block factory building, work upon which is now under way.

The Wayne Auto Axle Company, Fort Wayne, Ind., has awarded the general contract for the construction of a one-story addition to its factory, 50 x 140 ft. The company will manufacture automobile axles eliminating the differential gears and is in the market for standard machinery.

The Central Boxboard Company, whose plant at Sterling, Ill., was visited by fire August 31, was not crippled as regards its output and the fire interfered with the operation of the plant only 24 hours.

The Colby Iron Works, Granville, Ill., is preparing to manufacture trolley wheels for electric cars and will be interested in new equipment consisting of turret lathes, milling machines, drill presses and screw machines.

Philadelphia

PHILADELPHIA, PA., September 28, 1910.

While there has been little more inquiry for certain classes of machine tools recently, orders develop slowly, but from the class of prospective buyers, even though their requirements are not extensive, the trade believes that a more healthy market is in sight. Planers, lathes and radial drills figure more numerously in the demand, some of comparatively good size, and while the individual requirements are still rather small, in a few instances the inquiries covering more than a few tools, the outlook is considerably better than immediate business. Few merchants report any sales of consequence, and on the whole the month so far has been a disappointment as far as actual business transacted is concerned. Very little in the way of railroad lists is now expected until after the first of next year. An occasional inquiry and order is received from the roads in this vicinity, but generally these cover odd tools for replacement and minor extensions, and have no bearing on the general situation.

Manufacturers are feeling the absence of new business more acutely. In the majority of instances builders of tools in the Philadelphia territory have sufficient work on hand to keep them fairly well occupied for several months, and, in instances, until the year end; but quite a few have reached the point where they must string out the business they now have to keep them going at a moderate rate during the remainder of the year. The market shows hesitancy; there is a condition of unrest, and the trade generally cannot see far enough into the future to encourage any extensive buying of equipment. The same thing follows as to purchases of materials entering into the construction, not only of tools and machinery, but the crude materials generally.

In the boiler and engine trade business develops slowly, although for general power equipment inquiry shows some betterment. Negotiations for a fair number of engines of moderate horsepower are pending and the trade feels more hopeful as to the future.

The majority of the foundry plants note a smaller demand for castings; in some instances steel casting plants are particularly short of new work. Sharp competition for prospective business is to be noted in all classes of work.

Business in the second-hand machine tool trade continues to drag. Moderate day to day sales are reported, but the market lacks snap.

The city of Belmar, N. J., will receive bids until October 4 for an issue of $18,000 5 per cent. bonds, the proceeds of which are to be applied for the erection of a sewage disposal plant.

The York Mfg. Company, York, Pa., has completed the erection and practically all the machinery has been installed in its new boiler shop. A number of additional improvements are under way by this company, including a plant to manufacture gas for use in connection with its oxyacetylene process for welding purposes.

The Pooley Furniture Company suffered a fire loss of $100,000 by the burning of its warehouse, upholstery and shipping departments on the 20th inst. The manufacturing department of the plant was not effected. It is the intention of the company to replace the burned structure as soon as plans can be prepared with a modern building.

The McCaffrey File Company is having plans prepared and will soon take bids for the construction of a two-story addition to its plant, a considerable portion of which will be used as an extension to its forging department.

The Virginia Bridge & Iron Company, Roanoke, Va., has increased its capital stock from $800,000 to $1,500,000. The issue will be common stock.

Bids are being taken by L. H. Erwell, engineer, for a brick and concrete coal pocket to be erected for the estate of M. Le Rue at Ninth street and Girard avenue. F. J. Bradley, Hale Building, is also understood to be taking bids for a concrete coal pocket to be erected at Llanerch, Pa.

The Steacy-Schmidt Mfg. Company, York, Pa., reports a fair volume of inquiry and has sufficient work on its books to keep both its plate shop and foundry fairly well occupied for some time ahead. It notes a continued hesitancy in the closing up of business under negotiation.

The S. Morgan Smith Company, York, Pa., is making additions to its plant, which when completed will double the present machine and erecting shop capacity and more than double the capacity of the power plant. The buildings for the extensions are under roof and practically completed. Electric cranes will be installed and while a good portion of the power plant equipment has been purchased, a considerable portion of the erecting and machine shop equipment still remains to be purchased. This concern heretofore used considerable outside electric power, but on completion of its new power plant will furnish its own requirements.

The York Engineering Company, York, Pa., is busy

in all departments and will be fully engaged for several months in order to complete the various orders for power equipment now under way. This company has about completed a power plant for heating and ventilating purposes for the Baltimore Novelty & Enamel Company, Baltimore, Md. Inquiries for considerable work, the installation of which will not be begun until next spring, are now being figured on.

The Treadwell Engineering Company, Lebanon, Pa., has been incorporated with a capital stock of $400,000 under the laws of the State of Pennsylvania and will act as a holding company for the M. H. Treadwell & Co. interests, including M. H. Treadwell & Co., the Lebanon Steel Castings Company, Lebanon, Pa., and the Stoever Foundry & Machine Company, Myerstown, Pa., for which a combined plant is now in course of erection at Easton, Pa. The incorporators of the Treadwell Engineering Company are W. E. Farrell, H. T. Gerdes and Grant Weedman of Lebanon, Pa.

The Reading Crane & Hoist Works, Reading, Pa., notes a steady increase in the demand and a better volume of orders for overhead traveling cranes, tramways, chain hoists and trolleys. That for floor controlled electric hoists is also considerably better. A very satisfactory volume of business is on the company's books, sufficient to keep its plant actively engaged for the next three months. This company has just completed one 16-ton, 57-ft. 16-in. span; one 12-ton, 57-ft. 6-in. span, and one 8-ton, 78-ft. 8-in. span, cranes for the Powell River Paper Company, Powell River, British Columbia. A number of large girder cranes have also been shipped to Canada for use in various power plants; also a number of cranes for the use of the Government in the Philippines for handling submarine mines, cable reels, &c. The general capacity of the plant has recently been increased, giving it an increased productive capacity of 25 per cent.

The Young Safety Razor Company, Eleventh street and Erie avenue, has been incorporated under New Jersey laws, with a capital of $100,000, the incorporators named being Elmer I. Young and Charles V. O'Donnell, Philadelphia, Pa., and Joseph O. Farr, Atlantic City, N. J. The company will manufacture and sell the Young safety razor. It does not contemplate the immediate erection of a factory, but will in all probability equip a plant in the near future for electro plating purposes.

The Elmore Tool Mfg. Company, Hartford, Conn., announces the increased demand for its entire line of Elmore Indestructible tools has necessitated the carrying of a stock in Philadelphia. It has therefore appointed Parker & Haines, 512 Commerce street, Philadelphia, as its sole direct factory representative. All deliveries to the city and nearby trade will be made from this stock.

The Terminal Taxicab Company, 1219 Thirteenth street, Washington, D. C., is planning to erect a three-story concrete garage, 75 x 140 ft., which will be operated in connection with a four-story building the company recently purchased.

New England

BOSTON, MASS., September 27, 1910.

The machinery dealers have had another quiet week. Much importance is attached to the apparently authentic report that the patents and business of the Wonder Worker Shoe Machinery Company, controlled by Thomas G. Plant, Jamaica Plain, Mass., have been purchased by the United Shoe Machinery Company. The report is substantiated by announcements of the laying off of men by the Bresnahan Shoe Machinery Company, Lynn, Mass., and the Stanley plant at Lawrence, Mass., both of which build the machinery of the Wonder Worker Company. If the sale has taken place competition in the shoe machinery business has been seriously affected, and the demand for machine tools has been again concentrated at the Beverly works of the United Shoe Machinery Company.

In Providence, R. I., and vicinity the jewelry manufacturers are busier than for at least two years. The Boston & Maine Railroad's annual report shows an increase in revenue for the fiscal year, due to a large extent to the prosperity of the manufacturing plants.

Further answers to inquiries among the machinery manufacturers as to the status of business affords the basis for a more intelligent estimate of the business situation than can be obtained from conjectures founded within a superficial range of observation. In considering the question it must also be kept in mind that the last three months, during which these opinions were formulated, were normally the lightest of the year because of the season. One builder of machinery which is used in a large way by the automobile manufacturers makes an interesting analysis, following a fiscal year totaling twice the business of that preceding it, and correspondingly greater than anything in the earlier history of the company. He states: "While we had some orders canceled and some put over until a later date, we are sufficiently optimistic, so that we are going to keep all our men going, for the purpose of getting some stock of machines. We have been told many times in the last year or two that people would have been glad to put in our machines, and thought they were the best, but could not wait for our delivery, and this, of course, is an unsatisfactory state of affairs. It hurts us worse than it does to have a man prefer some other make of machine, because those cases will always come up more or less. No one should expect to sell all the machines that are used, but when a customer frankly states that he wants our machine and believes it to be the best one, and has to take something else because our delivery is too far away, we wish to remedy that condition. Still we are human and suppose that if we see a big pile of machines staring us in the face we shall feel like slowing down a little. However, the writer does not expect this to happen. We believe that a large portion of the canceled orders will be reinstated in the course of a few months' time. We do not believe there will ever be the rash and extravagant buying by the automobile people again that there has been for the last two years, but there will always be a demand for good machines, and there will be a continuous balancing up of equipment in the different factories, which will call for a very satisfactory amount of machine tools."

Replies from the large lathe builders of New England are instructive. One says: "Business with us has been very good up to within a couple of weeks, since when it has shown a tendency to drop off. While we are not so sanguine about the outlook as we were last spring, we nevertheless anticipate a good business during the winter." Another opinion from this trade is: "We find business very good and think there are indications of an improvement this fall. At any rate, this is what we are looking forward to and we have no fears for the immediate future, at least." A builder of heavy lathes states: "Business is not as good as we would like to see it, but we are strongly impressed that we are going to have an improvement this fall over the present conditions." Yet another lathe experience is this: "Regarding general conditions at the present time we are extremely busy and we anticipate a satisfactory trade during the remainder of the year." An important house writes: "Business has been very quiet, but it is opening up a little at the present time. Whether it will continue or not is more than I can tell you. We are still running full time and full help, but a great deal of our output is being put into stock."

A manufacturer of planers and shapers says: "Business seems to have a much better tone as far as we have been able to ascertain, and if the troubles of the automobile manufacturers do not overtake the improving tendency of other lines we see no reason why we should not have a fair winter's trade." A manufacturer of friction clutches puts it: "Business is very good with us at present and the outlook is bright." Others write, their lines being indicated: Swaging machines: "We are continuing a fair volume of orders, but we do not feel sure of increased business this fall, except such increase as may be due to the change of season." Gear machines: "Our business is fairly good at the present time, although not up to what it was a few months ago. We expect, however, that there will be a marked improvement within the next two or three months." Riveting machines: "During July and August business has not been very brisk with us. September appears to be coming along better and we anticipate an improvement this fall." Chilled rolls and heavy machinery: "We find that business is falling off and do not look to any improvement this fall." Wire mills, rolls, thread rolling machines, riveting machines, presses, &c.: "If you want a frank expression as to the condition of the machinery market as it affects us, it could not be worse. By this we mean that we are not receiving orders, but are pleased to advise you that we have so much more work on hand, that has been on our books for some months, that we shall be able to coast for some time without serious results." Grinding machinery: "Business at present is very quiet, but we certainly anticipate an improvement in the market for machinery before long." Steam engines: "We anticipate that business will not pick up seriously until after election, and reserve our opinion as to what will occur, until it has occurred." Standard and special wire and metal working machinery: "All during the summer and up to the present, business has been remarkably good. While we do not feel at all pessimistic as to the future, we cannot see that the outlook for the immediate future is very promising." Grinding machines: "Business is very good for this time of year, with very few cancellations of orders. We are anticipating an improved market this fall in our line and are making plans to be prepared for it." Sensitive drills: "Business is very dull now, but we think it will improve a little later." Vertical drills:

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"We are quite busy working on orders, a sufficient amount of which for some time to come we have on hand. While general business seems to have fallen off during the past month, we have been quite fortunate in securing a fair amount of new business. We see nothing except the political situation to interfere with future business."

It has developed that many of the manufacturers of automobile parts and accessories have not suffered nearly as much from cancellations and hold-ups of orders as had been feared. The curtailment in the industry in the purchases of equipment is a serious one, when the orders are compared to the enormous buying of the past two years. But the production of automobiles, both pleasure and commercial, will be very great. Judging from statements occasionally heard some business men do not realize that the motor car as a source of pleasure and convenience is suffering no decline, and that the future of commercial vehicles should be one of consistent, continuous growth. Those automobile manufacturers who have built up their business on substantial foundations do not appear to be very seriously affected.

The Heald Machine Company, Worcester, Mass., manufacturer of grinding machines, has decided to defer the proposed large additions to its shops until next spring, because of general business conditions and also because the bids for construction were considerably higher than had been expected.

The New Haven Sherardizing Company has established works at 1040 State street, New Haven, Conn., and will carry on the business of dry galvanizing under the Sherardizing process. C. L. Ganser is the secretary and manager.

The Board of Boiler Rules of the State of Massachusetts, State House, Boston, has issued a list of boiler manufacturers who are authorized to manufacture Massachusetts standard boilers, together with the approved trade stampings in the style adopted by the board.

John Quinn & Son, Cambridge, Mass., will build an addition to their working shops 38 x 100 ft., three stories.

The Chandler & Farquhar Company, Boston, Mass., dealer in machine tools and mill supplies, has leased a large store adjacent to the present machine tool warehouse, and the machinery office and salesroom will hereafter be at 419-425 Atlantic avenue.

The Berkshire Street Railway Company, one of the New York, New Haven & Hartford properties, will build a power house at Zylonite, Mass., 100 x 150 ft.

That the work of construction of the Boston, Cape Cod and New York Canal will be pushed vigorously is indicated by the purpose to issue $400,000 of new securities, in addition to the $600,000 already disposed of, the proceeds of which have been expended on the property.

The Clark Bros. Bolt Company, Milldale, Conn., manufacturer of carriage, machine and plow bolts, coach screws, washers, rivets, &c., has awarded the contract for a one-story brick factory building, of saw tooth roof construction, containing about 28,000 sq. ft. of floor space. The building will adjoin the company's office and warehouse buildings near the railroad station. It will be used for both storage and manufacturing purposes, the intention of the company being to transfer a part of the manufacturing now done at the old plant, which is located a quarter of a mile from the railroad, thus affording additional room and better railroad conveniences. The business is an old one. It was established in 1854 by William J., Henry H. and Charles H. Clark. The last named founder is still living and is the president of the corporation. The Western office, in Chicago, is managed by Charles Clark, son of Henry H. Clark. E. S. Todd is the secretary and treasurer.

The Dunbar Bros. Company, Bristol, Conn., manufacturer of rings, is completing a new brick and concrete hardening shop, 30 x 50 ft., and is starting work on a power plant which will be pushed to completion as rapidly as possible. These additions, with a three-story building, 32 x 80 ft., just completed, will double the company's manufacturing capacity.

It is announced that the section of the Shore Line Electric Railway between Saybrook and East Lyme, Conn., will be built next spring.

Announcement of additions to general manufacturing establishments of New England include the following: Williams Mfg. Company, Northampton, Mass., new plant, consisting of a main building 80 x 100 ft., with ell 32 x 120 ft., two stories, of reinforced concrete, together with buildings for shipping and storage purposes: Max Henkels, Bridgeport, Conn., addition to factory 60 x 190 ft., one story; Moosehorn Paper Company, Old Town, Maine, tentative plans for a tissue paper plant in that place; Hartford Builders' Finish Company, Hartford, Conn., addition 20 x 40 ft., two stories; Seekonk Lace Company, Pawtucket, R. I., mill building, 52 x 122 ft., just completing, and another addition 32 x 66 ft.; Edwards Mfg. Company, Augusta, Maine, textiles, addition to slasher room, 43 x 55 ft.; C. A. Eaton Company, Brockton, Mass., shoes, seven-story factory, 106 x 236 ft.; Oxford Linen Mills, North Brookfield, Mass., weave shed; Booth Mfg. Company, New Bedford, Mass., new plant, consisting of spinning mill containing 175,000 sq. ft. of floor area, weave shed having 100,000 sq. ft., storehouse, and power plant with 15,000 sq. ft.

The Morgan Construction Company, Worcester, Mass., has been awarded the contract for a merchant mill for the Lackawanna Steel Company and a contract from the Indiana Steel Company for an 18-in. sheet bar mill for the Gary works. The Morgan Company is exceedingly busy in all of its departments and is operating a night shift, following a schedule which has been in practice for some months past.

The Abbott Ball Company, 14-18 Hicks street, Hartford, Conn., has begun the manufacture of a tumbling barrel and steel balls, constituting an equipment designed for burnishing metal goods.

The New Haven Sand Blast Company, Malley Building, New Haven, Conn., has perfected its sandblast tumbling barrel, the invention of G. A. Dreisbach of that city. For the present the machine will be manufactured by outside parties; but the company proposes to establish works later. The barrel is made to revolve slowly, the work tumbling to receive the blast, either of sand or steel balls, from a series of nozzles arranged on the axis of the receptacle. The abrasive material is automatically used over and over again, the machine being entirely self-contained. G. A. Dreisbach is the president and William J. Smith the treasurer of the company.

The G. A. Dreisbach Foundry & Machine Company, New Haven, Conn., manufacturer of gray iron castings and patterns, has decided to go out of business.

The Pratt-Whitney Company, Hartford, Conn., has completed a vertical spindle surface grinding machine of revolutionary proportions. The table takes work 20 in. by 6 ft. The cup wheel employed is 30 in. in diameter. The drive is from a 60 hp. motor. The machine weighs 25,000 lbs. The equipment includes a revolving table, carried on the regular table, and operated with the traverse. The company has just delivered to a customer a measuring machine which measures up to 144 in. or any part of 144 in. to 0.00005 in.

The Eastern Machine Screw Company, New Haven, Conn., is occupying its new shop and has begun manufacturing, though on a small scale, its own screw machines not being completed. The company will manufacture hardware specialties as well as screw machine products, the line including a new type of safety razor. The new screw machine is the design of William H. Gates, vice-president and superintendent. It is of the single spindle type, a characteristic being that the spindle runs constantly in one direction, it being unnecessary to reverse in taking the die from the work. All motions are controlled by cams, all of which are at the back of the machine. There are four slides. It is stated that the capacity is within 75 per cent. of the multi-spindle type. The new shop, 40 x 125 ft., and two stories, will give ample manufacturing space for the industry, and a large tract of land provides for future growth.

The F. B. Shuster Company, New Haven, Conn., has brought out an improved sheet metal straightening and cutting machine containing various new features, including separate control of the rolls and cutting-off mechanism. The machine has a capacity of metal up to 14 in. wide and ⅛ in. thick in lengths as required.

The Providence Engineering Works, Providence, R. I., has decided to defer the erection of its new building until the situation has cleared in the automobile trade. The company has become one of the units of the United States Motor Company, and the increased space is intended for the manufacture of automobile engines and transmission. New machinery is being installed in the present large building, however.

Cincinnati

CINCINNATI, OHIO, September 27, 1910.

The export business is attracting a great deal of attention here, and several machine tool builders who have lately returned from abroad state that Cincinnati tools are fast becoming better known in foreign markets. Orders recently booked call for tools to be shipped to almost every country on the globe. During the past few days local firms entertained a representative of a large Melbourne, Australia, house, who placed quite a number of orders for different kinds of shop equipment. He was followed by a Porto Rican importer, who is also understood to have bought some tools. It is believed that a little concerted action on the part of local manufacturers would bring much better results from the export trade. Manufacturers as a rule look to their export agents entirely to work up the business, not realizing that the average exporter has a multiplicity of

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representations to take care of and is not able to devote much individual effort to further the interests of any particular one.

Domestic business is yet rather slow, but inquiries are numerous, and with the present excellent crop prospects business men generally anticipate very much better conditions for the last quarter of the year. Probably never before have crop reports been followed so closely by the manufacturing interests in this section as they have been this season.

Manufacturers and dealers in machinery and engineering specialties and supplies report a steady business. Second-hand machinery dealers are not faring so well, and some are complaining again. However, this particular business seems to run in waves and its general condition cannot be judged by one week's report.

A. S. Boyle & Co., Cincinnati, have made arrangements to build a two-story brick factory, 80 x 170 ft., at Evanston suburb, which will be used for the manufacture of hardwood finishes.

The Ohio Valley Exposition, which closed its doors September 25, was one of the most successful affairs of its kind ever held in Cincinnati. Large crowds were in daily attendance and out of town visitors were numerous. Many exhibitors are said to have booked sufficient business to pay all expenses for their exhibits. The machine tool exhibitors were especially pleased with the large list of prospective customers they were able to gather.

The Peck, Anderson & Peck Company, Cincinnati, has had to keep its factory on Court street running on a part night shift in order to fill the demand for its heating and ventilating appliances.

The fall term of the University of Cincinnati commenced last week with a large attendance in the mechanical department, which is in charge of Prof. Herman Schneider.

The Continuation School, which has quarters on Ninth street, near Main, Cincinnati, is contemplating opening a night school for the benefit of pupils unable to attend the day sessions. This is a school supported by local machine tool builders for apprentices, who receive full allowance for time while attending the school.

The plant of the John B. Morris Machine Tool Company, Cincinnati, recently mentioned, is nearly completed and will be in operation before January 1.

Foundations for the new storage building of the Ohio Pattern Works, Cincinnati, have been completed and work on the addition will be rushed, as the company desires to get it under cover before cold weather begins.

H. Clyde Gregory, machinery importer of San Juan, Porto Rico, was a local visitor last week. He has lately been appointed Porto Rican agent for the John Steptoe Shaper Company. While here he called attention to the excellent market Porto Rico is for automobiles and accessories; the latter includes the necessary machine tools for doing repair work.

The Rahn-Carpenter Company, Cincinnati, has recently received an order, through its New York representatives, for three of its extension bed gap lathes to be shipped Ardeshrr D. Wadia & Co., Ahmedabad, India. Other export orders include two of its larger sized lathes for Copenhagen, Denmark, and Rotterdam, Holland, also a specially built lathe for a customer in Melbourne, Australia.

George Barkman, architect, Hamilton, Ohio, has in charge plans for the new plant of the H. P. Duescher Company which is to take the place of the old factory buildings recently destroyed by fire.

The new foundry addition to the Niles Tool Works, Hamilton, Ohio, will be 180 x 432 ft., and when completed will very much increase the capacity of the company's present plant.

Rapp, Zettel & Rapp, contractors, Cincinnati, have nearly completed the new factory for the Stroud Machinery Company, on Knowlton street, near the Cincinnati, Hamilton & Toledo Railway. The building is 140 x 225 ft., two stories, and has a saw tooth roof.

The Wayne Oil Tank & Pump Company, Fort Wayne, Ind., has opened a Cincinnati office, with F. W. Stukenborg in charge.

Schumacher & Boye have recently received orders calling for several of their larger sized lathes, and they report many domestic and foreign inquiries for tools of their make.

The plant and storehouse of the Merrie Plumbing Supply Company, 90 Bowen street, Cincinnati, was almost totally destroyed by fire September 25. It is the intention of the management to commence rebuilding as soon as insurance adjustments can be made.

Among recent oil furnace contracts taken by Walter Macleod & Co., Cincinnati, Ohio, are a large plate heating furnace for the J. Baum Safe Company, Cincinnati; complete furnace equipment for the Southern Motor Works, Nashville, Tenn., and a complete furnace equipment for the W. H. Glore Mfg. Company, Washington, Ind.

Cleveland

CLEVELAND, OHIO, September 27, 1910.

While there is steady buying of single tools and small lots the aggregate business placed is rather light. The largest list that has come out in several months appeared during the week, being from the American Steel & Wire Company for its new plant at Corey, Ala. It is expected that this business will be placed within the next few weeks. Other new inquiries are not numerous and are for lots of not more than four or five tools. While September has been a quiet month all through, machinery men did not look for much change in conditions before October. The general opinion prevails that the demand will show an improvement during the coming month. Present buying is very scattered, the orders coming largely from small shops. Railroad orders are still mostly for single tools, the expected lists for additional shop equipment not yet having appeared. In the automobile trade manufacturers are making plans for their 1911 output, and some business is expected from this source as soon as their requirements are decided upon. While it is improbable that the larger manufacturers will buy very much new equipment it is not believed that the large capacity of existing plants will prevent some small manufacturing companies from entering the field. New types of cars are being perfected, in which the promoters have sufficient confidence to invest their capital and put them on the market in a limited number, and a number of small plants are expected to spring up within the next few months.

Local manufacturers in most metal working lines report a good volume of business and the outlook is encouraging. New orders with machine tool builders are light. Only a small number of foreign orders are being received. In the foundry trade conditions continue quite satisfactory. The light gray iron foundries are well filled with work.

The American Steel & Wire Company, through its purchasing department in Cleveland, has issued the following list of machinery requirements for its machine shops in connection with its new plant in Corey, Ala.

One gear head engine lathe, 48 in. by 22 ft., screw cutting, belt driven.
One 30-in. by 28-ft. screw cutting engine lathe, with taper attachment, belt driven.
One 30-in. by 10-ft. screw cutting engine lathe, belt driven.
One 20-in. by 10-ft. screw cutting engine lathe, belt driven.
One 16 in. by 6-ft. screw cutting engine lathe, belt driven.
One 14 in. by 6-ft. screw cutting engine lathe, belt driven.
One 34-in. by 10-ft. screw cutting engine lathe, with taper attachment, belt driven.
One 14-in. by 14-ft. speed lathe with lever feed, belt driven.
One 48 x 48 in. by 14 ft. variable speed planer, two heads on rail, one head on column, motor driven.
One 36 x 36 in. by 8 ft. planer, two heads on rail, belt driven.
One standard 72-in. boring mill with two heads on rail, motor or belt driven.
One horizontal boring mill, 63 in. by 8 ft., diameter of spindle, 5 in., motor driven.
One extra heavy 26-in. shaper, belt driven.
One extra heavy 24-in. shaper, belt driven.
One extra heavy 20-in. shaper, belt driven.
One extra heavy 14-in. shaper, belt driven.
One 14-in. shaper, heavy pattern shape, belt driven.
One No. 4 universal milling machine, belt driven.
One No. 3 universal milling machine, belt driven.
One plain milling machine, same size as No. 1½ Brown & Sharpe, belt driven.
One hand milling machine, same size as No. 2 Brown & Sharpe, belt driven.
One 48-in. spur gear cutter, belt driven.
One 1200-lb. steam hammer, single column.
One roll lathe, 36 in. by 24 ft., with two sets of housings, motor driven.
One necking lathe, 30 in. by 16 ft., motor driven.
One 20 x 96 in. grinding machine, with centers and housings to support roll necks for grinding both chilled and soft wire rolls, motor driven.
One 24-in. turret lathe, capacity 2½-in. bars, with attachment for making studs and mill machine parts, belt driven.
One 18 x 3 in. key seater, belt driven.
One 10 x 1 in. keyseater, belt driven, both for cutting key seats in hubs.
One pipe cutting machine, 2 x 10 in., with cut-off attachment, belt driven.
One pipe cutting machine, 1 to 4 in. capacity, with cut-off attachment, motor driven.
One 36-in. upright drill, belt driven.
One 26-in. upright drill, belt driven.
One 20-in. upright drill, belt driven.
One 30-in. upright drill press, motor driven.
One 16-in. heavy three-spindle drill press for 1¾-in. drills, belt driven.
One 72-in. half universal radial drill with tapping attachment, motor driven.
One bolt cutter, with dies and taps, capacity 2½-in. bolts and nuts, belt driven.
One 15¾-in. slotter to center 63-in. circle, motor driven.
One turret drill grinder.
One No. 8 arbor press.
Two 48-in. down draft forges.
One pressure blower, 8-in. outlet, belt driven.
Five double emery wheel bench stands, with 1¼-in. spindle with countershafts, belt driven.
Four double emery wheel bench stands, for wheels with 1½-in. face spindles, 1¼-in. in diameter, with exhaust attachment, belt driven.

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Two heavy power hack saws, belt driven.
One No. 4 exhaust blower.
One No. 4 pressure blower, belt driven.
Two grindstones, belt driven.

The National-Acme Mfg. Company, Cleveland, Ohio, has commenced the erection of a new plant in Montreal, Canada, and has about completed the building of a four-story addition to its Cleveland plant, 40 x 185 ft. This latter will be used for store and stock rooms, case hardening department, &c., and will enable the company to make considerable rearrangement of its present plant. Practically no new machinery equipment will be required. The company reports that it is still well filled with orders and that its plant is running at full capacity.

The Columbia Planter Company, Springfield, Ohio, has purchased a 3-acre site on East street, in that city, and plans to begin at once the erection of a new plant, 65 x 200 ft., for the manufacture of grain planters. The officers of the company are C. E. Patric, president and treasurer; Benjamin Beal, vice-president; J. J. Veasie, secretary.

The Cleveland Worsted Mills Company will build an addition to the boiler room of its Cleveland plant, plans for which have been prepared by Geo. S. Bider & Co., engineers, Cleveland. The plans provide for 2,000 hp. in boilers, contracts for which have not yet been placed. The building will be of brick and steel and will be equipped with coal bunkers.

Sealed proposals will be received by the Board of Trustees of the Athens State Hospital, care the Osborn Engineering Company, Room, 420, No. 20 Broad street, Columbus, Ohio, October 22, for a 22 x 80 ft. stand pipe, two 150-hp. horizontal tubular boilers and a system of steam and water piping for improving the water supply at the state hospital at Athens, Ohio.

The Bower Roller Bearing Company, which has been operating a plant in North Dayton, Ohio, has been dissolved, having sold out to a Michigan company of the same name, which is building a new plant in Detroit. The equipment of the Dayton plant will be moved to Detroit in December.

The Ohio Blower Company, Cleveland, which will largely increase its capacity by the erection of a new plant, has increased its capital stock from $50,000 to $150,000.

The Dayton Sure Opener Company, Dayton, Ohio, has been incorporated with a capital stock of $25,000, to manufacture hardware specialties. The company has established a plant in the Beaver power building. The officers are: J. V. Brumbaugh, president; F. M. Riethmiller, secretary and treasurer, and F. G. Feitshans, general manager.

Satisfactory reports regarding business conditions are made by the Standard Tool Company, Cleveland, maker of drills and reamers. Orders are coming in in fair volume and this company has kept its plant running full during the entire summer.

The Cuyahoga Mfg. Company, Cleveland, has been incorporated with a capital stock of $10,000 by William T. Bonnell, J. E. Rawson and others. The company plans to make a wire inner tube for automobiles and may establish a manufacturing plant.

Extensive additions and improvements have caused the Royal Rubber Company, Akron, Ohio, to take steps to increase its capital stock from $50,000 to $200,000. A meeting of the stockholders will be held October 22 to take action on the proposed increase.

The Wright Aeroplane Company, Dayton, Ohio, has commenced the erection of a manufacturing plant, 52 x 232 ft., of brick, steel and concrete construction. Other buildings will be added as the business grows.

On the application of A. H. Reeves, president of the Acme Boiler Company, Canal, Dover, Ohio, that company has been placed in the hands of Albert Graber as receiver. It is claimed that the company is insolvent.

The Defiance Machine Works, Defiance, Ohio, has added to its plant a two-story brick warehouse, 66 x 132 ft., which will be used for the storage of finished machines. The company has also replaced all of its out of date machines with new equipment, and is making arrangements to erect an L-shaped factory building, 50 x 182 ft. and 50 x 80 ft. This structure will be equipped with all the latest foundry appliances and the company expects to erect in the spring.

The Tyson Company, Canton, Ohio, has been incorporated with $75,000 capital stock, to take over the business of the firm of Tyson & Co., manufacturers of dairy appliances and ice cream machinery. The company is figuring on erecting a new plant during the spring of 1911, plans for which have not been worked out.

The Falls Rivet & Machine Company, Kent, Ohio, has been incorporated with $150,000 capital stock by Edwin Seedhouse and C. A. Weidner.

The County Commissioners of Cuyahoga County have finally decided not to build a power plant in connection with the new court house in Cleveland, for which bids were received some time ago. A contract has been closed with the Cleveland Electric Illuminating Company for the light, heat and power for the building.

Pittsburgh

PITTSBURGH, PA., September 27, 1910.

An increase in inquiries for machinery has been noted during the past week by some of the leading manufacturers and dealers of this district, with a somewhat heavier percentage of bookings than formerly. The improvement in industrial conditions is, nevertheless, not yet sufficiently general to warrant any strong statement on the subject, and in some quarters the immediate prospect is not regarded as very hopeful.

The principal difficulty seems to be that there is no snap to the market. Purchasing continues to be done piecemeal, as material or equipment are needed, rather than on the usual contract basis; and it is very little, if at all, in advance of actual requirements.

While buyers, however, hold to a waiting attitude, the same is true of the various sales departments and offices, whether representing large interests or small. There has been no disposition this fall to force the marketing of machinery or related lines of equipment, and prices are well maintained. A remarkable feature of the latter is, in fact, their uniformity. This can be plainly seen in the published bids on machinery for municipal power, pumping and filtration or sewage plants. Here the figures of competing manufacturers and contractors run very close together, even though originating in widely separated parts of the country. Exceptions to this occur, of course, but they have not been sufficiently numerous to more than prove the rule.

Taken altogether, the situation of current trade is such that it will respond quickly to any stimulating influence and yet would retrograde from its present position only under very strong pressure. Many believe that the market will hold about where it is until after the Congressional elections. Beyond that point few venture to prophesy.

Arrangements for the construction of a seven-story factory building, 95 x 154 ft., have recently been made at New Brighton, Pa., by the Standard Sanitary Mfg. Company, Pittsburgh.

Among orders from Mexico which are now being filled by the Westinghouse Electric & Mfg. Company, Pittsburgh, is one for a line of 40 induction motors to be installed in the ore reduction plant of the La Blanca & Anexas Mining Company, Pachuca, Hidalgo, Mexico, together with auxiliary apparatus.

The Duquesne plant of the Bessemer Coal & Coke Company at Bradenville, Pa., which has stood idle for a long time, is to be improved and operated again.

The Pittsburg Filter Company, Pittsburgh, will furnish two low service pumps and other equipment for the new water works system at Macomb, Ill.

Work is about to start on a new two-story shop building, 60 x 215 ft., at East Pittsburgh, Pa., for the Westinghouse Air Brake Company, the plans for which were recently completed by Miller & Milligan, Wilkinsburg, Pa. This will give the company additional facilities that are much needed at the present time.

The Platt Iron Works, Dayton, Ohio, has the contract for a pumping unit to be installed in connection with a filtration plant for Miles City, Mont.

Motors will be used for operating the machinery in the works of the United States Glass Company, Glassport, Pa., an addition to which is now under way, and current will be purchased from the Allegheny County Light Company, Pittsburgh.

The Pittsburg Testing Laboratory Company, Pittsburgh, whose need of increased facilities was recently mentioned, has let the contract for a new building.

The Erie City Iron Works, Erie, Pa., is filling a large order for boilers to be installed in the new city power and pumping plant at Clarksburg, W. Va., and has on its books numerous other contracts from municipalities in various parts of the country.

A new quarrying and crushing plant has been established by the Capital Stone Company, Columbus, Ohio, in which Felix Jacobs of the Kilbourn & Jacobs Mfg. Company is interested. As the property is developed considerable additional machinery will undoubtedly be required. The rock breaker already installed has a capacity of 800 tons daily.

Manufacturers of this vicinity will furnish equipment for a new two-story factory building, 120 x 510 ft., which the Angldile Mfg. Company, Elkhart, Ind., will use in the production of scales. Work on the plant has already started.

Some improvements are to be effected in the handling facilities of the United States Coal & Coke Company's plant at Gary, W. Va., including the replacement of wooden with steel tipples.

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Geo. S. Comstock, Mechanicsburg, Pa., is making numerous sales of his patented inclosed self-oiling air compressor, which is very compact and efficient for its size. It can be belted to any existing source of power or direct driven from a motor.

The Crestline Mfg. Company, Crestline, Ohio, has developed a pump for moderate capacities, which can be belted to an engine or other source of power and used to excellent advantage in factories or for any similar industrial service.

The Russell Machine Company, Twenty-eight street and Allegheny Valley Railway, Pittsburgh, has purchased 10 portable boilers, from 40 to 90 hp., and 10 hoisting engines, double cylinder from 30 to 60 hp. with about 48-in. drives, from the Conneaut Dock Company, Conneaut, Ohio, which will be sold in whole or part. Recent sales made by the concern include the following: Ellwood City Forge Company, Ellwood City, Pa., lathes, radial drills and cold saws; Pittsburgh Printing Company, Pittsburgh, 75-hp. Brighton gas engine; Keystone Tube Company, Connellsville, Pa., an 18 x 24 in. Atlas automatic engine; Perry Mfg. Company, Perryopolis, Pa., a 150-hp. Babcock & Wilcox water tube boiler.

The W. W. Patterson Company, 55 Water street, Pittsburgh, manufacturer of Patterson tackle blocks, either wood or steel and for manila or wire rope, reports that its business over the last four months shows an increase over each preceding month and its current business on heavy iron and steel tackle blocks is good. Its product is extensively used by the Carnegie Steel Company, Riter-Conley Mfg. Company, McClintic-Marshall Construction Company, American Bridge Company and other structural and bridge interests.

The S. Keighley Metal Ceiling & Mfg. Company, Locust street, Pittsburgh, has been awarded a contract for 192 Phoenix steel lockers, by the Pittsburgh & Lake Erie Railroad, for use in its club room at Haselton, Ohio.

The Bruce-Macbeth Engine Company, Cleveland, Ohio, builder of vertical multi-cylinder gas engines, announces that its rapidly increasing Pittsburgh business has made it necessary to open an office there. It is located at 1537 Oliver Building, and is in charge of W. N. Richey as local manager.

Detroit

DETROIT, MICH., September 27, 1910.

Manufacturers of automobiles, motor-wagons, trucks and parts are becoming increasingly active in the purchase of equipment, although their inquiries lately have been so scattered as to exert little apparent influence upon the market as a whole. For plants in which gasoline engines are the principal product, whether to be used in automobiles, with farm machinery, contractors' outfits or in general industrial service the tendency towards further expansion of shop facilities is especially pronounced. This is true not only among the manufacturing centers of Michigan, northern Ohio and Indiana, but also through the country at large, which looks to this section for much of its equipment in the line mentioned, owing to the experience that has been developed here. During the summer all of the large gasoline motor plants were much visited, and a great deal of information now being utilized elsewhere was picked up in these tours of local shops. In many cases the manufacturers who came here from a distance were invited to do so by leading machinery houses, and salesmen from the latter accompanied them on their rounds, with the result that tools seen in operation were mutually noted and subsequently ordered duplicated for the visitors' plants.

Sales of equipment for iron, steel, brass and aluminum foundries, which were expected to follow the lead of last spring, have been disappointingly small; but a number of manufacturers, jobbers and dealers have been doing fairly well in this line. The foundries themselves are also busier than they were in August, and before the approach of winter many of them will undoubtedly be in the market for considerable material.

The requirements of other metal working plants are comparatively light. The support of the entire market at present is chiefly from the general manufacturing field, where the production of staples of all kinds has become heavy.

The organization is reported here of the Crucible Steel Castings Company, Detroit, which has been incorporated for $10,000 by R. A. Bailey, Grace M. Bailey, L. A. Rosier and B. H. Mark.

The Marquette Commercial Club, Marquette, Mich., is reported to be back of a project to establish an automobile factory in that city, with a view of getting considerable of the business of the upper peninsula, where motor cars are now being extensively used for all purposes.

The construction of a new sawmill equipped with heavy machinery is being planned by the Hunter & Love Lumber Company, Newberry, Mich. It will be located at some distance from that place.

Geo. A. Marsh and Wm. L. January, Detroit, have organized the Buchanan Aeroplane Company.

The Northern Engineering Works, Detroit, has installed one of their three-motor traveling cranes, with 41-ft. span, in the plant of Adam Groth & Co., Joliet, Ill.

The Banting Machine Company, Toledo, Ohio, is about to add to its facilities for the manufacture of agricultural implements. The plans include a new building.

The Hudson Motor Car Company, Detroit, has increased its capital stock from $100,000 to $1,000,000.

A new boiler of larger capacity than the one now in service is being installed by the New Baltic Copper Company, Houghton, Mich., and an air compressor has been ordered. Additional machinery will be needed later on.

The Toledo, Port Clinton & Lakeside Railway, Toledo, Ohio, is installing automatic stokers in the furnace room of its engine-driven generating plant at Port Clinton, Ohio, originally equipped by the Allis-Chalmers Company, Milwaukee. The boilers were furnished by the Erie City Iron Works, Erie, Pa., and the new stokers are from the shops of the Underfeed Stoker Company of America, Chicago, Ill.

The electric power and lighting plant at Bronson, Mich., will be purchased by the community and improved.

No pumping machinery will be required this year for Grandville, Mich., as proposed, for the reason that a bond issue to cover the expense has been defeated.

The plant of the Lloyd Mfg. Company, Menominee, Mich., is to be doubled in the near future, and considerable additional equipment will probably be required.

It is probable that the woodworking plants of Forster Bros. Company, Munising, Mich., including a sawmill, which recently burned, will be rebuilt along somewhat different lines, but no definite decision in the matter has as yet been arrived at.

Machinery will be required within the next few months for two new buildings, 50 x 200 and 40 x 100 ft., to be added to the plant at Goodwillie Bros., Manistique, Mich.

The Wolverine Furniture Company has been organized at Holland, Mich., to operate a manufacturing plant.

Work has been started on the boiler making and repair plant of the new Lake Shore & Michigan Southern Railway shops at Elkhart, Ind., which will be 123 x 490 ft. This is the first of the units to be constructed.

It is reported from Houghton, Mich., that the Calumet & Hecla Company is planning the remodeling of its Osceola stamp mill. The underground pumps are also being gradually replaced with new motor driven units, supplied with power from the company's 7500-kw. electric plant at Lake Linden, Mich., and further changes of a similar nature will be made, necessitating the purchase of considerable equipment within the coming year.

It is rqeported from Bay City, Mich., that the M. Lamont Company has had plans drawn for a large new plant.

The Tittabawassee Power Company, Bay City, Mich., is stated to be arranging for the construction of one of the largest hydroclectric power plants in this part of the country.

The Board of Trade, Saginaw, Mich., through its Committee on New Industries, has been conferring with a representative of the Seeley Auto Engine Company relative to the establishment of a manufacturing plant there.

The Elmore Mfg. Company, Detroit, is preparing to treble its output for the coming year.

A new factory building is to be erected here this fall by the Michigan Crank Shaft Company.

It is stated that the Solvay Process Company, Detroit, will purchase, shortly, 50 heavy gondola cars for its own use.

From Wickenburg, Ariz., it is reported that the United States Sulphide Smelter Company, Toledo, Ohio, has been awarded the contract for the complete equipment of a new smelting plant to be erected there by the Monarch Mining Company.

A new power house of brick and steel construction is being completed for the Lake Copper Mining Company, Houghton, Mich., and the installation of boilers and an air compressor will be undertaken shortly. The hoisting units which it is planned to provide will not be required for some time yet.

The new foundry of the Dake Engine Company, Grand Haven, Mich., besides filling the company's own requirements, will undertake considerable custom work. It is equipped for the manufacture of both gray iron and brass castings, having the most modern facilities for efficiently and promptly turning out these parts.

The Hancock Mfg. Company, Charlotte, Mich., manufacturer of brass goods, has increased its capital stock from $30,000 to $100,000. The company will make extensive improvements, details of which have not been worked out.

The Michigan Pressed Steel Company, Ypsilanti, Mich.,

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manufacturer of sheet metal goods of all kinds, is erecting a new manufacturing building 60 x 200 ft., one story, which is now nearing completion. Practically all equipment to be installed has been purchased.

The City Council of St. Charles, Mich., will expend $14,000 for the construction of an electric light plant.

The Culver-Taylor Chain Works, 140 Madison avenue, Detroit, Mich., recently incorporated with $50,000 capital stock, will make wheel sprocket and transmission chains. The company now has in operation a toolroom and is in the market for punch presses, screw machines and crude oil furnaces for case hardening.

The Severance Tank & Silo Company, Lansing, Mich., is negotiating with the Lake Shore Railroad with a view to a lease of land along its tracks upon which it is contemplating the erection of a large new plant.

Plans have been completed for rebuilding the railroad car shops of the South Shore Railroad at Marquette, Mich., which were recently destroyed by fire. The new shops will be of larger size than the old, and it is understood that the work of construction will be commenced at once.

Indianapolis

INDIANAPOLIS, IND., September 27, 1910.

The Terre Haute, Indianapolis & Eastern Traction Company has plans prepared for the construction at Indianapolis of a power house to be erected in two sections, 94 x 160 ft. and 121 x 193 ft., which will be equipped with the following equipment: Two 8000-k.v.a., 13,200-volt, three-phase, 25-cycle Westinghouse Parsons turbines; two 25,000-sq. ft. Wheeler condensers, two 2000-kw. Westinghouse rotaries, 12 520-hp. Babcock & Wilcox boilers, with Roney stokers. The chimneys on the power house will be 18 x 295 ft., of radial brick construction, and will be built by the H. R. Heinicke Company of New York City.

The Ideal Mfg. Company, Anderson, Ind., advises that it will probably install some small size high speed drill presses in the near future.

The Cartwright-Stevenson Mfg. Company, Indianapolis, has been incorporated, with $10,000 capital stock, to manufacture mechanical specialties. The directors are E. E. Cartwright, C. E. Stevenson and A. J. Cartwright.

The Phillips Demountable Rim Company, Indianapolis, has been incorporated, with $30,000 capital stock, to manufacture vehicles and vehicle parts and attachments. The directors are James N. Crabb, William A. Zumpfe and John F. Messick.

The Electro Lighting Company, Indianapolis, has been incorporated, with $100,000 capital stock, to manufacture electrical machinery. The directors are William H. Harbison, S. C. Renick and C. C. Wedding.

The Bucyrus Vulcan Company has been incorporated at Evansville, Ind., with $600,000 capital stock, to manufacture excavating machinery. The directors are George F. Steedman, W. W. Coleman and H. P. Wells.

The Westcott Motor Car Company of Richmond, Ind., has increased its capital stock from $100,000 to $250,000. B. J. Westcott is president of the company.

The Kokomo Public Utility Company has been incorporated at Kokomo, Ind., with $10,000 capital stock, to operate a public utilities company. The directors are John B. Carter and L. J. Kirkpatrick of Kokomo and George J. Marott of Indianapolis.

The City Council of Connersville, Ind., has accepted bids for $20,000 of work on a new water works system which is to cost $40,000. Bids for the remainder of the work are held over.

The Riverside Electric Company, Lagrange, Ind., has been incorporated with $10,000 capital stock, to supply municipal lighting. The directors are J. C., W. H. and A. L. Cain.

Leo M. Rappaport has been appointed receiver for the Indianapolis Machinery Exchange of this city. The assets are placed at $20,000; liabilities at $8000.

The Fletcher Enamel Company, Anderson, Ind., has increased its capital stock from $50,000 to $75,000. U. G. Fletcher is president of the company.

New chilled grind departments and new paint shops are to be the latest additions to the plant of the Oliver Chilled Plow Works, South Bend, Ind. The former will be 240 x 260 ft. and the latter 80 x 340 ft. The improvements will permit an increase of the company's working force to 5000 men. It is expected the branch factory at Hamilton, Ontario, Canada, to cost $1,500,000, will be completed by January.

The plant of the American Car & Foundry Company at Jefferson, Ind., has begun shipping on a large contract of steel freight cars for the Chicago, Milwaukee & Puget Sound Railway Company. The cars are 60 ft. long and have the doors toward the front and back of the cars instead of in the middle.

The Bedford Stone & Construction Company, Traction-Terminal Building, Indianapolis, has secured the contract for an eight-story modern building for the William H. Block Company, dry goods merchant. The contract price is $450,000. It will be fireproof, 120 x 195 ft. It will have six passenger elevators, two freight elevators and a sidewalk lift.

The Bedford Foundry & Machine Company, Bedford, Ind., has been incorporated, with $100,000 capital stock, by E. A. Sohn, Joseph Krementz and Charles Sohn.

The City Council of Terre Haute, Ind., is considering the question of establishing a municipal electric light plant at a cost of $800,000, according to plans prepared and furnished by George C. Morgan, consulting engineer, 169 Jackson boulevard, Chicago.

The Sullivan Bridge & Supply Company, Sullivan, Ind., is erecting a one-story 48 x 72 ft. steel factory building and a one-story office building, 25 x 50 ft., which are expected to be ready for occupancy by December 1.

The Cole Motor Car Company, Indianapolis, has increased its capital stock from $100,000 to $300,000. The additional stock will be sold to present stockholders only. The output this year was 900 cars and contracts are in for the full output of 1911, which will be 2000 cars. President J. J. Cole says: "It is true, of course, that a few of the large automobile builders overproduced for the season of 1910. This has engendered conservatism and will result in a healthier condition than has prevailed the present year. One of the surest ways to correct the tendency toward 'wildcatting' in the automobile business is the stand taken by bankers, which will make it necessary for the manufacturer to sell to responsible dealers, who will contract only for a number of cars they can reasonably expect to sell."

Contracts have been awarded for new buildings for the Anderson Knife & Bar Company, at Anderson, Ind., to take the place of those recently destroyed by fire. The main building will be of brick and cement, 36 x 300 ft.

The De Witt-McIntyre Gear & Bending Works of Oakland City, Ind., has changed its name to the H. H. De Witt Company.

Milwaukee

MILWAUKEE, WIS., September 26, 1910.

A canvass of manufacturing plants in the leading industrial centers of Wisconsin shows a fair percentage of them running practically full time, and some factories are even crowded with work. Sales forces are being increased. Contracts long pending in various parts of the country are on the point of being closed, and the prospect files of machinery houses have recently been very carefully gone through, with the idea of following up business that was scheduled for fall or early winter. Power plant equipment, mill and woodworking machinery are among the best sellers at present, but factories in many diverse lines will be in need of a great deal of apparatus of all kinds during the next few months, and it is the future of this class of trade to which most attention is being devoted now. Metal working industries, strictly speaking, have not yet developed the purchasing power that was anticipated for this season of the year, and from present indications their requirements will be somewhat under normal all through the autumn months.

From the interior of the State there is considerable demand for second-hand machinery, particularly for equipping the small shops and factories that have sprung up within the past quarter. In the larger manufacturing cities, including Milwaukee, the tendency is in the opposite direction, very little machinery being considered that is not strictly modern and of the most improved type. The products of local establishments are also given preference to a greater extent than ever before.

As a consequence of the growth in its business and the shop and foundry facilities that have been added the Nordberg Mfg. Company, Milwaukee, has increased its capital stock from $1,225,000 to $1,550,000. The products of the company have been widely sold this year, often at a premium for proven economy in operation, and its prospects for the future are notably good.

While in Europe, Theodore O. Vilter, of the Vilter Mfg. Company, Milwaukee, will investigate the practical workings of industrial insurance in the countries where it has been tried.

The Allis-Chalmers Company, which has always devoted a great deal of attention to the training of apprentices in its foundries, machine shops and erecting departments, will still further perfect the system, having en-

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gaged Geo. L. Sprague, who had similar work in charge at the Dunkirk, N. Y., plant of the American Locomotive Company, to superintend the company's activities in that line.

A Corliss engine, 12 x 36 in., and a number of electric motors, blower, &c., will be required for the new plant which is to be occupied by the O. O. Storle Valve Company and the Willow Grass Rug Company, Green Bay, Wis. Other equipment, including a boiler, has already been secured.

The Gateway Steel Tank Company, La Crosse, Wis., has been awarded the contract for all of the sheet metal work on the new Federal building at La Crosse, Wis.

The enormous new ore reduction works of the New Jersey Zinc Company at Mineral Point, Wis., are now well under way, the brick work for the furnaces being in course of erection and two of the large ore bins completed.

The Bayley Structural Iron Company, Milwaukee, will furnish all of the ornamental iron work for the new city hall at Kenosha, Wis.

A test was made last week of the new gasoline traction engine invented by Geo. W. Morris, Racine, which pulled 10 Deere plows, each 14 in. wide, turning over a strip of land 140 in. wide and from 6 to 8 in. deep. It is reported that Mr. Morris, who was formerly superintendent of the J. I. Case Threshing Machine Company's works, will organize a company to manufacture the machine.

Advices from Sheboygan, Wis., which have not been directly confirmed, are to the effect that a high pressure pumping unit for fire protection service will be purchased by the Northern Furniture Company of that city.

A bond issue of $50,000 to provide funds for the construction of a municipal power and lighting station, will be voted upon in La Crosse, Wis., November 8.

The United States Government has contracted for motors to be installed in the wood testing and forestry experimental plants at Madison, Wis. They will be furnished from the works of the Sprague Electric Company, New York City.

The Gardner Machine Company, Beloit, Wis., will operate its new plant throughout by means of electric power, but will not install generating units, as satisfactory arrangements have been made with the local central station to supply current for the purpose. All of the motors needed for the present have been purchased.

A small motor driven pump is to be purchased in the near future by the city of Mineral Point, Wis.

A new box factory is to be built at Merrill, Wis., by John Heib.

Machinery for the new factory of the S. W. Miller Piano Company, including motors for electric drive, will not be bought for about three months. Arrangements for power will probably be made with the Sheboygan Light, Power & Railway Company.

The Crown Commercial Car Company, Milwaukee, has been organized to succeed the Meiselbach Manufacturing Company, which has a motor-truck factory at South Milwaukee. This represents principally a change of name, as the interests composing the two companies are practically identical.

The details of the power equipment of the new buildings of the Jacob J. Vollrath Mfg. Company, Sheboygan, Wis., have not yet been decided upon. Motors will probably be required, but it is uncertain, as yet, how far the electric system will be introduced.

Construction work will start early next month on a new office building for the Gisholt Machine Company, Madison, Wis., which is to be furnished with a steam heating plant independent of that supplying the shops.

Wisconsin manufacturers of hydro-electric machinery will probably be asked in the near future to submit plans and estimates for a power plant to be built by the Sterling-Moline Traction Company, Sterling, Ill., on the Rock River, near Lyndon, Ill.

A large contract for hydrants and valves to be used in remodeling and extending the water-works system at Waterloo, Wis., has been let to the Bourbon Copper & Brass Works Company, Cincinnati, Ohio.

It is reported that the Chicago, Milwaukee & St. Paul Railway Company has decided upon the construction of a water supply station at Corliss, Wis., including the erection of an elevated steel tank of 100,000 gal. capacity and the installation of a deep well pump.

The Filer & Stowell Company, Milwaukee, has in hand the contract for the complete machinery to be installed in a large new mill at Judson, N. C., of the Whiting Mfg. Company, Asheville, N. C., which will be the most modernly equipped of any in that section.

Contracts for the construction and equipment of a new power house, 40 x 50 ft., have been let by the Beloit Iron Works, Beloit, Wis. Boilers will be furnished by the Reliance Boiler Works, Oshkosh, Wis., an engine by the C. & G. Cooper Company and generator by the General Electric Company.

Additional concentrating machinery for zinc ore is being installed by the Peaceful Valley Mining Company, Cuba City, Wis.

The Cedarburg Box & Woodwork Mfg. Company has been organized to establish a factory at Cedarburg, Wis.

The Allis-Chalmers Company, Milwaukee, is working on the contract for the full equipment of the new mill which Lee Wilson & Co. are building at Wilson, Ark. This is notable not only for the thoroughly modern character of the machinery to be installed, but also for the fact that the buildings are of steel construction, a relatively new feature of sawmill practice.

More coal handling machinery will be needed within the coming year by the C. Reiss Coal Company, Sheboygan, Wis., in connection with new docks to be erected adjacent to to its present property.

The S. Freeman & Sons Company, Racine, Wis., has been awarded the contract for boilers to be installed in the new factory of the Kelley-Racine Rubber Company of that place.

Bids are to be taken shortly on a power plant, sprinkler system, &c., for the new six-story factory to be erected by the Phoenix Knitting Works, Milwaukee, the contracts for the construction work on which are about to be let.

A contract has been given the Wisconsin Bridge & Iron Company, Milwaukee, by the Menasha Woodenware Company, Menasha, Wis., covering the steel frame for a dry kiln to be operated in connection with its factory.

Arrangements have been concluded by the Mitchell Lewis Motor Company, Racine, Wis., for building a new boiler house, 48 x 65 ft.

The Christensen Engineering Company, Milwaukee, has made notable progress this season in the sale of its Badger type of gasoline engine, which is manufactured in sizes up to 65 hp. for stationary or portable service. A feature of this machine is the fact that all valves are in a vertical position, assuring even wear to the stems and perfect seating to the heads, and that they have been placed in removable cages, rendering them easily accessible without taking off the cylinder head. Other details, which are perhaps equally important, combine to make a very high grade machine of its class.

The Albert Trostel & Sons Company, Milwaukee, tanners, is rebuilding its four story building which was recently destroyed by fire. It will also construct an additional building 118 x 148 ft., one story, which will be equipped with dry kilns.

St. Louis

ST. LOUIS, MO., September 26, 1910.

Business has been rather quiet the past week in the way of orders placed, although there is considerable in prospect. Some machines have been sold for delivery in the neighborhood of New Orleans, and one dealer mentions the sale of a heavy machine for the St. Louis district.

The formal opening of the Illinois Traction System's new $3,500,000 bridge across the Mississippi, which is set for the middle of October, will give St. Louis superb service for both passengers and quick freight to all points on the Illinois Traction System, aggregating something over 600 miles of main line. This company is erecting a 12-story terminal building in the heart of the new retail district.

The big Western trunk lines radiating from St. Louis are making extensive improvements in their permanent way work and are going in for electric block signals quite heavily.

The inauguration of the through service to the Pacific Coast by way of the Missouri Pacific, Denver & Rio Grande and Western Pacific properties is bringing much new traffic through this gateway.

The National Clock & Electric Company, which makes a specialty of advertising clocks and dial thermometers for cooking stoves, &c., is preparing to remove into its large new plant in the new factory district on the outer belt line, and has been placing some orders for screw machines, drop hammers, sheet metal working machinery, &c.

The reorganization of the St. Louis Car Company seems to be about accomplished now and it is expected to have this big plant, which normally employs about 5000 men, going ahead in good shape soon.

The C. J. Shea Realty Company announces that a contract has been let to the Jenkins Construction Company to remodel the building at the corner of Eighth and Howard streets into a four-story factory for the T. L. Horn Trunk Company, now at 314 South Main street.

Joe Smith & Co. and L. J. Cohen & Co. of Kansas City, Kan., and A. Rubenstein of Kansas City, Mo., joint creditors of the Kansas City Foundry Company, have filed an application in the United States District Court asking that the latter company be declared insolvent and a receiver appointed.

THE MACHINERY MARKETS

The Garrison Mining Company, Webb City, Mo., has just installed a 100-hp. boiler and a 6-in. centrifugal pump and gas engine. Dexter & Co. are putting in a similar plant, and as soon as the ground is drained mining will begin. Both companies propose to build a mill.

The plans and specifications for the new shoe factory at Marshall, Mo., have been approved by the Citizens' Committee and put into the hands of the contractors.

George Joslin, Cassville, Mo., will erect an ice factory and creamery. The creamery will be of sufficient capacity to take all the butter fat in southwest Missouri and north Arkansas. The ice plant will be 5 tons daily capacity and will be built so that additions can be made to increase its capacity.

The city of Nevada, Mo., has granted a franchise for natural gas to W. C. Gunness of Fort Scott, Kan. The gas will be piped from Fort Scott.

The East St. Louis Oil & Gas Company of East St. Louis, Ill., has been incorporated. Capital stock, $20,000. The incorporators are R. J. McMurda, J. M. Harris and W. F. Rothe.

The Board of Public Improvements, St. Louis, Mo., will receive bids until October 7 for furnishing designs and plans for approval and furnishing and delivering and erecting in place at high service station No. 2 one 30-ton electric traveling crane, complete with all appurtenances, and for furnishing complete at the same station a steel crane runway and columns, with all necessary connections.

The Moline Pump Company, Moline, Ill., will remove to Ottumwa, Iowa, within 30 days. The Commercial Association of Ottumwa is raising a fund amounting to $20,000 as a bonus to this new company.

R. S. Walters & Co. have commenced the operation of a candy factory at Clinton, Iowa. The factory is located at 412 Front street.

The D. A. Chalmers, Washington, Iowa, grain elevator was destroyed by fire recently, the building having been struck by lightning. Both the building and contents were partially covered by insurance.

The Des Moines Clay Mfg. Company of Des Moines, Iowa, has increased its capital stock from $35,000 to $150,000. About $115,000 will be expended in enlarging the plant of the company on South West Seventh street.

The Fort Madison Reliable Foundry property, which has been the object of bankruptcy proceedings, has been sold at auction to Harvey J. Briggs of Quincy, Ill., for $9005.23.

The city of Audubon, Iowa, is advertising for bids, open until October 3, for the furnishing of all labor and material and doing all work necessary for the construction of a stand pipe upon a foundation about 23 ft. in diameter and 20 ft. high, of brick.

E. Buxton, R. Sloan, Charles Edwards and M. Gwundler, owners of the mines recently opened at Cave Springs, near Galena, Kan., will soon begin the erection of a 150-ton mill.

A. W. Shulthis of Independence, Kan., has applied to the City Council of Cherryvale, Kan., for a gas franchise for that city to run 20 years.

The town of Chanute, Kan., has voted $75,000 bonds to improve its water supply by laying larger mains, extensions and aerating and filtering the water. It is possible also that a larger filtration system may be put in.

The Lyons Milling Company, Lyons, Kan., will erect a fireproof warehouse, 40 x 70 ft., of steel and reinforced concrete. The company will arrange for the installation of an oil burning equipment. The entire improvement will cost upward of $10,000.

M. Busch of Oklahoma City, Okla., has removed to Potean, Ark., where he will erect an ice plant.

The Jones-Everett Machine Company, Ardmore, Okla., will install a foundry in connection with its machine shop. The new concern will be known as the Ardmore Foundry Company, and will be composed of M. W. Jones, C. H. Everett and Harry B. Traw. A 36-in. cupola, capable of handling 3,500 pounds at one charge, has already been contracted for, and work on the building has been started.

The State Board of Agriculture is contemplating the installation of an oil-burning plant at Stillwater, Kan., and will use oil in place of coal in the State institutions.

Work has been started on the new freight depot of the Missouri, Kansas & Texas Railroad at Muskogee. The main building will be 80 x 338 ft. to be built of steel and reinforced concrete. There will be eleven tracks leading into the depot yards. The new depot will cost upward of $135,000. Seven fireproof automatic doors are to be used in its construction.

The Oklahoma Public Service & Interurban Company of Stillwater, Okla., has been incorporated, capital stock $100,000. The company will build four lines out of Stillwater. The directors are: Harry L. Drullard, Harry G. Lytle, A. G. Lampone, Geo. W. Tucmer, Jr., Claude Powell and R. A. Sturgeon.

The Pawhuska (Okla.) Chamber of Commerce, has succeeded in locating a large window glass factory in that city. It will be thirty blower plant and cost $65,000. Construction will begin at once.

The Pawhuska Gin Company of Pawhuska, Okla., is erecting a three-stand cotton gin in the eastern part of the city.

L. Y. McFarland of Bartlesville, Okla., has been awarded the contract for installing a water works system at Havener, Okla., to cost upward of $50,000. The Kansas City Southern Railway has lately removed its shops to Havener from Mena, Ark.

The Southern Hay Press Mfg. Company, Silver Creek, Lawrence County, La., has been incorporated; capital stock, $25,000. The incorporators are Thomas M. Freeman, F. W. Ehman and others.

The Home Light & Ice Company, Cleveland, Boliver County, La., has been incorporated; capital stock, $10,000. The incorporators are J. R. Collins, E. J. Knott and others.

The car factory of Brown & Herliby, Denham Springs, La., was burned September 12, through an unknown cause. Loss, $50,000 to $75,000; no insurance.

The town of Shiner, Texas, has voted a bond issue of $8000 for the extension of the water works system.

The City Commission of Denison, Texas, has ordered a bond election to be held October 8 for the purpose of voting on an issue of $50,000 in bonds, the money to be used in putting in a pumping station at the new reservoir, together with a pipe line 3 miles in length to connect it with the present system.

The R. C. Lynn Machine & Foundry Company is building a new machine shop and foundry at Graham, Texas, and will remove to that city from Inooza City, Miss. The Commercial Club gives the site and pays all the expense of moving the plant. The foundry will be equipped for both cast iron and brass casting.

It is announced that T. P. Fay of the Jones Iron Company of St. Louis is contemplating establishing an iron foundry at Dallas, Texas.

The South

NASHVILLE, TENN., September 26, 1910.

While sales of machinery, material and supplies continue to fall somewhat below the expectations of dealers there is evidence that conditions have recently been shaping themselves for a very good trade later on. Inquiries are plentiful in most, though not all, of the principal centers of distribution, and the extent to which estimates are wanted shows that there are numerous projects, including shop and mill extensions or improvements, to be taken up and pushed to completion as soon as the situation warrants decisive action. Were it not for the general unrest of the country, resulting from political agitation, a strong buying movement would undoubtedly have set in by this time in all parts of the South, and shrewd observers believe that, being retarded, it is merely gathering head. Meanwhile manufacturers of some lines of equipment, such as boilers and power machinery, are already beginning to do a very satisfactory business.

The Wilson & Cochrane Company is putting into execution plans for a large manufacturing plant at Lottie, La., including sawmill, planing mill, shingle mill and lath factory.

The construction of a pumping plant for city service has been authorized at Rockmart, Ga.

The Broadway Mfg. Company, Knoxville, Tenn., is reported to be planning to build a large new factory, as the result of a consolidation with other interests which is to be effected.

The municipal power plant at Lakeland, Fla., which is now equipped with two alternating current generators of 120 kw., driven by Westinghouse vertical engines, is to be enlarged. The capacity of the city's pumping station may also be increased.

The municipal plant at Covington, Ga., which is equipped with a General Electric generator of 75 kw., driven by a Lane & Bodley engine, will be enlarged in capacity. The purchase of a new unit of 125 kw. is now under consideration.

It is reported from St. Augustine, Fla., that the plant of the St. Johns Light & Power Company, which is now equipped with three alternating current-generating units of 750 kw., built by the Allis-Chalmers Company, Milwaukee, will be acquired by new interests and considerably enlarged.

Structural material will be delivered shortly at Decatur, Ala., for the new shops of the Louisville & Nashville Railroad Company, which are to be pushed to completion this winter.

The North Alabama Rolling Mill Company, Sheffield, Ala., is strengthening its force and otherwise preparing for a busy season.

THE MACHINERY MARKETS

Construction has been started at Melbourne, Ky., on a new machine shop for the Chesapeake & Ohio Railway Company, whose plant there has, for some time past, been crowded beyond its normal capacity.

From Birmingham, Ala., it is reported, although without direct confirmation, that the Howe Company, Louisville, Ky., will establish a plant there for the manufacture of brass goods.

Two boilers of 150 hp. have been ordered from the Henry Vogt Machine Company, Louisville, Ky., this season, by the North Vernon Lumber Company. One of these was installed in the company's plant at Louisville, and the other will be used for the new mill at Dyersburg, Tenn.

The Montgomery Light & Water Power Company, Montgomery, Ala., is arranging to furnish electric current for operating motors to be installed in a hardwood mill at that place, which has been purchased by the C. W. Cromwell Company, Jackson, Miss.

It is reported, from what appears to be a reliable source, that shops for the manufacture of steel gondola cars and steel underframes for freight cars will be erected in the vicinity of Louisville, Ky., by the Louisville & Nashville Railway Company.

The Chattanooga Plow Company, Chattanooga, Tenn., which has added largely this year to the capacity of its plant, is busy on orders from all parts of the South and West, and a good foreign trade has been developed.

The Birmingham Safety Cut-Off Lever Company, Roanoke, Va., has been incorporated, with $150,000 capital stock, to manufacture a railway couple cut-off. The company will erect a plant at a cost of $20,000. The officers of the company are R. H. Woodrun, Roanoke, Va., president; J. P. Birmingham, Lexington, Va., vice-president, and R. H. Willis, Roanoke, secretary-treasurer.

Hugger Bros., Montgomery, Ala., have been awarded the contract for the erection of the Catawba Fertilizer Company's plant at Lancaster, Ala. The main building will be 173 x 240 ft., with storage tanks 20 x 106 ft. The plans also call for an office building, pump house and oil house, all to be equipped with up-to-date fire apparatus. The plant will be electrically driven and the most modern machinery employed in fertilizer manufacture will be installed. The capacity of the plant will be 200,000 tons annually. John F. Stephens is president of the company.

The Lee Street Terminal Company, Montgomery, Ala., is to be organized with a capital stock of $80,000 fully paid in. The officers of the company will be prominent business men. The company will be organized among other reasons for the building of tracks from the tracks of the Mobile & Ohio Railroad to Montgomery street, in the business center of the city. The right of way has already been purchased. It is stated that passenger trains will be brought over these tracks and a terminal built at the corner of Lee and Montgomery streets which will be used by three railroad companies.

J. F. Walker and associates of Birmingham, Ala., plan to establish a plant at Tuscaloosa for the manufacture of columns of gum cypress and poplar. The plant will be equipped with modern woodworking machinery and have a capacity of about 350 columns per day, complete with bases and caps.

Southern Texas

AUSTIN, TEXAS, September 22, 1910.

The machinery trade in Texas, New Mexico, Arizona and Mexico kept up remarkably well all summer, and the prospects are encouraging for a substantial increase in the demand for various lines of machinery and tools during the fall and winter. This is particularly true of factory machinery. Many new manufacturing plants are being planned. Orders for the necessary machinery for some of them have already been placed. The season for general repairs and rehabilitation of shops and factories is now fairly open and good orders for machinery come from this source. Texas particularly seems to have entered upon an era of wonderful industrial development. More manufacturing plants are in contemplation and actually under way in the State than at any previous time in its history. The fact that in Mexico Americans are rapidly obtaining control of the various lines of manufacturing industry serves to broaden the market for American made machinery in that country.

The extensive shops which the Santa Fé Railroad is preparing to erect at Sweetwater, Texas, will call for the purchase and installation of a large amount of machinery and tools. Sweetwater is to be made the division point on the new 310-mile cut-off line which the Santa Fé is constructing between Texaco, on its transcontinental line, to Coleman, on its Gulf division. It is stated that the plans for shops, terminals and other improvements at Sweetwater call for the expenditure of more than $1,000,000 by the road in question.

The City Council of Georgetown, Texas, has issued an order for an election to be held October 17 to vote on the proposition of issuing $45,000 bonds, of which $32,000 is to be for water works and $13,000 for the electric light plant.

J. C. Houston, Floresville, Texas, is in the market for machinery for a 15-ton ice plant that he will erect at that place. He expects to have the plant ready for operation by next spring. Part of the output will go to ice vegetable shipments originating in that section of Texas.

P. A. Gorman, Street Commissioner of Waco, Texas, is conducting negotiations with a syndicate which proposes to install a new electric light and power plant and construct an electric street railway system in that city. Mr. Gorman has not yet divulged the names of the parties interested in the project.

N. J. Hitz, San Benito, Texas, is promoting the erection of a vegetable canning factory at that place. Associated with him in the project are Madison, Ind., men. The proposed plant will cost about $60,000.

An election will be held in Burnet County, Texas, October 22, to vote on the propostion of issuing $18,000 bonds for the purpose of erecting two bridges across the Colorado River. A like sum will be expended for the same purpose by Llano County, as the proposed bridges are to connect the two counties. The Board of County Commissioners of Burnet County, Burnet, has charge of the matter.

The city council of Rogers, Texas, has ordered an election to be held October 18, to vote on the proposition of issuing $14,000 bonds, the proceeds of which shall be used in constructing a water works system.

An issue of $11,000 bonds for improving the water works system of Belton, Texas, will be voted on by the people of that place on October 18.

James Harrington, Texarkana, Ark., who recently purchased 3,500 acres of coal land near Carbondale, Texas, including a fully equipped mining plant, will install additional machinery and also erect coke ovens and a brick manufacturing plant.

An election has been ordered by the city council of Ballinger, Texas, October 16, to vote on the proposition of issuing $20,000 of bonds for extending the mains and otherwise improving the water works system of that town.

The Border Gas Company, Laredo, Texas, has a large force of men at work laying the natural gas-pipe line that is to run from the gas field at Reiser to Laredo, a distance of 30 miles. Shipments of pipe for the proposed line are being received. The company also holds a franchise from the city of Laredo for laying a distributing system upon the principal streets. It has under consideration the construction of a gas-pipe line to San Antonio, 150 miles, and another one to Monterey, Mexico, about 160 miles. It owns a number of large gas wells in the Reiser field.

J. T. Cameron of El Paso has been granted a permit by the city council to erect a large meat-packing plant in that city.

W. F. Tappan of Worcester, Mass., has taken preliminary steps looking to the erection of a plant at Orange, Texas, for the manufacture of a breakfast food from rice.

According to an unconfirmed report The Texas Company, which has its headquarters at Houston, has in contemplation the laying of an oil pipe line from the new oil field at Toyah, Texas, to El Paso, about 160 miles.

The Holland-Texas Irrigation Company will install about $20,000 worth of machinery at its irrigation plant near Cotulla, Texas. T. N. Picnot of San Antonio is at the head of the company.

The Mexican Northern Power Company, a subsidiary concern of the Conchos River Agricultural & Electric Power Company, which has its principal office at Montreal, Canada, is making good progress in the construction of its great hydroelectric plant and irrigation system upon the Conchos River, 19 miles from Santa Rosalia, State of Chihuahua, Mexico. The English firm of S. Pearson & Son, which has offices in London and the City of Mexico, has the contract for the construction of the large dam across the Conchos River and for the installation of the hydroelectric plant for the company. The initial capacity of the hydroelectric plant will be 40,000 hp. It is planned to increase this later on to 90,000 hp. Power transmission lines will be built to the cities of Chihuahua, Parral, Santa Eulalie, Jiminez, Santa Barbara, Santa Rosalia and a number of other places within a radius of 150 miles. The irrigation system will furnish a water supply for the reclamation of 250,000 acres of land. The plans for this great enterprise call for the expenditure of about $20,000,000 gold. G. F. Greenwood, Montreal, Canada, is superintendent of the Mexican Northern Power Company.

The Compania Minera Agustias Dolores y Anexas of Pozos, State of Hidalgo, Mexico, has completed the installation of an electric power plant and other equipment.

Lon Hill, owner of the Harlingen Land & Water Com-

pany and the townsite of Harlingen, Texas, has placed orders for machinery for a 400-ton sugar mill that he will erect at Harlingen. The mill will have a daily capacity of 400 tons of cane.

The large double pumps of the irrigation plant of the Mission Land & Improvement Company near Mission, Texas, which were recently installed, were given a test and found to work satisfactorily.

The Valley Reservoir & Canal Company, Chapin, Texas, which is constructing a large system of irrigation in the valley of the Rio Grande, will soon place an order for machinery for a large pumping plant. It will be located where the canal intersects with the reservoir.

John H. Davis and T. A. Austin, Laredo, Texas, have had plans and specifications prepared for an ice factory and cold storage plant that they will erect at that place. Bids will be asked on the machinery needed. The proposed plant will cost about $75,000.

The Tyler Commercial Club, Tyler, Texas, is in receipt of a proposition from the J. L. Wortham Construction Company of Beaumont, Texas, whereby it proposes to construct an electric railroad from Tyler to Paris, Tex., and to establish machine and repair shops at Tyler, in consideration of a bonus of $300,000 upon completion of the road. The proposition is now under consideration and it is believed that a favorable decision will be reached.

The Calvert Water, Ice & Electric Lighting Company, Calvert, Texas, is preparing to erect an addition to its plant.

It is reported that the water works of Shine, Texas, will be improved at a cost of $8000.

The City Council of Belton, Texas, has decided to enlarge and improve the water works system and has ordered an election to be held October 18 for the purpose of voting on an issue of $11,000 in bonds, the proceeds to be used in drilling a new artesian well and enlarging the capacity of the standpipe.

Toronto

TORONTO, September 25, 1910.

The demand for factory equipment and other productive plonts continues to reflect the growth of the country, though in a way to indicate that the growth has been more nearly caught up to than it evidently was at the same time last year. Canadian towns are still springing into existence on what were previously blank townsites, and the new towns call for works of various kinds, such as brick making industries, lumber dressing factories and other industries contributing to town building. Town expansion goes on, too, and calls for new industrial developments, but the pace is soberer. Municipalities' credit is still good and the issue of debentures continues to be rather copious, more or less of the money being expended on such outfits as fire fighting appliances, pumping works, public lighting plants, &c. Private enterprise is also healthy and money seems not to be lacking to carry out changes on large or small scale. It is always to be kept in mind, however, that Canada has done a tremendous amount of fitting up in the last year or two.

The ratepawers of Merritton, Ont., are to vote September 30 on a by-law providing for the fixing at $100,000 of the assessment of the Independent Rubber Company, which has been formed to manufacture rubber boots and shoes. The company undertakes to employ 300 hands and to pay out not less than $100,000 in wages every year after the first. Mr. Robinson, the president, stated at a public meeting of the ratepayers this week that the machinery for the plant will be obtained at once.

The machinery for the power distribution plant the municipality of London, Ont., is installing is not coming forward as fast as it was expected, and there is some doubt that the power station will be completed by December 1, as was planned. It is expected that the pumping machinery will be in place in a very short time. The motors have not yet arrived, but they will be ready for service by November 1. Nearly the whole of the construction work is now finished, and with the setting up of the machinery the plant will be finished.

The great grain elevator plant the Canadian Pacific Railway Company has been at work upon for many months at Victoria Harbor, the Georgian Bay terminal point of its new trans-Ontario link in its through route for Western grain, is expected to be ready to receive the first lake shipments early in October. The Canadian Bridge Company of Walkerville had the contract for the steel work, which is just completed. The motive power instalment is also practically finished. Officials of the Canadian Pacific Railway Company tested the work a few days ago, Mr. Christie of the Westinghouse Company starting the turbines.

The Canada Steel Company, which was incorporated last spring, to do business in Ontario, has decided to establish its works in Hamilton. For a time it seemed probable that Welland would get the industry, a free site having been offered by that town. The company proposes to put up and equip works to cost $400,000 and to employ 300 men. The men who are at the back of the undertaking are for the most part of Montreal and Toronto. They are not of the group who are uppermost in Hamilton's steel, power and traction interests. F. W. Baillie, of the Toronto financial firm, Baillie, Wood & Croft, is president. R. M. Bertram, formerly president of the Bertram Shipbuilding Company, Toronto, is vice-president. W. M. Currie, formerly chief inspecting engineer of the Hamilton Steel & Iron Company, is to be manager. Bedstead angles, light structural angles, agricultural shapes of all kinds, concrete bars, light plowbeams, sleigh shoes, &c., will be rolled from rail scrap. The rails will be broken up, heated and passed through rolls, which will split them into three pieces—the head, webb and flange. Electrical power will be used for the operotion of the plant, and for that purpose special machinery will be designed. Hamilton being an important industrial center, favored by cheap hydroelectric power, and being an important railroad point toward which worn out rails drift, is deemed a very suitable spot for the industry. The plant is being designed by one of the leading engineering firms in Pittsburgh. The mill will be in a structure of steel concrete and currugated iron 70 x 250 ft. There will be a number of other buildings. It is stated that later the company will add a tube mill.

The Water Commissioners of Welland, Ont., are calling for tenders for the supply of 2000 ft. of 6-in. and 2900 ft. of 14-in. cast iron water pipe, and specials therefor; also 300 ft. of 14-in. flexible pipe for crossing the canal.

In Montreal the Canadian Pacific Railway Company is enlarging its Windsor station at a cost of between $2,500,000 and $3,000,000, and is enlarging and improving its terminal at the Place Viger station at a cost exceeding $1,000,000. The Grand Trunk Railway Company is arranging for the elevation of its tracks from St. Henri to Bonaventure station at a cost that may run to $6,000,000. The Canadian Northern Railway Company is negotiating for the purpose of clearing the way for an up to date station and freight sheds in the heart of the city and will probably spend thereon as much as $5,000,000. The Grand Trunk Pacific Railway Company's terminal projects in Montreal are rather farther in the future, but they will be very large. On the water front the Harbor Commissioners are planning an expenditure of $6,000,000 to spread over the next three years.

The Cleveland Bridge & Engineering Company of Darlington, England, and the Metropolitan Amalgamated Railway Carriage & Wagon Company of Birmingham, England, have obtained incorporations in Canada as the British Empire Bridge Company, the capital stock being $5,000,000. The new company is understood to be one of the tenderers for the construction of the Quebec bridge.

The Canadian Tube & Iron Company of Montreal has been incorporated with a capital stock of $1,000,000.

The Niagara, Welland & Lake Erie Railway Company is applying to the Dominion Parliament for power to construct an electric railway line from Niagara Falls, N. Y., to points on Lake Erie between Fort Erie and Port Dover, via Welland and Port Colburne.

The Bullen Company, ship repairer, Vancouver, B. C., has applied to the Canadian Minister of Public Works for a subsidy for a drydock of the first class. It is to be located at Esquimault. It is believed that the company has associated itself in the enterprise with a large British shipbuilding firm. An expenditure of $3,000,000 is to be involved.

The prospectus of the Port Arthur Wagon Company has been published. In this it is shown that the company has in hand large contracts with several imoprtant concerns, such as the John Dure Plow Company and the Tudhope-Anderson Company.

The construction at Belleville of what is said to be the second largest roundhouse in Ontario is expected to be completed for the Grand Trunk Railway Company within the present year. The work, which was begun in August, is in a forward state. It is to contain 42 engine stalls. There is to be an 80-ft. turntable. There are 350 men at work on the structure. The company's old machine shop is to be demolished and a new one, 50 x 200 ft., is to be put up near the roundhouse entrance. A thousand carloads of material have already been used in the construction.

The Canadian Board of Railway Commissioners has ordered the Canadian Pacific Railway Company to build a subway at Broad street in Regina that will be the largest work of the kind in the West, if not in all Canada. It is to provide for the carrying of 19 tracks.

The Industrial Commissioner at Port Arthur, Ont., has received a telegram from Robert Greig of the Port Arthur Enamel Works, dated at New York, to the effect that Mr.

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Greig had been busy in the latter city for a whole week in regard to machinery and buildings for the plant, and that much larger works were being planned than those contemplated at the outset.

Several of the manufacturers in Gananoque, Ont., have improved their works in the past summer, auxiliary steam plants being installed in some instances in order to be forearmed against a momentary failure of water power in time of low water. The Jones Mfg. Company, Skinner & Co., Cowan & Britton and the Spring & Axle Company have more than doubled their power resources.

The Collingwood (Ont.) Shipbuilding Company has a prospect of a busy winter. A new freighter now on the stocks is to be launched late in October or early in November. Some of the large freighters will be sent to the company's yards for repairs. The company has just closed a contract for the lengthening of the Canadian Pacific Railway steamer, the Alberta. The rebuilding of the whaleback Trevor is also to be done at the company's works.

The shops the Grand Trunk Pacific Railway Company is building at Winnipeg are to be on a very large scale. Several huge structures have been erected in the 14 months since the work of construction began; 42,000 tons of concrete have been built in, 4,200,000 bricks, 250 carloads of steel, $35,000 worth of copper, and 256 carloads of such articles as piping, radiators, tanks, contractors' plant, tarpitch lumber, &c. The locomotive shops are 184 x 823 ft. and 75 ft. high. The frog and track shop, near completion, is 60 x 100 ft. The frog shop is 100 x 250 ft. The power house is 110 x 150 ft. The chimney, which is of reinforced concrete, and has an inside diameter of 11 ft., is 211 ft. high. The gray iron foundry, a building 200 x 250 ft., is a structural steel frame. There are 13 buildings for which the contracts have not yet been let.

The Tobin Arms Mfg. Company of Woodstock, Ont., has completed arrangements for the purchase of the plant, patents, tools, materials, manufactured product and other assets of the Caldwell Bit & Tool Company of Port Rowan, Ont. The Tobin Company is arranging to extend its works.

The by-laws submitted to the ratepayers of Woodstock, Ont., to authorize the bonusing of the Canadian Linderman Machine Company and the Fibre Board Folding Package Company received almost unanimous support, and the industries will accordingly be established. The product of the Linderman Machine Company is a dovetail glue joining machine, to sell at prices ranging from $3000 to $5000. The company is made up of parties from Muskegon, Mich. Machinery to the value of $30,000 is to be put in the Woodstock factory.

The ratepayers of Welland approved a by-law authorizing the raising and expending of $52,000 for the improvement of the town's water works.

Negotiations are still on foot between the Industrial Commissioner of Brantford, Ont., and parties in Detroit for the establishment of an automobile factory in the former city.

According to figures given out by the Industrial Bureau of Winnipeg, Man., the annual manufacturing output of that city has doubled in the last five years. The value of the output in the last year is given as $40,000,000, as compared with $18,875,000 in 1905. J. P. Given of Chicago has informed the bureau that he hopes very soon to have a plant in Winnipeg for the utilization of flax straw.

T. McAvity & Sons of St. John, N. B., are considering plans to establish brass works at Port Arthur, Ont., and Montreal. A site was secured some time ago in Port Arthur, but the land is needed by the G. T. P. Railway Company, and another lot twice as large has been offered the company. A long term option has been secured by the company on a site in Montreal. Whether this will be taken up and a factory established there by the company is said to be dependent on the success of the company in securing certain large contracts figured on. If the company builds in Montreal the works will be large enough to employ 500 men. Also a site for large works in St. John is being sought by the company.

A new machine shop is in process of construction for the Canadian Pacific Railway Company at Medicine Hat, Alberta. It is to be equipped with the most up to date machinery, adequate for handling the largest repair work. Heavy repair work for railway equipment on the part of the line between Calgary and Moose Jaw will no longer have to be sent to the Winnipeg shop after this Medicine Hat plant is ready for operation.

Engineers are at work making surveys in connection with the Canadian Collieries (Dunsmuir) project for the development of 50,000 hp. of hydroelectrical energy on the Puntledge River in the center of the Comox coal field, Vancouver Island. About a year will be spent and about $1,000,000 will be laid out on this work. The power will be used to operate a system of compressed air haulage in the mines and in running the various plants connected therewith, as well as for traction purposes on the 14-mile railway connecting the various collieries with the ore bunkers at Union Bay.

Speaking of the economic effect the Hudson Bay project the Canadian Government has in hand, Mr. Butler, general manager of the Dominion Steel Corporation, who was formerly Deputy Minister of Railways, said that there is room in the West for 30,000 or 40,000 miles more of railroad than that part of the country now has, and that this additional mileage will be built within a reasonable time. The Hudson Bay Railway will, he considers, give the rails and other products of the Dominion Steel Corporation a cheap and short way into that railroad building region.

The contract for constructing the new aqueduct intake at Point St. Charles has been awarded by the Montreal Board of Control to Lemoine & Son and L. A. Desy, their tender being for $155,000.

The Hamilton-Lewitt Company, which is establishing itself in Amprior, Ont., is to employ 50 hands.

The Hawthorne Silver & Iron Mines Company has been organized to develop iron ore deposits tributary to the Kingston & Pembroke Railway line. The company owns 70,000 acres of land. It will ship ore for a time and proposes to manufacture pig iron in Kingston in the not distant future.

The Ontario Iron & Steel Company of Welland last week turned out a wheel of 12 tons weight. This is said to be the largest casting of the kind ever produced in Canada. It was made for the Allis-Chalmers Bullock Company of Montreal.

The Board of Governors of the Kingston School of Mining finds it impossible to award contracts for the erection of the Nichol Building for mining and metallurgy, owing to the high level of the tenders.

Mr. Plummer, president of the Dominion Steel Corporation, says that the company never went into a winter with better prospects in the way of orders for business.

The Dome Mining Company will install 40 heavy stamps, crushers and a cyanide plant as soon as the roads into the Porcupine country will permit of winter travel. The Porcupine gold region of northern Ontario promises to be a field in which a large amount of plant will be necessary for the operation of the mines. It is not a poor man's country, as the surface deposits led people to name the Cobalt district. There seems to be a widespread gold area in the Porcupine, but it will have to be worked by capital freely invested in plant.

Representatives of the 34 Ontario municipalities committed to undertakings to bring electrical energy from the Hydro-Electric Power Commission of the Province met the chairman of the commission at London, Ont., and ready to consider the application of Windsor for 15,000 hp., 12,000 or 13,000 of which the town would dispose of to Detroit. The convention decided in favor of granting Windsor's request, upon the conditions that the export service should be terminated on reasonable notice, and that the profits made on the electricity furnished to Detroit be divided among all the municipalities in the power league.

The Dominion Stove & Foundry Company, Ltd., Penetanguishene, Ont., has been incorporated with $250,000 capital stock, by Charles Beck, Dennis A. Lahey, Charles E. Wright and others.

Interior Canada

WINNIPEG, September 22, 1910.

There never was so heavy a demand for structural steel in this part of Canada as this season. Building operations have made new records, and an unusually large number of warehouses is being erected. The advent of the Grand Trunk Pacific Railway to western Canada has necessitated the construction of quite a few bridges, and several more have to be put up. Practically all the work so far has been on the main line, but in the future, like other roads, many branches will be built and here and there bridges of big dimensions will be required. Manufacturers of structural steel are looking forward to increasing business in western Canada, as the country is still young and is bound to be developed.

The iron and steel works here, although still in their infancy, are growing rapidly and some surprisingly large contracts have been undertaken by them this year. They are adding new equipment all the time, but of course are not able to handle the volume of trade in their line in the west. Train load after train load of material comes from the east and south, and several millions worth of machinery and frame work of all descriptions comes in from the United States every year, and this has been a specially brisk year in that connection.

The crops have turned out better than was expected a couple of months ago, and that, together with the enormous

amount of money being brought in by capitalists and settlers, makes money plentiful, and business men report the financial situation very satisfactory. In some parts where, the crops were damaged by drouth in the month of June the season's work on the farm has been somewhat discouraging, but it so happens that it was the older districts that suffered most, and as the farmers there have been accumulating for years they do not suffer as much from a bad crop as the new settlers do. Manufacturers and wholesalers are quite satisfied with the situation, and it is anticipated that industrial development will be greater next year than in any former season. This is particularly a big field for farm machinery, and it is stated that manufacturers are working overtime to supply the demand from all parts of the country. This is likely to be the case for many years, as the country west of the Great Lakes is being settled rapidly.

A company composed of leading business men has been formed in Winnipeg, to be known as the Western Steel & Iron Company, Ltd., with a capital of $300,000. The company's special line of work has not yet been announced.

A party of English capitalists is preparing to erect a large hotel in Saskatoon, Sask. A site has been purchased for $60,000, and it is said that the building will cost about $250,000.

The Winnipeg Steel Culvert Company, Ltd., with a capital stock of $60,000, and headquarters in Winnipeg, has been incorporated.

The roof, most of the machinery and a considerable part of the building of the Western Iron Works, Elmwood, Winnipeg, was damaged by fire recently.

The Port Arthur authorities are trying to induce William McKenzie, president of the Canadian Northern Railway, to establish a foundry there, to use the pig iron manufactured at the plant of the Atikokan Iron Works.

The Shell River Lumber Company is building a mill at the west end of Prince Albert, Sask. It will have a capacity of between 30,000 and 40,000 ft. per day.

McLaren Bros., proprietors of the Strathcona Hotel, Winnipeg, are erecting a seven-story hotel on Main street.

McKinnon & Clarke, proprietors of the foundry at Cranbrook, B. C., report a busy season, the saw mills in the Crow's Nest Country having operated steadily since early spring. The company makes a feature of manufacturing a saw guide that has established a good reputation.

The authorities of Medicine Hat, Alberta, are talking of replacing all wood pipes with iron pipes. A by-law to that effect has been carried there.

A Winnipeg firm has secured the contract for the Canadian Northern Railway roundhouse at Port Arthur.

The J. McDermid Company, Winnipeg, is working on the contract for the Canadian Pacific Railway machine shops at Kamloops.

The Southwest

KANSAS CITY, MO., September 26, 1910.

The machinery trade of the Southwest, although improving, is still very irregular. Many of the orders recently entered have developed from inquiries made some time ago, and they originate largely at points distant from the centers of population where new industries are being opened up or other development work is in progress. Steam, gas and gasoline or oil engines, electric generators, motors, transformers, pumping outfits, hoists, air compressors, drilling rigs, crushing, mining and ore treating machinery constitute the lines most in demand. For sawmills and plants manufacturing or utilizing various wood products some equipment is being purchased, and from the general industrial field, including factories and machine, boiler, tank or fabricating shops, there are scattering orders for standard apparatus.

Local representatives of Eastern machinery houses have been figuring on the equipment of a large new factory and power plant to be erected in Kansas City by the National Biscuit Company.

An elevated steel reservoir to hold 333,000 gal. will be erected before long in connection with the city water system at Ft. Worth, Texas.

Work has been commenced on an addition 25 x 150 ft. to be made to the power plant of the Metropolitan Street Railway Company, Kansas City, in order to provide room for the installation of additional boilers and other equipment.

The Bisbee Improvement Company, Bisbee, Ariz., which is now operating an electric generating plant equipped with steam turbines, 800 kw. capacity, has had plans drawn for an enlargement of its facilities, with a view to supplying mines and other communities in the vicinity.

The Chicago, Rock Island & Pacific Railway will build a new roundhouse and install some repair equipment at Hot Springs Junction, Ark.

W. J. Benjamin, J. J. Laubach and others of Las Vegas, N. M., are organizing a company to erect a large hydroelectric power plant on the Rio de La Casa, the franchise for which has already been granted by the local authorities.

One of the Gates gyratory crushers ordered for its new plant is now being installed by the Ray Consolidated Mining Company at Ray, Ariz., and additional machinery will follow as soon as the facilities can be provided.

A combined electric power and refrigerating plant is to be built for the municipality at Pryor Creek, Okla.

Machinery for a municipal pumping station is to be purchased in about a month at Paris, Ark.

James T. Gates, Wagoner, Okla., has drawn plans for a pumping plant and system of water works at Haskell, Okla., the equipment of which includes an elevated steel tank, boiler and two steam pumps of moderate capacity.

J. A. Ritzler, Kansas City, has begun the erection of a new two-story tin shop, 30 x 115 ft.

An electric power plant is to be built by the Greenville Railway Company, Greenville, Texas.

A new hoisting unit of large capacity is to be installed by the Mildred Mining Company, Stanton, Ariz. An ore crushing plant equipped with 10 stamps is now being erected and other improvements are to follow.

It is reported from Phoenix, Ariz., that the Phoenix Street Railway Company, as a result of the success which it has had in building cars in its own shops, may enlarge the latter and install additional machinery.

A 250-ton ore reduction plant is to be erected by the Cinco Mines Company, Hostotipaquillo, Jalisco, Mexico.

Machinery for a new pumping plant is being installed by the Arkansas & Arizona Mining Company, Jerome, Ariz., and other improvements are to follow.

E. R. Smith, Stephens, Ark., will install an electric light plant to be operated in connection with the Stephens Canning & Mfg. Company, of which he is the owner.

The City Council of Exeter, Mo., is considering the installation of a water works system.

The Tulsa Corporation, Tulsa, Okla., will install a 500-kw. alternating current generator, to be driven by a turbine engine, two boilers of 500 hp. each and condensers.

The Arkansas Heating Company, Little Rock, Ark., has been incorporated, with $25,000 capital stock, for the purpose of manufacturing an oil gas burner invented by W. L. Slater and to do a general plumbing business, as well as carrying a full line of plumbing, heating and gas supplies. The company is now in the market for some 300-gal. closed steel tanks, with working pressure of 120 lb.; 10,000-gal. open tanks for supply purposes, hot water systems, hot air systems, bathroom and toilet fixtures, and a full line of plumbers' supplies, air compressors, single phase 1 and 2 hp. motors and three-phase 2-hp. motors. The officers of the company are Charles E. Adams, president; E. J. Slater, secretary; W. A. Slater, manager.

The Imperial Heater Company, Kansas City, Mo., has been incorporated, with $100,000 capital stock, by W. Z. Flannery, R. L. Wilder, George B. Cushman and others.

The municipality of Hamburg, Ark., has awarded to W. J. Kennedy, St. Louis, Mo., a general contract for installing a water works and electric light plant. The equipment will include a 50,000-gal. tank, which is to be 125 ft. high.

The Northwest

MINNEAPOLIS, MINN., September 26, 1910.

Increased buying of equipment on the part of Northwestern railroads, even though mainly in small lots at a time, and a better volume of inquiries from industrial concerns generally are features of the present trade situation that bring encouragement to manufacturers and dealers. Information as to new enterprises or development comes principally, however, from the more remote districts, notably in the West, and the largest orders for machinery still originate there, whether for the account of the mining, ore reduction, power, irrigation and lumber companies, or of the communities that have grown up around these several operations.

The Otter Tail Power Company, Fergus Falls, Minn., which operates a hydroelectric plant of 600 kw. equipped with General Electric generators and the S. Morgan Smith Company's turbines, will establish an auxiliary steam power plant at Wahpeton, Minn. Further particulars have not been made public.

A steam heating and electric power plant is included in plans for a new institutional building at Redfield, S. D., bids upon which will be taken by the architect, August Schwenn, Madison, Wis.

A steel tank of 50,000-gal. capacity, carried on a 100-ft. steel tower, together with a deep well pump of moderate capacity and other equipment will be purchased by the city

of Bradley, S. D. Bids are to be taken until October 5 and construction work pushed to completion this fall.

A steam turbine power plant will be installed in the new timber cutting mill at Elk River, Idaho, that is under construction by the Potlatch Lumber Company, Potlatch, Iowa, and all of the machinery operated by means of electric motors. The entire mill was designed by W. A. Wilkinson of Minneapolis, Minn.

The contract for the engine to be installed in the new municipal power plant at Miles City, Mont., has been awarded to Whiteacre & Co., St. Paul, Minn. The electrical machinery will be furnished by the General Electric Company, Schenectady, N. Y.

L. U. Loomis, Philipsburg, Mont., who has control of two of the mines in that vicinity, is installing a new hoist and air compressor.

Plans are in course of preparation for a new factory to be built by the Oxford Linen Mattress Mfg. Company, at Winona, Minn.

Gerrard & Co., Sheridan, Wyo., have the contract for furnishing a steel tower and tank of 75,000 gal. capacity, motor-driven pump &c., for the water system at Laurel, Mont.

A powerful pneumatic hoist and an air compressor built by the Nordberg Mfg. Company, Milwaukee, are in operation at the mine of the Boston & Alta Copper Company, Corbin, Mont., power being supplied from a hydro-electric plant in the vicinity.

The box manufacturing plant of the H. H. Rieckoff Company, New Duluth, Minn., which recently burned, will be rebuilt, temporary arrangements being made meanwhile to take care of the company's business. There are at present a large number of orders on the books.

The authorities at Miles City, Mont., have awarded the contract for an elevated steel tank to the Chicago Bridge & Iron Company, Chicago, Ill.

In consequence of losses from the recent conflagration considerable machinery will be needed by the Lincoln Mining Company, Wallace, Idaho, including a new compressor plant.

From Missoula, Mont., it is reported that a plant will be built there this fall by the Standard Lime & Brick Company.

The Construction of a municipal pumping station, water and sewage system is under consideration at Red Lake Falls, Minn.

The Blue Bell Mining Company, Wallace, Idaho, will install an air compressor and drilling machinery. Other equipment is to be purchased later on.

The Idaho National Harvester Company, Ltd., Moscow, Idaho, is enlarging its plant by the erection of a reinforced concrete building 50 x 100 ft., one story, which will be equipped with modern machinery and used for assembling purposes. The plant is located on a tract of 7 acres and contains about 13,000 sq. ft. of floor space, including the new addition now being erected, and additional buildings will probably be erected during the summer of 1911. Orders have been placed for new equipment to be installed in the new addition when completed.

The light and water works plant of the city of Fairmont, Minn., will be improved at a cost of $3000.

The Coeur d'Alene Ironworks, Ltd., Wallace, Idaho, is erecting new shops in which are to be installed the following equipment: One 10-hp. motor, one 20-hp. motor, one 25-hp. motor, one patternmakers' lathe, one band saw, one rip saw, one jointer, one surfacer, three trimmers, power punch, power hammer, 24-in. Cincinnati drill press, four Lodge & Shipley lathes, one 24 in. by 30 ft., one 36 in. by 16 ft., one 27 in. by 14 ft. and one 16 in. by 10 ft.; one 24 in. by 6 ft. Rahn & Carpenter lathe, one 36-in. Cincinnati planer, one 32-in. drill press, electric drill, one No. 2 keyseater, one 7 x 10 ft. Betts boring mill, one 2-in. bolt cutter, one cupola, one steel gib crane. Compressed air will be used for riveting and chipping in the shops.

The Farther Central West

OMAHA, NEB., September 26, 1910.

Orders for machinery and other mechanical equipment, as well as material and supplies, continue irregular and scattering. Jobbers and dealers are now profiting more by the present situation than manufacturers or their direct representatives, and this condition is one likely to last until at least late in the fall. At the same time, salesmen for the large machinery builders have recently been very active, and they are drumming up considerable trade in unexpected quarters. One of the surprises of the season is the amount of business coming from the Black Hills country, where there has been a decided renewal of activity in mining operations. This trade has not, as yet, run into very large figures, but it is relatively an important item, and the prospects are that it will play quite a part in the year's business.

Improvements to be made in the plant of the Waterloo Drop Forge Company, Waterloo, Iowa, will include a new building, 120 x 120 ft. The general plans, however, have not yet been fully decided upon.

Arrangements have been made by the authorities for the installation of a new pumping unit at Ida Grove, Iowa.

Contracts recently taken by the Des Moines Bridge & Iron Company, Des Moines, Iowa, include an elevated steel tank of 75,000 gal. capacity for Hampton, Iowa, and complete water works for Cheyenne Wells, Colo.

Extensive improvements are to be made in the city pumping plant at Fairfield, Iowa.

The Gus Pech Foundry & Mfg. Company, Le Mars, Iowa, which makes a specialty of well drilling machinery, is planning to erect a large foundry building in the spring. The addition recently completed gives it increased facilities, but a considerably heavier output is needed in order to meet the requirements of the business.

An improved water works system, involving the purchase of new pumping machinery, is being planned by the authorities at Council Bluffs, Iowa.

The installation of machinery for municipal power and lighting is proposed at Akron, Iowa.

Plans and specifications for general water works improvement have been prepared at Grand Island, Neb., and a bond issue of $90,000 for the purpose will be submitted to the voters shortly.

Joseph E. Bortenlanger, Omaha, was awarded the contract for boilers, engines, dynamos, motors and pumping machinery to be installed in the new municipal power and water works plant at Pella, Iowa.

It is reported that W. D. Bowen, Charles City, Iowa, has been granted the franchise to install an electric power and lighting plant at Sanborn, Iowa.

A new pumping station is to be built at Guthrie Center, Iowa, and the water system modernized.

A bond issue of $5000 has been voted at Underwood, Iowa, for the installation of pumping machinery and a water distribution system.

A repair shop with machine tools, forge, &c., is to be built this fall at Falls City, Neb., by the Missouri Pacific Railway. The necessary equipment has been ordered.

The construction of an electric power and pumping plant for municipal service is now under consideration at Milford, Neb.

In addition to the engine driven generators now operated, which were supplied by the Ft. Wayne Electric Company, Ft. Wayne, Ind., the authorities at Fremont, Neb., will purchase a steam turbine unit of 500 kw. for the municipal lighting station.

The Omaha Structural Steel Works, Omaha, is reported to have under consideration a material extension of its present shop facilities, including new buildings and machinery.

The Topeka Foundry & Machine Shop, Topeka, Kans., formerly owned by Roy Bone of that city, has been sold to M. Masching, St. Joseph, Mo., who will hereafter conduct the business under the name of the Topeka Foundry & Mfg. Company.

The Tri-City Railway & Light Company, Davenport, Iowa, through its directors, has authorized an issue of $20,000,000 in bonds. Of this amount the sum of $10,000,000 will be used to refund present debts, while $2,000,000 will be used in improvements and extension work during the next two years, and the remaining $8,000,000 will be issued from time to time as occasion requires to maintain the properties of the company. The construction of the Muscatine Interurban line will be included in the expenditures during two years.

Grand Island, Neb., has plans prepared for a water works system to be constructed at an estimated cost of $100,000.

The Des Moines Sheet Metal Company, Des Moines, Iowa, has been incorporated with $15,000 capital stock by L. C. Krutz, president; E. M. Sheridan, J. R. Shuster, Frank Fisher and J. C. O'Donnell.

Manufacturers of this section who use gray iron castings in large quantities for machinery parts in their respective lines of production are placing season contracts with the Ottumwa Iron Works, Ottumwa, Iowa, which has excellent facilities for that class of work.

Pacific Coast

PORTLAND, ORE., September 23, 1910.

Those who are engaged in selling and installing machinery on the North Pacific Coast have found increasing evidence this fall of the expansion which is taking place all through the more populous sections of Oregon, Washington and northern Idaho, as well as across the Canadian border,

THE MACHINERY MARKETS

in all lines of general manufacturing. It is this that has recently constituted the principal support of the market. In addition, however, there are rapidly growing requirements on the part of the various timber and woodworking mills, quarries, crushing plants, logging and mining companies, traction lines, central power stations and the like, from all of which there promises to be more business during the coming winter season than at any previous period in the history of this territory. Even repair work, which has long been the mainstay of many shops and foundries, is becoming a more important factor in the situation, due to the renewals of parts made necessary by the severe service to which operating machinery of every description has been subjected ever since last fall.

From the foregoing it should not be assumed that there is room on the coast at this time for an unlimited number of machinery plants or agencies competing for the business. The ones already established are in good shape to take care of the season's bookings and any new concern entering the field, that does not supply some special or local need, will have the same struggle for a foothold as in any other section. Any one contemplating such a move would do well to make a thorough study of conditions before entering upon the initial investment.

The Pacific Coast Power Company, Seattle, Wash., is constructing on the White River a power plant capable of developing 100,000 hp. Water will be diverted from the White River at a point over one-half mile above Buckley, Wash., and will be conveyed through a canal a distance of eight miles through a natural basin, in which is located Lake Tapps. The flood waters of the stream will be impounded in this basin and will be conveyed by a tunnel through the mountain between the lake and Derringer, a station on the Northern Pacific Railroad, within 1000 feet of which will be located the power house. From this point the water will be returned to White River. Water will be delivered to the machinery in the power house under an effective head of 450 ft. The first installation of machinery will be for 36,000 hp., but the ultimate installation will be for an output of 100,000 hp. and will be added as the market demands.

The Pacific Power & Light Company, 1211 Spalding Building, Portland, Ore., has been bonded for the sum of $30,000,000 to be expended for improvements during the term of life of the bond issue. The company owns and controls gas and electric plant at Astoria, The Dalles, and Pendleton, Oregon; Lewiston, Idaho; Walla Walla, Pasco, Kennewick, North Yakima, and Sunnyside, Washington, and is affiliated with the Electric Bond & Share Company, 71 Broadway, New York City. The company expects to rebuild the gas plant at North Yakima, erect substations at Walla Walla and North Yakima and construct about 100 miles of 66,000 volts of transmission line in the Columbia River valley. These improvements will be in addition to the ordinary maintenance and requirements and will probably cost about $400,000.

The Sumner Iron Works, Everett, Wash., is about to begin the construction of its new Canadian plant, for which a site of 30 acres has been secured at Burnaby, between Vancouver and New Westminster, B. C.

Commercial interests of Kenton, Ore., are reported to be back of the construction there of a new factory to be owned and operated by the Ajax Auto Traction Company.

By the time fall trade in this section has become really brisk, the new foundry and shops of the Vulcan Iron Works, Seattle, will be in full operation, ready to take care of the large business which this company has developed, particularly in the line of mining machinery.

As soon as the plant of the Salem Water Company, Salem, Ore., is secured by the city, as at present proposed, a large expenditure for new equipment and other improvements will be authorized.

If the present plans of the authorities are carried out, the municipal plant of Seattle, which now has a capacity of 15,000 k.w., will be considerably enlarged and improved. Action in the matter will be taken at the November election.

Plans are now being made for the construction of a system of municipal water works at Waterville, Wash.

The city of Tacoma will authorize the construction shortly of two new bascule bridges at an estimated cost of $621,000.

The Golden Gate Mining Company, Sitka, Alaska, has ordered five additional stamps for its ore crushing plant on Chicagoff Is., doubling the capacity of the latter.

Work is now well under way on the new auxiliary steam power plant of the Portland Railway, Light & Power Company in Portland, Ore., which will be 100 x 100 ft. and have an initial capacity of 7500 kw. Other equipment will be installed later, as the growing needs of the system require it.

The San Diego Shoe Mfg. Company, San Diego, Cal., has broken ground for the erection of a factory building 50 x 140 ft., to be completed and ready for occupancy within seventy-five days.

The City Council of Oceanside, Cal., will expend $20,000 for the construction of a new water works system.

The Standard Railway Supply Mfg. Company, Tacoma, Wash., has been incorporated with $1,000,000 capital stock by O. L. Lance, F. F. Foster and L. F. Crumley.

The Seattle Car Mfg. Company, Seattle, Wash., whose forge and machine shop were recently destroyed by fire, is erecting a new fireproof building 75 x 160 ft., which will be equipped to handle all kinds of car and bridge construction.

J. G. White & Co., Inc., engineers and contractors, 43 Exchange place, New York, have been awarded a contract for the engineering and construction of a steam and electric power plant to be built for the Power Transit & Light Company at Bakersfield, Kern County, Cal. The building will be 82 x 140 ft., with substructure of concrete, self-supporting steel frame and walls of metal lath and plaster, which is the usual form of construction throughout lower California, and will be designed to accommodate two 2000-kw. horizontal turbines, with boilers, condensers and necessary auxiliaries. A 750-kw. turbine will be temporarily installed at the earliest possible date. As the boilers will be installed with oil burners, there will be no basement under the boiler room.

Government Purchases

WASHINGTON, D. C., September 27, 1910.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids October 8 for pumps, piping and appurtenances for fuel oil and gasoline storage tanks at Bradford, R. I.

The Paymaster-General, Navy Department, Washington, will open bids October 11, under schedule 2886, class 1, for one motor-driven blower, and under schedule 2909, for two flat turret lathes, three geared-head lathes, one No. 2 wire feed screw machine, one combination turret lathe and one motor-driven engine lathe.

The Bureau of Yards & Docks, Navy Department, Washington, will open bids October 22, for a dry dock pumping equipment at Navy Yards New York and Puget Sound.

The commanding officer, Frankford Arsenal, Philadelphia, Pa., will open bids October 10, for the alteration and extension of the boiler plant.

The Isthmian Canal Commission, Washington, circular No. 605, calls for bids to be opened October 3 for two manual operated double twin drills, two motor-driven double twin drills and two hydraulic compasses.

The Isthmian Canal Commission, Washington, will open bids October 14, under circular 606, for condenser, motor driven engine lathe and valve reseating machine.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids September 10 for additions to the power plant and distributing system at the Naval Hospital, Annapolis, as follows: Evans, Admiral & Co., New York, $23,242; the John W. Danforth Company, Washington, D. C., $19,787; the Noel Construction Company, Baltimore, Md., $19,200.

The Isthmian Canal Commission, Washington, opened bids September 9, under circular 601, class 1, for oxyacetylene welding and cutting plant as follows: Bidder 39, the Linde Air Products Company, Buffalo, N. Y., $7255; 90, the Davis-Bournonville Company, New York, $8809.50.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids September 13, as follows:

Class 41, one set of plate bending and flanging rolls: Bidder 15, the Bethlehem Steel Company, South Bethlehem, Pa., $41,945; 62, the Hilles & Jones Company, Wilmington, Del., $16,875; 96, the Niles-Bement-Pond Company, New York, $15,720; 153, Wickes Brothers, Saginaw, Mich., $18,949.

The Isthmian Canal Commission, Washington, opened bids September 20, under circular 603, class 4, for two motors as follows: Bidder 7, the General Electric Company, Schenectady, N. Y., $4670.

As yet no definite plans have been made by the Whitaker-Glessner Company, Wheeling, W. Va., for the building of an open hearth steel plant, to comprise two 60-gross ton open hearth furnaces, a blooming mill and sheet bar mills. It will probably be some time until the company decides whether to go through with the project or not.

Iron and Industrial Stocks

NEW YORK, September 28, 1910.

While the stock market has not shown much activity, prices have displayed considerable strength during the week under review. A general advance in prices occurred last Wednesday, following the publication of a decision favorable to the railroads in the Minnesota rate case. Further strength was imparted on succeeding days by announcements that labor organizations would back up the railroads in their efforts to secure permission to advance freight rates. The remarkable prolongation of favorable weather for the ripening of crops was also a strengthening influence, as a record corn crop now seems absolutely certain. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Beth. Steel, com...	27 - 28¾	Republic, pref.....	91½- 92⅝
Beth. Steel, pref...	58⅝- 59¾	Sloss, com.....	54¼- 57
Can, com.....	8 - 8¼	Sloss, pref.....	114¼
Can, pref.....	66⅜- 67¾	Pipe, pref.....	56 - 57½
Car & Fdry, com..	46 - 47	U. S. Steel, com...	66¾- 68¾
Steel Foundries...	41 - 43⅛	U. S. Steel, pref...	115¾-116¾
Colorado Fuel....	29¾- 31	Westinghouse Elec.	60¾- 63
General Electric...	143½-145	Am. Ship, com.....	74 - 75
Gr. N. ore cert....	54½- 56	Am. Ship, pref....	108½-109
Int. Harv., com...	96½- 98	Chi. Pneu. Tool...	35½- 37
Int. Harv., pref...	119½-120	Cambria Steel.....	41½- 42
Int. Pump, com...	39½- 41¼	Lake Sup. Corp.....	21½
Int. Pump, pref...	82½- 84⅜	Pa. Steel, pref....	108 -108½
Locomotive, com...	36¾- 37⅞	Warwick	10⅜
Pressed St., com...	32⅛- 33⅝	Crucible St., com..	11¼- 12
Pressed St., pref....	93¼	Crucible St., pref..	72½- 74½
Railway Spr., com.	32 - 32¼	Harb.-W. Ref., com.....	32½
Republic, com.....	30½- 32½		

The annual report of the Westinghouse Air Brake Company, covering the fiscal year ending July 31, 1910, shows that, after the payment of dividends totaling 20 per cent. and liberal appropriations for improvements and depreciation, about $1,400,000 was carried to surplus, which now stands at $6,931,760.64. In addition to this surplus the balance sheet shows a depreciation reserve fund of $800,000 and an employees' pension fund of $129,444.80.

The Midland Steel Company, Pittsburgh, operating the Midland blast furnace at Midland, Pa., has sold $750,000 of 6 per cent. bonds, to retire outstanding obligations and provide additional capital for improvements. It intends to develop some coal property across the Ohio River from its furnace, washing the coal at the mines and carrying it across the river on aerial tramways.

Dividends.—The New York Air Brake Company has declared a quarterly dividend of 1½ per cent., payable October 28.

The Nova Scotia Steel & Coal Company has declared a quarterly dividend of 1¼ per cent. on its common stock, an increase of one-quarter of 1 per cent. over the last payment, placing the issue on a 5 per cent. per annum basis; also the regular quarterly dividend of 2 per cent. on its preferred.

The Yale & Towne Mfg. Company has declared a quarterly dividend of 1½ per cent. and 1 per cent. extra, payable October 1.

The Union Switch & Signal Company has declared the regular quarterly dividends of 3 per cent. on its preferred and 3 per cent. on its common stock.

The Westinghouse Electric & Mfg. Company has declared a quarterly dividend of 1¾ per cent. on the first preferred, payable October 15; also 8¾ per cent. on account of back dividends, payable 3½ per cent. October 5, 3½ per cent. January 15 and 1¾ per cent. April 15.

The Wheeling Steel & Iron Company, Wheeling, W. Va., has declared a quarterly dividend of 2 per cent., payable October 1.

The Nicholson File Company has declared the regular quarterly dividend of 4 per cent., payable September 30.

The American Iron and Steel Institute at Pittsburgh.—Referring to the visit of the American Iron and Steel Institute to Pittsburgh, October 20 and 21, a Committee of Arrangements has been appointed, consisting of W. L. King, vice-president of the Jones & Laughlin Steel Company, chairman; A. C. Dinkey, president of the Carnegie Steel Company, and T. W. Guthrie, president of the Republic Iron & Steel Company. This committee has appointed a subcommittee, which will have in charge the preparation of a programme. It is proposed to have an excursion up the Monongahela River, and also to visit a number of the leading manufacturing plants.

A Canadian Experimental Ore Concentrating Plant.—The Mines Branch of the Canadian Department of Mines, of which Dr. Eugene Haanel is director, is installing an experimental testing plant in Ottawa for the concentration of magnetic ores. It will consist of a standard Gröndal concentrating unit, comprising an ore crusher, ball mill and two Gröndal magnetic separators operating in tandem, with a capacity of 2 to 4 tons of crude ore per hour. Tests will be carried through for the determination of the following points: 1. Extent of crushing required to raise the iron content of the crude to 65-70 per cent. in the concentrate. 2. Extent of crushing required to depress sulphur, phosphorus or titanium content to percentages acceptable to furnacemen. 3. Number of tons of crude that are required to produce 1 ton of concentrate. 4. Power consumed per ton of crude ore concentrated. 5. Cubic feet of water used per ton of crude ore concentrated. It is expected that the plant will be ready for operation about the first week in November, 1910. Tests will be made free of charge on Canadian ores, but it is required that shipments shall be delivered carriage paid at the testing plant at Ottawa.

The Increased Use of Cement

More cement was made and used in the United States in 1909 than in any preceding year and the price per barrel was lower than ever before, says a report by E. F. Burchard prepared for the United States Geological Survey. The production in 1908 was 52,910,925 barrels, valued at $44,477,653; the production in 1909 was 64,196,386 barrels, valued at $51,232,979. The increase was mainly in the output of Portland cement—62,508,461 barrels, valued at $50,510,385, as against 51,072,612 barrels in 1908, valued at $43,547,679. The output of natural and puzzolan cement formed only a small percentage of the total cement production.

The average price of Portland cement per barrel in 1909 was less than 81 cents; the average price per barrel in 1908 was 85 cents. Portland cement cost $3 a barrel in 1880, but by reason of improvements in method of manufacture it can now be profitably sold for 80 cents a barrel.

In 1909 there were 103 Portland cement plants in operation, an increase of five over the number working in 1908. Of these plants 21 were in Pennsylvania, 12 in Michigan, 10 in Kansas, 8 in Ohio, 7 in New York, 6 in Indiana, 5 in Illinois and 5 in California.

The strike of coal miners in the Southwestern field was ended September 18, when an agreement was made with the operators. The miners receive an increase of 5.55 per cent. on day work, dead work and yardage; an increase of 3 cents a ton on shooting coal, and an increase of 5 cents a ton on long wall work. A penalization clause provides that when the operators close a mine they shall pay the men $1 a day each during the time it is closed, and the miners agree each to pay the operators 50 cents a day for the time they cause a mine to be closed. The strike has continued more than five months.

The syndicated steel works of Austro-Hungary made practically the same output of manufactured products in the first seven months of 1910 as in the corresponding period of 1909—353,741 tons this year as against 356,876 tons last year. The total of bars and shapes was 202,218 tons this year, against 182,948 tons, and of rails, 46,289 tons, against 64,190 tons.

The National Iron & Steel Company, Houston, Texas, has purchased from the San Antonio & Aransas Pass Railroad 100 miles of 52-lb. relaying steel rails, which are being released on the main line between Kenedy and Houston. The railroad mentioned is laying new 75-lb. rails, bought from the Tennessee Coal, Iron & Railroad Company.

Philadelphia Foundry Foremen's Banquet

The Associated Foundry Foremen of Philadelphia and Vicinity held their first annual banquet at the Hotel Bingham, Philadelphia, Pa., on the evening of September 24. Covers were laid for over 100 members and guests. At the speakers' table were seated Clarence R. Brown, president of the association, who acted as toastmaster; Mayor John E. Reyburn of Philadelphia; Rev. John R. Davies, D.D.; Thomas Devlin, president of the Philadelphia Foundrymen's Association; George Benkert, treasurer of the Associated Foundry Foremen; Abram C. Mott of the Abram Cox Stove Company, Louis G. Amonson, William Adams, Alexander Naye and A. A. Miller, *The Iron Age*.

President Brown, in beginning the post-prandial programme, stated that the object of the association was for the betterment of its members in their daily work, that it had no interest in the question of labor, but rather gave its full attention to matters of research in connection with foundry interests, methods and practice. Rev. Dr. R. Davies made a forceful address on "What Does the Present Growth of Socialism Mean?" He reviewed briefly the history and growth of the socialistic movement, and pointed out methods by which its advancement could in a measure be retarded. Mayor Reyburn responded to the toast "What Would Happen to Philadelphia if All Smoke Were Banished?" He said if banishing smoke would mean the curtailment of industry and the removal of foundries and manufacturing plants from the city, we would keep the smoke and be glad to see it. Abram C. Mott followed, responding to the toast "An Ideal Foundry Foreman." He said, in part, the ideal foundry foreman is a rare article, for the reason that as soon as he reached that point he no longer remained a foreman but became an employer. The disposition of most foremen was to plod along, rather than develop betterments for their employers and themselves, and it was a difficult task to bring them to the ideal stage. He contradicted the statement that business conditions were so changed that advancement was almost impossible, saying that a better opportunity never existed for the advancement of the individual with skill and ability. This reasoning he deduced from the fact that organized labor eliminated 90 per cent. of the workmen from competition, saying that "The organizations of the working men prohibit the aggrandizement of the individual, but encourage in the strongest manner the aggrandizement of the whole. This makes the chance for the ambitious able man, which never before existed, and it is well for you to have your foot on the ladder, to take cognizance of it and recognize that practically you have a clear field and your future lies with yourself, and will be whatever you choose to make it, as this condition of affairs makes it almost impossible to secure an able foundry foreman from the rank and file of molders. This is sad, but true." Louis S. Amonson, president of the People's National Fire Insurance Company, spoke on "Fires and Their Causes."

Souvenirs distributed to the diners consisted of cast iron dragon candlesticks, jointly contributed by the Associated Foundry Foremen, Fairmount Foundry Company, Union Machine Works & Iron Foundry and E. E. Brown & Co.; metal ash trays, the J. W. Paxson Company; calipers, S. Obemayer & Co.; pocketbooks, Tabor Mfg. Company; cast iron paper clips, Independence Mfg. Company; steel rules and case, Petinos Bros.

The officers of the association are as follows: President, C. R. Brown, E. E. Brown & Co.; vice-president, W. P. Cunningham, Pencoyd Iron Works; treasurer, George Benkert, Fairmount Foundry Company; secretary, D. M. Kittinger, Pencoyd Iron Works. The committee having the arrangements for the banquet in charge consisted of A. J. Wallace, Matthew Addy & Co.; J. Whitehead, Abram Cox Stove Company; George Benkert, Fairmount Foundry Company; George Moore, J. W. Paxson Company; Thomas Smith, Midvale Steel Company; Thomas Livezey, Haines, Jones & Cadbury Company, and F. Robinson, W. C. Robinson & Sons Company, together with the president and secretary as ex-officio members.

The Jamison Coal & Coke Company

Through the courtesy of W. A. Johnson, general sales agent of the Jamison Coal & Coke Company, Pittsburgh, a representative of *The Iron Age* recently inspected several of its coke and coal plants located in the Greensburg field. The company was organized and incorporated in 1892. It has at this time about 6000 acres of coal lands, lying between the Connellsville region on the east and the Irwin gas belt on the west, all three districts geologically belonging to the Pittsburgh vein. Its mines and ovens are on the Alexandria Branch of the Pennsylvania Railroad, which leads off the main line of that road at Donahue Station in Westmoreland County, Pa.

The location and equipment of its plants are as follows: No. 1 plant at Luxor, Pa., contains two slope mines equipped with rope haulage. The capacity of the mines is 2000 tons of coal per day. This plant also has 400 coke ovens. It is equipped with a Luhrig jig and coal washer to wash coal for the coke ovens. No. 2 plant is at Hannastown, Pa., this being a shaft mine and equipped with compressed air haulage. The mining is done at this works by pick and machine, the capacity of the mine being 2500 tons of coal per day. This plant has 516 coke ovens, and has a coal washer equipped with Stine jigs. No. 3 plant is located at Forbes Road, Pa., being a shaft mine, equipped with compressed air haulage, the coal mining being done by pick and machine. The capacity of this mine is 2500 tons per day. No. 4 plant is located at Crabtree, Pa., and has two slope mines, equipped with rope haulage from the bottom of the slopes to the tipple, and also equipped with compressed air haulage system. The capacity of these works is 4000 tons per day, the mining being done by pick and machine. This plant has 492 coke ovens, 70 of which are equipped to utilize waste heat to generate electric power. It also has a coal washer equipped with Luhrig jigs. No. 5 plant is located at Winthrop Station, Pa., being a drift mine with a capacity of 500 tons per day. It is equipped with rope haulage, all the mining being done by hand. No. 6 plant is located at Forbes Road, Pa., being a new slope mine, equipped with coal mining machines and rope haulage, the capacity being 1000 tons per day.

The coal production of the Jamison Coal & Coke Company for the past several years has been as follows: 1906, 2,266,500 tons; 1907, 2,400,600 tons; 1908, 2,429,000 tons; 1909, 2,608,200 tons. Its coke shipments were as follows: 1906, 474,000 tons; 1907, 554,900 tons; 1908, 538,000 tons; 1909, 682,700 tons. Its production of coal the first eight months of the current calendar year approximated 200,000 tons per month and its coke shipments for the same period were 451,000 tons.

As a matter of some interest, a statement is given below showing the payrolls of this company for the first eight and a half months of this year—January 1 to August 15. The average number of men employed in all departments during this period, including miners, drivers, washermen, machine shop men, coke drawers, coke loaders, day labor, &c., averaged 1600 to 1800 men, and the table gives a very complete statement of the compensation which the employees received in the period named. The table headed gross earnings shows the total amount of money earned by its employees

every two weeks, while the table headed net earnings shows the amount of cash paid to its employees by the company after all deductions were made for provisions, fuel, rents, tool sharpening, &c. The statement is as follows:

Period. 1910.	Gross.	Net.
January 1-15	$63,169.14	$43,268.02
January 16-31	70,736.00	50,594.21
	$133,905.14	$93,862.23
February 1-15	$70,399.23	$49,676.03
February 16-28	59,285.15	40,471.66
	$129,684.38	$90,147.69
March 1-15	$72,026.98	$51,590.38
March 16-31	71,660.77	49,411.05
	$143,687.75	$101,001.43
April 1-15	$64,517.23	$45,825.22
April 16-30	64,811.88	46,115.02
	$129,329.11	$91,940.26
May 1-15	$60,080.22	$43,413.96
May 16-31	64,119.67	46,584.41
	$124,199.89	$89,998.37
June 1-15	$62,321.89	$45,240.89
June 16-30	58,921.39	42,611.57
	$121,243.28	$87,852.46
July 1-15	$53,911.79	$38,567.34
July 16-31	60,734.03	44,958.31
	$114,645.82	$83,525.65
August 1-15	$56,479.01	$41,218.86

The figures indicate clearly that the reports printed in the daily press that the earnings of the miners employed by this company are all absorbed in charges for provisions, rents, fuel, tool sharpening, &c., are absolutely untrue.

The Detroit Seamless Steel Tubes Company Breaks Its Records

A few months ago the Detroit Seamless Steel Tubes Company, Detroit, Mich., made a complete reorganization of the administrative force from the superintendent down. Since that time, the company states, there has been an increasing output, and every previous record has been broken in all departments. The rate of increase runs from 10 to 25 per cent., and the owners feel as though they are making a record that is extraordinarily great at a time when the automobile business is slack and has a natural tendency to decrease the demand for their products.

The reorganization began with the appointing of W. H. Lantz of Detroit as superintendent. The other new appointees are: William H. Imhoff, head of the cold drawing department, secured from Shelby, Ohio, as was also his assistant, Robert Ihler; James Thompson, Detroit, superintendent of rolling mills; Charles Koelbel, Chicago, night foreman of the cold drawing department; Thomas W. Smythe, Detroit, general foreman; William Sythes, Detroit, night superintendent.

In an item relating to contracts secured from the Government by the Crucible Steel Company of America, Pittsburgh, printed in *The Iron Age* of September 22, the impression was given that the contracts included a number of 5 and 6 in. armor piercing projectiles. This is erroneous, the fact being that, in addition to securing orders for a large number of 12, 10 and 8 in. projectiles, the company received orders for a number of 5 and 6 in. guns, and not 5 and 6 in. projectiles.

The McKeesport Tin Plate Company, McKeesport, Pa., which completed 10 new tin mills at its plant several months ago, has under consideration the building of two more hot tin mills, but a definite decision has not yet been reached. The company now has a total of 20 hot mills, being the second largest independent tin plate concern in the country.

German Industry Disturbed

A cablegram from Berlin dated September 24, says: German industry is seriously disturbed by strikes and lockouts. Unless the disputes can be ended within the next few days 700,000 workmen will be idle. A little hope appeared to-day in the announcement that negotiations would begin Monday between the Association of Metal Employers and the Metal Trade Workers. An adjustment of the differences in this trade will have great influence upon the situation in allied industries. The total number of metal workers is close to 600,000. They have been financially assisting the striking shipbuilders, and to cut off this aid, the Association of Metal Employers recently decided to lock out 60 per cent. of its men unless the shipbuilders returned to work prior to October 8. In retaliation the employees voted to declare a strike of the other 40 per cent. in the event that the threatened lockout of 60 per cent. of their number was enforced. The textile manufacturers of Cottbus, Forst, Spremberg, Guben, Luckenwalde, Sommerfeld and Finsterwalde have notified their 25,000 employees that their mills will be shut down October 5 unless the striking spinners at Forst return to work next Tuesday. The 40,000 striking shipbuilders show no signs of weakening. The managing committee of the Socialist party is aiding in the support of the idle men.

Census Announcements

The Census Bureau is now rapidly giving out population statistics. Following are the figures for a number of cities:

City.	1910.	Gain on 1900.	Per ct. gained.
Fall River, Mass.	119,295	14,432	13.8
Cambridge, Mass.	104,839	12,953	14.1
Lynn, Mass.	89,336	20,823	30.4
New Bedford, Mass.	96,652	34,210	54.8
Salem, Mass.	43,697	7,741	21.5
Springfield, Mass.	88,926	26,867	43.3
Lawrence, Mass.	85,892	23,333	37.3
Haverhill, Mass.	44,115	6,940	18.7
Manchester, N. H.	70,063	13,076	22.9
Erie, Pa.	66,525	13,792	26.2
Altoona, Pa.	52,127	13,154	33.8
Lancaster, Pa.	47,227	5,768	13.9
McKeesport, Pa.	42,694	8,467	24.7
Dubuque, Iowa.	38,494	2,197	6.1
Fort Worth, Texas.	73,312	46,644	174.7
San Antonio, Texas.	96,614	43,292	81.2
Galveston, Texas.	36,981	Dec. 808	Dec. 2.1

About 30 members of the Detroit Engineering Society spent an enjoyable day in Cleveland, September 24, as the guests of the Cleveland Engineering Society. On their arrival the guests were escorted from the boat to special street cars and spent the morning in visiting the plants of the Warner & Swasey Company, Wellman-Seaver-Morgan Company, H. Black & Co. and the Newburg mills of the American Steel & Wire Company. Luncheon was served at the Euclid Club and in the afternoon the visitors were taken on an automobile ride through the parks and boulevards. The party was entertained at dinner at the Athletic Club and started home late in the evening.

The William Tod Company, Youngstown, Ohio, has installed one of its standard long cross head engines at the Andrews & Hitchcock blast furnaces, Hubbard, Ohio. Its dimensions are 49 and 96 x 60 in., and it will run with the 96 and 96 in. engine furnished last year as a disconnected compound. The new engine replaces a 42 and 84 x 60 in. old style poppet leather valve blowing engine, built by the William Tod Company in 1895, and which has been in continuous operation since that time, but is no longer suitable for the high pressures demanded by the new furnace.

Customs Decisions

Wrenches or Spanners

In sustaining a claim filed by Robert B. Ways, the Board of United States General Appraisers has decided that, under the terms of the tariff act of 1909, wrenches or spanners are entitled to entry at 45 per cent. ad valorem under the provision in the law for "manufactures of metal not specially provided for." The articles were assessed by the customs authorities under paragraph 198 of the new tariff as being "nippers and pliers of all kinds." Under this classification duty was exacted at the rate of 8 cents a pound and 40 per cent. ad valorem. The decision states that the claim of the importer appears to be well founded. It is held that they are not of the class of so-called "jaw" tools, for which provision is made in another paragraph of the law. The classification at 45 per cent. as claimed by the importer is accordingly sustained.

Carpenters' Pincers

A protest filed by Herman Hessenbruch against the assessment of duty at 8 cents a pound and 40 per cent. ad valorem on cheap carpenters' pincers is overruled. It was alleged by the importer that the articles should be allowed to enter at 45 per cent. as "articles of metal not specially provided for." The protest is held to be without merit.

Metal Articles for Demonstration Purposes

Metal articles used for demonstration purposes, and imported by C. H. Wyman & Co., are not to be regarded for dutiable purposes as "scrap," according to a decision handed down by General Appraiser Fischer. The articles in question are cog wheels showing a fracture or breakage clamped with an iron band and imported to show the Castolin process in brazing metals. Duty was exacted under paragraph 199 of the Payne act at 45 per cent. ad valorem as "articles of metal not specially provided for." The importer's claim for a duty of only $1 per ton as "scrap" is denied.

Ferroalloys

Lower duty is accorded various ferroalloys imported by J. W. Hampton, Jr., & Co. Duty was exacted at the rate of 20 per cent. as "unwrought metals not specially provided for." The importers claimed a rate of $4 per ton by similitude to ferromanganese. This claim the board sustains.

Railroad Equipment Orders.—The Carolina, Clinchfield & Ohio has taken bids on 250 box and 100 stock cars. The Winston-Salem Southbound will buy 100 box cars and 50 gondola cars. The New York Central has ordered 10 all steel postal and 10 all steel postal and baggage cars from the Pressed Steel Car Company. The Argentine Republic is reported to have placed orders for $1,400,000 worth of steel cars with two car companies in the United States. The American Locomotive Company has an order from the Chicago & Northwestern for 15 locomotives, which will be built at its plant on the North Side, Pittsburgh. The same company has booked 10 Mallet locomotives for the Central Railway of Brazil. The St. Paul & Des Moines has ordered three consolidation locomotives from the Lima Locomotive & Machine Company.

New England Boosters.—The Pilgrim Publicity Association, Boston, Mass., is conducting an active campaign in boosting New England. The association is largely composed of publicity men connected with manufacturing or mercantile establishments, all imbued with a high admiration for their section, who have united for the purpose of impressing the merits, advantages and resources of New England upon the country at large. The members of the association seize every opportunity to bring their views to the front, and not only on public occasions but privately to push with vigor the advocacy of New England interests. A publication is issued under the name of the Pilgrim Publicity Association *Bulletin,* of which the September number has just appeared. It bristles with strong points in favor of New England and displays cleverness and energy on every page. Special articles of high merit appearing in this issue are "Ages of Development," "The Yankee Knack," and "Ideals in Merchandise," all of which glorify New England.

A movement is on foot in Germany to persuade the Government to give notice to the United States of the termination of the patent agreement made February 23, 1909, on the ground that it is detrimental to the interests of German inventors, patent owners and German industry generally, or to enact a revised patent law which shall deprive Americans of privileges they now enjoy under the international agreement. It is surmised that German manufacturers are desirous of the establishment of a provision requiring Americans taking out German patents to manufacture the patented articles in Germany.

George J. Hagan, furnace engineer and contractor, People's Bank Building, Pittsburgh, recently closed a contract with the Canton Sheet Steel Company, Canton, Ohio, for four Bailey combination sheet and pair furnaces. Later the number of furnaces on this contract was increased to six. A second contract has been awarded to Mr. Hagan by the same company for 18 American stokers to be used in firing sheet and pair furnaces. Mr. Hagan is the sales representative for the American Stoker Company in the Pittsburgh district.

The Thomas Iron Company held its annual meeting September 13 at Hokendauqua, Pa. The attendance of stockholders was unusually large, over 48,000 shares out of the total of 50,000 shares being represented. The financial statement presented by the officers was exceedingly satisfactory. The old Board of Directors was re-elected, and the following officers, also re-elected, were chosen for the coming year: B. F. Fackenthal, Jr., president and general manager; William H. Hulick, vice-president; James W. Weaver, secretary and treasurer.

The National Gas & Gasoline Engine Trades Association will hold its next convention in Racine, Wis., December 12 to 15, inclusive. The convention will be held in Dania Hall, and the usual exhibition arrangements will also take place in that hall. O. C. Parker, president of the Reliance Iron & Engine Company, Racine, has been appointed chairman of the Local Committee, and will have entire charge of the allotting of exhibition space. Members will be charged $10 for space and nonmembers $15.

The Cambria Steel Company, Johnstown, Pa., is rapidly finishing the building of a 66-in. pipe line, 14 miles long, to carry water to its works from an 11,000,000-gal. reservoir located on Quemahoning Creek. It is making progress on the building of the new wire plant and is also increasing the capacity of its merchant bar mills.

Charles M. Pepper of the Bureau of Trade Relations of the State Department at Washington, is making a tour of Canada's chief cities, gathering data bearing on the negotiations that will soon be taken up for reciprocity between Canada and the United States. The situation as to coal and pulp wood is of special interest in this connection.

Personal

W. G. Ireland, formerly chief chemist and manager of the foundry department of Gulick-Henderson & Co., engineers and chemists, Pittsburgh, is now connected with the sales department of the Jamison Coal & Coke Company, Pittsburgh. J. F. Esperon, formerly of the American Radiator Company, Pittsburgh, succeeds Mr. Ireland in his old position.

Karl Nibecker of the sales department of the Southwark Foundry & Machine Company, Philadelphia, has been transferred to the company's office in the Frick Building, Pittsburgh, where he will be sales representative for that district, succeeding Herman E. Beyer, recently resigned and now general manager of the Birmingham Machine & Foundry Company, Birmingham, Ala.

Wm. H. Baldwin, for a number of years an officer of the Ohio Steel Company, Youngstown, Ohio, and later of the National Steel Company, recently concluded his special work for the Bureau of Corporations at Washington, in connection with the investigation of the steel industry and will spend some months in Europe.

E. C. Felton, president of the Pennsylvania Steel Company, has returned to his office in Philadelphia after a vacation of several weeks spent in Massachusetts.

Charles R. Stevenson has been elected secretary and auditor of the E. R. Thomas Motor Company, Buffalo, N. Y. He has also been elected a member of the Executive Committee and will become one of the directors of the company. For the last seven years he has been a member of the firm of Miller, Franklin & Stevenson, business economists and public accountants of New York, Boston and Chicago, previous to which he was assistant metallurgical engineer of the Homestead Works of the Carnegie Steel Company.

H. B. McMaster, who as assistant manager of sales has had charge of sales of wire products for the Youngstown Sheet & Tube Company, has resigned. He was formerly secretary of the General Fireproofing Company, Youngstown, Ohio.

President E. A. S. Clarke of the Lackawanna Steel Company, announces that Marshall Lapham has resigned as comptroller of the company, and L. W. Hesselman has been appointed to the position, effective September 22.

A. R. Reiche, president of the Orenstein-Arthur Koppel Company, manufacturer of light steel dump-cars and portable tracks, Machesney Building, Pittsburgh, sailed from New York for Germany, September 17, expecting to be absent several months. While abroad he will consult with the general officers of the company, who are located in Berlin, with regard to the enlarging of the American plant, which is at Koppel, Pa., about 30 miles from Pittsburgh, on the Pittsburgh, Fort Wayne & Chicago Railroad.

E. G. Richards, who was formerly with the Dodge Mfg. Company, for about six years superintendent of its iron department, and also superintendent of the Berlin Machine Works, Beloit, Wis., for 14 years, has become general manager of the Hilliard Clutch & Machinery Company, Elmira, N. Y., and will hereafter devote his entire time to the manufacture and sale of the Hilliard & Richards high speed friction clutches and cut-off couplings.

H. A. Higgins, general manager of the Standard Tool Company, Cleveland, Ohio, returned home September 20 from a three months' trip to Europe.

William L. Hirsch, sales manager of the American Steel & Wire Company, Frick Building, Pittsburgh, has gone up the lakes on a pleasure trip, to be absent about 10 days.

J. C. Neale, assistant sales manager of the Carnegie Steel Company, Pittsburgh, is in Montreal this week, in connection with the letting of the contract for the building of the Quebec Bridge, bids on which are to be opened October 1.

Effective October 1, some changes will take place among officials of the Pressed Radiator Company of America, Bailey-Farrell Building, Pittsburgh. J. K. Frye, who has been general manager for some time, will become president and general manager, succeeding H. W. Armstrong, president, who resigned some time since. A. M. Pearson, formerly sales manager, will be secretary and treasurer, and J. F. Seigel, formerly sales manager in Chicago, will be general sales manager, with headquarters in the Pittsburgh offices.

C. H. Conover, vice-president of Hibbard, Spencer, Bartlett & Co., Chicago, landed at New York September 22 on his return from a three months' vacation in Europe.

G. H. Jones, vice-president of the Inland Steel Company, Chicago, has returned from a visit to his old home in England and a short tour of the Continent.

The Morrow Mfg. Company, Elmira, N. Y., announces that J. M. McDowell, formerly president and manager of the Russell Drill Chuck Company, is now associated with the first named company as general sales manager of the drill chuck department. Long experience in the manufacture of drill chucks qualifies him as an expert in that line.

The Tariff Board Confers with Manufacturers.—The Tariff Board has held a number of conferences at Washington the past week. Henry R. Towne, Yale & Towne Mfg. Company, who has been active in the Tariff Commission Association, discussed with the board the matter of getting data from manufacturers and the belief was expressed that conditions do not require the enforcement of special measures to compel the giving of information, the board feeling that it will be able to secure the facts through the co-operation of manufacturers. The procedure in making inquiries as to metal products has been considered, and E. J. Spilsbury, mining engineer, New York, has been retained by the board for advice in connection with the metal industries. It is believed that in view of the time required for the investigations of the board action on the revision of certain tariff schedules will be deferred until the regular session of the next Congress, beginning December, 1911, when the members elected this fall take their seats.

The National Association of Manufacturers, of which John Kirby, Jr., is president, has removed its general offices from 170 Broadway to 30 Church street, New York. The association's growth during the past few years necessitated more commodious quarters than could be obtained at the Broadway address. The new location is adjacent to steamship piers and is directly connected by the Hudson River tunnels with the great railroad systems of the country.

The American Railway Association reports that the net surplus of idle freight cars on railroads in the United States and Canada, September 14, was 47,076, a decrease of 3653 in two weeks. In the previous period of two weeks the reduction was 22,950 in the number of idle cars, or 30 per cent.

The Pittsburgh Testing Laboratory, Pittsburgh, Pa., has moved its New York office from 1 Liberty street to 50 Church street, Hudson Terminal Building. The company's interests in New York and New England have been placed in the hands of Wm. F. Zimmermann, second vice-president of the company.

The German Iron Market

BERLIN, September 8, 1910.

The fate of the new Pig Iron Syndicate is still uncertain. The negotiations with the Luxemburg-Lorraine group of furnaces have not yet led to positive results. A meeting of furnace owners there was held yesterday for the purpose of inducing the outsiders to join the local organization, which might then be in a position to reach an understanding with the syndicate. This meeting, however, did not accomplish anything, owing to the fact that the terms offered by the syndicate were regarded as too hard; hence an adjournment for a week was voted. Whether an arrangement shall then be agreed upon is more than doubtful.

Meanwhile the furnaces of the Siegerland region are selling steelmaking qualities of pig for the first quarter of 1911 at 59 to 61 marks, and the syndicate, which has not yet opened 1911 business in general, is meeting these Siegerland offers with offers 1 mark lower. In view of this price war in miniature it looks more doubtful than ever whether the Siegerland furnaces will enter the syndicate. The strongest company of that region, the Geisweider Eisenwerke, explains in its annual report its reasons for standing aloof. It says that the allotment offered it was too low, whereas the big steel companies of the lower Rhine and Westphalia, which are running the syndicate, made unduly large allotments to themselves. The report adds that the company is at present consuming in its own mills all the iron its one furnace turns out, but after the completion of its second furnace it will resume the sale of pig. The company raised its dividend by 2 per cent.

Continued Improvement in Trade

The report on the fortnightly trading on the Düsseldorf Exchange last week said that the improvement in the iron market continues. This agrees with the statements of the newspaper market reviewists, though some of these are rather cautious in expressing themselves as to the permanent character of the improvement. The doubters assign considerable importance to the reports from the American market, holding that there can be no far-reaching recovery in Germany so long as the American situation is so unsatisfactory. At any rate, it seems certain that any considerable revival of business in America would now have a most invigorating effect upon the German market.

The autumn business has become more active and prices are firmly held. The general tone of the market has been further improved by the rising prices of iron and steel in Belgium and England. The volume of orders on hand with the mills underwent a marked increase in August, and deliveries on contracts are being called for at a regular rate. Foreign business is pretty good, particularly with South American countries and East Asia.

A slightly firmer tendency is noted in the market for scrap. Ore prices continue firm. The imports of ores are still rather light, the total for August having been 1,016,800 tons, against 1,171,500 tons in August, 1909.

The steel market shows a satisfactory aspect in most of its departments. In semimanufactured steel buying has been very active since business for the fourth quarter was opened several weeks ago; but some of the reports mention that a quieter tone has commenced within a week, home consumers having provided for the bulk of their requirements. England made large purchases in this specialty, and some other foreign countries also. In structural shapes a slight improvement in the demand for the heavier forms is noted, especially from the foreign market. There is an active demand for supplies on the part of bridge building concerns and construction shops.

In bar iron, buying has been at a brisk pace since the price was marked up. Dealers had allowed their stocks to run low, expecting to get better prices, but since the higher price was adopted they have abandoned such hopes and are replenishing their stores as fast as they can. The reports differ as to prices. While some authorities claim that the mills are adhering strictly to the new price of 112 to 114 marks, others assert that much of the recent business has been done at 110 marks. A similar discrepancy is to be noted in the reports on the foreign business in bars. According to one report, the mills are strictly demanding 100 marks per ton f.o.b. Antwerp, but another report, emanating from Essen, declares that the foreign price is only 98 marks, which, however, is an improvement upon the prices of two or three weeks ago. Business is also better in iron bars.

In heavy plates business remains brisk, despite the strike of the shipbuilders. Considerable new business from abroad, presumably England, has come in. The demand for thin plates is also improving. Other departments of the market report normal conditions, with little change since last week. The German locomotive shops have had a considerable improvement in their foreign business this summer. The exports in July reached 3500 tons, which compares with only 2000 tons shipped abroad in July, 1909.

The latest news from the Belgian market is to the effect that the improvement continues to gain momentum. At the end of last week an advance of 2.50 francs in the home price of bars and plates was reported, and a Brussels dispatch of to-day, says that the export price of bars, both of soft steel and iron, has again risen by 1 franc, while plates are put up 1 to 2 francs. Reports from Russian Poland, across the Silesian frontier, indicate that a remarkable revival of activity has set in there.

Industrial Notes

A number of German iron companies have within the past few days announced good dividend distributions for the past business year. The Hasper Company pays 8 per cent. on a capital of 10,000,000 marks, as compared with 5 per cent. on 5,000,000 for last year; its net earnings rose from 262,700 marks to 1,094,000 marks. The Rheinische Stahlwerke to-day announced a dividend of 7 per cent., against 6 per cent., and the Mannesmann Tube Works of Düsseldorf pays 12½ per cent., the same as last year. The stock market is excited over the probable dividend of the Phönix Company. The estimates of it have been steadily moved up till it now stands at 15 per cent., against 9 per cent. for last year. The market for iron shares is pretty strong.

The big Phönix Company, whose works are scattered among several towns in the West, has decided to erect another blast furnace at Ruhrort. Its battery of furnaces there is not able to supply its steel mills at that place and the new furnace will obviate the necessity of buying iron in the market, or shipping it from another of its furnaces elsewhere.

According to a recent dispatch, 5000 tons of spiegeleisen was sold to American buyers at Siegen in August.

BERLIN, September 15, 1910.

When it is stated that the production of pig iron in August, 1,262,804 metric tons, beat all previous records, it might seem equivalent to saying that the German iron industry is enjoying greater prosperity than ever before. But this is not the case. The industry is doing well, but it is not doing its best. For example, the big Steel Syndicate running on an average restriction of about 20 per cent. in what are called class A products (steel rails, structural shapes, and semimanufactured steel); in August the restriction was about 14 per cent. The rail trade, so far as home consumption is concerned, remains very unsatisfactory; but foreign orders about make up for the lack of home business and caused a big gain in the August shipments. In structural shapes business continues unsatisfactory, despite the fact that the lock-out in the building trade was settled nearly three months ago. This department of the industry has to contend with the hard fact that concrete construction is largely doing away with the use of heavy beams in building houses; but this is helping the manufacturers of steel bars, since these are called for in increasing quantities for reinforcement. In steel billets, on the other hand, the mills are well employed, The shipments in August amounted to 99.9 per cent. of the allotments. The total shipments of these three classes of products in August reached 446,589 tons, or about 52,800 tons more than in July.

Trade Grows Quieter

This week indicates that a quieter tendency has set in. Consumers have mostly provided for their requirements for the rest of the year and manifest no particular inclination to make longer engagements. The unsolved problem of the new Pig Iron Syndicate continues to weigh upon the general position of the trade. The beginning of business on 1911 contracts was again postponed with the hope that an arrangement with the Luxemburg-Lorraine group might be effected. The outlook for a favorable result of the pending negotiations, however, is reported to be very bad. It appears that the Essen Syndicate is offering the southwestern furnaces a considerably smaller proportion of the total trade in pig iron than they think they are entitled to; hence, they refuse to come to terms on the basis offered. The situation is, therefore, precisely like that which caused the failure of the negotiations with the Siegerland group some weeks ago. There is naturally very little business in pig, in view of the conditions just mentioned. Dealers are selling occasional amounts for delivery before the end of the year. Notwithstanding the fact that production is at high-water mark there are still a dozen or more furnaces in the Rhenish-Westphalian district that have not been put into blast during the present period of prosperity; and yet a number of new furnaces are projected in that region.

The latest pig iron quotations in western Germany are as follows; Spiegeleisen containing 10 to 12 per cent. manganese, 63 to 65 marks at Siegen; high grade puddling, 58 to 60 marks; steel making iron, 59 to 60 marks at Siegen and 62 to 63 marks in the Rhenish-Westphalian district; German Bessemer, 63 to 64 marks; Thomas (basic), 53 to 55 marks at Luxemburg; German No. 1 Foundry, 63 to 65 marks; No. 3, 62 to 64 marks; German hematite, 65 to 67 marks.

In bars a quieter tone is reported, the requirements of consumers for the next three or four months having been provided for. Dealers continue to show a waiting attitude.

The Manufacture of Rolled H-Beams*

Steps in the Evolution of the Universal Mill for the Rolling of Structural Shapes—The Work of American and German Inventors

BY G. E. MOORE.

Many inventors have devoted time and brain work to the perfection of the means for manufacturing rolled beams, and in late years more particularly to the manufacture of so-called H-beams, or beams having flanges of great width as compared with the hight of the beam. With ordinary two or three high mills having grooved horizontal rolls only, the practical economic limit appears to have been reached in the case of the commercial standard sections; but beams of much larger section than these, and more particularly beams having relatively far wider flanges, are rolled more or less successfully in universal mills which have both horizontal and vertical rolls. Moreover, with a universal mill a more economic distribution and better working up of the metal appears to be attainable than is the case with ordinary grooved rolls. Using grooved rolls only, the width of flanges which it is possible to roll is limited, not only by the necessity of using rolls of very large diameter to accommodate the deep grooves necessary to produce wide flanges, and still leave sufficient metal in the rolls to give the necessary strength, but also by the necessity of making such grooves with a very great inclination of their sides in order to avoid the tendency for the metal to become jammed therein, which results in the flanges being weakened, if not torn away altogether.

Universal mills having a pair of horizontal and a pair of vertical rolls all in the same vertical plane are now in operation, adapted to roll beams of much larger sizes than those hitherto called for, or, say, up to about 30 in. high by 15 in. wide. But the practical difficulties which had to be overcome to insure success in the production of such sections have necessarily involved a complication of the machinery used, as compared with the mills customarily used to roll ordinary standard sections.

The difficulty of working up the metal in a complicated section, such as an H-beam undoubtedly is, is to secure sufficient uniformity to avoid undue internal stresses, having regard to the comparative thinness of the metal in the web and flanges necessary to enable them to be manufactured sufficiently cheaply to compete commercially with built-up beams. Another difficulty is that of producing finished beams of sufficiently good appearance, free from fins, eccentricity of web and other irregularities. These are the chief points which the inventor has had to watch, and to overcome which still taxes his ingenuity.

In the succeeding pages the author proposes first to describe briefly a few of the characteristic types of machines disclosed by different inventors through the medium of the Patent Office of the United States of America, to offer a few remarks thereon, and finally to present his own suggestions for criticism.

An Early German Invention

Hugo Sack, patent No. 365,100 (1887), describes a single reversing universal mill having a pair of horizontal rolls and a pair of vertical rolls, with their axes all lying in one vertical plane, the two horizontal rolls being both alike but individually unsymmetrical, while the two vertical rolls are both different but individually symmetrical (Figs. 1 and 2). Thus the gaps between the rolls are on one side at the extreme outside edges of the flanges and on the other side at the extreme inside edges of the flanges. After each pass between the rolls the bar is tilted half round and the positions of the flange edges relatively to the position of the gaps between the rolls are reversed; the edges which in one pass were adjacent to the gaps between the rolls are, in the subsequent pass, adjacent to the closed corners of the rolls. In this way the surplus metal extruded between the gaps of the rolls in one pass is rolled down and suppressed in the next.

The use of a single set of rolls for the reduction of the preliminary bar into a beam renders reversing and adjustment of the rolls after each pass necessary, and it is impracticable, with the rolls as described by Sack, and illustrated, to have a closed pass between them. At best gaps are left at the corners of the flanges, which gradually become narrower as the pass is reduced and the blank rolled down, until the final adjustment is made prior to the final reduction, when the gaps are reduced to a minimum. Nor, even at the final pass is it practicable to have an entirely closed pass, because, although the rolls may be adjusted prior to the final reduction so that they touch and the pass is practically closed, yet directly the bar enters the pass deflection takes place which opens out the pass, and gaps are left between the rolls when fins will be formed on the bar.

With this method the section is developed with

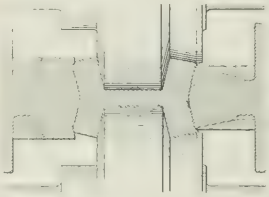


Fig. 1. Roughing Rolls, Open.

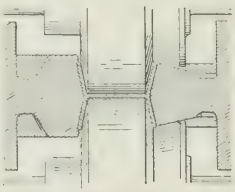


Fig. 2. Roughing Rolls, Closed.

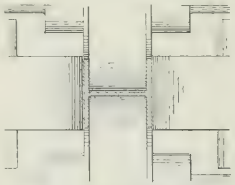


Fig. 3. Finishing Rolls.

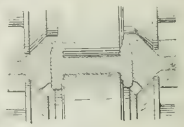


Fig. 4.
Two-High Rolls, Open.

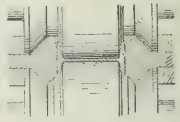


Fig. 5.
Two-High Rolls, Closed.

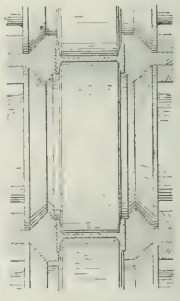


Fig. 6. Three-High Rolls.

* A paper read at the meeting of the Iron and Steel Institute at Buxton, England, September, 1910.

flanges outwardly bent from the longitudinal center line, in order to obtain a better rolling effect with the horizontal rolls upon the flanges, and this feature renders necessary the use of a finishing set of rolls (Fig. 3) through which the bar is passed after having been completely reduced in the previous set. The pass between these rolls need not be adjustable excepting to compensate for wear or displacement, and may be fixed in the ordinary way. Its shape is exactly that

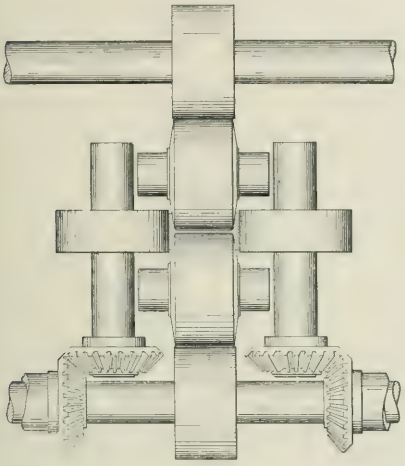


Fig. 7.—First Mill of Kennedy and Aiken.

of the section required, so that the effect of passing the bar through these rolls is merely to square up the flanges and give a final finish to the bar, particularly at the corners of the flanges, where traces of surplus blank metal may have been left after reduction in the previous mill. No appreciable reduction need be given to the bar in the finishing roll, and consequently no appreciable deflection of the rolls takes place when the bar is passed through them; the pass, therefore, remains practically closed, and the formation of fins on the finished bar is avoided.

Pittsburgh Designs of 20 Years Ago

J. S. Seaman, patent No. 400,495 (1889), describes a single reversing universal mill having a pair of horizontal rolls and a pair of vertical rolls, with their axes all lying in one vertical plane, the two horizontal rolls being unlike each other, but individually symmetrical, while the two vertical rolls are both alike, but individually unsymmetrical (Figs. 4 and 5). Thus, as in the Sack mill, the positions of the flange edges are changed relatively to the gaps between the rolls by tilting the bar half round after each pass, and thereby rolling down in one pass the surplus metal extruded between the gaps in the rolls in the previous pass. Or he proposes to attain the same result, without tilting, by using a three-high universal mill having rolls of exactly similar construction to those described above, but with the top and bottom rolls alike and the center roll different (Fig. 6).

In this mill the bar is developed with the straight flanges lying in a plane at right angles to the web, so that no subsequent straightening is required, and the bar may be finished in the one mill only.

Julian Kennedy and the late Henry Aiken, patent No. 410,107 (1889), describe a series of mills comprising three different types, each having a function distinct from that of the others. The first is a reversing, roughing, universal mill, having adjustable horizontal and vertical rolls, with their axes all lying in one vertical plane (Fig. 7). In this it is proposed to reduce the ingot or bloom into approximately the finished form of beam required, by passing it several times backwards and forwards through the rolls, and adjusting the latter together after each pass. When the bar emerges finally from the mill the sides and edges of the flanges are still rough, and it has, consequently, to undergo a further operation in the next mill.

The second mill (Fig. 8) is a nonreversing universal mill having nonadjustable horizontal and vertical rolls with their axes all lying in one vertical plane and intended to reduce the sides of the flanges only. It is proposed to pass the bar through these once, and in order to secure effective co-operation between these and the subsequent rolls, and to prevent the formation of fins, it is proposed to roll slight depressions in the center of each flange which the next operation will obliterate.

The third mill is a nonreversing two-high mill having nonadjustable horizontal rolls only, intended only to reduce the edges of the flanges (Fig. 9). It is proposed to pass the bar through them once to bring it to its finished form and to shape the edges, whereby the slight depressions formed along the centers of the flanges in the previous mill will be exactly filled in this operation, and no fins will be left on the finished bar.

The York and Butz Mills

L. D. York, patent No. 410,724 (1889), covers a single reversing universal mill having a pair of horizontal rolls and a pair of vertical rolls, with their

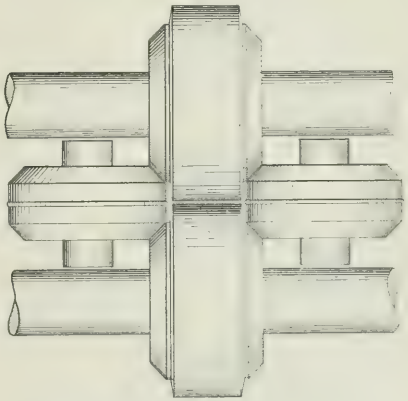


Fig. 8.—Second Mill of Kennedy and Aiken.

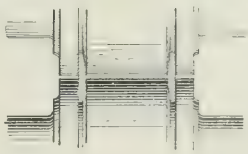


Fig. 9.—Third Mill of Kennedy and Aiken.

axes all lying in one vertical plane, the horizontal rolls being both alike and symmetrical, and the two vertical rolls similarly both alike and symmetrical (Fig. 10). It does not transpire how the formation of fins is avoided, but some supplemental means would be required, as gaps must necessarily occur between the rolls until they have been adjusted to their ultimate positions prior to the final pass, and fins would inevitably be formed on the edges of the flanges of the bar.

E. M. Butz, patent No. 499,651 (1893), describes a series of nonreversing universal mills, each having a pair of horizontal rolls and a pair of vertical rolls,

with their axes all lying in one vertical plane, the two horizontal rolls being alike and symmetrical, and the two vertical rolls being similarly alike and symmetrical (Fig. 11). The rolls are nonadjustable, having a fixed pass, and the bloom is reduced by passing it once only through each set of rolls, the pass of which is narrower in each set than in the preceding set, until in the last set of rolls the pass has the exact contour of the finished beam. Thus, as many mills must be used as number of passes necessary to reduce a bloom into a finished beam, each mill having its rolls shaped according to the reduction required to be given in each pass.

The rolls being fixed and the adjacent surfaces of the horizontal and vertical rolls being suitably shaped so that they are almost in contact with each other, it is probable that no very pronounced fins will be formed on the bar; but as it is not practicable entirely to close the gaps between the rolls, particularly as during rolling considerable deflection takes place and the pass somewhat opens out, it is certain that at least beads, if not fins, would be formed on the corners of the bar flanges. Consequently, to obviate this, Butz proposes to use supplementary means to roll down the corners of the beam flanges adjacent to the gaps between the rolls. These consist of two small idle rollers, one on each side of the beam as it emerges from the main rolls, as shown dotted on the sketch (Fig. 11), and so adjusted that at each successive rolling operation the pass between the main rolls would be only just filled up at those corners, and there would not be sufficient metal to flow into the gaps and form fins. It appears, however, as if this arrangement would necessitate some means of supporting the flanges, as otherwise they would become bent, and consequently the corners would not be rolled down in the manner intended.

The Grey Patent

Henry Grey, patent No. 587,958 (1897), describes a reversing universal mill having a pair of horizontal rolls and a pair of vertical rolls, with their axes all lying in one vertical plane, the two horizontal rolls being alike and symmetrical, and the two vertical rolls being similarly alike and symmetrical (Fig. 12). This mill works in combination with a second mill having a pair of symmetrical horizontal rolls only. The first mill has rolls for shaping the web and sides of the flanges of the beam, but not the edges of the flanges, and the second mill has rolls for shaping the edges of the flanges only.

The two mills are situated as close together as possible and have their driving and adjusting mechanisms connected together so that the bar passes through both sets of rolls as nearly simultaneously as possible with such an arrangement. Thus on one portion of the bar the flanges are being shaped on their edges, while a short distance farther on the sides of the flanges and the web are being formed, and the resulting beam is free from fins and presents a good appearance.

The Prevention of Fins and Other Difficulties

The foregoing systems of rolling beams devised by different inventors have been chosen as typical and to illustrate the means which experience teaches or ingenuity suggests might be adopted to overcome the chief difficulties which were mentioned at the beginning of this paper. Each points out the direction in which the endeavors of the inventor were brought to bear and each possesses features which, although involving complications as compared with the ideally simple plant represented by a pair of horizontal grooved rolls, yet are to be considered, for the time being at least, as having their justification in the better quality of the product obtainable thereby, or in the ease, cheapness or speed of production.

The author does not assume, of course, that the systems he has chosen for his illustrations were all intended by their several inventors as means for manufacturing H or wide flanged beams as differentiated from I-beams or beams of the ordinary standard sections; but they illustrate some of the features which the practical designer of to-day is likely to take into consideration in evolving a mill suitable for the production of H or wide flanged beams.

For the production of beams with abnormally wide flanges it may be assumed that a universal mill having four rolls, two horizontal and two vertical, all lying in one vertical plane, is the simplest type of machine that can satisfactorily answer the purpose. A single reversing universal mill, requiring a tilting gear on each side, with which the bar is turned half round after each pass, is described by H. Sack and also by J. S. Seaman. These mills look simple, but evidently have drawbacks, due partly to the introduction of the tilting gears, which are complications in themselves and are apt to require considerable time for their manipulation, particularly when the beam is long and bent, and partly also, perhaps, to the unsymmetrical section developed at each pass which, in the rolls described by H. Sack, would have the tendency to produce a bar bent sideways, and in those described by J. S. Seaman a bar bent vertically, so that very powerful guides would be required in the case of the heavier beams to keep the bar sufficiently straight as it emerges from the rolls to enable the tilting gears to operate satisfactorily. Briefly, in other words, the unsymmetrical rolls probably render other complications necessary in order to counteract their bending effect.

A three-high universal mill housed within one pair of stands only and requiring a lifting table on each side is described by J. S. Seaman (Fig. 6), and this would doubtless be a simple system to adopt if it were practicable to design the details of the roll satisfactorily and simply as regards the accommodation and adjustment of the vertical rolls in particular. Hitherto the author has not discovered a design of such an arrangement which would be considered satisfactory by himself or by the practical man.

Two mills arranged side by side and having rolls such as those of Hugo Sack or J. S. Seaman could be adopted, and tilting avoided, by making the horizontal rolls and the vertical rolls symmetrical in each case, but so formed that in one mill the edges of the flanges would be formed by the horizontal rolls only and in the other mill by the vertical rolls only (Fig. 13). Then after each pass the bar could be shifted from the one mill to the other, being rolled alternately in each mill until completely reduced. By this means the formation of fins would be avoided, but the plant would be considerably complicated, and as the centers of the passes in the rolls of the two mills could not conveniently be arranged very close together the shifting gears would require to be particularly powerful and quick acting in order not to lose much time over this operation.

A plurality of mills having universal rolls, or horizontal rolls only, each mill intended for developing a certain portion of the section, is described by Kennedy and Aiken, and also by Grey; but whereas the former leave certain portions of the section to take care of themselves in the initial passes and to be worked upon in the final stages only, Grey works upon the whole section at every pass, and his system appears to possess advantages and to combine practicability and simplicity to a greater extent than the other systems hitherto described.

Finally, a series of universal mills, each working upon the whole section of the bar, but each adapted for one pass only, is described by E. M. Butz. This system would entail, perhaps, the maximum outlay on plant and machinery, and would possibly be adapted for the maximum production per unit of time. For rolling rails, of which thousands of tons of one section can be disposed of on a single contract, a plant of this description might possibly be a good investment, but

for the manufacture of beams it seems more than doubtful whether it would be profitable to roll a sufficient quantity of each section to justify the expense of the plant and the time and trouble involved in changing so many sets of rolls for each section of beam.

Methods of Driving Vertical Rolls

Having dealt at some length with the various means adopted to overcome or prevent the formation of fins, which has been shown to be a matter of great importance, calculated to influence enormously the design of the rolls, of the mill containing such rolls, and even

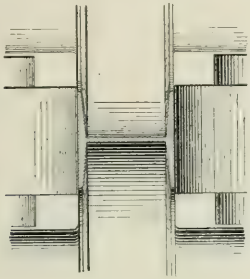


Fig. 10.—York Mill.

of the disposition of the whole plant, some mention should be made of the other features of the designs illustrated, for which they have also been specially selected.

J. S. Seaman, Julian Kennedy and Henry Aiken, E. M. Butz and Henry Grey have all endeavored to devise means for driving all the rolls of their universal mills, whereas Hugo Sack and L. D. York made no attempt to drive the vertical rolls, but content themselves with driving both the horizontal rolls and letting the vertical rolls rotate by contact with the moving bar as it is drawn through the pass by the driven horizontal rolls.

J. S. Seaman shows conical surfaces on the horizontal rolls engaging conical surfaces on the vertical rolls, contact being maintained between the two rolling surfaces by the pressure of the bar as it is squeezed between the rolls. This design has such grave defects that it cannot be regarded as mechanically sound enough for practical purposes; for, to be effective and avoid excessive wear and tear, the sides of the conical surfaces should be at such angles that, if prolonged, the apices of the cones represented by the prolonged sides would meet at the centers of the respective rolls, thus maintaining equal peripheral speed throughout the adjoining surfaces, in the same way as bevel gearing is designed. This is so obvious that it needs no further illustration; but if the vertical rolls were so designed their conical surfaces would make such acute angles that they would have a powerful wedge action, and, on application of the rolling pressure, component forces of excessive magnitude would occur, resulting in excessive deflection of the rolls, wear and tear, and probably a wrecked mill.

Grey shows a device whereby conical or cylindrical collars on the top horizontal roll engage, by frictional contact, with conical or flat surfaces on the vertical rolls, and contact is maintained between the two by means of hydraulic pressure (Fig. 14). Like Seaman's design, this has also the defect that the peripheral speeds of the frictional surfaces are not constant throughout, and this defect cannot be remedied without introducing others as great or greater. Moreover, the driving force imparted to the vertical rolls by such means must be so limited as to render it inoperative for practical purposes. Altogether the device looks too unsound mechanically for practical purposes.

Kennedy and Aiken in their second mill show in contact conical surfaces, which are designed on proper lines, but between which effective contact could hardly be maintained during rolling, for the pressure would cause deflection and spreading of the rolls; nor could sufficient pressure be applied in any case to render such contact very effective. They suggest, however, that the friction cones could be replaced by toothed gearing, and similar toothed gearing is also suggested by Butz; but in both cases, although a positive drive would be obtained, it would not be possible to adjust the rolls even slightly without interfering with the proper engagement of the gearing.

The neatest device for driving all four rolls, while still maintaining adequate adjustment between them, is that shown in the first mill by Kennedy and Aiken. In this case the rolling pressure on the horizontal rolls is directly utilized to furnish pressure to give the requisite frictional contact between the driven and the idle horizontal rolls, while the vertical rolls are positively driven by gearing. Such a device would doubtless give satisfactory practical results, although it is doubtful whether the results obtained thereby would compensate for the complications it involves in the mechanism of the mill.

In the manufacture of H-beams a bloom is usually first reduced in a blooming mill to a rough I-shape, and thereafter operated upon and finished in the universal mill, and the idea that it is necessary to drive the vertical rolls in the universal mill as well as the horizontal rolls appears to be more theoretical than real.

The advantage of driving the vertical rolls instead of letting them run idle is most apparent before the bar has been gripped by the rolls as it enters the pass, and it is then conceivable that it would be easier to grip the bar if the vertical rolls were driven. Once the bar has been gripped by the driven horizontal rolls there is, however, no apparent drag upon it, due to any lagging of the vertical rolls. In fact, if a tendency

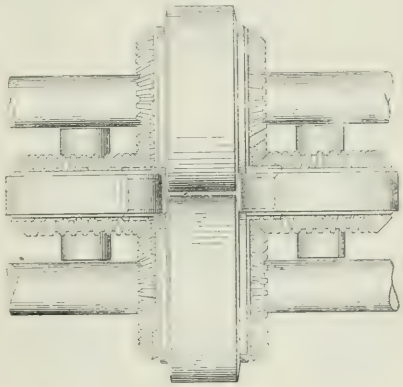


Fig. 11. Butz Mill.

for the vertical rolls to lag behind were present no frictional device on the lines of any of those disclosed would be sufficiently powerful appreciably to diminish such a dragging effect.

The best conceivable frictional device for driving the idle vertical rolls is afforded as soon as the bar has been gripped by the rolling surfaces of the horizontal rolls and is in contact with those of the vertical rolls, and, as before stated, an independent frictional drive could only serve a useful purpose providing it were sufficiently powerful, by helping to introduce the bar within the pass before it had been gripped by the horizontal rolls, but not otherwise.

Action of Horizontal Rolls on Flanges

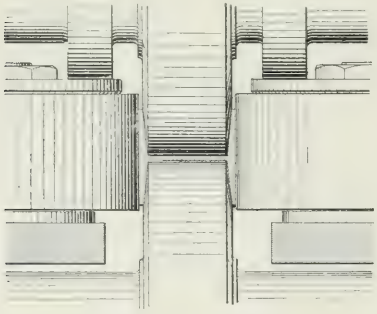
In this connection the fact must not be overlooked that the horizontal rolls do not operate upon the web

of the beam alone, but operate equally upon the sides and, perhaps, also upon the edges of the flanges. Thus it is not a case of the flanges being pulled through the rolls by a force imparted to the web, but, as a matter of fact, the flanges are directly gripped by the driven horizontal rolls, and the vertical rolls are only a form of surface for resisting the side pressure and participate in squeezing the bar, and have really no appreciable tendency to slip and lag behind. It is obvious, however, that the horizontal rolls will have a better grip upon the flanges the more the inside faces of these are inclined outwardly, and the greater the inclination the greater will be the rolling effect also. Consequently the author ventures to express the opinion that the method described by Sack, whereby the section is developed with the flanges outwardly bent from the horizontal center line, is not only peculiarly well adapted for rolling H-beams having very wide flanges, but the material in such beams should also be particularly well worked up and free from internal stresses.

The modern tendency is to reduce the inclination of the flanges of beams in order that the material may be better distributed by concentrating it as little as possible in the center of the section and distributing it more outwards, in order to obtain a higher moment of inertia, and thereby greater strength for a given weight. This applies particularly to H-beams intended to be used as columns, where the least moment of inertia must be used as a basis for calculating their resistance against buckling, and where the ideal section should have an equal moment of inertia in all directions.

Therefore, by so distributing the material in the flanges that a greater amount than formerly is concentrated on the edges of the flanges, and a proportionately lesser amount at the roots where they join the web, the moment of inertia is increased without increasing the weight of the beam.

Now, with the system described by Sack, the flanges can just as easily be made parallel throughout, or without any taper, as otherwise, thus obtaining the advantage of increased strength without adding to the weight of the beam. But in addition to this advantage such beams possess the further advantage that they can



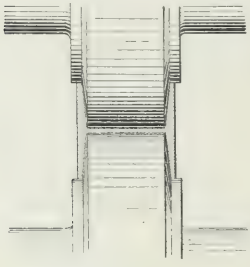
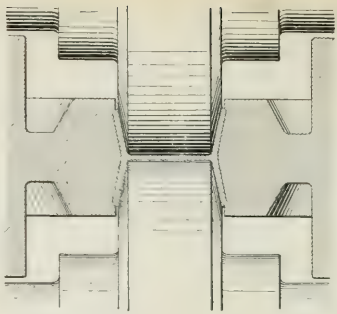


Fig. 12.—Grey Mill, 1907 Patent.



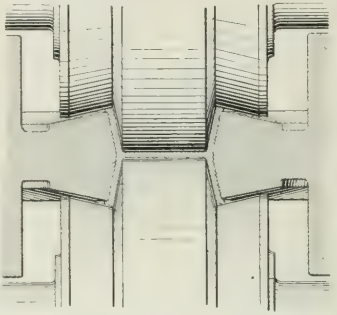


Fig. 13.—Modification of Sack and Seaman Mills.

be drilled and punched, rivet and bolt heads bedded, and connections with other members made much more easily and cheaply than the ordinary sections having flanges which taper however slightly. These advantages are, moreover, obtained without sacrificing in any way the quality of the materials, but rather the contrary is the case.

With all systems in which the flanges are developed straight—that is to say, with their outside surfaces at right angles to the plane of the web, or nearly so—a certain inclination of the inside surfaces is essential to the proper performance of the rolling or reducing operations, and the more this taper is reduced the greater will be the risk of damaging the material, by reason of the greater tendency of the sides of the horizontal rolls to scrape away instead of rolling or squeezing away the inside surfaces of the flanges; and not only this, but also the greater will be the friction of the horizontal rolls on the inside surfaces of the flanges and consequently the greater the wear and tear on the rolls.

It is obvious that the application of the system described by Sack will result in a better beam, a stronger beam, a beam with a better quality of material in it, and diminished wear and tear of rolls, as compared with other systems which do not develop the flanges in an outwardly bent state.

The Sack Mill at Rombach

The author having been intimately associated with the late Hugo Sack, whom he assisted in the development of his ideas, has had the opportunity of making himself thoroughly conversant with the practical aspects of this particular process, and he feels convinced that no other system at present known is so well adapted to produce commercially H-beams of a good, sound quality, as that which Mr. Sack invented nearly 25 years ago, and upon which he brought his masterly mind to bear with such persistent energy and enthusiasm.

The extensive trials carried on at the Rombach Iron Works have proved the soundness of the system, and

they have shown that the direction in which improvements can still be made lies chiefly in the adaptation of the plant for producing large quantities of material on a commercial basis with a minimum outlay in capital expenditure and working cost. To this end the author has endeavored to apply the experience he has acquired, and ventures to give the results of his efforts in the succeeding.

The Two Systems of Rolling Compared

From what has been stated in the foregoing it will be understood that in order to produce H-beams free from fins there is a choice of two distinct systems. First, the mill may be so constructed that one set of universal rolls operates upon the whole of the section excepting where the unavoidable gaps occur between

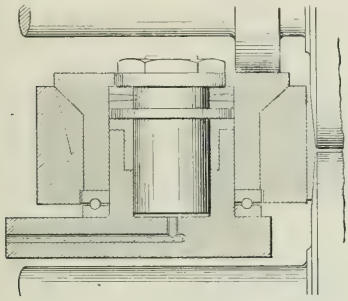


Fig. 14.—Grey's Device for Frictional Contact.

the rolls, the positions of which gaps must be changed frequently, or at every pass, this being attainable with one set of universal rolls forming an unsymmetrical pass as regards the location of the gaps, or with two sets of universal rolls, each forming a symmetrical pass, but each different as regards the location of the gaps—that is to say, using a single reversing universal mill and tilting the bar half round between the passes, or using two universal mills (which may be reversing or nonreversing), and shifting the bar from one to the other between the passes. Secondly, the mill may be so constructed that one set of universal rolls operates

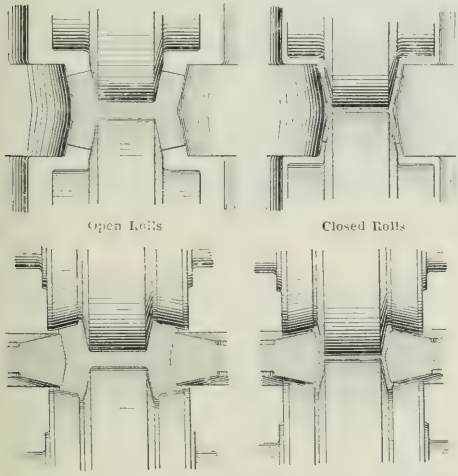


Fig. 15.—Suggested Shapes of Rolls in Tandem Universal Mills.

upon the greater portion of the section and is adapted to reduce and elongate the bar as a whole, while a second set of rolls operates only upon those portions of the bar which are not operated upon in the first set and are adapted to reduce the bar locally, but not to elongate it or reduce it as a whole—that is to say, using a primary reversing universal mill in tandem with a secondary reversing mill, the two situated so close together that the bar is operated by both at the same time, although on portions a short distance apart.

It is with the second of these systems that the author wishes to deal, because the first is already sufficiently well known, and because he believes that the second possesses greater possibilities of development in the direction of economy.

Grey uses a primary reversing universal mill with four rolls operating upon the web and the sides of the flanges of the bar, reducing and elongating the bar as a whole, but leaving the edges of the flanges untouched; and in tendem therewith a second reversing mill, having two rolls which guide the bar and operate upon the edges of the flanges only. Thus, in the tandem mill, at every pass the bar is operated upon all over and the formation of fins is prevented.

Retaining the system of Sack, in which the beam is developed with outwardly bent flanges, the author suggests the employment of a primary reversing universal mill having its four rolls shaped to operate upon the web and sides and edges of the flanges, with the gaps between them located somewhat short of the extreme edges of the flanges, and sufficiently wide to prevent the extruded metal from cooling too quickly; and in tandem therewith, a secondary reversing universal mill with rolls shaped to guide the bar and roll down only the surplus metal extruded between the gaps of the primary rolls (Fig. 15).

Any irregularities which might still be left at the edges of the flanges after the last pass in this mill could then be eliminated altogether by properly shaping the rolls, so that the final pass required to straighten out the flanges in the separate set of rolls would roll down or fill up any irregularities, as the case might be, and give the section a final finish all over. The tandem system of rolling has the advantage that the beam is reduced all over, and extrusions of metal beyond the limits of the desired contour rolled down all in one pass, so that the mill may work uninterruptedly backwards and forwards, and no time be lost in tilting or shifting from one stand to another. The cost of the equipment should be very slightly, if anything, more than that of a single mill with a suitable tilting gear; but even if the cost were considerably greater, it would be more than justified by the increased output and by the saving of extra wages which would be incurred in the more elaborate manipulation.

Where two stands are used, and the bar shifted from one to the other, an increased output might be looked for proportionate to the increase in the cost of the plant and wages, provided that two bars could be rolled simultaneously and nonreversing engines used; but it is just a question whether the quantity of a given section required to be rolled at one time would justify the additional capital outlay in the plant required for such an arrangement, having regard to the fact that the rolls in both stands could be adapted for only one size of beam at a time

A Thompson-Starrett Building Record.—In perhaps the quickest time ever made on a hotel structure, the 17-story steel frame Rector Hotel, now being erected by the Thompson-Starrett Company at Forty-fourth street and Broadway, New York, was finally closed in last week. It is the opinion of experts that nothing in the history of building has ever been accomplished quite like this before. For one whole week the exterior or stone work went forward at the rate of a story a day. The Thompson-Starrett organization has now been engaged on the Rector operation about seven months, but this period includes five and one-half months for the work of demolishing the old buildings and excavating for foundations, so that the erection of the superstructure from cellar to roof has been accomplished in eight weeks. The progress to date augurs well for the completion of the building next December.

The Robey-Smith Bevel Gear Planer

Details of an Interesting English Machine

BY JOHN M. LLOYD.

Gear cutting machines form a very interesting class of machine tools, and one that is made more so by the number and diversity of ingenious movements used. Milling machines using plain formed cutters can produce perfect spur gears of a given pitch and number of teeth, but for other numbers of teeth only approximate theoretical perfection. The same applies for bevel gears produced on planers using formers. In the Robey-Smith bevel gear planer, built by Smith & Coventry, Ltd., Manchester, England, and marketed in this country by Schuchardt & Schütte, West Street Building, New York City, the proper tooth form is generated in the cutting of the gear and no use is made of formed cutters or formed guides. The teeth of bevel gears are not of uniform thickness and depth, which is the main difficulty. By the hobbing method worm wheels and now spur gears also are produced with teeth of true involute form, but the principle cannot be applied in the cutting of bevel gears. In this machine the cutting tools are reciprocated like those of a shaper, and the correct relation of the tools and the work is maintained so that the proper form of tooth curve results.

Fig. 1 is a general view of the machine from the operating side, while Fig. 2 is a view on the opposite side of the machine showing a blank in position for cutting, some of the work turned out and the different gauges used. Practically all the essential parts are shown in both views from two different angles and for convenience in locating them the same reference letters have been used throughout. Fig. 3 shows a special piece of work turned out by one of these machines at the shops of the Brightwood Motor Mfg. Company, Springfield, Mass.

General Description

The planer operates on the shaping machine principle and uses two tools, one on each side of the tooth.

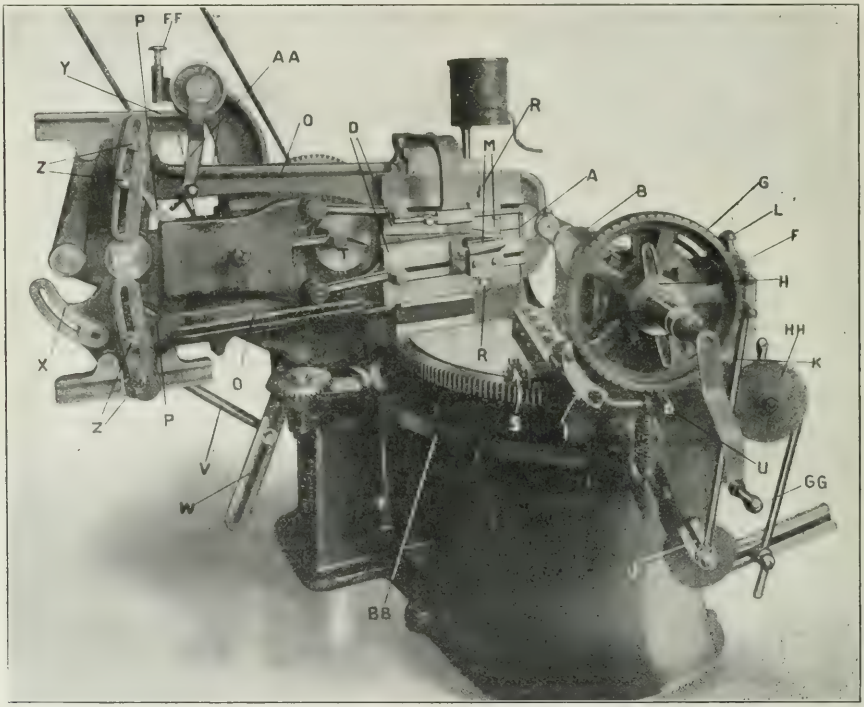


Fig. 1. General View of the No. 2 Robey-Smith Bevel Gear Planer, Built by Smith & Coventry, Manchester, England; Schuchardt & Schütte, New York City, American Agents.

These are carried on slides on pivoted arms converging to a center which intersects the apex of the wheel to be cut. The tools move backward and forward on their slides, the former movement being accelerated, and at the same time the pivoted arms are gradually opened and closed like a pair of scissors, varying the distance between the cutting tools and forming a curve on the tooth being cut. This mechanism for opening and closing the arms carrying the slides and the tools is the basis for one of the patents covering this machine. It will be seen from Fig. 1 that the saddle carrying the blank to be cut has a rotary motion, the center being directly under the apex of the blank to be cut. This rotary motion feeds the blank to the tools, and is stopped automatically when the tooth has been cut to the proper depth. This saddle is connected with the pivoted arms carrying the slides and cutting tools by a circular bar, B B, having teeth cut in a portion of

its circumference. These engage with a quadrant, which through a pair of bevel gears and a slotted lever actuate a connecting rod to control the swinging parallel motion which in its turn operates the pivoted arms. The blank is rotated the pitch distance at each stroke of the tools, which is said to prevent the local heating common in machines which complete one space at a time and eliminates the errors produced by the wear of the cutting tools.

Setting the Work

The first step in cutting the gear is the setting of the wheel blank in its proper position relative to the

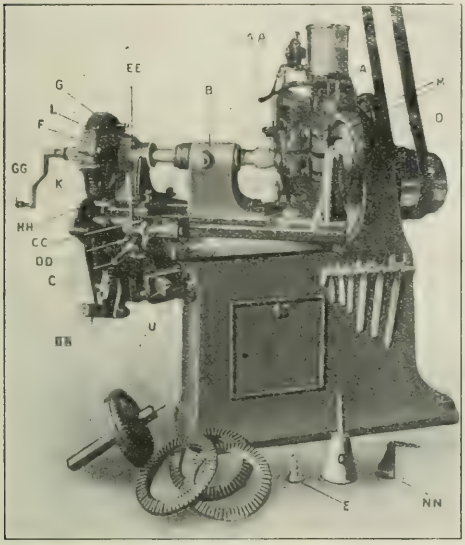


Fig. 2.—Side View of the Planer.

center of the machine. For this two gauges are used. The first of these, the distance gauge A, is used for setting the blank at the right distance from the center of the machine, which also corresponds with the apex of the blank. The rod in this gauge is adjusted until the vernier with which it is provided reads a number corresponding to the center distance obtained from a formula given in the book of instructions which accompanies the machine. The rod is then locked in position and the wheel blank set in position by withdrawing the slide B, whose motion is controlled by the crank GG, until the back face of the wheel just touches the pointer of the gauge. Once the slide is properly set it should not be disturbed again, and the gauge is then swung out of the way to the top of the machine. The top of the machine table has a scale marked in degrees which is used for reading the pitch, face and base angles of the wheel, a vernier being provided to read these quantities to five minutes. The table slide is moved by the handle C until the vernier reads the face angle of the blank. If the blank has been truly turned and accurately set to the distance gauge, the face of the wheel should be perfectly parallel with the tool slide D, and this is tested by the gauge E, which should just fill the space between the tool slide and the face of the wheel at every point.

The blank is divided with reference to the number of teeth to be cut by a pawl, F, and the dividing plate G. The plate is placed in position on the spindle sleeve and secured by screwing up the split nut H. This nut locks together the dividing plate, the split sleeve and the mandrel, and if it is not securely locked the blank will move while being cut. To set the dividing apparatus the spindle is revolved until the plunger I falls into a notch in the dividing plate. The slot J is placed in a vertical position and the connecting rod K set to take up the required number of teeth, which to secure the best results should not exceed three. The pawl F is then adjusted by the screw L until it almost touches the face of a tooth in the dividing plate, which concludes the setting.

Setting the Tools

Both round nosed and pointed tools are used, the former for roughing out the spaces and for finishing where the ratio of the wheels does not exceed 3 to 1, and the latter for finishing when this ratio is exceeded. As the pointed tools are more generally used, the method of setting them will be taken up first and the deviations necessary for the round nosed tools given later.

The tools M are placed in the holders with the cutting edges facing each other and are lightly held in position by the taper bolts at the back of the tools. The gauge N is held against the surface of the tool slide D and the tools adjusted forward in the holders by a small set screw until they just touch the under surface of the gauge, which is ground at the end nearer the support and stepped at the other. The taper bolt is then tightened and the tools locked in position. To set the tools in the correct position vertically, the former arms O must be adjusted until the pointers P read zero on the scales. The gauge Q is then placed on the table of the machine and the tool holder moved vertically by the screw R until the cutting edge of the tool just touches the upper and lower surfaces of the gauge, respectively. In setting the round nosed tools that portion of the under surface of the gauge N bearing the size of the radius of the round nose must be the one to which the tools are adjusted. In opening out the former arms for the thickness of the tooth when using round nosed tools, a deduction from the angle given for a sharp nose tool must be made.

Two distinct operations are usually performed in the cutting of a gear—the roughing out of the spaces and the forming or finishing of the sides of the tooth. For each operation the planer has a different setting. When roughing out the spaces, the former arms are set so that the pointers attached to them read one and one-third times the angle to which the arms are set when finishing the teeth. The knock-off motion is then set

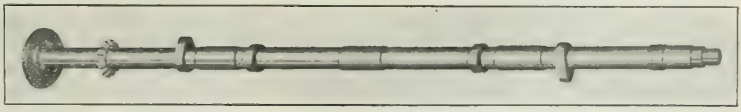


Fig. 3.—An Automobile Cam Shaft with Bevel Gear Made on the Planer

when using round nosed tools by turning the saddle around until the tool touches the face of the blank. It will then be found that the vernier reading is not the same as that given by the formula and whatever the difference is the same allowance must be made on the base angle. When pointed tools are used the saddle is turned around until the vernier reading is the same as the base angle. When in this position the stop bracket S is moved to touch the end of the knock-off rod and bolted securely. The stroke of the tool should be 1¼ in. more than the face of the gear wheel teeth and in the case of a large, heavy gear may be made still longer. The length of stroke is regulated by the position of the connecting rod bolt in the slot of the disk T, which is marked with a scale, by which the stroke can be immediately set to any desired length.

The overrun of the tools after cutting through the blank should not exceed ¼ in.

When setting the machine for forming or finishing the teeth the spindle slide U is turned around until the vernier reads the pitch angle. The connecting rod V is set to the pitch angle on the scales W and X and the scale Y is moved to correspond. When this has been done the bolts Z are released and the former arms O adjusted until the pointers P read the correct angle of the former arms, as determined from the formula. For adjusting the former arms the lever AA, attached to the pulley over which the band for balancing the arms passes, is used. When this adjustment has been made the bolts Z are locked. The accuracy of the settings is first tested by depressing the plunger FF, and if the graduation on the center of the lower edge of its face coincides with the pitch angle on the scale Y the proper setting has been made. The other test is to turn the spindle slide U outward and bring it back to the pitch angle when the pointers P should give the same scale readings as at first. The settings for the stroke and the knock off motion should remain undisturbed from the roughing operation. Before starting to cut, the spindle slide U should be wound back to allow the vernier on the table to read the face angle plus half a degree. More or less curvature can be secured by changing the position of the connecting rod V on the scale W.

Operation of the Machine

The machine is driven from a three-step cone pulley and a small pinion mounted on this shaft meshes with the gear showing above the top of the former arm in Fig. 1. At the other end of the shaft, to which the large gear is fastened, is the disk T. This disk is connected with a slide and from this slide two connecting rods convey a shaping motion to the two slides carrying the tools, which motion is accelerated on the return stroke. The motion for the feed mechanism and the dividing plate is taken from the shaft of this large gear by a chain and sprocket to the disk containing the slot J, the connection being through a universal joint, a friction disk and a bevel gear. Motion for the feed is transmitted from this disk to the ratchet wheel HH. On the opposite end of the shaft is mounted the worm CC, which meshes with the wheel DD. The feed may be operated by hand through the lever C or the clutch FF may be thrown in to secure power feed.

The saddle is mounted on an extension of the body of the machine and to its upper surface is bolted the headstock carrying the wheel blank to be cut and also the dividing mechanism. The spindle in the headstock is very large in diameter and is made in two parts, the end containing the index wheel remaining stationary, while the front part is fed back and forth to locate the blank in the proper position for cutting. A hole extends through its entire length to receive mandrels or the specially long bosses found in motor car work. For supporting the latter an outer support is provided for the ends which renders the blank very steady under all cuts.

Twenty-one dividing plates are supplied which are made with two separate sets of notches. The set in which the pawl F works is used for dividing the blank, while the other set in which the pawl I works serves to push the plate around and is more powerful, as its action is controlled by a spring, which also prevents back lash. Three gauges for setting the tools, one for setting the blanks in position, eight pairs of high speed cutting tools, a countershaft with tight and loose pulleys, the necessary screw keys and an instruction book for operating the machine and turning the blanks accompany the machine.

Four sizes of planer are built, of which the following table gives the principal dimensions and specifications:

Machine number	1	2	3	4
Pitch line diameter of miter wheels cut, inches	9¾	16	24	36
Pitch line of bevel wheels cut, inches	11½	17½	26	38
Diameter of hole in spindle, inches	⅝	1¾	2	2¼
Maximum pitch cut, inches	1½	2	2½	3
Maximum width of tooth, inches	3¼	4	6¼	7½
Floor space, feet	5¼ x 4¾	7½ x 6	8 x 7½	11½ x 8½
Net weight, pounds	3,450	6,390	8,850	15,900

The No. 2 machine at the plant of the Brightwood Motor Mfg. Company cut the gear shown on the automobile cam shaft in Fig. 3 in one hour. The gears shown on the floor in Fig. 2 were cut in 1 hour and 15 min. These had 60 teeth 1⅜ in. wide and the pitch was 5. The material used was 3½ per cent. nickel-steel.

Iron and Steel Analysis

Method for the Estimation of Total Carbon in Iron Alloys

The following method is described by Professor Wüst in a recent number of *Metallurgie:*

From 0.5 to 1.0 g. of the alloy, in the state of fine drillings or powder, is mixed with powdered antimony, three times the weight, and powdered zinc, an equal weight to the drillings. These two metals should be as pure as possible, and are powdered in a steel mortar. The method followed is similar to that in the direct combustion process for steel, the temperature necessary being from 800 to 900 degrees C. On fusion, the solubility of the carbon is lowered, and it separates from the metal in an easily oxidizable form. Below are given some results, showing how the new method compares with the Sarnstrom:

No.	Material.	Method.	1.	2.	3.
1.	Gray pig iron	Sarnstrom	2.403	2.400	....
		New	2.408	2.400	....
2.	Salamander	Sarnstrom	8.018	7.90	....
		New	8.015	8.013	....
3.	Nickel steel, 24.8 per cent.	Sarnstrom	0.385	0.355	....
		New	0.393	0.393	0.390
4.	Tungsten steel, 1.70 per cent W.	Sarnstrom	0.543	0.605	0.582
		New	0.590	0.597	0.590
5.	Ferrochrome, 44.96 per cent.	New	5.71	5.69	....
6.	Ferrotungsten, 50-55 per ct.	New	0.052	0.060	0.060
7.	Silicon manganese alloy, 14 per ct. Mn., 7 per ct. Si.	New	3.24	3.25	3.278
8.	Ferrosilicon, 27.28 per cent.	New	0.609	0.603	0.605
9.	Ferrosilicon, 47.88 per cent.	New	0.270	0.262	0.278

The Sarnstrom method is one of solution in chromic and sulphuric acids. There may be seen excellent comparison with the first two samples. Samples 3 and 4 were not well adapted to the Sarnstrom method. The new method shows results that check excellently with each other.

The other samples could not be done by the Sarnstrom method, and it is to such materials that the new method is specially applicable. G. B. W.

Sons of Vulcan Puddling Scale Settled.—At a meeting held in Pittsburgh, September 25, a settlement was reached between the Sons of Vulcan and certain bar iron mills. The organization had demanded 50 cents more a ton for boiling than the rates called for in the Amalgamated scale. The mills have compromised by granting an increase of 25 cents a ton. The manufacturers represented at the meeting, and who have signed the Sons of Vulcan scale are as follows: Youngstown Sheet & Tube Company, A. M. Byers & Co., Brown & Co., Pittsburgh Forge & Iron Company, Zug Iron & Steel Company, Lockhart Iron & Steel Company, Kittanning Iron & Steel Company, Colonial Steel Company, Crescent plant of the Crucible Steel Company and Wheeling Iron & Steel Company. The Lockhart Iron & Steel Company and the Pittsburgh Forge & Iron Company signed both scales. In both these mills the Amalgamated men have been working for the past month or so taking the places of the Sons of Vulcan.

The Mechanigraph

A machine which is of interest to those who pay for making tracings for any form of light printing has been placed on the market by Topping Brothers, 122 Chambers street, New York City, and is illustrated herewith. This machine renders an opaque pencil or pen drawing transparent and printable practically instantaneously and at a cost of approximately one-third of a cent per sq. yd. It is also of interest to makers and users of blue prints because it effects a saving in time and also in money.

The Mechanigraph, as it is called, consists of a series of electrically warmed rolls, a bath also electrically warmed, a series of traveling tapes, and a pair of drying rolls. Fig. 1 is a front view showing the drawing passing through to the drying rolls and supported by the traveling tapes. The electrically warmed rolls and the bath are in the front of the machine as shown at the right end where the covering is broken away. Fig. 2 is a rear view showing the treated drawing as it issues from the drying rolls. The machine is built of heavy wrought and cast steel with turned rolls and when set up ready to work occupies a floor space less than 4 ft. square or about half the space occupied by a single draftsman.

Any piece of white paper no matter how heavy or thick is rendered transparent enough to blue print through quickly, thus eliminating tracing on cloth or paper and rendering it possible to make details in pencil and after passing the sheet through the Mechanigraph, to blue print directly from it. Among the advantages of such a machine are the elimination of the time spent in tracing details which enables estimating and real construction to be started as soon as the original drawings are made. Errors that are bound to creep into any tracing, the time occupied in making the tracings themselves and in checking them all cost money and take time and are done away with.

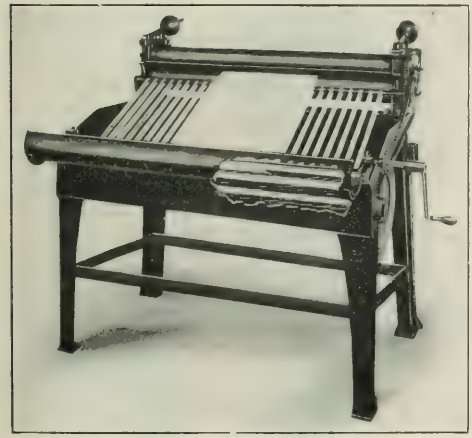


Fig. 1.—The Mechanigraph for Making Opaque Drawings Transparent, Made by Topping Brothers, New York City.

The drawing to be treated is passed through the first pair of rolls which carry it through the bath containing the transparantor liquid and from there it is carried along a series of moving tapes through the drying rollers. The machine is operated by the crank shown at the right in Fig. 1, and the amount of current employed for warming the rolls and the bath is regulated through the rheostat underneath. The time occupied in treating a drawing from the instant it is placed in the machine until it goes out finished and thoroughly dry is not much more than it would take to pass it through an ordinary clothes wringer. The pressure on the drying rolls, which are driven by a chain running over sprockets from the crank, is maintained by adjustable spherical iron weights. Practically all the attention required is said to be oiling the bearings occasionally and washing out the bath tray and refilling it with the liquid. This is inexpensive, does not evaporate, and is said to be absolutely non-inflammable.

Ink drawings can be treated as easily and as satisfactorily as pencil ones and it can also be used for

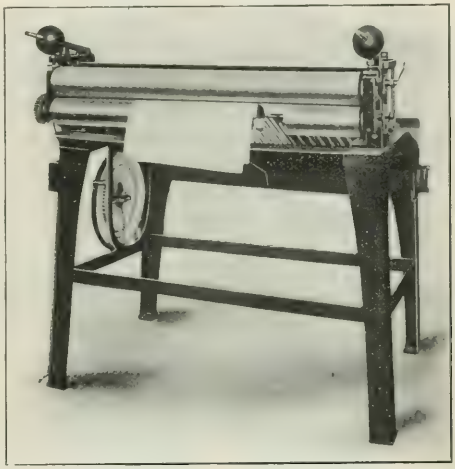


Fig. 2.—Rear View of the Mechanigraph, Showing a Treated Drawing Issuing from the Drying Rolls.

restoring old tracings that have become water spotted and crinkled until they will scarcely print at all, so that they are as bright and crisp as when they were first made. Van Dyck prints may be treated and made so transparent as to form negatives for producing positive blue prints and pencil drawings after having been treated may be erased and changed as readily as originally. When passed through the machine again the corrected drawing will be just as good as the original.

The Amsler Gas Producer for Glass Houses.—The Fostoria Glass Company, Moundsville, W. Va., has been operating two Amsler gas producers in its glass house. The installation has been found so satisfactory from an economical standpoint that the company has ordered five additional producers 11 ft. in diameter. It formerly used natural gas. In placing the order with Walter O. Amsler, Wabash Building, Pittsburgh, the company made this statement: "We are using gas from these producers in an entirely new manner, having connected them up with our deep eye furnace without leaving the furnace out. The results have been fully up to our expectations. The furnace is running on its natural draft. We use it in melting Hancock sand in large pots, 45 x 60 x 54 in. Everybody knows that Hancock sand is hard to melt; this furnace is melting the pot of glass in from 22 to 24 hours. Daily average for two months' run is 10 tons of coal. We believe the life of our furnace with producer gas, using it in the manner in which we are, will be as long or longer without repairs as with natural gas for fuel."

The Michigan Central Railroad tunnel under the Detroit River, between Windsor, Ontario, and Detroit, Mich., was opened to regular freight service September 17. Passenger service will shortly be inaugurated. The railroad company's car ferry, which was a picturesque marine feature of Detroit, will then be discontinued.

Segregation in Soft Steel Ingots

Its Effect on Rolled Material as Shown in Tensile and Shock Tests

In the issue of *Metallurgie* for June 22, 1910, is a paper by Professor Wüst and Herr Felser on "The Influence of Segregation on the Tenacity of Soft Steel," detailing the results of a valuable piece of research work. The aim was to find what influence the segregation in soft steel had on the mechanical properties of round bars rolled from the ingots. Six square ingots were taken as follows:

No.	Kind.	Top. Inches.	Bottom. Inches.	Length. Inches.	Hight. Pounds.
1.	Basic Bessemer	11.4	12.6	61	2,200
2.	Basic Bessemer	7.3	6.9	41.3	550
1.	Basic open hearth	11.4	12.8	61	2,200
2.	Basic open hearth	7.9	8.9	45.3	750

They were all bottom cast. The two small Bessemer ingots were made from a different heat from the large one, but all the open hearth ingots were from the same heat. One of the small Bessemer ingots and one small open hearth ingot were rolled into rounds; the others were examined for segregation. First, they were cut longitudinally and the surfaces planed and polished with fine emery paper. The photographs are reproduced in Figs. 1 to 4.



Fig. 1.—Large Basic Bessemer Ingot.

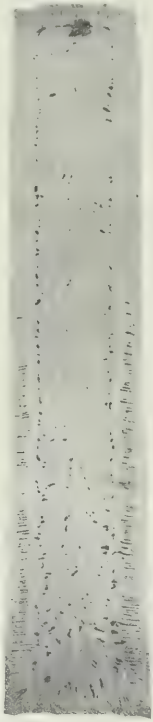


Fig. 2.—Large Open Hearth Ingot.

Two Kinds of Blowholes

In Fig. 1, the large basic Bessemer ingot, may be seen the pipe at the top and two kinds of blowholes. One kind starts from the pipe and keeps at an even distance from the edge; some may also be seen scattered in the interior. Between this series and the edge in the lower half of the ingot is seen the second series of blowholes. They extend horizontally, approaching very closely to the walls, and are dangerous on this account. At a high temperature oxidizing gases can penetrate the walls of the ingot and oxidize the inner surfaces of the blowholes; then tears and scales are formed in rolling. One theory for their formation is that they come from the rapid chilling of the steel in the lower part of the mold; the upper part being heated by radiation and the good conductivity of the iron mold does not cool the steel so fast. Both the open hearth ingots are similar in appearance to the one just described, but the small Bessemer ingot is quite different. It must be remembered it was made from a different heat. It gives the typical appearance of a rising steel, the upper half being full of scattered blowholes. In order better to observe the distribution of the blowholes, pieces were cut horizontally and photographs are shown in Figs. 5, 6, 7 and 8. The blowholes are arranged symmetrically, the long ones being parallel to the nearest edge. It is also clearly seen that they reach over half way up the ingot in the case of the open hearth, but not quite to the middle in the Bessemer.

In order to determine the segregation drillings were taken with a ¾-in. drill, the method of drilling being shown in Figs. 9 and 10 for the large and small ingots, respectively. The horizontal sections were also drilled, method being shown in Fig. 11. The ladle tests were as follows:

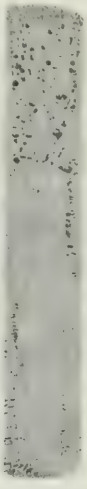


Fig. 3. — Small Basic Bessemer Ingot.

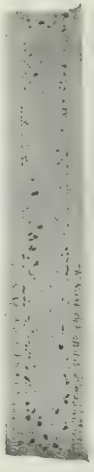


Fig. 4.—Small Open Hearth Ingot.

	C. Per ct.	Mn. Per ct.	S. Per ct.	P. Per ct.	Si. Per ct.
Basic Bessemer	0.07	0.53	0.061	0.05	....
Open hearth	0.065	0.48	0.04	0.05	0.016

The samples were analyzed for carbon, sulphur, phosphorus, manganese and copper, and the results will be taken up in that order.

Carbon Segregation

In the following tables are shown the results of the carbon estimations:

Table 1.—Carbon in Large Bessemer Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average center 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A1	0.080	0.135	0.130	0.138	0.085	0.083	0.134
A	0.085	0.082	0.096	0.073	0.073	0.079	0.084
B	0.076	0.087	0.080	0.070	0.070	0.073	0.079
C	0.076	0.076	0.085	0.078	0.068	0.072	0.080
D	0.055	0.082	0.073	0.080	0.060	0.058	0.078
E	0.055	0.070	0.062	0.083	0.060	0.058	0.072
F	0.062	0.060	0.078	0.082	0.056	0.059	0.073
G	0.078	0.065	0.073	0.066	0.082	0.080	0.068
H	0.060	0.080	0.060	0.078	0.085	0.073	0.073
I	0.078	0.073	0.062	0.074	0.063	0.071	0.070
K	0.083	0.074	0.068	0.075	0.068	0.076	0.072
L	0.066	0.067	0.092	0.070	0.076	0.071	0.076
M	0.070	0.063	0.070	0.060	0.067	0.069	0.064
N	0.064	0.066	0.070	0.070	0.073	0.069	0.069
O	0.067	0.092	0.065	0.075	0.090	0.079	0.074
P	0.072	0.083	0.065	0.075	0.076	0.074	0.074
Average						0.071	0.078

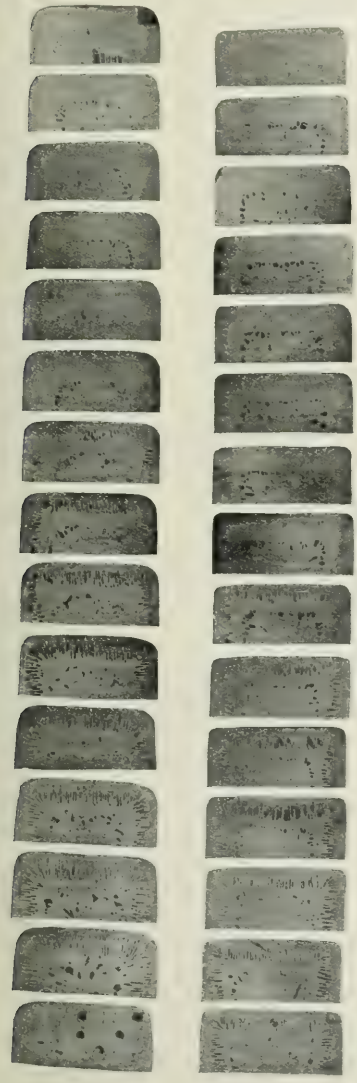


Fig. 5.—Large Basic Bessemer Ingot.

Fig. 6.—Large Open Hearth Ingot.



Fig. 7.—Small Basic Bessemer Ingot.

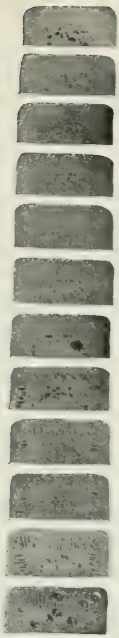


Fig. 8.—Small Open Hearth Ingot.

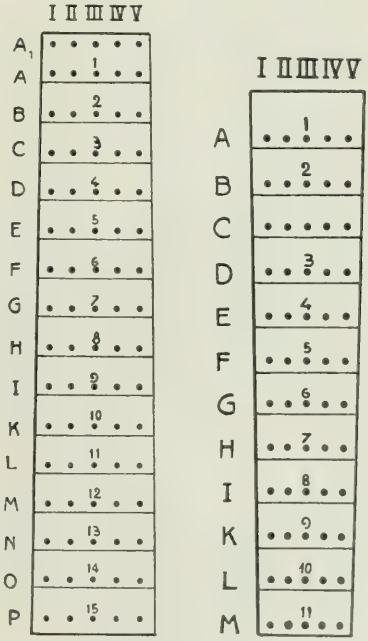


Fig. 9.—Large Ingots.

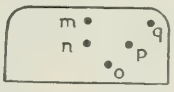


Fig. 10.—Small Ingot

Fig. 11.—Horizontal Sections.

METHODS OF DRILLING.

Table 2.—Carbon in Large Open Hearth Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average Center, 2, 3 and 4
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct
A 1	0.075	0.10	0.095	0.103	0.078	0.077	0.099
A	0.093	0.113	0.113	0.100	0.083	0.088	0.109
B	0.082	0.086	0.081	0.086	0.088	0.085	0.084
C	0.067	0.116	0.086	0.083	0.080	0.074	0.095
D	0.096	0.082	0.10	0.100	0.078	0.087	0.094
E	0.085	0.084	0.061	0.084	0.078	0.082	0.076
F	0.084	0.086	0.078	0.081	0.082	0.083	0.082
G	0.080	0.078	0.080	0.083	0.080	0.080	0.080
H	0.075	0.070	0.076	0.080	0.075	0.075	0.075
I	0.073	0.076	0.077	0.078	0.080	0.077	0.077
K	0.078	0.071	0.073	0.083	0.077	0.078	0.076
L	0.076	0.075	0.084	0.078	0.080	0.078	0.079
M	0.082	0.060	0.080	0.075	0.085	0.084	0.072
N	0.075	0.107	0.085	0.070	0.083	0.079	0.087
O	0.075	0.080	0.100	0.076	0.072	0.074	0.085
P	0.072	0.093	0.092	0.076	0.070	0.071	0.087
Average						0.079	0.079

Table 3.—Carbon in Small Bessemer Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average Center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A	0.130	0.117	0.120	0.120	0.135	0.133	0.119
B	0.128	0.125	0.160	0.126	0.147	0.138	0.137
C	0.104	0.160	0.167	0.124	0.110	0.107	0.150
D	0.104	0.118	0.117	0.126	0.093	0.099	0.120
E	0.100	0.117	0.176	0.116	0.092	0.096	0.156
F	0.093	0.092	0.127	0.112	0.092	0.093	0.110
G	0.098	0.087	0.081	0.090	0.100	0.099	0.086
H	0.098	0.087	0.096	0.102	0.102	0.100	0.095
I	0.097	0.095	0.094	0.084	0.120	0.109	0.091
K	0.088	0.084	0.092	0.095	0.091	0.090	0.090
L	0.091	0.080	0.082	0.112	0.160	0.126	0.091
M	0.160	0.080	0.086	0.104	0.340	0.250	0.090
Average						0.120	0.110

Table 4.—Carbon in Small Open Hearth Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average Center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A	0.078	0.085	0.108	0.122	0.079	0.078	0.105
B	0.077	0.089	0.086	0.104	0.076	0.076	0.090
C	0.074	0.086	0.076	0.093	0.070	0.072	0.085
D	0.068	0.086	0.103	0.080	0.073	0.070	0.090
E	0.062	0.090	0.098	0.065	0.062	0.062	0.084
F	0.062	0.075	0.072	0.065	0.062	0.062	0.071
G	0.061	0.060	0.083	0.084	0.080	0.070	0.076
H	0.062	0.072	0.087	0.107	0.051	0.056	0.089
I	0.060	0.070	0.072	0.080	0.056	0.058	0.074
K	0.062	0.067	0.071	0.088	0.056	0.059	0.075
L	0.074	0.084	0.100	0.100	0.065	0.069	0.071
M	0.060	0.080	0.083	0.095	0.062	0.061	0.087
Average						0.066	0.083

The results with the horizontal sections are not given in detail here, though they are to be found in the original paper. They confirm those given above. By taking the results of rows 1 and 5, and *m* and *q* and averaging them, the analyses of the edges of the ingots are obtained; then by taking 2, 3 and 4 and *n*, *o* and *p* results are obtained from the center of the ingots. These are brought together in the following table:

Table 5.—Segregation of Carbon.

Ingot.	Composition.—Edge.	Composition.—Center.	Segregation.—Absolute.	Segregation.—Per ct.
Large Bessemer	0.070	0.0725	0.0025	3.5
Large open hearth	0.0757	0.081	0.0053	6.8
Small Bessemer	0.125	0.111	.....	.....
Small open hearth	0.070	0.085	0.015	21.4

From these figures the segregation in the case of the large ingots is practically negligible. In the case of the small Bessemer ingot, owing to the manner of solidifying, the center has actually less carbon than the edge. The small open hearth shows 21.4 per cent. The two open hearth ingots are very interesting, being both from the same heat.

Sulphur Segregation

The results of the sulphur determination are given in tables 6 to 10:

Table 6.—Sulphur in Large Bessemer Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average Center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A 1	0.026	0.132	0.120	0.112	0.026	0.026	0.121
A	0.038	0.072	0.109	0.085	0.028	0.033	0.089
B	0.032	0.074	0.095	0.073	0.027	0.030	0.081
C	0.026	0.080	0.067	0.065	0.028	0.027	0.071
D	0.029	0.076	0.070	0.065	0.031	0.030	0.070
E	0.031	0.055	0.077	0.067	0.039	0.035	0.066
F	0.032	0.058	0.061	0.064	0.039	0.036	0.061
G	0.032	0.068	0.059	0.061	0.035	0.034	0.063
H	0.040	0.057	0.058	0.075	0.031	0.036	0.063
I	0.040	0.059	0.057	0.063	0.039	0.040	0.058
K	0.036	0.067	0.053	0.061	0.030	0.033	0.060
L	0.032	0.065	0.050	0.059	0.026	0.029	0.058
M	0.029	0.069	0.046	0.057	0.033	0.031	0.054
N	0.028	0.055	0.053	0.054	0.027	0.028	0.054
O	0.026	0.050	0.041	0.046	0.027	0.027	0.046
P	0.024	0.043	0.052	0.038	0.026	0.025	0.044
Average						0.031	0.066

Table 7.—Sulphur in Large Open Hearth Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average Center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A 1	0.057	0.182	0.164	0.187	0.043	0.050	0.178
A	0.047	0.157	0.134	0.140	0.046	0.047	0.144
B	0.042	0.116	0.124	0.135	0.040	0.041	0.125
C	0.035	0.137	0.121	0.139	0.037	0.036	0.132
D	0.031	0.100	0.122	0.123	0.035	0.033	0.115
E	0.033	0.124	0.080	0.116	0.040	0.037	0.107
F	0.035	0.102	0.101	0.126	0.035	0.035	0.110
G	0.032	0.080	0.102	0.115	0.034	0.033	0.099
H	0.030	0.090	0.104	0.103	0.033	0.032	0.099
I	0.030	0.090	0.099	0.104	0.035	0.033	0.098
K	0.029	0.093	0.091	0.096	0.035	0.032	0.093
L	0.028	0.098	0.095	0.080	0.038	0.033	0.088
M	0.027	0.077	0.082	0.080	0.042	0.034	0.080
N	0.028	0.081	0.095	0.064	0.032	0.030	0.080
O	0.042	0.068	0.106	0.071	0.042	0.042	0.082
P	0.045	0.054	0.066	0.060	0.048	0.047	0.060
Average						0.037	0.106

Table 8.—Sulphur in Small Bessemer Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average Center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A	0.047	0.040	0.057	0.045	0.060	0.054	0.041
B	0.041	0.054	0.064	0.042	0.044	0.043	0.053
C	0.037	0.065	0.047	0.041	0.034	0.036	0.051
D	0.040	0.045	0.065	0.031	0.033	0.035	0.047
E	0.038	0.047	0.082	0.043	0.044	0.041	0.057
F	0.037	0.044	0.054	0.046	0.055	0.046	0.048
G	0.040	0.040	0.042	0.045	0.053	0.047	0.042
H	0.046	0.042	0.056	0.049	0.050	0.048	0.049
I	0.037	0.035	0.032	0.036	0.036	0.037	0.034
K	0.041	0.043	0.041	0.045	0.030	0.038	0.043
L	0.028	0.038	0.032	0.053	0.040	0.034	0.041
M	0.026	0.032	0.038	0.040	0.032	0.029	0.037
Average						0.041	0.045

Table 9.—Sulphur in Small Open Hearth Ingots.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average Center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A	0.045	0.095	0.131	0.133	0.049	0.047	0.120
B	0.040	0.104	0.108	0.124	0.047	0.044	0.122
C	0.041	0.090	0.130	0.120	0.036	0.039	0.113
D	0.035	0.101	0.101	0.108	0.036	0.036	0.103
E	0.036	0.090	0.090	0.106	0.034	0.035	0.095
F	0.033	0.090	0.104	0.103	0.033	0.033	0.099
G	0.040	0.080	0.100	0.090	0.038	0.039	0.090
H	0.039	0.082	0.090	0.120	0.037	0.038	0.097
I	0.034	0.075	0.075	0.103	0.032	0.033	0.084
K	0.033	0.063	0.054	0.066	0.030	0.032	0.061
L	0.032	0.057	0.108	0.060	0.030	0.031	0.075
M	0.034	0.058	0.056	0.054	0.031	0.033	0.056
Average						0.037	0.092

By again taking all the results from the edge and all from the center and averaging them, a table may be drawn up. It is as follows:

Table 10.—Segregation of Sulphur.

Ingot.	Composition.—Edge.	Composition.—Center.	Segregation.—Absolute.	Segregation.—Per ct
Large Bessemer	0.025	0.0615	0.0365	146.0
Large open hearth	0.035	0.0985	0.0655	187.1
Small Bessemer	0.039	0.043	0.004	10.3
Small open hearth	0.038	0.086	0.048	126.3

It is very plainly evident that in the large ingots,

which cool more slowly, there is much more segregation than in the small ones.

Phosphorus Segregation

In the tables following are shown the results of the phosphorus determinations on the longitudinal sections:

Table 11.—Phosphorus in Large Bessemer Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A 1	0.061	0.194	0.162	0.158	0.056	0.059	0.168
A	0.050	0.099	0.135	0.121	0.064	0.057	0.118
B	0.047	0.102	0.116	0.117	0.067	0.057	0.112
C	0.049	0.106	0.112	0.120	0.057	0.053	0.113
D	0.053	0.103	0.094	0.120	0.074	0.064	0.106
E	0.049	0.099	0.098	0.110	0.067	0.058	0.102
F	0.045	0.098	0.091	0.113	0.067	0.056	0.101
G	0.050	0.108	0.088	0.108	0.068	0.059	0.101
H	0.054	0.085	0.083	0.117	0.057	0.056	0.095
I	0.054	0.091	0.078	0.106	0.060	0.057	0.092
K	0.051	0.093	0.083	0.102	0.069	0.060	0.093
L	0.045	0.093	0.083	0.102	0.053	0.049	0.093
M	0.047	0.083	0.080	0.096	0.053	0.050	0.086
N	0.042	0.071	0.083	0.089	0.049	0.046	0.081
O	0.045	0.070	0.082	0.089	0.053	0.049	0.080
P	0.044	0.072	0.083	0.071	0.048	0.046	0.075
Average						0.055	0.101

Table 12.—Phosphorus in Large Open Hearth Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A 1	0.061	0.147	0.154	0.168	0.069	0.065	0.126
A	0.065	0.131	0.115	0.125	0.052	0.059	0.124
B	0.046	0.108	0.120	0.125	0.052	0.050	0.118
C	0.046	0.117	0.112	0.126	0.053	0.050	0.118
D	0.048	0.101	0.112	0.150	0.052	0.050	0.121
E	0.045	0.105	0.108	0.124	0.052	0.049	0.112
F	0.046	0.100	0.109	0.104	0.052	0.049	0.104
G	0.050	0.100	0.096	0.106	0.053	0.052	0.101
H	0.046	0.093	0.104	0.105	0.055	0.051	0.101
I	0.053	0.089	0.095	0.101	0.056	0.055	0.095
K	0.048	0.098	0.090	0.102	0.057	0.053	0.097
L	0.046	0.087	0.093	0.090	0.052	0.049	0.090
M	0.060	0.079	0.077	0.086	0.052	0.056	0.081
N	0.045	0.068	0.098	0.075	0.050	0.050	0.080
O	0.045	0.070	0.095	0.075	0.048	0.047	0.080
P	0.045	0.066	0.076	0.076	0.057	0.051	0.072
Average						0.052	0.103

Table 13.—Phosphorus in Small Bessemer Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A	0.093	0.080	0.061	0.078	0.097	0.095	0.110
B	0.082	0.093	0.092	0.076	0.080	0.081	0.087
C	0.070	0.096	0.083	0.074	0.066	0.068	0.084
D	0.066	0.082	0.064	0.056	0.065	0.066	0.067
E	0.051	0.051	0.115	0.068	0.057	0.054	0.078
F	0.047	0.066	0.062	0.058	0.072	0.060	0.062
G	0.061	0.061	0.062	0.056	0.066	0.064	0.060
H	0.061	0.056	0.059	0.062	0.061	0.061	0.059
I	0.058	0.060	0.051	0.057	0.047	0.053	0.056
K	0.053	0.067	0.063	0.061	0.057	0.055	0.064
L	0.081	0.060	0.059	0.073	0.062	0.072	0.064
M	0.092	0.062	0.058	0.064	0.055	0.074	0.061
Average						0.067	0.074

Table 14.—Phosphorus in Small Open Hearth Ingot.

	1.	2.	3.	4.	5.	Average edge, 1 and 5.	Average center, 2, 3 and 4.
	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
A	0.048	0.081	0.106	0.112	0.046	0.047	0.100
B	0.042	0.107	0.109	0.115	0.043	0.043	0.110
C	0.040	0.094	0.107	0.096	0.035	0.038	0.099
D	0.037	0.086	0.093	0.097	0.042	0.040	0.092
E	0.037	0.095	0.090	0.093	0.036	0.037	0.093
F	0.040	0.082	0.091	0.086	0.037	0.039	0.086
G	0.044	0.075	0.086	0.080	0.040	0.042	0.080
H	0.040	0.074	0.088	0.105	0.055	0.048	0.089
I	0.045	0.087	0.095	0.110	0.050	0.048	0.097
K	0.048	0.083	0.066	0.076	0.039	0.044	0.075
L	0.050	0.080	0.108	0.074	0.042	0.046	0.087
M	0.060	0.074	0.080	0.076	0.042	0.051	0.077
Average						0.044	0.080

In a similar manner to those of the carbon and sulphur the results of the edge and of the center of all the sections may be brought together in a table. This is as follows:

Table 15.—Segregation of Phosphorus.

Ingot.	Composition. Edge.	Composition. Center.	Segregation. Absolute.	Segregation. Per ct.
Large Bessemer	0.054	0.0965	0.0425	78.7
Large open hearth	0.0525	0.0838	0.0313	59.6
Small Bessemer	0.070	0.075	0.005	7.1
Small open hearth	0.048	0.083	0.035	72.9

Excluding the small Bessemer ingot as abnormal, the large ingots show less segregation than the small ones. This was also noticed in the case of the carbon.

Manganese Segregation

The detailed results of the manganese determinations will not be given. There is a tendency to segregation, as is shown below:

Table 16.—Segregation of Manganese.

Ingot.	Composition. Edge.	Composition. Center.	Segregation. Absolute.	Segregation. Per ct.
Large Bessemer	0.52	0.56	0.04	7.7
Large open hearth	0.38	0.40	0.02	5.2
Small Bessemer	0.59	0.52	...	...
Small open hearth	0.421	0.466	0.045	10.7

Copper Segregation

This was only determined on the open hearth ingots. The average results for the edge and center are 0.303 per cent., and 0.377 per cent. for the large ingot, 0.300 and 0.373 for the small one.

Physical Tests

As mentioned before, two small ingots one Bessemer and one open hearth were rolled to 1.34 in. in diameter rounds. After blooming the Bessemer ingot was cut in three pieces and the open hearth in four. When these pieces were rolled test pieces were cut for tensile and shock tests. One series of tensile bars was made 7.87 in. between centers, 0.78 in. in diameter. Another series were turned down to 0.39 in. in diameter and 3.94 in. long. The latter were to show the influence of segregation. The material was tested in two conditions—one after heating in a gas muffle to 1000 degrees C., cooling to 950 degrees C. and quenching in ice water, the other after heating to 1000 degrees C. and cooling very slowly. The results of the tensile tests are shown in Tables 17 and 18:

Table 17.—Tensile Strength of Quenched Steel.

Material.	Elastic limit, pounds. 0.78-in. diameter.	Elastic limit, pounds. 0.39-in. diameter.	Ultimate stress, pounds. 0.78-in. diameter.	Ultimate stress, pounds. 0.39-in. diameter.	Elongation. 0.78-in. diameter.	Elongation. 0.39-in. diameter.	Reduction of area. 0.78-in. diameter.	Reduction of area. 0.39-in. diameter.
Bessemer, head	48,500	.....	78,795	90,330	10.7	16.5	30.0	39.9
Bessemer, middle	49,496	.....	76,662	83,261	12.2	17.0	35.1	38.2
Bessemer, base	52,198	.....	84,056	76,050	12.3	18.2	28.6	41.2
Open hearth, head	56,181	.....	84,342	93,033	11.6	13.9	22.8	35.1
Open hearth, upper middle	63,292	.....	87,044	89,776	12.9	14.9	24.1	33.5
Open hearth, lower middle	60,874	.....	83,915	82,579	13.8	15.8	27.8	37.7
Open hearth, foot	59,025	.....	82,067	83,261	14.6	16.4	33.2	38.5

Table 18.—Tensile Strength of Annealed Steel.

Material.	Elastic limit, pounds. 0.78-in. diameter.	Elastic limit, pounds. 0.39-in. diameter.	Ultimate stress, pounds. 0.78 in. diameter.	Ultimate stress, pounds. 0.39-in. diameter.	Elongation. 0.78-in. diameter.	Elongation. 0.39-in. diameter.	Reduction of area. 0.78-in. diameter.	Reduction of area. 0.39-in. diameter.
Bessemer, head	33,140	.....	56,039	55,185	28.2	26.1	42.1	47.6
Bessemer, middle	31,575	.....	52,483	56,323	28.4	27.5	46.3	47.8
Bessemer, base	32,428	.....	55,043	56,465	28.1	25.0	43.0	49.2
Open hearth, head	45,087	.....	61,017	54,616	26.0	26.1	39.2	45.6
Open hearth, upper middle	43,380	.....	59,310	61,159	28.2	22.6	38.5	40.5
Open hearth, lower middle	40,678	.....	56,892	55,470	30.5	32.4	43.6	49.4
Open hearth, base	41,531	.....	55,327	57,461	30.0	28.2	44.6	49.8

The shock tests were made on square pieces 0.78 x 0.78 in. and 4.7 in. length tested. The machine was a pendulum hammer of 542.3 ft.-lb. The average results are given in Table 19:

Table 19.—Shock Tests.—Foot-Pounds.

		Upper		Lower	
Material.	Head.	middle.		middle.	Base.
Bessemer, quenched	72.1	...	121.7	...	126.5
Open hearth, quenched	44.0	59.4	...	86.2	100.8
Bessemer, annealed	15.1	...	21.7	...	18.8
Open hearth, annealed	49.5	73.0	....	86.9	95.7

Conclusions

1. The analyses show the amount and distribution of the segregation.

2. Sulphur and phosphorus segregate the most; carbon, manganese and copper giving lower results.

3. Sulphur shows more segregation in the case of the large ingots. The reverse is true of phosphorus, carbon and manganese.

4. The influence of the segregation on the tensile tests is not very considerable, but the ductility is considerably affected.

5. The greatest effect is seen in the shock tests, the segregated material being very unreliable and brittle.

G. B. W.

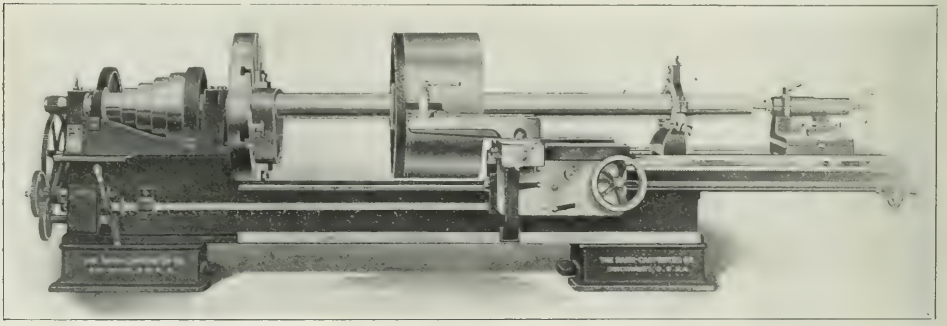
The Rahn-Carpenter Gap Lathe

A tool designed to meet the requirements of repair and jobbing shops where a large range and variety of work is to be done at a minimum expenditure for equipment has been brought out by the Rahn-Carpenter Company, Cincinnati, Ohio. As was announced under New Tools and Appliances in *The Iron Age*, June 30, 1910, the company has redesigned its 24-40 in. sliding bed gap lathe to swing 24-48 in., and the new model, with double back gears and a three-step cone pulley, is shown in the accompanying engraving.

The top bed, which is 12 in. deep, slides along the lower one, the depth of which is ¾ in. greater, and can be adjusted to any width of gap required, within the range of the lathe. The shortest length of bed in which this lathe is made is 10 ft. This size will take work when the gap is closed measuring 5 ft. between centers and with the gap open, 8 ft. overall. For each additional 2 ft. in length of bed 3 ft. additional between centers can be obtained with the gap open. Both beds are very heavily constructed and are firmly braced throughout their entire length with box girders, to absorb the vibration of the heaviest cut. The sliding bed is accurately planed and fitted into the lower one, and as the carriage and tailstock are moved along with it, perfect alignment with the head spindle is assured in all positions. The bed is moved by a hand wheel and coarse pitch screw at the rear of the lathe.

The carriage is gibbed to the bed, both front and back, and provides a broad bearing for the rest. It has a long, continuous bearing of 31 in. on the bed and can be firmly locked to it for cross feed work. The construction is such that the tool rest can be brought close up to the gap when required and the front of the carriage is extended and firmly braced, thus allowing extra travel for the compound rest, in order that the tool may operate on the greatest diameter that can be swung in the gap. A large range of both longitudinal and cross feeds are provided, any one of which is instantly available without stopping the lathe by shifting a lever on the feed change box.

This lathe is very heavy, the weight of the one with a 10-ft. bed being over 7000 lb., which is increased 625 lb. for each additional 2 ft. of bed length.



A New Extension Bed Gap Lathe Built by the Rahn-Carpenter Company, Cincinnati, Ohio.

The Globe Seamless Steel Tubes Company's New Plant

The Globe Seamless Steel Tubes Company, Milwaukee, Wis., is making rapid progress in the construction of its large plant. The main building will be practically completed and under roof within a week and the foundations for the heavy equipment are also nearing completion. The boilers and a large part of other material for the equipment are now on the ground, and it is expected that the company will be ready for operation early in November. The main building is about 250 x 500 ft., but with side bays which are under construction the building will be practically 300 x 600 ft. The annealing ovens and finishing departments will be located in the side bays, leaving the central part of the main building for the machinery used for piercing, rolling and drawing tubes. There will be several auxiliary buildings in the plant, and one of these contemplated buildings will be occupied by the trolley pole department. The capacity of the plant will be about 2000 tons of finished tubing per month.

Baltimore gained only 9 per cent. in population between 1900 and 1910, the Census Bureau reporting 559,485 for this year against 508,957 in 1900. Cleveland, with a population of 560,663, has thus replaced Baltimore as the sixth city in the United States. Should St. Louis and Boston, which are respectively the fourth and fifth cities, gain but 19 per cent. in the next decade, as in the last one, and Cleveland continue the gains of the past two decades—46.9 and 46 per cent., respectively—Cleveland will have passed both these cities by 1920.

Wool, for the third time in a decade, is selling at a lower price in Boston, Mass., than in Europe, thus inducing considerable sales for export. It is of course unlikely that this condition will be of long duration. Nevertheless, the fact is of interest in view of the present discussion of the tariff question.

The Farwell Gear Tester

The latest addition to the line of gear machines built by the Adams Company, Dubuque, Iowa, is the Farwell gear testing machine, designed for testing spur gears up to 30 in. between centers. Any inaccuracy in the diameter or the depth of teeth is shown and skew teeth or gears cut eccentrically with the bore are detected. The machine also shows the clearance and running of a pair of gears on the correct center distances. Fig. 1 is a front view of the machine and Fig. 2 shows the micrometer dial employed for reading the center distances.

The machine consists of a horizontal table, with a graduated rail on its upper front edge, and two heads, one stationary and one sliding, in which arbors are inserted for mounting the gears to be tested. The sliding head is moved and set by a screw operated by a crank handle, which is provided with a ratchet relief to act as a safety device and prevent injury to the various parts by careless jamming of the gauge or gears. The screw controlling the sliding head is accurately cut, and to minimize any error due to its expansion or contraction a 12-in. micrometer is furnished, which may be used to check up the setting of the micrometer disk on the end of it, shown in Fig. 2. In this way it is said that the error either way from a 12-in. setting probably would not exceed more than 0.00025 in. In checking the adjustment with this gauge the screw on the micrometer or gauge is used, the gauge being set at 11½ in. when ½-in. arbors are used, or 11-in. when 1-in. arbors are used.

The rail is graduated to read to inches and tenths; the micrometer disk is graduated to read thousandths, and a block on the head will read to one-quarter of these divisions. The screw is supported in the stationary head by a series of collars having angular sides and runs like an Acme thread screw in split babbitt nuts. The lower thumb nut in the head enables the nuts on the screw and collars to be kept as tight and free from lost motion as is consistent with the free working of the screw. A gib provided with a thumb screw adjustment prevents possible lost motion in the sliding head on the rail.

In testing gears with this machine the arbors are placed in the vertical holes and the gears mounted thereon for testing center distances, as shown in both engravings. In testing gears for noise the arbors are placed in the holes shown in the front of the heads in Fig. 1, and the gears are driven by a belt, while the center distance is adjusted to a point where they run best.

A shelf running the entire length of the bed is used to hold the gauges, arbors, bushings, &c., when the machine is in use, and a cabinet in the column provides room for storage. The equipment furnished includes two ½-in. and 1-in. arbors and a 12-in. micrometer checking gauge.

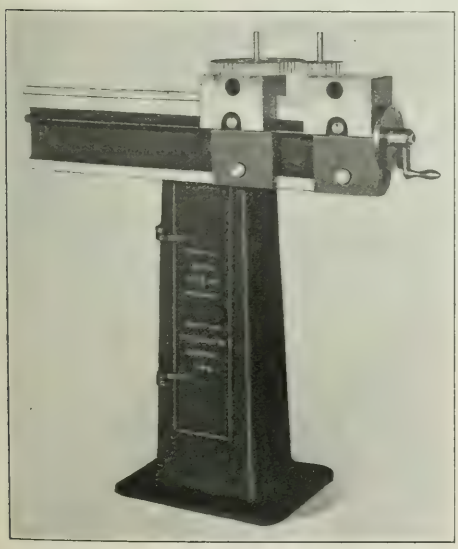


Fig. 1.—The New Farwell Gear Testing Machine Made by the Adams Company, Dubuque, Iowa.

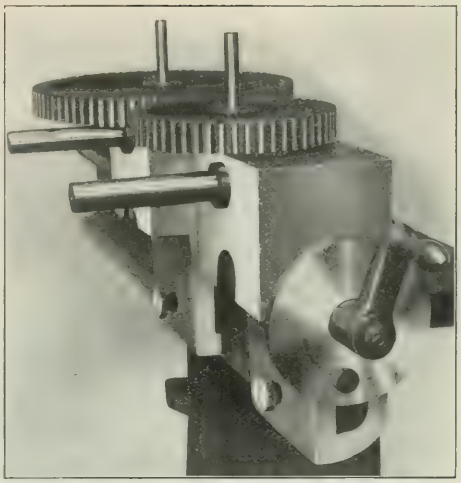


Fig. 2.—Micrometer Dial Used for Reading Center Distances of Gears Tested.

Iron Ore Shipments from Cuba

The American Iron and Steel Association's statistics of Cuban iron ore production in 1909 credit the Juragua Iron Company with 389,926 gross tons, the Spanish-American Iron Company with 524,949 tons and other companies with 53,983 tons—a total of 968,858 tons, as compared with 699,735 tons, the largest previous production, made in 1902. The total shipments of the Juragua Iron Company, which began in 1884 and have continued through all the intervening years, were 5,285,023 tons to the end of 1909. Beginning in 1895, the Spanish-American Iron Company has shipped a total of 4,791,093 tons. Shipments by all other companies have been 115,662 tons, making a grand total of 10,191,778 tons. The total of 115,662 tons shipped by "other companies" than the two leading producers, is made up of 6,418 tons in 1892 and 14,020 tons in 1893 by the Sigua Iron Company, 17,651 tons in 1901 and 23,590 tons in 1902 by the Cuban Steel Ore Company, and 53,983 tons in 1909 by the Ponupo Manganese Company, which is owned by Charles F. Rand, Jennings S. Cox, Jr., and Pedro Aguilera. The Ponupo company's iron mine is at El Cuero. Its manganese ore shipments from Ponupo in 1909 were 2885 tons, against 1484 tons in 1908.

Shipments from the Pennsylvania Steel Company's (Spanish-American Iron Company) Mayari deposits in 1909 were 5196 tons, but in recent months the rate has been 45,000 tons a month.

The Frick Company, Waynesboro, Pa., has placed an order with Tate, Jones & Co., Inc., Pittsburgh, Pa., for a large plate heating furnace, 8 x 10 ft. inside. This will be equipped with Kirkwood fuel oil burning appliances.

New Diamond Grinders

Four Improved Lines of Grinding and Polishing Machines

Among the new or most recently improved products of the Diamond Machine Company, Providence, R. I., are a traveling head face grinder, a heavy disk grinder, a motor driven polisher and an under belted polisher is claimed to be the largest and heaviest on the market and is intended for extra heavy work which the ordinary medium size disk grinders are not capable of handling. The motor driven polisher is a redesigned

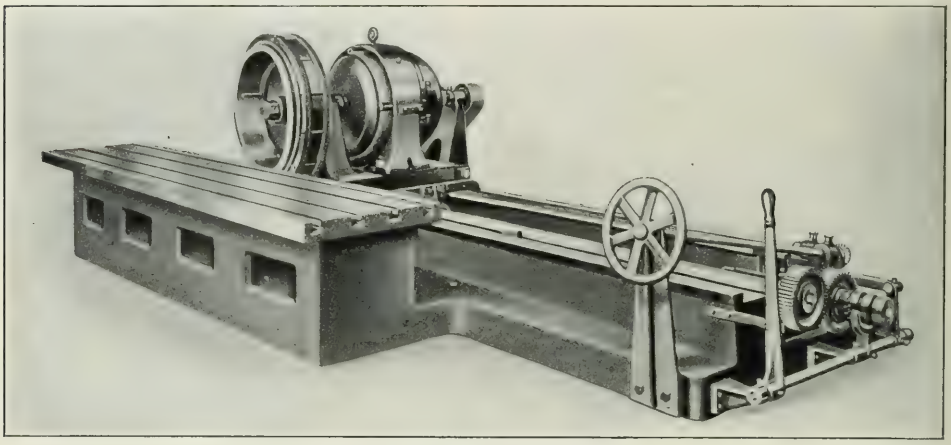


Fig. 1.

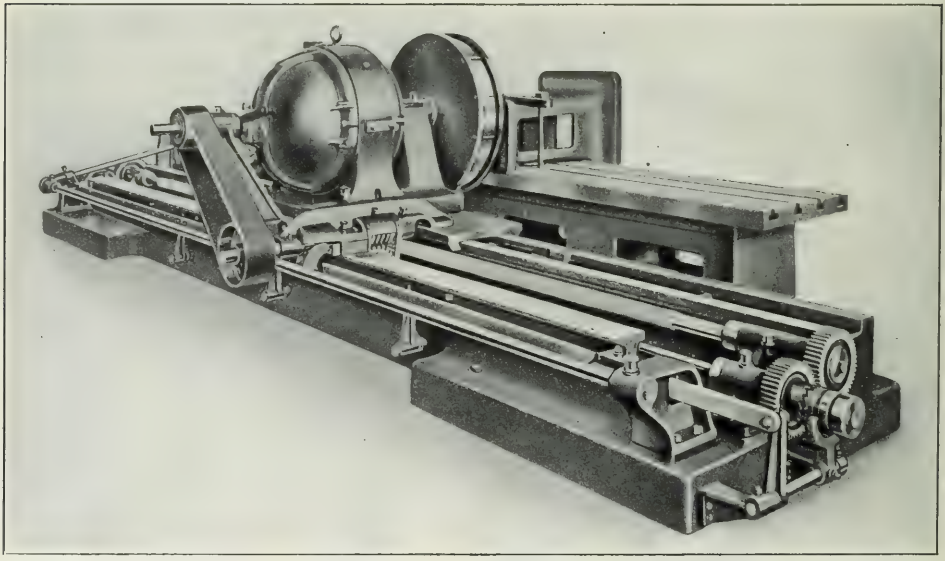


Fig. 2.

Two Views of the New Traveling Head Face Grinder Built by the Diamond Machine Company, Providence, R. I.

The first is a machine designed for heavy grinding on work of such shape and size as to make it more advantageous to move the wheel head than the work. It is especially fitted for grinding the ends of long pieces, such as cast iron building columns, built-up steel columns, &c. It is also employed for grinding heavy pieces of various shapes, the finishing of which would otherwise be impossible without the use of a very heavy and expensive machine. The disk grinder machine, with several improved features, explained later, and the under belted polisher is a response to the demand for an entirely inclosed machine driven from below.

Traveling Head Face Grinder

This machine, shown in Figs. 1 and 2, has a heavy table cast in box form, and will support the heaviest work without distortion. The grinding wheel fur-

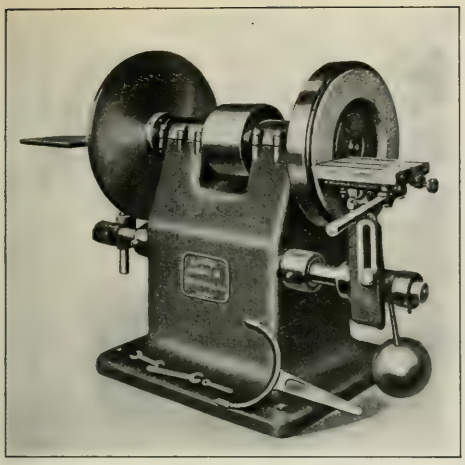


Fig. 3. The No. 6 X Extra Heavy Diamond Disk Grinder.

nished with the machine can be of any abrasive desired. It is held in an adjustable chuck, which makes the wheel absolutely safe from bursting, and at the same time allows the wheel to be fed forward in the chuck, thus getting the maximum amount of wear from the wheel. The motor is mounted upon the grinding wheel spindle, and has sufficient power for the heaviest work. The front bearing for the emery wheel spindle is a ring oiling bronze box held in a massive support cast solid with the traveling head.

The longitudinal feed of the wheel head is obtained from the rear end of the emery wheel spindle through a belt and gearing, the belt acting as a safety clutch and slipping in case the abrasive wheel encounters any obstruction. From the same source the automatic feed of the wheel to and from the work is obtained. The longitudinal feed is automatic, its direction being changed either automatically or by a hand lever conveniently placed. The operator of the machine has all necessary control of the machine from one point.

In its details the machine has been carefully worked out. Liberal means for oiling are provided for all bearings, both cylindrical and sliding. All gears are cut and are of suitable material for the work they have to do.

The principal dimensions of the machine are given below, but the length of the table can be changed to suit the requirements.

Total travel of head, inches	144
Size of bed plate, inches	73 x 216
Size of table, inches	25 x 144
Hight of table from floor, inches	24
Length of main ways, inches	216
Distance across ways, inches	32
Length of slide bearings, inches	60
Cross feed of head, inches	4
Hight of center of spindle, inches	34
Speed of wheel, revolutions per minute	625
Diameter of spindle in bearings, inches	3½
Length of spindle bearings, inches	10
Wheel, inches	30 x 6 x 26

No. 6-X Heavy Disk Grinder

The work for which the machine shown in Fig. 3 is designed is the grinding of automobile cases, feet of motor frames, sides of large wrenches and any other surfaces where a finish is desired. It was found necessary for this heavy grinding where considerable stock had to be removed to use an abrasive wheel in place of a disk. Therefore, this machine has been built with one end of the spindle carrying a steel bound chuck with an abrasive ring and the other a steel disk for emery circles. On the side of the machine which has the disk is an ordinary plain table, as this side of the machine is not used for such heavy work as the other and a man can hold the work against the disk without excessive fatigue.

The other side, which has the large abrasive ring wheel, is intended to remove the greater amount of stock and do it more rapidly than the other. This side of the machine is therefore equipped with a sliding table operated by a hand lever. The work can be held in any jig, which in turn is bolted to the T slots on the sliding table. The sliding table is provided with a micrometer stop, thus producing duplicate parts. The sliding table is operated by a hand lever which not only brings the work up against the wheel but also rocks the work back and forth over the face of the wheel, thus using the entire surface of the wheel. The wheel can be dressed quickly and economically by fastening a wheel dresser on the sliding table top and then rocking the table back and forth over the face of the wheel. The table is balanced by a counterweight hanging out of the way, below the stud, which supports the table.

The entire construction of this machine is extremely massive and heavy. The emery spindle bearings are babbitted and ring oiling. The stud which supports the tables is of extra large diameter. With the machine are furnished all necessary wrenches, a press for cementing emery circles to the disk and a countershaft.

The dimensions are as follows:

Hight from base to center of spindle, inches	36
Size of base, inches	32 x 41
Diameter of spindle in bearings, inches	3
Length of spindle, inches	41½
Length of bearings, inches	12
Size of pulley, inches	12 x 8½
Diameter of disk, inches	30
Size of emery ring, inches	22 x 17 x 2½
Speed, revolutions per minute	900
Size of plain table, inches	14 x 30¾
Size of sliding table, inches	8½ x 12
Weight, crated, ready for shipment, pounds	1,500

No. 3 Motor-Driven Polisher

Fig. 4 shows this machine, which has lately been redesigned to make it self-cooling and to allow it to be operated without the necessity of opening the base of the machine. The cooling is obtained by placing a fan on the spindle of the machine close to the armature on the side outside the commutator and by placing inlets and outlets on the ends of the motor frame. By this means while the machine is in motion the fan is drawing cool air through the parts of the motor which ordinarily heat up, and discharging it outside of the machine. The inlet may be connected with the outside air or any place from which clean air can be obtained.

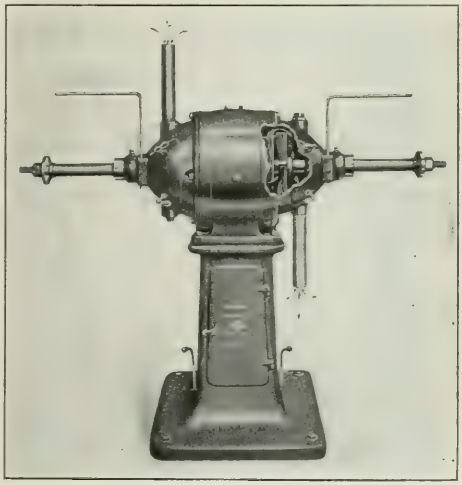


Fig. 4.—The No. 3 Diamond Air-Cooled Motor-Driven Polisher.

The discharge may be carried to a dust collector or discharged anywhere the dust is not objectionable.

A polisher or grinder electrically driven requires that the products of grinding or polishing be kept from the electrical parts as much as possible. This in turn necessitates using an inclosed motor. When the motor

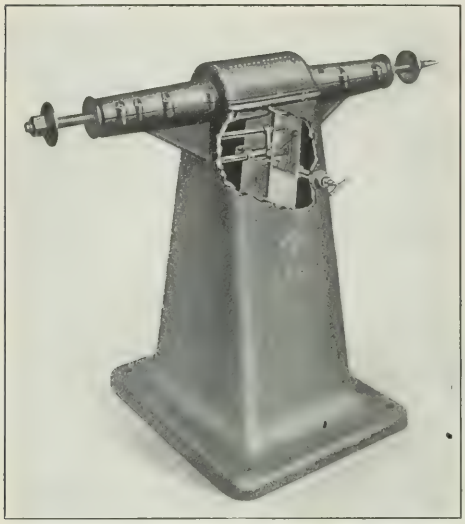


Fig. 5. The No. 8 Diamond Polisher Belted from Beneath, with Countershaft Contained in the Base.

is developing a good deal of power the entire machine necessarily becomes very hot. This undesirable condition is prevented by the arrangement of the fan with the inlet and outlet connections. This machine is rated at 10 hp. and under actual service for short intervals has produced double this horsepower; the amount of power obtainable depends solely upon the motor, and as it cannot get hot the machine will develop as much power as a light motor entirely open.

In previous machines it has been necessary to open a door in the column to throw the switch and also to get at the regulator. In this machine a lever projects on each side of the machine which can be moved by the operator's foot to throw off the switch. Another lever, not shown in the engraving, operates the controller. The machine is provided with bronze ring oiling bearings each 5¾ in. long.

The builder is now shipping an order of 20 of these machines to one purchaser. The dimensions are as follows:

Maximum wheel taken, inches	16 x 3¼ x 1¼
Size of base, inches	26 x 26
Hight from floor to center of spindle, inches	39
Diameter of spindle in bearings, inches	1⅝
Diameter of spindle between flanges, inches	1¼
Length of spindle, inches	60
Diameter of body, inches	17¼
Horsepower	10
Distance between wheels, inches	45⅞
Speed, revolutions per minute	2,300
Weight, crated for shipment, pounds	900

No. 8 Polisher

In designing the polisher, of which a view is given in Fig. 5, it was found desirable to include the countershaft in the base of the machine, as it would be awkward to make a hole through the floor to ship the belt on the countershaft. The belt is shipped by turning the handle shown projecting through the front of the column, which in turn through a linkage moves the belt. The machine can be driven from above by removing the cap over the pulleys. The dimensions of this machine are as follows:

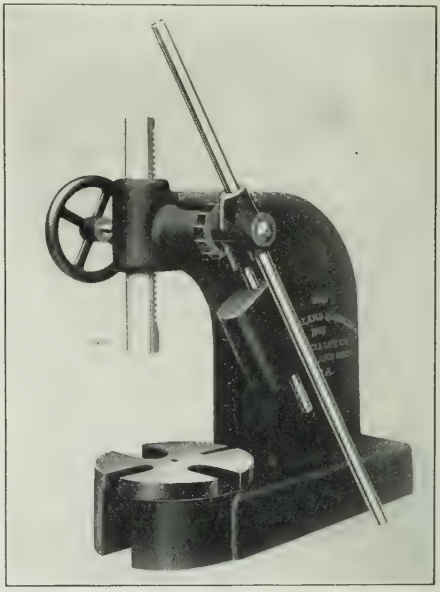
Diameter of spindle in bearings, inches	1⅝
Diameter of spindle between flanges, inches	1¼
Length of spindle, inches	54
Hight from floor to center spindle, inches	38
Size of base, inches	25 x 33½
Size of tight and loose pulleys, inches	6 x 4¼

The machine is very strong and heavy throughout, with liberal surface in the bearings. The long bearings enable a very long spindle to be used, so that large and awkward shaped work can be handled successfully on this machine. At the same time the bearings are supported by heavy brackets cast with the column. One end of the spindle is provided with a removable taper point, as shown in the cut.

The New Cleveland Arbor Press

An unusually heavy arbor press, recently placed on the market by the Cleveland Machine Specialty Company, Cleveland, Ohio, which is designated as its No. 5 arbor press, is shown herewith. The cast iron frame is of box construction with a base 5½ in. high and heavily ribbed to the full depth of the frame. The lever, which is of tool steel, is counterweighted and, when released, rises to the vertical position, where the pawl is automatically raised from the ratchet wheel so that the ram can be quickly adjusted to or from the work by the hand wheel.

The press will take work 20 in. in diameter by 15



The No. 5 Arbor Press Made by the Cleveland Machine Specialty Company, Cleveland, Ohio.

in. high, and will press a 3-in. arbor, exerting a pressure of 6 tons. The machine weighs 430 lb. net, and is designed to withstand the rough usage to which these machines are often subjected.

The Ellwood City Forge Company, Ellwood City, Pa., recently organized by a number of former employees of the Tindel-Morris Company, has its new plant nearly completed. The building is finished and the machinery is now being installed. The company will manufacture crank shafts, connecting rods, die blocks and machine forgings. J. A. Evans is president.

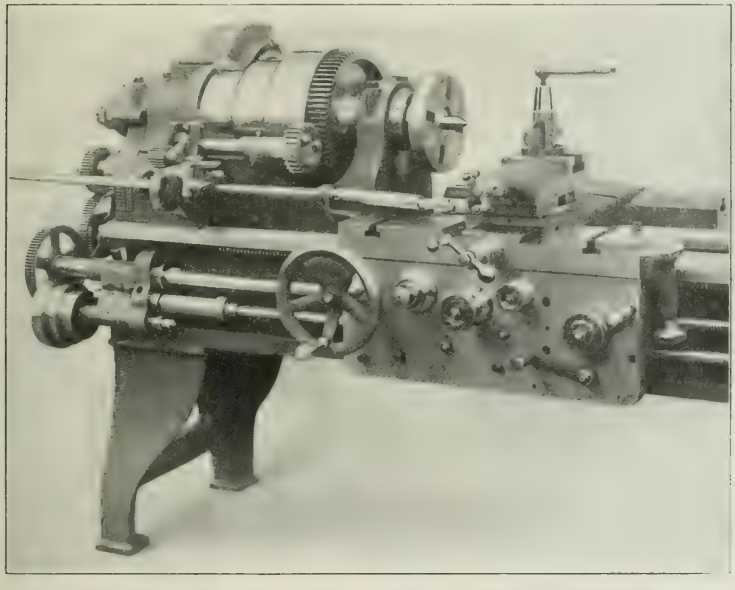
The New Bradford Lathe Relieving Attachment

For backing off the teeth of reamers, taps, hobs, mills, &c., the Bradford Machine Tool Company, Cincinnati, Ohio, has brought out the relieving attachment illustrated herewith. This is furnished with its 14, 16, 18, 20 and 22 in. lathes and the 18-in. heavy pattern lathe regularly, but can be had with other sizes if ordered. The lathe shown in the engraving is the 21-in. model. In conjunction with the Bradford taper attachment this attachment will relieve straight or taper work of any number of flutes, from 2 to 24, inclusive.

One of the novel features of the attachment is the connection between the connecting rod and the rock shaft, which facilitates the easy longitudinal movement of the latter even on coarse pitch taps and heavy cuts. The crank is fastened to an inner sleeve and is driven by an outer bush. The sleeve drives the rock shaft through a key, but is capable of an automatic limited longitudinal movement with relation to the rock shaft, entirely independent of its driving connection, a strong spring returning it to its original position after each cut. This construction is said to overcome any tendency of sticking or binding of the rock shaft.

A strong substantial bracket is built as a separate unit, with all parts self-contained to insure permanent alignment and correct action of the parts, and is mounted on the headstock, as shown in the engraving. Its position is easily accessible and in plain sight of the operator, which does away with the necessity of going to the rear of the lathe to make adjustments and remove or replace the change gears. The attachment is driven by a spur gear which meshes with the face gear, and not by the spindle gear, as in other makes. This possesses the advantage that the attachment has its speed varied in the same degree as the work, thus avoiding abnormal gear ratios and small driven pinions or a multiplicity of gears to provide for the 2 to 24 movements per revolution of the spindle. It is said that heretofore this feature has been entirely overlooked and the result has been either a clumsy and heavy attachment or one that was not fitted for the severe stresses imposed.

A single fixed cam only is required with this attachment, and that is mounted on a large diameter shaft close to the bearing, thus providing the rigidity essential in a device of this kind. The cam actuates one arm of a lever through a roller, which as it is fixed in position on the lever receives a correct movement at all times. To obtain the desired amount of relief the derived motion of this roller is transmitted through the rocking lever and connecting rod to the rock shaft which transmits the movement to the compound rest. One end of the connecting rod is attached to a sliding block adjustable toward and away from the center of the rocking lever. This adjustment controls the amount of motion transmitted to the rock shaft, and is obtained through a knurled knob placed within easy reach of the operator. The amount of relief is thus quickly, easily and precisely adjusted to any amount that may be required and changes within the range of the attachment can be made without stopping the lathe.



A 21-In. Lathe Equipped with the New Relieving Attachment Made by the Bradford Machine Tool Company, Cincinnati, Ohio.

One end of the rock shaft is carried in a bracket on the carriage, and the movement of this shaft is transmitted to a set of spur gears in the compound rest through a telescopic sleeve and knuckle joints. An eccentric hub on the side of one of the spur gears engages a bronze nut through which the top slide screw of the compound rest passes, and in this way the slide receives a rocking motion. A set of change gears and an index plate provide for the different numbers of movements per revolution of the spindle. The carriage of the lathe has full traverse between centers and the movements of the compound rest are always available. It is not necessary to remove the attachment for doing ordinary work, as it is engaged or disengaged by simply locking the small quadrant up or down. Gear guards are placed over all exposed gears, and can be readily removed when necessary.

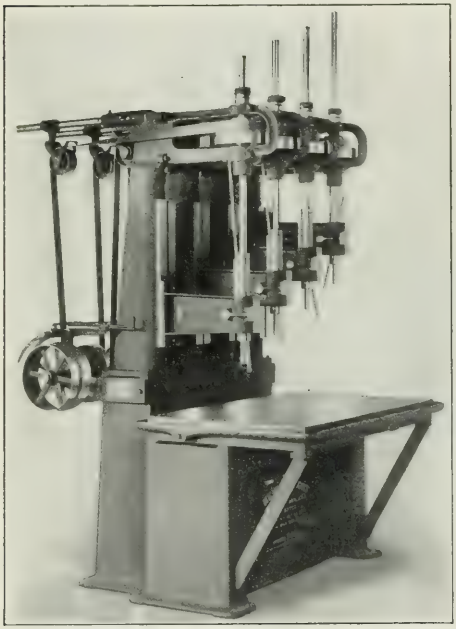
The gear meshing into the face gear is fixed to a flange keyed to the shaft in such a way as to provide an adjustment between the tool and the work without disconnecting. The cam used is of such a shape as to secure a uniform movement of the tool into the work, and it is quickly withdrawn by a strong spring provided with an adjustment by a nut and washer.

The International Acheson Graphite Company, Niagara Falls, N. Y., has opened a branch in Atlanta, Ga., the better to serve its many customers throughout the South. It is understood that the company is highly pleased with the appreciation shown for its lubricants—Gredag, Oildag and Aquadag—and its pure powdered graphite by Southern industries.

The U. S. Metal & Mfg. Company, City Investing Building, 165 Broadway, New York, has removed the offices of its Western department from the Railway Exchange Building to the eleventh floor of the new McCormick Building, Van Buren street and Michigan avenue, Chicago.

The Henry & Wright Cabinet Base Drilling Machine

A further development in the line of ball bearing high speed drilling machines built by the Henry & Wright Mfg. Company, 111 Sheldon street, Hartford, Conn., which were described in *The Iron Age*, August 4 and 25, 1910, is the No. 4 machine herewith illustrated. This machine is of particular interest to large manufacturers, where a great number of similar operations are constantly performed. The table is not adjustable, but is firmly fastened to the cabinet base to make it absolutely rigid and immovable in service, but by removing four screws it may be easily taken off for



The No. 4 Cabinet Base Drilling Machine Built by the Henry & Wright Mfg. Company, Hartford, Conn.

redressing to renew its accuracy. The head is of the same type as that used in the automobile manufacturers' drilling machine illustrated in an earlier article and the combination is said to be extremely rigid and unyielding. The under surface of the table is ribbed like a standard surface plate and it is possible to redress the top, as it is made very heavy. For removing the lubricant from the table four ducts, fitted with strainers, connect with a tank inside the base.

The maximum size high speed steel drill handled by the machine is 1⅛ in., but the most efficient field of operation is drilling holes ⅞ in. and smaller, the extra power being provided to drill the occasional larger holes that may occur in a piece of work in connection with small ones. This arrangement increases the working range of the machines, as a large number of parts that would either have to be drilled, tapped, counterbored or reamed in two or more machines may frequently be completed on one of them without removing the part from the jig, which tends toward greater interchangeability, accuracy, economy and rapidity in manufacturing.

The hole in the spindle is a No. 2 Morse taper, so that the taper of the larger drills must be reduced in order that they may fit the spindle. The machines can be furnished with plain tables or with full oiling equipment, including tank, pump, piping, flexible tubing and faucets, as ordered. The No. 4 machine is the first of the type produced and can be furnished for drilling to the centers of 16, 24 and 30 in. circles, but it is the ultimate intention of the manufacturer to make a greater variety. The weights of the three styles made are 3200, 3500 and 3800 lb., respectively.

New Tools and Appliances

Sensitive Drill Press.—The Albany Hardware Specialty Mfg. Company, Albany, Wis., is manufacturing a bench drill press of the sensitive type where the power is transmitted from the driving pulley to the spindle by two friction wheels and a hemispherical plate, mounted on a pivoted support and free to change its position relative to the wheels. This produces the variations in the spindle speed as the movement of the plate around its support causes one of the friction wheels to continuously move on a larger circle while the other is being moved to a smaller one. Ten speeds are available and an index plate is furnished showing the correct position for the lever controlling the movement of the plate for different sizes of drills boring in cast iron, steel or brass. A depth gauge and an adjustable stop are also included in the regular equipment of the tool which can handle drills up to ½ in. in diameter and will drill to the center of a 12-in. circle.

New Die Grinder.—F. L. Schmidt, Twenty-first street and Eleventh avenue, New York City, has brought out a new type of die grinder equipped with either a lever or screw table feed. The dies to be ground are fastened to the table and the latter swung under the wheel. Vertical adjustment for the table is provided by a hand wheel and fine pitch screw, and it can be clamped in any position by a locking screw. The cup wheels are mounted on opposite ends of the spindle and the whole swung from the horizontal to the vertical position or vice versa while the machine is in motion. Intermediate positions can be obtained by loosening the binding screw of the spindle. The drive is from a countershaft at the rear over two flanged idler pulleys which are free to slide on their stationary shafts and can be adjusted to the proper position when the spindle is swiveled.

Quick-Acting Wrench.—A wrench that can be instantly and conveniently adjusted to the desired size, or which may be locked and used as an ordinary monkey wrench, has been placed on the market by George W. Jessup, Jr., Newton, Mass. The handle is hollow and forms a receptacle for a detachable pipe jaw which makes it possible to grip pipe or other cylindrical work.

Lathe Quick Change Gear.—The New Haven Mfg. Company, New Haven, Conn., is equipping its 32, 36, and 42 in. lathes with a new type of quick change gear box which renders 32 different screw threads and the same number of gradations of feed available through the manipulation of two levers. One of these controls the movement of a nest of sliding clutch gears and affords four variations while the other operates in conjunction with a seven-step cone of gears and this nest to provide the balance, four variations being possible with each step. This box can be used to make changes while the lathe is running, without danger of breakage. If it is desired to cut threads or employ feeds not given on the index plate of the box these can be obtained by substituting change gears in the usual way.

Driving Wheel Lathe Tool Block.—A tool block for driving wheel lathes has been placed on the market by the Putman Machine Company, Fitchburg, Mass., which has a novel clamp. The lever used has a cam-like projection at one end while the other carries the clamping screw that impinges on a hardened block bearing against the top of the tool. This block is removable but is chained to the tool post to prevent its being lost. In practice the tool is placed under the lever and the block slipped into position under the end of the clamping screw. Tightening the screw, rocks the lever on its pivot and clamps the tool.

Trade Publications

Cutting Presses.—A. H. McCall, Rochester, N. Y. Booklet. Pertains to the Baxendale line of cutting presses for sheet metal, three of which are illustrated and described. One of these is especially intended for small cutting, perforating and forming dies; the second is an open front press which is made either upright or inclined for handling various kinds of work that cannot be done on a solid bed model, and the third is designed for cutting blanks, wiring work of various kinds and also for closing side seams on square, round and oval work.

Drilling Machines.—The Fosdick Machine Tool Company, Blue Rock, Apple and Palm streets, Cincinnati, Ohio. Catalogue. This is the company's latest catalogue describing and illustrating its complete line of radial drills and horizontal boring, drilling and milling machines. Each machine is illustrated, and this is followed by brief description and specifications. *The Iron Age*, April 29 and November 11, 1909, contained illustrated descriptions of the No. 0 and the Style A machines and an account of a notable piece of work done on one of the former was printed in the issue of May 26, 1910.

Electric Generators.—Triumph Electric Company, Cincinnati, Ohio. Two bulletins. No. 411, superseding No. 291, relates to a line of small direct-connected generating sets, which are made in sizes ranging from 4 to 25 kw., inclusive. The construction of these units is briefly described and a list of the principal dimensions is appended. No. 421, superseding No. 331, deals with the belted type of steel frame generators, built in sizes from ½ to 500 kw., those under 100 kw. having a bracket base while the larger ones are mounted on a pedestal. Details of the different parts are given, and this is supplemented by illustrations.

Steel Bridges and Steel Roofing. McClintic-Marshall Construction Company, Pittsburgh, Pa. Blotters. Call attention to the bridge over the Ohio River at Beaver, Pa., recently completed by this company for the New York Central Lines, and the Aiken depressed roof construction for shops, which is said to possess the advantages of good light, no gutters and economy in installation and maintenance.

Ventilating Cowls.—The Pullman Automatic Ventilator Mfg. Company, York, Pa. Mailing card. Refers to the Pullman ventilating cowl, which is made in both round and rectangular styles of galvanized iron or copper with or without fire retarding dampers. The round model is made in sizes ranging from 3 to 120 in. in diameter, while any desired size of rectangular cowl can be made to order. Three illustrations show the cowl installed on a skylight, the square base type installed on the ridge of a roof and the Pullman cowl-standard ejector, which works on a principle that is practically the same as that of the ejector.

Special Wood Turning Lathes.—Gilman & Son, Inc., Springfield, Vt. Catalogue. Size 6 x 9 in.; pages 20. Refers to a line of lathes for turning odd shapes in wood, such as gun stocks, hat blocks, boot trees and lasts, golf heads and tackle blocks. In the catalogue all of these different machines are illustrated and the specifications occupy the facing pages. In addition to these lathes the firm is also prepared to build special machines to order.

Foundation Pumps.—Nye Steam Pump & Machinery Company, 565 Washington street, Chicago, Ill. Folder. Concerned with the Nye new model high-pressure pump, which is especially designed and adapted for wells or caissons in deep foundation and mining work. For this kind of work the pump is said to be cheaper than any other steam pump on the market, as it creates higher vacuum and will lift water by suction higher and more rapidly. It is guaranteed to deliver water at a hight of 150 ft., and is said to be the only pump made which will handle water containing sand or silt without damaging the mechanism. Other uses for which the pump is adapted are mining, railroad work, paper mills, chemical or gas works, tanneries, breweries, sugar refineries, draining quarries and for raising water for any kind of manufacturing or fire purposes.

Electric Hoists.—Pawling & Harnischfeger Company, Milwaukee, Wis. Folder entitled "Four Laborers Instead of Thirty." Contains a reprint of an article from the July issue of *Factory* describing an installation at the plant of the Simmons Mfg. Company, consisting of an electric traveling crane with two electric traveling hoists serving the storage yard and also the different cupola buildings by I-beam spur runways.

Chain Hoists.—American Hoist & Mfg. Company, Hamburg, Pa. Folder. Relates to the new Century hoist, which is simple in construction, light in weight and self-sustaining in any point. The housing is cast in one piece to provide for the lift wheel inside of it, and the chain guide will retain the chain on the handwheel at any angle.

Condensers.—Wheeler Condenser & Engineering Company, Carteret, N. J. Pamphlet. Contains a reprint of a paper entitled "Condensers for Small Central Stations," presented by Charles S. Lewis at the annual convention of the Missouri Electric, Gas, Street Railway and Waterworks Association, April 16, 1910. There are a number of useful tables, charts and curves relating to the operation and economy of condensing machinery. The principles entering into the design of both surface and jet condensers are discussed and a report of two tests made showing the advantages of the countercurrent construction of the Wheeler rectangular jet condenser as affecting economy of operation and the attainment of high vacuum is included. This paper was published practically in full in *The Iron Age*, August 11, 1910.

Pressure Regulators.—Reynolds Gas Regulator Company, Anderson, Ind. Catalogue. Illustrations and descriptive matter explain the operation of the Reynolds gas regulators for controlling the pressure in artificial and natural gas distribution systems and also for keeping the pressure constant in the house service pipes connected with the system. The various types of regulators are discussed as well as the various distribution systems. Charts showing how these regulators keep the pressure constant and a partial list of users are appended.

Wrought Iron Pipe and Fittings. — Longmead Iron Company, Conshohocken, Pa. Folder. Lists the different sizes of standard and extra strong wrought iron pipe, standard wrought couplings and standard weight bundled pipe made by this company, and gives brief definitions of trade terms.

Electric Fixtures.—Pettingell-Andrews Company, Pearl street, Atlantic avenue and Purchase street, Boston, Mass. September number of *Juice*. The first of a series of special issues devoted to various departments of this company's business. This one is devoted to the fixture department and contains an illustrated article descriptive of the process of building electric fixtures, which covers all the different steps in the work and is illustrated by a number of views of the several departments. Another article dealing with fixture work describes an installation of the United Illuminating Company, New Haven, Conn., for which this company furnished the fixtures.

Pressure Controlling and Regulating Valves.—Ziermore Regulator Company, Johnsonburg, Pa. Nine circulars. Illustrate and describe various types of valves for controlling and regulating pressures made by this company, pressure controlling and regulating valves, stoker and force draft regulator, flexible-stem throttling valves, boiler feed pump regulator, double adjusting low-pressure regulator, water level regulator for steam boilers, fuel, gas and oil regulator for steam boilers, vacuum pump regulator, and a special type of regulator for elevators, fire pumps and paper mill digesters. Each of these circulars is uniform in character, an illustration of the valve or regulator being given on one inside page while brief specifications are given on the facing page.

High Pressure Blowers.—B. F. Sturtevant Company, Hyde Park, Mass. Catalogue No. 175, superseding No. 140. Size 6 x 9 in.; pages 43. Treats of the Sturtevant high pressure blowers for handling air where the pressure is between 1 oz. and 5 lb. per square inch. The most common uses of these blowers are for furnishing blast for cupolas, gas and oil burners, furnaces of all sorts, converters and forges. Among the special uses for which they are adapted are agitating water in filtration plants and tanning liquors or other fluids, forcing smoke or other gases through water to remove impurities, aerating milk, mine ventilation, blowing chips from lathes and for many other special manufacturing purposes. The blowers are illustrated, both assembled and in detail, and test curves and tables of dimensions are appended.

Electric Welders.—The Toledo Electric Welder Company, Knowlton and Langland streets, Cincinnati, Ohio. Booklet. Size 6 x 9 in.; pages 35. Illustrations and descriptive matter explain the operation of the Toledo electric welders for welding stock, both round and bar, and also plate and standard pipe. In addition to these machines others are made for making combination T and butt welds, riveting spokes in a small metal wheel, doing spot welding, welding automobile rims, welding the shanks and stems of twist drills together and for making wire racks. A number of sample welds made by these machines are illustrated and a brief description under the illustration of each machine is supplemented by a fuller account of what the machines do and how they do it.

Coal Handling and Mine Equipment and Conveying Machinery.—The Jeffrey Mfg. Company, Columbus, Ohio. Bulletin No. 42 and booklet No. 28. The former describes the coal handling and mine equipment machinery of this firm and contains illustrations reproduced from photographs of actual installations of the Jeffrey apparatus. The booklet suggests the company's methods of handling and treating stone, ore, sand, gravel, cement and other heavy and bulky material. There is little text in the booklet, the story being told by photographs of the different pieces of the apparatus and views of installations, the salient features of which are briefly given in the captions.

Tool Grinders and Ramming Machines.—The Tabor Mfg. Company, Eighteenth and Hamilton streets, Philadelphia, Pa. Catalogue and loose leaf circulars. The former deals with the Taylor universal tool grinder and includes a detailed description for forging and grinding Taylor standard shape cutting tools, with suggestions for the toolroom and the arrangement and description of the Taylor belt bench. The circulars pertain to the line of ramming machines made by this company and show the different styles of machines as well as typical castings made by them.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square ..... ₡ lb 1.90¢
1½ to 4 in. x ⅜ to 1 in. ..... "
1½ to 4 in. x ½ to 5-16 ..... ₡ lb 2.10¢
Rods—⅝ and 11-16 round and square ..... ₡ lb 2.10¢

Angles:	Cts ₡ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 5-16 in. and ⅜ in.	2.35¢
1½ to 2½ in. x ⅜ in.	2.20¢
1½ to 2½ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.30¢
1 to 1¼ in. x ¼ in.	2.20¢
1 x 1¼ in.	2.40¢
2¼ x 1¼ in.	2.50¢
3 x 3½ in.	3.15¢
1 x 1 x 1/32 in.	4.50¢

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2 x 1¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.40¢
Channels, 3 in. and larger	2.40¢
Bands—1 to 6 x 5-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H B & S" Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ₡
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price 1 x 4 inch	7¢

Sheets from Store—

Black

	One Pass, C R Soft Steel	R G Cleaned.
No. 16	₡ lb 2.85¢	2.95¢
Nos. 18 to 21	₡ lb 2.85¢	3.00¢
Nos. 22 and 24	₡ lb 2.95¢	3.1 ¢
No. 26	₡ lb 3.05¢	3.20¢
No. 28	₡ lb 3.10¢	3.4 ¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₡ lb 12 @ 14
Patent Planished, W. G. No. 8 to No. 16, inclusive ..... 10¢

Galvanized.

Nos. 11 to 14 ..... ₡ lb 2.95¢
Nos. 22 to 24 ..... ₡ lb 3.30¢
No. 26 ..... ₡ lb 3.50¢
No. 28 ..... ₡ lb 3.85¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ..... ₡ lb 5.15¢
No. 26 ..... ₡ lb 6.25¢
No. 28 ..... ₡ lb 7.50¢

Corrugated Roofing—

2½ in. corrugated.

	Painted	Galvd
No. 24 ..... ₡ 100 sq. ft.	$4.85	4.80
No. 26 ..... ₡ 100 sq. ft.	3.95	3.40
No. 28 ..... ₡ 100 sq. ft.	3.60	3.45

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IL, 14 x 20 ..... $6.35
IX, 14 x 20 ..... 7.60
A, Charcoal:
IC, 14 x 20 ..... $5.10
IX, 14 x 20 ..... 6.50

American Coke Plates—Bessemer—
IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40

American Terne Plates—
IC, 20 x 28 with an 8 lb coating $8.50
IX, 20 x 28 with an 8 lb coating 10.50

Seamless Brass Tubes—

List November 12, 1908 Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 Base price 15¢

Copper Tubes—

List November 13, 1908 Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 19½¢ ₡ lb

High Brass Rods—

List August 1, 1908 14¼¢ ₡ lb

Roll and Sheet Brass

List August 1, 1908 14¼¢ ₡ lb

Brass Wire—

List August 1, 1908 14¼¢ ₡ lb

Copper Wire—

Base Price, carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz., quantity over ₡ 8 ¢
Sheet Copper Cold Rolled, 1¢ ₡ advance over Hot Rolled
Sheet Copper Polished 2 in. wide and under, 1¢ ₡ square foot
Sheet Copper Polished over 20 in. wide, 2¢ ₡ square foot
Planished Copper, 1¢ ₡ square foot more than Polished

METALS—

Tin—

Straits Pig. ..... ₡ lb 36¾@37 ¢

Copper—

Lake Ingot ..... ₡ lb 14¾@15 ¢
Electrolytic ..... ₡ lb 14½@14¾¢
Casting ..... ₡ lb 14¼@14½¢

Spelter—

Western ..... ₡ lb 6¼@6½¢

Zinc.

No. 9, base, casks.. ₡ lb 8 ¢. Open. ..... ₡ lb 8½¢

Lead.

American Pig ..... ₡ lb 5 @5¼¢
Bar ..... ₡ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed ..... ₡ lb 22¼@22½¢
No. 1 ..... ₡ lb 20¼@20½¢
Refined ..... ₡ lb 18 @18½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₡ lb . @10¢
Hallett's ..... @10¢
Other Brands ..... @9½¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot or remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₡ lb 10.75@11.00
Copper, Heavy and Wire	₡ lb 10.50@10.75
Copper, Light and Bottoms	₡ lb 9.50@9.75
Brass, Heavy	₡ lb 7.25@7.50
Brass, Light	₡ lb 5.75@6.00
Heavy Machine Composition	₡ lb 9.50@9.75
Clean Brass Turnings	₡ lb 7.00@7.25
Composition Turnings	₡ lb 8.25@8.50
Lead, Heavy	₡ lb . @8.50
Lead, Tea	₡ lb @8.25
Zinc Scrap	₡ lb . @3.75

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PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 — New York, October 6, 1910 — Vol. 86: No. 14

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Pig Iron Output Holds Up

A Reduction in Wrought Pipe

Good Activity in Wire Products and Sheets—Consumption Generally Unchanged

Pig iron production in September amounted to 2,054,275 tons, or 68,476 tons a day, an increase of about 500 tons a day over the August rate. With 238 furnaces in blast October 1, the average daily rate of production was 67,312 tons, against 66,768 tons a day for 244 furnaces September 1. The increase in output per furnace in September is explained by irregular working in August. The figures show that in spite of a weakening market and the heavy accumulations of stocks there has been no curtailment of output worth mentioning since the drop from 75,500 tons a day in June to 69,300 tons a day in July. Production of all kinds of pig iron is now at the rate of about 24,900,000 tons a year.

The United States Steel Corporation has 45 blast furnaces idle, and its capacity active is 67.82 per cent., there being practically no change in three weeks.

Generally the feeling in the iron and steel trades has been better in the past week, but without any definite change in the amount or character of the buying. The way in which sentiment responds to small events is illustrated in the ado made over an order for 15,000 tons of rails for the Atlantic Coast line for delivery this year, just placed with the Tennessee Company.

On the other hand, too unfavorable a construction has been put on the overdue rearrangement of basing discounts on steel pipe. While too complicated to admit of a general statement as to the amount of the changes, the new schedule makes a reduction in extra strong and double strong pipe, as well as in butt weld merchant pipe, and an increase in lap weld merchant pipe. On the average business coming to the pipe mills it represents a reduction. The iron pipe manufacturers have made similar changes in their card. Line pipe orders are still the feature, 38 miles of such pipe having been placed in the past week, including 25 miles of 6-in. and 8-in. pipe for the Philadelphia Company. Some gas and oil projects requiring large amounts of pipe are shaping up and a very heavy demand is expected for next year.

The September bookings in wire products were greater than for any previous September save one. Specifications and new contracts exceeded those for August. The leading wire interest is now operating 80 per cent. of its capacity. Wire rods are firmer at $28.50, Pittsburgh.

Structural steel shows some betterment. Details of the Quebec bridge bids will not be known for some time, but a bid in which a combination of American and Canadian interests is represented may bring the 83,000 tons of steel to this country. For the new New

York subways, on which the bids go in this month, about 150,000 tons of steel will be required for the portions to be built at once, while later contracts are likely to bring the total up to 302,000 tons, including 35,000 tons of reinforcing bars. The contract for the Long Island Railroad bridges, 6000 to 12,000 tons, will go to the Fort Pitt Bridge Works.

Plate mills are expecting a considerable tonnage from the battleship to be built at a Government yard and from the two colliers that will soon be let. At Philadelphia there is figuring on 10,000 tons of plates against a foreign battleship inquiry.

The foundry iron market is uninteresting. The largest buying reported is of 5000 tons of Northern and Southern iron for a Western stove foundry, October to March delivery, the Southern iron being on an $11.25 basis for No. 2, and the Northern iron at $14, at Valley furnace. Large buying for 1911 is still deferred, and the shadow of lower prices for ore in 1911 has now been thrown across the situation.

A Central Ohio inquiry has come up for 8000 tons of basic iron. The large inquiry for basic for 1911 from a southern Ohio steel works has been withdrawn for the present. A Chicago district steel company has bought 10,000 tons of basic iron in northern Ohio at a low price made possible by water shipment and by unloading directly on the buyer's dock.

Lake Superior ore shipments during September were 6,273,834 gross tons, a falling off of nearly 700,000 tons as compared with August. The total shipments to October 1 are 35,100,864 tons, which is an increase of 5,461,331 tons over the corresponding period of last year.

The pig tin market has been somewhat excited this week, and New York spot sales have amounted to 1000 tons. Spot tin has sold at 36.50 cents.

Federal Control of Business

Considerable significance is attached to statements made by President Taft, in an address delivered in New York City on the evening of October 1, at the dinner of the National Republican League given in his honor. The address, although regarded as a campaign deliverance, was marked by temperate language, in perfect keeping with the dignity of the high office now filled by the speaker. One part of the address, which has attracted wide attention from business interests, alludes to the Standard Oil and American Tobacco cases pending in the Supreme Court, the decisions in which are almost universally regarded as likely to be of momentous consequence. With regard to these matters, he said:

> It has been thought that those decisions, if adverse to the corporations, would greatly disturb financial centers, would halt general business and would bring on financial disaster. I do not share these fears.
>
> I have proposed to Congress in this connection a Federal incorporation act which might be taken advantage of by the largest corporations. It would give and it ought to give no immunity from the antitrust law. But it would have this advantage—it would give the Government the benefit of direct supervision of these powerful corporations and it would afford to these corporations ample opportunity to do a legitimate business within the State borders.

The President's announcement that he does not share the fears that decisions adverse to these corporations would bring on financial disaster, while not wholly reassuring, is certainly much more agreeable than if he had, for instance, made the assertion that he would follow the course thus apparently laid down by the Supreme Court and direct the Department of Justice to proceed against any other corporation in a possibly similar position, regardless of the consequences. We had for some years been accustomed to deliverances of this latter character from the Executive, and the change should be received with thankfulness by the business community. The President's long training as a lawyer and his experience as a judge undoubtedly qualify him to give an opinion on these matters entitled to far higher respect than if he were a layman. Of course he does not anticipate what the decision of the Supreme Court may be, but it is certainly noteworthy that he expresses himself in this reassuring manner.

In this connection it is also worthy of note that a circumstance has just transpired, which may indicate a new method of procedure in the handling by the Federal authorities of infractions of the antitrust law. Government agents have for some time been investigating the plan of purchasing materials through a single agency by a considerable number of large manufacturers. Complaint was made to the Government that this action by the associated companies was a restraint of trade. It is understood that the investigation thus made convinced the Federal authorities that such combined purchasing was a violation of the antitrust law. The ordinary course of procedure, under these circumstances, would have been a prosecution through the courts of the several companies thus associated. This would have branded the officers of the companies as guilty of a criminal action, and while the charge may not have held, they would nevertheless have been subjected to obloquy and a stigma would have been placed upon them. A different course was pursued. The various parties involved in this combined buying movement were quietly advised that such operations were not regarded with favor and that the arrangement should be discontinued. As far as can be ascertained, no threat was made, but the notification accomplished the purpose intended, and hereafter such purchases will be made by each company operating independently. The new departure in the methods of the Department of Justice commends itself to business interests. If it is to be taken as indicating further procedure in apparent violations of the antitrust act it will be a most salutary change from the old recourse to drastic enforcement of the law.

The Vitality of the Wire Industry

The wire rod statistics for 1909 are remarkable, since they show almost a trebling of the output of wire products in the United States in 10 years, something not paralleled in any other finished steel line apart from structural shapes. The latter, under the stimulus of the low prices for steel, as well as for fabricating, which prevailed all last year, made a new record, more than doubling the output of 1908. We have been accustomed to speak of the doubling of pig iron production in the United States every 10 years, while open hearth steel production has more commonly doubled in six or seven years; but the use of structural steel and of wire products has grown in a really spectacular way. This becomes particularly marked when comparison is made with rails, which, though not now so

considered, were taken for so many years as a gauge of the steel industry. We have set down below the production of these three classes of products for the past 10 years:

Production of Rails, Structural Shapes and Wire Rods, 1900 to 1909. Gross Tons.

	Rails.	Structural shapes.	Wire rods.
1900	2,385,682	815,161	846,291
1901	2,874,639	1,013,150	1,365,934
1902	2,947,933	1,300,326	1,574,293
1903	2,992,477	1,095,813	1,503,455
1904	2,284,711	949,146	1,699,028
1905	3,375,929	1,660,519	1,808,688
1906	3,977,887	2,118,772	1,871,614
1907	3,633,654	1,940,352	2,017,583
1908	1,921,015	1,083,181	1,816,949
1909	3,023,845	2,275,562	2,335,685

Several striking features of this table might be commented upon. It might be pointed out that so recently as 1906—a year of high pressure production in every quarter of the steel industry, structural shapes and wire rods together barely exceeded the production of steel rails, while together they were more than 50 per cent. more than the rail output of 1909. Reference might be made, also, to the fact that structural shapes, which in the popular mind represent so large a proportion of the increase in steel consumption in recent years, have never exceeded wire rods except in 1906. We might comment, moreover, on the great fluctuations in steel rail consumption, as shown in 1901 and 1902, in 1904 and 1905, and again in 1908. But the outstanding feature of the table is the consistent and almost uninterrupted growth of the wire industry and its comparative immunity from the effects of depressions. It is particularly noteworthy that in 1904 when pig iron production fell off nearly 10 per cent., steel ingots 5 per cent. and steel rails 23 per cent. from the respective totals for 1903, wire products made an increase of no less than 23 per cent. It is remarkable, moreover, that in 1908 wire products fell off only about 10 per cent. from 1907, while rails and structural shapes were cut nearly 45 per cent.

It is the aggregate of small needs of millions of people that constitutes the strength of the wire industry in good times and bad. Undoubtedly the growth in the use of wire mesh reinforcement and the increase of other new uses have been factors in the wonderful vitality of the wire industry, counteracting the usual effects of depression. When it is considered that the product of some departments of the industry, as at the Worcester works of the American Steel & Wire Company, means the drawing of wire to hairlike fineness it can be appreciated that an almost infinite number of outlets must be found if tonnage is to be made on a scale comparable with the structural industry with its thousands and often tens of thousands of tons of steel entering into a single contract.

The amount of new competition coming forward in the wire industry has been commented on; but there has been a tendency to overestimate its contribution to the country's total. The two steel companies that are adding wire to their line of products will probably not produce more than six or seven per cent. of the output of the next two years. If the well maintained tonnage of wire products in 1908 attracted some of this competition, the great increase in 1909 will no doubt prove a further incentive. It is interesting to note the percentage of the wire production of the country contributed by the United States Steel Corporation. The statistics of the corporation give in gross tons the production of wire rods marketed as such and in net tons the production of wire products. If we regard the figures for the latter as about equal to the number of gross tons of wire rods required for the products in question (reckoning 10 to 12 per cent. waste) we may make a comparison between the wire rod output of the Steel Corporation and that of the country. In the past eight years they were as follows:

Wire Rod Production of the United States Steel Corporation and of the United States. Gross Tons.

	Total for United States.	Steel Corporation.	Per cent. Steel Corporation.
1902	1,574,293	1,232,139	78
1903	1,503,455	1,228,304	82
1904	1,699,028	1,311,544	77
1905	1,808,688	1,367,992	76
1906	1,871,614	1,511,205	80
1907	2,017,583	1,607,321	79
1908	1,816,949	1,379,191	76
1909	2,335,685	1,746,838	75

While there has been a falling off in the Steel Corporation's percentage of the total wire rod production in recent years, its extent is less than might have been inferred from the wide advertisement given to the new competition. Wire is still the product in which the Steel Corporation's control of capacity is greater than in any other.

The Coming Machine Tool Builders' Convention

The annual meeting of the National Machine Tool Builders' Association, to be held at the Hotel Astor, New York, October 25 and 26, is expected to be an occasion of exceptional value to the trade. In the first place, the membership will represent a very much greater proportion of the industry than it did a year ago. Recent applications, coupled with the great influx of new members at the June meeting, will have brought the total to a point which means an increase in association influence, such as comes only with a representation closely approaching the unanimous. The topics which will be featured for consideration include several that are vitally interesting, notable among them being the noncancellation clause in machinery contracts, commissions to dealers and the projected court of patent appeals. These and other matters of business and education, coupled with the inestimable importance of bringing together the members of a great industry at a time when general business conditions are not well understood, should result in an unusual influence upon the future, not only of the manufacturer, but of the dealer as well.

The matter of establishing a standard practice in machinery contracts, under which users will not be permitted to cancel orders without the free consent of the manufacturer or dealer, has been given careful study during the months that have elapsed since the Rochester convention. While some difference of opinion prevails in the two branches of the trade as to the manner of carrying the reform into effect, none would fail to welcome a change that would place the business in its logical position as to contracts of sale. While the meeting may take no definite action, finally establishing the new practice, the movement will be given a still greater impetus and a still more vigorous cooperation on the part of the members. This campaign is receiving the hearty assistance of manufacturers who are not yet members, and has, doubtless, been no insignificant factor in increasing the association's ranks.

No action will be taken in respect to the petition of the dealers, pending for several years, establishing a higher and universal discount, which in most cases would increase commissions. The machine tool builders have threshed out this question, in the sessions of the organization and of its various sections, and privately, and cannot reach the conclusion that association action is desirable. No standard discount could be created equitably, it is argued. To do so is even less feasible than formerly, because the sales methods of members have departed in various ways from the older customs. The ratio of their share of the cost of marketing the goods to that of the dealer has changed in a large way and with increasing lack of uniformity. While no definite statement is possible, of course, it may be taken for granted that the movement will be further discouraged at the meeting. The opinion has accumulated that the matter of commission is one for individual arrangement between the manufacturer and his dealers.

The committee appointed to take up the question of a patent court of appeals and other matters pertaining to the patent laws has the assurance of Members of Congress that bills creating the new tribunal and making other desirable changes in the patent laws, and creating a commission to investigate the whole patent system, will be made laws at the next session, a fact that has simplified the committee's efforts.

So great an impression was made at the last meeting by a paper read by the works manager of one of the great automobile establishments on "Machine Tools from the Users' Point of View," that the subject will be given greater prominence at New York. The discussion following the paper was necessarily curtailed for lack of time. The address aroused an interest spontaneous and general, and the subject has since been brought up by manufacturers and dealers in various ways. Strong emphasis has been laid upon the need of co-operation on the part of the user in assisting the manufacturer to understand the producing needs of those dependent upon him for equipment. Good results have already followed from the initial agitation of the question, and the promised addresses should be stimulating to the industry in a manner having an influence on machine design.

To Investigate the Patent Laws

The creation of a commission to investigate the general subject of patents on inventions is included in legislation which is promised by the next Congress. The existing system may have been a good one originally, but it does not meet modern requirements, and great dissatisfaction has steadily accumulated, resulting in a demand for a thorough overhauling. The United States patent has lost much of its value as a property right. It is distrusted until it has been proved by litigation. Infringements are more common than would be the case if the Government's protection of an invention should carry with it a greater degree of guarantee. Other countries have developed better methods, and much good material is available to a commission as the basis of new laws which would be adapted to conditions here.

An American patent is too easily obtainable. The claim is sometimes heard that the Patent Office has been developed into a moneymaker for the Government. Examinations of claims are not complete enough. The examiners are paid insufficiently. The office is in a large sense a training school for patent solicitors, and changes in personnel are too frequent for the good of the service. A United States patent possesses little or nothing of a guarantee. The time has not arrived when the Government can register a patent, assuming financial responsibility for its validity, in the manner in which title to real estate is guaranteed by some State governments under the Torrens system, but a first step in that direction may be made following the German practice. In that country a patentee, finding what he believes to be an infringement, may petition the authorities for a certificate in which the Government, if convinced by official investigation, asserts its belief in the validity of the patent. It is not a guarantee in a full sense, but it is a factor which restrains infringers against making a contest, and, therefore, does away with much costly litigation. Examinations of alleged inventions should be most thorough, and the laws should be amended, if necessary, to secure that end. If the cost be more the inventor class may consider itself entitled to the outlay, for the Patent Office is continuously in possession of a surplus of revenue above its expenses received in the form of fees.

The matter of compulsory working of patents needs threshing out. Some difference of opinion exists, but the best judgment, considering the subject from the standpoint of the public as well as that of the inventor and of the purchaser of patents, is that the system should be embodied in some form in our patent laws. It is necessary as a basis of favorable treaty with other countries, practically all of which are employing it. It would rid the country of a multitude of unworked inventions, some of them very important to industries. Manufacturers can assist greatly in the proposed investigation, a beginning being the urging of the passage of the proposed act. The bills already before Congress provide for radical improvements, including a patent court of appeals. Possibly these proposed laws will in themselves relieve to some extent existing conditions, by inspiring the overthrow of office precedents which have accumulated through succeeding administrations. If, however, the commission is created, and does its work well, the act for its establishment will be the most important of all recent legislation relating to patents.

Correspondence

The Introduction of the Bessemer Process in America

To the Editor: Permit me to correct a statement made October 1 by our American Ambassador to England, at the opening of the library building at Luton, given by Andrew Carnegie, as follows:

"He [Mr. Carnegie] then had the farseeing sagacity, courage and untiring persistence to introduce the Bessemer steel making process in America."

The facts are as follows, taken from the history of the introduction of the Bessemer process in the United States as given in James M. Swank's "History of the Manufacture of Iron in All Ages":

The control in this country of Mr. Bessemer's patents was obtained in 1864 by John F. Winslow, John A. Griswold and Alexander L. Holley, all of Troy, N. Y., Mr. Holley visit-

ing England in 1863 in the interest of himself and associates. In February, 1865, Mr. Holley was successful at Troy in producing Bessemer steel at experimental works which he had constructed at that place for his company in 1864.

The dates of the adoption of the Bessemer process and the names of the works, also taken from Mr. Swank's book, are as follows:

1. Albany & Rensselaer Iron & Steel Company, Troy, N. Y., Winslow, Griswold & Holley. First blow February 15, 1865.
2. Pennsylvania Steel Works, Steelton, Pa. First blow June, 1867.
3. Freedom Iron & Steel Works, Lewistown, Pa. First blow May, 1868.
4. Cleveland Rolling Mill Company, Cleveland, Ohio. First blow October 15, 1868.
5. Cambria Iron & Steel Works, Johnstown, Pa. First blow July 10, 1871.
6. Union Steel Company, Chicago. First blow July 26, 1871.
7. North Chicago Rolling Mill Company, Chicago. First blow April 10, 1872.
8. Joliet Steel Works, Joliet, Ill. First blow January 26, 1873.
9. Bethlehem Iron Company, Bethlehem, Pa. First blow October 4, 1873.
10. Edgar Thomson Steel Works, Carnegie Brothers & Co., Ltd., Bessemer Station, Pa. First blow August 25, 1875; first steel rail September 1, 1875.

It, therefore, appears that Mr. Carnegie did not adopt the Bessemer process until after it had been in use by nine other works for a period of 11 years and 8 months. Of course, Mr. Reid is in no sense responsible for the statement he made, for he only repeated what he had been told.

GEO. W. MAYNARD.

NEW YORK, October 2, 1910.

Automobile Investments and Their Economic Aspect

To the Editor: The following is submitted as a contribution to the current discussion on the economic status of the automobile:

Let us suppose that 100,000 American families, by thrift and some measure of self-denial, have each accumulated $1000, making an aggregate sum of $100,000,000.

EXAMPLE I.

1. Each of these families uses its $1000 to purchase an automobile.

2. The manufacturers of automobiles distribute the $100,000,000 among their employees, agents and others, retaining certain amounts as profits.

Five Years Later.

3. One hundred thousand families have as their net assets:

(*a*) A fine lot of pleasant memories of good times enjoyed.

(*b*) An acquired taste for more of the same, the satisfaction of which is necessary to their happiness.

(*c*) An intimate knowledge of the difference between first cost and the same plus maintenance and depreciation.

(*d*) One hundred thousand heaps of junk.

EXAMPLE II.

1. Each of these families deposits its $1000 in the bank, which in turn invests the money in bonds of a railroad which is opening up new country.

2. The railroad distributes the $100,000,000 among owners of real estate and manufacturers of locomotives, cars, track equipment, &c., who in turn distribute among their employees, agents and others, retaining certain amounts as profits.

Five Years Later.

3. One hundred thousand families have as their net assets:

(*a*) The serenity of mind which comes from the knowledge that one is living within his income.

(*b*) A strengthened habit of thrift.

(*c*) The satisfaction of having an interest in the wealth producing industries of the country. This is the best antidote to socialism and the blatant demagogism now so much in evidence.

(*d*) Bank accounts which at 4 per cent. interest, compounded semiannually, amount to $1218.98 each.

So much for the individual investors. The effect on the country at large may be illustrated as follows:

Example I.

In the last analysis this form of investment has proved to be a consumer instead of a producer of wealth, and has thus by the inevitable working of the law of supply and demand tended to increase the cost of living. In addition, a large proportion of the individuals concerned are driven by stern necessity to adopt a more simple style of living, and are eager to blame everybody but themselves for this condition. They are ready to listen to the radical outpourings of the demagogue and thus become a real menace to stable government.

Example II.

The railroad has opened up a new section of country; uncultivated lands have been taken up by farmers; mines and quarries have been opened and lumber mills erected, and all these industries have been brought within reach of consuming markets. The railroad has earned maintenance and depreciation charges; has paid interest on bonds; has actually added to the commonwealth a vast amount of the necessaries of life, and has thus tended to reduce the cost of living.

D. R.

NEW YORK, September 30, 1910.

Damascus Steel Works Improvements.—The Damascus Crucible Steel Company, New Brighton, Pa., is building three new structures of steel and brick. One building will be 48 x 160 ft., and will contain steam hammers and heating and annealing furnaces used for the manufacture of Capper's high-speed tool steel. Another building, 45 x 205 ft., will contain melting furnaces and gas producers and will be used for the steel casting department, and will also contain necessary machinery for getting the castings ready for shipment. The third new building, 20 x 40 ft., will be used for a power house and machine shop, and will contain two engines and a dynamo, which will furnish light and power for the entire plant, together with lathes, planers, shapers and drill presses. On one building will be added a leanto running parallel with the railroad, to be used for storage bins for coal, molding sand, crucibles and scrap. These improvements will increase the capacity of the plant. Charles Capper is president and general manager, and C. H. Capper is secretary and treasurer.

Frank B. Gilbreth, contractor, New York, will present a paper on "Fires, Effects on Building Materials and Permanent Elimination" at the New York meeting of the American Society of Mechanical Engineers, 29 West Thirty-ninth street, on the evening of October 11. The paper discusses the enormous annual fire loss of the country, shows the effect of a destructive fire on a typical steel-frame building and outlines the methods by which the permanent elimination of fires may be assured. Following this paper H. de B. Parsons, consulting engineer, New York, will show by means of lantern slides the effects of fires on a number of office buildings. The subject will also be discussed by others concerned with various phases of fireproofing building construction.

As a result of the settlement of the boiling scale with the Sons of Vulcan, the puddling plant of the A. M. Byers Company, at Girard, Ohio, having 42 puddling furnaces, resumed operations last week. This concern is building an addition to its puddling department to contain 48 puddling furnaces, which will give it the distinction of having the largest puddling plant in the country.

The Oneida Steel Pulley Company, Oneida, N. Y., has purchased the business of the Pennsylvania Steel Pulley Company, Pittsburgh, Pa., and has taken possession of the plant. The principal output is electrically welded pulleys, and the manufacture of these will be continued. The new owner also intends to manufacture steel pulleys in small sizes in order to make the line complete.

Pig Iron Production

A Slightly Increased Rate

Active Capacity October 1 Was 550 Tons a Day More Than on September 1

The blast furnace statistics for September show that the total production of coke and anthracite iron was 2,054,275 gross tons in 30 days, or at a daily rate of 68,476 tons. This compares with 67,963 tons a day in August and 69,305 tons in July. Thus there has been no significant change in the rate of production since the drop from 75,516 tons a day in June to 69,305 tons in July. The number of furnaces in blast October 1 was 238, a net decrease of six from September 1. Slower working in August caused a smaller average output per furnace than in September, so that the capacity of the 238 furnaces active at the beginning of this month, 67,312 tons, was about 550 tons a day more than that of the 244 furnaces in blast September 1. Production is now at the rate of 24,900,000 tons a year for all kinds of iron.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with September, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
September, 1909	55,361	24,146	79,507
October	57,067	26,789	83,856
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,876	27,740	85,616
March	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963
September	47,007	21,469	68,476

September Output by Districts

The table below gives the production of all coke and anthracite furnaces in September and the four months preceding:

Monthly Pig Iron Products.—Gross Tons

	May. (31 days)	June. (30 days)	July. (31 days)	August. (31 days)	Sept. (30 days)
New York	171,461	163,575	162,901	158,666	148,999
New Jersey	22,973	18,443	18,962	19,177	18,773
Lehigh Valley	70,344	66,944	61,014	63,878	63,919
Schuylkill Val.	65,725	60,349	61,340	64,926	60,689
Lower Susquehanna and Lebanon Val.	65,667	60,315	60,043	54,442	53,750
Pittsburgh dis.	510,514	483,909	502,711	510,352	505,342
Shenango Val.	120,301	130,290	113,280	113,500	108,114
West. Penn.	144,478	132,344	129,786	116,117	115,622
Md., Va. and Kentucky	82,071	82,181	75,051	76,477	68,398
Wheeling dis.	94,217	76,166	73,164	68,341	70,443
Mahoning Val.	218,243	208,988	215,282	211,575	201,986
Central and North. Ohio.	144,344	145,393	139,627	122,960	111,958
Hocking Valley, Hanging Rock and S.W.Ohio.	43,290	41,521	30,163	32,490	27,657
Mich., Minn., Mo., Wis., Col., Wash.	71,588	68,051	65,863	66,096	63,935
Chicago dis.	358,509	328,953	264,136	258,145	259,672
Alabama	165,937	160,970	143,313	140,015	149,805
Tenn., Georgia and Texas	40,418	37,086	31,806	29,690	25,213
Totals	2,390,180	2,265,478	2,148,442	2,106,847	2,054,275

The list of active furnaces shows a net loss of six in the month. Among furnaces blown out in September or on October 1 were two Lackawanna at Buffalo, one Edgar Thomson and one Lucy in the Pittsburgh district, one South Sharon in the Shenango Valley, one Dunbar in western Pennsylvania, Buena Vista and Covington in Virginia, one Maryland Steel at Sparrows Point, Upson in northern Ohio, Union in the Hanging Rock district, Hamilton in southwest Ohio, one South Chicago (old) in Illinois, one Mayville in Wisconsin, Williamson in Alabama and Citico in Tennessee.

The list of furnaces blown in includes one Buffalo Union at Buffalo, Soho in the Pittsburgh district, Allegheny in Virginia, one La Belle in the Wheeling district, one Lorain in northern Ohio, Lawrence in the Hanging Rock district, one Sloss and Woodstock in Alabama and Rome (changing from charcoal to coke) in Georgia.

Capacity in Blast October 1 and September 1

The following table shows the daily capacity of furnaces in blast October 1 and September 1. These figures are based largely on the performance of the furnaces in September and August:

Coke and Anthracite Furnaces in Blast and Capacity.—Gross Tons.

Location of furnaces.	Total number of stacks.	October 1. Number in blast.	October 1. Capacity per day.	September 1. Number in blast.	September 1. Capacity per day.
New York:					
Buffalo	16	13	3,985	14	4,545
Other New York	7	3	582	3	582
New Jersey	8	3	625	3	620
Spiegel	2	..	....	..	....
Pennsylvania:					
Lehigh Valley	23	13	1,970	13	1,910
Spiegel	3	2	161	2	151
Schuylkill Valley	16	7	2,023	7	1,934
Low, Susquehanna	7	5	913	5	928
Lebanon Valley	10	6	878	6	828
Pittsburgh dist.	50	40	16,433	40	15,524
Spiegel	3	1	130	2	366
Shenango Valley	20	11	3,487	12	3,560
West. Penn.	27	15	3,704	16	3,840
Maryland	4	3	795	4	965
Wheeling dist.	14	8	2,510	6	2,205
Ohio:					
Mahoning Valley	23	18	6,633	18	6,483
Central and North.	22	10	3,715	10	3,505
Hocking Val., Hanging Rock and S. W. Ohio	15	7	758	8	945
Illinois and Indiana	21	20	8,410	21	8,230
Spiegel	3	1	155	1	240
Mich., Wis. and Minn.	10	5	905	6	1,010
Colo., Mo. and Wash.	7	4	1,096	4	1,080
The South:					
Virginia	23	10	1,150	11	1,200
Kentucky	5	1	200	1	195
Alabama	46	23	5,175	22	4,885
Tenn. and Georgia	20	9	910	5	947
Totals	415	238	67,312	244	66,768

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.— 1908.	1909.	1910.	Spiegeleisen and ferromanganese. 1909.	1910.
January	664,415	1,117,823	1,773,201	12,525	19,538
February	745,802	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,553	1,739,212	23,743	25,591
April	725,548	1,093,092	1,669,898	22,478	22,304
May	759,674	1,256,448	1,619,283	20,854	26,529
June	717,689	1,365,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,991	1,442,572	22,313	25,756
September	933,514	1,660,839	1,410,221	28,148	15,151
October	996,481	1,709,094	.....	25,384	.....
November	981,167	1,689,994	.....	23,376	.....
December	1,090,339	1,768,799	.....	20,791	.....

Pig Iron Production and Prices Plotted

The fluctuations in pig iron production from January, 1907, to the present time are shown graphically in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	39,619	59,232	84,459
April	73,885	38,289	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	36,444	64,656	75,516
July	72,763	39,287	67,793	69,305
August	72,594	43,851	72,546	67,963
September	72,783	47,300	79,507	68,476
October	75,386	50,554	83,856	.....
November	60,937	52,595	84,917	.....
December	39,815	56,158	85,022	.....

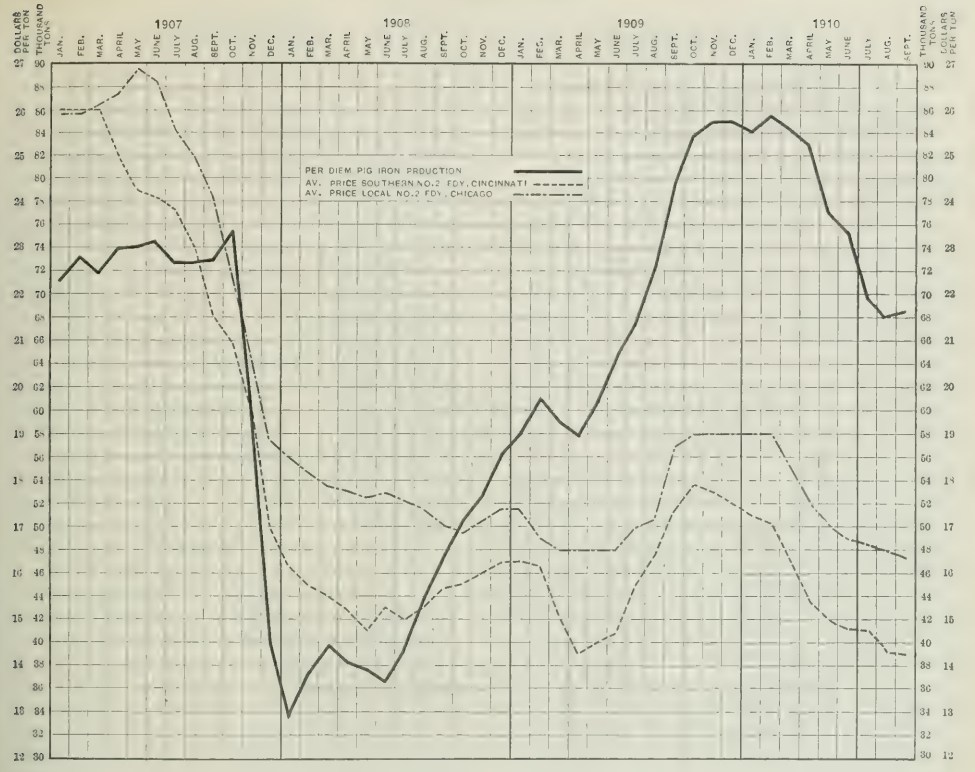


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to October 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron Delivered at Chicago.

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	14.25	16.40
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	....	....
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—*Gross Tons.*

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,230,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	2,054,275
October	2,336,972	1,567,198	2,599,541	.....
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

Recent orders entered by the Bessemer Gas Engine Company, Grove City, Pa., are as follows: Charles C. Robb, Fairmont, W. Va., a 30-hp. engine to drive refrigerating machinery; Charles J. Corbin & Sons, Fairmont, a 20-hp. engine to furnish electric light and power; J. J. Vogelspohl Company, plumber, Cincinnati, a 20-hp. engine; Foy Paint & Glass Company, Cincinnati, a 75-hp. engine; United Natural Gas Company, Van, Pa., a 20-hp. engine, to be used for electric light work; Federal Engineering Company, Pittsburgh, two 20-hp. engines; Melrose Mining Company, Cartersville, Mo., a 110-hp. engine, and J. W. Pond & Co., Wichita Falls, Texas, a 35-hp. engine.

The United Skylight & Cornice Company is being organized at Sharon, Pa., and application has been made for a Delaware charter, with a capital stock of $600,000. The company proposes to manufacture skylights and cornices. The incorporators are Charles M. Ohl of Sharon, Pa., and Frank L. Cleveland and F. J. McCaskey of Pittsburgh. Work on the building of the shops will start shortly, and considerable machinery for making the above named products will be required.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has been awarded a contract by the Parkersburg Mill Company, Parkersburg, W. Va., for the complete electrification of its lumber and saw mills, which will require about 45 motors, ranging in capacity from 1 to 50 hp. each.

The Michigan Supreme Court has decided that the contention that the International Harvester Company is a trust doing business in Michigan in violation of the State antitrust law in no way affects the right of the corporation to collect on its contracts in that State.

The plant of the Kittanning Iron & Steel Company, Kittanning, Pa., containing 35 puddling furnaces, resumed operations last week, after being shut down since July 1. The company's Rebecca Furnace is also running.

Ella Furnace of Pickands, Mather & Co. at Sharon, Pa., is out of blast for relining. The contract for this was awarded to William McIntyre & Sons, Sharon, Pa. The stack is expected to be idle about six weeks.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 5, 1910.	Sept. 28, 1910.	Sept. 7, 1910.	Oct. 6, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$16.00	$16.00	$16.00	$18.50
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	*16.25*	16.25	16.50	19.00
Basic, delivered, eastern Pa.	15.00	15.00	15.00	18.00
Basic, Valley furnace	*13.50*	13.50	13.75	16.75
Bessemer, Pittsburgh	15.90	15.90	15.90	18.90
Gray forge, Pittsburgh	14.15	14.15	14.15	16.90
Lake Superior charcoal, Chicago	*18.25*	18.25	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*24.00*	24.00	24.50	25.00
Forging billets, Pittsburgh	29.00	29.00	29.00	29.00
Open hearth billets, Philadelphia	*26.00*	26.00	27.00	27.60
Wire rods, Pittsburgh	**28.50**	28.00	28.00	31.50
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.75
Steel rails, melting, Philadelphia	**14.00**	14.00	13.75	18.00
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	14.00	14.00	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.75
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.75
Heavy steel scrap, Philadelphia	**14.00**	14.00	13.75	18.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.40	1.40	1.40	1.57
Common iron bars, Chicago	*1.35*	1.37½	1.37½	1.50
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.55
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	*1.40*	1.40	1.45	1.45
Skelp, sheared steel, Pittsburgh	*1.50*	1.50	1.55	1.55
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	**2.20**	2.15	2.15	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.75*	12.75	12.87½	13.50
Electrolytic copper, New York	*12.50*	12.50	12.62½	13.00
Spelter, New York	**5.60**	5.60	5.40	5.90
Spelter, St. Louis	**5.45**	5.45	5.25	5.75
Lead, New York	4.40	4.40	4.40	4.38
Lead, St. Louis	*4.37½*	4.27½	4.30	4.25
Tin, New York	**36.50**	35.12½	36.20	30.50
Antimony, Hallett, New York	7.87½	7.87½	7.87½	8.30
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 15 and 16, 1.95c.; Nos. 17 and 21, 2c.; Nos. 22 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.20c. to 3.25c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought steel pipe, in effect from October 1:

	Butt. Black.	Butt. Galv.	Lap. Black.	Lap. Galv.	Lap. Black.	Lap. Galv.
⅛, ¼, ⅜ in.	72	58	..	..	..	..
½ in.	75	63	..	..	..	..
⅝ to 1½ in.	79	69	..	..	..	..
2 to 3 in.	80	70	..	..	..	..
3½ in.	..	..	76	66	..	..
3½ to 4 in.	..	..	78	68	..	..
4½ to 6 in.	..	..	77	67	..	..
7 to 12 in.	..	..	..	..	75	59
13 to 15 in.	..	..	..	..	51½	..

Plugged and reamed:

1 to 1¼ in., 2 to 3 in.	Butt	Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap	Weld	

Extra strong, plain ends, card weights.

	Butt	Butt	Lap	Lap		
⅛, ¼, ⅜ in.	69	59	..	..	..	..
½ in.	74	68	..	..	..	..
¾ to 1½ in.	78	72	..	..	..	..
2 to 3 in.	79	73	..	..	..	..
3½ in.	..	..	75	69	..	..
3½ to 4 in.	..	..	77	71	..	..
4½ to 6 in.	..	..	76	70	..	..
7 to 8 in.	..	..	69	59	..	..
9 to 12 in.	..	..	64	54	..	..

Double extra strong, plain ends, card weight.

½ in.	64	58	..	..	..	..
¾ to 1½ in.	67	61	..	..	..	..
2 to 3 in.	69	63	..	..	..	..
3½ in.	..	..	65	59	..	..
3½ to 4 in.	..	..	67	61	..	..
4½ to 6 in.	..	..	66	60	..	..
7 to 8 in.	..	..	59	49	..	..

THE IRON AND METAL MARKETS

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

A new card on wrought iron pipe has been adopted to correspond with the new card on steel pipe. Prices have been revised in the same manner as on steel pipe, running throughout four points under the steel pipe discounts above given.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
3½ to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, October 5, 1910.—(*By Telegraph.*)

Pig Iron.—An inquiry is in the market from a Chicago steel company for 5000 tons of basic iron, but it is hardly likely that any of the Valley furnaces will secure this business as the freight is against them in competition with furnaces located nearer the steel plant. There is not much new inquiry for any kind of pig iron, consumers still pursuing the policy of buying only what they absolutely need. A sale of 1200 tons of basic iron for October and November delivery has been made at $13.50, Valley furnace, and a sale of 1500 tons of Bessemer for December, January and February delivery at $15, Valley furnace. The No. 4 furnace of the Jones & Laughlin Steel Company at Aliquippa, Pa., may go in blast within the next month or six weeks. We quote Bessemer iron at $15; basic, $13.50; malleable Bessemer, $14 to $14.25; No. 2 foundry, $13.75 to $14, and gray forge at $13.25, all at Valley furnace, the freight rate for delivery in Pittsburgh being 90c. a ton.

Steel.—There is not much new inquiry, consumers of billets and sheet and tin plate bars being pretty well covered. Small lots of billets and sheet and tin plate bars continue to be offered by dealers, and in some cases by one or two of the smaller open hearth plants, at prices slightly less than the larger steel mills will name. Nevertheless, the tone of the market is regarded as slightly firmer. We quote Bessemer 4 x 4 in. billets, $24 to $24.50; open hearth 4 x 4 in. billets, $24.50 to $25; Bessemer and open hearth sheet and tin plate bars, $25; forging billets, $29 to $29.50, all f.o.b. cars Pittsburgh, Youngstown or Wheeling district.

(*By Mail.*)

In spots the situation in the iron trade is better, but taken as a whole the improvement is slight. The feeling is growing that present prices on pig iron, steel and finished material are so low that there is not much chance of further decline, and for this reason consumers and distributers are a little more inclined to take hold. The average price of Bessemer pig iron in September, based on reported actual sales, was $15.02 at Valley furnace, a decline of 13c. on the August price, while the average price for basic in September was $13.83, a decline of 19c. on the August price. Sheets are showing betterment in demand and prices, and a considerable volume of business has been booked in the past week or two for delivery over remainder of this year; as a rule the mills are refusing to sell into next year at present low prices. There is a better demand for rods and prices are firmer, being possibly 50c. a ton better than last week. New discounts on wrought pipe announced by the leading mills, effective from October 1, created some stir in the market, but are really not entitled to the importance attached to them. In a general way the new discounts represent a reduction in prices of pipe, but just how much this reduction will amount to has not yet been determined, there being a new classification. The market on scrap is showing more activity with prices stationary. As yet there is very little buying of furnace or foundry coke, but taken as a whole the coke market is a shade better, with a more hopeful feeling that the last quarter of the year will show more activity than the three months just closed.

Ferromanganese.—Prices are weaker. On a recent inquiry for 300 tons, part for delivery this year and part for the first half of next year, $39, Pittsburgh, failed to get the order, and it is said to have gone at about $38.75, Baltimore. We also note a sale of 75 to 100 tons for delivery this year at less than $39, Baltimore. We quote foreign 80 per cent. at $38.75 to $39, Baltimore.

Ferrosilicon.—The market is weaker on 50 per cent. and the lowest prices reached for a long time are now being quoted. We quote 50 per cent. at about 55, Pittsburgh, and note a sale of about 75 tons at that price. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—The recent revision in discounts on steel pipe, and a probability that discounts on iron pipe will also be revised, may have the effect of bringing about lower prices on skelp. The fact that some of the puddling plants that were closed for several months are now in full operation will have a tendency to increase the supply of grooved and sheared iron plates. The skelp market is not as firm in tone as it has been. We note a sale of about 2000 tons of wide iron plates on the basis of about 1.80c., Pittsburgh. We quote grooved steel skelp, 1.40c. to 1.45c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c., and sheared iron skelp, 1.85c. to 1.90c., all f.o.b. Pittsburgh, usual terms.

Rods.—Prices on rods are decidedly firmer and new inquiry is better than for some time. One leading maker is quoting $29, and actual sales are reported as having been made at $28.50, maker's mill, one sale of 250 tons having been made at this price for October and November. We quote Bessemer, open hearth and chain rods at $28.50 to $29, Pittsburgh.

Muck Bar.—The supply of muck bar is slightly better, owing to the resumption of operations among the puddling plants, but there is still a scarcity for the available market, and prices are firm. Most concerns rolling muck bar use their entire output in their own finishing mills and are often buyers in the open market. We continue to quote best grades of muck bar, rolled from all pig iron, at $29.50 to $30, Pittsburgh.

Steel Rails.—No orders of moment for standard sections are being placed, but the Carnegie Steel Company is booking a pretty large tonnage in light rails and is well sold up on such sections for the remainder of this year. One order taken was for 500 tons for a coal mining interest. Lumber concerns are also buying quite freely. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—New inquiries are fairly large, but actual bookings have been light. The tonnage entered by the American Bridge Company in September was the smallest in a good many months, but this month, it is believed, will show betterment. Bids went in on the Quebec Bridge on October 1, but it will be some time until definite announcement is made of the letting of the contract, and it is possible that all bids will be thrown out and new ones asked. The McClintick-Marshall Construction Company of this city did not bid, but reports in circulation that it is sold up on its entire output are untrue. This company has taken a foundry building for the Niles-Bement-Pond Tool Company at Hamilton, Ohio, 1600 tons, and also a train shed for the Pennsylvania Railroad at Baltimore, 730 tons. The Fort Pitt Bridge Works of this city is the lowest bidder on 12,000 tons of track elevation for the Long Island Railroad, but the contract has not yet been placed. Some small local jobs are about ready to give out and the outlook for the structural trade is better. Very low prices are still being made. We continue to quote beams and channels up to 15 in. at 1.40c., Pitsburgh, in large lots, and 1.45c. in small lots.

Plates.—No work of moment has recently come up in plates and all the mills are in need of tonnage. Inquiries have not yet gone out for the battleship to be built by outside shipbuilders, nor have requests been made for bids on the plates for the battleship to be built by the Government at Brooklyn. Bids have been asked on about 1500 tons of plates needed for six torpedo boat destroyers. No

THE IRON AND METAL MARKETS

important orders for cars have been placed. We continue to quote ¼-in. and heavier plates in the wide sizes at 1.40c., Pittsburgh, but for delivery at certain points, and in competition with outside mills, slightly lower prices are being named in some cases. We quote narrow plates at 1.35c., Pittsburgh.

Sheets.—The report that the American Sheet & Tin Plate Company has shut down its Struthers mill to remove the equipment to Gary, Ind., is absolutely untrue. The plant is idle this week, but is expected to be started at an early date. New inquiries for sheets are decidedly better, and a good deal of tonnage has been placed in the last week or two for delivery over the remainder of this year. Prices are firmer. We quote box annealed one pass cold rolled sheets, No. 28 gauge, at 2.20c., and No. 28 galvanized at 3.20c., maker's mill, in carload and larger lots. Prices in effect on the other gauges of black and galvanized, and also on painted and galvanized roofing sheets, will be found on a previous page.

Tin Plate.—Not much new business is being placed, but consumers are specifying quite freely against contracts. The mills are pretty well booked up for this year and into the first quarter of next year. Prices are firm, mills quoting 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Specifications against contracts for soft steel bars continue very satisfactory, but most of the new orders being placed are for hard steel bars for reinforced concrete work. The bar iron market continues quiet, specifications against contracts from the railroads coming in very slowly, while new orders are light and only for small lots to cover actual needs. We quote steel bars at 1.40c., and common iron bars at 1.45c., f.o.b. Pittsburgh.

Spelter.—The market is quiet. Most consumers seem to be covered and are not asking for quotations. We quote prime grades of Western at 5.35c., East St. Louis, equal to 5.47½c., Pittsburgh.

Hoops and Bands.—New orders are light, but specifications against contracts were better in September than in August. Prices are quite firm and we quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

Spikes.—The market on spikes is in very unsatisfactory condition. For some time railroads have been placing only such orders for spikes as were needed for repair work. The demand for small railroad and boat spikes is fair, but all the spike makers could take care of more business if they had it. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—There is a fair volume of new orders for small lots to cover current needs, and specifications against contracts are coming in at a moderate rate. Trade in September is reported as having been slightly better than in August. Regular prices of 1.90c. on structural rivets and 2c. on boiler rivets continue to be shaded from 10c. to 15c. per 100 lb., depending on the order.

Shafting.—Not much is doing in new orders, while specifications against contracts are not satisfactory. The automobile trade, from which a good deal of tonnage was received some time ago, is now taking very little. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—We note a slight increase in the demand for wire nails and fence wire. Shipments of wire products by the mills in September showed a slight increase over August. Stocks of wire products held by the mills and also by distributers are reported to be lighter than for some months. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—Effective October 1, the National Tube Company, Youngstown Sheet & Tube Company, La Belle Iron Works, Republic Iron & Steel Company, Spang, Chalfant & Co. and other pipe makers sent out new Pittsburgh basing discounts on wrought pipe. The main changes in these new discounts involve a material reduction in extra strong and double strong, a reduction in butt weld merchant pipe and an increase in lap weld. Summed as a whole, the new discounts involve a moderate average reduction in pipe. The new table of discounts, effective from October 1, will be found on a previous page. The demand for merchant pipe continues fairly active. Contracts on larger sizes recently placed include 25 miles of 6 and 8 in. for the Philadelphia Company, 5 miles of 3 to 10 in. for another interest, 4 miles of 3-in. and 1 mile of 18-in. for the Ohio Fuel Supply Company, and 3 miles of 4, 6 and 8 in. steel pipe for the United Natural Gas Company. Some large projects for line pipe for oil and gas lines are under way, but definite mention of these cannot be made until they have been financed and rights of way secured. All indications point to a very heavy demand for larger sizes of pipe next year. The market is firm and the leading pipe mills have considerable tonnage on their books.

Boiler Tubes.—The demand for both locomotive and merchant tubes continues dull. The railroads are placing orders only for such tubes as are absolutely needed for repair work. Regular discounts on tubes have not been observed for a long time, the market being practically open.

Coke.—There is a little better feeling in the coke trade, inquiry being slightly better. A furnace interest has bought about 15,000 tons of standard grade blast furnace coke for October delivery, on the basis of about $1.60 per net ton at oven. Operators decline to sell coke at this price for delivery beyond October and ask from $1.70 to $1.75 for delivery over fourth quarter. There is not much inquiry for foundry coke, most consumers being covered for the remainder of this year, and in several cases into the first half of next year. The output in the Upper and Lower Connellsville regions last week was 344,765 net tons, a slight increase over the previous week.

Iron and Steel Scrap.—The scrap lists of the Pennsylvanies Lines West, the Erie, and New York Central railroads closed Tuesday, and it is understood that bids sent in by dealers are about on the same basis as on such lists a month ago. There is some scrap moving from dealers to consumers, but the immediate future of the market is uncertain. Some in the trade believe that a turn for the better will come soon, while others feel that not much betterment can be expected until the pig iron market improves in demand and price. We note sales of 1500 tons of heavy steel scrap at $14.50, delivered Monessen, Pa., and Steubenville, Ohio; 2000 tons of cast iron borings at about $8.25, f.o.b. Pittsburgh; 1800 tons of bundled sheet scrap at $11.25, delivered, equal to about $10 at shipping point in Pittsburgh district; 1500 tons of turnings at $9.25, delivered, equal to about $8.70, Pittsburgh. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.75 to 14.00
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	12.00 to 12.25
Low phosphorus melting stock	18.00 to 18.25
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.25 to 14.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.25
Machine shop turnings	8.75 to 9.00
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00

Chicago

FISHER BUILDING, October 5, 1910.—(*By Telegraph.*)

While the volume of new business is light, the mills are generally maintaining 1.40c., Pittsburgh, as the basis for soft steel bars, plates and structural shapes. Specifications during September made a good showing in these lines as well as in sheets and wire products. The sales managers are generally more hopeful of the future. The railroads have exhausted their stocks of storekeepers' supplies and their insistance on immediate shipment of all orders indicates that they cannot continue much longer the policy that has so long prevailed. An encouraging feature of the market for structural plates and shapes is the large amount of new business pending. Financial conditions appear to have improved somewhat, and structural work which had been delayed by inability to sell bonds or obtain loans is now on the point of being closed. The fabricating interests have had an unusual amount of small jobs the past summer, but only a few large contracts have been closed in the past three months. No important rail inquiries have appeared from Western roads; railroad officials intimate that their requirements for 1911 will be light but developments along this line are expected before the end of the year. The scrap market continues to record a lack of interest among buyers for mill and foundries. Each week is bringing more favorable reports of the corn crop which is now safely matured without frost damage and is expected to prove the largest in the history of the country.

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Pig Iron.—The only activity of the week in the pig iron market has been in Northern iron. A local independent steel plant purchased last week 10,000 tons of basic iron from a Lake Erie furnace, delivery to be made by boat before the close of navigation. This follows the similar purchase of 10,000 tons by the same steel interest about a month ago. Reports which have been circulated regarding the price are somewhat misleading, as the buyer has the advantage of dock facilities to receive direct shipments in cargo lots, making it an unusual transaction. If the furnace were to ship by rail the iron would cost the buyer about $16 delivered. One local sale of 1000 tons of Northern foundry is noted, and a local buyer is in the market this week for 500 tons of special analysis iron, on which lower prices have been quoted. The business of the local furnaces consists chiefly of small lots for prompt shipment, aggregating a considerable tonnage each week. The Northern interests in Chicago do not appear so willing as furnaces in Eastern districts to sell round lots for the first half of next year, and buyers are generally satisfied with this policy until there is some definite turn in the business situation. Buyers who can use analysis grades of Northern iron, differing slightly from regular grades, are generally able to obtain bargains, as the furnaces make concessions in order to confine their furnace stocks to regular grades. A radiator interest is expected to close in the near future for a large tonnage of Northern iron for the first quarter, but deliveries are chiefly for Buffalo and Detroit plants. This inquiry includes 4000 to 5000 tons of Southern iron for Southwestern plants. Very little Southern iron is being sold in this territory, owing to the unwillingness of a large number of furnaces to quote for first quarter. A few sales have been made at $11.50, Birmingham, for first quarter shipment. The price of $11 which has prevailed during the third quarter has carried into the last quarter of the year. The following quotations are for October, November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.25 to $18.75
Northern coke foundry, No. 1	16.75 to 17.25
Northern coke foundry, No. 2	16.25 to 16.75
Northern coke foundry, No. 3	16.00 to 16.25
Northern Scotch, No. 1	17.25 to 17.75
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.25 to 16.75
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—A sale of 100 tons of forging billets was made last week in this market at $28, which represents the market price for current lots of open hearth billets.

Rails and Track Supplies.—The mills in this district have enough rail business on their books to carry them comfortably through the year. The leading Western roads show no disposition to come forward with inquiries or estimates for next year and will probably delay until the last minute their purchases for 1911. Stocks of track supplies in the hands of railroad storekeepers are evidently exhausted, as orders are running in small lots, on which immediate shipment is wanted. In many cases shipment is expected within a day after the order is received. The market for spikes and track bolts is weak, owing to the fact that mills in the Pittsburgh district make special prices for Western territory. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—The W. H. Block Building at Indianapolis, Ind., a department store, which calls for 1700 tons of steel, was let to the Brown-Ketchum Iron Works of that city. The general contract for the National Biscuit Company's building at Kansas City was let to the George A. Fuller Company. The steel, amounting to 2200 tons, has not been bought, but bids are pending, and it is expected the contract will be closed this week. C. L. Stroebel, Chicago, has taken a contract for changes in the Union Elevated loop, which will require 500 tons. The Tehema Bridge, Tehema, Cal., 300 tons, went to the American Bridge Company. A Masonic temple at Houghton, Mich., 150 tons, was let to the Worden-Allen Company, Milwaukee. While new contracts last week only show about half the total represented by the previous week, there is a large amount of business pending which gives tone to the market for fabricated material. In one city alone, Portland, Ore., projects amounting to 30,000 tons must be closed in the near future, including one bridge of 12,000 tons and another which will require 10,000. While there are reports of concessions on light material, quoted by smaller Eastern mills, all the important interests represented in this district are holding firm on regular business. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Specifications for the month of September were better than during August. The plate mills have latterly been running on car material which was contracted for some time ago, and new orders are not coming in to replace the specifications that are being worked out. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The sheet business is making a better showing than other lines of finished material, as the volume of new orders is fairly satisfactory, especially for open hearth sheets. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.38c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—Specifications for soft steel bars in September amounted to a larger total than in August. The large corn crop which is now safely matured will undoubtedly keep the agricultural implement manufacturers going at high pressure during the winter, this industry being the principal market for soft steel bars in this territory. The rail stock mills are getting enough new business to keep them in steady operation, principally in orders for concrete reinforcement, although there is a fair demand from other sources for hard steel bars. The bar iron mills have had a hard summer and the small mills in this district have done very little while the larger ones have only run at 40 to 60 per cent. of capacity. The railroads continue buying in small lots. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—The crop situation is an important factor in the wire trade. A record-breaking corn crop in the North and a fair cotton crop which is bringing high prices in the South have rounded out the year from an agricultural point of view and created favorable conditions for a large consumption of wire. Jobbers and dealers are ordering only for immediate requirements, but the volume of business is reported very satisfactory. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—The record-breaking shipments of merchant steel into this territory during August were followed by a good month in September, and the business is running along in a very satisfactory manner, getting along comfortably without the heavy orders that were placed a year ago by automobile manufacturers. The mills had more business last winter than they could take care of and a slackening in the automobile demand will enable other buyers to obtain better deliveries the coming year.

Cast Iron Pipe.—The first important inquiry for water pipe for winter shipment has appeared in the market from the city of Detroit, which is asking for prices on about 6000 tons. The foundries are well booked with business for this year; enough to carry them in Northern territory until freezing weather. The foundries look forward to a good year in 1911. Buying has been restricted somewhat the past summer by conditions in the bond market. Many cities have held off on water works construction because of the high rates of interest they would have to pay and the reluctance of investors to take bonds. The funds of the savings banks, estates and other investors in bonds have been accumulating the past summer, and it is expected that they will seek investment next year at rates that will be satisfactory to municipalities. Mean time current orders for small lots are coming in at a fair rate for shipment this year. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The reaction noted in the market last week has developed into lower prices for practically everything except steel scrap. For No. 1 railroad wrought the maximum price is now about $12 delivered and No. 1 cast has sold as low as $12.50. The market for steel for remelting has been sustained by the fact that a local interest recently gave dealers orders amounting to about 10,000 tons on which they have been covering. One sale of 1000 tons of rerolling rails was made last week at $15.75, delivered, but smaller lots have gone at lower prices. Values are a little lower this week than the bids received by railroads on lists which closed early last week. Dealers have no trouble in placing all the material that arrives for disposition as there are always consumers who will buy lots of a few cars when offered them at current prices. Both the mills and the

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foundries have accumulated stocks the past summer without coming into the market for round lots. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., October 4, 1910.

There has been some further inquiry for foundry pig iron, covering last quarter and early 1911 delivery, but orders, particularly when shipments are extended, close very slowly. Steel-making grades of iron remain quiet. A little better volume of business has been done in heavy steel plates and more inquiry, particularly for boat steel, is noted. Rumors regarding the discontinuance of the scrap buying arrangement continue to be heard, but it is stated that nothing definite is expected for a few weeks. Meanwhile some of the mills have been picking up odd lots of heavy melting steel in the open market. Bars are dull and there has been little movement in coke.

Iron Ore.—The market is at a standstill. Efforts are still being made to have shipments of foreign ore deferred and postponement has been effected during the week on two cargoes now due, which will not come in until December-January. Importations during September show a falling off of about 50,000 tons, as compared with August, statistics available showing importations in the past month to have been 94,727 tons, valued at $249,212.

Pig Iron.—Transactions have been confined almost exclusively to the foundry grades, the aggregate coming pretty close to that of the previous week. A fair volume of inquiry is reported. Buyers are testing the market both for deliveries over the remainder of the year and for early 1911 shipment. The position of sellers is practically unchanged, business is not being forced and sales made are at close to $16 delivered, for standard brands of eastern Pennsylvania 2 X foundry, for shipment over the remainder of the year and in some cases extending into the first quarter. In instances sellers have lost business at that figure, and, while no definite information is available, it is believed that a slight concession has been made for spot iron. At the same time odd lots of some brands of No. 2 X are sold at $16.25, delivered. The most important inquiry during the week was that of the Pennsylvania Railroad Company for about 10,000 tons of foundry iron for last quarter shipment. Of this 1750 tons is charcoal iron, the remainder being coke iron. Several inquiries for lots of 300 to 500 tons of No. 2 X and No. 2 plain iron are reported, a fair proportion of which is for first quarter delivery. Sellers still hesitate when it comes to quoting for strictly 1911 shipment, but prices are evidently working closer to the present market for at least first quarter delivery. The cast iron pipe makers have not been particularly active buyers during the week, taking only small lots, some of which was high grade iron. The leading interest is out, however, with an inquiry for 10,000 tons of low grade iron, delivery on a portion of which extends beyond the year end. Virginia foundry irons show little movement. It is reported that the present range of quotations, $13.25 to $13.50, furnace, for No. 2 X can be shaded, but we learn of no lower sales in this district. A sale of 300 tons of No. 2 X for first quarter delivery in this territory is reported at $13.50, furnace; few sellers, however, will dispose of forward iron at to-day's prices. Southern iron has been quiet. The demand for forge iron is irregular, no transactions of importance being recently reported: $14.50 to $14.75 about represents the market for rolling mill grades. There has been no further inquiry for steel making iron. Melters are not taking customary deliveries and stocks of basic are increasing on furnace banks. Quotations are nominal at $15, delivered. Very little new inquiry for low phosphorus iron is noted; standard brands are flatly on a $22.50, delivered, basis. The following range of prices about represents the market for standard brands of eastern Pennsylvania iron, delivered in buyers' yards in this territory, for shipment during the last quarter and in instances extending into the first quarter of next year:

Eastern Pennsylvania, No. 2 X foundry	$16.00
Eastern Pennsylvania, No. 2 plain	$15.50 to 15.75
Virginia, No. 2 X foundry	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 14.75
Basic	15.00
Standard low phosphorus	22.50

Ferromanganese.—There has been no further demand from consumers in this territory.

Billets.—The large inquiries which were recently before the trade have, for the most part, been withdrawn, having evidently been made with a view of testing the market. Current orders are mostly small and for early delivery. Consumers are constantly urging shipments, which would seem to indicate that supplies in consumers' hands were small. Standard open hearth rolling billets command from $26 to $26.50, delivered in this territory, according to tonnage. There is a trifle better demand for forging billets at $28, Eastern mill, with the usual extras for high carbons and special sizes, but the quantities taken are usually small.

Plates.—Makers report a slightly better volume of business, but mills are not booked very far ahead and the greater proportion of the business taken is of a hand-to-mouth character. Bridge tank and boat plates are figuring more prominently in the business placed. There has been a larger volume of inquiry in connection with boat plates; shipbuilders are figuring on a battleship and two colliers for the Government, while one for some 10,000 tons of plates against an inquiry for foreign war vessels is reported. Prices for ordinary plates are unchanged, 1.55c., delivered, being fully maintained as a minimum carload rate.

Structural Material.—There is a somewhat better volume of business in building work. Bids for the general construction of the 18-story Munsey Building in Baltimore, Md., are being taken. Proposals for bridges in connection with the Philadelphia & Reading Railway Company's elevated work on its Port Richmond Branch, requiring approximately 2000 tons, will be opened next week. A number of smaller buildings in this city, as well as in the nearby territory, are also being figured on. Current business continues light with prices unchanged at 1.55c., delivered, as a minimum for plain shapes delivered in this territory.

Sheets.—Mills are better supplied with orders and operating on a more satisfactory basis. The demand, however, is still irregular and a large share of the business placed is for prompt shipment. Mills in this territory hold prices a trifle more firmly. For ordinary business Eastern makers name the following range of prices for prompt shipments: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand is quiet and the market lacks snap. Inquiries are mostly for moderate lots. On desirable business competition is sharp, and while 1.40c., delivered, is the minimum open quotation for refined iron bars, it is stated, however, that some mills will shade this figure a few hundredths for attractive business. Steel bars are in moderate demand at 1.55c., delivered here.

Coke.—Producers are exerting no pressure to sell. As a consequence the business transacted is small and confined principally to foundry coke, on which prices are pretty well maintained at $2.25 to $2.50 per net ton, at oven, for early delivery. A little inquiry for spot furnace coke has come out, for which $1.60 to $1.65, at oven, is named, while forward deliveries are quoted at $1.65 to $1.85. The following range of prices per net ton is named for delivery in this territory:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.80 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—Rumors of governmental action in connection with the buying arrangement of the associated steel mills still prevail, and while dealers contend that the Government will force the mills to abandon the practice, no information bearing on the matter can be obtained from the mills. Color is given the correctness of the reports, however, in the fact that a few purchases by such mills have been made in the open market, No. 1 heavy melting steel being purchased in moderate quantities at $14 to $14.25, delivered. A purchase of old rails at $14.50 is also reported. There has been little movement in rolling mill scrap; wrought iron pipe has been purchased, however, at $13, delivered. Stove

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plate continues scarce and commands a slightly higher price. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$14.00 to $14.50
Old steel rails, rerolling	16.00 to 16.50
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.25 to 16.75
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50

* Nominal.

Plitt & Co., iron and steel scrap merchants, Real Estate Trust Building, Philadelphia Pa., will open an office at 725 Singer Building, New York City, for the transaction of business in that territory. Alfred K. Barber, who has for a long time been connected with B. Nicol of that city will have charge of the office.

Cleveland

CLEVELAND, OHIO, October 4, 1910.

Iron Ore.—Shipments will show a heavy falling off this month. Some of the ore firms are nearly through with their season's shipments and more mines are being shut down. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—Some round lots were sold during the week and a fair volume of new inquiries developed, mostly for foundry iron in lots of 500 tons and under for delivery during the first half. A Chicago steel company has bought 6000 tons of basic from a local furnace for early delivery, at a price slightly above $14 at furnace, and is reported to have also purchased 10,000 tons from a Buffalo interest. Shipments will be made by boat, giving a low freight rate. An Ohio foundry, which had an inquiry out last week for 4500 tons for the first half, has bought 5000 tons. Of this 2000 is Northern No. 2, 600 is Jackson County silvery and the remainder No. 2 Southern and high silicon. The Northern iron went to a Cleveland furnace at about $14, at furnace. The buyer has a 45c. freight rate from Cleveland, as compared with a 90c. freight rate from the Valley, making the sale on the basis of about $13.50, Valley furnace. The central Ohio inquiry for 10,000 to 12,000 tons of foundry iron noted last week has not yet been placed. Among the new inquiries is one from a central Ohio foundry for 1000 tons of Northern for the first half and one from Pittsburgh for 1000 tons of No. 2 for the last quarter. Prices on foundry iron are no firmer and more furnace interests appear willing to meet buyers' views by quoting for first half delivery at current prices. Ohio silvery iron is weaker. Some tonnage has been sold for the first half by Jackson County producers at $17.50 for 8 per cent. silicon, the prevailing price for the last quarter. Southern foundry is quoted at $11 to $11.50, Birmingham, for the remainder of the year. Some producers that have not been quoting for delivery after the first of the year are now asking $11.50 for the first quarter and $12 for the second quarter. For prompt shipment and the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$15.00 to 15.25
Northern foundry, No. 2	14.50
Northern foundry, No. 3	14.00 to 14.25
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.25 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—The market is very quiet. Some consumers who have inquired for first half furnace coke prices have been given a quotation of $2. Prices are stationary and fairly firm. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment, and $1.70 to $1.75 for the remainder of the year. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 for spot shipment and $2.25 to $2.50 for delivery through the last quarter and first half.

Finished Iron and Steel.—The new demand is light in all lines, actual orders being all for small tonnages. Some fair inquiries have come out, but those that have resulted in orders have been almost entirely for immediate requirements. With deliveries fairly good in practically all lines, consumers are holding off, knowing that they can secure early shipments, while they are able to take advantage of price concessions should any be made later. This policy has resulted in the stocks of some manufacturers running quite low. Specifications on steel bar contracts are quite satisfactory, a good volume of orders coming from the implement manufacturers, whose plants are very busy. Prices are firm at 1.40c., Pittsburgh. Specifications on structural contracts are holding up well and some new business in small lots is coming out. The King Bridge Company has taken the contract for grade crossing elimination work for the Michigan Central Railroad in Detroit, requiring 500 tons of steel. Not much structural work requiring round tonnages is in prospect in this vicinity, but fabricating plants are well filled. The steel for the Cleveland Electric Illuminating Company's plant, 3100 tons, has not yet been purchased by the contractors, T. H. Brooks & Co. Prices are firm at 1.40c., Pittsburgh. The demand for iron bars shows no improvement, but both of the local mills are getting enough orders to keep running. We quote iron bars at 1.35c. to 1.40c., at mill. Plates are in light demand. The 1.40c. price is being maintained by most of the mills. The demand for sheets is fair. Prices are being better maintained, several of the independent producers adhering to $1 a ton above recent quotations. The demand from the railroads for track supplies is light. The demand for tin plate is quite active.

Old Material.—The demand for all grades is light. Local mills are buying only in small lots and for immediate requirements. There is little inquiry for scrap for shipment to outside mills. Dealers generally have accumulated stocks which they are not adding to unless they can pick up good bargains. Dealers' prices per net ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, October 5, 1910.

Pig Iron.—There is some quiet buying, but business booked is behind the previous week or two. For shipment October to March a Western stove maker placed about 5000 tons last week, 1200 of which was Southern silvery, purchased through a local agency, on a No. 2 foundry base price of $11.25, Birmingham, and it is stated that 2000 was Valley foundry, bought at $14, furnace, the remaining 1700 being made up of Southern foundry, purchased at a figure slightly below market quotations. A central Ohio manufacturer has put out an inquiry for about 8000 tons of basic, and a Michigan company is asking for a small tonnage of high silicon, both inquiries calling for shipment from November to March. The large southern Ohio inquiry for basic is said to have been withdrawn, and as this company is understood to have a supply that will last until April, it may be some time before the business is placed. Prices have been bumping the bottom rather hard, and $11, Birmingham basis, for the remainder of the year is generally quoted. While the furnace interests are holding out for $11.50 for the first quarter, a few small contracts have been taken below this figure. Some spot shipment iron can be bought in the Hanging Rock district below the regular quoted price of $14.50, Ironton, and for the first quarter of next year this quotation has been freely named. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(By Mail.)

Coke.—In the Connellsville, Pocahontas and Wise County districts there is said to be some spot shipment

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furnace coke that can be obtained around $1.55, per net ton at oven, and even this figure is understood to have been shaded 5c. in one or two instances. The contract price for 48-hour coke is from $1.65 to $1.85 at oven, the delivery date governing the figure obtained to a large extent. Foundry coke contracts can be made all the way from $2.10 to $2.50, according to the quality and time of shipment. For immediate delivery some 72-hour coke can be bought as low as $2 in all three fields. There is very little new business in either furnace or foundry coke.

Finished Iron and Steel.—During the past week the mill agencies report business as being very light. With the exception of the small cut in price of narrower sizes of plates to 1.35c., made by two or three independent mills, which has already been noted, 1.40c., Pittsburgh, is the quoted figure on beams, channels and steel bars. Local warehouse prices are around 1.80c. to 1.95c.

Old Material.—The usual dullness prevails and with the exception of some small lots of cast scrap going to the foundries there is nothing moving. Prices for delivery in buyers' yards, Cincinnati and and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

St. Louis

ST. LOUIS., October 3, 1910.

The appeal being made by the leading merchants, manufacturers and bankers of the city to defeat the proposed constitutional amendment providing for State-wide prohibition, in which very serious financial and industrial losses are predicted for St. Louis in the event of the measure being carried, is causing a halt in important new building and other business operations. The bank clearings for September show an excess over the same month last year. Some of the leading sellers of pig iron state that their total sales for September exceeded those of August. Collections are reported as having improved. Money is firm at 5½ to 6 per cent. on call and time loans, but a 5 per cent. rate on real estate is being restored.

Coke.—The most important transaction in coke reported last week was the sale of 25,000 to 30,000 tons of Kentucky smelter coke to a manufacturing company in St. Louis territory for shipment over one year from October 1. Another leading house made a sale of 35 cars of Connellsville foundry for shipment running to July 1, 1911. Other offices reported the usual inquiry, mostly for keeping posted on the market, together with sales of small lots, principally for spot shipment. Prices, while ruling unchanged, are not held as firmly as last reported. We quote Connellsville 72-hour foundry, standard brands, at $2.30 to $2.40 per net ton, the former price for spot and the latter for contract; Virginia, $2.10 to $2.25, all f.o.b. oven.

Pig Iron.—There is reason to believe that at least one transaction was closed for a round lot of Northern iron to a local foundry. A leading office reports a sale of 1000 tons of No. 2 Southern foundry, divided among three buyers, two of whom specified remainder of the year, and the other shipment over the first quarter of 1911; also a sale of 500 tons of malleable Bessemer for shipment over the second quarter of 1911. Various other brokers and merchant sellers report a number of inquiries and some sales of small lots, mainly, in case of sales, for shipment over the remainder of the year. Complaint of poor car service is becoming more common. Buyers are reported quite generally to be taking contract iron freely. Prices show no improvement and are still irregular. No. 2 Southern foundry is offered at $11, Birmingham, for prompt shipment; for shipment over the remainder of the year $11.25 to $11.50; while for first half of 1911, quotations range from $11.50 to $12, Birmingham, with several furnaces refusing to quote for that delivery. Southern Ohio is offered at $14.50 to $15 for No. 2 foundry f.o.b. furnace.

Finished Iron and Steel.—The leading interest states that conditions show some improvement and in some lines a better demand. Standard rails are in limited inquiry, but there is an excellent call for light rails, coming mostly from coal interests. Structural material is in moderate demand from country fabricators, but quiet locally. Steel bars are in better request from manufacturers, particularly wagon manufacturers. The demand for track material is more active, being quite good for spikes and moderate for bolts.

Old Material.—The market for scrap iron and steel presents no new features of interest, either in inquiry or demand. The only railroad list offered during the past week was that of the St. Louis & San Francisco, 400 to 500 tons. While there are no price changes to report, the tone of the market is weaker. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft.	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.25 to 12.75

The following quotations are per net ton:

Iron fish plates	$12.00 to $12.50
Iron car axles	18.00 to 18.50
Steel car axles	18.00 to 18.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	10.00 to 10.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	9.00 to 9.50
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.75 to 8.25

The Secretary of the Treasury has awarded the contract for the steam heating apparatus for the St. Louis post-office building to Hanley-Casey Company, Chicago, at $59,295. The Llewellyn Iron Works, Los Angeles, Cal., was awarded the contract for the elevator plant at $13,852.

The State Capitol Committee has about completed its general plans for building a State Capitol at Oklahoma City, Okla. Layton, Wemeiss, Smith & Hawk, an Oklahoma City firm, have been selected as the architects. The building will cost $1,500,000.

The plant of the Times-Democrat Publishing Company, New Orleans, was almost totally destroyed by fire September 30. The loss is estimated at $125,000, partly covered by insurance.

The Sodeman Heat Power Company, Edwardsville, Ill., has been absorbed by the United States Radiator Company, Dunkirk, N. Y. The Sodemann Company was recently acquired by the H. McClain Company, Canton, Ohio.

The Mississippi Valley Transportation Company, St. Louis, has let the contract for the first of its new steel craft for shallow draft navigation. This vessel will be a rake bow barge, 300 ft. long and 60 ft. wide, which will draw about 20 in. It will carry 1700 tons on 6-ft. and 3000 tons on 8½-ft. draft.

Buffalo

BUFFALO, N. Y., October 4, 1910.

Pig Iron.—The heavy inquiry for first quarter and first half deliveries keeps up, but buyers are conservative about placements. Inquiries have accumulated for 75,000 to 100,000 tons with Buffalo furnaces, including the 42,000 tons for a radiator company which has been under consideration for some weeks. The inquiries are chiefly for foundry grades, with some malleable and a very limited amount of basic. The radiator and cast iron pipe interests are the predominating factors in the quest for favorable quotations; although the general foundry trade is also well represented, covering New York State, Atlantic Coast and New England points. Inquiry and sales for the current quarter have been relatively small, the orders placed being almost entirely for carload and 100-ton lots. Prices for current quarter delivery remain unchanged, some furnace interests carrying deliveries into first quarter at present quarter prices and others refusing to name prices for next quarter except at an advance. We quote as follows for remainder of year, f.o.b. Buffalo:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.50 to 14.75
No. 2 plain	14.25 to 14.50
No. 3 foundry	14.00 to 14.25
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.00 to 15.50
Charcoal	18.50 to 19.00

Finished Iron and Steel.—Most selling agencies report a slight falling off in the total of new business placed in September as compared with the preceding month, although one of the largest interests, which has added two new lines of products lately, states that its September bookings of new business compare very favorably with any month of the year. Current orders show little change in volume from last week. Jobbers are apparently still reducing stocks and have not yet come into the market for additional requirements to any large extent, and consumers generally are maintaining a waiting attitude. There does not appear to be any shrink-

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age in consumption, but the large volume of shipments on old contracts takes care of immediate current requirements, mill shipments for September keeping up well toward the largest total for any month of the year. Conditions, therefore, seem to point to a renewal in buying in the comparatively near future. Inquiries are in the market from the Merchants' Despatch Transportation Company for about 500 tons of steel bars for its Rochester car shops for prompt delivery. Prices for steel bars, structural shapes and structural plates remain firm at 1.40c., Pittsburgh, base, for round lots, and 1.45c. for small miscellaneous lots. In the Canadian export trade current buying is very heavy. Reports indicate that all the principal agricultural implement concerns and structural companies are filled with orders to capacity, many of them, in fact, running overtime. The local agency of the leading interest reports the completion of the placement of a very large and attractive tonnage in steel bars, plates and other material for the Canadian market. In fabricated structural lines the past week has shown something of a slackening in demand, although most interests report a fairly good run of business. Figures went in last week for the Jerome Hotel at Erie, Pa., requiring 600 tons of steel. Revised plans are now being figured for the Y. M. C. A. building at Erie, 300 tons, and inquiries are soon to be out for steel for a new theater in the same city. The Buffalo Structural Steel Company was low bidder for the steel for the lock gates for the United States ship canal lock in Black Rock Harbor, Buffalo.

Old Material.—The market still lacks life, consumers holding back almost completely in the placing of orders. Dealers are pretty well loaded up with stock and are not inclined to purchase very freely from producers under present conditions; consequently but little business is being transacted. Dealers' prices, largely nominal, are as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	5.75 to 6.25
No. 1 busheling scrap	11.25 to 12.00

Birmingham

BIRMINGHAM, ALA., October 3, 1910.

Pig Iron.—It is not improbable that the bulk of the iron sold in this market in the past week brought less than the $11.50, Birmingham, basis. The aggregate of sales was small and a very desultory demand is represented. The $11.50, Birmingham, basis is being adhered to by most selling interests, and, as was the case last week, the average seller manifests indifference as to additional commitments at that price. It is hard to make a definite statement as to the actual market price for either prompt shipments or deliveries after January 1, owing to the very limited business in sight at this time and to the lack of interest by the trade generally. With the improvement in the demand for cast iron pipe it is not improbable that pipe manufacturers will make round purchases of low grade iron at an early date. The figures of stocks on furnace yards as of October 1 are not yet available, but will probably not show a decrease, owing to the heavy movement of warrant iron in September. Warrants have recently been offered at a concession and the sales made by producers at a lower price than $11.50 were to a certain extent the result. An addition to the active capacity was made October 1 in the blowing in of one Woodstock furnace, thereby increasing the total output of foundry grades some 6000 tons per month. At present 16 stacks are being operated on foundry iron in this State.

Cast Iron Pipe.—A round tonnage of water pipe has been placed with a leading Southern interest for Havana, Cuba, but the price has so far not been made public. It is announced that a fairly attractive tonnage is to be placed by the city of Dallas, Texas, in the coming week and a similar tonnage for Salt Lake City, Utah, is under consideration. Bids have been opened on a round lot of water pipe for Kansas City, Kan., but the award has not yet been made. There has been no change in authorized quotations and in view of the tonnage now in sight it is probable that these quotations are firmer. Small orders recently placed are of fair volume. We quote the market as follows for water pipe per net ton f.o.b. cars here: 4-in. to 6-in., $22.50; 8-in. to 12-in., $21.50; over 12-in., average $20.50, with $1 per ton extra for gas pipe. These quotations are subject to shading for large municipal contracts.

Old Material.—This market is in practically the same condition as at the time of last report. Dealers are not making an unusual effort to move their holdings, but are probably prepared to accept smaller margins. The trading during the week was very light and involved bargain lots principally. We quote dealers' asking price per gross ton, f.o.b. cars here, as follows:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 cast	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

The Woodstock Iron & Steel Corporation blew in one furnace at its Anniston, Ala., plant, October 1.

The Weller Rolling Mill, at Alabama City, Ala., has been taken over by the Southern Iron & Steel Company and will be put into operation during this month.

The blast furnace of the Southern Iron & Steel Company, at Alabama City, Ala., is undergoing repairs preparatory to being blown in on basic iron about November 1.

San Francisco

SAN FRANCISCO, September 28, 1910.

This market remains quiet in nearly all departments. The increasing activity usually experienced in the month of September has not materialized this year, and business at present is hardly as active as in the first part of the month. There has been a barely perceptible improvement in the general distributive trade, which has not been reflected in bookings by mill interests. The shading of prices by some of the Eastern interests has had no apparent effect on the market here. The firmness with which local jobbing prices are maintained is an encouraging feature, values on most finished products remaining at about the same level as during the first quarter. Arrivals of foreign material during the month have been comparatively large, probably about balancing the movement from store, and there is some talk of prices being shaded by the importers. A considerable tonnage of this material is being held in bonded warehouses, some of it being held by the importers in a speculative way. Structural material continues to move fairly well all over the coast, but extreme dullness is reported in steel pipe and sheets.

Bars.—The material imported consists largely of bars, and in consequence bookings by mill interests continue light. A considerable tonnage of foreign bars is being taken for concrete reinforcement as well as for the general trade. The larger consuming interests in this territory continue to buy on a comparatively small scale, and the local demand is extremely light, though merchants are getting a fair volume of business through the interior. Probably the greatest demand at present is for concrete construction work, both actual and prospective business in this line showing a noticeable increase. Tentative plans have been drawn for a number of large concrete docks on the local waterfront, which will require a large quantity of both bars and structural shapes. While some shading of prices is reported on direct importations and shipments from domestic mills, local merchants are holding firmly to their former resale prices, bars from store, San Francisco, being quoted at 2.30c. for iron and 2.50c. for steel.

Structural Material.—While there is no unusual activity in this department, the movement on the coast as a whole is about normal. Locally the situation is not altogether satisfactory, but is better than at the beginning of summer, and the tonnage is materially increased by the construction of small bridges, tank towers, &c., through the country. Local fabricators have a fair volume of small work in hand, and while they have little future work on their books a number of new inquiries are coming into the market. Prospective work includes several municipal buildings, which will probably be let to local interests. The movement of plain material shows some increase, several contracts having been booked for the coming year's requirements of small fabricators, and there is a fair inquiry from general manufacturing interests. New fabricating contracts are comparatively few, most of the important work being subject to delay. Bids have been submitted on the Masonic Temple, but no award is expected for some time, and while the general contract for the Native Sons' Hall has been let, the steel work will not be given out until next month. Plans are to be completed next month for a new court house at Sacramento, Cal. It is reported that Sullivan & Considine will build a large theatre at Portland, Ore.

THE IRON AND METAL MARKETS

Prices on beams and channels, 3 to 15 in. from store, San Francisco, are still maintained at 2.70c.

Rails.—Sales of light rails have been extremely small, as the mining interests, which are the principal buyers, are for the most part keeping out of the market. The logging roads are also buying very little, as the season is too far advanced for much new construction work. Present requirements of existing interurban and street railroad lines have been well covered by purchases during the first half year. New business is accordingly confined to small and scattered orders, and the total movement is of little consequence.

Plates. While some marine work is in progress, the demand for plates in this connection is of little significance, the principal demand being for tank steel. Tank fabricators are receiving a fair tonnage on old contracts, but are not coming forward with much new business, and altogether the demand is hardly normal. A fair tonnage is being used for waterworks and oil tanks through the country, but no large individual contracts such as were booked last spring have appeared for some time. The outlook, however, is improving in the oil fields, as arrangements have been made for disposing of some of the surplus oil, and progress is being made on new storage plans. The Palmer Oil Company is considering the erection of four steel tanks of 55,000-bbls. capacity each near Avila, Cal.

Merchant Pipe.—Both merchants and mill interests are disappointed regarding the volume of business. The smaller buyers who usually enter the market at this season are purchasing on a very limited scale, and the distributive movement is not much greater than last month. Jobbers are also limiting their purchases, as their stocks have not been broken up to any extent, and supplies are ample for all immediate needs. Orders from all sources are limited to a few scattered carloads. It is probably too late in the year for much new business in the oil districts, but there are indications of a better condition in that quarter as soon as deliveries can be made in the spring. Money is becoming more plentiful for new transportation projects, and active preparations are being made for several pipe lines. There has been some talk of an 18-mile 4-in. line for the development of a salt mine in Inyo County, Cal. The Union Oil Company is planning a 6-in. water system to supply its oil wells.

Cast Iron Pipe.—Business continues rather quiet. There has been a general suspension of buying by the water and gas companies for current improvements and replacements, and the principal new business is for municipal work. The city of San Francisco recently placed a new order for 3800 tons with the United States Pipe Company for the auxiliary fire protection system, and has taken bids on another small lot of 8-in. pipe. The city of Phoenix, Arizona, is in the market for 300 tons of 4-in. and 6-in. pipe, and small purchases are made from time to time for the municipal waterworks of Portland, Ore. The town of Oceanside, Cal., is planning an extension of the municipal system. It is reported that the Domestic Gas Company of Los Angeles will install a line covering the territory between that city and San Bernardino. As far as can be ascertained, the Bay Cities Water Company of Oakland has not yet entered the market, though representatives of the company state that an extensive system of cast iron mains will be installed within the next six months.

Pig Iron.—The local foundry business shows no life whatever at present, and such work as there is brings about the lowest prices on record. Most melters are well supplied with pig iron, and it is very difficult to sell anything of ordinary grade for either immediate or future delivery. At least one foundry, operating on structural work, will be closed as soon as its supply of pig iron is used up. The outside foundry trade is buying to some extent, but there is no active movement anywhere on the coast. The installation of new steel plants on the coast has increased the consumption of pig iron, but the bulk of the material is brought from China on contracts. Arrivals of foreign iron locally have been rather light, but there is a considerable tonnage in transit, and some pressure to sell on the part of importers is reported. Quotations, however, are steadily maintained, being as follows: Chinese, $23; Continental, $23; English, $23 to $23.50; Scotch, $25.

Old Material.—There is some movement of steel melting scrap to the East, and small quantities of mixed steel scrap are being taken as ballast in foreign-bound grain ships, but otherwise there is no marked activity in any department. Melters are not in the market for any large tonnage of cast scrap, but offerings are not excessive. Railroad wrought scrap and old rails are very quiet. Prices are fairly well maintained, being quoted as follows: Cast iron scrap, per gross ton, $17; steel melting scrap, per gross ton, $10; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

New York

NEW YORK, October 5, 1910.

Pig Iron.—The local pig iron market has shown about the same rate of buying in the past week as in two or three weeks preceding. A few several-hundred-ton lots have been bought by foundries in New Jersey for delivery this year, one of these contracts being for 1000 tons, taken by a machinery manufacturing company. There was active competition, most of the business going to an eastern Pennsylvania furnace. For No. 2 plain it is understood that $15.70 was the delivered price. Further negotiations for pipe iron are under way. Several sales of charcoal iron are reported, both Southern and Lake Superior. On the former prices were $21.50 and $22, at furnace. A pipe manufacturer in eastern Pennsylvania is reported to have bought 6000 tons, paying $14.15 for gray forge and $14.65 for No. 3, delivered. Some New England business has been done, for the most part at low prices, and it is still true that occasionally a seller appears willing to make 1911 deliveries at but a small advance over to-day's prices. For iron at tidewater we quote as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.25 to $15.50; Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—In these lines September fell behind August, but feeling that general business conditions are improving now, the iron and steel trades are taking a hopeful view of the future. Steel bars are still in most active demand; liberal specifications are being received from the West, and there is considerable demand for reinforcing bars. The closing down of some bar iron mills has about offset the loss of business that the others would have felt. Track supplies are rather weak, and especially spikes. The plate trade is feeling the lack of steel car orders from the railroads, and structural lines are suffering from strikes in the building trades, especially in the East. The subway work for New York is commanding most attention at present. October 20 the bid for subway construction on private capital will go in and October 27 the bids for municipal construction. S. Pearson & Son, who will tender bids on routes 9, 20 and 5, are asking prices on about 73,000 tons of riveted steel, about 54,000 tons of beams and shapes with connections and about 19,000 tons of open hearth reinforcing bars. Results on the bids for the Quebec Bridge have not been given out and it is probable that it will take two weeks to render an intelligent decision. It is estimated that about 83,000 tons of nickel steel will be required. Bids closed September 30 on 2000 tons for viaducts at the Grand Central terminal, but no award has been made. The Radley Steel Construction Company has the general contract for the Johnson apartments, New York, 1000 tons, and most of the plain material will be furnished by the Eastern Steel Company. Inquiries are out for about 1000 tons for the Washington Irving High School, New York City, and bids have been asked for nearly 1700 tons for an addition to the Oppenheim, Collins & Co. store. The New York, New Haven & Hartford has placed a bridge, to be erected at Valley Falls, R. I., with the Boston Bridge Works, 500 tons. The Munsey Building, Baltimore, 2000 tons, has gone to the Jones & Laughlin Steel Company. Milliken Bros. have taken a loft on West Thirty-first street, 400 tons, and an apartment at Ninety-eighth street and West End avenue, 500 tons. An apartment on Seventy-ninth street, near Amsterdam avenue, 500 tons, has gone to the Passaic Steel Company. The Lehigh Portland Cement Company's plant at Mason City, Iowa, 2000 tons, has been awarded to the Worden-Allen Company. The American Bridge Company has taken some bridge work for the Grand Trunk Railway at Chicago, 200 tons. The Blocks store, Indianapolis, 1700 tons, has gone to the Bedford Construction Company. The Eastern Steel Company is getting out the plain material, 1200 tons, for the Mirror Building, the general contract for which was let to Ravitch Bros. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Ferroalloys.—The local market in ferromanganese has stiffened and good sales have been made at $39.50, seaboard. There is a good demand for ferrosilicon and the generally quoted price here is $56.50, Pittsburgh.

Cast Iron Pipe.—Considerably more inquiry is being received from general buyers, such as private water and gas companies, especially for delivery next spring. For such delivery a higher price is quoted than for shipment this year. The New York City Department of Water Supply, Gas and Electricity opens bids to-day on about 1900 tons of water pipe of a wide range of sizes. The statement is published that the Havana Gas Company, Havana, Cuba, has closed a contract for 600 tons of 4 to 8 in. gas pipe with French manufacturers. Bids of American manufacturers were about $2 per ton higher than those of the

THE IRON AND METAL MARKETS

French makers. Carload lots of 6 in.. continue to be quoted at $23.50 to $24 per net ton, tidewater.

Steel Rails.—The Atlantic Coast Line has placed an order for 15,000 tons of open hearth rails for early delivery with the Tennessee Coal, Iron & Railroad Company. About 1000 tons of angle bars, included in the order, will be rolled at Pittsburgh. The Illinois Steel Company has booked 6400 tons of Bessemer rails, of which 5500 tons are in one contract and the remainder scattering lots. The Cuba Railway has given the Pennsylvania Steel Company an order for 1000 tons of standard sections.

Old Material.—The volume of business is small. Rolling mills are still purchasing but sparingly. The foundries are buying cast scrap only from hand-to-mouth, apparently being influenced by the continued weakness in pig iron. Some old car wheels have been sold, but consumers are taking little interest in the market and the offerings are very heavy. As it is understood that the associated buying arrangement in vogue among a number of steel manufacturers for some time has been discouraged by the United States Government, and these companies will in the near future arrange to make their purchases on their own account, dealers are inclined to hold their steel scrap for somewhat better prices. The strengthening conditions in this line have extended to a few other articles. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.75 to $13.25
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	19.00 to 20.00
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.25
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, October 5, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
		Electro-		New	St.	New	St
Sept.	Lake.	lytic.	Tin.	York.	Louis.	York.	Louis.
29	12.75	12.50	34.65	4.40	4.27½	5.60	5.45
30	12.62½	12.37½	34.70	4.40	4.27½	5.60	5.45
Oct.							
1	12.62½	12.37½	....	4.40	4.27½	5.60	5.45
3	12.62½	12.37½	35.15	4.40	4.27½	5.60	5.45
4	12.62½	12.50	35.75	4.40	4.27½	5.60	5.45
5	12.75	12.50	36.50	4.40	4.27½	5.60	5.45

There is a squeeze in pig tin for spot deliveries and prices have been advancing rapidly all the week. Better inquiries for copper are being received and the tone of the market has improved. Lead continues weak in the West. Recently advanced prices on spelter are being well maintained.

Copper.—After sagging somewhat last Friday and Saturday, the copper market has assumed a brighter tone. Electrolytic copper was down to 12.37½c., but is back to 12.50c. where it stood a week ago to-day. It has been asserted that electrolytic copper was sold during the week as low as 12.35c., but this was in very few instances. The September statistics of the Copper Producers' Association, due shortly, are expected to show a considerable reduction in production in addition to excellent deliveries into consumption. According to the New York Metal Exchange statistics and Customs House returns the exports of domestic copper from the Atlantic ports during the month amounted to the large total of 31,733 tons. There is a noticeable increase in inquiries. Lake copper has advanced ⅛c. in the last two days. Quotations now are 12.75c. for Lake, and 12.50c. for electrolytic. L. Vogelstein & Co., give the following figures of German consumption of foreign copper for the months of January-August, 1910: Imports, 114,915 tons; exports, 6074 tons; apparent consumption, 108,841 tons, as compared with consumption during the same period in 1909 of 104,046 tons. The London market closed to-day with spot copper selling at £56 5s. and futures at £57 2s. 6d. The day's sales amount to 250 tons of spot and 350 tons of futures. The market was firm.

Waterbury Average.—The Waterbury average for September was 12.75c. The average price of lake copper in New York for September was 12.81½c. and the average price of electrolytic was 12.56¼c.

Pig Tin.—There has been more excitement in the pig tin market during the week than at any time during the year. What amounts to practically a corner in pig tin exists and prices for spot deliveries have been soaring. The market has been very active; in two days, last Monday and Tuesday, at least 750 tons were sold, and the sales during the week have aggregated fully 1000 tons. It is admitted on all sides that spot tin is excessively scarce and some sellers who are badly in need of the metal are being squeezed. A comparison of quotations for October and for immediate delivery will show the rapid advance in spot prices. On September 28 spot tin closed at 35.05c., while October tin was bringing 34.90c. The following day spot tin receded to 34.65c. on lower London cables and October tin was offered 15 points less. Yesterday spot tin was bringing 65 points more than tin sold for delivery in October. The table prices at the head of this report will indicate how rapidly the market has advanced. Prices here all the week have been much in excess of the London quotations. The heavy demand for spot tin was brought about to some extent by the statistics for September, showing that deliveries into consumption during the month were very good, amounting to 3300 tons; the total deliveries for the nine months show an increase of 4900 tons as compared with the consumption during the same period last year. The total visible supply of tin September 30 was 2420 tons below that of September 30, 1909. Pig tin was sold in New York this afternoon for 36.56c. The London market closed to-day with spot tin selling at £162 and futures at £159 5s. The day's sales amounted to 250 tons of spot and 300 tons of futures. The market closed strong.

Tin Plates.—There has been a further drop in the London market for tin plates and the price at Swansea, Wales, is now 13s. 10½d. As an excellent demand for tin plates is experienced abroad, American representatives of London houses are under the impression that the drop there is largely due to recent declines in the price of pig tin at London. A good demand is enjoyed in New York for domestic tin plates. The price for 100-lb. coke plates continues to be held at $3.84.

Lead.—The Western market continues weak and sales have been reported there as low as 4.25c., St. Louis. The average quotation in that market, however, is 4.27½c., and most of the business being done is being transacted by outside sellers. The New York market continues firm, but there is very little buying. The American Smelting & Refining Company is making a lower price than that asked by outside sellers and it controls the market by offering the metal at 4.40c. This is cheaper than the St. Louis price, freight rates considered.

Spelter.—The spelter market is practically at a standstill. Buyers are taking the metal only as they need it while the producers show a great deal of independence in the matter of accepting orders. Most of them are quoting the metal at 5.60c., New York, but some are even holding out for a higher price. The price in St. Louis is 5.45c.

Antimony.—The market continues weak and nominal prices are as follows: Cookson's 8.15c.; Hallett's 7.87½c.; Chinese, 99½ per cent. guaranteed, 7.40c. to 7.50c.; Hungarian grades, 7.20c. to 7.30c

Old Metals.—The demand continues light, but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, October 4.—The Chicago market has been quiet. Quotations for copper, lead and spelter remain unchanged, but tin is slightly higher. The weakness reported in lead in other markets has not developed lower prices here, owing to the light demand. We quote Chicago prices as follows: Casting copper, 12⅝c.; lake, 13c., in carloads, for prompt shipment; small lots ¼c. to ⅜c. higher; pig tin, carloads, 35¾c.; small lots, 36½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.45c. to 5.50c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10⅝c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter, No. 1, 25¼c.; tin foil, 30c.; block tin pipe, 32c.

Metals, St. Louis, October 3.—Lead is quiet at 4.25c. to 4.30c.; spelter is dull at 5.40c., both at East St. Louis. Zinc ore is quoted at $42 to $44 per ton, Joplin, base. Tin is offered at 34.95c. per pound; antimony (Cookson's), 8.50c.; lake copper, 13.05c.; electrolytic, 12.85c., all at St. Louis. The demand for finished metals showed an improvement over the previous week.

The Machinery Markets

Business in the machinery trade in the East is reported slightly better than it has been in some time. New York dealers are doing a good business, but the demand is coming in for small lots and there are no machinery lists out of any size. A good export trade is reported in a number of machinery centers, and this is especially true in Pittsburgh, where there is also some excellent demand for second-hand machinery. A slight improvement is noticed in business in other quarters, and in Cleveland there are some good orders in sight for heavy machinery. In Detroit the automobile companies continue active and that branch of trade seems to have a more encouraging aspect. Excellent reports come from Chicago, where machinery business is expanding and there are two large railroad lists before the trade there at present. In Milwaukee manufacturers are showing their faith in the future by making up material for stock. Metal working plants are busy on the north Pacific Coast and the railroads there are becoming active.

New York

NEW YORK, October 5, 1910.

Business has picked up somewhat in this territory and machine tool dealers and manufacturers report that they are getting a better volume of orders. Most of the trade that is coming in is for single tools or small lots and the business is largely for replacement. Inquiries are also coming in better volume and some good business is in sight from new manufacturing enterprises. Manufacturers of power equipment have been experiencing something of a lull in business and there is little demand in this market for heavy power equipment. The export business continues fairly active and some good orders for machine tools for export to Continental Europe have been placed of late. The Pennsylvania Railroad has inquiries out for a small list of machine tools, not more than a half dozen, and the New York Central Railroad continues its policy of buying against requirements in small lots rather than issuing any list.

The Smith & Cox Company, Bayonne, N. J., has been incorporated to manufacture all kinds of pipe and tube bends as well as coils of all descriptions. The company will also do a general manufacturing business for the trade. J. Fillmore Cox, president and general manager of the company, is now getting bids on a line of equipment for the plant. The company will require, in addition to power equipment, electric and gas arc lamps, a heating plant, hangers, shafting, pulleys, belts, electric welding machinery, oxide welding apparatus, pipe threading and cutting machines, a full line of bending equipment, oil and gas forges and furnaces, steam hammers, cranes, engine lathes, milling and boring machines, drill presses, shapers, &c. The company will be extensive users of pipe, tubings and fittings and desires catalogues relating to that subject. Mr. Cox can be addressed at Twenty-sixth street and the Boulevard, Bayonne, and at the place of construction, which is at the foot of Fifty-seventh street and Avenue E.

The Bosch Magneto Company, 223-225 West Forty-sixth street, New York, has not as yet made up its list of machinery requirements for its new plant at Brightwood, Mass., which is now well under way. The part now being constructed is the first unit of what is later to be a larger plant. It is 65 x 400 ft. and four stories, with two L's, one 22 x 59 ft. and the other 65 x 70 ft. The company will plan extensions to the plant as needed and will eventually occupy most of the 7-acre tract to which it has acquired title. The company will purchase the power it requires.

The Ellis Adding Typewriter Company, Newark, N. J., is erecting a new plant, 50 x 200 ft., of four stories. This new building will be the first of a group of structures the company intends erecting on the site. It is expected it will be ready for occupancy about January 1, when the machinery now in use in an existing plant will be moved to the new structure.

The Westinghouse Electric & Mfg. Company has recently received an order from the Simonds Mfg. Company for six 500-kva. O.I.S.C. transformers, two 200-hp. type HF rolling mill motors to be used in the new Lockport, New York, plant of the purchaser. The transformers will be used in stepping down the power purchased at 12,000 volts to 480 volts. One of the motors will be used on the hand sawmill and the other on a cross-cut sawmill. The motors will be geared to the mills, which will consist of two stands each. The motors will be of the Westinghouse extra heavy rolling mill type, so constructed as to permit the moving of the stator sideways in case of necessary repairs to the rotor.

The recently organized Carbon Machinery Equipment Company of Rochester, N. Y., has taken over the plant of the Charles W. Mayer Company and has increased facilities for manufacturing carbon paper typewriter ribbon machinery and other special machinery.

The fire which visited the plant of the Rubberset Company at Newark, N. J., September 11, completely destroyed a building which was used for storage and machine shop, causing a loss of about $250,000. Fortunately a new five-story concrete fireproof building was recently erected by the company and a large portion of brush manufacturing material has been moved there, so that the fire will not interfere with the company's manufacturing arrangements to any great extent.

The Salisbury Wheel & Mfg. Company will not rebuild its plant recently destroyed at Jamestown, N. Y., where front axle and chain driven rear axles were made. This work will all be diverted to the Greenville Metal Products Company, Greenville, Pa., which is controlled by the stockholders of the Salisbury Wheel & Mfg. Company.

The Beaver Company, Buffalo, N. Y., manufacturer of beaver board, is building two additions to its plant at Black Rock, Buffalo. One building will be used for raw stock and the other for storing finished material. The company will be interested in any machinery for handling stock economically and will also require some electric motors.

The plant of the New York Revolving Portable Elevator Company at 450 Princeton avenue, Jersey City, N. J., was practically destroyed by fire October 3. The plant, which was a two-story brick structure about 150 x 150 ft., was recently refitted and most of the machinery equipment was destroyed.

Fire which destroyed a number of buildings consumed the plant of the Atlas Metal Bedstead Company in West Twenty-fifth street, New York, October 3. All of the manufacturing equipment of the company was ruined in the flames and a great deal of finished material was also destroyed.

Wurtz & Son, structural iron and steel fabricators, Buffalo, N. Y., have purchased the Buffalo plant of the American Bridge Company at Bailey avenue and the Pennsylvania Railroad, which has not been in use for some time, and will equip it and remove their business from the present plant on Lloyd street. The building on the property is about 75 x 600 ft., with clear story 40 ft.

The Buffalo Gasoline Motor Company, Buffalo, N. Y., has completed plans for the erection of a two-story brick addition to its factory at Niagara street and Auburn avenue.

The Shur-on Trolley Guard Company, Buffalo, N. Y., has been incorporated, with a capital stock of $25,000, to engage in the manufacture of trolley safety devices. Henry J. Tiedt, Frank J. Nolan and Howard J. Young are directors.

The Buffalo Leather Company, Buffalo, N. Y., Wm. R. Smith, general manager, 920 Seneca street, will add to its plant a two-story brick fireproof factory, 100 x 250 ft., at Hardwood place and the Erie Railroad, for the manufacture of patent leather and other shoe leathers, and considerable special machinery will be required.

Chicago

CHICAGO, ILL., October 4, 1910.

Business with Chicago machinery houses the past week showed further evidence of expanding. The sources of demand are not only becoming greater and more varied, but the orders and inquiries cover more than single tools, as was the case for some time. The betterment in the demand and increase in the volume of inquiries are very encouraging to machinery dealers, who are confidently expecting much greater activity in the trade in the near future. Viewed as a whole, the business of September was of fairly satisfactory volume and exceeded by far the business transacted during the month of August. While some of the dealers report busi-

THE MACHINERY MARKETS

ness as not entire satisfactory, the majority are inclined to take an optimistic view of the future. Industrial plants are coming into the market more freely and such orders are more liberal than they have been for several months. There are two large railroad lists on the market at present, but the demand from this source of buyers is light and is confined chiefly to single tools for replacement. It is understood that the Chicago City Railway is about to close on a list of tools amounting to about $20,000, on which it has been receiving bids for some time. The J. I. Case Threshing Machine Company has issued the following list of machine tools for its plant at Racine, Wis.: One Fox lathe, one 20-in. lathe, one 26-in. lathe, one 18-in. lathe, one 60-in. boring mill, one 30-in. boring mill, one 48-in. boring mill, one 36-in. boring mill, one slab milling machine, one slotting machine, one 36-in. planer, one 30-in. planer, one 28-in. drill, one high speed drill, one 20-in. drill, one 26-in. drill, one 4-ft. radial drill, one cylinder boring machine, one piston ring grinder, one 21-in. chucking lathe, one 2-ft. radial drill, one bulldozer, one 1½-in. bolt header, one eight-spindle multiple drill, three wet tool grinders, one plate bending roll, one No. 2 universal milling machine. It is also understood that the Falk Company, Milwaukee, is considering the purchase of a number of tools, including a large boring mill, lathe, traveling head shapers and automatic screw machines, all of which are to be motor driven with the exception of the screw machines.

The H. A. Stocker Machinery Company, Chicago, has decided to open a branch office in Milwaukee, Wis., to take care of the company's growing business in Milwaukee territory. Robert C. Tate, who has long been identified with the Chicago office of the company, has been appointed manager of the Milwaukee branch and will open headquarters in that city in the near future.

J. G. Clough, Quincy, Ill., is erecting a building 50 x 100 ft., the first floor of which will be used as a garage and the basement for the manufacture of a concrete mixing machine of which he is the inventor. No new machinery will be purchased at present.

The Macomb Sheet Metal Works, Macomb, Ill., has been incorporated with $13,500 capital stock. The company will manufacture sheet metal specialties of all kinds and advises that it will use its present quarters for the time being. New machinery to be purchased consists of electric motors, stamping dies and a few small tools such as folders and foot power squaring shears.

The Aurora Automatic Machinery Company, Aurora, Ill., manufacturer of the Thor line of pneumatic tools, is contemplating the erection of an addition to its blacksmith shop and other portions of its plant of sufficient size to give employment to about 100 additional workmen.

The Sulzberger & Sons Company, Chicago, Ill., packer, advises that it is considering the construction of a large packing plant somewhere in the vicinity of Portland, Ore., the exact location of which has not been decided upon.

The H. A. Stocker Machinery Company, Chicago, has sold to the Pridmore Molding Machine Company the entire equipment for its new plant located at Twenty-third street and Western avenue, Chicago.

Plans and specifications for the construction of a water works system and reservoir have been prepared by the city of McLeansboro, Ill. The proposition will be submitted to a vote of the citizens on November 1.

New England

BOSTON, MASS., October 4, 1910.

A slight improvement in business is reported by the machinery and supply dealers. Their experience varies. Some have fared better than others during the week. Taking the trade as a whole, however, conditions are better and certainly more hopeful. Buying in these as well as in general lines of business is conservative. No one seems to care to increase their stocks. The heater, furnace and stove manufacturers are doing a very prosperous business. Two of the largest houses report the identical increase in volume of orders of 15 per cent. over last year, constituting the largest business ever transacted. A prominent lead company reports business as very good, reflecting the condition of the electrical, rubber, glass, chemical and pulp industries.

One of the great builders of automatic machinery makes this interesting statement: "The machine tool business has had, of course, an important drop, which began in April, with plenty of countermands of orders that had been placed by automobile builders. General business, however, has come in, and we are pleased to say that the last five days has brought in business from different places that nearly brings us up to our normal requirements. The lowest ebb took us down to orders for about one-fourth our output. The last five days has brought us business from various points which has brought up the business to 75 per cent. of our normal output. The automobile business, however, has not commenced to come in to any considerable extent yet. This business has been mostly American, with some French and British."

One of the large builders of grinding machinery states: "It is very difficult to correctly size up the situation at the present time. While the sale of our machines dropped off quite materially the latter part of July and during August, just at the present time we are receiving a few orders and quite a number of very good inquiries. The automobile business, so far as we are concerned, is practically at a standstill, though we are told by some of our agents that in some sections the industry is beginning to get into a little better shape. We are running our factory full time, and hope to do so for some time to come, and make up a limited amount of stock. Our principal set-back, so far as orders for machines are concerned, is from the automobile industry, but we are hoping that after the first of the year business in this line will show a decided improvement."

The Revere Rubber Company, Boston, Mass., will erect large works at Providence, R. I. Building permits have been taken out for a one and two story machine shop 50 x 153 ft., a one-story brick and steel manufacturing building 60 x 164 ft., two-story manufacturing and storage building 32 x 115 ft., and a brick and steel boiler and pumping house 54 x 57 ft. The company is a branch of the United States Rubber Company.

The New London Ship & Engine Company, New London, Conn., which will operate the great shipyard at Groton, across the river, formerly the property of the Eastern Shipbuilding Company, has been incorporated in Connecticut with $500,000 authorized capital stock. The incorporators are Thomas A. Scott, William H. Reeves and Henry R. Bond, Jr., all of New London.

The Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., manufacturers of planers and engine lathes, will increase its capital by the issue of $100,000 of preferred stock. Authority has been asked to issue $150,000 of preferred securities, but only $100,000 will be sold at this time. The present capitalization consists of $150,000 of common stock.

The Boston State Hospital, Dorchester Center, Mass., will not have a list of requirements for the new machine shop and carpenter shop until late in the year. A full line of machinery will be purchased.

The Porter Machine Works, Hatfield, Mass., has put on the market an engine lathe of its standard type, equipped with quick change gear box.

The Farnham Cam Jack Company has been organized at Rumford, Maine, to manufacture a lifting device known as the Farnham cam jack, in which a new principle is embodied. The company proposes to establish a factory for manufacturing the jack and to do a general machine shop business at Rumford. Charles E. Garcelon is the president and Fred E. Farnham the vice-president and treasurer.

The Champion Igniter Company, Hudson, Mass., will manufacture miners' safety lamps and igniters in that town, and will develop a plant for the manufacture of peat fuel, getting the raw material from bogs of which there is a large acreage in the vicinity. A modern factory has been purchased, and the plans call for the erection of another building, which will be devoted to the peat end of the business. Machines of special design will be built for the purpose. E. F. Koehler is the president of the company.

The Central Autogenous Welding Company has established a plant at 73 Union street, Worcester, Mass., to do autogenous welding with the oxy-acetylene process. John A. Braithwaite, Chicopee Falls, Mass., is the president, and walter Winton, Springfield, Mass., treasurer and clerk. The company has a capital stock of $2000.

The directors of the Boston & Maine Railroad voted today to appropriate $10,000,000 for improvements and for the purchase of new equipment. The additional detail is given out that $3,000,000 will be devoted to rolling stock, largely passenger cars, but also including freight and passenger locomotives. Bridge work will take a large proportion of the remaining $7,000,000. The deduction is made that repair shop facilities will not be overlooked. The beginning only has been made of the Somerville, Mass., shops, plans for which involve some $2,000,000, and the expectation is expressed that other units in addition to the running repair shop, now under construction, will be included in the new appropriation. The New York, New Haven & Hartford Railroad has recently taken control of the Boston & Maine system, which is interpreted to mean a much more progressive policy.

The purchase by the United Shoe Company of Thomas G. Plant's Wonder Worker Shoe Machinery Company has had a very direct effect upon general industry. Various shops which have been building the new machinery have ceased the work and have released a large number of mechanics. The Stanley plant at Lawrence, Mass., recently

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acquired by the Plant interests, is one of these. Another is the Bresnahan Shoe Machinery Company, Lynn, Mass. The Taft-Pierce Company, Woonsocket, R. I., has done much work for the Wonder Worker Company, and other New England shops are similarly relieved of a part of their business. Probably some of the machine tools purchased during the past two or three years for the development and construction of the new line will get on the market. Not a very large percentage of the men who have been made idle can be classed as skilled machinists, according to the experience of the labor bureau conducted by the Boston Branch, National Metal Trades Association. The machinery trade has experienced much disappointment because of the collapse, by sale, of what promised to be a large competing industry.

L. R. Stanley, who formerly occupied the works at Lawrence bearing his name, will proceed with the erection of a new shop at Salem, Mass., which will house his marine combustion engine business. The plant will be of considerable size, it is announced. The abandoning of the Lawrence factory by the Wonder Worker business will have no bearing on the Salem proposition, so Mr. Stanley has announced.

The Gurney Heater Mfg. Company, Boston, is completing the foundations for its new works at Framingham, Mass. It will be some months, however, before they will be ready to receive their equipment. They will have double the producing capacity of the present works at East Boston.

The Exeter Machine Works, Exeter, N. H., of which Joseph H. Symonds is the president and treasurer, has purchased the large plant of the Hyde Park Woolen Mills, Hyde Park, Mass., and will occupy it for the manufacture of the Symonds commercial car, motor car wheels, gasoline engines and transmission. The work of equipping the shops will begin in the near future. The property consists of between 3 and 4 acres of land, upon which are a main building, 78 x 400 ft., with an annex, 77 x 95 ft., and buildings respectively 45 x 65 ft., 40 x 45 ft., 42 x 175 ft., 33 x 75 ft., 63 x 150 ft., 25 x 37 ft., 60 x 75 ft., together with an engine and boiler house, 36 x 75 ft. The plant is to start manufacturing with some 75 men and to increase gradually to 300 or upward.

Additions to general manufacturing properties and new plants in New England include the following: Waite, Thresher & Co., Providence, R. I., manufacturing jewelers, five-story mill construction building, 80 x 146 ft.; Collier & Keyworth Mfg. Company, Gardner, Mass., baby carriages, 60 x 200 ft., four stories; Connecticut Clasp Company, Bridgeport, Conn., brick factory, 40 x 66 ft., three stories.

Philadelphia

PHILADELPHIA, PA., October 3, 1910.

The situation still lacks snap and buying has been largely of a hand-to-mouth character. Occasional improvements are to be noted in the demand for small tools, but the movement is irregular and, on the whole, below the average demand. Machine tool sales have been confined largely to single tools; some few heavy tools have been disposed of, but the bulk of the trade has been in those of moderate sizes. Inquiries in general are, if anything, less pronounced. There is an absence of any list covering any general equipment and several propositions of this character, which have been before the trade for some little time, show no disposition to develop into business in the very near future. The trade schools, usually fair buyers of tools in the early fall, have been particularly backward in coming into the market. The railroads still refrain from making inquiries for any general requirements, coming out from time to time, however, in a rather small way for emergency needs. Such inquiries have been received from the Pennsylvania Railroad during the week, quotations being separately asked for on an axle lathe, a wet grinder, a drill press and a bolt cutting machine. It is understood that one concern in this territory is in the market for two open side planers, but the inquiry has been kept pretty quiet and the proposed purchaser is not known. Very little in the way of export business comes out. Builders of heavy engines report a trifle more demand, but considerable hesitancy is shown in placing orders of this character. In special machinery lines the situation is unchanged; a moderate volume of new business is before manufacturers, but orders develop rather slowly.

Machinery and tool builders are in some cases less actively engaged, in others a large volume of old orders on hand is sufficient to keep plants working at full capacity. Industrial plants in the majority of instances are operating below normal capacity, a condition which is not particularly encouraging as to purchases of equipment.

The foundry trade shows little betterment; jobbing foundries report a fair trade, but there is little new business in machinery castings. No improvement is reported in the demand for steel castings.

W. W. Lindsay & Co. have been awarded a contract for two one-story brick, concrete and steel buildings, 48 x 240 and 52 x 125 ft., for the McAndrews & Forbes Company, Camden, N. J. The addition will be used for the extension of its boxboard factory.

The William F. Read & Sons Company, Twelfth and Jackson streets, have awarded a contract for the erection of a five-story brick and concrete manufacturing building, 35 x 200 ft., to John G. Brown. A part of the new building will be used for the extension of its business in connection with the manufacture of cotton goods and part for warehouse purposes. No information can be obtained as to the machinery requirements.

The Lorraine Motor Company has obtained permits for the preliminary work in connection with the erection of a large garage at Thirty-seventh and Ludlow streets, in which will be embodied all the usual garage features as well as new developments in that line. W. L. Walker is president, and Joseph Booth secretary-treasurer of the company.

Wilson, Harris & Richards, consulting architects, announce the award of the general contract for the new plant of the Pennsylvania General Electric Company, Erie, Pa., to the National Fireproofing Company, Pittsburgh, Pa. Work will begin at once on a one-story foundry and machine shop of brick and steel construction, 375 x 800 and 160 x 800 ft.

The Seaford Planing Mill Company, Seaford, Del., has been incorporated under the laws of the State of Delaware, with a capital stock of $25,000, taking over the mill at the above location, formerly operated by L. W. Hurley & Son. The officers of the new company are W. S. Lowe, president, Charles E. Day, secretary and treasurer, and A. Russell, superintendent. The mill is equipped to manufacture building material and it is stated that additional machinery will be installed, so as to materially increase the capacity of the plant.

The power house and boiler plant of the Pennsylvania Marble & Granite Company, Avondale, Pa., were practically destroyed by fire on September 28. It is reported that a new building will be erected and necessary machinery installed as soon as possible.

Specifications have been prepared, it is stated, for the new foundry building for the Light Mfg. Company, Pottstown, Pa., to be erected on ground adjoining its present plant. Plans call for a building 40 x 60 ft.

Bids will be received by the committee of the Board of Trustees, State Hospital for the Insane, Norristown, Pa., for a considerable quantity of laundry machinery, the list of which will be furnished by Richard Markley, steward. Bids must be in not later than October 5.

The Lester Piano Company, Lester, Pa., has received bids through Ballinger & Perrot, engineers, for a two-story brick addition to its plant, measuring 60 x 100 ft. The addition will be used for manufacturing purposes; details, however, are not now available.

Cincinnati

CINCINNATI, OHIO, October 4, 1910.

A rumor has been circulated locally to the effect that there are signs of an early improvement in the automobile trade. Some machine tool salesmen, who have visited the automobile manufacturing district, to a certain extent confirm this report, and straggling business lately booked would indicate that there is some truth in the rumor. There is no denying the fact, however, that September, generally speaking, proved an unsatisfactory month for machine tool companies. The inquiry has been and is now very good, but actual business booked is not up to standard by a wide margin. The railroads continue disappointing customers, and although some few have placed orders for small lots of tools there are no indications that they will be very heavy purchasers in the immediate future. No one feels pessimistic over the situation, as crop reports are so good that at least an average business may be expected this winter.

In reply to a direct question as to the cause of the present quiet conditions the average business man will almost invariably reply, "unwise political agitation," and not a small number will add that the railroads have contributed their share by holding off in the purchase of tools and equipment, which are badly needed, with the hope of influencing legislation in their favor.

The demand for woodworking machinery is reported to be light and orders coming in are principally from the South.

The Central Mfg. Company, Cincinnati has tentative plans under way for building a fertilizer factory in Lockland suburb. Work on the new plant will probably not commence before next spring.

Contract for the addition to the Niles Tool Works, Ham-

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ilton, Ohio recently mentioned, has been awarded to the McClintic-Marshall Construction Company, Pittsburgh. The total cost, it is said, will be over $500,000, and the capacity of the plant will be increased about 40 per cent.

The heating contract for the new plant of the Incandescent Light & Stove Company, Oakley, Cincinnati suburb, has been awarded to Robert S. Mayer, Gerke Building, Cincinnati.

The American Valve & Meter Company's new building on Spring Grove avenue, Cincinnati, is completed up to the first story and work will be pushed all possible so as to get the factory under cover before cold weather sets in.

Recent orders booked by the Cincinnati Shaper Company include some of its shapers to be shipped to Paris and Brussels.

Walter Macleod & Co., Cincinnati, report some recent shipments of oil furnaces to Java, Cuba and Mexico.

The large reinforced concrete addition to the R. K. Le Blond Machine Tool Company's plant in East End, Cincinnati, is expected to be finished before January 1.

New Ohio incorporated companies include the Browning Mfg. Company, Mansfield, Ohio, to manufacture cranes, shovels, &c. The incorporators are L. C. Pelott, Geo. F. Stalley, Jr., and A. S. Meyer, all of Columbus. The capital stock is $200,000.

The U. S. Coupling Company, Columbus, Ohio, has been incorporated, with $12,000 capital stock, to make pipe, pipe couplings, &c. W. V. Strickler, Horace Willoughby and J. P. Davis are the principal incorporators.

The Fremont Stove Company is a new incorporation at Fremont, Ohio, with $35,000 capital stock. J. C. Christy is said to be the principal incorporator.

John F. Moloney, who formed a new company recently reported as organized at Hamilton, Ohio, with $200,000 capital stock, has definitely decided on building a large paper mill at Franklin, Ohio. The name of the new incorporation has not yet been decided on.

The Peck-Williamson Company's plant in Oakley suburb, Cincinnati, can be classed as one of the busiest in this section of the country. The company's present orders for heating apparatus are coming fast enough to keep every department busy.

The Hugh Merrie Plumbing Supply Company, Cincinnati, Ohio, suffered a loss estimated at about $15,000 when the four-story brick building which it occupied at 90 Bowen street was destroyed by fire on September 25.

It is reported that the citizens of New Carlisle, Ohio, will in the near future vote on the question of installing a water works system.

The Board of Local Improvements of Springfield, Ohio, is making arrangements for improving the water works system.

Cleveland

CLEVELAND, OHIO, October 4, 1910.

Business with local machinery dealers continues dull, although some report a slight improvement as compared with last month. Sales during the week were nearly all small single tools. There seems to be a better demand for tools to equip small shops that are starting up in various metal working lines. This business which usually amounts to about a half a dozen tools is generally divided up between several dealers. Some inquiries made during the summer are still pending, the prospective purchasers being able to get along with their present equipment until their business becomes better. The demand for second-hand tools is fairly active, showing some improvement. Machine tool builders report that orders are still light. Some that are getting caught up on old orders are looking for a better demand shortly and are making tools for stock instead of reducing their production by cutting down their working forces.

The demand for heavy handling machinery for ore and coal has been light for some time, but a few good orders from industrial plants are in prospect. Good inquiries are pending from the East for hydraulic turbines for new power plants. The outlook for considerable demand for mining machinery in the West is reported to be quite good, although some large installations are still being held up. In electrical equipment the demand for small motors for a large variety of purposes continues very good, but no inquiries are coming out for large equipment. Makers of industrial railroad equipment report a good volume of business.

The Bilt Rite Mfg. Company, Minneapolis, Minn., manufacturers of a cash carrier system, is negotiating with the Board of Trade of Canton, Ohio, for the removal of its plant to that city. Preliminary steps have been taken by the incorporation of the International Store Service Company, under which name the concern will be known should the plant be located in the Ohio city. The incorporators are F. A. Alexander, William C. Herbruck, G. A. Leonard, I. M. Chandler and Clarence G. Herbruck. If satisfactory arrangements are made the company will start with a capital stock of $150,000.

The William Edwards Company, Cleveland, will erect a large warehouse for wholesale groceries and a factory building at St. Clair avenue and West Tenth street, Cleveland, plans for which have been prepared by W. S. Lougee, architect. There will be six stories, each containing about 1½ acres of floor space. There will be a power plant consisting probably of two 500-hp. boilers, engine, generators, and motors for operating six elevators, heating, and driving printing and other machinery.

The Howard Motor Car Company, Galion, Ohio, has commenced the erection of a new plant for the manufacture of automobiles, the contract for which has been awarded to the Carey Construction Company, Cleveland. An expenditure of about $125,000 is planned. The plant will consist of three buildings of steel and concrete, of saw-tooth roof construction, and will provide about 60,000 sq. ft. of floor space.

The Cleveland Novelty Mfg. Company has been formed by Victor Moore, Harry Wells and others to manufacture various metal novelties. The company is starting a plant in the F. W. Roberts Building on High avenue. The company has been incorporated with a capital stock of $10,000.

The Chisholm & Moore Mfg. Company, Cleveland, reports that its plant is well filled with work, both in its hoist and malleable castings departments, and that the total volume of its business during the present year will exceed that of any previous year.

The Lake Shore Railroad has an inquiry out for a 6-ft. plain radial drill, motor driven, for its Collinwood shops.

Proposals for furnishing additional boilers or boiler for the light, heat and power plant of the Boys' Industrial School at Lancaster, Ohio, will be received by the Board of Trustees of that institution October 27.

The Mt. Vernon Bridge Company, Mt. Vernon, Ohio, has completed its new plant, which has been under construction the past few months, to replace the one that was burned last winter. The plant is up to date in every particular. The main building is 135 x 496 ft., giving a capacity more than double that of the former one.

Charles F. Laganke has established a plant in the Card Building, 118 St. Clair avenue, Cleveland, for the manufacture of textile machinery. In addition to various specialties the plant will make the Davis looper and looper attachment for the Southern Textile Machinery Company of Paducah, Ky.

The Cameron Car Company has commenced the erection of a new plant in Attica, Ohio. The building will be 150 x 200 ft. and two stories.

The American Rubber Company, which was recently organized in Akron, Ohio, with a capital stock of $200,000, announces that it will build a plant in that city for the manufacture of automobile tires and mechanical rubber goods. F. L. Kryder is the manager.

It is reported from Bellefontaine, Ohio, that the Big Four Railroad is considering plans for building a new central power plant at its shops in that city.

The Al-Ton Motor Accessory Company, which recently established a plant at Akron, Ohio, has increased its capital stock from $50,000 to $100,000.

The Thomas Mfg. Company, Dayton, Ohio, has completed plans for the erection of a new plant. The building will be of steel and concrete construction, 175 x 250 ft. and three stories.

The American Can Company, Cleveland, will enlarge its plant by the erection of an addition, 40 x 115 ft. and five stories.

The Ferro Machine & Foundry Company, Cleveland, has let contracts for the erection of a new office building. It will be of brick and steel 35 x 120 ft. and two stories.

Detroit

DETROIT, MICH., October 4, 1910.

In view of the widespread currency given to reports of the decline in the automobile industry it is of interest to note that, during the past two weeks nearly 1100 men, including machinists, assemblers, bodymakers, finishers and workers in all departments, have been added to the shop force of the Packard Motor Car Company, Detroit, following the resumption of full activity as usual after the between-season period. It is also stated that within the past few months approximately $115,000 worth of new machinery has been installed, with an increase in working floor space of 9½ acres, all of which is occupied. The capacity of the electrical power plant is being increased 2000 kw. and work on a

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separate power plant for the foundry is being pushed. The equipment of the newly completed drop forge plant will also be installed this month and the company's operations correspondingly extended.

With the general renewal of manufacturing in the plants of automobile and motor truck builders of Michigan and adjoining districts, the situation in the machinery trade is beginning to take on a much more cheerful aspect than was the case a month ago, and further encouragement has been derived from the unexpectedly heavy contracts for season deliveries placed with the foundries, gasoline engine makers, bodybuilders, forge shops and other plants manufacturing automobile parts and accessories. The effect is already being felt in purchases of material and supplies of various kinds; and inquiries for shop tools which were made some time ago, only to be dropped, are again subjects of discussion between manufacturers or dealers and prospective users. So far as actual sales are concerned the situation has not yet improved sufficiently to justify the prediction of an immediate uplift in the market, but conditions are certainly promising.

H. B. Lewis, Detroit, has the contract for structural iron work on the new buildings to be erected by the McRae & Roberts Company of this city, whose plans for plant extension have been previously mentioned.

The Board of Trade, Grand Rapids, Mich., is negotiating for the location there of a factory for the production of automobile parts and accessories.

The hoisting facilities at the Tecumseh mine of the La Salle Copper Company, Houghton, Mich., are now inadequate to the further demands of the service and additional machinery will be needed to be provided before spring.

Chrysler & Koppin, Detroit, are arranging for the construction of an addition to their factory.

The sale of bonds for the construction of a pumping plant and water distribution system has been authorized at Pigeon, Mich.

The Hayes Ionia Company, Ionia, Mich., which has recently engaged a large force of skilled workmen for both its metal and woodworking departments, will operate the plant to capacity this fall.

Canadian manufacturers of automobile and parts were taking advantage of the shutting down of some of the motor vehicle factories here to secure operatives for their own plants, and quite a number of men have been induced to migrate. Others found immediate employment in other cities of the United States, particularly those from which they originally came. What were meant as merely temporary lay-offs are, therefore, likely to result in serious losses from some of the plants of many of their best trained employees.

The Alamo Mfg. Company, Hillsdale, Mich., is making a specialty of gas and gasoline engines in sizes from 3 hp. up, which show excellent economy in service and have proved very durable.

A. B. Preston, St. Johns, Mich., whose plans for an electric power plant at Sheridan, Mont., have previously been mentioned, is now making the final arrangements for it there, and expects to have the machinery installed by January 1.

Some additional machinery will be required by spring for the property of the Mass Consolidated Mining Company, Houghton, Mich., whose principal efforts at the present time are being devoted to development work that will lead to heavy operations later on.

A bond issue has been voted at St. Charles, Mich., to cover the cost of constructing a pumping plant and complete system of water works.

A new woodworking shop 80 x 250 ft. is to be erected by the Duluth, South Shore & Atlantic Railway, on the site of the building that recently burned at its plant in Marquette, Mich.

The Industrial Works, Bay City, Mich., has let contracts for a new office building.

The Toledo-Massillon Bridge Company, Toledo, Ohio, has been awarded the largest contract for steel bridges let by any railroad in this section for some time past. It includes 28 structures to be placed along the line of the Toledo & Ohio Central Railroad.

The Detroit Injector & Brass Mfg. Company, Detroit, Mich., has had plans drawn for a new factory building, 40 x 60 ft.

A car house, with equipment for light repair work, will be built at Pontiac, Mich., by the Detroit United Railways, Detroit. Smith, Hinchman & Grylls of this city are to prepare the plans.

Bids will be submitted from here on a gasoline engine driven pumping unit for the municipal water works system at Dunkirk, Ind. Included in the contracts upon which tenders will be invited shortly is also an elevated steel tank of 50,000 gal. capacity.

The new manufacturing plant of the Hudson Motor Car Company, Detroit, will be completed in the near future and a heavy output is to be maintained during the winter months.

The Rapp Motor Company is reported organized at Detroit by James H. Christian and Hiram B. Sackett.

The Centreville Water & Light Company, Centreville, Mich., is preparing to construct a power and pumping station equipped with thoroughly modern machinery. Its present electrical unit consists of a General Electric generator of 60 kw., driven by a water turbine, but the new apparatus will be of greater capacity.

During August the Packard Motor Car Company shipped the largest number of automobiles and commercial vehicles in the history of the company.

The Allis-Chalmers Company, Milwaukee, has been awarded the contract for the equipment of the new steam turbine municipal plant for power and electric lighting at Grand Rapids, Mich.

The Constantine Motor Casting Company has been organized at Constantine, Mich., to operate a foundry for the production of gasoline engine and automobile parts. Its further plans have not been made public.

The construction of a new water works station equipped with electric motor driven pumps, having an aggregate daily capacity of 24,000,000 gal., is being planned at South Bend, Ind. When these facilities have been provided the present plant will be discontinued, as it does not show sufficient economy.

The Nachtegall Mfg. Company, Grand Rapids, Mich., is doing a good business this year and may add to its shop facilities before the opening of another season.

The Oliver Motor Car Company, Detroit, Mich., incorporated with $300,000 capital stock, has purchased the building formerly occupied by the National Cutlery Company at Lawton avenue and the Michigan tracks, and will manufacture this year 300 to 500 commercial cars, to be known as the Oliver delivery wagon. The officers of the company are Louis W. Schimmel, president; Paul Widner, vice-president; Robert F. Hartstein, treasurer; Frank Gies, secretary; Charles F. Case, general manager.

The Yates-Up-holt Brass Company, Plymouth, Mich., will move its factory to Saginaw, Mich., where it will be located in a building 60 x 90 ft. erected on a site donated by the Saginaw Board of Trade. The company manufactures auto supplies, plumbing fixtures and a general line of brass fittings. Building operations will be commenced at once.

The Portage Lake Foundry & Machinery Company, Hancock, Mich., advises that the loss entailed by the fire which occurred at its plant September 18 was confined chiefly to the coke shed and warehouse where its finished product was stored, and that its operations were not interfered with. The warehouse will be rebuilt at once.

Pittsburgh

PITTSBURGH, PA., October 4, 1910.

Conditions in the machinery market are without essential change, except that there seems to be a growing tendency to make up for lack of orders by manufacturing for stock, based on a more or less vague confidence in the future of the demand for plant equipment. Buying now being done is chiefly for the account of small or medium sized shops, whose business, owing to light overhead expense, has been more generally profitable this season than that of the larger establishments. A good deal of second-hand machinery has also been placed recently, particularly for shipment to the more remote districts. A number of dealers who have followed up their opportunities in this respect seem to have done very well, indeed, while others depending on local trade have been disappointed. Among the larger manufacturing plants orders for export are being sought to a greater extent than usual, and some good contracts are reported to have recently been taken.

A power plant 48 x 76 ft., with boiler and engine rooms, is to be erected by the Pennsylvania Coal & Coke Company at Cresson, Pa., in accordance with the plans of the W. G. Wilkins Company, Pittsburgh. Steel frame construction will be used. A steel tipple 53 x 80 ft. is to be built at the same time.

Work has been started by the McClintic-Marshall Construction Company on a two-story machine and repair shop for the Pittsburg Railway Company near the south entrance to the Mt. Washington tunnel. It will cover an area 75 x 112 ft.

Among the contracts for handling machinery recently taken by the Heyl-Patterson Company, Pittsburgh, is one covering rigs to be installed on an 80-ft. extension of the Northwestern dock at Superior, Wis.

The plant of the E. A. Humphries Coal & Coke Company, Bradenville, Pa., recently resumed operations after the installation of considerable new equipment, and it may be further improved before next spring.

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The contract for the horizontal surface condenser and vacuum pump to be installed in the new steam turbine power and pumping plant at Chicago Heights, Ill., for municipal service has been awarded the Platt Iron Works, Dayton, Ohio. They will be operated in connection with a Terry steam turbine unit of 300 kw.

A contract has been placed with the General Electric Company's office here for three steam turbine units of 2500-kw. capacity, to be installed in a central power plant which the Davis Coal & Coke Company has under construction at Thomas, W. Va., to provide current for the operation of a number of mines and coal handling plants belonging to that concern. Some auxiliary apparatus will be purchased later as the improvements will not be completed until about February 15 or later.

A patent was recently granted to Clark T. Henderson, formerly of this city, on an improved device for starting electric motors, ownership of which has been assigned to the Cutler-Hammer Mfg. Company. Mr. Henderson is now with that company in Milwaukee.

Figures are being taken on the construction and equipment of a new shop building, 55 x 180 ft., for the Bunting Brass & Bronze Company, Alliance, Ohio.

The Bellefontaine Bridge & Iron Company, Bellefontaine, Ohio, has the contract for the structural steel work of three new buildings to be erected by the Howard Motor Car Company at Galion, Ohio.

The Pactola Placer Mining Company, Pactola, S. D., which is financed by Pittsburgh capital, has made plans for extensive development work, which includes the purchase of a large dredge.

A new concrete factory and storage plant, 110 x 150 ft., four stories, will be built by Price & Lucas, Pittsburgh, on a site at Windsor and Walker streets recently acquired.

Manufacturers of pumping machinery are figuring on equipment for the water works system at Dayton, Ohio, including a single stage, double suction, horizontal centrifugal pump, motor-driven. The electric current available at the station is three-phase, 60-cycle, 220 volts.

The extent to which manufacturers of the district will be able to rely in future on graduates from the various technical courses at the University of Pittsburgh, is shown by the fact that this year's enrollment is 1400, of which the school of engineering has a fair percentage.

The contracts for the two boilers of 200 hp. each to be installed in the new city pumping plant at Parkersburg, W. Va., has been awarded, through its representatives here, to the Babcock & Wilcox Company.

It is reported from McKeesport, Pa., that the city's main pumping station will be rebuilt, new machinery installed and an intake built in the Monongahela River at an estimated cost of $300,000.

The Massillon Bridge & Structural Company, Massillon, Ohio, has been awarded the contract for 9 steel bridges to be erected in the vicinity of Girard, Kan.

The manufacturing plant of the Zanesville Barrel Company, Zanesville, Ohio, which burned last week, is expected to be rebuilt for larger capacity and equipped with motor-driven machinery.

The Pittsburgh Piping & Equipment Company, 3422-28 Smallman street, Pittsburgh, has completed its new machine shop, about 60 x 100 ft., of steel construction, and is now installing a new Niles 10-ft. boring mill and radial drill.

Indianapolis

INDIANAPOLIS, IND., October 4, 1910.

The Wallace Machine & Foundry Company, Lafayette, Ind., has increased its capital stock from $20,000 to $40,000. R. B. Wallace is president.

William J. Norton has been appointed receiver of the Westerfield Motor Company at Anderson, Ind. The company manufactures gasoline motors and accessories and cream separators.

The Muncie Electric Light Company, subsidiary of the American Gas & Electric Company, is planning an extension of the system to surrounding towns, from which it is securing franchise. The system will be centralized in Muncie.

The commissioners of Shelby County, Ind., meeting at Shelbyville, will receive bids to October 22 for the construction of a steel truss bridge, with concrete floor. G. B. Huntington, Shelbyville, is County Auditor.

The Indiana & Kentucky Power Company, New Albany, Ind., has been incorporated, with $50,000 capital stock, to establish a power plant for light manufacturing. The company has taken an option on the woolen mills property on Vincennes street, which consists of 7 acres with 10 buildings having a floor space of 10 acres. The mills have not been in operation for several years.

Thomas Taggart will build an addition of 198 rooms to the French Lick Hotel at French Lick, Ind. The building will be of brick and steel. He is also having plans prepared for a 15-story modern hotel to replace the Denison Hotel at Indianapolis.

The American Gas Appliance Company has been organized and incorporated at Indianapolis, Ind., with $40,000 capital stock, to manufacture automatic gas lighters. The directors are H. T. Parker, P. R. Stockton and P. W. Wemple.

The Fremont Dredging Company, Indianapolis has been incorporated with $50,000 capital stock to do a general dredging and mining business. The directors are A. L. Lockridge, A. R. C. Kipp, L. M. Rappaport, J. F. Koenig and Gertrude Flowers.

The Heimberger and Dunkard Veneer Mills at New Albany, Ind., has increased its capital stock $25,000.

The Schacht Rubber Works, Huntington, Ind. is preparing plans for an addition that will double its capacity. New machinery will be necessary.

The Commissioners of Public Buildings and Property of Indianapolis, Ind., have authorized B. V. Hubbard, commissioner, 48 Monument place, to investigate the practicability of constructing a plant to supply the State capitol with water light, heat and power. Manufacturers' catalogues and net prices requested.

St. Louis

ST. LOUIS, MO., October 3, 1910.

The local demand for metal working tools ruled quiet the past week, but the leading merchant sellers report an increase of inquiry, particularly from the Southwest. There are also indications of some improvement in the demand from railroads operating in that section, since their earnings through crop movement are increasing, with good prospect for a large tonnage until January 1.

The Dew Drop Mill on the Granby land at Oronogo, Mo., was destroyed by fire September 26. The mill was a 120-ton plant and was owned by Robert Martin and others.

The organization of the Monnig Shoe Company of Marshall, Mo., was effected September 24, with a capital stock of $80,000. Hugh Monnig is president; W. C. Gordon is secretary and treasurer. The contract for the shoe factory has been let to A. Darling of Marshall, and it is expected the building will be completed by January 1.

The boiler and engine room of the Peoria Artificial Ice Company's plant at Peoria, Ill., were destroyed by fire September 21, causing a loss estimated at $15,000 as valuable machinery was also damaged. H. Williams is the manager.

The Elgin Wheel & Engine Company of Elgin, Ill., has been incorporated. Capital stock, $30,000. Incorporators, Herbert L. Thompson, Nelson W. Johnson and C. F. Trehune. The company will engage in the manufacture of machinery and engines.

The city of Eldorado, Okla., will establish a municipal water plant and bids will be asked for installing the same.

Parties interested in the Pearl Button Company of Miami, Okla., are arranging for its organization. It is expected to give employment to 50 hands.

The town of Allen, Okla., proposes to install a system for water supply costing $25,000. Ekman & Tolbert of Ada, Okla., engineers, will have charge of the work.

The large brick buildings for the Texas Glass Company of Texarkana, Ark., the corporation which is installing a $100,000 glass factory in Texarkana, are nearing completion. The company will manufacture window glass exclusively. Natural gas will be used for fuel.

The American Land, Timber & Stave Company of Camden, Ark., has arranged to establish a sawmill near Bradley's Ferry, in Onachita County. The company owns 1,400 acres of oak timber, which it proposes to convert into staves.

The Thomas Fordyce Company of Little Rock, Ark., is engaged in the manufacture of the Doremus cotton gin. Daniel J. Sully of New York is largely interested in the patent.

The Barnhart Mercantile Company of St. Louis has closed a deal in Texarkana, Ark., for a site on which to locate a $20,000 plant for the manufacture of peanut products. The company has pledged itself to expend at least $35,000 for peanuts this year and is offering a bonus of $100 to farmers engaged in raising peanuts.

The Jernigan Mercantile & Gin Company of McCrory, Ark., has been incorporated, with a capital stock of $10,000. The company will engage in ginning cotton. The incorporators are H. W. Jernigan, L. L. Cole and I. R. McCommons.

Clements & Solesbee, Bonanza, Ark., are preparing to install the necessary machinery for the manufacture of wagons and furniture.

J. S. Stoffering of Muscatine, Iowa will build a factory at Batesville, Ark., for the manufacture of fancy articles out of shells.

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John T. Fuller of Little Rock, Ark., one of the owners of the diamond mine in Pike County, announces that the machinery for mining will be installed during October.

The plant of the Baton Rouge Lumber Company was burned September 24. The loss is estimated at $10,000 the planing mill and engine room being totally destroyed.

The plant of the Genesee Lumber Company, Genesee, La., was destroyed by fire September 26. The loss was $50,000, partially covered by insurance.

The Union Brewing Company of New Orleans, La., has been incorporated. Capital stock, $150,000. Joseph Di Carlo is president. The company will engage in the manufacture of lager beer, &c.

It is reported that bonds in the sum of $125,000 will probably be issued by Columbia, Mo., for the construction of a water works system.

The H. L. Kramer Mines, operated at Carl Junction, Mo., has taken over the Herald Mining Company's property in Jaspar County, Mo., and are erecting thereon a 500-ton concentrating plant, motive power for which will be supplied by a full Corliss condensing equipment approximating 450 hp. The plant will be equipped with two Foust automatic jigs of latest design, four sets of crushing rolls and four concentrating tables. Mining will be carried on between two levels of 190 and 290 ft., and dirt will be hoisted through a 7½ x 14 ft. shaft, equipped with two automatic self-dumping cages, and power will be supplied by a double engine first motion hoist. The engineering and management of the property is in the hands of W. C. Kramer, Miners Bank Building, Joplin, Mo.

The Galveston Brewing Company, Galveston, Texas, correcting a recently published item, states that it will merely erect a small ice storage house at Texas City and not a plant for the manufacture of ice.

Baltimore

BALTIMORE, MD., October 3, 1910.

Irregularity is still to be noted in conditions governing the machine tool trade as well as the general market. Purchases of equipment continue on a conservative basis and the volume of new work coming out shows, in instances, a further decline. In a number of cases the aggregate business transacted in September shows a betterment over that of the previous month, but in practically all instances the volume is below that transacted in normal times. The structural work fabricators have closed a fair amount of business; a little export business has been done, but the larger share of the work offered is small. Several moderate power plant propositions have been recently closed up, while others, requiring in instances installations running up to 1000 hp., are pending. In the heating and ventilating lines moderate orders are reported, the aggregate being larger probably than in August. No marked betterment in the demand for machine shop and mill supplies is noted, purchases made are uusally small and cover only near future requirements. Builders of machine tools, as well as merchants, still report difficulty in closing up pending business, while probable purchasers seem less inclined to come into the market, except in case of urgent needs. A fair business in contractors' supplies is reported, although no propositions of large size have come out.

Machine toolbuilders are not very actively engaged, and although they are probably figuring on a little more business they are not able to close that under consideration very promptly. Industrial plants generally are probably a trifle less active; while some fabricators of structural shapes are quite busy, others are not so fully engaged.

The foundry trade is somewhat upset on account of labor difficulties; molders in union shops have demanded an increase from $2.90 to $3.25 per day wage, which in the large majority of cases has not been granted. In instances shops are operating on a restricted basis, others have temporarily closed down, founders being determined not to make the advance asked for. The open shops have not been effected, nor have the stove molders gone on strike, the latter working under a special agreement with the employers.

The general uncertainty of business on the whole effects trade in this city as well as it does in other districts, and the disposition to go ahead slowly and carefully is just as pronounced, producers conducting their business conservatively and making purchases of equipment and supplies accordingly. It is hardly believed that business will develop rapidly during the fall months, but from the present outlook the betterment will be slow and gradual.

The McShane Bell Foundry Company, Baltimore, has under consideration additions to its brass foundry, although actual work will not be started until after January 1.

The Ellicott Machine Company will add an extension 50 ft. long to its machine shop, to house additional tools recently purchased. This company is quite busy, although no large orders have recently been booked. Work in hand includes two 20-in. suction dredges with steel hulls.

Bids are being taken by McKim, Mead & White, architects, for the construction work on a second unit of the 18-story Munsey Building, to be erected at Calvert and Fayette streets. The construction of the first unit is now well under way.

The Plant & Land Food Company, A. B. Prickett, president, is taking bids for a warehouse building, two stories, 32 x 72 ft., and is having plans made for a building to be used to house its machinery for manufacturing its product.

The J. F. Wiessner & Son Brewing Company has had plans prepared for a fireproof garage to be erected for its own use. It is understood that it will be equipped with all the necessary appliances and machine tools for the general repair of its automobile delivery trucks.

The Pennsylvania Railroad has completed plans for a large shed to be erected in connection with its new Union Station in this city. It will be 100 x 700 ft., of structural steel construction. An expenditure of $150,000 is understood to be involved in this work.

Freidenwald Bros. continue quite busy on special machinery, largely for export. The domestic demand has not increased very extensively, although sufficient work is on their books to keep their plant actively engaged for several months.

The C. J. Kemp Mfg. Company has recently made improvements to its Twentieth Century Gas Machine and is also developing special heating furnaces using oil fuel. This company, which has noted a slight falling off in business for some months, now reports an improved demand.

Coggins & Owens report a light demand for machine tools, although occasional sales of a few tools have been made for general repair work to garages in the South. This concern notes a material betterment in the demand for bicycle sundries, which branch of the trade constitutes a good share of its business

Bartlett, Hayward & Co. have decided, it is stated, to erect a two-story addition to its machine shop at Scott and McHenry streets. Plans are in course of preparation, but bids have not yet been asked for, as it has not been decided when the work on the new building will be started.

John B. Adt notes an active demand for certain classes of machinery, particularly such as is used in the manufacture of tobacco products. The demand for machine tools has not been very active, although a very fair volume of business has been done in supplies and fittings. The outlook for an increased general business during the fall months is believed to be favorable.

The Chesapeake Iron Works has taken contracts for the erection of the structural steel work for an office and stock building for the F. Bauernschmidt Brewery; a garage building for the Queen City Garage, Cumberland, Md., and a steel building to be used as a shed by the Baltimore Gas Company. Estimates for structural and ornamental work in connection with several large buildings and additions are also being figured on, both in this city and in the Southern States.

The Crown Cork & Seal Company will make extensive additions to its Highlandtown plant. Two buildings each 100 x 200 ft., two and three stories, will be erected, one of concrete, the other steel and brick. The general contracts of these buildings have been awarded to D. M. Andrews, who has not yet placed sub contracts. One building will be used as an addition to the lithographing department, the other for general manufacture. No power equipment will be required. Lithographing facilities will be increased, while a few tools will probably be needed in the manufacturing department. Elevators are to be installed in both buildings.

The Crook-Kries Company finds the volume of business transacted during September greater than during the previous month; individual orders have been smaller, but more numerous. Inquiry continues quite good. This company has recently taken orders for the heating and ventilating of the Southern Building, Washington, D. C., and the Falconer Building in this city. The former includes two 150-hp. boilers, while the latter will be a low pressure heating system. Several contracts for both steam and hot water in private apartments have also been booked, while power plants are being figured on for several of the larger building propositions now under way in this city.

The Baltimore Bridge Company is busy with erecting work and has booked considerable new business during the past month, among which may be mentioned a kiln and a raw material building for the Tidewater Cement Company, Union Bridge, Md.; a 275-ft. span bridge to be erected on the Banes Plantation in Cuba for the United Fruit Company; Pratt Street Bridge, requiring about 200 tons of material, for the city of Baltimore; a transfer bridge for the Baltimore & Ohio Railroad, together with the necessary machinery, to be erected at Locust Point; a power station in Webster, Texas, for Stowe & Webster, engineers; a bridge

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at Porto Barrios and miscellaneous structural work for the Northern Railway in Costa Rico. Considerable extimber work for export to South America and a fair amount of miscellaneous local business has also been recently booked.

The T. C. Bashor Company has booked orders for a number of small heating and ventilating propositions, and are figuring on several good size installations. In its boiler shop it is particularly busy. Orders have recently been taken for two 250-hp. corrugated furnace boilers for shipment to New York, which a large amount of tank work has also been taken. The demand for engines is reported as being rather quiet, as is also that for machinery and machine shop supplies.

Dietrich Brothers note a decline in fresh inquiries for building work. That before the trade at the time is small individually. This firm has begun the erection of the structural work for the O'Niel Building and has completed a contract for general work for the Polytechnic Institute. Dietrich Brothers have had plans prepared for a new office building and an addition to their shops, works on which will probably be started in a few months.

The Crook-Horner Supply Company, W. H. Pitcher, president; H. Kunnecke, vice-president; Emile Boucher, second vice-president; J. C. Schusseler, secretary, and H. A. Booth, treasurer, succeeds the Crook-Horner Company, manufacturers and jobbers in plumbers', machinists' and mill supplies, engines, boilers, pumps, &c., located at 17 and 19 East Pratt Street, which retired from business on September 1. The officers of the new concern were all employees for the old company and have secured several floors and the basement of a large building, 60 x 80 ft., at 7, 9 and 11 Balderston street, where the business of the new concern will be conducted.

Plans are now in progress for a large electric light and power plant to be erected at the Springfield State Hospital, Sykesville, Md. Henry Adams has been appointed consulting engineer in connection with this work. The plant will be complete in all details; the building will be fireproof and boilers, engines, dynamos, &c., are to be installed.

The Bluefield Gas & Fuel Company, Bluefield, W. Va., is receiving bids through Louis N. Rancke, engineer, Hull and Nicholson streets, Baltimore, for a plant for the manufacture of gas for illuminating and heating to be supplied to Bluefield and Graham, W. Va. Corrugated iron, steel frame, retort and apparatus houses are to be erected, as is also a 75,000 cu. ft. gas holder. Ten miles of steel distributing mains will be laid, five of which will be 8-in., three of 6-in. and two miles of 4-in pipe. The Baltimore Retort & Fire Brick Company will furnish the retorts, a bench of sixes, exhausters, scrubbers, condensers, purifying boxes, tar extractors, &c.

The Frederick City Packing Company, Frederick, Md., will erect a new abattoir and packing plant. The building will be of brick and concrete, 60 x 112 ft. Bids are now being taken for the construction of the building.

The United Gas Improvement Company will erect a large power house in connection with its Charleston, S. C., plant, the general contract for which has been placed with the Charleston Engineering Company of that city, which is now taking bids on the structural and other work in connection with the building.

Milwaukee

MILWAUKEE, WIS., October 3, 1910.

While the demand has thus far failed to meet the expectations in relation to fall trade which were entertained during the summer, sales of power and electrical equipment, as well as other apparatus of general utility, are the most prominent feature of the present situation here. Orders recently taken are pretty well distributed among the leading industries of the country, indicating a steady expansion of manufacturing facilities which will necessarily lead to further purchases of operating machinery; but, except as noted in recent reports, the placing of any sizable contracts for the latter is still being delayed.

Local manufacturers of machine tools and other shop and foundry equipment have suffered from the slump in the automobile trade and prospects for the immediate future are not very alluring. There will, however, be no lessening in production on this account, and any surplus which may develop will be carried along in stock, thereby enabling them to make better terms of delivery, when the tools are wanted, than was possible last season. Some firms, indeed, are not sorry to have an opportunity of getting ahead on the production of certain parts. Builders of milling machines, lathes and shapers are in a relatively strong position, having the assurance, from past experience, that they can dispose of their entire annual output at favorable prices by merely taking advantage of the opportunities that come during the year. There is no need at this time to force sales or to worry about the future.

Builders of agricultural machinery and manufacturers of farm and laborers' implements continue to give support to the market, having recently started preparations for a large output to be marketed in the late winter and early spring. The growth of this industry in Wisconsin, even through the panic period, has been little short of phenomenal, and it has also obtained a good footing in the prairie States west of the Mississippi River. All of the new plants are being equipped for motor drive, and the older establishments have been gradually changing over to the new system, thereby creating an increasingly important element in the demand from that branch of manufacturing.

The Power Improvement Company, Milwaukee, has the contract for steam and electrical equipment to be installed in additions planned for the factory of the Kiel Furniture Company of that city.

It is reported from Richland Center, Wis., that a large new factory, furnished with boilers, evaporators, pumps and other apparatus will be built there by the Pacific Coast Condensing Company.

Plans for a water works system, including pumping plant, are under discussion by the authorities at Random Lake, Wis.

The Columbia County Electric Light & Power Company, Wyocena, Wis., has been organized by M. V. S. Mallory, John Loughrey and Theo. H. Dimon, to establish a public service plant.

The Westinghouse Electric & Mfg. Company, which is represented in Milwaukee by a district office, 1009 Majestic Building, has been doing a good business throughout the State, and prospects for fall trade are excellent.

From Monticello, Wis., it is reported that plans will be made this fall for the construction of a municipal pumping plant, favorable action in the matter having been taken at the recent election.

Molding machines will be used in the new foundry addition of the Badger Malleable & Mfg. Company, South Milwaukee, the contract for building which has just been let.

The Klar-Piquette Mining Company, Platteville, Wis., has ordered a 12-in. pump for dewatering and will make further improvements before spring.

The contract for boilers of 300 hp. to be installed in the new steam plant of the Gem Hammock & Fly Net Company, Milwaukee, has been let to the International Heating & Engineering Company of this city, whose office is in the Caswell Building.

It has been decided to install pumping machinery for municipal service at Schleisingerville, Wis.

Advices from Beloit, Wis., are to the effect that the Beloit Iron Works has completed and is shipping to C. Fairbanks & Co., Federal, Ill., the largest paper-making machine of its kind ever constructed.

Between now and spring the boat building plant of Thompson Bros. at Peshtigo, Wis., will be doubled in capacity.

The John T. Lindstrom Machine Works, Allentown, Pa., has arranged for the handling here of its steam traps and separators through an agency in the Majestic Building, room 1419, where inquiries may be addressed.

The complete equipment for the new plant of the Antigo Lumber Company, Antigo, Wis., will be furnished by the McDonough Mfg. Company, Eau Claire, Wis.

It is proposed at Oshkosh, Wis., to have the municipality take over the water works there, which are now owned by a private corporation, and remodel the system along the most modern lines. If this is done, it will necessitate the purchase of some new pumping machinery.

The Milwaukee Boiler Company, Milwaukee, has the contract for a boiler of 150 hp., to be installed in the new building of the Charles H. Stehling Company of this city, which makes a specialty of planning and equipping tanneries.

It is stated in a report from Platteville, Wis., that the branch plant maintained there by the Galena Iron Works Company is having a big run on small parts and fittings, repairs and renewals, keeping a large force of mechanics busy. This company has the bulk of the trade in the lead and zinc producing districts of southwestern Wisconsin.

The Wisconsin Bridge & Iron Company, Milwaukee, has been given the contract for remodeling and repairing the steel bridges at the unloading wharves of the Barkhausen Coal & Dock Company, Green Bay, Wis.

The Felker Brothers Mfg. Company, Marshfield, Wis., will build a large two-story addition to its plant, to be used in the production of galvanized iron ware. No announcement has been made as to the new equipment required.

The Northwestern Mfg. Company, Milwaukee, has been busy this season with orders for electric motors and other devices to be used for special service, where machines of standard types cannot be utilized to advantage. In this line of work the company has built up a large business, being especially equipped to handle such orders on a contract basis.

An additional factory building, 90 x 155 ft., is to be

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erected at New London, Wis., for the plant of the National Condensed Milk Company.

The Western Electric Company, Chicago, is now conducting an active campaign for business here from an office and warehouse recently established, where a very comprehensive display is made of the company's various lines.

A machine shop for repair work, the first unit of which is to be 50 x 50 ft., will be erected at Clintonville, Wis., by Ebert & Kuester.

The Bucyrus Company, South Milwaukee, Wis., is taking bids on the steel foundry mentioned some time ago, which will be of steel frame construction, 60 x 120 ft. This means principally a shifting of equipment and no additional apparatus is likely to be required until some time later on. The part of the existing plant now devoted to steel castings will be used as an extension of the iron foundry.

The Ashland Paper Company, Ashland, Wis., incorporated with $50,000 capital stock, is contemplating the construction of a tissue paper mill.

The Bertler Brick Company, Manitowoc, Wis., is planning extensive improvements and will install sufficient machinery to give the plant a capacity of 35,000 brick daily. There will also be installed a 40-hp. gasoline engine.

The Nordberg Mfg. Company, Milwaukee, Wis., to provide for larger working capital has increased its capital stock $300,000, making the total issue outstanding $1,550,000. No improvements are contemplated at this time.

The Standard Crucible Steel Casting Company, Milwaukee, Wis., incorporation notice of which was recently published, advises that it has secured a building 42 x 100 ft. which it is using as a foundry. All necessary machinery has been purchased and installed and the plant is now in operation.

Toronto

TORONTO, October 1, 1910.

Manufacturers of machinery report a fair demand. Trade is not below expectations. In spite of some disappointment in the Western wheat field, the factories of the country continue to be kept busy. So far there is no money stringency. The banks are as liberal to manufacturers as they usually are at this season. Municipal enterprise is quite active. Public works for the distribution of power and light, for the pumping of water supply, for the carrying on of street railroad business, &c., are being constructed, and large quantities of contractors' outfit are called for for the construction of pavements, sewers, sewage disposal systems and of similar works of a public utility character. There never was a time when Canadian municipalities found it so easy to sell debentures and thus obtain money, for the most part British, for the carrying out of programmes of civic improvement. Building operations show no particularly marked decline from the great activity at which they were maintained throughout the summer. Everywhere the work of extending the limits of towns and cities goes on. New buildings are being erected where there were none before and old buildings are being demolished to make way for more modern structures. The manufacturing industries engaged in producing the material for building purposes have plenty of work for their plants, which are, therefore, undergoing wear and tear and making way for new equipment. Thus the lumber mills, brick works, steel structural material plants, foundries, &c., are for the most part well supplied with orders.

The Canadian Tube & Iron Company, with a capital stock of $1,000,000, and Montreal as its chief place of business, has been incorporated under the laws of Canada. It is authorized to carry on the manufacture of iron, steel, pipe, tube, tin plate, &c.

The capital stock of the newly incorporated British Empire Bridge Company is $5,000,000 and its head office is in Montreal.

The Dominion Steel Corporation, Sydney, N. S., is calling for tenders for the construction of seven buildings, to be erected at once. These include a boiler, house, machine shop, foundry, warehouse, oilhouse, carpenter shop, repair shop and finishing mill. All the buildings are to be of cement, brick and structural steel.

Charles Reed & Sons, manufacturers of paper boxes on a large scale in Hamilton, Ont., have bought a site in Winnipeg. They will build a warehouse there next year at a proposed cost of $300,000.

Wood, Vallance & Co., wholesale hardware dealers, Hamilton, have purchased a site for a building in Winnipeg, the price being $115,000.

At Hamilton, Ont., the International Harvester Company is almost doubling the capacity of its works. The Westinghouse business there has also outgrown the capacity of its present building and new ones are being constructed.

It is expected that Dominion Government will have constructed at the Davies dock at Quebec this winter a vessel to be used as a transport between Quebec and Levis in connection with the National Transcontinental Railway. This is to serve in the interim between the completion of the railroad and the completion of the bridge, whose place the vessel is to take in the mean time. The cost is to be between $300,000 and $400,000.

George Ross & Co., Brockville, are installing the heating apparatus in the tack works at Morrisburg, Ont.

The Wilbur iron mine, in the northern part of Frontenac County, Ont., is being actively worked, 1100 men being employed. The company is arranging to put in a hoisting plant to lift 1000 tons per day, and is negotiating for a rotary crusher. Magnetic separators are to be used for the concentrating of the ore.

An agreement satisfactory to the Board of Trade of Collingwood, Ont., has been submitted by the representatives of the New Iron & Steel Company, which proposes to establish in that town works for the manufacture of wrought iron directly from the ore by a new process. Of course, the Board of Trade can do no more than approve the agreement, which must next be adopted by the Town Council and after that be ratified and financially provided for by the ratepayers.

The machinery at the Kingston (Ont.) Shipbuilding Company's plant is in working order now, with the exception of two machines which are expected to be installed within a few weeks.

The Chipman-Holton Company, Hamilton, is buying up property to the north of its present factory upon which it will at once proceed to erect a large addition.

The commissioners of the Transcontinental Railway are calling for tenders, to be received at Ottawa by noon of October 18, for the machinery required for the equipment of a roundhouse at Lake Superior Junction, Ont., and for the centrifugal pumps and motors required for the sewage pumphouse at the Winnipeg shops. Full information can be obtained at the office of Gordon Grant, chief engineer, Ottawa, Ont., and of S. R. Poulin, district engineer, St. Boniface, Man.

Tenders are invited for the purchase of the plant, raw material, real estate, &c., of the Reeder Electrical & Mfg. Company, 15 Saunder avenue, Toronto.

The People's Railway, an electric line that is to connect Guelph, Berlin and Stratford and all intermediate points, and to build lines from Guelph to Puslinch Lake, Hespeler, Elora, Fergus and Arthur, is in course of construction. Most of the municipalities mentioned have subscribed for preference stock, so that the undertaking is to some extent of a public ownership character. The ratepayers of Guelph decided by vote on Monday to take $85,000 preference stock for the city and to grant a franchise for running rights over the city's streets.

A deputation of Aldermen from London, Ont., visited Detroit recently to examine the motor fire engine in use in that city. As a result of their report the City Council of London is considering the calling for tenders for a motor steam engine, a motor combination engine such as Detroit has and a steam fire engine.

A very extensive central heating and lighting system is being established by the University of Toronto. The numerous and somewhat widely scattered large collegiate buildings that form the university group will be connected.

The McGuigan Construction Company, which has the contract to build the Hydroelectric Power Commission's transmission lines, has this week been instructed by the commission to proceed with the erection of towers and the stringing of wires along the route surveyed for the entry of the system into Toronto.

A committee of the Town Council of Glace Bay, N. S., has been appointed to interview the coal company concerning the rumors that it is about to remove its machine shops and offices to Sydney.

Work on the distributing station at Galt is in a forward state and the building will soon be ready for the equipment. A carload of copper wire for power lines and primary arrived this week.

The Lincoln Paper Company, Merritton, Ont., has converted what was formerly a cotton mill there into an additional paper mill. The work of equipping the new mill has just been completed and its operation has been begun. The paper making machine came from the United States. The multiple variable speed electric drive and the wiring installation are the work of the B. & C. Electrical Construction Company, Utica, N. Y.

Coward's Boat Works, Kingston, Ont., have been very busy this season, 308 boats having been built there since the beginning of the year. Contracts have just been secured for 20 family launches for a Toronto engine company and for several boats for private parties.

A call for tenders is to be sent out in the next 30 days

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by the Canadian Northern Railway Company for the construction of the line between Chilliwac and Lytton. It is estimated that in some portions of this section the road will cost as much as $100,000 per mile.

Tenders for the construction of a lighthouse and buoy steamer for the Pacific Coast are called for by the Deputy Minister of Marine and Fisheries at Ottawa. The steamer is to be 200 ft. over all, 38 ft. beam and 11 ft. 6 in. deep, and to have a speed of 12 knots an hour.

On Wednesday Crowland township and Humberstone township, rural municipalities upon which the town of Welland, Ont., borders, voted favorably on by-laws to give privileges to the John Deere Plow Company, to an automobile manufacturing company, to the Chemical Company, and to the group known as the Allied Companies. The factories have their assessment fixed for a long period at a low amount, and have permission to build switches crossing the township roads.

The purchase of President Silliker's holdings of the common stock of the Silliker Car Company by a syndicate that completes control of the company has created a sensation in Halifax, N. S., where the company's works are located. There is curiosity to know the intentions of the buyers. The company has plenty of work but it has lacked working capital. To handle its latest large order additional machinery is needed, and the financial means are not in hand. This situation possible led to the president's selling. Latest reports are to the effect that the new parties in control mean to operate the works more vigorously, and that there will be no closing in the interests of the Canada Car Company.

The city of Windsor, Ont., may soon be in the market for water works machinery and fire equipment. The Canadian Fire Underwriters' Association has requested the city council to take up the matter without delay, the association's report showing the fire protection service to be far from the required state of efficiency.

The Manufacturers' Committee of the City Council of Peterborough, Ont., has recommended that the assessment of the Peterborough Lock Company be fixed for 10 years at $25,000.

Notice has been given in the Montreal City Council that a motion will be introduced at its next meeting for the adoption of a by-law to borrow $5,000,000 for the construction of underground conduits.

The Montreal Light, Heat & Power Company has obtained the contract for street lighting in Montreal. It will at once install 2400 new street lamps, which are to cost $72.80 each. Additions to the company's plant will be entailed involving an outlay of $200,000.

The Western Dry Dock & Shipbuilding Company, Port Arthur, Ont., has placed orders with the John Bertram & Son Company, Dundas, Ont., for a large plate shear and bending roll, an angle sheave, a lathe, and a drill. It has contracted with the Canadian Westinghouse Company, Hamilton, Ont., for all the electrical apparatus and equipment. To the John Inglis Company, Toronto, it has given the order for the pumping machinery.

The Windsor *Record* complains that the Mergenthaler typesetting machine is no longer made in Canada, and that to get one from the United States the Canadian buyer has to pay a duty of $600, bringing the price up to $4000. Printing presses being on the free list, why, asks the *Record*, are not typesetting machines?

The Vulcan Tube Cleaning Systems is the name of a company for whose incorporation letters patent have been issued by the Dominion Government. Its capital stock is $149,000 and principal place of business is Montreal.

The Spring & Axle Works Company, Gananoque, Ont., began operating its factory September 29 with steam power.

A new steam boiler has arrived for the Deseronto Iron Works, Deseronto, Ont. The repairs at the works are completed and operations are to be resumed at once.

On September 30 the following tenders were awarded by the Toronto Board of Trade in connection with the civil electrical department: Storage batteries, Chapman & Walker Company, $2870; transformers, Canadian General Electric Company, $15,800; motor generator sets, Lancashire Dynamo & Motor Company, $2262.

The Canadian Grain Shocker Company is preparing to build a factory in Chatham, Ont.

The Canadian Lindemann Company has been organized, with a capital stock of $160,000, to manufacture the Lindemann automatic dovetail glue jointer, made in this country by the Lindemann Machine Company of Muskegon, Mich. The company has started the erection of a new building at Woodstock, Canada, which will be 100 x 250 ft. The company will use Niagara River power, but will install a small steam plant.

The Perth Bolt & Forging Company, Ltd., of Perth, Canada, is in process of reorganization and arrangements are being made to go extensively into the manufacture of bolts of all kinds and drop forgings.

The South

CHATTANOOGA, TENN., October 3, 1910.

The movement of freight over Southern railroads has been so heavy recently that existing facilities in the way of rolling stock, terminal and maintenance or repair equipment have proved far inadequate to the demands of the service. Hence, a good deal of buying of a miscellaneous character has developed; and while it is so scattered as to attract little attention, the effect upon various local industries has been considerable. Some of the foundries that make a specialty of railroad castings have been especially benefited, and dealers in railroad material, including various tools, are picking up a good deal of business. For the heavier equipment inquiries are largely sent North, but there seems to be a disposition on the part of both trunk lines and industrial roads to give all the support they can to the plants in their territory. As a whole trade is gaining.

A modern electric generating plant, which will probably be equipped with steam turbines, is to be built in or near Montgomery, Ala., by the Montgomery Traction Company. Power is now being purchased from the local lighting company. The additional facilities are in part necessitated by an important extension to be made in the company's lines.

The construction of a large mill to take the place of the one that burned is being planned by the Dowling Lumber Company, Dowling Park, Fla. Power and operating machinery will be required.

As the result of large contracts now in hand some improvements are likely to be made this season in the equipment of the Harris Granite Company, Salisbury, N. C.

An electric power plant of 4000-kw. capacity will be built in the near future for the Covington, Big Bone & Carrollton Railway, Covington, Ky. Steam turbine units of 1000 or 2000 kw. will probably be used and so arranged that a portion of the power can be kept in reserve.

The best modern quarrying and stone working machinery will be installed at Lonsdale, Tenn., by the Appalachian Marble Company, recently formed, which is identified largely with H. Kreis & Sons, Knoxville, Tenn. in whose care it may be addressed.

The Wheland Machine Works, Chattanooga, Tenn., is manufacturing, as a part of complete mill machinery, a very simple, substantial engine designed in a number of different patterns, according to the service required. Either portable or stationary boilers are also furnished.

Plans will be prepared some time during the fall or early winter for a large power plant to serve the Tennessee Rapid Transit Company, recently organized by Joseph L. Parke, Franklin, Tenn., and others, which has been incorporated to build a traction line connecting Nashville with Springfield, Tenn.

Among the growing concerns of the South engaged in the manufacture of power machinery is the Kentucky Electrical Company, Owensboro, Ky., which has built up a good trade in generators, motors, &c., and is now selling a line of standard machines for industrial service of every description.

The Kissammee Ice & Cold Storage Company, Kissammee, Fla., has been organized to purchase the plant of the Winn Ice Company of that place. The company expects to increase the capacity of the plant from 6 tons to 15 tons of ice a day with an equivalent in cold storage refrigeration. The cold storage house will be of modern construction and the contract has already been let for the ice machinery and will be furnished by the Henry Vogt Company of Louisville, Ky. The company is now in the market for cork insulation, 1¼-in. storage room circulation pipe and other insulating material. Dolf Berli is president of the company.

Southern Texas

AUSTIN, TEXAS, October 2, 1910.

The development of South Texas, particularly in the Valley of the Rio Grande and in the Gulf coast region, is causing a heavy demand for irrigation machinery. In addition to the many private pumping plants that are being installed, the canal companies, which have for their purpose the supplying of water for many farmers are equipping their respective systems with large pumping stations. There is an unprecedented number of these irrigation projects now on foot, and machinery dealers anticipate a large trade in that line during the fall and coming winter. This same condition of development also applies to Arizona, New Mexico and Mexico.

According to the authorized statement of A. D. Bethard, general superintendent of the Missouri, Kansas & Texas Railroad in this State, that railroad will build shops at Greenville, Texas, within the next twelve months.

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Morris & Co. of Chicago, successors to the Nelson Morris Company, have obtained permission from the city council of El Paso to erect and operate a meat packing plant in the latter city, to cost not less than $1,000,000. The site for the proposed plant has been selected.

The Business Men's Club of Floresville, Texas, through its secretary, L. G. Wilder, is arranging for the installation of an electric light plant in that town.

The Cotton Belt Railroad will construct a steel viaduct over its tracks in Texarkana, Texas, at an estimated cost of about $200,000. The structure will be about 1500 ft. long. F. H. Britton, general manager, with headquarters at St. Louis, Mo., is in charge of the details of the proposed improvement.

An appropriation of $42,000 has been made by the Gulf, Colorado & Santa Fe Railroad for adding improvements to its shops at Temple, Texas. New machinery and tools will be purchased. The road's headquarters are at Galveston.

O. M. Williams of New York is promoting the erection of a large smelter at Eagle Pass, Texas. The proposed plant will treat ores of Mexican mines.

The Texas City Company, which is establishing the town and port of Texas City, situated on the mainland, opposite Galveston, is preparing to install water works and sewer systems and an electric light plant. It is finishing the construction of ocean terminals at that place at a cost of $1,300,000.

William Laurence is preparing to erect a 10-stand cotton gin, a large saw mill and a broom corn factory at Blaylock Colony, State of Tamaulipas, Mexico.

It is announced by Miller Brothers of Falfurrias, Texas, who are to erect a large sugar refinery at Texas City, that they will also install several sugar mills at different points in the lower valley of the Rio Grande, where the sugar cane industry is making remarkable strides.

The Guanajuato Power & Electric Company, Guanajuato, Mexico, is constructing another power transmission line from its hydro-electric plant at El Duro, state of Michoacan, Mexico, to San Luis Potosi. The new line has been finished as far as the San Felipe mining district where the prinicipal mines will be equipped with electrical machinery and use the power. The large smelter of the American Smelting & Refining Company at San Luis Potosi has also contracted to use the power for operating its machinery. It is planned to extend this transmission line later to the San Pedro mining district.

The Mexican Light & Power Company recently finished the hydraulic works for the proposed enlargement of its large power plant at Necaxa, Mexico. Two new general electric units will be installed. Each of the two generators will have a normal rated capacity of 16,500 hp. They will operate at a normal speed of 300 rev. per min., and, with their maximum capacity of 20,200 hp., are said to be the largest water-wheel-driven generators ever manufactured. The installation of these generators will give the company 40,000 hp. additional to its present capacity of 44,000 hp. The general offices of the company are in Mexico City.

The American Foundry & Machine Works, Graham, Texas, has recently completed and is now occupying a new machine shop building 35 x 50 ft., and is receiving bids for the construction of a foundry building of like dimensions, both of which will be served with traveling cranes. The company was formerly located at Yazoo City, Miss., but was induced to move its plant to Graham through the efforts of the Commercial Club which donated a free site and paid all moving expenses and other considerations. The company advises that it will not purchase any new machine tools at present.

The Farther Central West

OMAHA, NEB., October 3, 1910.

Numerous projects which were talked of last summer but held in abeyance until conditions of trade became better established are now beginning to be revived, and although the short time remaining of the open season will prevent much more work this year where entirely new construction is required, extensions or replacements of machinery in existing plants can be made to provide the additional facilities that are needed. Inquiries at present originate chiefly with factories, mills and other establishments outside of the metal working industries, but local foundries and shops, inclusive of machinery building plants, are fairly well filled with current orders, and some have all that they can do; hence, the increasing activity in all lines will be certain to bring out many orders for new tools, motors and other equipment between now and the first of the year.

The Iowa Mfg. Company, Oskaloosa, Iowa, is having a good run of business in orders from municipalities. Among recent contracts is one for the gate valves, boxes, hydrants, &c., to be used in the extensive water works system planned for Oakley, Kan.

D. W. Bowen, Charles City, Iowa, is taking bids at Sanborn, Iowa, on the equipment of a complete power and lighting plant, including boiler of 85 to 100 hp., Corliss or high speed automatic engine rated at 75 hp., single phase alternating current generator of 40 kw. and other apparatus.

New bids will be called for at Sioux City, Iowa, on the construction and equipment of an auxiliary pumping station, including a motor driven turbine pump.

The largest contract for concentrating machinery of a single type which has ever been placed was recently taken by the Galigher Machinery Company, Salt Lake City, Utah. It includes 1500 Isbell vanners to be installed in the plants of the Ray Consolidated Copper Company and the Chino Copper Company in Arizona.

The decision to construct a municipal water system for Denver, Colo., at an estimated cost of $8,000,000, will not involve the purchase of much pumping or other mechanical equipment, as a gravity flow is obtainable.

Machinery for a power and lighting plant may be purchased this fall by the Ridgeway Electric Company, recently organized at Ridgeway, Colo.

The Primos Mining Company, Boulder, Colo., is about to install a large hoist and air compressor, both of which will be driven by electric motors. Other improvements are also to be made.

It is reported from Denver, Colo., that the shops which are being vacated there by the Pullman Company will be occupied by the Union Pacific Railroad Company as a repair plant for its Colorado divisions, present facilities being inadequate to the increased needs of the system.

New machinery, including boilers, engines, air compressors, &c., will be installed on the property of the Gold Queen Mining Company, Buena Vista, Colo., to be ready for extensive operations in the spring. Some of the equipment has already been purchased.

From Salt Lake City, Utah, it is reported that the International Smelting & Refining Company has made arrangements for the construction of a large lead smelter at Tooele, Utah, where the immense battery of McDougall furnaces for copper smelting was recently put in service.

The Ritchie Corrugated Culvert Company, Ottumwa, Iowa, has awarded the contract for the construction of its new factory in Muscatine, Iowa, which will consist of a main building, 60 x 100 ft., and a boiler and engine room. It is expected that the building will be ready for occupancy by January 1.

It is reported that the Park Dam Company, Eldora, Iowa, will erect a concrete dam across the Iowa River and install a hydroelectric power plant and a steam auxiliary plant.

The Commercial Club of Murray, Utah, is negotiating with the Perfection Mfg. Company of Salt Lake City, Utah, can manufacturer, for the removal of its factory to Murray. In case a favorable decision is arrived at a new factory, costing about $30,000, with a capacity of 125,000 cans, will be erected.

The Union Coal Company, Davenport, Iowa, is erecting a large coal storage plant on its premises, to be operated entirely by machinery. It will hold 150 cars of coal.

The Maple Cabinet Mfg. Company, Des Moines, Iowa, will soon begin to enlarge the capacity of its plant. W. W. Maple is the president of the company.

The Cement Machinery Corporation, Waterloo, Iowa, will increase its capital stock from $50,000 to $150,000. H. B. Lichty is the president and L. H. Weideman secretary. The Polygon cement mixer manufactured by the company has a large and growing sale. Though the plant has been twice enlarged during the present year, further expansion is found to be necessary.

The United Wood Works Company, Davenport, Iowa, has been incorporated with a capital stock of $10,000, to manufacture office and bank fixtures and interior trimmings. W. C. Campbell is president; A. Hussey, secretary, and James Powers, treasurer.

D. A. Chalmers, Davenport, Iowa, whose elevator was destroyed by fire, has adjusted the insurance and will rebuild.

The Southwest

KANSAS CITY, MO., October 3, 1910.

To meet the increasing demand for both cut and crushed stone owners of quarries in nearly all parts of the Southwest are providing for an increase in equipment, and a number of new companies have recently been formed to enter this field. The complete outfit of a modern quarry, stone working and crushing plant comprises such a variety of machinery, including boilers, engines, hoists, compressors, drills, derricks, locomotives, cars, tipples, crushers, elevators, revolving screens, cranes, channelers, planers, saws, and appa-

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ratus for both generating and applying electric power, that it represents a large investment in machinery. Hence, the salesmen of various houses are following up prospective business in this line with considerable avidity. From other industries the demand continues practically as reported in *The Iron Age* for the last two weeks of September, with perhaps some increase in the aggregate of purchases at the principal centers of distribution.

Construction work will begin some time this winter on the new 3000-bbl. plant of the White Cliffs Portland Cement Company, White Cliffs, Ark. All of the machinery is to be electrically driven, mainly by means of individual motors. Power will probably be obtained from a hydroelectric development.

Weber & Co., Wilson, Kan., are arranging for the construction of a new power plant, 30 x 60 ft., for the Wilson Electric Company, which they control. The present generating equipment, consisting of a General Electric dynamo driven by an Atlas engine, will be replaced by one or more units of larger capacity. New boilers are also to be installed. The company has a steam heating service in addition to supplying light and power.

The Canton Bridge Company, Canton, Ohio, through its representatives in Kansas City, has taken the contract for a steel bridge to be erected over the Marais des Cygnes River near Ottawa, Kan.

It is proposed at Ballinger, Texas, to install pumping machinery for the service of the community, and the matter will be decided the latter part of this month.

Bonds have been voted at Woodward, Okla., for the construction of an electric power and lighting plant to be operated by the city.

To meet the growing necessities of its business the Jordan Marble Quarry Company, Alpine, Texas, has made a large increase in the capital stock and will provide additional machinery for its plant.

An expenditure of $25,000 for a new filtration system, including considerable mechanical equipment, has been authorized at Temple, Texas.

The Baumann Copper Company is resuming development work on its property near Prescott, Ariz., which will lead during the year to the purchase of some additional equipment.

The expenditure of $85,000 has been authorized at Douglas, Ariz., for improvements to the water works system.

The Tiawagh Mining Company, Galena, Kan., has put a large pumping plant in operation and installed machinery for ore milling.

The authorities at Oklahoma City, Okla., are planning to install an incinerating plant in the old pumping station.

The San Marcos Utilities Company, San Marcos, Texas, which has a combined steam and hydroelectric plant, will enlarge its capacity, having obtained a franchise for a period of years sufficient to justify extensive improvements.

At Blytheville, Ark., bids will be taken until October 15 on the equipment of a water works system.

The city of Mulvane, Kan., will award the contract for the construction of a water works system as soon as the $30,000 in bonds recently issued have been disposed of.

The city of Britton, Okla., will expend $50,000 for the construction of water works system and sewers.

Sylvia, Kan., has voted bonds in the sum of $5000 for an electric light plant.

An election will be held at Hobart, Okla., to vote on the question of issuing bonds for water works system and for six wells.

At an election recently held at Eldorado, Okla., bonds were voted for the construction of a water works system.

The Eagle Mfg. Company, Kansas City, Mo., manufacturer of agricultural implements, is contemplating the erection of a factory at Muskogee, Okla., but advises that a definite decision has not been reached.

North Pacific Coast

TACOMA, WASH., September 30, 1910.

Most of the metal working plants along the coast are now operating well up toward their capacities, with conditions favorable to a steady increase in orders both for new machinery and repairs, as well as structural material, tanks, piping, blower systems, &c. Further evidence of general industrial expansion are also to be found in reports from all parts of the North Pacific slope, from Coos Bay to the new railroad terminals of British Columbia, and even beyond into Alaska, where the canneries are already making preparations for the next spring run, and power developments, mining enterprises and railroad work are being pushed. If pending differences between the timber interests and the railway companies are satisfactorily adjusted there will also be greater activity in that direction, and a fair amount of business is insured in any event, as much capital is now being invested with an eye to the future rather than present needs.

Contracts have been let at Tacoma, Wash., for the additions to be made to the plant of the Griffin Wheel Company. Among the new buildings the principal structure will be 100 x 436 ft.

Reese & Rogers, whose headquarters are stated to be at Shasta, Cal., have acquired control of the Yellow Horn mine, near Placer, Ore., and will undertake extensive improvements, including the construction of a large ore reduction plant and addition power and compressor equipment. A greater number of machine drills are to be put at work.

Plans are now being completed for the installation of a water works system at Comas, Wash.

A large new mill is being erected in the vicinity of Cottage Grove, Ore., by the Orchard Land & Timber Company, Portland, Ore.

The construction of a 1000-ton ore crushing and cyanide plant will soon be undertaken by the North Washington Power & Reduction Company, Republic, Wash. J. L. Harper, general manager, is in charge of the work.

A new car house with repair equipment is to be built within the next few months at Albany, Ore., by the Portland, Eugene & Eastern Railway.

The new steel frame mill which the Standard Lumber Company has under construction at Deer Park, Wash., will be electrically operated in every department, most of the machines being driven by separate motors.

The Island Mfg. Company, Coupeville, Wash., is reported to be preparing plans for a new woodworking plant.

A battery of boilers for its new power plant at Everett, Wash., has been ordered from the Casey-Hedges Company, Chattanooga, Tenn., by the Weyerhauser Timber Company.

The Olympic Power & Development Company, recently incorporated at Port Townsend, Wash., by Thos. T. Aldwell and others, has started the preliminary work on a large hydroelectric plant which will take its power from the Elwah River at a point about 60 miles inland. The equipment details of this and other stations subsequently to be built have not yet been fully determined upon.

The Coquille Electric Company, Coquille, Ore., whose plans for a new generating station were reported at the time the old plant burned, recently purchased the complete equipment in Portland, Ore., and is now installing it.

Bids will be received until October 17 by the city clerk, Oroville, Wash., on pumping machinery and the construction of a water works system, pipe line, &c. It is stated that information, plans and specifications will be furnished on request.

Some additional machinery is being provided by the Coast Coal Company for its transfer plant at Pittsburg, Wash.

It is again reported that a branch plant for the manufacture of the tanks and gas used in its portable lighting system will be built in or near Seattle by the Presto-Lite Company, which is also arranging for an addition to its main works at Indianapolis, Ind.

The authorities at Elma, Wash., are considering plans for the installation of a water works system.

The Puget Sound, Chelan & Spokane Railway Company, Tacoma, Wash., in which financial interests of New York City and London, England are prominent, will undertake the development of 30 hydroelectric properties capable of producing upward of 300,000 hp., to be used principally in the operation of electric traction lines. An engineering firm in Kansas City, Mo., the W. K. Palmer Company, has been engaged to prepare the necessary plans and supervise all construction work.

The Bellingham Mfg. Company, Bellingham, Wash., has been incorporated, with $25,000 capital stock, to manufacture all kinds of woodenware articles. A factory building has been secured and is now being equipped with a 75-hp. boiler and compound Corliss engine, one large band saw, one rotary saw, two lathes, one dowelling machine, three planers and miscellaneous machinery for the manufacture of pails, fruit baskets, candy buckets, &c. The officers of the company are A. A. Adams, president; Wilson Stewart, vice-president; Sesley Brooks, secretary and treasurer.

The City Council of Los Angeles, Cal., has passed an ordinance providing for the issuing of $3,500,000 of electric light bonds which were voted at a special election held August 19. The proceeds are to be used to continue work on the aqueduct system from a point in Owen River alley to San Fernando Valley.

The Olympic Railway & Power Company, Elma, Wash., has been incorporated with $3,000,000 to develop several water power sites. No definite plans have been decided upon as yet, however. The officers of the company are J. B. Kirkaldie, president; W. F. Downs, vice-president; Thorwald Hyam, secretary and treasurer.

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The Northwest

ST. PAUL, MINN., October 3, 1910.

The first month of the fall season has shown up rather better here for the machinery trade than reports indicate to have been the case in most other parts of the country, and representatives of leading manufacturers, as well as jobbers and dealers, who have traveled extensively of late, feel very well satisfied with conditions in the Northwest. Few contracts of any size are now being let, but the general trend of buying is such that a fairly steady demand many be looked for from the same sources for some time to come, with the probability that it will gradually develop large proportions. Municipalities continue to be good customers of dealers and contractors, and their requirements cover a wide range, from valves, hydrants, culverts, &c., up to complete power and pumping plants, refuse destructors, bridges, viaducts and other heavy material. Automatic devices of all kinds, which tend to eliminate labor, instead of being shunned as heretofore on account of depriving political henchman of jobs, are being called for wherever they can be made applicable, indicating an improved condition in the management of local governmental affairs, which is of considerable importance to the machinery trade. Quite a number of contracts have recently been let for steel towers and tanks, in connection with both public and private water systems, and there will be much more of this work to come out before cold weather sets in. Increased attention is being paid by industrial plants to the matter of fire protection. Sprinklers, underwriters' pumps, chemical compounds, &c., will be required during the coming year for probably a majority of the new plants to be erected, and installations of suitable apparatus are also to be made in many of the existing buildings.

The contract for installing a complete water works system at Leola, S. D., exclusive of machinery, has been let to the Des Moines Bridge & Iron Works, Des Moines, Iowa. It includes a steel tower with a tank of 50,000 gal. capacity.

A franchise has been granted at Crosby, N. D., to H. F. Pierce, Bay City., Mich., for the installation of an electric power and lighting plant. It is understood locally that the machinery has not yet been ordered.

Some additional equipment for the city pumping plant, including electrical apparatus, will be purchased at Canby, Minn., the first week in November.

A 60-hp. boiler and 50-hp. Corliss or automatic high speed engine will be added to the equipment of the municipal power plant at Starbuck, Minn., which now consists of two Ft. Wayne generators driven by engines from the shops of Fairbank-Morse & Co., operating on gasoline.

The authorities at Paynesville, Minn., have under consideration plans for the installation of an electric generating plant.

An appropriation of $70,000 to be expended for the construction of a pumping plant and water distributing system has been made at Mandan, N. D., and an engineer engaged to prepare the plans.

A vote is to be taken at Anoka, Minn., on a bond issue for improvements to the water works system.

Plans are now under way for hydroelectric power developments aggregating 20,000 in capacity, to be undertaken by the Minnesota River Improvement Company, of which John R. Diers, Blakeley, Minn., is secretary. None of the details of the equipment required has as yet been worked out, however, the project being still in its preliminary stages.

The authorities at Gettysburg, S. D., have engaged an engineering firm to prepare plans and specifications for a water works system, with pumping units of moderate capacity.

An addition is to be made by the Consolidated Power & Light Company, Deadwood, S. D., to the electric plant which it is operating.

Some additional equipment is required for the municipal power plant at Rochester, Minn., and its purchase will probably be determined upon in the near future.

The Dakota Portland Cement Company, Sioux Falls, S. D., has under course of construction a cement plant near the city of Chamberlain, S. D., which will have an initial capacity of 1500 barrels daily, which will ultimately be increased to 3000 barrels per day. Most of the heavy machinery has already been purchased and the company expects to have its finished product on the market during the coming year.

Bonds in the sum of $25,000 have been voted by the citizens of Gilbert, Minn., for electric lighting and sewer systems.

Government Purchases

WASHINGTON, D. C., October 3, 1910.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids October 11 for two stoker engines, schedule 2932; one sensitive drill press, schedule 2933.

The Bureau of Supplies and Accounts will open bids October 18 for one electric concrete mixer, schedule 2935; one milling machine, schedule 2936, and one set of gasoline machinery, schedule 2947.

The Isthmian Canal Commission will open bids October 27, under circular 608, for one washer cutting machine, one portable grinder, punches, dies, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids November 1, under schedule 2948, for one grinding and crank shaft lathe.

The Isthmian Canal Commission, Washington, opened bids September 23 for the following:

Class 2. Two manual operated double twin drills and two motor driven double twin drills—Bidder 2, the United States Steel Products Company, New York City, item 12, $150 each, and item 13, $325 each.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids September 27, as follows:

Schedule 2888, Class 61. One No. 2 universal milling machine, complete—Bidder 12, the Brown & Sharpe Mfg. Company, Providence, R. I., $944.25; 36, the Fairbanks Company, Washington, D. C., $925; 71, Manning, Maxwell & Moore, New York, $930; 83, the Niles-Bement-Pond Company, New York City, $920.

Class 122. Four 5-hp. motors—Bidder 24, the Diehl Mfg. Company, Elizabethport, N. J., $575 and $650; 44, the General Electric Company, Schenectady, N. Y., $419.50.

The Illinois Steel Company's New Joliet Power Plant.—Ground has been broken at Joliet, Ill., by the Illinois Steel Company for a new power plant to be operated in connection with its Joliet mills. The plant will comprise three units of gas engines and electric generators, and a gas washer will also be erected. The gas engines will be built by the Allis-Chalmers Company and are of the same type as those built for the power plant at the Gary mills of the Indiana Steel Company. The Joliet engines and generators are of the same size as those which will be installed in the second power plant which is now under construction at Gary, each unit generating 3000 kw. In the original power plant at Gary which is now in operation each unit is of 2500 kw. capacity. During the past year the Illinois Steel Company has installed six units at the South Works, of 2000 kw. each, besides gas blowing engines. The new plant at Joliet will use blast furnace gas.

The Taylor-Wilson Mfg. Company, with plant and offices at McKees Rocks, near Pittsburgh, is operating its foundry to practically full capacity and is also busy in its pipe mill machinery department. A recent shipment of pipe threading machines was consigned to Germany. The company is finding a good market for its new motor driven socket reaming machine, which has been installed in practically every pipe mill plant in the country. It is a quick acting machine and is especially adapted to large outputs. The Taylor-Wilson Mfg. Company is claimed to be the largest manufacturer of pipe threading machinery for pipe mill use in the country.

A new automobile company with $1,000,000 capital stock is being organized at Lansing, Mich., for the manufacture of a commercial motor truck designed in the experimental works of the Reo Motor Car Company under the direction of R. E. Olds. The company has secured the factory building in Lansing known as the Bement plant which is being thoroughly overhauled and equipped. The new company is being financed by the Reo Motor Truck Company under the direction of Mr. Olds

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

When Delivery of Freight to Railroad Company Is Complete.—Mere loading of freight in a car placed by the railroad company in a convenient position for such purpose does not complete delivery to the company as a carrier so as to make it liable as an insurer of the freight. Before delivery will be deemed complete the shipper must not only relinquish his control over the car, but the company must be notified that it is ready for transportation. (Oklahoma Supreme Court, Kansas City, Mexico & Orient Railway Company *vs.* Cox, 108 Pacific Reporter, 380.)

Right of Carrier to Lien for Charges.—A railroad company is not entitled to a lien against an ore mill for charges for transporting to it ore belonging to a third party, under the Arizona statute which gives a lien for labor performed in the operation of a mill. (Arizona Supreme Court, Santa Fe, Prescott & Phoenix Railway Company *vs.* Arizona Smelting Company, 108 Pacific Reporter, 256.)

Liability of Railroad Company for Changing Route of Freight.—A railroad company having deviated from its agreement with a shipper to transport his freight over specified lines rendered itself liable as an insurer, even against those causes of loss from which a common carrier ordinarily is exempt. (Indiana Appellate Court, Cleveland, Cincinnati, Chicago & St. Louis Railway Company *vs.* Schaefer, 90 Northeastern Reporter, 502.)

When Negligence of Carrier of Freight Presumed.—Where goods are delivered in good condition to a railroad company to be carried over more than one road, and are delivered by the last road in a damaged condition, it will be presumed that the injury occurred on that road, and the burden is on it to exonerate itself. This presumption arises even though the goods are delivered to the terminal carrier in a sealed car. (Maine Supreme Judicial Court, Colbath *vs.* Bangor & Aroostook Railroad Company, 74 Atlantic Reporter, 918.)

Validity of Bill of Lading Limiting the Carrier's Liability.—A clause in a bill of lading providing that the shipping charge is based on a certain valuation, and declaring that the carrier shall not be liable for loss by negligence or otherwise in excess of the amount specified, binds the shipper, if knowing of the existence of such a provision therein he receives it without objection. (New Jersey Court of Errors and Appeals, Hill *vs.* Adams Express Company, 74 Atlantic Reporter, 674.)

Duty of Railroad Companies Respecting Freight.—A railroad company not authorized to deliver a shipment until the presentation of the bill of lading need not place the car containing the goods on the delivery track until the person entitled to the goods is prepared by the presentation of the bill of lading to receive the goods. (New York Supreme Court, Appellate Term, Lyons *vs.* New York Central, 119 New York Supplement, 703.)

Measure of Recovery for Injury to Freight.—The measure of a shipper's recovery for the injury to a machine in transportation by a railroad company is the difference between its market value when delivered to the company and when it reached its destination. (Iowa Supreme Court, Parsons *vs.* United States Express Company, 123 Northwestern Reporter, 776.)

Receipt of Goods by Railroad Company Presumed.—A railroad company will be presumed to have received the whole of a shipment where it is shown to have received part. (South Carolina Supreme Court, McMeekin *vs.* Southern Railway Company, 67 Southeastern Reporter, 745.)

Damages Recoverable for Delaying Freight.—The measure of damages recoverable from a carrier for delaying delivery of freight is the difference, at the time and place of delivery, between the value of the shipment when it should have been and when it was delivered, with interest on its value at the legal rate during the time of the delay. Special damages can also be recovered, if they naturally result from the delay and the carrier had notice that they would probably result. (Texas Court of Civil Appeals, Dorrance & Company *vs.* International & Great Northern Railroad Company, 126 Southwestern Reporter, 694.)

Bill of Lading as Presumptive Evidence.—A bill of lading creates a presumption that the goods covered by it were delivered to the railroad company in good order. (North Carolina Supreme Court, Sumrell *vs.* Atlantic Coast Line Railroad Company, 67 Southeastern Reporter, 585.)

Liability of Carrier for Special Damages Caused by Delay in Delivering Goods.—A carrier is not liable for special damages caused by a delay in delivering freight in the absence of knowledge of the special circumstances requiring prompt shipment. (Alabama Supreme Court, Southern Railway Company *vs.* Lewis, 51 Southern Reporter, 863.)

Validity of Contract of Shipment.—A provision in contract for the shipment of freight stipulating to relieve the carrier, in whole or part, from liability for damages resulting from its negligence, is invalid and unenforceable. (North Carolina Supreme Court, Stringfield *vs.* Southern Railway Company, 67 Southeastern Reporter, 333.)

Liability of Common Carrier for Delaying Shipment.—Generally the liability of a common carrier for unreasonable delay in delivering goods is the difference between their market value when they should have been and when they were delivered, with interest from the first date, less unpaid freight. The consignee cannot reject the delayed shipment and then recover its full value from the carrier. (Georgia Supreme Court, Southern Express Company *vs.* Hanaw, 67 Southeastern Reporter, 944.)

Delivery of Freight.—A railroad company can be required to deliver cars on private tracks only when it has contracted to do so. Before the company's liability as insurer of a shipment ceases it must place the car in such part of its freight yards as to make it reasonably accessible for unloading. North Carolina Supreme Court, Brooks Mfg. Company *vs.* Southern Railway Company, 68 Southeastern Reporter, 243.)

Duty of Railroad Company in Carrying Freight.—A railroad company is bound to transport and deliver freight within a reasonable time, not being merely bound to exercise ordinary care to so transport and deliver. (Texas Court of Appeals, Gulf, Colorado & Santa Fe Railway Company *vs.* Shultz, 129 Southwestern Reporter, 845.)

Liability of Telegraph Company.—A telegraph company, which receives a message by telephone and accepts it for transmission, is liable for mistakes in transmitting it. (Texas Court of Civil Appeals, Western Union Telegraph Company *vs.* Buchanan, 129 Southwestern Reporter, 850.)

Waiver by Buyer of Damages for Delayed Delivery.—An agreement for a sale of pumps provided for delivery at a particular time if not delayed by conditions over which the seller had no control. It was also agreed that the pumps should show a certain mechanical efficiency, to be tested in the seller's factory in the presence of the buyer's engineer or representative. After some delay, excusable under the contract, the buyer urged shipment, and on receipt of the pumps they were installed without question as to their efficiency or without test. No objection was made until more than three months afterward. Held, that damages for the delay were waived by the buyer. (California Supreme Court, Byron Jackson Machine Works *vs.* Duff, 109 Pacific Reporter, 616.)

Improper Measure of Damage for Injury to Freight.—The cost of freight at the place of shipment is not the proper measure of damages recoverable from a railroad company for injury to it during transportation. (Springfield, Mo., Court of Appeals, McHaney *vs.* St. Louis & San Francisco Railroad Company, 129 Southwestern Reporter, 1065.)

Liability of Employer for Injury Caused Workman by Fellow Employee.—An employer is not liable for injury to one workman caused by another, while both were engaged in erecting a boiler under the same superintendent, by the other workman permitting a chain to fall. (Arkansas Supreme Court, Graham *vs.* Thrall & Shea, 129 Southwestern Reporter 532.)

Liability of Employer for Failing to Warn Against Obvious Dangers.—An employer is not liable for failing to warn an employee against a danger of the employment that was obvious and as easily known to the employee as to him. (Georgia Supreme Court, Hendrix *vs.* Vale Royal Mfg. Company, 68 Southeastern Reporter 484.)

Employer's Duty to Guard Machinery.—The Indiana statute which requires employers to guard shafting includes countershafts and pulleys running on shafts. In a suit against an employer for injury to a workman resulting from violation of the statute, the workman need not show that the unguarded machinery was dangerous. (Indiana Appellate Court, Hohenstein-Harmetz Furniture *vs.* Matthews, 92 Northeastern Reporter, 196.)

Validity of Agreement for Employment of Union Labor Exclusively.—An agreement made by an employer with trade unions not to employ nonunion workmen is not invalid as to such workmen, if it benefits the employer, as by settling differences with the unions, and if it is not made with malice toward the nonunion employees, nor with intent to injure them or to compel them to join the union. (New York Court of Appeals, Kissam *vs.* United States Printing Company, 92 Northeastern Reporter, 214.)

Liability of Employer for Injury to Employee.—An employee suing for injury resulting from defective machinery must show that the defect was the direct cause of the injury and that the employer was responsible for the defect. He does not establish his claim by showing a possibility that the accident resulted from the defective condition, if the circumstances are clearly consistent with a theory that the

injury resulted from some other cause. An employer was bound to warn an inexperienced workman against the danger of boiler plate slipping from clamps by means of which the plate was being unloaded from a car, if he did not know that plates had slipped before. A foreman who superintended the unloading was a fellow employee of the workman in the manual work of unloading, exempting the employer from liability for his negligence in that work; but the foreman was the employer's representative in the matter of warning the inexperienced workman against the dangers of doing the work in a certain way, and the employer is liable for his negligence in that capacity. (Iowa Supreme Court, Ashcraft *vs.* Davenport Locomotive Works, 126 Northwestern Reporter 1111.)

Assumption of Risk of Injury by Employee.—Where an elevator cable was slackened by the car lodging, an employee, in replacing the cable on the drum, assumed the risk of injury through a tightening of the cable on a sudden release of the car. (Rhode Island Supreme Court, Capuano *vs.* American Locomotive Company, 76 Atlantic Reporter 435.)

The German Iron Market

BERLIN, September 22, 1910.

We have at last reached a point where we know just what will be the dimensions of the Essen pig iron organization. The negotiations with the Luxemburg-Lorraine group were finally broken off for good yesterday. The failure to reach an agreement was due to the fact that the furnaces of that group demanded 22½ per cent. of the total allotments, a figure which the Essen party regarded as too high. What is thought among the syndicate's members as to the prospects of the organization, in view of the independent position of the Luxemburg-Lorraine and Siegerland groups, is apparent from some remarks made to-day at Lübeck at the stockholders' meeting of the new furnace company there. One of the managers said that the earning capacity of the syndicate furnaces could not be substantially affected by the outsiders, inasmuch as the Siegerland furnaces are situated too far from the great industrial region, and those in Luxemburg-Lorraine make only an iron high in phosphorus, which is used for mixing with other foundry grades. The stock market has taken the failure of the negotiations very calmly, as this result had been clearly foreshadowed and was expected. Iron shares were actually stronger to-day, owing to other news of a favorable character.

Now that all negotiations are at an end, the first task of the new syndicate will be to fix prices for next year. A meeting was held to-day for that purpose, but it adjourned without taking action. It is fully expected, however, that pig iron prices will be marked up 4 to 5 marks per ton, according to quality and point of delivery. This advance is regarded as necessary in view of the big rise in ore prices during the past few months. The Luxemburg-Lorraine furnaces, now that the negotiations have been broken off, have begun to do business for 1911 delivery at 52 to 53 marks for German No. 3 foundry. The delay of the Essen syndicate in issuing its price-list is understood to have been caused by the fact that it is arranging business terms with certain big dealers, which have not yet been wholly closed. It is expected the business in pig will become very brisk as soon as the syndicate begins to take orders, which will probably be by October 1.

The mills running on the cold rolling process have just voted to raise the price of bands 5 marks per ton for the first quarter of 1911, and the manufacturers of bands by the usual process have called a meeting for next week for the purpose of voting a rise of 2.50 marks. It is reported in the press that the Steel Syndicate will advance the prices of semimanufactured steel, beams and other heavy structural forms for the first quarter of 1911. The wire rod association has brought the four outsiders to an agreement to join and the association has been prolonged to the middle of 1912. Three independent mills are in course of construction, but negotiations with these will be begun. The rivet association has also reached an understanding with the outsiders, the latter agreeing to hold to the association's prices; this renders the prolongation of the combination possible. The general association of the foundries of the country has voted that an advance in the prices of castings shall be made in view of the higher prices of pig iron and coke. It was left to the district organizations to carry this resolution into effect.

A controversy has broken out between the Deutsch-Luxemburg Company and several other big companies in the Steel Syndicate in regard to heavy beams made under the Grey patents. That company owns these patents for Germany and runs a part of its Differdingen Works in Luxemburg on them, but several other companies have evolved methods for turning out such beams by processes of their own and they are naturally trying to get a part of the business. Hitherto Deutsch-Luxemburg has had an allotment of 123,000 tons of structural material in the syndicate, and it has been turning out Grey beams exclusively, but taking care to adjust its business in such a way as just to keep under its allotment figure in deliveries, in order that the other mills might not have an opportunity to get their beams introduced in the market. Latterly, however, the demand for beams has so increased as considerably to exceed the Luxemburg Company's allotment. Thereupon, and probably in part for the foregoing reason, it absorbed the Dortmunder Union Company, and it now wants to make Grey beams for the 92,400 tons allotment in structural material held by that company. Naturally its rivals contest its rights to do this. It is not possible to say what the outcome will be.

The imports of manganese ores into Germany this year have heavily increased. For the first seven months of the year they reached 335,400 metric tons, against 234,690 tons in the like period of 1909 and 200,300 tons in 1908. The Caspian territory of Russia is the largest source of supply, and it was there that the chief increase occurred. The arrivals from there reached 160,300 tons, being a gain of 70,500 tons; from the rest of Russia 60,600 tons, a gain of 27,300 tons; from British India 83,400 tons, a gain of 24,700 tons.

Germany's exports of iron and steel in August amounted to 405,376 metric tons, against 319,975 tons in August, 1909. The surplus of exports over imports was 357,121 tons. For eight months exports amounted to 3,171,372 tons, against 2,536,884 tons last year; and the excess of exports over imports was 2,812,698 tons, against 2,239,856 tons last year.

Iron and Industrial Stocks

NEW YORK, October 5, 1910.

While transactions in stocks have not been in large volume, prices of securities have shown increasing strength, under the stimulus of the excellent crop reports. In some securities the advance has been decidedly marked. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chalm., com..	8¼- 9¼	Pressed St., pref..	94¾- 95½
Allis-Chalm., pref....	34	Railway Spr., com.	33½- 34¼
Beth. Steel, com..	27½- 28⅜	Republic, com.....	31⅝- 33¾
Beth. Steel, pref..	58½- 59½	Republic, pref.....	92½- 94
Can. com.....	8 - 8¼	Sloss, com.....	55 - 58¼
Can. pref.....	67¼- 68⅞	Pipe, com.....	15⅜- 16¼
Car & Fdry, com..	47 - 48¾	Pipe, pref.....	57¾- 59¼
Car & Fdry, pref..113 -114		U. S. Steel, com...	67⅝- 70¾
Steel Foundries....	41¼- 43	U. S. Steel, pref...116⅝-118	
Colorado Fuel.....	30¾- 33	Westinghouse El..	62 - 70⅛
General Electric...144 -148½		Chi. Pneu. Tool...	37 - 39
Gr. N. ore cert....	54¾- 58	Cambria Steel.....	42 - 43
Int. Harv., com...	97½- 99½	Lake Sup. Corp....	22¼- 24⅝
Int. Harv., pref...121¾-123		Pa. Steel, pref....108 -109	
Int. Pump, com...	41¼- 42⅜	Warwick	11
Int. Pump, pref...	83¾- 84½	Crucible St., com..	12 - 12½
Locomotive, com...	37⅝- 39¼	Crucible St., pref..	74½- 78
Locomotive, pref...102½-104		Harb.-W. Ref., com.....	32
Nat. En. & St., com....	15	Harb.-W. Ref., pref.....	94
Pressed St., com..	33 - 34⅝		

Dividends.—The Chicago Pneumatic Tool Company has declared the regular quarterly dividend of 1 per cent., payable October 25

The International Steam Pump Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 1.

The Harbison-Walker Refractories Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable October 20.

The Pittsburgh Coal Company has declared a dividend on the preferred stock of 1¼ per cent., payable October 25.

The William Tod Company, Youngstown, Ohio, is at work on its contract received some time ago for the jobbing and sheet mills for the new plant of the American Sheet & Tin Plate Company, at Gary, Ind. The statement that it had also received a contract for the tin mills is incorrect, as its contract covers only the jobbing and sheet mills.

The United States Glass Company, Pittsburgh, has abandoned the idea of increasing its power plant at its Glassport, Pa., plant, and has contracted with the Allegheny County Light Company, Pittsburgh, for 250-hp. in motors for operating the extensions of the works. The company has also arranged for 600 electric lights in the factory.

The erection of a bridge over the Hudson River between New York City and some point in New Jersey now seems impracticable. Borings made by engineers at various points have not found hard pan under the river bed except at too great a depth to enable the necessary channel piers to be built.

Personal

Elmer E. Wilson, formerly purchasing agent and assistant superintendent of the Bateman Manufacturing Company, Grenloch, N. J., has been appointed general superintendent of the plant.

Charles Whiting Baker, editor of *Engineering News,* who has been detained in England by illness since the Birmingham meeting of the Institution of Mechanical Engineers, has quite recovered and will arrive in New York this week.

James L. Fry, has been appointed secretary of the Strong-Battelle Manufacturing Company, Bellaire, Ohio, succeeding L. G. Battelle, resigned. F. E. Jones is sales manager. The company manufactures high grade enameled ware and is operating its plant day and night.

William H. Yetma severed his connection with J. J. McCabe, and now represents the McCabe Machine Company, 95-97 Liberty street, New York City.

Justus Hofmann, general superintendent of the open hearth plant, and Josef Jeller, chief engineer of the Witkowitz Steel Works, Witkowitz, Austria, are in the United States visiting steel plants in the Chicago, Central Western and Eastern Pennsylvania districts.

Marshall Lapham, who has retired from the position of comptroller of the Lackawanna Steel Company and subsidiary companies, was the recipient of a testimonial banquet September 28 at the Lafayette Hotel, Buffalo, N. Y., tendered by the heads of the various departments under his jurisdiction. Mr. Lapham has become connected with the B. F. Goodrich Company, rubber manufacturer, Akron, Ohio.

E. Stütz, vice-president and general manager of the Goldschmidt Thermit Company, 90 West street, New York, retired October 1 from the direction of the company, which passes under the management of William C. Cuntz, who brings to his new position a thorough knowledge of the steel business and a wide acquaintance with railroad officials, having been connected for 18 years with the Pennsylvania Steel Company.

The Garwood Electric Company, 149 Broadway, New York, announces that Hugh A. Brown has been appointed manager of its Chicago branch with office at 555 Old Colony Building. During the past eight years he has been actively engaged in the sale of electrical machinery in Chicago and Cincinnati. The company is now giving particular attention to special designs of direct current motors and dynamos in addition to its complete line of standard C & C apparatus.

The H. W. Johns-Manville Company, whose main office is at 100 William street, New York, has recently opened new branch offices at Atlanta, Ga., and Rochester, N. Y., for the convenience of its customers and to meet its growing business in those sections. The Atlanta office is located in the Empire Building, in charge of W. H. Johns, who has been traveling in that territory for the company for a number of years, and the Rochester office is located at 725 Chamber of Commerce, in charge of H. P. Domine, formerly with the Buffalo branch of the company.

W. N. Richey has been appointed Pittsburgh agent of the Bruce-Macbeth Engine Company, Cleveland, Ohio, with offices in the Oliver Building, Pittsburgh, Pa.

Henry W. Hock, formerly superintendent of the pipe department of the Youngstown Sheet & Tube Company, East Youngstown, Ohio, has resigned to become superintendent of the Pennsylvania Works of the National Tube Company, at Pittsburgh.

W. S. Ransom of Matthew, Addy & Co., Cincinnati, Ohio, returned last week from a two months' pleasure trip through Europe.

Obituary

WILLIAM WHITWELL, J. P., of William Whitwell & Co., owners of the Thornaby Iron Works, Thornaby-on-Tees, died at Scarborough, Eng., September 19, aged 75 years. He was one of the prominent figures of the past half century in the iron trade of the Cleveland district and was known best for his efforts over a long period of years to further the adjustment of industrial difficulties by arbitration and conciliation. He was one of the founders in 1869 of the Board of Conciliation and Arbitration for the Manufactured Iron and Steel Trade of the North of England and was president of the Board from 1875 to 1907. He was one of the first among English iron manufacturers to recognize the value of the iron ores of Bilbao. He was president of the Iron and Steel Institute in 1901-1903 and accompanied the Institute on its American tour in 1904.

T. D. DEWAR, of the firm of T. D. Dewar & Sons, mining engineers, Toronto, and metallurgists, and president of the Toronto Wire Nail and Tack Company, is dead.

RICHARD WOOD, for many years president of R. D. Wood & Co., Philadelphia, manufacturers of pipe and machinery, died in that city September 29, aged 77 years. His first business experience was in the dry goods trade, with a firm established by his father, Richard D. Wood. He was afterward associated with his brothers in the extensive business of R. D. Wood & Co., but retired from active connection with this firm several years ago. He was a trustee of the University of Pennsylvania for 37 years and a manager of Haverford College, which was his alma mater. Mr. Wood's four brothers, George, Walter, Stewart and Edward, are active in business.

EDWARD THOMAS, secretary and treasurer of James E. Thomas Company, brass founder, Newark, Ohio, died September 10, at Longport, N. J.

Richmond, Va., now has a population of 127,628, an increase of 42,578, or 50.1 per cent. over the figures of the census of 1900. The extremely large percentage of increase in the case of the Virginia capital is partly explained by the annexation in the interval since 1900 of the sister city of Manchester, on the south side of the James River. The Census Bureau reports the following figures for other cities: Springfield, Mo., 35,201, an increase of 11,934, or 51.3 per cent.; Joplin, Mo., 32,073, an increase of 6050, or 23.2 per cent.; Malden, Mass., 44,404, an increase of 10,740, or 31.9 per cent.; Quincy, Mass., 32,642, an increase of 8743, or 36.6 per cent.; Somerville, Mass., 77,236, an increase of 15,593, or 25.3 per cent.; Newton, Mass., 39,806, an increase of 6219, or 18.5 per cent.; Terre Haute, Ind., 58,157, an increase of 21,484, or 58.6 per cent.; York, Pa., 44,750, an increase of 11,042, or 32.8 per cent.; New Castle, Pa., 36,280, an increase of 7941, or 28 per cent.; Harrisburg, Pa., 64,186, an increase of 14,019, or 27.9 per cent.; Jacksonville, Fla., 57,699, an increase of 29,270, or 103 per cent.; Topeka, Kan., 43,684, an increase of 10,076, or 30 per cent.

Stockholders of the United Engineering & Foundry Company will meet in the offices of the company in the Farmers' Bank Building, Pittsburgh, Pa., October 8, to take action on a proposed increase in the capital stock of the company from $3,000,000 to $5,000,000, which will make the total capitalization $7,500,000. No material improvements or extensions to existing plants or new erection are contemplated at present. However, for some time it has been making material enlargements and improvements to its Oak street plant at Youngstown, Ohio, in which rolls are made.

The Briqueting of Iron Ores

The Schumacher Process for Blast Furnace Flue Dust

A paper was read at the Buxton, England, meeting of the Iron and Steel Institute, September 27, by C. de Schwarz, Liége, Belgium, on "The Briqueting of Iron Ores." Most of the methods which have been tried for briqueting fine ore, it is pointed out, have proved to be too expensive not only in initial outlay and cost of manufacture, but also on account of the great reduction in the iron content of the ore by too great an addition of binding material. The conditions for successful briqueting are summarized as follows:

1. The iron ore briquets must have a certain resistance against mechanical influences. They must resist a pressure of not less than 2000 lb. per square inch, and, when dropped from a hight of 10 feet on a cast iron plate, they must not fall into dust, although they may break into pieces.

2. They must resist heat. Heated to 900 degrees C. they may commence to sinter, but they must not disintegrate into small fragments.

3. They should be capable of being placed in water for a certain time without softening.

4. They must resist the influence of steam at 150 degrees C. without crumbling.

5. They must possess a certain amount of porosity in order to allow the carbon monoxide in the blast furnace to penetrate the interior of the briquet and to exercise its beneficial reducing influence. In order to test the briquets for porosity, they are, after being dried, placed for about 25 minutes in water, during which time they ought to absorb not less than 12½ to 16 per cent. of water, according to the nature of the ore.

6. The binding medium, if any is used, should not contain noxious substances (sulphur, arsenic) to such an extent as to be injurious to the quality of the pig iron produced.

7. The cost of producing briquets should not exceed the difference in the prices between lump ore and fine ore.

Referring to briqueting without a binding medium, two operations are cited, which are considered successful — one at Kertsch in Russia, where bean ore is briqueted by being mixed with eight per cent. of water and put under a pressure of 5600 lb. per square inch; another at Ilsede in Germany, where clay iron ore is mixed with the waste of the iron ore washing plant and with other powdery waste products from rolling mills. The mixture, which is not allowed to contain more than six per cent. water, is heated to about 75 degrees C. and made into briquets under pressure of 4000 lb. per square inch. Generally, the author observes, it is found that the use of common clay as a binding medium requires adding such a large percentage of clay to the ore as to reduce too much the content of iron. It is stated that of all processes of briqueting without a medium, by heating the briquets after they have left the press, the Gröndal process has proved most successful for magnetic ores. A description of this process is given.

Some suggestions are made as to the proper proportion of briquets made of concentrates for use in the open hearth furnace for descarburizing and as an enriching addition to the metal bath.

Adding Chloride of Magnesium to Flue Dust

In the portion of the paper dealing with briqueting by the use of a binding medium, reference is made to the success obtained in briqueting blast furnace flue dust. This success is principally attributed to the fact that this by-product already possesses hydraulic properties because, like cement, it contains lime, alumina and soluble silica, ready for combination. In addition to this it has been found that these hydraulic properties can be raised by adding certain salts. Chloride of magnesium is considered most suitable because it is cheap (being a by-product in the manufacture of certain artificial manures), and because it does not contain any noxious substances. The author continues:

Owing to the high temperature in the blast furnace, the chloride of magnesium is decomposed into magnesium and chlorine. The former enters into the blast furnace slag as MgO, and the latter combines with hydrogen to form hydrochloric acid. The acid further combines with the free lime to form chloride of calcium, which is finally absorbed by the water used for washing the blast furnace gases. In some instances it has been observed that the iron portions of the furnace top become slightly attacked, which is ascribed to the presence of hydrochloric acid not fully neutralized.

This process of briqueting, called after the inventor the "Schumacher" process, has given very satisfactory results, not only with reference to the quality of the briquets produced, but also as far as cost of production and initial outlay are concerned. It must, however, be pointed out that the blast furnace flue dust used for briqueting must be used almost immediately after having been removed from the catchers, and that, like cement, it must be protected against humidity before briqueting. The installation for briqueting flue dust should therefore be situated in the close proximity of the blast furnace from which the flue dust is taken.

It is to be regretted that this process can only be used for briqueting blast furnace flue dust. However, in some instances where the chemical composition of the flue dust is particularly favorable to the purpose, an addition of about 40 per cent. of purple ore to the flue dust has been found to be admissible; the latter thus acts, as it were, as a binding medium to the former.

Another method of briqueting flue dust consists in the use of basic blast furnace slag, after having been exposed to steam pressure. Owing to the influence of compressed steam the silica in the slag changes from the insoluble to the soluble variety and combines with the lime in the flue dust to a kind of cement, which acts as a binding medium.

Conclusions

The author gives details of other processes using binding material and states his conclusions as follows:

A universal method of briqueting fine iron ore, fulfilling all the conditions enumerated above, has not been invented as yet, and probably never will be.

Taking the financial results of the different methods of briqueting into consideration, it is found that the methods of briqueting practiced at Kertsch in Russia and at Ilsede in Germany appear to be the most economic, the working expenses, as reported, amounting to only 1 shilling per ton of briquets. This method can, however, only be applied successfully when the ore contains sufficient hydrate of alumina to serve as a medium.

The manufacturing expenses of briqueting by the Gröndal process amount to 3 shillings 4 pence per ton of briquets, exclusive of general expenses, redemption and royalties, for which at least 1 shilling 4 pence will have to be added, thus resulting in a total expense of 4 shillings 8 pence per ton of briquets. This would be far too high to allow of the general introduction of this process. However, the Gröndal process is of particular value for Sweden, where its use has become almost unavoidable in order to be able to utilize the iron ore of that country; besides, its use is, in Sweden, combined with a saving of 6 shillings 6 pence per ton briquets in fuel, thus resulting in a final saving of 1 shilling 10 pence (6 shillings 6 pence-4 shillings 8 pence) per ton in favor of the Gröndal process. Similar results may also be obtained with this process where charcoal is used as fuel in the blast furnace.

Of all the different methods employed for briqueting blast furnace flue dust, the "Schumacher" process has given the best financial results, the cost of briqueting according to that method amounting to 1 shilling 8 pence per ton briquets only, without royalty.

The other methods of briqueting iron ore flue dust and other ferruginous residues of other industries have given less favorable financial results, the cost of briqueting amounting from 2 shillings 6 pence to 3 shillings 9 pence per ton briquets. Besides this it must be mentioned that where a binding medium is used, on an average about 7 per cent. is required to be added to the ore, thus reducing considerably the percentage of iron. In several cases it has also been found necessary to stack the briquets for several weeks in the open before they could be used, thus requiring a good deal of space and extra labor for transporting and handling.

Finally, it may be mentioned that at present an establishment for making briquets is being erected at a Belgian works according to a new process recently introduced. According to this method from 2½ to 4½ per cent. of binding medium, costing about 16 shillings a ton, is used. The initial outlay for a plant turning out 5 tons of briquets an hour amounts to about £2500, and the manufacturing expenses, inclusive of general expenses, to 1 shilling 6 pence per ton briquets. The briquets fulfill all the conditions enumerated above, and can be used within 24 to 36 hours after having left the press, no heating or any additional work being necessary. By this method not only fine ore but also rolling mill and forge scale (Fe_3O_4) have been briqueted with success, the latter having been successfully used as an enriching and decarbonizing addition in the open hearth furnace.

The Lake Superior Corporation

Annual Report for 1909—10

The Lake Superior Corporation has issued its annual report for the fiscal year ending June 30, 1910. The result of the year's operations of all the subsidiary companies of the corporation shows a surplus, subject to depreciation and other charges, of $1,194,735.22. This surplus has been applied to the writing off of losses in assets realized and bad and doubtful debts, discount on securities sold, reserve for renewals and doubtful debts, sinking fund for the payment of the note issue of the Lake Superior Iron & Steel Company and a payment to the Lake Superior Corporation of $564,718.92 as interest and dividends. The income account of the corporation is as follows:

Income from the subsidiary companies	$564,718.92
Interest and miscellaneous receipts	113,506.10
	$678,225.02
Deduct interest and general expenses (including interest on the first mortgage and collateral trust bonds)	622,852.05
	$55,372.97
Balance of income brought forward	22,995.55
	$78,368.52
Interest at the rate of 2½ per cent. on $3,000,000 income bonds	75,000.00
Balance to be carried forward	$3,368.52

President T. J. Drummond, in his accompanying remarks to the stockholders, states that a large amount of new construction is under way, but that, with the exception of the No. 3 open hearth furnace, none of the new plants being installed were in operation during any part of the past fiscal year. Although the bounty allowed by the Canadian Government on the steel manufactured was equivalent to about $1 less per ton than in the previous year, causing a loss in net earnings for the fiscal year of about $200,000, an increase was made in the net earnings of the subsidiary companies owing to the greater volume of business done and the economies effected in operation.

The rail mill was in steady operation throughout the year, except an interval of about four weeks for repairs and general renewals, and the production was 201,615 tons against 158,465 tons in the previous year. The pig iron produced was 153,528 tons against 130,268 tons in the previous year.

No more ore will be sold from the Helen Mine, as, in view of the increasing requirements of the steel department, it is considered inadvisable to continue the sale of the ore which is especially suitable for the requirements of the corporation. It is the expectation to have blocked out, ready for mining by the spring of 1911, a tonnage equal to the total quantity shipped from the Helen Mine since it was opened in 1900, which has aggregated 1,692,549 tons.

The new installations now being made include a blast furnace with a rated capacity of 400 tons per day, a 12 and an 18 in. merchant mill, by-product coking ovens with sufficient capacity to care for the immediate needs of the corporation, and a new gas engine system which will care for all the blast furnaces and create sufficient surplus power to operate the new merchant rolling mills. The open hearth department is to be extended, and further provision has been made for the handling of coal, ore, &c., by additional docks and coal and ore handling machinery of the best and most economical type.

The corporation's limestone properties have been augmented by the purchase of the Fiborn limestone quarry in Michigan, which contains sufficient limestone of a high fluxing quality to last for an indefinite period. The corporation has also recently acquired and is now operating the Cannelton Coal & Coke Company which owns nearly 6000 acres of coal lands in West Virginia. The Magpie Mine, which is not far distant from the Helen Mine, will be put in operation as soon as the necessary machinery can be installed, and a branch railroad is now being built to that mine by the corporation's Algoma Central Railroad Company.

As indicating the improving condition of the corporation's affairs, a payment of interest at the rate of 2½ per cent. was made on the outstanding income bonds during the year.

New Publications

Wireless Telephones and How They Work. By James Erskine-Murray. Size, 5 x 7⅜ in.; 68 pages; 17 illustrations. Bound in cloth. Price, $1. Published by the Norman W. Henley Publishing Company, 132 Nassau street, New York City.

In nine short chapters the author has attempted to give a well balanced sketch of a subject so complex that it has been possible only to show the leading principles in their proper values by excluding a mass of less important details. The result of this has been to produce a practical work free from elaborate details which aims at giving a clear survey of the way in which wireless telephones work including a discussion of the methods and instruments used.

The book is divided into nine chapters, the first of which deals with how sound is transmitted from a source to the ear and how it is heard. Chapter II is historical, dealing with the experiments made, while the third relates to the conversion of sound into electric waves. The next two chapters deal with wireless transmission and the production of alternating currents of high frequency, and are followed by chapters relating to the radiation and reception of electric waves and the receiving instruments employed. Chapter VIII is concerned with the detector, which converts the high frequency current into a direct current capable of causing audible sounds in a Bell telephone receiver, and the final chapter relates to what has been done and what may reasonably be expected along this line. A glossary of technical words and an index complete the volume.

A New Ore Unloading Record

An unusual performance in unloading iron ore was made September 3, 1910, at the Superior docks of the Pittsburgh & Conneaut Dock Company, at Ashtabula Harbor, Ohio. The four new Hulett 15-ton machines installed at this dock, which were described in *The Iron Age* of July 21, 1910, page 162, unloaded 35,855 gross tons of ore from four vessels, working day and night shifts. The total average time for the four machines from start to finish was 20 hours 51 minutes. The total average lost time from shifting of vessels and machines and other causes was 1 hour 41 minutes. The net working time for the four machines was thus 19 hours 10 minutes. The amounts of ore unloaded from the respective vessels were as follows: Schiller, 10,788 tons; Perkins, 10,031 tons; Sonoma, 6478 tons; Hebard, 8558 tons. About 90 per cent. of the ore was taken out by the machines independent of the shovelers, and the work of the latter consisted in shoveling the small amount of the ore from the corners and piling it under the buckets.

The best unloading record for a single cargo made with the four Hulett machines at Ashtabula Harbor was the performance of August 5, 1910, when 11,131 gross tons was taken out of the steamer Thomas F. Cole in 4 hours 30 min., net time. The Cole arrived at Ashtabula at 10.53 a.m. and left at 5 p.m., making the total time at dock 6 hours and 7 min., including an hour for dinner. The average rate of unloading was 630.6 tons per hour for each machine.

The American Iron and Steel Institute's New York Meeting

Foreign Guests Who Will Attend—An Outline of the Tour to Steel Works Centers

Committees are at work in New York and in the various cities which will be visited on the coming tour of members of the American Iron and Steel Institute and their foreign guests, and preparations for the meeting and the excursion are now nearly completed. The invitations sent to leading representatives of foreign iron and steel industries to attend as guests of the institute have been accepted by about 30 officers of European companies. Many more would have accepted but for the fact that October is the month of important company meetings both in England and on the Continent and attendance upon these meeting is in many cases imperative.

The formal meeting for the discussion of papers will begin its sessions in the Myrtle Room of the Waldorf-Astoria, New York, at 10.30 Friday morning, October 14. The programme is as follows:

Address by the president, Elbert H. Gary.
Paper by James A. Farrell on "Foreign Relations."
Paper by William B. Dickson on "Betterment of Labor Conditions."
Paper by Willis L. King on "Contract Obligations."
Paper by Charles Kirchhoff on "The International Metallurgical Congress at Duesseldorf."

A banquet will be held at 7:30 p.m. in the Astor Gallery. Following the after-dinner programme, an exhibition will be given of moving pictures of the Gary plant of the Indiana Steel Company, illustrating the process of manufacture from ore to finished product. The pictures will be explained by G. G. Thorp, vice-president of the Indiana Steel Company.

The programme of visitation and inspection will begin Saturday with a tour of New York Harbor. The members and their guests will assemble on board the steamer Observation at Pier 83, North River, foot of West 42d street at 10.45 a.m. for an excursion around the harbor, viewing the railroad terminals and large industrial plants.

Excursion to Buffalo, Chicago and Pittsburgh Works

The special train for the excursion to Buffalo, Chicago, Pittsburgh and Washington will leave the Grand Central Station, New York, at 7.45 p.m., Sunday, October 16. Arriving in Buffalo Monday morning the party will be taken through the plant of the Lackawanna Steel Company and later will take steamer for a trip around the water front to the new barge canal. Monday afternoon the train will be taken for Niagara Falls where the afternoon will be spent, the programme including a visit to the Ontario Power Company's plant.

The arrangements for the stay in Buffalo are in charge of C. H. McCullough, vice-president of the Lackawanna Steel Company.

Leaving Buffalo Monday evening, the train will reach Gary, Ind., at 7.30 Tuesday morning. The Gary plant will be inspected in the forenoon, and about noon the train will be transferred to the Elgin, Joliet & Eastern Railroad, conveying the visitors to the South Works of the Illinois Steel Company, to which a portion of the afternoon will be devoted. There will be a dinner Tuesday evening, and Tuesday night will be spent in Chicago hotels. Wednesday's programme includes a visit to the Pullman Company's works, to one of the plants of the International Harvester Company, probably the McCormick Works, and to the Chicago stockyards. There may be a division of the party and a choice of trips part of the day. The Chicago committee consists of E. J. Buffington, president Illinois Steel Company, as chairman; T. W. Robinson, vice-president Illinois Steel Company, and H. F. Perkins, president Wisconsin Steel Company.

Wednesday night will be passed on the train en route for Pittsburgh. There the arrangements are in charge of Willis L. King, chairman; A. C. Dinkey, and T. W. Guthrie. The party will go by train Thursday morning to a point up the Monongahela River, where a steamer will be taken for a trip down the river. There will thus be opportunity to see in a short time the various iron and steel plants along the Monongahela, and it will give the visitors a good idea of the method of coal loading and of transportation by river barges. It will also make it possible to go ashore at intervals. The most extended inspection trip on the way down to Pittsburgh will be at the Homestead Steel Works. Friday will also be spent in and around Pittsburgh, with inspection of some of the plants on the Allegheny River; also visits to the Carnegie Institute and Technical School and to the works of the Westinghouse Electric & Mfg. Company. An automobile trip around the city is also planned.

Leaving Pittsburgh Friday evening and arriving in Washington Saturday morning, the Institute will be received by the President at 11 a.m. Automobiles will be taken for a sight seeing trip. The Bureau of Standards will be visited and opportunity will be given to go to the Capitol building and Congressional Library. The train will leave Washington Saturday afternoon, arriving in New York in the evening.

The general Committee of Arrangements consists of E. A. S. Clarke, president Lackawanna Steel Company, as chairman; James A. Farrell, president United States Steel Products Company, and John A. Topping, president Republic Iron & Steel Company. Howard H. Cook, assistant secretary of the Institute, will visit the various cities included in the excursion itinerary this week to confer with the local committees.

The membership of the Institute, including a number of recent additions, is now 262.

Guests of the Institute

Below are given the names of the representatives of foreign iron and steel industries who have accepted the invitation of the Institute to attend the New York meeting and take part in the excursion:

GREAT BRITAIN.

Col. Sir Charles Allen, director Ebbw Vale Steel, Iron & Coal Company, Ebbw Vale, Monmouth.
Lincoln Chandler, secretary Metropolitan Amalgamated Railway Carriage & Wagon Company, Ltd., Saltley, Birmingham.
David Colville, managing director David Colville & Sons, Ltd., Motherwell, Scotland.
P. N. Cunningham, manager Stewart & Lloyds, Ltd., Glasgow, Scotland.
Joseph Ellis, managing director and chairman Workington Iron & Steel Company, Ltd., Moss Bay, Workington, Cumberland.
F. Hill, managing director Richard Hill & Co., Middlesbrough.
M. Mannaberg, Frodingham Iron & Steel Company, Ltd., near Doncaster.
F. W. Manson, director Richard Hill & Co., Middlesbrough.
Alfred N. Mosscrop (Rochester, N. Y.), director Dorman, Long & Co., Ltd., Middlesbrough.
John O'Connor, manager John Brown & Co., Ltd., Sheffield.
William B. Peat, W. B. Peat & Co., 11 Ironmonger lane, London, E. C.

Sir John Randles, chairman Moss Bay Hematite Iron & Steel Company, Ltd., Workington.
S. J. Robinson, managing director William Jessop & Sons, Ltd., Brightside Works, Sheffield (representing also Sheffield Chamber of Commerce).
G. Scoby Smith, managing director Bolckow, Vaughan & Co., Ltd., Middlesbrough.
T. Scott Smith, general manager Samuel Fox & Co., Ltd., Stockbridge Works, near Sheffield.
Harry Steel, Jr., director Steel, Peech & Tozer, Ltd., Rotherham, York.
T. Frame Thomson, chairman Otis Steel Company, Ltd., 62 London Wall, London, E. C.

GERMANY.

Baron von Bodenhausen, director Fried. Krupp Aktiengesellschaft, Essen.
H. Eisner, director Hahnsche Werke Aktiengesellschaft, Berlin.
F. Harlinghausen, director Phœnix A. G. für Bergbau & Huettenbetrieb, Abteilung, Westfaelische Union, Hamm, Westphalia.
E. Schaltenbrand, chairman Stahlwerks-Verband Aktiengesellschaft, Duesseldorf.
Carl Stevens and Herr Zapf, directors Felton & Guilleaume Lahmeyerwerke Aktiengesellschaft, Muelheim a. d. Ruhr.

BELGIUM.

L. Spaak, director Societe Anonyme d'Ougree-Marihaye, Marihaye, Ougree.
E. Tonneau, director Societe Anonyme John Cockerill, Seraing.
J. Van Hoegaerden, director Societe Anonyme d'Ougree-Marihaye, Marihaye, Ougree.

FRANCE.

Herman Harjes, Morgan, Harjes & Co., Paris.
R. de Labriolle, director Comptoir d'Exportation de Produits Metallurgiques S. A., Paris.

AUSTRIA.

Wilhelm Kestranek, manager, and Dr. Eugen Herz, secretary, Prager Eisen-Industrie Gesellschaft, I Landskrongasse 1, Vienna.

New Carnegie Publications

The Carnegie Steel Company, Pittsburgh, has published two pamphlets, one on "Vanadium Steel," and the other entitled "Standard Specifications." The former is prefaced with the statement that to meet special engineering conditions it is manufacturing steels containing vanadium alone, vanadium with either chrome or nickel and vanadium with chrome and nickel. "The increasing demand for vanadium steel is due to the high ratio of its elastic limit, to its ultimate tensile strength, its great resistance to failure under dynamic stress repeatedly applied and its great strength and toughness, all these being necessary requirements in the design of locomotives, automobiles, bridges and any parts of moving machinery requiring increased resistance to failure through repeated applications of dynamic stresses." Of the heat treatment of vanadium steel it is stated that the three essential features are the determination of the correct temperature, an accurate pyrometer for measuring temperatures, and careful heating of the piece so that the temperature registered by the pyrometer at any given point is uniform through the piece. Descriptions are given of the various types of vanadium steel manufactured by the Carnegie Steel Company, with their physical properties, and the heat treatment in each case is indicated. These different types are furnished in the form of blooms, billets, slabs, plates, bars, die blocks, forgings and eye bars.

The pamphlet on "Standard Specifications" has 65 pages, 5 x 7⅝ in. It contains the specifications of the Association of American Steel Manufacturers on structural steel, special open hearth plate and rivet steel and concrete reinforcement bars; of the Carnegie Steel Company for steel wheels, steel axles and structural nickel steel; of the American Society for Testing Materials for structural steel for buildings, bridges and ships, for open hearth boiler plate and rivet steel, and for steel forgings and steel axles. The latest revisions of these specifications are given in each case.

Winnipeg Welcomes American Manufacturers

As many American manufacturers, feeling the restraint of the Canadian tariff, are establishing branch works in the Dominion, numerous cities and towns in the Canadian West are bidding for such enterprises by the establishment of municipal leagues and bureaus through which advertising campaigns are being vigorously pursued. Winnipeg, Manitoba, is an example of what can be accomplished by united efforts of this nature. Four years ago that city formed an official institution composed of representatives of several business bodies, headed by the City Council, Board of Trade, Bankers' Association, &c., entitled the Winnipeg Development and Industrial Bureau. It now has representatives of 16 business bodies on its Board of Directors, having 8700 affiliated members, 425 of whom are business firms who contribute to its financial requirements.

In welcoming the Canadian Manufacturers' Association to that city on September 13, Mayor W. S. Evans directed attention to the growing importance of Winnipeg as a manufacturing city. He pointed out that in 1900 the value of the manufactures produced in Winnipeg was $8,686,000; in 1905 it reached $18,983,248, and, according to a census taken by the Civic Bureau, the annual output has now reached $38,500,000. The wholesale houses of Winnipeg annually handle, in addition to the local manufactured output, a total of over $100,000,000 of goods made elsewhere.

That Winnipeg welcomes the manufacturer is shown by the fact that the city has under construction one of the largest and best equipped power plants on the continent, that will cost, when completed, $3,500,000. The Dominion Government has, in the past month, officially opened St. Andrews Locks on the Red River, thus placing Winnipeg in direct water communication with Lake Winnipeg—a lake 2000 square miles larger than Lake Ontario, and surrounded by a country in which raw materials of various kinds abound, a country of vast undeveloped resources that will surely yield richly for the upbuilding of Winnipeg industries.

Falls Rivet & Machine Company Changes

Important changes have been effected in the ownership and management of the two plants of the Falls Rivet & Machine Company, at Cuyahoga Falls and Kent, Ohio. The two properties have been divided, and will hereafter be operated entirely independently by separate companies. Edwin Seedhouse, who has been president of the company operating both plants, has disposed of his interest in the Cuyahoga Falls plant, and with some associates has acquired the ownership of the Kent plant, which will be operated under the old name of the Falls Rivet & Machine Company, a new company having been incorporated under that name a few days ago, with a capital stock of $150,000. Mr. Seedhouse has been elected president of the new company, and H. C. Weidner secretary and treasurer, the latter having been treasurer of the old company.

The Cuyahoga Falls plant has passed to the control of Theophilus King and associates, who, it is stated, will operate under the name of the Falls Mfg. Company. No change in the products nor extensions are contemplated. The Cuyahoga Falls plant will continue to make power transmission machinery, and the Kent plant bolts, nuts and rivets.

Kansas advices state that the supply of natural gas in the vicinity of Iola has been so greatly reduced that quite a number of industries in that section will remove to other localities. It has been an important manufacturing district for the past 14 years, covering the period after the discovery there of natural gas.

Factory Systems and Management

A Notable Contribution to Efficiency Literature

The author of the latest work on factory systems * is a consulting industrial engineer and professor of industrial engineering in Pennsylvania State College. He is one of the workers on the problems of shop organization and administration, who has grasped their essentials and has the faculty of presenting these in practical working form. Manufacturers have been well instructed in the past few years on methods of securing greater efficiency in the shop. Of the need of such instruction there can be little dispute, and much excellent literature has been produced. At the same time we have had some high sounding discourse that has rather befogged the issue—so much so as to suggest an effort to create a professional terminology that would constantly call for a professional interpreter. In contrast, a common sense book like this one is refreshing. The reader feels that he is really following a man who wants to clear up rather than obscure the subject.

The author has put in 20 years' work calculated to equip him to write on shop organization and efficiency, about half the time being spent as an employee and half in consulting work. It is, therefore, not a theoretical treatise he has produced, but one full of workable suggestions. There are 26 chapters, and the scheme is developed in logical order. At the beginning is a brief chapter on industrial engineering, in which reference is made to the evolution of the works manager who, in addition to engineering, commercial and administrative equipment, has an accountant's perception of money values. Production engineering has to do with the output of men and machines, and the production engineer must know every item that enters into his finished product and every step involved in the handling of every piece. He must be able to design as well as execute and to secure the co-operation of others in carrying out his plans. Next, the economic theory of factory location is discussed, and the rather familiar elements brought in of low assembling cost for materials, proximity to markets, availability of labor, and favorable transportation rates. For one of his illustrations the author takes the case of a blast furnace, and cites the common argument for location at or in close proximity to lake ports, of the small weight of fuel required in comparison with ore. The disparity is quite overstated, however. Doubtless what was in mind was the melting ratios of foundry cupolas in the statement that "the total weight of fuel required in furnace work is from 10 to 20 per cent. of the weight of the iron produced."

After considering the planning of factory buildings and the influence of design on their productive capacity the author treats of factory and office organization. Much of the matter under these heads naturally applies to large companies. The order department, drafting department, pattern department, purchasing department, stores and stock departments and production department are dealt with each in a separate chapter, following which comes one on foundry systems. As in most of the preceding chapters the author here introduces a number of excellent forms which have been used in his own experience. This chapter will well repay the study of foundry managers, its suggestions and forms applying particularly to the average jobbing foundry.

In considering the machine shop and tool department Mr. Diemer has in mind the small and medium size as well as the large shop. He regards most machine shops to be insufficiently officered. The foreman is often compelled to do all the following up of orders in his department, to act as expert in processing, to design new tools and to hire labor—conditions under which anything like high efficiency is impossible. The suggestions made as to subdivision of duties, and particularly the delegation of shop orders and following them up, as well as keeping the record of proper departments, are well considered.

The chapter on the cost department is one of the most important. The author considers that this department should have the attention of the best intellect obtainable; that there are few machine manufacturing establishments of any magnitude which would not find it a great advantage to have the data that may be obtained if the whole time and energies of a man were given to the arrangements and comparison of costs of individual pieces and entire machines. An hourly operating expense is urged as a key to accurate cost keeping, such expense being based on a grand total of all items in the expense account divided by the total productive hours taken from all the payrolls of the year. The next step is establishing a general hourly operating rate, keeping out of it all expense items which are strictly local departmental expenses, making distinct hourly rates for the latter so as to establish local burdens as well as a general burden rate. This puts the expense of operating high-priced and heavy power machinery where it belongs instead of diffusing it on bench and other work. Very essential in the carrying out of the scheme laid down for the cost department is the close co-operation of the head of the cost department and the head of the bookkeeping department.

Since the book is designed to be a working tool for shop managers it gives less space than some works that have preceded it to discussions of the theory of wage systems and the fixing of piecework rates. Mr. Diemer shows a sympathetic interest in the workman. For example:

> No matter how we may scoff at paternalism and the coddling of the workmen, there is no denying the fact that to make better men and women of the rank and file is a great fundamental step in the direction of a disposition on the part of the employees to become better help. Give them better air and better surroundings and they will have better health and better dispositions. But we must do more than this; we must have better craftsmen with better technique in their trades. It is right here that we are weakest, and it is here that we will first feel foreign competition. . . . It is the great majority of our people who never get beyond the seventh or eighth grade of school that are most in need of further trade education to make them better craftsmen. There is certainly tremendous need for the establishment of real trades schools with the best obtainable really practical instructors for this great class of working people.

It is shown that the human side of the shop problem must have more attention, not only in better apprenticeship systems but in rational welfare work. For the latter a good works manager can find abundant arguments, we are told, from the standpoint of advantage to the shop owner. Emphasis is put in this connection on efficiency records, which will not only show which men need to be given a chance to do better work, but also which men in the shop are most capable of showing others how, the author truly saying that the workingman will take more kindly to a demonstrator selected from among his fellows than to a speed boss or speed expert hired from outside. He considers that the great majority of men who have fallen below a standard of good performance will make a success of their tasks when helped in the proper way.

In writing of so-called betterment work, the author says that workingmen have complained to him that manufacturers are willing to spend time and money to influence municipal councils and secure switches, also to secure the election of men of their choice to public office, but little effort to secure the public betterment of the workingman's home surroundings. In so many cities, he adds, civic improvements are made in the portions occupied by the homes of the well-to-do, while workingmen's homes are on muddy streets, with

* Factory Organization and Administration." By Hugo Diemer, M. E. Cloth bound, 317 pages, 6 x 9 in. Illustrations and forms, 150. Price $3, net. Published by the McGraw-Hill Book Company, New York.

no trees, sewers or paving, and with poor sidewalks and poor lighting. It is pointed out that the greatest successes in social betterment work are in shops turning out lighter products—breakfast foods, bed springs, cash registers, &c. The greatest difficulty is encountered, as in the steel industry at Pittsburgh, in interesting adult workmen engaged in heavy labor. Clubs and entertainments do not appeal to such men.

Suggestion schemes in shops are favored, but personal letters of acknowledgment are advocated; also intelligent awards by competent judges and the prompt-putting into effect of suggestions adopted.

In the chapters on wage systems and the fixing of piecework rates, it is not so much the novelty of treatment as the thoroughly practical character of the matter that is noteworthy.

An interesting feature of the book is the final chapter, which gives a bibliography of works management. All the well-known works on the subject are reviewed, and some that are not so well known; but it is rather surprising that the author has not mentioned the work on "Factory Organization and Costs," by J. Lee Nicholson, published so recently as 1909.

The Cupola Melting Process

Some Theoretical Considerations as to Temperatures and Character of Gases

Dr. H. Holm of Nurnberg, Germany, discussed the cupola melting process from the theoretical standpoint in *Stahl und Eisen*. He compares the phenomena occurring in the lower part of the cupola with those in the corresponding portion of the gas producer. In a shaft furnace with a grate, using coke for fuel and with a regular air supply and removal of slag, the temperature of the various gases should remain continuously constant. It has been shown that with the temperatures existing above the grate of a producer, the union of the oxygen of the air with the carbon of the coke is very rapid; the maximum production of carbonic acid is found but a few inches above the grate, the exact distance depending upon the blast pressure and the character of the coke.

Again, the higher the temperature, after the oxygen has been used up, the quicker will there be a taking up of more carbon from the incandescent fuel to make carbonic oxide gas. This renders a quantity of heat latent and means a reduction in the temperature. From the analysis of the gases and their specific heat some calculations of interest can be made. The same amount of carbon burned to carbonic oxide and to carbonic acid gives heat quantities of 1 to 3.26, and by dividing the heat quantity by the specific heat the temperature can be found. In the case of the cupola the formula would be arranged to take into account the varying percentages of the two gases for different points and then making certain deductions for heat losses.

Specific Heat of Gases

Le Chatelier has worked out a table for the specific heat of carbonic acid gas at varying temperatures, as also for the so-called permanent gases (carbonic oxide and nitrogen) in the cupola. This table plotted as a diagram shows the remarkably high specific heat of carbonic acid, as against the values for the permanent gases. Now, from these things the author has constructed a diagram showing the average specific heat of cupola gases with carbonic acid running as high as 27 per cent.—the maximum limit when carbon is burned in air. This diagram also takes into consideration the variation in the specific heat of the gases at high and low temperatures. Taking, for instance, a composition of the gases of 15 per cent. carbonic acid and 11.3 per cent. carbonic oxide, with nitrogen at 73.7 per cent., the calculated temperature theoretically would be 3550 degrees F. Practically, on account of warming up the coke bed, this temperature is somewhat reduced.

About 3 ft. above the layer of highest temperature in the producer the gases correspond to 2 per cent. carbonic acid, 34.3 per cent. carbonic oxide and 65.5 per cent. nitrogen. This corresponds to a temperature of 2475 degrees F., theoretically. On account of the warming up of the coke bed, however, this is reduced to 2100 degrees F., and from this a small item for radiation should be subtracted. This shows, by comparison with the cupola, that at such a distance above the melting zone, there will exist temperatures considerably lower than the melting point of the metal itself. The highest temperature in the cupola is where there is a maximum of carbonic acid gas.

Thickness of Coke Beds

In operating a cupola practically it is impossible to do without making some carbonic oxide. Only those temperatures above the melting point of iron will be useful for melting purposes; the rest serve only to preheat the charges. The charges should, therefore, be melted as closely as possible to the zone of maximum carbonic acid. The iron melts fastest here, and is also hottest. If it melts above this zone it cannot acquire as much temperature, and in trickling down through the coke will not take up much extra. Hence dull iron with excessive coke beds. The nearer the metal gets to the high temperature zone, the faster the melting, the less sulphur absorbed, and the better the slagging off of sand, &c. The position of the zone depends upon the blast pressure and the character of the coke. The amount of air blown in determines the heat produced, and this the quantity of iron melted. Again, the velocity with which the air enters—it should be distributed evenly around the cupola—determines the necessary thickness of the bed above the tuyeres. A second row of tuyeres, not too far above the first, can be of use in burning up to carbonic acid the carbonic oxide formed, more particularly in the case of poor cokes.

Wet air for the blast is unfavorable, the dissociation of the moisture taking up heat just when it is required most. This accounts for poor heats on moist or rainy days in contrast to cold, clear ones. Heating up the blast looks advantageous theoretically, but is questionable practically. Only in the case of continuous melting in large cupolas will it be worth while to make experiments in this direction.

Coke should be large, smooth and sound, apart from its chemical composition. The smaller and more cellular, the less the chance for proper burning up, and hence reduction in the rate of melting. As stated above, too high a coke bed means that for every pound of the coke burned in the zone of highest temperature, another pound is taken and dissolved to make carbonic oxide higher up, and hence lost for economical melting. In taking up this extra pound of coke, the bed sinks, iron begins to melt, and finally arrives at the point of quickest melting, unless by this time the next intermediate charge of coke is down and brings the bed up too high again. The result is poor melting and dull iron, which is accentuated if the intermediate charge of coke is also too large.

Too low a bed means that the highest temperatures possible in the cupola are not realized, on account of an overplus of air, which means iron getting below the melting zone, necessitating dropping the bottom. Wet coke cuts no special figure in melting, as it is dried before it gets down to the critical point for melting. The crucial part of the whole discussion, according to the author, lies in the character and depth of the coke bed, everything else being equal.

Employees at the Carnegie, Pa., plant of the McClintic-Marshall Construction Company have formed a relief association for the benefit of their sick and disabled.

The Late Charles T. Porter's Advanced Ideas

Charles T. Porter, whose death was noted in *The Iron Age* of September 1, at the age of 85 years, had not only distinguished himself for his achievements during the ordinary period of a man's activity, but to a most remarkable degree maintained his interest in the lines in which he had accomplished so much. Even in his later years he was engaged in making further developments in the perfection of the high-speed engine of which he was the originator. After his death his sons placed in the hands of H. F. J. Porter, consulting engineer, 1 Madison avenue, New York, a collection of papers left by the deceased, which appeared to them of considerable interest. Among these documents are a number which deal with what the deceased termed the "Ultimate Ideal Engine." He had in mind the production of a high-speed steam engine suitable for horsepowers from 1000 to 12,000. This engine, by a novel arrangement of cylinders, employing high steam pressure of about 300 lb., and operating at 1500 ft. piston speed, secured quadruple expansion, thus developing a horsepower on three-quarters of a pound of coal. In December, 1894, he presented before the December meeting of the American Society of Mechanical Engineers four papers in which he outlined some of the principles which were to be embodied in this engine. These papers, which are published in Vol. XVI, 1895, of the *Transactions,* have the following titles: "Comparison of the Action of a Fixed Cut-Off and Throttling Regulation with That of the Automatic Variable Cut-Off on Compound and Triple Expansion Engines"; "Description of a Cam for Actuating the Valves of High-Speed Steam Engines"; "Description of an Improved Centrifugal Governor and Valve"; "Description of Improved Forms of Steam Separator, Steam Jacket and Reheater." In the first of these papers he makes the following statement:

It has appeared to me that an opening presented itself for a large improvement in the direction of economy, by employing a fixed point of cut-off, suitably selected, and regulating by means of a throttling governor, thus avoiding early cut-off entirely. There can, I think, be no doubt that, although the theoretical gain by cutting off earlier is considerable, this is outweighed many times over by the increase in the losses from cylinder condensation and waste room.

In this paper he states that he has also devised a form of governor that is entirely frictionless. The engine proposed has no steam chest, only the necessary pipe connection. These two features, he says, give the closest possible regulation. A number of tests of his devices that were made by Professor Denton are shown in these papers. In December, 1899, in discussing a paper on "The Steam Engine at the End of the Nineteenth Century," presented by Professor Thurston before the same society, he stated that he had been working continuously on his engine and had developed a complete power plant on original lines involving what he termed "The New Engineering," and he elaborated quite fully on some of the principles of his late work. He then said that he would be able to obtain a horsepower from the evaporation of three-quarters of a pound of coal per hour. "I fully intend," said Mr. Porter, "if possible, to have this system in operation before the close of the century." This was not to be, however, for at that time the steam turbine was being developed, and a little later the entire interest of the engineering profession was absorbed in the outcome of this new application of steam to power development, so that Mr. Porter decided that it would not be propitious to bring forward his project then, and it was laid aside, as he supposed, temporarily, but his increasing age precluded his ever taking it up again. Now that the turbine has found its special sphere, and there seems to be a revival of the reciprocating steam engine, the results of Mr. Porter's efforts may at last become available.

Automobile Manufacturers on Their Industry

The October issue of *American Industries* has a symposium of opinions of prominent automobile manufacturers under the title, "The Truth About the Automobile Industry." The accompanying editorial comment is this:

The automobile business is too important a part of our industrial world to permit its injury by unwarranted attacks such as those recently made by certain financial interests. The industry has not invited defense nor asked for aid, but in simple justice *American Industries* has collected, and now publishes, the personal opinions of 20 or more prominent manufacturers. A careful reading of these statements will show conclusively that conservatism is strongly advocated, and also that the leaders in the industry are thoroughly convinced that the motor car is here to stay.

E. R. Thomas, E. R. Thomas Motor Company, in taking the position that there is no overproduction of high-class cars, gives the following statistical statement, the authority for which is not indicated:

It is estimated that there are now in use 150,000 automobiles made in the season of 1909-1910, and 125,000 to 150,000 made previously, the majority of which have been resold, second-hand; and many of the earlier models have been thrown into the junk pile. Statistics prove that there are in 1910 704,000 families in the United States having an income of from $3000 to $6000 a year. There are 220,000 families having an income of from $6000 to $15,000 a year, and 43,000 families have an income of from $15,000 to $60,000 a year, with 7000 families with incomes greater than $60,000.

Alexander Winton, president of the Winton Motor Carriage Company, argues that automobile money does not lodge in the hands of the manufacturer. The latter distributes part of it to his employees and part of it to the industries from which he buys iron and steel, rubber, lumber, leather and paint. These industries in turn distribute part of it to their employees and part of it to those who supply the raw material, and so on indefinitely. Mr. Winton adds that the volume of money said to have been diverted from other channels into the motor car channel has been grossly exaggerated. "Even waiving that point, whatever volume of money has been expended in motor cars represents money in motion, and that money in motion has kept busy the wheels of industry in a thousand plants that otherwise would have been practically stagnant since the panic of 1907."

D. M. Parry, president Parry Auto Company, says that there are in the United States 1,500,000 families who have the income to warrant their ownership of one or more cars; also that reports show that less than 5 per cent. of the autos sold have been bought on borrowed money. Mr. Parry considers that the outside edge of the demand for the automobile has hardly been scratched.

The Ingram-Richardson Mfg. Company, Beaver Falls, Pa., manufacturer of porcelain enameled signs, is building an addition to its brushing and stencil rooms, consisting of a fireproof structure, 90 x 100 ft., with a 40 x 40 ft. L at one side. The building is of saw-tooth roof construction, two stories. The company has added two new fusing furnaces of the Houston type, giving it a total of nine fusing furnaces. It is also building two sheds of rust-resisting corrugated iron, to cover the furnaces recently installed.

The J. D. Smith Foundry & Supply Company, Cleveland, Ohio, announces that it has purchased the patents of the Bayer Pattern Plate & Mfg. Company of the same city, and hereafter will manufacture the latter's match plate composition and also the combination roll-over and squeezer molding machines.

Baird Open Back Press Attachments

Reference was made in the illustrated description of the Baird open back press in *The Iron Age,* September 15, 1910, to the fact that various attachments might be added after purchase to a plain press. The press, which is of a new design, built especially for heavy blanking and stamping, is provided with finished seats for applying the attachments shown in the accompanying engravings.

The transfer attachment, Fig. 1, allows performing practically all the work usually done in a cut-and-carry press, and is cheaper both in initial tool cost and maintenance expense, since only one set of side tools is required and the degree of accuracy necessary with cut-and-carry tools is not as great with transfer tools. This attachment is furnished with an automatic stop, which will positively stop the press if the blank is not transferred to its proper position and prevents damage to tools. The attachment is compact and may be easily applied, as the shaft of the press projects to receive the cam, and a single bracket carries the rest of the attachment, adjustments being provided to care for inaccuracies. The distance from the blanking to the stamping or forming tools need not be an exact dimension, as the position of one end of the transfer finger is located by a stop and the transfer slide is actuated by a face cam. This finger, which is mounted on the end of the transfer slide, is fitted to the shape of one side of the blank and carries it from under the die through which it has been punched over to the stamping and forming tools. Positive motion is provided for the slide on the return stroke only to insure the finger being carried from under the blanking tools.

In Fig. 1 another attachment—namely, the back roll feed is also shown. This together with the side roll feed attachment illustrated in Fig. 2 can be added to the open back press and can be adjusted to feed the metal in either direction by throwing a pawl to one side or the other of the center. This attachment is more commonly used for feeding the metal from front to back, and consists of tool steel rolls mounted in a frame and provided with adjustable springs to hold them together and make them grip the metal. Either type is actuated through a pawl and ratchet by an adjustable pin in the plate on the end of the crank shaft. By varying the distance between this pin and the end of the shaft, the length of the metal to be fed at each stroke can be regulated exactly.

For work such as redrawing or forming shells, piercing buttons, assembling button parts, or when an article is required to be carried to several tools for successive operations, the friction dial attachment shown in Fig. 3 is provided in which the articles are placed by hand or automatic feed. The dial is generally actuated by a pawl engaging with a ratchet either cut in the dial itself or secured to it. The dial is on a reciprocating slide, which in some cases is connected through a lever to an adjustable pin in a plate on the crank shaft of the press. An attachment for positively locking the dial in position before the tools operate is sometimes provided, as well as a positive stop which automatically prevents the tools from descending if the dial fails to turn to its proper position. Another attachment which is not shown is an automatic lifting pin for raising articles out of the die after stamping to facilitate their being knocked off and for similar purposes.

These attachments can also be applied to the pillar pattern presses of this company. The open back type is intended for heavy blanking and stamping, while the pillar pattern presses are used for light work by jewelry, novelty, brass and steel goods manufacturers.

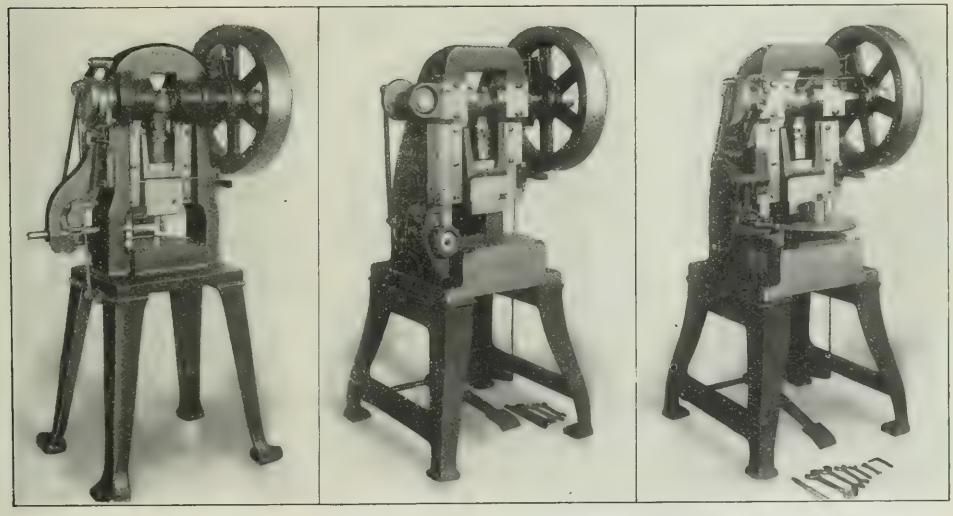


Fig. 1.—The Transfer Attachment. Fig. 2.—The Side Roll Feed Attachment. Fig. 3.—The Friction Dial Attachment.

Three Attachments Supplied for the Open Back and Pillar Presses, Made by the Baird Machine Company, Oakville, Conn.

A New Platinum Alloy.—William C. Finck, a manufacturing jeweler of Elizabeth, N. J., has patented a platinum alloy which is a substitute for pure platinum for many purposes and only costs about 3 per cent. as much. It melts at a temperature 600 degrees lower than platinum and does not corrode or tarnish under the influence of the atmosphere or acid fumes, but is slightly discolored by sulphur. It is claimed to wear as well and better than gold and not to be distinguishable from platinum when alternated with gold in chains. It is being used for diamond mounting and jewelry and it is believed will make good ignition points for spark plugs and possibly also may be available for use in cauterizing instruments and wood burning tools.

Edgar Allen & Co., Ltd., 434 West Randolph street, Chicago, manufacturers of tool steel, have leased the entire first floor of the building at 166 South Clinton street, Chicago, for additional storage facilities made necessary by the expansion of their business.

The Rotary House Service Pump

A Pittler Model to Furnish an Automatic Water Supply

A type of house service pump has been recently introduced into this country from Germany, where it is in extensive use and has been operating successfully for several years. The pump is the invention of Wilhelm von Pittler, Berlin, Germany, and the American rights, including those for the controlling apparatus and other accessory devices, have been secured by the Rotary House Pump Company, 103 Park avenue, New York City. Fig. 1 is an exterior view of the pump directly connected to an electric motor, while Fig. 2 shows the developed surface of the working cylinder. It is applicable to all classes of pumping work and combines the advantages of the rotary action of turbine or centrifugal pumps with the positive delivery of a displacement or piston pump.

The pump consists of a rotating bronze drum secured to the shaft and having slots parallel to the axis, through which small vanes slide axially, their movement being governed by two cam heads having parallel faces which fit closely on either side of the rotating drum, the whole being inclosed in a casing containing ports which connect with an inlet and outlet. The end faces of the rotating cylinder are plane surfaces, perpendicular to the shaft, while the end cams have a specially designed surface forming a series of working chambers around the shaft at either end of the rotating drum. The annular spaces between the cam heads and the drum are alternately filled with water from the inlet by the suction effect occurring as the vanes recede from the inlet ports and emptied through the outlet ports by the piston action of the next approaching vanes. The ends of the vanes enter these working chambers by the action of the cam surface at the opposite end. There is a port in the casing over the first part of each working chamber connected to the inlet, and as the vane moves under this port water is sucked in between the rotating cylinder and the cam to be discharged through a second port at the other end of the chamber to the discharge pipe. During the time the vane is under either port it is moving axially and is subjected to equal pressure on both sides. Between the ports the surfaces of the cams are parallel to the ends of the rotating cylinder and the vane has no axial movement. No sliding action of the vanes occurs in the cylinder except when they are under open ports and subjected to equal pressure on both sides, and whenever the vane is under load and pushing water forward in the pumping chamber it is moving along the straight part of the cam head and rotates with the cylinder, but does not slide. This absence of any eccentric action of the vanes and the even balance of all moving parts about the shaft differentiate the Pittler pump from other types of rotary pumps.

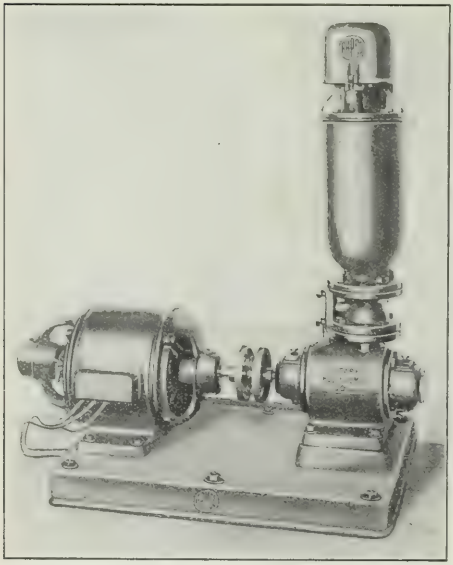


Fig. 1.—A 300 Gal. House Service Pump, Made by the Rotary House Pump Company, New York City.

Fig. 2 shows the diagrammatic representation of the developed pump surface. The vanes sliding between the two parallel and curved guiding pieces pass both the suction and the discharge openings in the casing once in each complete revolution of the shaft. In position I, at the left, the upper edge of the sliding vane is just entering the suction chamber which is open to the suction port. When moving toward the right from I to II under the suction port, the vane is surrounded by inflowing water with balanced pressure on either side, the vane sliding endwise out of the rotating cylinder. At the moment this sliding vane reaches the end of the suction chamber (position II) the preceding vane passes the beginning of the discharge port, so that the first vane in moving toward the right forces the water in front of it into the discharge port. In moving from position II to III the vane forces the water ahead of it by its piston action to the discharge port, at the same time sucking water with the opposite side. During this period the vane does not slide in the rotating cylinder, so there are no great losses by friction. From position III to IV the vane slides under the outlet with balanced pressures on either side, the sliding of the vane against the curve taking place without any great resistance. In moving from IV to I the vane is at rest, remaining entirely in the rotating cylinder, its purpose being to tighten the suction chamber against the pressure chamber.

On the other side of the drum the same action takes place, only at a difference of 180 degrees. Each vane with each full rotation of the drum therefore sucks and forces a quantity of water which has twice the volume of the space inclosed between the two sliding vanes in positions II and III. At the end of the suction and forcing periods of one sliding vane this one is immediately replaced by the full side of another one, and therefore an absolutely equal quantity of water is being constantly pumped or drawn in for every position of the shaft if it is rotating uniformly.

Solid vanes would give satisfactory service if perfectly clear water was handled at all times by the pump, but nearly all water contains grit or solid matter of some kind, which causes wear on the ends of the vanes butting against the cam heads. The pump is therefore constructed with vanes divided in the center and pressure is introduced between the two halves by leading a small channel from the discharge port to a groove which entirely surrounds the rotating cylinder. The vanes are always kept in contact with the cams at either end, and the wear on their ends is automatically taken up, thus maintaining the efficiency of the pump. The rotating drum being of the bronze and the vanes lignum vitae, they cannot stick or rust together. The balancing effect of the pressures reduces ordinary wear to a minimum, and with this split vane construction the pump is said to maintain its volumetric efficiency even when pumping mud and sand. To enable the pump to start without priming these vanes are held apart by a spring until pressure is developed between them.

The action of the pump is like that of a cylinder of infinite length with a piston moving through it, forcing the water ahead of it at constant speed. In this way the water issues from the pump without spurts or vi-

brations, which is an advantage, as pipes are much less apt to burst under a constant pressure and the familiar throbbing of pumping systems operated by reciprocating pistons is said to be entirely eliminated. A high efficiency over a wide range of speeds is made possible by simplicity of construction, the lack of heavy reciprocating parts, and the practically frictionless sliding of the vanes. Thus high efficiency high speed pumps are possible, and the Pittler rotary pump is designed for direct connection with any type of electric motor. The light moving parts have little inertia and require no excessive starting current. The head against which the pump will deliver water depends on the size of the motor and the strength of the material of which the pump is constructed.

Although the Rotary House Pump Company's standard pump may be used as a substitute for other types for house service and similar work, it is also adapted for operating without tanks under all conditions of suction and head. This no-tank system can be used to provide a constant and reliable water supply without the use of intermediate water storage tanks for high buildings, hotels, apartment houses and other buildings too high to be served by the regular city pressure, and in the country where no regular water supply is available. It consists of a Pittler pump fitted with a small air chamber and automatic switch, direct connected to an electric motor and a bed plate on which the pump and motor are mounted. The air is compressed in the top of the air chamber to a predetermined pressure, when it actuates a small diaphragm throwing out the automatic switch and cutting out the motor. When the pressure falls in the air chamber, due to water being drawn from the system, the reverse action occurs, the diaphragm being actuated be a spring. It can be seen from the above that the system is entirely automatic, the motor driving the pump only when water is being drawn from the system.

The action of this pump when direct connected to an electric motor insures a steady flow of water without any pulsations in the system. The pump itself, being entirely inclosed, runs practically noiselessly, without any of the attendant vibration so characteristic of reciprocating pumps. The installation cost is very low with this system, a comparatively light foundation being sufficient. The moving parts in the pump itself are few in number and simple in construction, there being absolutely no valves, and the wear and upkeep are extremely small. Any broken parts may be replaced in a few minutes by simply removing a cam head. The rotating cylinder containing the sliding vanes may then be taken out of the casing for inspection. The only attention necessary with this system is to see that the bearings of both the motor and pump are sufficiently supplied with lubrication from time to time.

The pump has an initial commercial efficiency of 80 per cent. or over, maintaining it for years. The design of the Pittler pump is such that it immediately picks up its load without requiring a large starting current. The high efficiency of the Pittler pump, when direct connected to a standard high efficiency electric motor, combines the advantages in one unit, which operates only when there is a demand for water, at which time the motor draws a minimum amount of current.

With this new system the disadvantages of the tank system, such as freezing in winter and supplying warm and stagnant water in summer, are eliminated, and no complicated mechanism or wiring system is required to maintain the water pressure. Where a tank system is employed all of the water used has to be pumped to a roof tank regardless of whether it is used on the ground or the top floor, while in this system it is never lifted higher than needed. This results in a considerable saving in the electrical energy used to operate the pump and the piping to the elevated tank, as well as the first cost and maintenance of the large tank and the extra wiring from the tank switch to the basement pump.

Foos Gas Engines for Government Work

The complete success of two installations of large Foos vertical gas engines by the United States Government in Ohio River improvement work has led to the placing of another order with the Foos Gas Engine Company, Springfield, Ohio, for six engines, four of which are 100 hp. each, of the three-cylinder vertical type, which will embody the new feature of the Foos design. This order will be divided and shipped to two different points where the engine will be used in the operation of locks which the Government is building in the Upper Ohio Valley to provide sufficient water to obtain continuous freight navigation during the dry season. The lock at each dam is operated by compressed air, furnished by compressors belted direct to each of the 100-hp. Foos units.

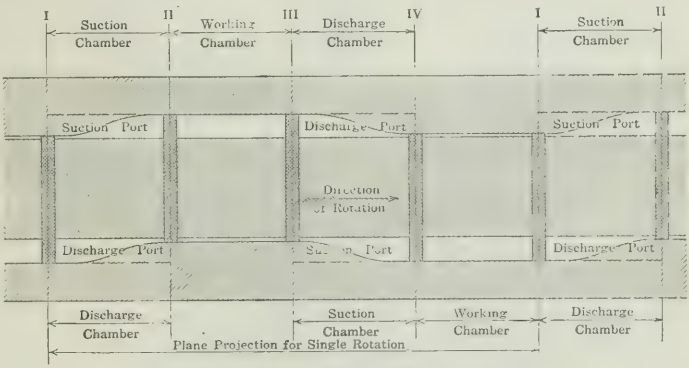


Fig. 2.—The Developed Surface of the Pump Drum.

The contract with the Government requires that not only each unit should be inspected at the factory of the company, but also that all material going into their manufacture should be inspected, and that the final tests should be witnessed by Government engineers. They made their own observations and checked all the results from their personal data. All the required conditions were fully complied with. The other engines will be used for auxiliary purposes. The order calls for engines operating on natural gas, but each unit will be so arranged as to be quickly adapted for the use of gasoline or kerosene, in order to prevent any interruption of the service in case of a shortage or temporary failure of the gas supply.

In connection with the free public lectures for adults arranged by the Board of Education of New York City, Dr. Charles E. Lucke, professor of mechanical engineering at Columbia University, will give eight lectures on "Power" on consecutive Saturday evenings, beginning October 1, at St. Bartholomew's Hall, 205 East Forty-second street. Bradley Stoughton will give a course of lectures in November at Cooper Union and at Institute Hall, 218 East 106th street, on the "Metallurgy of Iron and Steel."

A New Cincinnati Universal Grinder

One with Simplified Drive and Other Operating Conveniences

A new universal grinder has been recently developed by the Cincinnati Grinder Company, Cincinnati, Ohio. While essentially a manufacturing tool for grinding cylindrical work, either straight or taper, and chuck and face plate work, either internal or external, it is also adapted to toolroom use for grinding gauges, dies, jigs and fixtures, reamers and milling cutters, &c. The machine has speed and feed boxes, with which the operator can obtain instantly, from a central position, any speed or feed with which the tool is provided, thus eliminating all overhead cone pulleys and mechanical speed changing devices and reducing the overhead driving equipment to a drum and single shaft with four pulleys. Other special features are a massive headstock with one pulley, for both live and dead center grinding; a table tarry at points of reversal which can be varied, an automatic cross feed with positive stop for use in producing duplicate diameters, the complete separation of spindle speeds and table feeds making possible the use of the correct feed with any speed, and a single lever, convenient to the operator, for instantly starting or stopping both the rotation of the work and the travel of the table. Four sizes of machine are built, the No. 2 grinder being the one illustrated. Fig. 1 is a front view of the machine and Fig. 2 is an end view showing the drive.

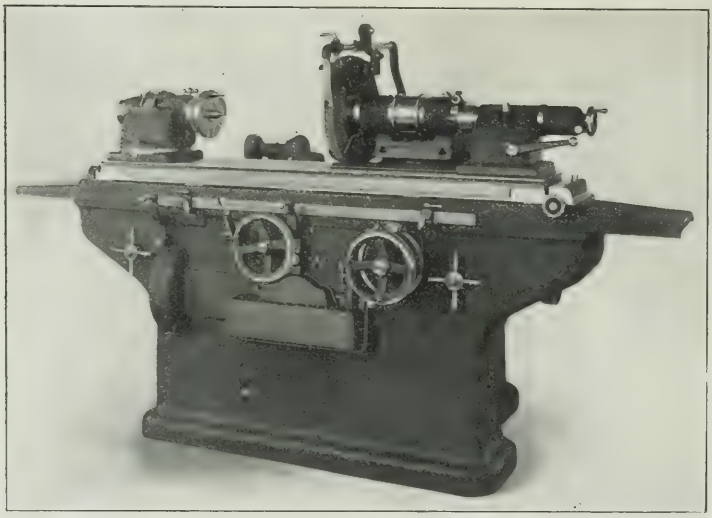


Fig. 1.—The New No. 2 Universal Grinder Built by the Cincinnati Grinder Company, Cincinnati, Ohio.

The Machine in Detail

Two tables are provided, one of which swivels and the other slides. The former has its bearing on the sliding table, turns on a central stud and can be set for grinding tapers without throwing the head and foot stock centers out of alignment. Scales graduated to read angles in degrees and taper in inches per foot are given, and the adjustment is made by a rack and pinion at the end of the table, with direct reading scales to indicate its position. To move the table through a distance greater than the graduations marked on the scale it is not necessary to disconnect any parts, as the adjusting device permits the table to swing through an arc which is limited only by the wheel slide. The sliding table has a reciprocating motion on the ways of the main base casting that is controlled by adjustable dogs operating against the reversing lever. This lever operates a clutch of the load-and-fire type, contained in the automatic feed plate, which is a complete unit, bolted to the front of the machine and easily removed. The travel is entirely independent of work speeds or the speed of the grinding wheel, and the work can be traversed the full width of the wheel face at each revolution. Power for moving the table is transmitted through worm gearing. The reversing dogs provide fine adjustment for grinding to shoulders, permit the table to be traversed beyond the points of reversal without disturbing the initial setting, and, after the table has been returned to the original position, readjust themselves, thus preventing it from feeding too far and injuring the work.

The headstock swivels on a graduated base and is locked to the swivel table by a large stud bolt sliding in the T-slot. The hollow spindle is threaded at the front end and has a taper hole. The work is revolved through accurately cut, powerful gearing, while a single pulley with one belt is available for either dead or live center grinding, the pulley being locked to the spindle during the latter operation. A special feature in the construction of the headstock is a supporting way which is always directly under the work, while the alignment is preserved through the use of a depressed inverted V, its upper edge level with the table surface. The footstock is secured to the swiveled table and has the same taper and preserves its alignment in the same way as the headstock.

The wheel stand is rigidly supported by the wheel stand pedestal cast integral with the base and extending to the floor. The slide rests upon long and wide ways, and, it is claimed, will not jump in or stick when a delicate adjustment is being made or lift under heavy cuts. This also swivels on a graduated base, and the transverse movement is controlled and adjusted by a hand wheel on the front of the machine graduated to read in thousandths of an inch on the diameter of the work. For still finer work a feed graduated to read in quarter thousandths of an inch on the work diameter is available by locking the automatic cross feed and turning the thumb wheel to suit the adjustment required. The automatic cross feed is adjusted by a thumb wheel, and covers a range varying from 0.00025 to 0.005 in. at each reversal of the table and furnishes a great diversity of changes. When the work has been reduced to the required size the feed is automatically thrown out.

The back rests used to support long, slender shafts take up the reduction in grinding, thus making possible a great uniformity in diameters. The base is made in box section, thoroughly ribbed and braced, and forms a massive unyielding unit. A three-point bearing is provided, compensating for any unevenness in the flooring and maintaining perfect alignment. A centrifugal pump is furnished, consisting of a fan revolving horizontally in a case immersed at all times in the lubricant pumped.

The principal dimensions and specifications of the

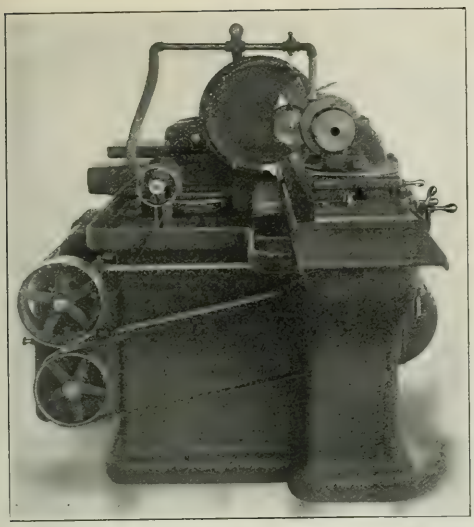


Fig. 2.—End View of the Cincinnati Universal Grinder, Showing the Drive.

different sizes of grinders are given in the following table:

Size of machine	No. 1.	No. 2.	No. 3.	No. 4.
Swing over table, inches.	10¾	13	13	13
Distance between head and foot stock centers, inches	34	42	54	68
Maximum angle of swivel table, degrees	8½	8½	7	6
Maximum taper, inches per foot	3½	3½	3	2
Maximum swiveling angle of headstock, degrees	90	90	90	90
Diameter of headstock spindle, inches	2¼	2¾	2¾	2¾
Diameter work carrying centers, inches	1	1¼	1¼	1¼
Jarno taper of spindle holes	No. 8	No. 10	No. 10	No. 10
Number of work speeds	10	10	10	10
Range of work speeds, revolutions per minute	25 to 288	21 to 242	21 to 242	21 to 242
Number of table feeds	16	12	12	12
Range of table feeds, inches	6 to 66	6 to 90	6 to 90	6 to 90
Diameter of grinding wheel spindle, inches	2¼	2¾	2¾	2¾
Size of grinding wheel driving pulley, inches	4⅜ x 2⅝	5¼ x 3⅛	5¼ x 3⅛	5¼ x3⅛
Size of grinding wheels, inches	12 x 1 12 x ¾	14 x 1½ 14 x 1	14 x 1½ 14 x 1	14 x 1½ 14 x 1
Diameter of countershaft pulleys, inches	10	12	12	12
Width of countershaft pulleys, inches	3¼	3¾	3¾	3¾
Speed of countershaft, revolutions per minute	460	480	480	480
Hight from floor to center of work carrying spindles, inches	44	44	44	44
Power required, horsepower	2 to 4	4 to 7	4 to 7	5 to 8
Floor space required, in.	41 x 96	49 x 112	49 x 124	49 x 164
Net weight of machine, pounds	4,200	5,300	6,000	6,900
Domestic shipping weight of machine, pounds	4,600	5,900	6,700	8,000
Foreign shipping weight, pounds	4,800	6,300	7,300	9,000

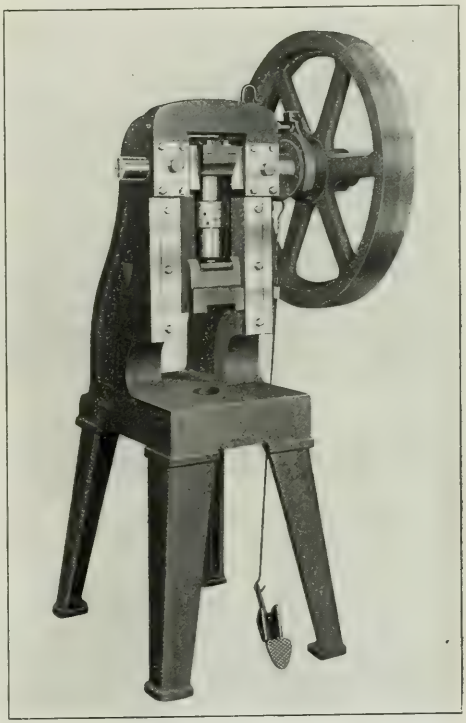
The equipment regularly furnished with this machine includes one internal grinding fixture, a draw-in collet, one three-jaw combination chuck, a face plate, two combination plain and universal back rests, center and tooth rests, two grinding wheels, a set of dogs, water guards and the necessary adjusting wrenches.

St. Joseph, Mo., has a population of 77,403, a decrease of 25,576, or 24.8 per cent. under 102,979 in 1900.

New La Salle Single Action Open Back Press

A new heavy No. 4 open back power press has been placed on the market by the La Salle Machine & Tool Company, La Salle, Ill. While no radical changes have been made from the usual design followed to produce a plain, strong, durable press, the tool has been made more rigid by using a little more material where it would do the most good.

One of the special features of the press is the adjustment of the slide. This is accomplished by a sleeve connection made by fitting a large steel nut, or internally threaded sleeve to the lower member of the connection and connecting both members by a right and left hand screw. This screw is turned by a collar through which the screw is fitted and both are case hardened. An exceedingly strong adjustment is obtained which, it is claimed, will not loosen from the shock or strain of operation.



The No. 4 Single Action Open Back Press. Built by the La Salle Machine & Tool Company, La Salle, Ill.

The following table gives the principal dimensions and specifications of the press:

Hight from bed to center of shaft, inches	27¾
Hight from bed to slide when down, inches	7
Stroke, inches	3
Distance from center of slide to upright, inches	4⅛
Distance from center of slide to front of bed, inches	8⅝
Width of bed, inches	19
Width between uprights, inches	9
Distance between centers of die bolts, inches	9
Diameter of hole through bed, inches	5
Diameter of flywheel, inches	44
Face of flywheel, inches	4½
Weight of flywheel, pounds	500
Weight of press, pounds	2,300

An adjustable brake is provided to prevent the press overrunning when the clutch is released. The members of the clutch are of hardened tool steel, and the sliding dog engaging the flywheel strikes on a hardened steel plug inserted in a slot in the flywheel thus preventing excessive wear. The flywheel is fitted with phosphor bronze bushings, and all bearings are scraped and adjustable for wear.

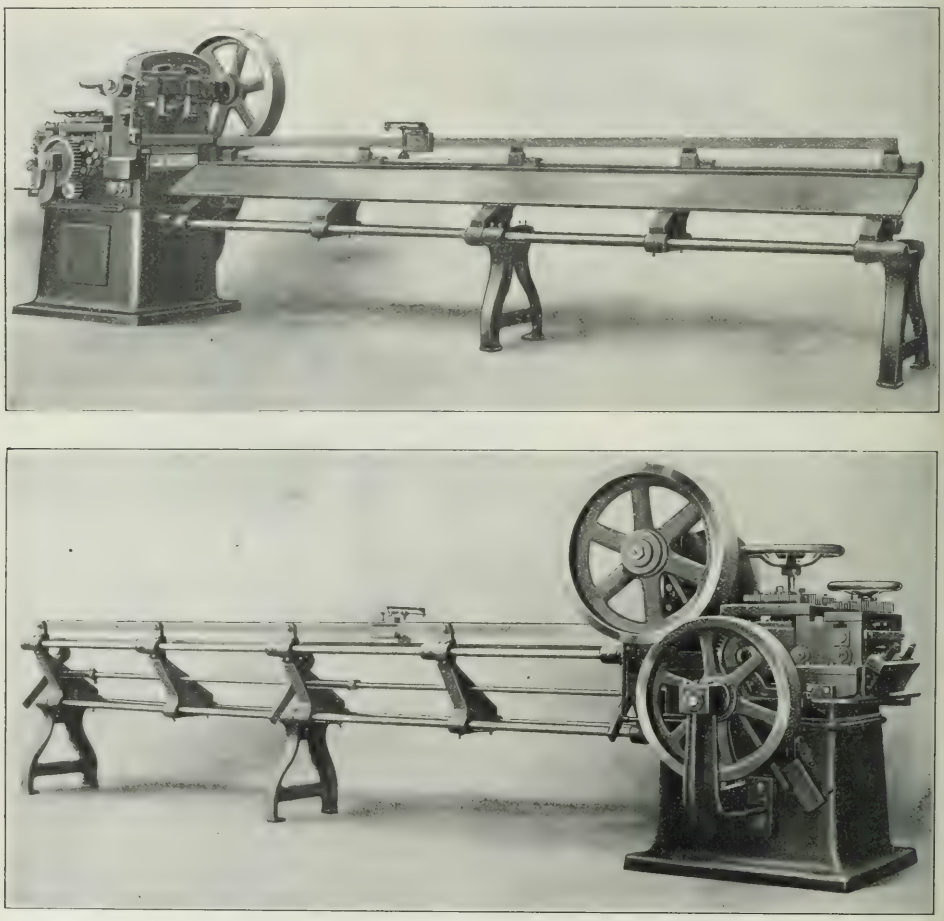
A Sheet Metal Straightener and Cutter

The Improved Type Made by F. B. Shuster Company

The sheet metal straightening and cutting machine shown in the illustrations is designed by its builder, the F. B. Shuster Company, New Haven, Conn., to take strip metal up to 14 in. wide by 0.065 in. thick. It is known as the No. 2 machine and contains several radical improvements upon the previous type. Instead of seven rolls it has five and the rolls are double driven through pinions and gears, with a set at either side of the machine. This arrangement equalizes the strain on the rolls and pinions. A most important innovation is the separate control of the rolls and the cutting-off mechanism, which is deemed necessary to take care of slivered or imperfect metal, cutting out such pieces, and in cases where the metal becomes tangled on the reel, or during other similar trouble. The control of the rolls is through a bell lever, the handle of which extends around to the front of the machine within easy reach of the operator. The lever disengages the clutch through which the straightening rolls are driven. This lever is also used in starting the coil into the rolls.

The cutting-off mechanism has electric control operated either automatically through the stop gauge of the table or by an electric button located at the front of the head. The switch at the side of the button throws out the current and is employed when the operator is working about the machine making adjustments or repairs. The electric gauge is very sensitive which makes possible the straightening of very thin metal in very narrow strips.

The machine consists of a pair of feed rolls which pass the metal through the straightening rolls, on between the cutting-off knives and thence to the gauging table. On the brackets supporting the table is fastened a bar upon which is a movable gauge. As the metal passes out upon the table it strikes a swinging part of the gauge, which operates the electric connection and throws in a clutch in the balance wheel of the cutting-off press and at the same instant releases a clutch in the straightening rolls, thus stopping the rolls during the moment of cutting off. The electric current controls an electric latch which operates a lever actuating the two clutches always throwing out one as it engages the other. On the completion of the revolution which cuts off the work the clutch lever is thrown to its position in engagement with the electric latch, starting up the rolls again and stopping the press. During the cutting off, the table is depressed quickly to an angle of 45 degrees, delivering the metal to a rack or other receptacle. The machine has a friction device which



Two Views of the New Sheet Metal Straightening and Cutting Machine Built by the F. B. Shuster Company, New Haven, Conn.

immediately stops the momentum of the rolls when the work strikes the gauge. The adjustment of the feed rolls and straightening rolls is obtained by the hand wheels which are operated independently of each other.

The machine may also be used in straightening strip in lengths longer than the capacity of the table. The gauge is removed and the cutting off is accomplished by the operator by means of the electric button. The standard machine will cut lengths up to 12 ft., but the table may be furnished in longer lengths if desired. The machine is capable of wide adaptation for special purposes. A typical case exists in one of the brass works where a fork is substituted for each pair of guide rolls and the machine is made to straighten and cut to length, simultaneously, four strips fed from separate coils. This type of machine is manufactured in a full line, straightening flat stock ⅛ in. wide by 0.016 in. thick up to 14 in. wide.

Special Crosby Metal Stampings

New possibilities are being continually found for the substitution of metal stampings for machined castings and built up parts. Some special work recently done by the Crosby Company, Buffalo, N. Y., is illustrated herewith. Fig. 1 is the rear axle housing for an automobile, Fig. 2 a pressure plate for an automobile clutch, Fig. 3 an interior ribbed piece for a cream separator, Fig. 4 its bowl and Fig. 5 the front hub for an automobile.



Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5.

Examples of Special Metal Stampings Recently Made by the Crosby Company, Buffalo, N. Y.

The rear axle housing for automobiles is probably the most important and most interesting class of stamping placed on the market by this company within the last year. That shown is one of several types made. It is 49½ in. long, measures 12 13-16 in. across the top and 9 in. deep, and the opening is 10⅜ in. in diameter, while the ends are 3 in. in diameter. The piece is made from special sheet steel 3-16 in. thick and is formed in two halves, which are autogenously welded on a plane parallel with the face of the side having the opening and 3 in. below it. The making of the lower half of the housing, including the oil hole, and setting up a neck around it, requires six operations and the upper half requires five operations. After the weld has been made the tubular ends are sized on a draw bench to exact roundness and correct diameter. No annealing is required except at the point where the small oil hole is placed, this being necessary to set up the neck without producing a fracture. This construction is a great advance over former methods, as it is not only stronger and more rigid, but lighter than any used heretofore, and the cost is less when large quantities are required.

The pressure plate for the automobile clutch, Fig. 2, is considered one of the most difficult pieces ever produced from sheet steel. The lower diameter is 8 in. and the upper one 3¼, with a 2 1-16-in. bore. The hight is 4 3-32 in. The plate is made from metal 5-32 in. thick and requires 28 press operations, a lathe operation for trimming the flange, and six annealings. Pressing this piece does away with four or five castings and simplifies the construction of the clutch greatly.

The cream separator parts shown in Figs. 3 and 4 represent a very high development in the art of producing cold drawn parts from sheet metal. The ribbed inner piece, Fig. 3, is made from 0.05-in. sheet copper and requires 20 press operations and one lathe operation, with 10 annealings. The diameter of the bell mouth at the left is 4½ in. and the overall length is slightly in excess of 5¼ in. The bowl, Fig. 4, is made from 0.134-in. sheet steel and requires 19 press operations, one lathe operation and eight annealings. The hight of the bowl is 3 11-32 in. and the internal diameter is 4.095 in.

The automobile hub is also an especially difficult piece. This hub is made from sheet steel 5-16 in. thick, and in the neck, where the diameter is reduced from 3⅝ to 2¾ in., the metal is upset to increase the thickness. This is done not so much to provide strength as to give as large a seat as possible in the expanded end upon which to rest the bearings. With this hub is used a loose flange of the ordinary type employed for artillery wheels, which is also made from sheet steel. Twenty-five press operations and nine annealings are employed in making the hub, in addition to a lathe operation for facing the edge of the small end. Although this makes the pressed hub more expensive than a cast malleable iron one, it possesses the advantages of being lighter and very much stronger. The outside diameter at the bottom is 7⅝ in. and the total hight 5 23-64 in.

The rear axle housing requires very little additional work on the part of the manufacturer using it and is furnished almost ready for assembling, and although the clutch pressure plate and the hub require considerable machining, the amount is said to be much less than is necessary when either forgings or castings are used. The bowl for the cream separator also requires considerable machine work, but the ribbed inner piece is practically finished as it leaves the maker's hands.

The Keystone Steel Foundry Company, Avonmore, Pa., on the West Penn division of the Pennsylvania Railroad, has recently made three shipments of steel castings, composed of gears, clutches, pinions, &c., for use on the Panama Canal. It also has a contract for 600 tons of gray iron furnace casting work for a large iron and steel plant in the Youngstown district, with other contracts for miscellaneous mill castings. Edward Hermes, formerly chief chemist and in charge of the foundry of the Pittsburgh Steel Foundry, Glassport, Pa., is now superintendent of the Keystone Steel Foundry Company.

The Triumph Electric Company, Cincinnati, Ohio, announces a change in the address and management of its Chicago office. W. R. Bonham succeeds F. L. Merrill as manager, and the office is located at 275 La Salle street, instead of in the Manhattan Building as formerly.

For the first time since the present fiscal year began, on July 1, the United States Treasury in September took in more money in a month than it had been obliged to pay out. The month's end showed a balance of $1,460,808.18 over all disbursements, including Panama Canal expenditures.

The New Bates Corliss Engine

Adapted to Higher Speeds and Steam Pressures

A tendency is growing to run Corliss engines at higher speeds and at higher steam pressures than was thought practical a few years ago. To adapt its product for use under these conditions the Bates Machine Company, Joliet, Ill., has recently improved its Corliss engine. Fig. 1 shows the heavy duty cross compound direct connected engine as redesigned, while their weight, at these higher speeds, would soon pound out the valve gear bearings and make them noisy.

Increased temperatures accompany higher steam pressures and increase the expansion of the cylinders while the engine is running. To take care of this expansion the cylinders are now set in planed recesses on sole plates and kept in position by bolts passing through elliptical holes. In this way the true center line is maintained and the fastening bolts can slip without being subjected to undue strains. The dash pots used are very light in weight and said to be noiseless in operation. They are of the differential

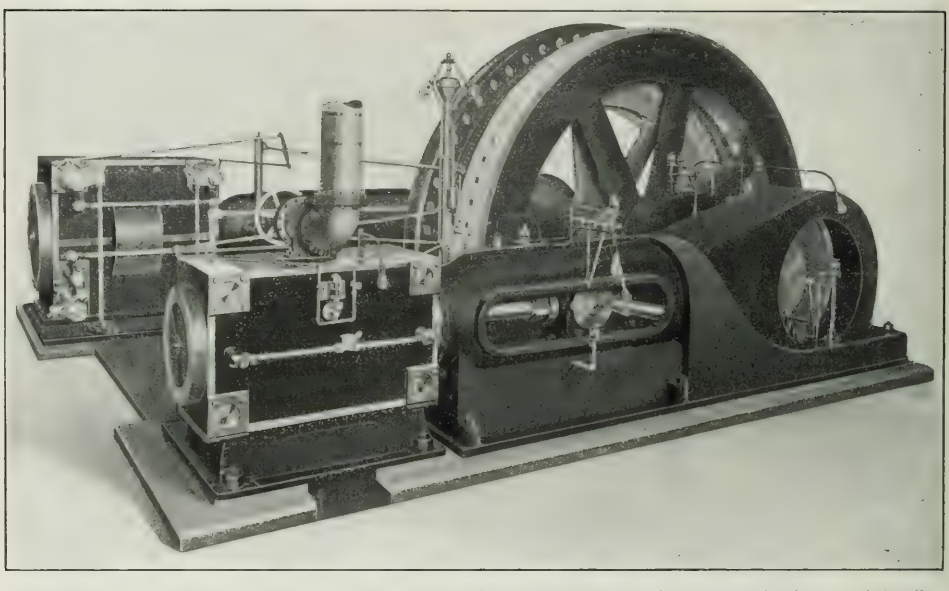


Fig. 1.—The Heavy Duty Cross Compound Direct Connected Corliss Engine, Built by the Bates Machine Company, Joliet, Ill.

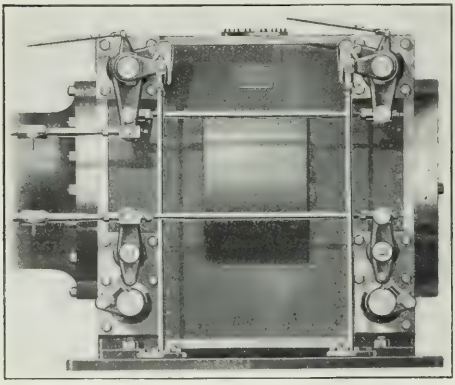


Fig. 2.—The Double Eccentric Valve Gear.

Figs. 2 and 3 illustrate the double eccentric valve gear and the cross head and wrist pin used.

The frame must take up and absorb all the shock incident to running the engine and the higher the more severe are the strains imposed upon it. To care for this effectively, the new bed is very heavy and cast in one piece which has a broad bearing on the foundation throughout its length. Another improvement is the elimination of heavy wrist plates on all the large valve gears and the substitution of straight line drives with link motion. The light rods have practically no inertia and keep their adjustment under the most severe duty, while wrist plates, because of type which proportions the amount of cushioning air to the lift automatically and does away with the hammering of the valve gear or the pounding of the dash pots when the load is changed.

Recent installations include a 2000-hp. engine complete with rope drive for driving a train of finishing rolls at the Massillon Sheet & Tin Plate Mill, Massillon, Ohio. This has been in operation about seven months and has averaged about 150 hours continuous running each week. Another engine, directly connected to an 85-kw. electric generator, is installed at the factory of the R. J. Reynolds Tobacco Co., Winston-Salem, N. C. A duplicate of the Massillon installation is now being built for the Canton Sheet & Tin Plate Mill, Canton, Ohio, and three cross compound engines each directly connected to 1000-kva. alternators in the plant of the Continental Portland Cement Company, Continental, Mo., are being installed.

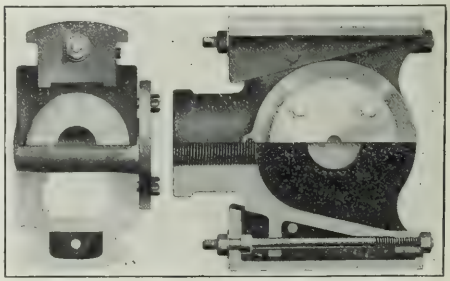


Fig. 3.—The Wrist Pin and Crosshead Used on This Engine.

These generators operate in parallel and very close regulation is therefore demanded from the engines. To facilitate putting the engines in step a rather ingenious device is used. Small electric motors are attached to the sliding weight of the governor and connected to double throw switches on the switchboard. In synchronizing the alternators, the operator can, while watching the synchroscope, manipulate these switches to vary the speed of any engine until all are running exactly in step.

Kentucky Steel and Sheet Plants Inspected

An inspection tour by the architects, sheet metal jobbers and members of the Master Sheet Metal Workers' Association of Cincinnati and vicinity was made September 20 to the plants of the Andrews Steel Company, Andrews, Ky., and the Newport Rolling Mill Company, and Globe Iron Roofing & Corrugating Company, both at Newport, Ky. The party was conveyed in a special chartered train. At the Andrews Steel Works the full process of steel and iron making was witnessed, including the charging of the great open hearth furnaces, tapping heats of steel, pouring 200,000 lb. of hot molten metal directly into the ladles, handling the ladles with electric cranes, casting the metal into ingots and rolling the ingots down into sheet bars and billets. The Andrews Steel Company has recently installed electric crane magnets by which, and with other cranes, all of the raw materials are unloaded directly from the cars and charged into the furnaces and handled throughout the plant and finally loaded into cars without touching the ground.

After the inspection at the Andrews Steel Works the visitors were taken to the plants of the Newport Rolling Mill Company and the Globe Iron Roofing & Corrugating Company, which are subsidiaries of the Andrews Steel Company. At these plants a thorough inspection was made of the methods of manufacturing sheets, both black and galvanized, and of formed roofing products.

The Newport Rolling Mill Company is the sole producer of "genuine open hearth iron" black and galvanized sheets and formed roofing products; this material being a product possessing rust-resisting noncorrosive qualities, claimed to excel Swedish or charcoal iron in this respect. The demand for "genuine open hearth iron" black and galvanized sheets, roofing and siding has increased over 300 per cent. in the last four or five months.

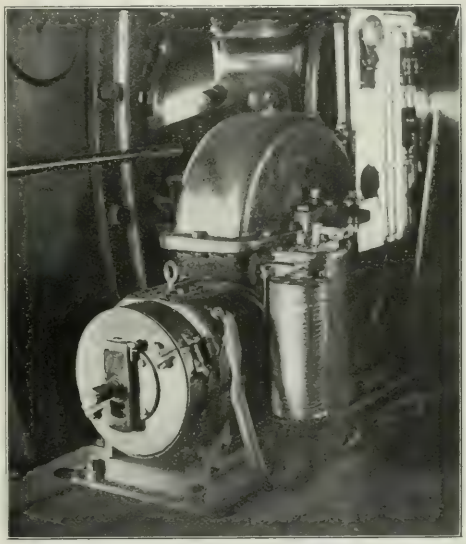
After the inspection tour the officials of the Newport Rolling Mill Company and the various department managers entertained the visitors with a banquet at the German village of the Wiedemann Brewing Company, Newport, Ky.

Electric Smelting and Refining in Europe.—Our correspondent at Düsseldorf, Germany, writes: "It appears that electric smelting of iron ore will be taken up soon on a large scale in Sweden. The enormous water powers of the country will be drawn upon to deliver the necessary current. The Stora Kopparberg Company will erect 10 furnaces, each with an electrical energy of 4000 hp., and each yielding a yearly product of 12,000 tons of iron. Other companies will eventually bring the total production of the country up to 250,000 tons per annum. The electrical process of steel making has made its entrance into Russia. The first electric furnace was put into operation in May at the Obuchoff Works, near St. Petersburg. It is a Héroult Furnace. Two further furnaces are already projected in other parts of Russia, one at Nizhni-Novgorod, and another by a French company in the Donetz district. The two latter will be of the Héroult-Lindenberg type, as used at Remscheid, Westphalia."

The American Motor-Driven Barring Device

It is frequently necessary to move an engine piston without using steam, as when making repairs or setting the valves. This, known as barring over an engine, is hard work when the engine is large; the force needed to accelerate all the parts that move and sometimes those of several driven machines as well may require the combined efforts of several men applied with a large leverage. To do this work by power, the American Ship Windlass Company, Providence, R. I., has designed a motor driven appliance, and the illustration shows one installed at the plant of the Stanley Company, Bridgewater, Mass.

The barring machine is geared to the flywheel of a 2000-hp. compound engine, with cylinders 32 and 36



A Motor-Driven Engine Barring Device Made by the American Ship Windlass Company, Providence, R. I.

in. in diameter by 50 in. long. This engine, running at 75 rev. per min., drives four pairs of 14-in. rolls for sheet steel and three pairs of 10-in. rolls. The entire machine is mounted on one bed plate, and power is transmitted from the motor through the spur gear reduction and the worm gear inclosed in the housing to a pinion which engages an internal rack on the inside of the rim of the flywheel, which is 20 ft. in diameter and weighs 75 tons. When the machine is not in use the hand lever at the right withdraws the pinion from contact with the rack.

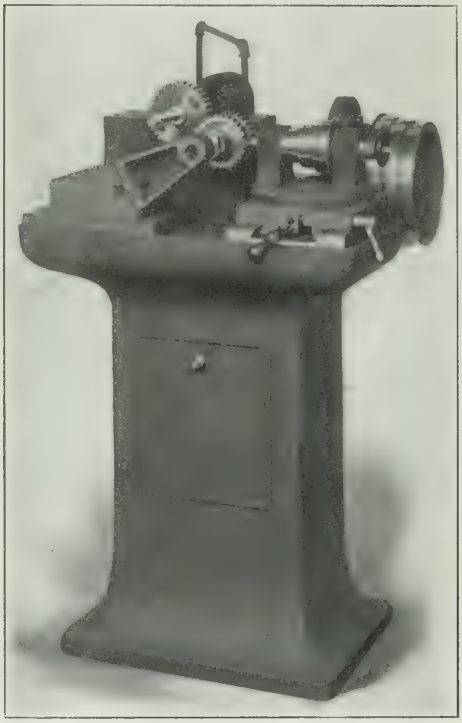
The electrical equipment of the machine consists of an 11-hp. Westinghouse type K motor, operating at 700 rev. per min. on 220 volts direct current. The motor turns the flywheel through one revolution in about one minute, and is especially adapted to this and similar classes of service where a heavy starting torque and considerable speed variation are required. The speed control is obtained by a Westinghouse type R-53 reversing controller, having five forward and five reverse notches which permit the speed to be varied through a considerable range.

An electric bell at the right of the panel is connected with the barring appliance, and rings during the entire time that the pinion is in mesh with the rack on the flywheel. Thus the operator is reminded to throw them out of engagement before turning steam into the engine.

The Rochester Automatic Gear Tooth Chamferer

For chamfering the ends of teeth on all styles of gears, including those of the internal type, the Ingle Machine Company, Rochester, N. Y., has recently placed on the market a machine of original design and compact and rigid construction. The proper feeds and speeds for the work can be selected, and no time is lost in indexing, as the cutting is continuous until the gear is finished. The ends of teeth of any gear within the capacity of the machine, regardless of the pitch or the number of teeth, can be automatically chamfered and different shapes or rounding of the teeth can be obtained by variations of the index cam. Either one or both sides of the gear can be rounded if desired.

In indexing the gear to be cut, three methods can



The New Automatic Gear Tooth Chamfering Machine, Built by the Ingle Machine Company, Rochester, N. Y.

be followed: the gear can be indexed by a duplicate gear meshing the feed drive gear, or it can do its own indexing if meshed directly with the feed gear, or any gear meshed with the feed drive gear will index all gears having the same number of teeth regardless of the pitch.

A rotary motion applied to the gear being cut combined with a reciprocating motion of the slide supporting the cutter spindle accomplishes the rounding of the teeth. This latter motion is obtained from a cam connected to the cutter slide by a lever provided with an index to locate the position of the fulcrum stud for the different pitches of gears to be rounded. The cam usually furnished gives a semicircular or half-round shape to the gear teeth, but one can be substituted to give any other desired contour or rounding of the teeth.

The machine is driven from a countershaft by two belts, one driving the cutter spindle and the other the cone pulley for the feeds of which a liberal range is provided to meet all requirements. The feed drive gear is driven through a worm and worm gearing from a three-step cone pulley, providing three feeds which allow liberally for variations in material and the pitch of gears to be finished. Using these different rates of speed 10, 14 or 20 teeth can be indexed, or cut per minute.

The cutter spindle is steel, hardened and ground, and is journaled in phosphor bronze bearings provided with ring oilers. A three-step cone pulley is provided to drive it at speeds of 500, 700 and 1000 rev. per min. Provision is made for swiveling the cutter head to the right or left depending upon which side of the gear is to be chamfered, and the head is also adjustable in or out by a screw, which may be firmly held in the cutting position. Either single or double end cutters can be used. A spring collet chuck for holding straight shank cutters is furnished.

The gears to be cut are mounted on an arbor secured to the work spindle, which is provided with a brake to take care of any back pressure of the cutter. All gears are located in the cutting position by a guide or stop, and no adjustment of the work is necessary after the machine is once set up. When the gear has been cut it is only the work of a moment to remove it. A steady rest with means for quick adjustment is provided for work requiring an outer support. An oil tray and reservoir is cast in the base of the machine and a circulating oil pump with the necessary fittings is furnished.

The following table gives the dimension and specifications of the machine:

Diameter of largest gear handled, inches	12
Diameter of smallest gear handled, inches	1¼
Maximum diametrical pitch	12
Minimum diametrical pitch	4
Number of cutting speeds	3
Number of feeds	3
Floor space required, feet	2½ x 2
Total hight, inches	50
Countershaft speed, revolutions per minute	333
Weight, pounds	1,200

The equipment furnished with the machine includes an oil pump and all the necessary fittings, two double cutters, an arbor, a complete countershaft and the required wrenches.

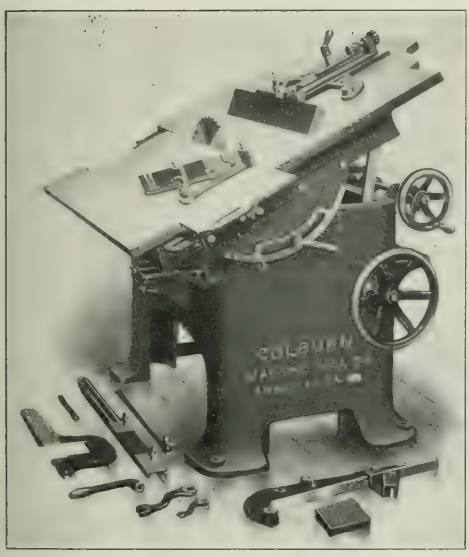
The Colburn Universal Saw Table

The improved saw table recently placed on the market by the Colburn Machine Tool Company, Franklin, Pa., is illustrated herewith. The special features of this new table are the mechanical tilting device, a splitting fence with micrometer adjustment, and the possibility of extending the table to allow wider stock to be cut.

The table is divided into three sections which from right to left of the engraving are the main table, the sliding table, and the shelf and the extreme dimensions are 22 in. long by 40 in. wide. This unique division is distinctive of the Colburn machine and possesses many advantages, the most important of which is the fact that the sliding table is much more quickly and easily operated. It measures only 12x40 in. and is much lighter than the wider and more cumbersome models. It is claimed for this type that faster and better work can be performed with less danger of accident. The sliding portion is mounted on dust proof, nonfriction roller bearings and travels in scraped and fitted ways which are properly lubricated. These ways are located in an intermediate track and can be moved out or in from the saw thus giving ample room for the dado heads not exceeding 2 in. in width. The outer portion of this track is extended to the left level with the sliding table thus making a shelf for supporting long work. The entire table can be tilted quickly to various angles up to 45 degrees by a hand wheel which operates a steel cut pinion running in a steel rack. Tilting in this way

is much quicker than with the older worm geared tilting device and as the table is perfectly balanced little effort is required to turn the hand wheel. The desired angle is easily determined by the pointer and segment.

The ripping gauge can be set to rip stock up to 21 in. wide and may be used either on the stationary or sliding table. If this work is to be done with the table tilted the gauge is always placed on the left hand or lower side which gives the stock a firm support and is



The New Universal Saw Table Built by the Colburn Machine Tool Company, Franklin, Pa.

an advantage in working heavy material as its own weight holds it against the gauge. It may be tilted to an angle of 45 degrees from the table and for cutting out hollows such as core boxes it may set diagonally to the saw, using one of the taper pins as a pivot while the other is removed and the gauge clamped in the desired position by a thumb screw. A small square block which may be attached to the face of the ripping gauge and used when cutting off short pieces is also provided. This block prevents the pieces from wedging between the saw and gauge after they are cut.

The cutting off gauge may be placed on the sliding table in two positions. The front one takes care of the widest work and the inner, which is the one most frequently used, cares for the average run. The gauge can be instantly set for cutting triangles, mitres, hexagons and octagons, as pin holes are drilled for all these angles. Intermediate angles may be obtained by clamping the gauge in position with a thumb screw. An auxiliary screw provided with end stops gauges the cutting off of lengths up to 60 in.

The saw arbors are 1 3-16 in. in diameter and of high grade crucible steel. They are ground and run in capillary self-oiling babbitt bearings which are fed from large oil reservoirs. Provision is made for taking up the end motion of the arbors and an outer saw arbor support is furnished to keep the saw and the entire saw arbor mechanism as free from vibration as possible to secure the best results. This support is always in position and operative even though saws as large as 18 in. diameter are used. The regular equipment of saws consists of one 14-in. rip and one 14-in. cross cut saw which will cut stock 4 in. thick, while saws as large as 18 in. may be used which will cut through 6-in. stock. Dado heads up to 2 in. wide may be used and when this is done the bolts holding the outer track or shelf to the main table are loosened and the sliding table and shelf moved out the required distance to accommodate the head.

The countershaft runs in babbitted bearings with capillary oiling devices and large reservoirs. The tight and loose pulleys are 10 in. in diameter by 6-in. face. The loose pulley is slightly smaller to relieve the belt tension when the machine itself is not in operation, and has a bevel flange on the edge so that the belt will easily mount the tight pulley.

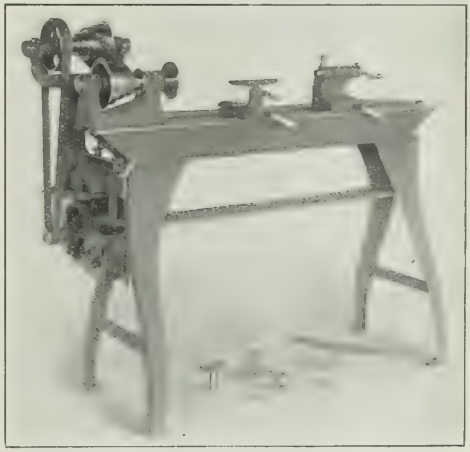
The regular equipment furnished consists of a countershaft, two 14-in. saws, one splitting fence, one cutting-off gauge, one auxiliary cutting-off gauge for cutting stock to exact length from 1 to 60 in., one extension cutting-off gauge for finished moldings and similar work so that the cut may be with the grain of the wood, a gauge block for cutting off short pieces and a complete set of wrenches, taper pins, thumb screws, &c.

A Motor-Driven 10-In. Seneca Falls Lathe

An application of electric motor drive to a 10-in. speed and wood turning lathe made by the Seneca Falls Mfg. Company, 255 Water street, Seneca Falls, N. Y., is illustrated herewith. This is similar to the motor drive which this company has been using for some time on its screw cutting engine lathe and which was illustrated in *The Iron Age,* November 25, 1909.

An important advantage of this type of drive is that any constant speed motor of from ½ to ¾ hp. may be used, the preferred style being a small high speed motor as the cost is less than for slower speed motors. Although many motor drive attachments are confined to one or two kinds of motors and cannot therefore be used on all kinds of current, this is not true in this instance as variable speed motors may be used if desired and will be found very satisfactory on some classes of work.

The upright countershaft frame is hinged on a



A 10-In. Wood Turning or Speed Lathe with Motor Drive, Built by the Seneca Falls Mfg. Company, Seneca Falls, N. Y.

bracket attached to the leg and the belt running over the cone pulley is tightened by turning the hand crank on this bracket. The belt from the motor is tightened by a hand nut and the proper tension for both belts can be maintained without shortening them until both are worn out. The ring oilers in the countershaft bearings are the same as those with which the head stock bearings of the lathe are provided.

The Lagonda-Enterprise Multiple Strainers

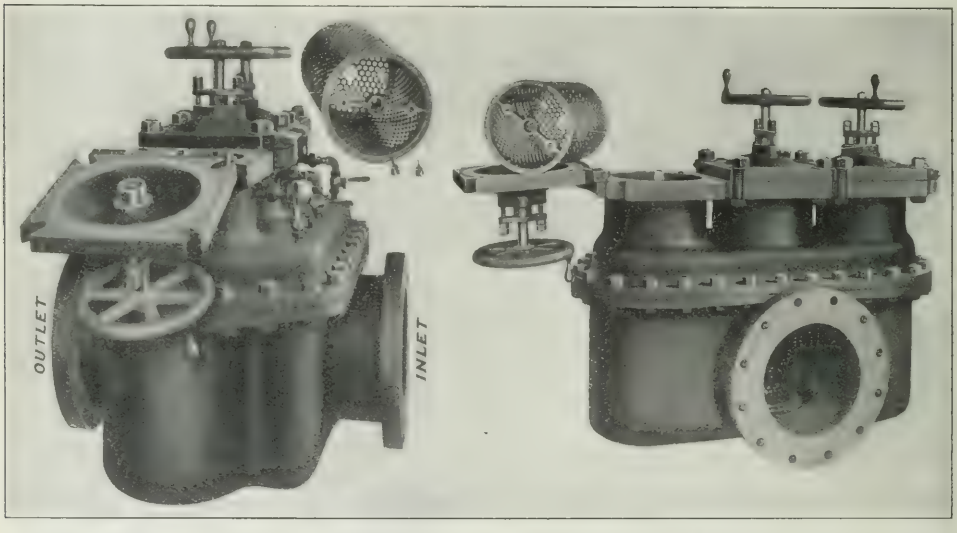
Solid matter in suspension in water is a menace to the pumps handling the water, and even if it passes them without doing serious injury, if it is delivered into surface condensers or boilers is certain to cause trouble.

Nearly all sources of circulating water supply contain such matter, and attempts are often made to remove it by placing a strainer around the suction pipe foot valve. This only transfers the seat of trouble as the strainer soon becomes clogged and it is necessary to shut off the pumps while it is being cleaned. If the water is being used for condensing purposes this means the loss of the vacuum and throwing an extra load upon the power equipment of the plant, and if there is no reserve power it means shutting down the plant.

To overcome these difficulties by removing impurities in circulating and feel water, the Enterprise, a multiple strainer, now made by the Lagonda Mfg. Company, Springfield, Ohio, and recently perfected, was first designed. It is built in sizes ranging from 2 to 48 in. These strainers are suitable for use in either pressure or suction lines where the pressure is not in excess of 200 lbs. per sq. in. and can be installed either outside or inside of buildings in any position, horizontal, vertical or inclined. They also possess the advantage of being made up of different sections which can be cleaned, one at a time, without interrupting the flow of the water.

The strainer consists of a cast iron body lined with bronze, having from two to six removable strainer baskets, the number depending upon the size of the line. As these baskets can be easily removed for cleaning, without shutting down the pumps, the mesh is made very fine and it is said that they eliminate more foreign matter than any other type of strainer. The water enters through the inlet pipe, passes up to the top of the valve chamber where it divides and finally goes down through all of the baskets in multiple. When it is desired to clean the strainer, one of the baskets is drawn to the upper part of the chamber by turning the corresponding hand wheel, and at the same time the valve collar is forced tightly against the valve seat and the valve disk on the bottom of the basket seats on the valve collar. This is all done automatically and entirely shuts off the water supply from the section containing the basket to be cleaned. By a small by-pass the pressure in this chamber is relieved and the bolts at the top loosened and the flange cap tilted over exposing the basket, which can now be taken out and cleaned. In replacing the basket the operations are exactly the reverse. The next basket can now be removed in the same way and the whole strainer cleaned without shutting off the water. Should an obstruction rest upon the top valve collar, the basket when raised to the cleaning position will tend to tilt the obstruction either into the basket or out of the way of the valve. This is due to the fact that the basket travels nearly its entire distance before the lower valve disk comes in contact with the lower seat of the valve collar.

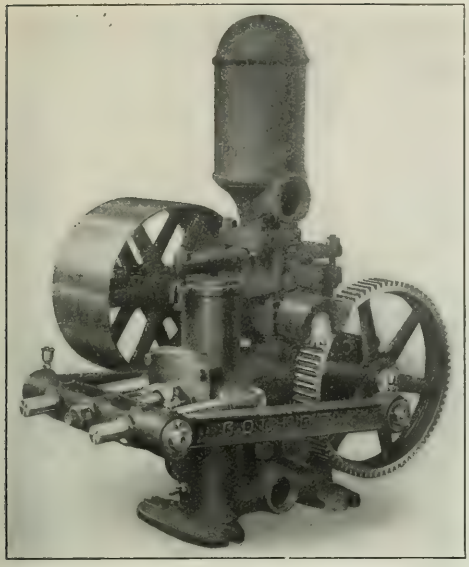
The effective straining area of a Lagonda-Enterprise strainer is from 2¼ to 4 times the area of the pipe line and in removing one basket for cleaning the straining area is not reduced more than 30 per cent. Thus the pipe line is never throttled in the process of cleaning. In practice one of the baskets is left out of service so that in case the baskets in use become clogged the clean basket can be quickly lowered into service.



Two Views, Partly Opened, of the Improved Enterprise Water Strainer Made by the Lagonda Mfg. Company, Springfield, Ohio.

The Pyramid Double Acting Piston Pump

A compact horizontal double acting power pump that is simple, durable and efficient, the Goulds Mfg. Company, Seneca Falls, N. Y., claims to have in the new Pyramid pump, which is an evolution from the original pump of the same name. This pump is designed for pumping of almost any kind where the pressure does not exceed 75 lb. or the delivery head 175 ft. Among the special fields in which it may be properly used are general water supply, including tank pumping for farms, country estates and railroad water tanks, irrigation, handling light oils, kerosene and gasoline, and for spraying trees. It is specially adapted for furnishing a large and constant supply of water for farms and country estates, and small gas or gasoline engines or electric motors are recommended as driving means. The design follows in a general way the same lines as the earlier model, but it is more compact, its general construction more rugged, and the efficiency has been greatly increased. Its overall dimensions are said to be smaller than those of any other pump of the same capacity and strength and the general construction combines ample power and large capacity in a very compact form. Another noteworthy change is the increased size and more directness of the waterways.



The Pyramid Double Acting Piston Pump, Built by the Goulds Mfg. Company, Seneca Falls, N. Y.

Stiffness and rigidity are secured by casting the base, the cylinder bearings and one cylinder head in one piece. This also removes possibility of leaking or blowing out the packing at this point. Casting the bearings as a part of the cylinder tends to keep the gearing in proper alignment, thus decreasing the wear and proportionately increasing the life of the pump. The cylinder is brass lined and has large suction valves just below the bore of the cylinder, while the discharge valves are above the cylinder. Both sets of valves are easily accessible through two hand holes, the covers of which can be removed by loosening one bolt, slipping it out of place and thus freeing the clamp holding the valve cover in position. This construction tends to eliminate any possibility of the valve cover caps rusting into position. Two substantial lugs are cast on the forward end of the cylinder and two machine turned steel rods are secured to them by heavy nuts and act as the cross head guides. This removes lateral strain from the cylinder head and eliminates the tendency for the cylinder head packing to work out. The front cylinder head is so machined that a recess in the cylinder body fits around a corresponding large projection, which is turned at the same time the hole for the stuffing box gland is bored. This compels the piston rod to run in line with the cylinder and prevents cutting the rod. The cylinder head stuffing box has a bolted bronze gland, making it easy to keep the packing tight at this point. The side rods are substantial heavy gray iron castings, designed to give a straight line thrust from the crank pin to the cross head.

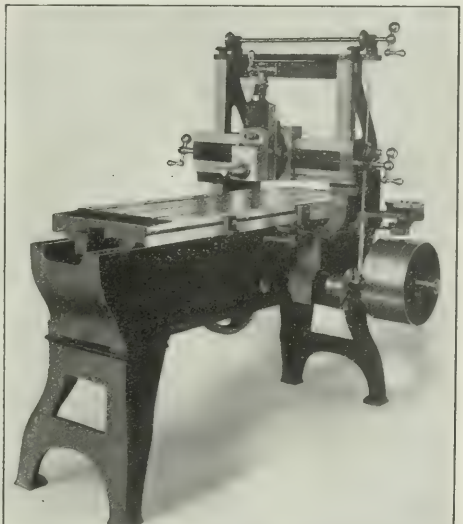
The pinion shaft comprising the power end of the pump is supported in the center directly under the air chamber by a long, double bearing, so that no outboard bearing is required. The lower portion of this bearing is very long and an auxiliary cap at the outer end, adjacent to the pulleys, furnishes a second bearing for supporting the shaft. A large oil pocket in the cap is readily filled by raising the cover between the main and auxiliary bearings, the oil being fed to the bearings from the reservoir by wicks. The pump may be operated for months without oiling at this point. The gear and pinion are both of cast iron, machined all over, and the teeth are cut from the solid metal to insure quiet operation and long life. The ratio of gearing is 5 to 1. A crank bearing of ample size and provided with a large oil pocket and cap is cast on the rear end of the pump and in common with all the other bearings is lined with high grade bearing metal. High carbon steel is employed for the crank and pinion shafts and the piston rod, the last having a brass case.

A New Schneider & Goosmann Planer

A new type of planer, built from patterns of approved design for handling work 16 in. square and three ft. long, has been placed on the market by the Schneider & Goosmann Machine Company, 1929 Race street, Cincinnati, Ohio. As will be noticed from the engraving the tool is well proportioned and all parts subject to strains are substantially reinforced.

The bed is deep and well ribbed and the shafts are high grade machinery steel with long bearings. Both the pulley and the intermediate shafts run in interchangeable bushings. The table measures 3 ft. inside the scrap pocket and has a steel rack 4 ft. long which permits work longer than 3 ft. to be planed if necessary. Clamps to prevent the table from lifting when planing very long work are located on the inside of the bed at the center and bear against grooves cut in the table just above the V ways. The T-slots in the upper surface of the table are cut from the solid and four rows of holes are drilled and reamed for $\frac{5}{8}$-in. studs.

The belt shifting mechanism moves one belt entirely off the tight pulley before commencing to move the other on, and a safety plunger prevents starting the planer accidentally when the driving belts are running on the loose pulleys. These belts are $1\frac{1}{4}$ in. wide and the ratio of belt to cutting speeds is 32 to 1. The head, cross rail and housings are strong and the wide bearing surfaces are scraped. The saddle is graduated. The tool slide has very long range and a micrometer dial on the feed screw affords fine adjustments. The cross feed is automatic both ways and the tool post will accommodate tools $\frac{5}{8}$ x $1\frac{1}{4}$ in. in section. The tight and loose pulleys on the countershaft are 6 in. in diameter by $2\frac{5}{8}$-in. face. The flywheel, which is 11 in. in diameter, acts as a reversing pulley while the other is 5 in. in diameter. The speed of the countershaft for a cutting speed of approximately 25 ft. per min., is 610 rev. per min. The weight including the countershaft is approximately 1150 lb.



A New Planer with 3-Ft. Bed, Built by the Schneider & Goosmann Machine Company, Cincinnati, Ohio.

The Manville Four-Slide Wire Forming Machine

Details of the Latest Model

The principle of having four slides surrounding a suspended former has been embodied in all the machines built by the Manville Brothers Company, 27 Benedict street, Waterbury, Conn., since 1854, when the first machine was placed on the market, and the 1910 machine, illustrated herewith, possesses qualities that make it comparatively as distinct as its crude predecessor of over half a century ago. In this machine the builder has paid special attention to the convenience of handling all the adjustable parts. It will be noticed from the engravings, of which Fig. 1 is a front view and Fig. 2 a view looking down on the machine, that the arrangement is such that the operator may stand at the front of the machine and reach the clutch lever, wrenches and the adjustments of the straightener, feed, cut-off, former, tools and stripper easily. In this way a machine has been produced which will enable the maximum output to be turned out with a minimum loss of time.

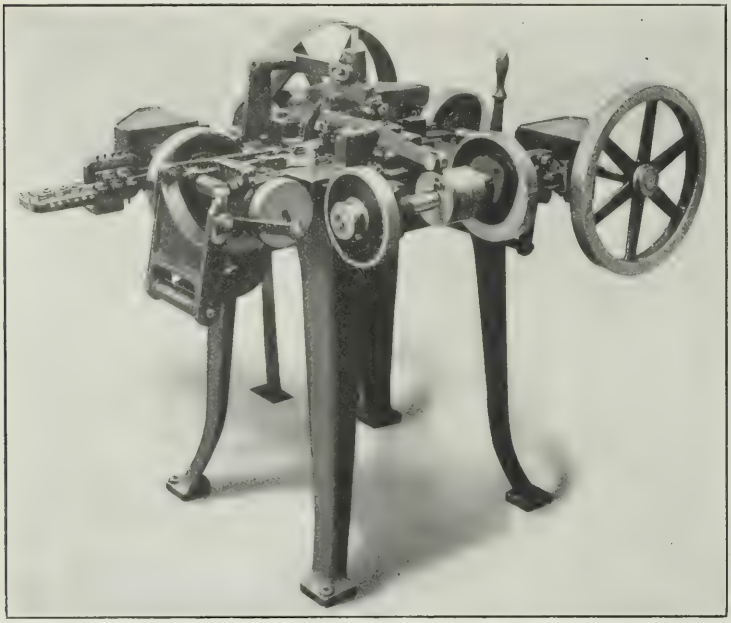


Fig. 1.—A New Four-Slide Wire Forming Machine, Built by the Manville Machine Company, Waterbury, Conn.

The wire straightener is of the double roll type, so placed that the operator may see the wire at all times during its passage between the rolls. The wire feed in the original machine was operated from a crank plate on the end of the side shaft, connected to the feed slide through rocker arms. This same type of mechanism is used in the 1910 model, modified to suit present requirements. The feed has two adjustments, a main one consisting of a binding nut on the crank pin and a knurled adjusting screw for moving the crank pin to and from the center of the crank plate, and an auxiliary one at the top of the rocker arm which raises and lowers the end of the main connection. The first is used for coarse adjustments and the second secures refinements in the length of feed said to be unattainable heretofore.

The feed grip is operated by an independent cam and cross slide, and is so arranged as to handle either wire or flat band metal. The grip lever is designed to be self-tightening and grip the material tighter as the resistance to feeding increases. A knurled handle on top of the lever enables it to be thrown into or out of action without stopping the machine. With this ma-

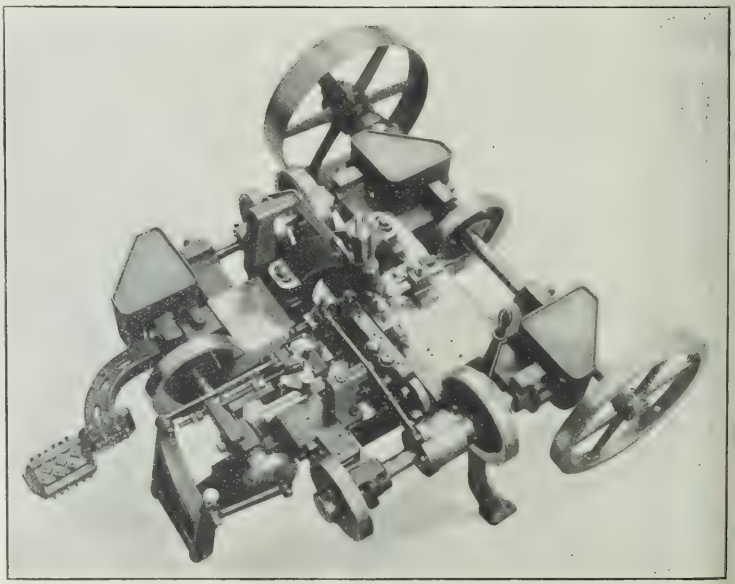


Fig. 2.—View Looking Down on the Machine.

chine it is not necessary to adjust the binder cam and the customary slide friction, which is said to have been the source of much trouble in the older types of feeds on account of its tendency to heat and cut, is not used.

A cut-off bracket adjustment in keeping with the refinements of feed adjustment has been provided instead of the older method of loosening two cap screws, and driving the bracket as nearly as possible to the correct position for the length of wire required. In the new arrangement which consists of a screw and miter wheels, the operator can loosen the clamping bolt and turn the screw adjustment until the bracket is in the correct position, thus giving a degree of accuracy which corresponds with that of the feed.

The bracket carrying the former is in the shape of an arch, which is the strongest form to resist the strains to which this bracket is subjected. In this way rigidity which is so essential is attained to such a degree that the bracket is cut away over the tools, thus leaving a clear opening for the observation of the work. These holders are fitted to take either round or rectangular shanks. The stripper lever is carried on an independent bracket bolted to the rear of the bed and no readjustment is required when the form holder is adjusted.

The slides in the machine are fitted and scraped to a bearing, and are supported by projecting shelves extending from the edge of the bed, which enables them to resist downward pressure at the cam rolls. In place of the old style tight and loose pulleys formerly used, a Johnson clutch has been substituted. The advantages of this clutch are that it is possible to change the size of the pulley without disturbing the clutch mechanism, and the use of this single pulley drive eliminates the necessity for a countershaft, as the machine may be belted direct from the main line shaft.

The Dodge Mfg. Company's Beginning

A Retrospective Letter

As reminiscent of the early days in the founding and development of one of the large Western industries the following letter to the *Dodge Idea* from C. L. Rice, a pioneer member of the selling organization of the Dodge Mfg. Company, Mishawaka, Ind., is especially interesting:

"It might seem a long stretch of memory to bridge the interval of time since my first acquaintance with the Dodge Mfg. Company, but I am 87 years old, and at my age people live more in the past—their friends, their hopes, their joys and sorrows of former days are the thoughts that fill the greater portions of their leisure hours and tend to keep green the memories of friends and events of younger days.

"Thus it seems hard to believe that 40 years have passed since I first met Wallace Dodge. At that time I was conducting a general machinery business, and carried about the only stock of wood and iron working machinery in Chicago. One day a young man came in, and after carefully looking over my stock of machines, selected several that he wished to purchase, giving me his name and address.

"'Now,' he said, 'I haven't the money to pay for these, but if you will let me have them I'll see that you get your money.'

"He followed this up by giving me full particulars regarding his business, experience, expectations, &c. There was something in the young man himself, and the way he talked, that won me to him, and—well, he got the machines and in due course of time I got my pay for them. This man was Mr. Dodge, and, as subsequent events in my life proved, it was the most profitable sale I ever made, for here began an acquaintance that quickly ripened into friendship, then merged into close business relations, resulting in my taking the first agency for the sale of the now justly celebrated Dodge Independence split wood pulleys. At that time the solid cast iron pulley, keyed on the shaft, was the only kind in use, and it required all the faith I had in the man to accept his belief in the merits of his invention.

"The first Dodge pulley sold in Chicago was to the Palmer-Fuller Company, sash, door and blind manufacturer, in 1882, on my personal guarantee to make good any damages that might occur from its use, and that the company was not to pay for it until it had proved to be in every way satisfactory. I put the pulley on the shaft myself, not without some misgivings of the possible results, and was pleasantly surprised to receive a check for the pulley on the first of the month following, and an order for five more. After that it was comparatively easy sailing, and I soon found it necessary greatly to increase my stock to meet the constantly growing demand.

"With the other inventions and developments in the transmission line, which rapidly followed, we are all familiar, and I only relate these two facts to illustrate the humble beginning of an industry that now ranks as the largest of its kind in the world, and that has conferred untold benefit upon the manufacturing interests at large. Creative ability alone, however, could not have accomplished these wonderful results had there not been allied with it great executive and initiative powers, enabling Mr. Dodge to look and plan far into the future and provide against those contingencies that often prove disastrous to enterprises less carefully thought out.

"The early death of Mr. Dodge, at a critical period in the company's history, has proved the great value of his judgment of men and affairs. The progress and present high standing of the company testify alike not only to the master mind of the man who first conceived the details and then worked them out, but also to his successors, who have labored so well and to such good purpose in carrying out and extending the ideas of the founder."

The receivership of the Passaic Steel Company was wound up in the United States Circuit Court at Trenton, N. J., October 3, when Judge Cross signed an order allowing counsel and other fees. The receivers have collected about $698,000, of which there remains $36,000. The court fixed the compensation of receivers J. P. Lee and W. A. Arnold at $7500 each. Receiver O. W. Cook, who was also superintendent of the plant was allowed $7500. W. B. Courley, special counsel, was allowed $10,000. Deducting these allowances, a balance of $3500 is left.

Rumors are current that efforts are being made by parties outside the William Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., to secure the controlling interest in the stock of that corporation. Charles M. Schwab of the Bethlehem Steel Company is credited with being interested in the proposition, but confirmation of this report is lacking.

According to the report of the Immigration Commission $275,000,000 was sent abroad from the United States by immigrants in 1909, of which amount approximately half passed through the hands of immigrant bankers or bankers not organized under State and national laws.

Columbia University, New York, is stated to be the largest university in America, according to the official registration, announced October 3. The total number in the university to date is 7058, which is 1350 more than it had registered at the corresponding date last year.

The Aiken Roof Construction

Manufacturing operations usually can be carried on more economically when the various departments are on one level and under a single roof. This, however, frequently necessitates constructing very wide buildings, and to satisfactorily provide light and ventilation becomes somewhat troublesome. The customary methods for obtaining light and ventilation for wide one story buildings are either skylights, dormers, monitors or the saw tooth roof, all of which have some disadvantages.

The McClintic-Marshall Construction Company, Pittsburgh, Pa., has recently acquired the control of the Aiken patented roof construction, the essential feature of which is the depressed bay. This, as will be noticed from the engravings, provides for parallel trusses with the upper parts sufficiently pitched for drainage and the purlins in alternate bays, supported by the upper and lower chords, respectively, provide openings for the windows which are placed against the trusses for the entire width of the building. This roof is particularly adapted to wide buildings which cannot be sufficiently lighted from the sides and permits them to be constructed of any desired width, with an assurance of ample light and thorough ventilation. Diffused light can reach every part of the floor area without causing dark shadows, as is shown in Fig. 2.

In the construction of this roof no more material is required than that necessary to cover the given area. The construction which secures light and ventilation is an integral and essential part of the roof itself. In practically all other types of roof, to obtain light and ventilation, extra material is used and is an additional load to be supported by the trusses. An Aiken roof divided into alternate high and low sections permits the low portion to be used as an outside walk for window cleaners and in some cases windows are placed from 12 to 14 in. from the trusses and the roof boards extended, thus making a walk on the inside. This is very desirable, especially for textile mills, where a uniform temperature must be maintained and windows cannot be opened for cleaning during cold or inclement weather.

With this construction a building can be enlarged either in width or length without impairing the light or ventilation, as they are entirely independent of the side or end windows. In roofs which are not subdi-

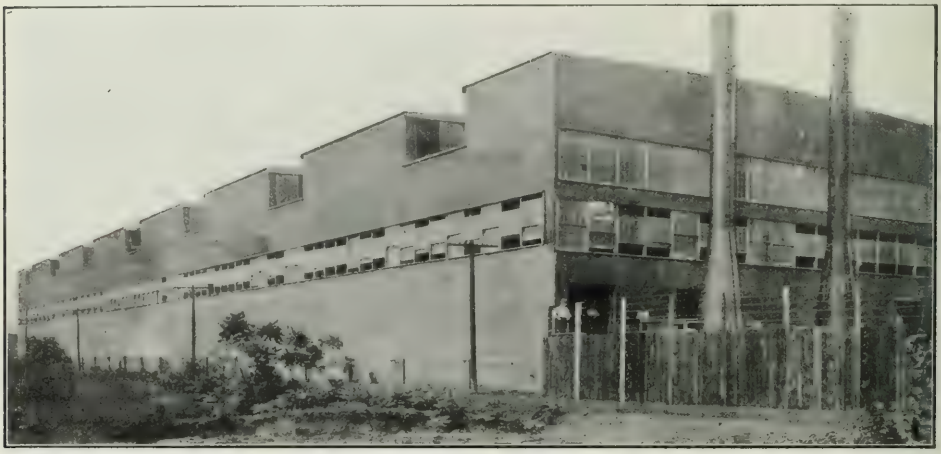


Fig. 1.—Exterior View of a Building with the Aiken Roof Construction as Installed by the McClintic-Marshall Construction Company, Pittsburgh, Pa.

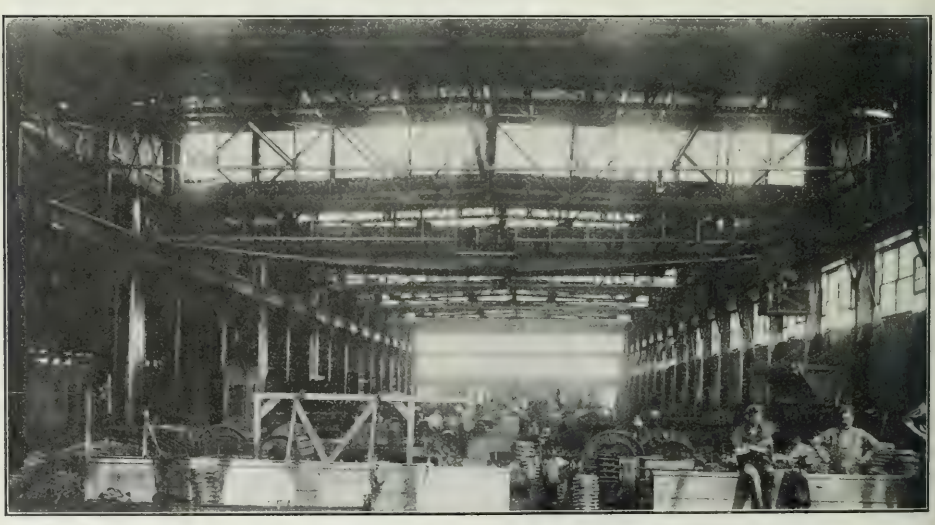


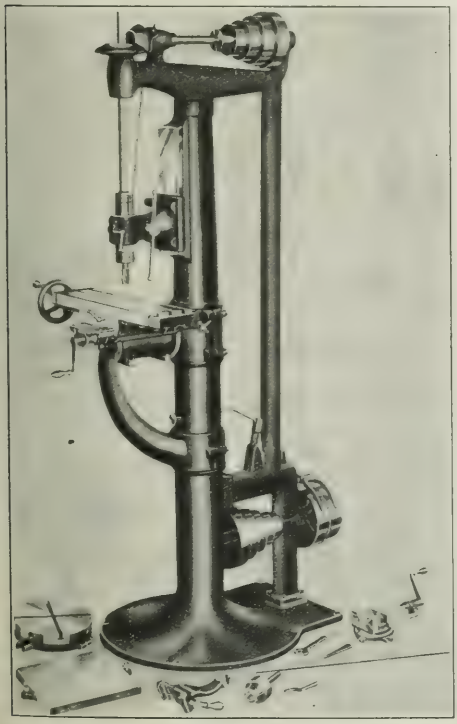
Fig. 2. Interior View, Showing the Lighting Effect of the Windows in the Depressed Bays.

vided the expansion and contraction with fluctuating temperatures is cumulative and results in trouble from leakage regardless of the covering employed. Where a roof is divided into moderate sized sections the effect of expansion and extraction is minimized and no trouble from leaks is said to be experienced.

This roof is adaptable to all forms of one-story buildings for manufacturing purposes, such as iron and steel mills, machine shops, blacksmith shops, boiler shops, foundries, locomotive repair shops, car shops, car and freight sheds, weaving sheds and other textile mills and boiler and power houses. It has been used on all the buildings of the Standard Steel Car Company at Butler, Pa., Hammond, Ind., and others, and has also been adopted as a standard for shop building construction by the New York Central Lines where the buildings are sufficiently wide to warrant its use. In the first named plant there is an aisle 80 ft. wide by 1612 ft. long, which is well lighted, and in the Sharon Steel Company's pipe plant at Sharon, Pa., there are aisles 100 ft. wide by 225 ft. long.

An Improved Knight Drilling and Milling Machine

Improvements have been made by the W. B. Knight Machinery Company, 2019 Lucas avenue, St. Louis, Mo., in its No. 1 drilling and milling machine which was illustrated in *The Iron Age* February 6, 1908. These changes are said to have produced a machine which has nearly three times the cutting power of the original model and is much more rigid. The principal changes are the placing of the countershaft near the base of the column which is the preferred position in this class of machines, as it tends to eliminate vibration, the supporting of the upper cone pulley by a pipe column from the base of the drill and extending the belt shifter through the column to a handle on the front under the table.



The No. 1 Milling and Drilling Machine Made by the W. B. Knight Machinery Company, St. Louis, Mo.

The machine is essentially a drill press equipped with a table having T-slots cut in its upper surface and provided with a hand operated cross and transverse movement which enables it to be used for vertical milling work. Five speed changes are provided by the cone pulleys. The versatility of the tool for both milling and drilling is further increased by mounting the table pivotally on a round arm projecting from the column which is graduated so that the table can be set accurately at any angle. The feed screws for the cross and transverse movements of the table have graduated collars for setting the table accurately in laying out and doing work.

The spindle runs in an adjustable taper bronze sleeve, and a ball bearing is provided to take up the end thrust. This contains a hole bored to a Brown & Sharpe standard taper for receiving end milling cutters and a drill chuck. The spindle and the head have vertical movement.

All ordinary milling and drilling can be done on this machine, and many special forms and pieces of irregular shape can be handled by using cutters of special shapes. A drill guide is provided, which prevents the point of the drill from running when drilling holes in a piece whose surface is not at right angles with the drill. This machine is declared to meet the requirements for accuracy in special work, such as the drilling of jigs or templets, or where holes are to be accurately located and definitely spaced with respect to one another in a piece of work.

A Serious Building Trades Trouble

What is claimed to be the most serious disagreement in the New York building trade that has taken place for 25 years is now in progress. It began with a comparatively trifling trouble which developed in Newark, N. J., in which a New York firm of contractors was involved. The Bricklayers' Union, in violation of a trade agreement with the Building Trades Employers' Association of Greater New York, refused to submit the disputed question to arbitration, and the members of that union were then locked out. Members of other unions refused to work, in sympathy with the bricklayers. The trouble has since been spreading to all contracts of New York building concerns, whether in New York or in cities in other parts of the country. As a consequence of this work on large buildings in St. Louis, Chicago, Kansas City, San Francisco and elsewhere are now tied up. It is claimed by the employers that the trouble which began in Newark is not the real issue, but that the important question involved is whether the bricklayers', masons' and plasterers' unions shall classify all work in the trade, which would involve the lining up of the employers with the bricklayers against the International Union of Plasterers.

The Pittsburgh Foundrymen's Association.—The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in Engineers' Hall, Oliver Building, Pittsburgh, on the evening of October 3. Charles S. Smith of the Pittsburgh Emery Wheel Company, Pittsburgh, and W. N. Sanderson of the Carborundum Company, Niagara Falls, N. Y., addressed the meeting on the subject of "Abrasives and Grinding in the Foundry."

The population of Birmingham, Ala., is 132,685, an increase of 94,270, or 245.4 per cent., over 38,415 in 1900. The population of Worcester, Mass., is 145,-986, an increase of 27,565, or 23.3 per cent., over 118,-421 in 1900.

Suggestions to Users of Machine Tools

BY A. J. LARMON.*

Manufacturers of machine tools are frequently troubled by complaints from purchasers that the machines they receive are inaccurate. These claims worry the manufacturer, as in every well run factory all machines are carefully examined and tested before shipping, and it is reasonably sure that if they are safely delivered in transit and properly set up before operation they will give no cause for complaint. A limit of error is established, according to which tests are made, and of every machine sent out the superintendent keeps a record as to just what it has done. This record is sent on to the user and is backed by the guarantee of the firm. Recently the company with which the writer is connected, received the following complaint: "The last lathe you shipped us, while in appearance a very fine tool, being built heavy, &c., bores out 0.005 in. in 4 in." We sent our tester and found the difficulty resulted from oil dripping on wooden wedges which had warped and thrown the bed out of true Our man, after reporting this, was assured this was not true, and to prove it the foreman of the shop placed a carpenter's level on the bed, which showed a perfect alignment. As soon as the tester's level with a graduated vial was placed across the V's of the machine it was shown to be out, and the complaint was easily and readily adjusted. This is not an extraordinary case, but happens frequently and is the cause of numerous unjust complaints. To all users of machine tools the necessity is urged of leveling machines, not only with the length of the bed, but especially across the shears before bolting them to the floor. Then after the machine has been in operation for two or three months, the level should be placed upon it again, for no matter how carefully the machine may have been set, settling of the floor or foundation may have occurred.

Many users of machine tools immediately upon receipt of a tool from the manufacturer tear down the machine to inspect the material used and the quality of the workmanship. This is a grave mistake and one in which both the user and the manufacturer suffer; the user in the time entailed shipping the tool or some of its parts back to the factory, and the manufacturer in the time spent in re-erecting it and the freight charges for additional transportation. If the user is dealing with a reputable manufacturer, he need not question that the tool he receives is first-class in every respect. It is to the manufacturer's interest to see that every tool shipped is his best, for every machine and satisfied user is a talking advertisement; but frequently users who are the best of machinists tear down a lathe and then report that the tool is inaccurate because they are not equipped to reassemble it properly.

The spindle is the heart of the lathe, and upon the accuracy of it and its bearings depends the life of the machine. If the latter are out of true no accurate boring, turning or facing can be expected of the lathe, but in the face of these facts the user will knock out the bearings and then try to replace them, expecting the lathe to be as accurate as ever. These bearings are driven in and are then rebored in place and scraped by hand to give the spindle a full bearing the entire length of the box, and any tampering with them will naturally throw the spindle out of alignment and will make any work on the lathe inaccurate. Fault is also found with the head spindle of the lathe when the centers run out of true, when, as a matter of fact, these centers are sprung through the hardening of them by the operator, who does not thoroughly understand how it should be done, and results in their not fitting properly to the taper bore of the machine. No matter how slight this may be, imperfect results are always shown. We take exceptional care on this point; harden and grind all centers before shipping a lathe, and do not leave this for the operator to take chances with.

Chucks running out of true are frequent causes of complaints from buyers resulting either in adverse criticism of the chuck itself or that of the spindle of the lathe. In 9 cases out of 10, the cause of the trouble is the chuck plate itself, which is either badly or loosely fitted to the spindle, or else the hub of the plate is not faced true with the bore and does not come in perfect contact with the shoulder of the spindle.

We urge our customers, upon receipt of a new lathe, to try the tool out carefully, and after it is in use, if anything is at fault, to write us at once, giving us a full explanation, but we especially urge them not to try to fix anything nor tear the machine apart, as we will replace anything defective, or send a man on to adjust any complaint. For every lathe manufactured a test sheet is made out, signed by our tester, and we guarantee the figures thereon to be absolutely correct and obtained by actual work in our shop, unless the lathe is damaged in transit, or taken apart and reassembled.

Lubrication is absolutely essential to secure good results from machine tools, as with the heavy work put upon the machines by present day high speed cutting tools the more oil used the more money saved. For all sorts of machine work, where the best and most accurate results are to be obtained, nothing should be used but the best mineral oil, as animal oil has a tendency to gum and clog the oil channels. To do its work a lubricant must have the ability to form a film between the moving surfaces which cannot then come into contact with each other and wear. In selecting an oil for a machine it is, therefore, best to select one that has ability to cling to surfaces and to form a film.

* Treasurer, the Rahn-Carpenter Company, Cincinnati, Ohio.

An Investigation of Defects in Cast Iron

Much more definite information is needed by foundrymen concerning the real cause of globules in gas cavities, solidly encased shot iron, hard streaks or spots in castings, and the occurrence of white iron inside of gray or soft iron. The theories that have been put forth on these matters do not give satisfactory explanations, nor do they suggest adequate remedies. With a view to obtaining better light on the subject, Thomas D. West, 10,511 Pasedena avenue, Cleveland, is collecting samples illustrating the above defects and plans to make a thorough investigation. He requests that further samples showing these defects be sent him, and it is desirable that foreign countries, as well as the United States, be represented in this way. To those who forward specimens it is suggested that accompanying information be given on the following points:

1. Character of the pig iron and scrap used in the mixture; also of fuel and flux; anything unusual occurring during the heat; grade of casting produced, whether soft, medium or hard, and preferably an analysis of the casting.

2. A rough sketch of the casting, showing its form and the thickness of the different sections as far as possible, with mark showing location of the sample forwarded.

3. Character of mold, whether green sand, skin dried, dry sand or loam, with description of gating and pouring.

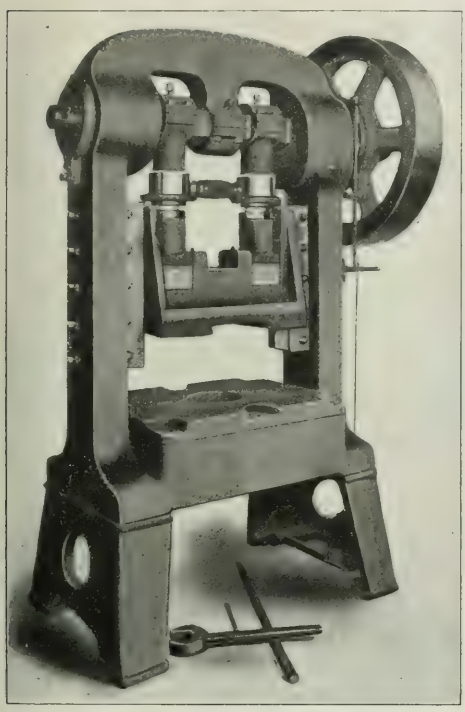
4. Condition of metal when tapped, as well as when poured into the mold, whether hot, medium or dull.

5. Any other information that would assist in an intelligent investigation of the subject.

It is the intention to give the results of this inquiry to the foundry trade in a paper to be presented before a foundry or engineering society.

A New Standard Double Crank Press

The double crank press shown in the illustration is a modification of the type J of its builder, the Standard Machinery Company, Providence, R. I. New



The No. 6-J Single Acting Double Crank Press Built by the Standard Machinery Company, Providence, R. I.

features are the method of adjusting simultaneously the two connections, and the heavy construction of the ram, boxes and bearings.

The simultaneous adjustment of the bearings is obtained through bevel gearing. Over the adjusting screw, which connects the upper to the lower connection, is a large bevel gear, which has a sliding fit with a keyway in the gear and in the screw, and also a running fit in the recess of the bearing connection, which is prevented from binding or turning by the pinion shaft. Thus the screw travels up and down, securing an adjustment on either side, while the bevel gear remains stationary so far as raising or lowering is concerned.

The connection shaft and its bevel pinions constitute another innovation. The shaft is telescopic, and has a squared clamping device on which a wrench is used. The movement of the nut engages the bevel pinions with the gears which raise or lower the ram, giving an easy and accurate control. A 14-in. wrench is employed having a 3⅜-in. opening to fit over the squared section of the pinion shaft clamp. The ram without attachments, dies or boxes weighs 1,000 lb. and with boxes, lower connection, attachments, &c., from 1800 to 2200 lb., but the ratio of lifting power is sufficient to permit a man to secure the adjustment with comparative ease.

The driving wheel of the plain press is 60 in. in diameter and weighs a ton in the rim, while the back geared press has a 42-in. wheel weighing 1400 lb. The slide is made unusually wide to accomodate blanking dies of large area. The thrust blocks are of bronze, and the connections of iron and steel.

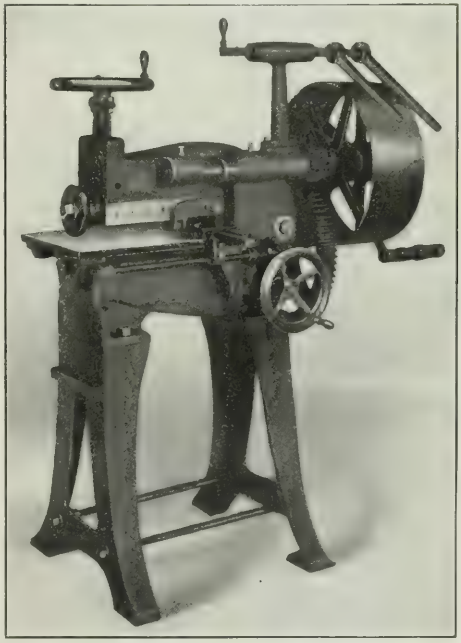
The dimensions of the machine, both geared and plain, follow:

Distance between uprights, inches	44
Overall hight, inches	112
Ratio when geared	8 to 1
Distance front to back on bed, inches	28
Distance right to left, inches	52
Distance ram to bed (stroke down), inches	13
Stroke, inches	3
Adjustment, inches	2½
Floor space, front to back, inches	60
Floor space, right to left, inches	75
Size of bottom of slide, inches	30 x 15
Section through upright, inches	11 x 6
Maximum hole in bed, inches	24 x 10
Thickness of bolster, inches	3
Net weight, plain, pounds	11,500
Net weight, geared, pounds	13,500

The press is fitted with the Horton roller friction clutch, which gives only 1-32 in. travel of the periphery of the wheel after engagement.

The Niagara Rotary Slitting Shear

The principal feature of the rotary slitting shear illustrated, made by the Niagara Machine & Tool Works, Buffalo, N. Y., is the slitting gauge with parallel motion. The width of the strips to be cut from the sheet is regulated by moving the gauge toward or away from the cutters, and to enable the operator to



A Rotary Shear with New Slitting Gauge Made by the Niagara Machine & Tool Works, Buffalo, N. Y.

make this adjustment rapidly and accurately both ends are moved in unison. A screw passing through a lug on each end of the slitting gauge and revolved by turning the hand wheel accomplishes the desired movement of the slitting gauge.

Antifriction rollers are mounted in the face of the gauge to reduce the friction between the edge of the material being cut and the gauge. This also reduces the friction on the cutters and increases their wearing qualities. A hold down attachment, bearing upon the stock while it passes through the machine, is also provided. These attachments are not special to this shear but can be applied to any of the numerous styles of this company for handling work of different sizes and capacity.

The Schieren Belt Exhibit at Brussels

In the award of prizes made at the Brussels Exposition, Chas. A. Schieren Company, 37 Ferry street, New York, received the Grand Prix, the highest possible award, for its exhibition of leather belting. The exhibit consisted of a large pavilion, in which there were eight belts running on different drives under various adverse conditions and serving to demonstrate the advantages of Duxbak belting.

Drive No. 1 consisted of a Duxback waterproof belt in operation, being sprinkled and sprayed with water continuously, showing that water, dampness, cold, or changes of temperature had no effect on it. It was also shown to possess great pulling power because of its adhesive qualities. Drive No. 2 showed a belt of the same kind connected with the Lenix belt tightener as a substitute for a chain transmission. This drive was remarkable on account of the short distance from center to center of shafts, and the small dimensions of the belt and its noiseless working. Drive No. 3 showed a Duxbak belt running half crossed.

Drive No. 4, shown in Fig. 1, represented a textile mill installation, the looms being operated in sets on the Kickermann system, with power supplied by Duxbak belts. This arrangement is remarkable on account of the short distance between shafts, and the simplicity of the system which allows the best supervision of the machine possible. Drive No. 5 was an example of belt transmission, with ceiling arrangement of driving shafts at right angles, using idler pulleys to change the direction of the belting.

Drive No. 6, Fig. 2, was an example of belt transmission employing the Bambag wheel. This arrangement affords a very efficient means of transmitting power between two crossed shafts by a belt. It takes the place of the bevel gear, obviates the noise produced by such an arrangement and insures greater power. Drive No. 7 illustrated a centrifugal pump drive obtained by a Duxbak belt, with a Lenix belt tightener. This installation showed that with a belt shifter the full power may be transmitted without the necessity of installing special mechanism.

Drive No. 8, Fig. 3, showed a belt half crossed working on a cone pulley with a Fadenschurtzer Bambag speed regulator. This outfit is convenient for spinning mills, as the speed can be changed during operation. It does away with the use of the belt shifter, and the result is longer service from the belt.

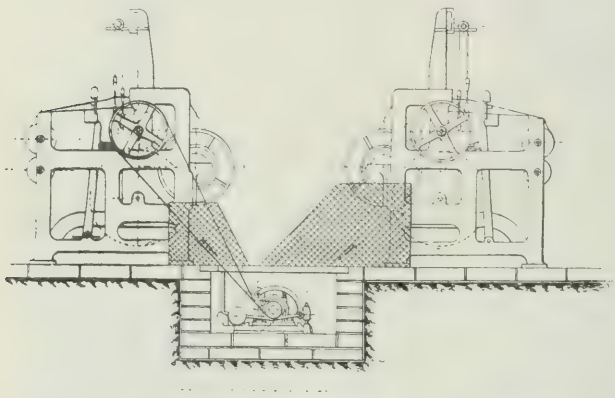


Fig. 1.—A Loom Transmission Shown at the Brussels Exposition by the Charles A. Schieren Company, New York.

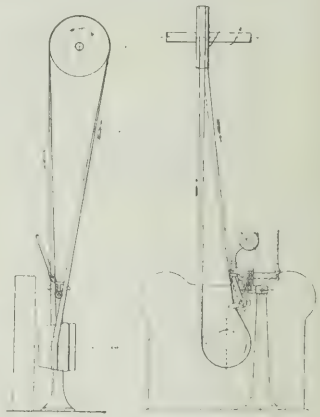


Fig. 3.—A Half-Crossed Belt and Fadenschurtzer Bambag Speed Regulator.

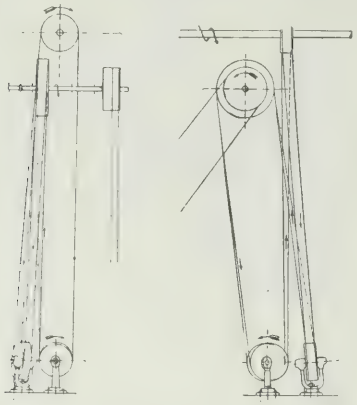


Fig. 2.—A Belt Transmission for Shafts at Right Angles.

The Illinois Cast Iron Pipe & Foundry Company

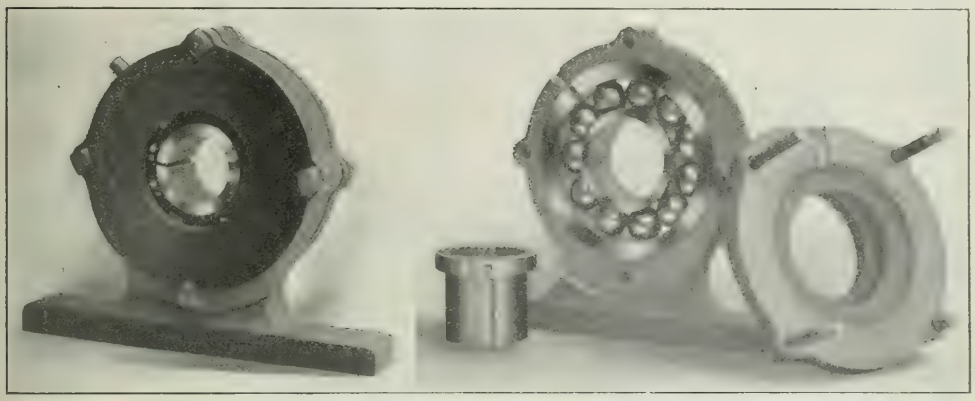
The Illinois Cast Iron Pipe & Foundry Company, 803 Great Northern Building, Chicago, recently incorporated with $2,000 capital stock, has increased this amount to $175,000 and will issue $250,000 in six per cent. bonds. The plant of the company will be built at Chicago Heights, where it has purchased fifteen acres of land. The main building will be 132x480 ft. and will be constructed on the most improved lines for the economical and effective manufacture of cast iron pipe and specials. The plant will have a capacity of approximately 40,000 tons annually and will be ready for operation in the fall of 1911. Although the actual work of construction will not be commenced until spring, it is understood that in the meantime contracts will be placed for all necessary equipment. The enterprise is being managed by A. M. Ozburn, the president of the company, who has been identified with the business for the past fifteen years and is well known to the trade throughout the West.

A Berlin cablegram dated October 3 states that the negotiations which have been going on with the object of preventing a lockout of the metal workers have failed. Both masters and workmen at meetings in Hamburg on that day declared their determination not to withdraw from their respective positions. Nearly 100,000 men are affected in Berlin alone.

The Bantam Ball Bearing Pillow Block

A special type of ball bearing pillow block made by the Bantem Anti-Friction Company, Bantam, Conn., is illustrated herewith. This bearing is intended for the high speeds encountered in the operation of hat machinery.

As will be noticed from the engraving, which shows the bearing assembled and unassembled, it consists of a block made in two parts and held together by four bolts, the ball race and steel balls and the bushing into which the shaft fits. One of the special features of this bearing is that the races are made of high grade close fiber machinery steel, which has been carefully and well converted, instead of tool steel. For lubricating the bearing oil is introduced through the opening shown in the upper left quadrant.



Assembled and Unassembled Views of a Ball Bearing Pillow Block, Made by the Bantam Anti-Friction Company, Bantam, Conn.

Pittsburgh Convention, American Foundrymen's Association. — The secretary, Richard Moldænke, Watchung, N. J., announces that the time of the Pittsburgh convention of the American Foundrymen's Association has been set for May 23 to 26, 1911. Elaborate preparations are being made by the members of the Pittsburgh Foundrymen's Association and other Pittsburgh interests to entertain the convention, and special efforts are being put forth to make the programme of papers of unusual value and interest. A committee of Pittsburgh foundrymen is co-operating with the officers of the American Foundrymen's Association on this feature of the programme.

The Steptoe Hoop Jig for Shapers

In welding steel hoops electrically a burr is left where the weld is made, which must be removed before the hoop can be used. Usually this is ground off with an emery wheel, which is tedious and expensive, on account of the time required.

The John Steptoe Shaper Company, Cincinnati, Ohio, has devised a special hoop jig for its standard shaper which, it is claimed, will remove the burrs on hoops much faster and at less expense than the grinding process. Fig. 1 shows the burr being removed from the inside of the hoop and Fig. 2 from the outside. The special tool holder used has a projection, *a*, on the side, which prevents the tool from gouging. Fig. 3 shows the specially designed vise or clamping jig, for holding the hoops while being planed. The eccentric stud moves the upper jaw so that when the lever is pulled toward the operator the jaw is pulled down and when it is pushed the jaw is released and forced up by a spring.

This attachment was put on a triple geared shaper and so arranged that by pulling the lever the ram or cutter bar would come forward, take the cut and return to its original position, thereby obviating the necessity of stopping the machine. It is claimed that with a triple geared shaper, arranged with these jigs, an operator can remove the burrs from both sides of from 750 to 1000 hoops per day, which, it is declared, is a much greater number than can be handled by grinding.

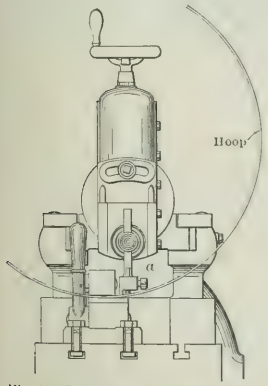


Fig. 1. —Removing an Internal Burr.

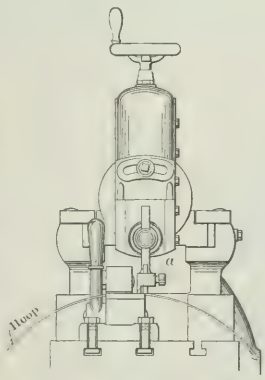


Fig. 2.—Removing an External Burr.

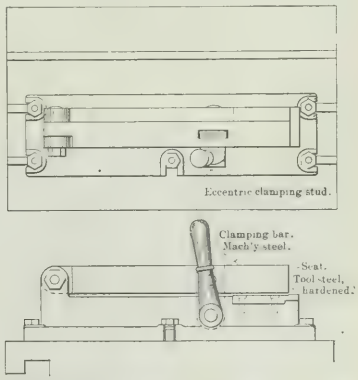


Fig. 3. The Clamping Jig for Holding the Hoops.

The Special Jig for Removing Burrs from Electrically Welded Steel Hoops, Made by the John Steptoe Shaper Company, Cincinnati, Ohio.

The Woods Profile Truing Device

Straight woodworking knives are now sharpened or trued while running on machines, and the capacity of planers has been increased to over 200 lineal feet per minute on straight work without impairing the quality of the finished product. A further step forward is the working of formed shapes and moldings at this speed, a feat made possible by the profile truing device recently invented and placed on the market by the S. A. Woods Machine Company, Boston, Mass. This is an attachment for truing the knives of a planing machine while running at full speed, and a number of its applications are illustrated herewith. Fig. 1 shows the device operating on the top head of a planer and matcher for truing siding cutters, the truing stone being hidden by the bar; Fig. 2 illustrates its use in connection with oval cutters on the top head of an inside matcher, while Fig. 3 shows the same thing on the bottom head and Fig. 4 represents the bevel cutters on a planer side head being sharpened.

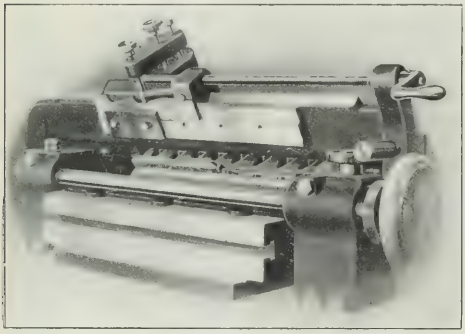


Fig. 1.—The Top Head of a Planer and Matcher Equipped with the Profile Truing Device, Made by the S. A. Woods Machine Company, Boston, Mass.

The advantages resulting from the use of this device are having a greater number of knives cutting and obtaining a faster feed. The cutters which it is specially designed to true are those of the formed type employed in working pipe or tank staves, casings, crown moldings, novelty or drop siding and other irregular shapes. Ordinarily in a planing or molding machine it is said to be impossible to grind or set two or more formed knives on a cutterhead so they will track perfectly when in operation, and heretofore there has been no way of making each knife take an equal cut. Irregular cutters being formed and ground to shape by hand, it has been impossible to duplicate them to a degree of exactness necessary in the production of high grade finish at high speeds. The profile truing device corrects the inaccuracies of grinding and setting by truing the knives while running at full speed. They are brought to a perfect cutting circle, which insures an equal cut from each, and the results are apparent in the quality of the dressing and the increased rate of feed.

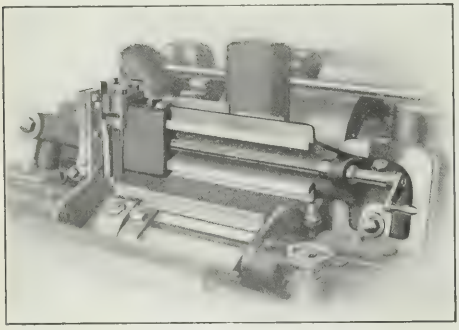


Fig. 2.—The Device Operating on Oval Cutters on the Top Head of an Inside Matcher.



Fig. 3.—Oval Cutters on the Bottom Head of an Inside Matcher Being Sharpened.

As applied to the regular top head of a planing or molding machine, the device consists of a sliding carriage mounted on dovetailed ways. The carriage contains an adjustable truing stone holder and with this holder is fed across the bed of the machine by a screw. The holder containing the truing stone has a free vertical movement and is made to follow a rider, which in turn follows the pattern of a templet, made to exact shape of the cutters In its movement across the machine the holder carrying the truing stone automatically rises and falls under the control of the profile or pattern plate, thus accurately truing all the cutters and making each track perfectly. Where the cutter shape makes a templet impractical, especially on the new beading or profiling attachments now in use, the truing stone is formed to the exact shape desired and fed into the cutters by hand until all have been trued alike. This process makes each cutter an exact duplicate, and the truing is done without disturbing any of the adjustments necessary in the process of manufacture.

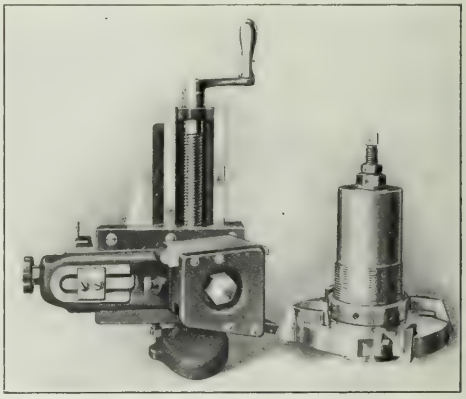


Fig. 4 The Truing Device Operating on Bevel Cutters on the Side Head.

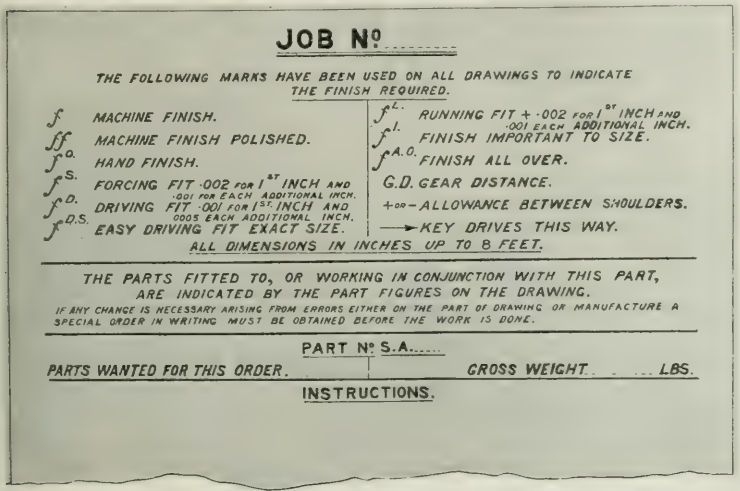
The old way of grinding, filing and whetting the cutters by hand is not only laborious, taking a great deal of time, but cannot finish any two cutters exactly the same, and to get perfect work at high speed this is imperative. Another disadvantage of the old method is the use of soft steel cutters, which quickly lose their edge, causing frequent shutdowns for resharpening, while the high speed self-hardening steel cutters used

in modern practice with the profile truing devices wear much longer and require less attention.

Elucidating Working Drawings

A System of Characters Which Indicate Finish, Fit and Other Instructions to Workmen

Elmer J. Taylor, the head of the Mono Service Vessels, Ltd., London, England, who is superintending at the works of the Taylor & Fenn Company, Hartford, Conn., the building of special machinery of his own design for manufacturing paper containers for fluids, has developed an interesting system of characters in connection with the working drawings of the machine. They are shown in the reproduction of a job sheet herewith. As will be seen, each character on a drawing indicates the finish, the fit and other information.


JOB Nº.....

THE FOLLOWING MARKS HAVE BEEN USED ON ALL DRAWINGS TO INDICATE THE FINISH REQUIRED.

f MACHINE FINISH.
ff MACHINE FINISH POLISHED.
f H.O. HAND FINISH.
f S. FORCING FIT ·002 FOR 1ST INCH AND ·001 FOR EACH ADDITIONAL INCH.
f D. DRIVING FIT ·001 FOR 1ST INCH AND ·0005 EACH ADDITIONAL INCH.
f D.S. EASY DRIVING FIT EXACT SIZE.

f L. RUNNING FIT + ·002 FOR 1ST INCH AND ·001 EACH ADDITIONAL INCH.
f I. FINISH IMPORTANT TO SIZE.
f A.O. FINISH ALL OVER.
G.D. GEAR DISTANCE.
+ OR − ALLOWANCE BETWEEN SHOULDERS.
→ KEY DRIVES THIS WAY.

ALL DIMENSIONS IN INCHES UP TO 8 FEET.

THE PARTS FITTED TO, OR WORKING IN CONJUNCTION WITH THIS PART, ARE INDICATED BY THE PART FIGURES ON THE DRAWING.

IF ANY CHANGE IS NECESSARY ARISING FROM ERRORS EITHER ON THE PART OF DRAWING OR MANUFACTURE A SPECIAL ORDER IN WRITING MUST BE OBTAINED BEFORE THE WORK IS DONE.

PART Nº S.A.....

PARTS WANTED FOR THIS ORDER. GROSS WEIGHT. . . . LBS.

INSTRUCTIONS.

Portion of a Job Sheet Showing the Key to the Characters Indicating Finish, &c.

Each working drawing has its part number, and is mounted in sequence in a folio with its job sheet on the opposite page. The two are also combined on a large card which is used in the shop, where they are kept, while not in use, in a rack, each on edge in its niche. The two end edges give instructive information. One edge has the natural color of the cardboard, the other is blackened. At the beginning of the job the light edge is visible; as the part is completed each card is reversed, end on end, in the rack, and the black edge is exposed, affording a visual assistance which is of much value to the superintendent or foreman in watching the passage of a lot of machines through the works.

Each blue print contains the characters as indicated at the top of the job sheet. Their meaning soon becomes familiar to the shop force. The sheet has also a blank space at the bottom for any additional instructions that may be required.

The stockholders of the Southwark Foundry & Machine Company, Philadelphia, Pa., will be asked at a special meeting called for November 23 to vote on a proposition to increase the bonded indebtedness of the company from $180,000 to $600,000. The increase will be used to retire present floating debt, as well as to provide improvements to the plant, the nature of which is not made public at this time. General business conditions are reported as somewhat improved, particularly in the demand for engines and equipment of the larger capacities.

Closing Blowholes in Steel Ingots

At the meeting of the British Association for the Advancement of Science held at Sheffield, England, September 5 to 7, Prof. Henry M. Howe read a paper on "The Closing and Welding of Blowholes in Steel Ingots." In part it covered ground traversed by Professor Howe's remarks at the 1909 and 1910 meetings of the American Society for Testing Materials. A brief abstract follows:

In the solidification of molten or liquid substances, especially those of high melting point, two classes of cavities are likely to form: gas bubbles called "blowholes," and a central contraction cavity called a "pipe." In case of steel ingots this pipe might reach very deep into the axis, and, because it was hard to work up, might compel the maker to disregard as much as one-third of the ingot in order to get sound unpiped metal. To avoid this some makers of steel of a composition favorable to welding purposely allow blowholes to form rather abundantly, so as to prevent the formation of a pipe, and, relying on the ease with which such steel welds, try to get flawless metal by welding these blowholes up in the process of rolling the ingot out into its final form such as boiler plate. This procedure is of great economic importance, in that it enables the steel maker to avoid the serious discarding which would be necessary in case his ingots were free from blowholes and hence deeply piped. But many intelligent metallurgists condemn this practice on the ground that the closing of blowholes is impossible, because the gas which they contained must remain ever present during the rolling, even though somewhat compressed. In his opinion, the reabsorption of the blowhole gases and the welding of the blowholes ought to be promoted rather by the practice of "reheating" than by that of "direct rolling." In the former the ingot is rolled part way toward its final shape, and the resultant bloom is then reheated before further rolling; in the latter the ingot is rolled to its final shape, such as a rail or a boiler plate, at a single heat. During the early part of the rolling the metal surrounding each blowhole should become strongly charged with gas reabsorbed from that blowhole because of the enormous pressure caused by rolling. To reheat the bloom exposes it for a long time to a high temperature in the heating furnace, during which time the gas dissolved in the neighborhood of the blowhole has an opportunity to diffuse away, and the gas in the blowhole has a chance to be reabsorbed by the adjacent metal. Further, the high temperature of the rolling immediately after this reheating facilitates both the further absorption and outward diffusion of whatever gas remains in the blowholes and the welding up of their sides.

Prof. J. O. Arnold said that his experience agreed with that described by Professor Howe. W. H. Hatfield referred to the danger of decreasing pipe at the expense of blowholes. The practice in Sheffield is to get the steel perfectly free from blowholes, and even to go to the expense of having a head to the ingot and

then cut it off. He considered this the better course. J. E. Stead had found that the blowholes in a perfectly pure metal weld up completely, but in the presence of a little sulphide of manganese the perfection of the welding is retarded. Professor Howe replying, agreed that it is not wise to leave blowholes in steel which does not weld readily, but boiler plate steel has this property—indeed, in some respects, it is exasperatingly sticky. From the character of the manufacturers who actually do leave blowholes in steel and then weld, he thought that without question the procedure is wise and good in their case.

Canada and the Steel Duties

The Approaching Reciprocity Negotiations

TORONTO, October 1, 1910.—It is rather confidently stated in the Ottawa correspondence of Government newspapers that the reciprocity negotiations which Finance Minister Fielding and Secretary Knox are expected to enter upon before the close of the present month will be confined on Canada's part to proposals for the freer interchange of natural products only. That the agreement will be reached for the admitting of any American manufactured product at lower duties —except it be paper—is considered very improbable. The interests on the side of protection are very strong, and it is only in the West that even the farmers are calling for a lowering of the tariff. In the older portions of the country the question of tariff revision cannot be said to be a live one. It is doubtful, too, if the representations made to Sir Wilfred Laurier on the subject in the course of his Western tour do not give an exaggerated idea of the force of the tariff reform movement there. The resolutions and memorials submitted to the Premier were prepared by men who are enthusiastic advocates of freer trade, but the mass of the people are not likely to be much more than indifferent as long as they continue prosperous. The West has had a disappointing crop this year, and may, therefore, be inclined to take more interest in the cause of tariff reduction, but, as the prairie dwellers had had a series of good crops up to this year, they are far from being in straits. Moreover, all but the southern section had very good crops this year. If, however, there is no great popular impulse for the lowering of the tariff, there is a strong body of opinion against the raising of it in any important items. Parliament is to meet next month, unless the Government in the mean time alters its plans, and it is certain that efforts will be made to have legislation put through for the advantage of the steel industry.

How Public Finance Bills Must Originate

As no bills touching the public finances can be introduced by a private member, it can be only by a minister—usually the Finance Minister—that measures to increase a duty or establish a bounty can be brought forward. In some quarters there is an expectation that Mr. Fielding will make provision for additional duties on iron and steel by way of compensation for the loss of the bounties. But the Winnipeg *Free Press,* a Government supporter and the most influential newspaper west of the Great Lakes bids him resist the temptation to do so. It says, "Better restore the bounties in part than increase the duties." It is significant that a newspaper so loyal to the Government thus branches tentatively to its wide circle of Western readers the idea of a return to the bounties. Another Liberal newspaper that stands very close to the Government—the Halifax *Chronicle,* a daily paper of which the Finance Minister was formerly the editor—is urgent in its demand for a more fostering policy toward the iron and steel industry of the country. It may be said, indeed, that the whole press of Nova Scotia, irrespective of party, is in favor of more protection for the steel industry. The Sydney *Daily Post* and the Halifax *Herald,* Conservative papers, are calling on the Government to give more generous treatment to the manufacturers of iron and steel.

The Machinery Tariff

In respect to proposals concerning the tariff on machinery, the line of party division is similarly crossed by lines of local interest. The Brantford *Expositor,* a daily newspaper with an extensive circulation in a thickly peopled flourishing district of Ontario, comes out in opposition to the idea of a lower duty on agricultural implements and machinery, albeit the *Expositor* is a supporter of the Government. Referring to the announcement that a huge deputation of Western farmers will shortly go to Ottawa with a strong petition for the reduction of the agricultural implement duties, the *Expositor* expresses the opinion that these duties are not too high, if they are high enough, and says that so long as there is protection in the Canadian tariff the agricultural implement industry ought not to be singled out for special attack.

Writing to the Toronto *Globe,* C. F. Wheaton, manager of the Dodfe Mfg. Company, of this city, says in part:

> For the year ending June 30, 1910, we have kept a strict account of all of our purchases of raw material in classified form. We show the kind and quantity and the value, and, after totaling the whole up and figuring the duty according to the tariff on the same and knowing that we must invariably pay the United States price plus the duty, we are able to make the statement that the raw materials we used in our machine shops and foundry during that year did cost us at least 25 per cent. more than they would cost manufacturers in Pennsylvania or Illinois, who are our competitors. Now by this fact, remembering the very large market on the other side and the possibilities of more thinly spreading their overhead load because of their larger volume and remembering our limited market, is not our protection of 27½ per cent. on our finished product very seriously diminished?
>
> C. A. C. J.

The Bristol Iron Mine in Quebec

Bulletin No. 2 of the Canada Department of Mines, Mines Branch, deals with the iron ore deposits of the Bristol mine, Pontiac County, Quebec. An investigation of these deposits was undertaken by E. Lindeman in view of the proposal to build an electric smelting plant at the Chats Falls on the Ottawa River, 26 miles west of the city of Ottawa. The Bristol mine is about 5 miles northwest of these falls. It was closed down in 1894. Some ore was mined in 1872-1873. Again operations were started in 1884. The ore contained considerable iron pyrite, and was crushed and roasted before shipment. The conclusion reached is that the unprofitable mining operations of previous years were due largely to iregularities in the ore bodies to primitive methods of working and to a long rail haul from the mine to Pennsylvania furnaces. It is believed the deposit is of considerable magnitude, but diamond drilling will be necessary to show the precise character and quantity of the ore. A report is also made on magnetic concentration of Bristol ores. It is recommended that they be either nodulized in a rotary kiln or briquetted by the Gröndal process. It is believed the Bristol concentrates would yield desirable low sulphur material for the manufacture of iron either in the blast furnace or the electric furnace. Analyses given show metallic iron contents ranging from 53.74 to 58.18. The phosphorus is very low, the average being 0.005. Sulphur varies from 2.92 to 1.48 per cent. Titanium is inconsiderable.

The automobile industry, according to the Department of Commerce and Labor, is the fifth industry of the country in amount of capital invested and value of production.

Trade Publications

Drill Presses.—The Sigourney Tool Company, Hartford, Conn. Circular. Relates to the Sigourney drill presses, which are made with one, two, three and four spindles. The different models are illustrated and brief specifications are given. A single-spindle bench drill press and a special countershaft are illustrated and views are given showing the application of motor drive with the Renold chain and belt to these tools.

Planers.—The Cincinnati Planer Company, Cincinnati, Ohio. Catalogue. Size 9 x 12 in.; pages 48. A more than ordinarily attractive publication with contents quite as much a credit as the style of its dress. The frontispiece gives an exterior and an interior view of the company's new works at Oakley, a suburb of Cincinnati, and is followed with a brief account of what the company has accomplished in the building of planers, which has been its exclusive specialty for many years. A general description of the Cincinnati planers is then taken up, with numerous detail illustrations of the special features of construction, including the ways and the manner in which they are protected from dust and dirt, the manner of securing the housings to the bed, the power elevating device, and numerous other special parts notable for their design, construction or convenience of operation. Next are views of standard and forged type planers in their different sizes, accompanied with brief tables of specifications and a succeeding section similarly deals with widened planers. Variable speed planers, in the building of which this company was a pioneer, are also illustrated, with a discussion of their advantages and an explanation of their operation. One of the specially interesting tools is a 72-in. planer for machining locomotive cylinders and particularly cylinders with piston valves. The last few pages are concerned with attachments, tools and the erection and care of planers.

Recording Gauges.—The Industrial Instrument Company, Foxboro, Mass. Condensed bulletin No. 38. Deals with the Industrial recording gauges for automatically and continuously registering in ink on a paper chart the pressure of steam, gas, air or water. These gauges are said to meet the economic necessity for exact, continuous and reliable knowledge, as they furnish a record of the time, rate and amount of pressure changes and show the variation from day to day, thus settling disputes and placing responsibility where it belongs. The case is round to match other pressure gauges beside which it is generally mounted, and the door is provided with a lock and key to prevent access by unauthorized persons. The clock for driving the chart is mounted in a dust-proof metal box and can be furnished to revolve the chart at the rate of 1 revolution in 15 min., or 1, 6, 12 or 24 hours; the last movement runs 48 hours on one winding so as to drive the chart over Sunday. The chart is clear and legible and can be read at a glance, while light and heavy face type are used to denote day and night.

Molding Sand.—M. F. Gulick Sand Company, Riverside, Pa. Pamphlet. Calls attention to the various lines of molding sand which this company can furnish. These include a number of ready made sands as well as a number of special selected grades made to order.

Squeezers.—The Adams Company, Dubuque, Iowa. Two circulars. No. 105 contains instructions for operating the Farwell squeezers and shows a number of pattern plates made on this machine. No. 107 deals with a special type of squeezers for use with Keep's hinged match plate, and contains a reprint from the March, 1910, *Foundry*. The various types of machines are illustrated and brief specifications are included in both circulars. Illustrated descriptions of machines recently added to this line were printed in *The Iron Age*, May 5 and June 2, 1910.

Pyrometers.—Charles Engelhard, 30 Church street, New York City. Booklet. Briefly describes and illustrates the Chatelier pyrometer for measuring temperatures up to 1600 deg. C., or 2920 deg. F. A number of testimonial letters from users is included, followed by tables of useful information on the melting points of metals, fusible plugs, solders, alloys and miscellaneous substances, and the effect of heat upon various bodies.

Abrasives.—Pittsburgh Crushed Steel Company, Pittsburgh, Pa. Booklet. Concerned with the use of Diamond steel emery, which is said to outwear the best Turkish emery and cut faster. These important points are due to the fact that the former does not pulverize and become inert. Instructions as to what to do and what not to do with abrasives and a partial list of users complete the booklet.

Iron and Steel and Machinery.—Joseph T. Ryerson & Son, Sixteenth and Rockwell streets, Chicago, Ill., and 30 Church street, New York City. September issue of *Ryerson's Monthly Journal and Stock List*. This is the first number of a special New York edition and has a blue cover to distinguish it from the Chicago edition. The leading articles are: "Painting Steel Smoke Stacks," "The Sales Engineer and His Duties," "Metal Flashing," and "Shear Scrap." The stock list follows and covers iron and steel specialties, boilers and furnaces, and a great variety of metal working machinery.

Wrenches and Vises.—The DuCharme Wrench & Novelty Mfg. Company, Johnstown, Pa. Booklet. Relates to a line of quick acting, self-adjusting wrenches and an open top pipe vise. The wrenches illustrated include a self-adjusting wrench, a turret head wrench, a fixture or ceiling wrench and an alligator wrench. Space is also given to an instantly adjusted open top pipe vise, a tail vise for manual training schools, and an adjustable clamp for holding material on flat bed machines. *The Iron Age*, July 28, 1910, contained an illustrated description of all these tools except the tail vise.

Safety Valves.—Ft. Wayne Safety Valve Works, 817 Barr street, Ft. Wayne, Ind. Deals with the Kunkle lockup pop safety valves for use on portable, stationary, locomotive and marine boilers. The different styles of valves are illustrated and brief descriptions and specifications are given. Instructions for operating the valves and a partial list of users complete the catalogue.

Electric Wiring Devices.—The Bryant Electric Company, Bridgeport, Conn. Catalogue. Size 6 x 9¼ in.; pages 120. This is the company's 1910 catalogue, describing and illustrating the various wiring devices which it manufactures. By increasing the size it has been possible to make numerous improvements in the make-up of the catalogue, the most important of which is the ability to group on facing pages a large number of devices of similar character. The scheme of grouping also includes dividing the catalogue into various departments, as sockets, wall sockets and rosette sockets, rosettes, surface and flush snap switches and accessories, &c., and the insertion of title pages at the beginning of each group. Each of the different devices is illustrated and a list of sizes in which it is made given. With the various switches complete tables of dimensions are given.

Steam and Vacuum Pumps.—Buffalo Steam Pump Company, Buffalo, N. Y. Two catalogues. No. 227 lists all steam driven direct acting water pumps used in ordinary service. No. 228 is concerned with vacuum pumps and jet, barometric and surface condensers. Both conform to the standard 6 x 9 in. size, and all of the different styles coming within their scope are illustrated and briefly described. Tables of useful information relating to both classes of pumps are included in the catalogues.

Boiler Tube Cleaners.—The General Specialty Company, 885 Niagara street, Buffalo, N. Y. Booklet. Is not intended to be a complete catalogue, but simply illustrates some of the more essential elements of the company's machines and shows the results of a few of the numerous tests made by it and other authorities. In the make-up of the booklet testimonial letters are given on one page, while the facing pages present in tabular and graphic forms the cost of boiler scale and illustrations show the Demon and Torpedo tube cleaners, the former for straight and curved tubes and the latter for return tubular boilers. Curves showing the torque developed by the Demon motor as compared with those of the turbine type and the less distortion made in the walls of boiler tubes by the Torpedo as compared to other cleaners are appended.

Bolt, Nut and Forging Machinery.—The National Machinery Company, Tiffin, Ohio. Catalogue E. Size 8¼ x 11 in.; pages 197. Covers the complete line of machinery made by this company for the manufacture of bolts and nuts and forgings. All of these are illustrated and brief specifications supplement the views. In connection with the descriptions of the machines typical products of the different ones are shown. Among the machines illustrated and described is the semi-automatic nut burring machine, an illustrated description of which appeared in *The Iron Age* April 28, 1910, and a number of new machines which were shown for the first time at the exposition of bolt, nut and forging machinery at the company's plant the latter part of August. The customary tables of weights and the amount of stock required to make various sizes of bolts and nuts complete the catalogue.

Boiler Plates, Tubes and Heads.—Worth Brothers Company, Coatesville, Pa. Three folders. These show the sizes of the various gauges of boiler plates manufactured, prices for flanging and dishing boiler heads, and the list prices and weights per foot of standard sizes of charcoal iron lap welded boiler tubes.

Engine and Extension Gap Lathes.—Fay & Scott, Dexter, Maine. Catalogues Nos. 15 and 16. The former is the company's 1910 standard engine lathe catalogue, describing and illustrating its engine lathes, which are built with swings ranging from 14 to 38 in. The different sizes are all illustrated and brief specifications are given on the facing pages. One of the special features of this lathe is the patented feed mechanism driven by a slotted screw with a belted feed independent of the gears. A lever on the side of the bed enables the change from one to the other to be obtained instantly without stopping the lathe. New designs of bed and carriage turrets are shown and are followed by a number of special lathes for turret work, turning tapers and facing both ends of a piece. An illustrated description of the double end lathe for facing and turning cast iron columns appeared in *The Iron Age* April 28, 1910. The other catalogue covers the extension gap lathes of this firm, which range from a 16-32 in. to a 38-66 in. model. In general appearance this catalogue is the same as the other. The application of motor drive to these lathes and tables of dimensions are included in both.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1 1/4 in. round and square	₰ lb 1.90¢
1 1/2 to 4 in. x 1/4 to 1 in.	₰ lb 2.10¢
1 1/2 to 4 in. x 1/4 to 5-16	₰ lb 2.10¢
Rods—3/8 and 11-16 round and square	₰ lb 2.10¢

Angles:

	Cts ₰ lb
3/16 in. x 1 in. and larger	2.10¢
3/16 in. x 5/16 in. and 1/4 in.	2.35¢
1 1/2 to 2 in. x 1/4 in.	2.10¢
1 1/2 to 2 1/2 in. x 3-16 in. and thicker	2.10¢
1 to 1 1/4 in. x 3-16 in.	2.30¢
3/16 in. x 1/4 in.	2.30¢
3/8 x 1/4 in.	2.40¢
1/2 x 1/8 in.	2.50¢
3/4 x 1/4 in.	3.35¢
3/8 x 1/32 in.	3.35¢

Tees:

1 in.	2.65¢
1 1/4 in.	2.15¢
1 1/2 to 2 1/2 x 1 in.	2.15¢
1 1/2 to 2 1/2 x 3/4 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1" to 6 x 5/16 to No. 8	2.30¢
Horseshoe Iron, base price	2.15¢
Burden's "H B & S" Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ₰ lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C R Soft Steel	R G Cleaned
No. 8	₰ lb 2.80¢	2.90¢
Nos. 18 to 21	₰ lb 2.85¢	2.90¢
No. 22 and 24	₰ lb 2.95¢	3.10¢
No. 26	₰ lb 3.00¢	3.20¢
No. 28	₰ lb 3.10¢	3.40¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₰ lb 12 @11½

Patent Planished, W. Dewees Wood ₰ lb A, 10¢; B, 9¢ net

Galvanized.

Nos. 14 to 16	₰ lb 2.95¢
Nos. 22 to 24	₰ lb 3.15¢
No. 26	₰ lb 3.15¢
No. 28	₰ lb 3.35¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₰ lb 5.75¢
No. 26	₰ lb 6.25¢
No. 28	₰ lb 6.50¢

Corrugated Roofing—

2½ in. corrugated,	Painted	Galv'd
No. 24	₰ 100 sq. ft. $3.50	4.50
No. 26	₰ 100 sq. ft. 2.95	4.00
No. 28	₰ 100 sq. ft. 2.60	3.70

Tin Plates

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	$5.10
IX, 14 x 20	6.35

American Coke Plates—Bessemer—

IC, 14 x 20	$4.10
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.40
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 13, 1908 ... base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 ... base price 18¢

Copper Tubes—

List November 13, 1908 ... Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 ... 19½¢ ₰ lb

High Brass Rods—

List August 1, 1908 ... 14½¢ ₰ lb

Roll and Sheet Brass—

List August 1, 1908 ... 14½¢ ₰ lb

Brass Wire—

List August 1, 1908 ... 14½¢ ₰ lb

Copper Wire—

Base Price ... carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity ... ₰ lb 8 ¢

Sheet Copper Cold Rolled, 1¢ ₰ square foot advance over Hot Rolled

Sheet Copper Polished 20 in. wide and under, 2¢ ₰ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₰ square foot

Planished Copper, 1¢ ₰ square foot more than Polished.

METALS—

Tin—

Straits Pig ... ₰ lb 36¾@37 ¢

Copper—

Lake Ingot	₰ lb 14¾@15 ¢
Electrolytic	₰ lb 14½@14¾¢
Casting	₰ lb 14¼@14½¢

Spelter—

Western ... ₰ lb 6¼@6½¢

Zinc.

No. 9, base, casks ... ₰ lb 8 ¢ | Open ... ₰ lb 8¼¢

Lead.

American Pig	₰ lb 5 @5¼¢
Bar	₰ lb 6¼@6½¢

Solder.

½ & ½, guaranteed	₰ lb 23½ @24¢
No. 1	₰ lb 20½ @21¢
Refined	₰ lb 18 @18½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₰ lb 10¢
Hallett's	10¢
Other Brands	9@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ... 34¢

Rods & Wire ... Base Price 31¢

Sheets ... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₰ lb 10.75@11.00
Copper, Heavy and Wire	₰ lb 10.50@10.75
Copper, Light and Bottoms	₰ lb 9.00@9.50
Brass, Heavy	₰ lb 7.25@7.50
Brass, Light	₰ lb 5.75@6.00
Heavy Machine Composition	₰ lb 9.50@9.75
Clean Brass Turnings	₰ lb 7.00@7.25
Composition Turnings	₰ lb 8.25@8.50
Lead, Heavy	₰ lb 6@6.50
Lead, Tea	₰ lb 6@6.25
Zinc Scrap	@5.75

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THE IRON AGE

Established 1855 | New York, October 13, 1910 | Vol. 86: No. 15

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Philadelphia, Real Estate Trust Building
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Milwaukee, 1417 Majestic Building.

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New Demand Still at a Low Rate

Yet Producers Find Ground for Encouragement

Considerable Buying of Pig Iron, but It Is Not General

Noteworthy evenness has been shown for some time in the daily rate of new business coming to the steel mills, with indications in some quarters that the repair of ragged stocks is responsible for the urgency of the call for shipments. This condition has encouraged producers, who interpret it to signify the approach of the irreducible minimum of demand which has so often been followed by improvement.

The United States Steel Corporation's statement of unfilled orders on hand September 30, showing 379,000 tons less than on August 31 was in line with expectations. This month's new orders have been very close to the rate of September, the lighter lines making up for the falling off in the heavier products and the export trade representing about 25 per cent. of the new business. The Corporation's subsidiary companies now have 46 idle blast furnaces against 45 one week ago.

Reports from the leading iron markets show varying activity, but all agree that the impulse to general buying is still lacking. At Chicago a sale of 10,000 tons of malleable Bessemer was made at a low price to a local interest. An agricultural buyer has closed for 6000 tons of foundry and malleable grades. On the whole Northern foundry irons have been more active than Southern. Northern Ohio furnaces have made a fair aggregate of sales in 1000 and 500 ton lots to foundries in Indiana, Michigan and Western Ohio, for delivery in the first half of 1911. These were largely on the basis of $14 at furnaces. Not all furnaces will sell as low; for some it means actual loss and relief in lower ore prices is seven months away.

Southern sellers find the weight of increasing stocks telling against the $11.50 level some of them have maintained. Sales of No. 2 Southern iron for delivery this year are still made at $11, at furnace, and this price has applied on some business done for the first quarter of 1911. Pipe companies have kept up their buying from both Southern and Northern furnaces, paying $10, it is reported, for Southern gray forge.

Two sales of 5000 tons of basic iron were made to Chicago district steel companies by local furnaces, while another Chicago company has added 6000 tons to previous purchases of 20,000 tons, largely from northern Ohio furnaces. An additional inquiry has come to Lake Erie furnaces for basic iron to be shipped to Chicago before navigation closes. In the Pittsburgh district late sales of basic have been at $13.10, Valley furnace.

It is plain that some important buyers of finished material are counting on further reductions in price. Car works, for example, are holding up 60,000 to 70,000 tons of plates and shapes. The real test will come when the attempt is again made to buy on a large scale. Values have been known to be held better through a

period of light buying like the present than on the first appearance of attractive tonnage at the end of such a period.

The Atlantic Coast Line purchases of rails for this year were increased to 30,000 tons. The railroads have made no inquiries for 1911, but several Western lines have canvassed their requirements. A recent 5000-ton inquiry by the Grand Trunk appears to have been withdrawn. Domestic rail mills have fared well in foreign markets recently, though British works captured the 12,000-ton order for South Australia.

Low prices on bar iron made by Western mills have attracted some business at the expense of the steel bar mills. A large steel bar contract has been closed at Buffalo for Canada, buyers there not sharing the timidity of American consumers. Eastern bar iron manufacturers report a good export demand.

The cotton tie requirements for this year are estimated at 2,500,000 bundles. For October shipment the price has been fixed at 77c. per bundle.

Structural works find a lessening number of large contracts in sight. Most of them can run into the winter on present bookings, but the withholding of railroad bridge work is causing some uneasiness for the early months of 1911. In the past week several 2000-ton jobs have been taken, including Philadelphia & Reading track elevation at Port Richmond, a cement plant at Mason City, Iowa, and the National Biscuit Company Building at Kansas City. Bids will soon be taken on the bridges over the Willamette River in Oregon, calling for 16,000 tons.

The wire nail trade is in more satisfactory shape than for some time. An independent wire interest has started its plant double turn.

It is not altogether clear how the associated buyers of steel scrap in eastern Pennsylvania will ultimately proceed in view of the Government intimation that the plan heretofore followed is objectionable. Individual purchases of heavy melting steel have amounted to 20,000 tons in the case of one interest, most of it at $14, and $13.75 is now offered.

An International Steel Conference

The meeting in New York this week under the auspices of the American Iron and Steel Institute is unique. It is the first international gathering of iron and steel manufacturers for the discussion of questions of a commercial character. Through the various tours of the Iron and Steel Institute—the two in the United States, in 1890 and 1904, and those in Great Britain and on the Continent—a certain international acquaintance has been furthered; but it has been largely among those whose interests centered in the study of works problems, the metallurgical and mechanical side of iron and steel manufacture. The meeting of this week brings together representative manufacturers for the consideration chiefly of commercial questions. Definite statement of what is in mind in this connection has not been made, though the brief programme for Friday contains two suggestions in the papers on "Foreign Relations" and "Contract Obligations."

In proposing such a meeting Chairman Gary of the United States Steel Corporation followed somewhat the line of his address at the dinner given him in London two years ago by officers of the Iron and Steel Institute. He believed there might be international competition without undue antagonism, just as at the dinner of steel manufacturers given in his honor in October, 1909, he interpreted the new doctrine to mean "competition, but not hostility; rivalry, but not antagonism; progress and success for all, but not the punishment or the destruction of any." That there is a disposition on the part of foreign steel manufacturers to respond to these sentiments has been indicated on several occasions, and the coming of a party of foreign guests to the meeting of this week is a confirmation of these expressions.

Generally speaking, the international struggle for commercial advantage is waged with growing sharpness and it is common to think that commercial rather than territorial expansion will come to be the chief cause of hostilities between nations. In the steel trade this feeling is shown in the alarm now and again raised over "dumping." British manufacturers were assured by the developments of last year that American steel manufacturers had no plans for an invasion of that market by slaughtering prices. The conditions in this country in the early months of 1909 might have led to such a campaign, if our manufacturers were ambitious to sweep the markets of the world. But it has been plain for some time that the policy of dumping has been definitely abandoned by American steel manufacturers. Proper appreciation of that fact would have saved some uneasiness recently expressed in Great Britain concerning "a heavy tonnage of American half products hanging over the market." It is fair to say that the increase in our bookings of export orders for steel in recent months has not been due to extraordinary price cutting, but is rather the accumulating result of assiduous cultivation of the foreign market by our manufacturers in the past decade in good times and bad. There is less disposition than ever on the part of American steel manufacturers to deplete their stores of raw material by sacrifice sales abroad for the sake of making the pace hot for their foreign competitors. Doubtless certain concessions will continue to be made on export sales, just as concessions have been made for some time on steel going to the Pacific Coast, where the revised tariff gives European manufacturers a better opportunity than they have ever had to place their products in some of the heavier lines. But there is little probability of any return to the policy that marked the earlier efforts of our manufacturers in outer markets.

The American Iron and Steel Institute thus enters upon its work at a time when the steel industry, at least, is not dominated by the idea of hostility and retaliation in the building up of export trade. While competition will always exist and may often be sharp, there will be ample field for the activities of an association aiming to correct demoralizing practices, to enforce contract obligations and to develop outer trade, particularly with non-producing countries, on sound and permanent lines.

A Lesson in Power House Economies

The saving of $1,000,000 by the navy in a year's consumption of coal and lubricating oil, as a result of $5000 offered as prizes in a competitive test between warships, is vitally suggestive of the economies that are possible in the boiler and engine rooms of manufacturing plants. The presumption is that the engineering staffs of the ships were ordinarily watchful against extravagance before the system was inaugurated. Yet this enormous percentage of saving was accomplished. Much waste occurs in the ordinary industrial power plant. Sharp attention to details of cost in their relation to efficiency would doubtless bring proportionate returns. Rewards are probably out of the question, ex-

cept, perhaps, with great concerns which operate several stations. But watchfulness would usually compel a more consistent effort at economical operation.

Paying the Workers

One of the great problems in the production of highly finished manufactured goods, greater than difficulties of manufacture, arises from the absolute necessity of producing them cheaply. Maximum output alone will not bring dividends unless the cost to manufacture enables ready sales to be made at reasonable profits, and on this problem—maximum production and minimum cost—many brains are concentrated. Processes are studied, tried, compared, and all but the paying propositions are rejected. New machines, faster and more efficient machines, are built, and the old and displaced machinery is stoically scrapped. Often the new process or the new machine proves of less value than was hoped and is abandoned, but at the year's end the progressive manufacturer can usually congratulate himself on a marked improvement in output and some little saving in production costs. Machines capable of completing 20,000 operations a day have been displaced by others turning out 50,000 in the same period. This has required considerable expense, either in the purchase of new apparatus or the construction of additional buildings, which expense must come out of the profits on goods sold.

As customers we are all glad to be able to buy the goods at reduced prices, and as citizens are duly proud of the shops and factories making them. However, the point we wish to bring out is that the saving or cost reduction accomplished has been almost entirely brought about by improvements in the appliances of manufacture and as the result of considerable expenditures. Yet both before and after the accomplishment of these cost reductions there existed a sure method of reducing costs which would not require the expenditure of thousands nor the maintenance of expensive departments.

Labor, material and expense—these are roughly the three components of cost-to-manufacture. In most establishments the first and last items cover the greatest part of manufacturing cost and are subject to considerable fluctuations from year to year. Making up, as they do, the greater part of the cost of most manufactured articles, it is important that they both be studied and carefully watched. We have mentioned the great care taken to increase the productive efficiency of the shop by every means; this increase naturally lowers the expense item when considered in the light of its ratio to unit of output. The efficiency of the labor itself, the ratio between the work done and the wages paid, does not by any means receive the attention it should. That this fact is beginning to impress itself on the thinking public is evidenced by the attention it is receiving in the technical press of to-day; yet there is plenty of evidence that far from enough has been said. For the natural prejudice of manufacturers toward an untried thing must be overcome and the customs and habits of generations must be broken up. Simply stated, our plea is this:

To make a workman do his utmost, there must be adequate incentive. There must be some strongly impelling force, constantly applied, which, like the steady pull of a belt, shall supply the energy and keep up the speed. This force must in no way partake of the nature of a temporary stimulant. Among such forces, as imparted to workmen by proper sanitary conditions and sympathetic influences are the following:

Sheer good health. (Desire to excel.)
Natural desire to please.
Ambition for further promotion.
Pecuniary reward.

There is nothing definite or tangible about the first three of these forces although their value as efficiency promoters must not be underestimated. Almost everyone answers to the fourth, however, and it will hardly be denied that it is a most powerful force to use for good or evil. It is the incentive of which we should make the greatest use and the one on which we should place the greatest reliance. Yet the different wage payment systems as administered to-day but feebly fulfill the proper conditions and therefore bring but small returns in comparison with that which may be expected from them if properly administered. It may be stated as susceptible of proof that the faulty administration of our wage payment systems in manufactories is responsible in a very great measure for the prodigal waste of one of the most valuable resources of the nation—its labor and brains. If one believes at all in the law of compensation, and with its tenets vividly in mind analyzes the wage-payment methods of our manufacturing establishments, he will either agree unconditionally to the existence of widespread maladministration—or else be silent. Where encouragement to the more productive workers should be given, one will find discouragement in the form of constant rate-cutting; where the more efficient workmen are necessary and should be attracted by higher wages, and considered a most valuable asset, one will find a sort of blind adherence to a flat-rate above which it is not the employer's policy to go. This widespread custom of stamping out the individuality of the workers is destroying the very teamwork that makes for success and permanence. There does not seem to be any good in expecting to win a boat race in an eight oar shell in which half the crew continually chafes under a knowledge of unfair treatment or is given to understand that neither credit nor reward will be forthcoming if the boat wins. Yet indiscriminate rate-cutting and the uncertainty which that practice leaves in the minds of the factory workers put a "dead weight" into the boat. And "dead weights" have lost many a race.

The Steel Trade and the Crops

The New York *Times* of October 11 has an exceedingly interesting article on the statement just made by the United States Steel Corporation regarding its shrinking unfilled orders and the contradictory factor of the Department of Agriculture making the best final report on the crops in the nation's history. While the Steel Corporation has before reported a lower total of unfilled orders, it never reported a smaller proportion to its productive capacity than in the statement just made. This presentation shows that the steel trade is at a low ebb. On the other hand, the Department of Agriculture reports an indicated yield of 3,057,424,000 bushels of corn, which is the largest on record and considerably exceeds all expectations. The total wheat yield is 691,769,000 bushels, which runs somewhat

above the yearly average. The oats crop, like the corn crop, is a record breaker, being estimated at 1,096,396,000 bushels. The *Times* remarks that the run of depression in the steel trade now approaches the record and cannot persist unless something is to happen beyond all experience. It continues as follows: "It is, perhaps, within the capacity of human achievement to wreck the promise of prosperity contained in these figures, but it cannot be blamed on Providence this year. There is work in sight for every hand and every wheel, and if they are not kept busy there ought to be a reckoning for whoever spoils the prospect." We heartily agree with this conclusion.

Steel Buyers and Steel Prices

Market reporters for the daily press often draw peculiar conclusions from trade conditions with which they are not familiar. For instance, the sage remark has recently been made by one of these writers that buyers of steel products are not entirely satisfied with the reductions in prices thus far made. The author of that remark evidently misunderstands totally the customary attitude of steel buyers. Under ordinary conditions, such a buyer is not satisfied with any price but endeavors to secure a still lower one. Some will even resort to questionable practices to get the advantage of the seller. A distributer or a manufacturing consumer of steel products differs in this respect from a retail buyer who pays a merchant the price asked for any article without haggling. The large buyer of steel products, however, seldom pays a price willingly, or because he is entirely satisfied with it. He is only likely to express his willingness or his satisfaction when the market is advancing and he is able to find a seller who holds his price down for a special purpose, or who miscalculates the strength of the upward movement, and takes all the orders he can at a rate under those of his trade colleagues. In the steel trade there has never yet been an asking price so low that the buyer has paid it willingly.

The Quebec Bridge Bidders

The names of the bidders on the superstructure of the Quebec Bridge, on which proposals were opened October 1, as furnished by our Toronto correspondent, are as follows: Die Maschinenfabrik of Augsburg and Nürnberg, Germany; Pennsylvania Steel Company, Philadelphia; British Empire Bridge Company, Montreal; St. Lawrence Bridge Company, Montreal. It will take some time to study the different tenders, so as to compare them and ascertain which is the lowest. As the capital required to carry out the work will be scarcely less than $6,000,000, and as $500,000 has to be deposited with each proposal, there has been a combination of forces in some of the cases. Thus the British Empire Bridge Company, Montreal, is a recently formed corporation, taking in two English companies —the Cleveland Bridge & Engineering Company of Darlington and the Metropolitan Amalgamated Railway Carriage & Wagon Company of Birmingham. The St. Lawrence Bridge Company represents in this undertaking the Dominion Bridge Company of Montreal and the Canadian Bridge Company of Walkerville, Ont. When the tenders have been examined by the Department of Railways and Canals they will be turned over to the Quebec Bridge Commission, and it may not be until the opening of the Parliamentary session, about the middle of next month, that the contract will be awarded. The whole cost of the bridge is estimated at $11,000,000, of which more than half will be expended on the superstructure.

August Exports and Imports of Iron and Steel

As compared with July, exports of iron and steel increased and imports decreased in August, according to the Bureau of Statistics of the Department of Commerce and Labor. The total value of the August exports of iron and steel and manufactures thereof, not including iron ore, was $17,628,538, against $16,108,102 in July. The value of similar imports in August was $3,473,636, against $3,656,395 in July.

The exports of commodities for which quantities are given totaled 130,877 gross tons in August, against 128,055 tons in July, 120,596 tons in June, 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for August and for the eight months ending with August are as follows compared with the corresponding periods of the previous year:

Exports of Iron and Steel.

	August,		Eight mos. ending August,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	11,652	6,193	70,865	37,975
Scrap	2,003	729	14,952	22,050
Bar iron	1,967	936	13,307	8,937
Wire rods	1,227	368	15,853	9,699
Steel bars	10,104	6,111	68,536	44,721
Billets, blooms, &c	2,025	9,309	9,682	84,119
Steel rails	24,726	26,739	243,244	166,306
Iron sheets and plates	7,756	6,211	69,130	44,838
Steel sheets and plates	18,784	9,605	110,432	62,897
Structural iron and steel	15,177	7,254	104,219	60,960
Barb wire	6,301	5,265	48,681	44,914
Wire	10,810	5,685	60,949	56,303
Cut nails	882	724	4,709	6,108
All other nails, including tacks	883	1,020	6,272	5,299
Pipe fittings	16,580	15,847	105,140	99,124
Totals	130,877	101,996	945,971	754,250

The imports of commodities for which quantities are given totaled 36,878 gross tons in August, as compared with 42,326 tons in July, 31,010 tons in June, 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of the imports of such commodities for August and for the eight months ending with August are as follows compared with the corresponding periods of the previous year:

Imports of Iron and Steel.

	August,		Eight mos. ending August,	
	1910	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	20,029	10,422	159,947	87,222
Scrap	1,882	2,125	62,271	4,377
Bar iron	3,769	1,380	28,703	9,944
Billets, bars and steel forms n.e.s	4,513	1,335	32,108	10,419
Sheets and plates	688	282	4,760	2,225
Tin and terne plates	4,072	5,070	51,082	40,041
Wire rods	1,925	1,238	14,523	7,606
Totals	36,878	21,852	353,394	161,834

The imports of iron ore in August were 282,949 gross tons, against 248,810 tons in July, 193,415 tons in June, 240,833 tons in May, 266,135 tons in April, this year, and 209,855 tons in the month of August, 1909. The total importations of iron ore for the eight months ending with August were 1,791,025 gross tons, against 954,718 tons in the corresponding period of last year and 424,963 tons in the corresponding period of 1908. Of the August imports of iron ore, 144,730 tons came from Cuba, 38,647 tons from Sweden, 37,536 tons from Spain, 19,330 tons from Canada and 42,706 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the eight months ending with August, was $130,148,125, against $100,953,952 in the corresponding period of last year. Similar imports were, respectively, $27,759,534 and $18,175,130.

Buffalo's Industrial Exposition

The third annual Industrial Exposition of Buffalo manufactures is now being held in that city under the auspices of the Chamber of Commerce and Manufacturers' Club, at the old Armory of the 65th Regiment on Broadway, which has been converted into an exposition hall. The period of the exposition is from October 3 to 15, and it is proving to be the most successful of the local expositions. There are 140 separate exhibits of local manufactures, 60 of them being working or demonstrating exhibits under power.

The electrical display exceeds in scope and beauty anything attempted since the Pan-American Exposition in 1901; both the exposition hall illumination and the street illumination on Broadway between Main street at Lafayette Square and the exposition, a distance of seven blocks, being exceedingly brilliant. The most effective and spectacular feature of this display is the flight (or apparent flight) of a huge ball of red electric lights passing from the top of a tall and graceful pagoda festooned with electric Japanese lanterns in Lafayette Square and ricocheting down the center of Broadway through numerous rings of fire to the top of an imposing arch in front of the exposition building, the effect being produced by the successive lighting and shutting off of current on a large number of duplicate balls of red lights erected between the beginning and end of the course.

On Cleveland Day, October 8, a delegation 200 strong from the Cleveland Chamber of Commerce attended the exposition, and on Detroit Day, October 15, it is expected that an equally large number will be in attendance from the Detroit Board of Commerce. Rochester and Erie have also sent large delegations to visit the exposition.

Many novel and interesting exhibits are being made. The Buffalo General Electric Company gives an illustrative exhibit of the generating of electric power at Niagara Falls by means of working models of the great electric generating plants there, showing power houses, canals, penstocks, tunnels and turbines in detail, together with the transformer, switchboards, distributing apparatus and cables carrying the current to distant cities. The same company has an extensive exhibit of the domestic uses of electricity. This is designated "the House Electric" and comprises five rooms in which all the household funcitons are performed by electricity. A modern printery operated entirely by electricity is also shown, including linotype machines, presses and stereotyping room.

Exhibits are made by Rogers Brown & Co. and the Lackawanna Steel Company. In the exhibit of Rogers Brown & Co. a large electric map is shown indicating in electric lights of different colors the location of each of the 40 or more blast furnaces of the company and of its coke ovens, and the different cities in which its sales offices are located. In this exhibit are also shown some remarkably fine and unusual samples of pig iron manufactured in this country and abroad, the local furnaces being largely represented, also samples of the products of English, Scotch, Swedish and German furnaces and iron from China. A number of special and high grade castings made from the company's products and some interesting samples of coke from the Connellsville, Pocahontas, New River and Virginia districts are also in the exhibit, as well as specimens of fluorspar from the Rosiclare mines which are now the largest fluorspar producers in this country.

The Lackawanna Steel Company's exhibit is also exceedingly interesting, a feature being a number of pyramids of highly polished cross-sections of the various products of the company in steel rails, structural shapes, bars and other rolled products, sheet piling, &c. A series of electrically illumined photographs, on glass, showing the different departments of the company's extensive plant, in operation, is also displayed.

The Western Steel Corporation

Concerning its newly acquired iron ore properties in Nevada, the Western Steel Corporation, Seattle, Wash., gives the following details in addition to what has already appeared in these columns. The properties are in Lyon and Storey counties in Nevada and are known as the Lyon, Hecla, Bear, Planet, Emma, Morning Light, Sunset, Sunrise, Round Hill, North Star and Sheba mines and the Dewey and Norway iron lodes. On the Dewey and Hecla and the Norway iron lodes a hill of iron ore is found which is about 1100 ft. long, 1000 ft. wide and 115 ft. high. A shaft has been sunk 157 ft. in the middle of the hill and ore was found to a depth of 145 ft. Various tunnels have been driven in the development work carried on in the past year. Engineers report 14,000,000 tons of ore in sight, with 39,000,000 tons assured and 139,000,000 tons probable. Reports on the property were made by R. N. Dickman, Alfred Merritt and J. Wells Smith. The ore is a brown hematite, averaging 63 per cent. metallic iron, 0.03 phosphorus and 6 to 7 per cent. silica. The Western Steel Corporation has bought the property as a reserve, without expecting to use the ore immediately. The deposit is 7 miles from the Southern Pacific Railroad, with which it can be connected almost without grade. The ore can be shipped to a point on San Francisco Bay, 225 miles distant, and thence by water to Irondale, where the company's blast furnace is located.

The Western Steel Corporation has started an iron and steel foundry of its own at Irondale and is making castings for its own use, including ingot molds, the latter being cast from metal direct from the blast furnace. Some other hearth steel castings have been made by the company for its own purposes, and the manufacture of steel castings for the market will be undertaken.

Car and Locomotive Orders.—The Maine Central has ordered 500 heater cars from the Laconia Car Company; the Atlantic Seaboard Dispatch, 30 all steel tank cars from the Chicago Steel Car Company; the India Refining Company, 69 tank cars from the American Car & Foundry Company; and the Duluth, Missabe & Northern, 25 refrigerator cars from the Peteler Car Company. Inquiries reported by the *Railway Age Gazette* include 25 box cars for the Richmond, Fredericksburg & Potomac; 40 steel subway cars for the Hudson & Manhattan; 150 freight cars for the Pennsylvania Lines West; 200 refrigerator cars for the Erie (not confirmed); 100 box cars for the Brinson Railway; 400 to 500 steel underframe cars for the Cold Blast Transportation Company. Locomotive orders include 2 for the Tata Iron & Steel Company, 5 for the Chicago Junction and 10 for the Spokane, Portland & Seattle.

The American Boiler Manufacturers' Association is holding its twenty-second annual convention in Chicago this week, the sessions extending from Monday to Thursday. A concurrent meeting of the Supply Men's Association is also being held. The members made a trip to Gary in a special train, to visit the mills of the Indiana Steel Company, and will enjoy other sightseeing trips during the week.

The population of Wheeling, W. Va., is 41,641, as compared with 38,878 in 1900, an increase of 7.1 per cent. The population of Kansas City, Kan., is 82,331, an increase of 30,913, or 60.1 per cent.

The population of Wichita, Kan., is 52,450, an increase of 27,779, or 112.6 per cent.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 12, 1910.	Oct. 5, 1910.	Sept. 14, 1910.	Oct. 13, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$15.75*	$16.00	$16.00	$18.50
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	*16.00*	16.25	16.50	19.00
Basic, delivered, eastern Pa.	15.00	15.00	15.00	18.00
Basic, Valley furnace	*13.10*	13.50	13.75	17.00
Bessemer, Pittsburgh	15.90	15.90	15.90	19.40
Gray forge, Pittsburgh	14.15	14.15	14.15	16.90
Lake Superior charcoal, Chicago	*18.25*	18.25	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*24.00*	24.00	24.50	26.00
Forging billets, Pittsburgh	29.00	29.00	29.00	29.00
Open hearth billets, Philadelphia	*26.00*	26.00	27.00	28.00
Wire rods, Pittsburgh	**28.50**	28.50	28.00	32.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.75
Steel rails, melting, Philadelphia	13.75	14.00	13.75	18.00
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	14.00	14.00	14.00	18.25
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	*14.25*	14.25	14.50	18.00
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.50
Heavy steel scrap, Philadelphia	13.75	14.00	13.75	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.40	1.40	1.40	1.57
Common iron bars, Chicago	*1.35*	1.35	1.37½	1.50
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	1.40	1.40	1.40	1.45
Skelp, sheared steel, Pittsburgh	1.50	1.50	1.50	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	**2.20**	2.20	2.15	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.80
Barb wire, Galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.87½	12.75	12.87½	13.00
Electrolytic copper, New York	*12.75*	12.50	12.62½	12.90
Spelter, New York	**5.60**	5.60	5.50	5.90
Spelter, St. Louis	**5.45**	5.45	5.35	5.75
Lead, New York	4.40	4.40	4.40	4.37½
Lead, St. Louis	*4.27½*	4.27½	4.30	4.25
Tin, New York	....	36.50	34.80	30.25
Antimony, Hallett, New York	7.87½	7.87½	7.87½	8.30
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 15 and 16, 1.95c.; Nos. 17 and 21, 2c.; Nos. 22 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.20c. to 3.25c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
¼, ⅜, ½ in.	69	59	65	55
⅝ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld } Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.

2, 2½ to 4 in... Lap Weld }

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, October 12, 1910.—(*By Telegraph.*)

Pig Iron.—Prices on basic have further declined and Bessemer iron is also very weak, with a practical certainty that the quotation of $15, Valley furnace, could be shaded 25c. or more. We quote basic at $13.10, Valley furnace. No. 2 foundry is fairly strong at $14 and gray forge is about $13.25, both at Valley furnace. We note a sale of 500 tons of No. 2 foundry for November, December and January shipment at $14, Valley furnace, and 1000 tons of basic for November and December at $13.10, Valley furnace, or $14, delivered in Pittsburgh district.

Steel.—New inquiry is confined to small lots up to 200 and 300 tons and reports are current of offerings at low prices. It is stated that Bessemer billets have been offered over the next three or four months at $23 or less, but the mills absolutely deny making such quotations. The fact is that not enough business is coming out to test the market and what would be done on a firm offer of 5000 to 10,000 tons of billets for prompt shipment in problematical. It is certain, however, that on such an inquiry less than $24 would be named. Reports are that a Valley steel mill has sold 30,000 to 40,000 tons of Bessemer rod billets to a Western wire concern at a low price. Quotations on steel are nominally as follows: Bessemer 4 x 4 in. billets, $24 to $24.50; open hearth 4 x 4 in. billets, $24.50 to $25; Bessemer and open hearth sheet and tin plate bars, $25; forging billets, $29 to $29.50, all f.o.b. cars Pittsburgh, Youngstown or Wheeling district.

(*By Mail.*)

The encouraging features of the market this week are that mail orders this month show an increase over the same period in September, and in some lines, notably pipe, sheets and wire products, the volume of new business is showing decided gains. Aside from the above there is nothing of special interest, the whole market apparently "marking time," waiting for the Interstate Commerce Commission hearings to be over, when it is believed there will be a better buying movement. There is no disposition on the part of the large steel interests to cut prices, and with orders coming in at only about 60 per cent. of rated capacity the way prices are holding up is remarkable. The Carnegie Steel Company is running to about 80 per cent. of ingot capacity, but large steel interests generally are operating at the rate of about 65 to 70 per cent. of capacity. This is being done with practically no help from the railroads in the way of orders. The pig iron market is dull, with prices showing a tendency to seek lower levels on Bessemer and basic. There is some inquiry for next year, but with furnaces asking more money for iron for 1911 delivery buyers are holding back and so far the amount of actual tonnage placed in this district in pig iron for next year is very light. The market on semi-finished materials, such as billets and sheet and tin bars, is being disturbed by offerings of open hearth steel by several of the small outside mills at prices lower than the large interests are inclined to meet. In finished iron and steel the volume of new business is holding up fairly well, but on some lines specifications are not coming in at a satisfactory rate. Ferrosilicon has reached the lowest price for several years. Coke and scrap also continue dull.

Ferromanganese.—There is not much new business being offered and prices are weak. A sale of 75 to 100 tons for delivery over the next three months is reported at about $38.50, Baltimore. We quote foreign 80 per cent. at $38.50 to $39, Baltimore, the rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—This material, being in little demand at present, has reached the lowest prices for several years. One consumer reports buying a small lot at about $54.50, Pittsburgh. We quote 50 per cent. at $54.50 to $55, Pittsburgh. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—There is a fair amount of new inquiry, and local mills report they have entered considerable new business recently. We note a sale of about 1500 tons of grooved iron skelp at about 1.70c., and 2000 tons of sheared iron plates at about 1.80c., Pittsburgh, to a local pipe mill for delivery over the next three months. We quote grooved steel skelp, 1.40c. to 1.45c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c., and sheared iron skelp, 1.85c. to 1.90c., all f.o.b. Pittsburgh, usual terms.

Rods.—There is not much new inquiry, consumers being pretty well covered, but specifying at a fair rate against their contracts. The Jones & Laughlin Steel Company has placed its new rod mill at Aliquippa on double turn and has been favored with some nice orders for rods. We quote Bessemer, open hearth and chain rods at $28.50, Pittsburgh.

Muck Bar.—The muck bar mills of the Wilkes Rolling Mill Company at Sharon, Pa., and the Wheeling Steel & Iron Company at Wheeling, W. Va., were started up last week. The consumption of muck bar seems to be increasing and the available supply in the open market is limited. Prices are firm and we quote best grades, rolled from all pig iron, at $29 to $29.50, Pittsburgh.

Steel Rails.—Reports are that the Pennsylvania Railroad engineers are now figuring on the rails required for this system next year. During the years 1904-1909, inclusive, the company is stated to have used for replacing a total of 721,569 tons of rails, an average of about 120,000 tons per year. The Carnegie Steel Company is steadily receiving good orders for standard sections for export, but new business from domestic roads is light. This company will roll about 1200 tons of angle bars on a contract for open hearth rails to be rolled at Ensley. New orders for light rails placed with the local interest are averaging 3000 tons per week or more, and the light rail mill at the Edgar Thomson Works is pretty well booked up for the rest of this year. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—Reports that the Fort Pitt Bridge Works of this city had secured the contract for the Long Island track elevation work, about 12,000 tons, are premature. The company is the lowest bidder, but the contract has not yet been placed. If it secures the work, the material will be rolled by the Jones & Laughlin Steel Company. The Bellefontaine Bridge Company, Bellefontaine, Ohio, has taken a contract for four small buildings for the Marion Shovel & Dredge Company, Marion, Ohio, about 300 tons. The American Bridge Company has taken a small bridge for the Hocking Valley and another for the same road was placed with the Mount Vernon Bridge Company. The Pittsburgh Bridge & Iron Company, Rochester, Pa., has a contract for the steel, about 250 tons, for St. Vincent's Hospital, Erie, Pa. Some large projects that will require a good deal of steel are under way, but they are being held up and very little new work is coming out. We quote beams and channels up to 15 in. at 1.40c. in large lots and 1.45c. in small lots, f.o.b. Pittsburgh.

Plates.—The plate market is interested in the report, which has not been officially confirmed, that the Pennsylvania Railroad is about to come in the market for 8000 to 10,000 steel cars. The inquiry has not reached the steel car companies, but it is known that the company has been figuring for some time on the purchase of a large number of cars. The Norfolk & Western is asking prices from the car companies on 500 50-ton steel hopper cars, but, unless prices made are attractive, the road intends to build these cars in its own shops at Norfolk, Va. Bids have been asked on about 2500 tons of plates for a new gas holder at Kansas City, Mo. New business being placed is light, all the mills are badly in need of work, and none of them is operating to more than 60 to 70 per cent. of capacity. We continue to quote ¼-in. and heavier plates in the wide sizes at 1.40c., Pittsburgh, but for delivery at certain points, and in competition with outside mills, slightly lower prices are being

THE IRON AND METAL MARKETS

named in some cases. We quote narrow plates at 1.35c., Pittsburgh.

Sheets.—Considerable new business has been placed in sheets by consumers for delivery over the remainder of this year, and in some cases into first quarter. The new price-lists recently sent out by several of the mills, which are based on 2.20c. for No. 28 black and 3.20c. for No. 28 galvanized, are regarded as minimum of the market. On painted corrugated roofing sheets the new prices are $1.60 and on galvanized for No. 28 gauge $2.80 per square for 2½-in. corrugations. It is stated that most of the new tonnage booked has been based on the above prices, except in one or two localities, where about $1 a ton less has been taken. The mills are now entering more actual orders than for some time. A full schedule of prices on the different gauges of black and galvanized sheets is printed on a previous page.

Tin Plate.—Consumers are specifying at a fairly liberal rate against their contracts, but in certain sections, notably in the Baltimore, Md., district, new specifications are not as active as they were some time ago, due to the partial failure of the tomato crop. All the mills have a good deal of business on their books for the remainder of this year and into the first quarter of next year. Prices are firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—New demand for soft steel bars is light, but specifications against contracts are coming in at a fairly satisfactory rate. On hard steel bars for concrete reinforcement, local mills report a good demand and specifications quite active. The low prices ruling for iron bars in Chicago and other Western points are disturbing the local market to some extent, reports being that common iron bars are being slightly shaded by mills in this district. On account of these low prices for iron bars a good many former consumers of steel bars will now use iron bars on account of the lower prices at which they can be obtained. We quote soft steel bars at 1.40c. in large lots and common iron bars at 1.45c., Pittsburgh.

Spelter.—New inquiry is light, consumers being pretty well covered. We quote prime grades of Western at about 5.35c., East St. Louis, equal to 5.47½c., Pittsburgh.

Hoops and Bands.—Buying is confined mostly to small lots to cover actual needs, but specifications against contracts are coming in at a fairly satisfactory rate. Prices are quite firm and we quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

Cotton Ties.—The business for this year on cotton ties is estimated at about 2,500,000 bundles. The price for October shipment is 77c., and for November shipment 77½c. per bundle, the mills advancing the price ½c. per bundle each succeeding month.

Spikes.—This trade continues slow, new orders being only for small lots to cover actual needs. The railroads have been buying very few spikes for some time. The demand for small railroad and boat spikes is fair, but in some cases specifications against contracts are being held up. All the makers are badly in need of orders and are running only to partial capacity. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carlord and larger lots.

Rivets.—The volume of new business is light, consumers placing only such orders as are needed to cover actual wants. Prices continue to be shaded.

Shafting.—New orders are mostly in small lots to cover actual needs, and specifications from the larger consumers, such as the automobile builders and implement makers, are not very satisfactory. None of the shafting makers is able to operate to full capacity. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent, is being named.

Wire Products.—The demand for wire nails and wire so far this month has shown a considerable increase over the same period in September. One of the leading makers of wire nails started up its plant on double turn last week to take care of its increased orders, the wire nail market being in more satisfactory shape than for some time. The demand for cut nails is also showing some betterment.

Merchant Pipe.—All the makers of iron pipe have issued new cards of discounts which are four points lower than on steel pipe, or, in other words, prices quoted on iron pipe are $8 a ton higher than on steel. The volume of new business in merchant pipe is holding up well, the demand being heavier so far this month than in the same period in September. No large contracts for line pipe have been placed in the past week and any large projects now under way will likely go over until next year. It is stated that the new discounts on both iron and steel pipe, printed on a previous page, are being maintained.

Boiler Tubes.—The demand for railroad tubes is fairly heavy, one leading maker operating more furnaces on tubes at present than at any previous time this year. The demand for merchant tubes is very dull and only small lots are being placed.

Coke.—There is no improvement in the coke market in demand or prices, and it is evident that more coke is still being made than is needed. A blast furnace interest bought in the past week 15,000 to 20,000 tons of standard grades of blast furnace coke for prompt shipment, at the reported price of $1.60 per net ton, at oven. There is some inquiry for furnace and foundry coke for delivery in the first half of 1911, but so far little of this business has been closed. We quote standard grades of blast furnace coke for spot shipment at $1.60 to $1.65 and for delivery over the remainder of this year at $1.70 to $1.75 per net ton, at oven. Standard makes of 72-hour foundry coke for spot shipment are held at $2.15 to $2.25 to consumers, and for delivery over the remainder of this year and into the first half of next year $2.25 to $2.50 per net ton, at oven, are being quoted. The output of coke in the Upper and Lower Connellsville regions last week was 345,390 net tons, an increase over the previous week of about 1300 tons.

Iron and Steel Scrap.—The market is very dull and prices are weak. Bids on the scrap lists of the New York Central, the Pennsylvania Lines west and the Erie Railroad which closed last week, were evidently not attractive to these roads, as very little scrap was secured. Consumers are not inclined to take in more material than needed in the very near future, not being satisfied that bottom has been reached. Sales of 2000 to 2500 tons of assorted heavy steel scrap are reported at about $14.50 delivered, Monessen, Pa., and also about 1500 tons of bundled sheet scrap at about $10 a ton at shipping point in the Pittsburgh district. We also note sales of 1200 tons of cast iron borings on the basis of $8.75 delivered, equal to $8.15, Pittsburgh. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.75 to 14.00
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	12.00 to 12.25
Low phosphorus melting stock	18.00 to 18.25
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.25 to 14.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.25
Machine shop turnings	8.75 to 9.00
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00

Chicago

FISHER BUILDING, October 12, 1910.—(*By Telegraph.*)

Railroad traffic indicates that business conditions in the West are normal outside the iron and steel trade. The railroads at an average are moving as much business as they did a year ago at this time, and some of the large systems have exceeded all former records of tonnage hauled. Reports of a shortage of cars are becoming more general and large shippers expect more trouble this winter than they have ever had in obtaining cars to keep their business going. Conditions in the coal trade are having considerable effect on the car situation. Railroads, manufacturers and coal dealers are approaching the winter without the reserve stocks of coal which they usually accumulate at this season and the railroads are giving the necessary preference to the movement of coal, using box as well as gondola cars for this traffic. As a result, shippers of other commodities find an unusual shortage of all classes of cars. The railroads allow gondola cars to be loaded for only a short distance beyond the system of the road furnishing the car. In many cases flat cars are being used for shipping steel. Traffic officials estimate that the movement of steel in this territory is fully equal to any former period except last fall, and state that the cars would not be available for shipping if the mills and blast furnaces were all going at full capacity. The car situation will undoubtedly have its effect in the market this winter and may now account to some extent for the firmness in prices. There are no features of interest in the market for finished material. Bar specifications are heavy and shipments of wire products are very satisfactory. Only a few inquiries have appeared for stand-

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ard rails for next year and progress is slow in closing large structural contracts. The scrap market is weak, with no active interest on the part of buyers.

Pig Iron.—A local independent sheet interest has made an additional purchase of 6000 tons of basic iron, making a total of 26,000 tons purchased recently. A Cleveland furnace will furnish 6000 tons of this purchase, the remainder being divided between Toledo and a local furnace. The shipments from Cleveland and Toledo will be made by water. Two other independent steel interests in this district have been in the market recently and each of them is understood to have purchased about 5000 tons of basic from a local furnace. A sale of 10,000 tons of malleable Bessemer to a local manufacturing interest has been closed the past week, for immediate delivery. The iron was of an unusual analysis and it is understood that one of the local furnaces made the sale from the stock on its furnace yard at a price under $16. Owing to the unusual analysis, however, the price does not reflect the current market for regular grades. A local foundry has also purchased 500 tons of Jackson Company silvery iron, eight per cent., at a special price. Inquiries for Northern iron are increasing, especially for foundry grades and the local furnaces are moving a considerable tonnage of iron for prompt shipment. Not many sales have been made for Northern iron for next year's delivery as the Northern furnaces are making concessions only on prompt shipment. The Southern market continues quiet, with both the furnace interests and the buyers inclined to defer trading in extended deliveries. An important Southern interest which has refused heretofore to quote any price beyond December, is now offering iron for the first quarter at $11.50, Birmingham, but another large maker continues to withhold quotations beyond the current quarter. The demand for shipment for this year is very light and supplied principally by Tennessee furnaces at $11, Birmingham. One sale of 1500 tons at $11.50 for delivery during the first half is noted, but there have been few transactions of that character in this territory. The following quotations are for October, November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.25 to $18.75
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The market is quiet with occasional inquiries for small lots. Open hearth forging billets on sales of this character are quoted at $28, base, Chicago.

Rails and Track Supplies.—The Illinois Steel Company booked small orders for standard steel rails last week amounting to a little over 6000 tons. Several Western railroads have made tentative inquiries for next year's delivery but not for a full year's requirements. The demand for light rails is quiet and orders for track supplies are generally in small lots for immediate shipment. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—The contract for the Lehigh Valley Portland Cement Company's plant at Mason City, Iowa, which will require about 2000 tons of steel, was let to the Worden-Allen Company, Milwaukee. The steel contract for the National Biscuit Company's new plant at Kansas City, about 2200 tons, was let to the Brown-Ketchum Iron Works, Indianapolis. The American Bridge Company booked 150 tons for a head frame for the James J. Burke mines, Salt Lake City. The International Harvester Company's building at Auburn, N. Y., 1600 tons, was let to the Groton Bridge Company. The remarkable run of small orders for fabricated material, which has been a feature of the market for the past summer, is unabated, and each office of the large fabricating companies takes a long list of orders of this character every week. On plain material the important mills are holding firmly, and the only reports of concessions in prices are on light sections of plain material, which are made by smaller mills. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The market is quiet, but specifications are keeping up at a satisfactory rate. The important mills are holding their prices firm and it is only on narrow plates from smaller Eastern mills that any concessions are reported. The larger companies report that they are apparently getting their share of the business at their regular prices. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—There is a fair amount of new business and prices are a little firmer than some time ago. A matter of considerable interest to the trade is the adoption by most of the mills of a new scale of differentials on galvanized sheets. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheet are quoted at 1.83c., Chicago, and No. 28 black 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—With many of the mills September was the best month this year in specifications for soft steel bars and October has made a good beginning. In some cases the mills are 60 days behind on their specifications for special agricultural shapes. The hard steel bar mills are getting a fair amount of business, but the bar iron mills continue to receive a very light volume of new orders. No increase is reported in the demand from the railroads. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Shipments of wire products from the mills during September were unusually heavy in supplying the demand from jobbers and dealers who were replenishing their stocks. The weather has been exceptionally favorable for building field fence and sales of this product this fall have broken all records. There is a fair demand for barb wire and nails. Manufacturing consumers of wire appear to be doing a normal business. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—The demand for merchant steel from store has been improving somewhat the past week or two and is on a very satisfactory basis. The mills making special lines of steel are also doing better than those which produce heavy plain material. On special sections for the agricultural trade some of the mills are two months behind on specifications, and the lighter demand from the automobile industry this year will be offset by the growth of the market in other directions.

Cast Iron Pipe.—The Detroit inquiry which was mentioned last week is the only notable one thus far that has appeared for winter shipment. There is a fair run of routine orders for small lots. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The scrap market fails to reflect any notable improvement in the iron and steel industry. The largest buyer of steel scrap is now under a railroad embargo which has stopped deliveries and checked the stronger tone in melting steel which was apparent a week or two ago. The agricultural malleable foundries are busy and are steady buyers of scrap, but the railroad foundries, which represent the largest tonnage, are not in the market. The steel foundries are also light buyers of the grades of material which they favor, and the rolling mills are taking only bargains in the material offered them. An interesting movement in the Chicago market for old material is an effort of the dealers to organize a protective association. The chief object which is advocated is to employ an inspector, who will examine personally all cars rejected by buyers and thus secure a better observance of grades in the Chicago market. There is more trouble over rejections in the scrap trade than any other feature of the business, but large buyers insist that the trouble lies with the shippers rather than with them. It is claimed by leading buyers that 90 per cent of the cars they actually accept could be legally rejected, because they contain material different from the grade or quality that was purchased. The railroads have adopted a uniform classification for their scrap which has proved very successful, and buyers will pay a premium for material shipped by the railroads. The outcome of the proposed association will be watched with interest by dealers as well as buyers. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

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Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

The Inland Steel Company's blast furnace at Indiana Harbor, Ind., blew out last week for relining. The company expects to have it in blast again by December 1, having recently made purchases of basic pig iron to cover its requirements in the meantime.

Cleveland

CLEVELAND, OHIO, October 11, 1910.

Iron Ore.—It is estimated that shipments this season will be very little in excess of those in 1909, in spite of the fact that the movement up to October 1 was 5,461,331 gross tons over the corresponding period of last year. Lake shipments in 1909 were 41,683,873 tons. Last year the movement was very heavy after October 1, aggregating 12,044,546 tons. This year it is expected that the October movement will reach about 5,000,000 tons, as compared with 6,273,834 tons shipped in September. The Steel Corporation is nearly through with chartered tonnage and plans to load the last of its own boats by the middle of November. The total movement after November 1 will be very light. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market is very quiet in this immediate territory, but more activity is noted in other portions of the Central West. A local interest reports sales during the week aggregating about 8000 tons, in Michigan, Indiana and western Ohio. This was in lots of 1000 tons and under, both malleable and foundry. Some of the tonnage is for last quarter delivery, but the sales were largely for the first half. Some fair sized inquiries are also pending from the same territory. For delivery through the first half $14. Valley furnace, for No. 2 foundry, is being more generally quoted, but some producers are unwilling to meet that price, claiming that it is below the cost of production. It is pointed out that furnaces have considerable tonnage on their books for last quarter delivery, taken early in the year, at $14.50 to $15.50 for No. 2 foundry, and that they can afford to take on $14 tonnage to dispose of their surplus output during the last quarter, but that it will be impossible for them to run their plants except at a loss after the first of the year at $14, with no higher priced tonnage on their books to average up. The consumption is holding up well, as indicated by shipments on contracts, and another encouraging feature of the market is the report that stocks on furnace yards are being slowly decre sed. For prompt shipment and the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.75 to 15.00
Northern foundry, No. 2	14.25 to 14.50
Northern foundry, No. 3	14.00 to 14.25
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—There is some demand for spot foundry coke from foundries that have declined to enter into contracts, but most foundries have contracts either for the remainder of the year or through the first half. We quote standard Connellsville furnace coke at $1.60 to $1.70, per net ton, at oven, for spot shipment, and $1.70 to $1.75 for the remainder of the year. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 for spot shipment and $2.25 to $2.50 for delivery through the first half.

Finished Iron and Steel.—The demand is light in nearly all lines. Price conditions, however, continue satisfactory, all recent quotations being firmly maintained. While steel bar specifications are quite satisfactory, shipment of considerable tonnage is being held up. When mills were far behind on deliveries consumers generally specified quite heavily for deliveries three months and more ahead in anticipation of future requirements. The demand for the products of some of these manufacturers has fallen off somewhat, so that their orders for steel have proved to be in excess of their requirements and suspensions of orders have resulted. New orders and specifications are nearly all for small tonnages. With deliveries good on all lines, consumers are allowing their stocks to run low and when material is needed orders are placed for quick shipment. Steel bars and structural material are firm at 1.40c., Pittsburgh, and that price is being shaded on plates for only the narrow sizes. The demand for plates continues light. The demand for small lots of structural material continues fairly active. Fabricators when figuring on work requiring good tonnages are now seldom asking protection on prices from the mills in advance of bids, being willing to take their chances with the market. It is reported that the Mt. Vernon Bridge Company is the low bidder on a county bridge to be built in Zanesville, Ohio, requiring about 2000 tons of steel. The Lake Shore Railroad has received bids for bridge work requiring 250 tons. There is a fairly good demand for sheets. Some contracts are being placed for the remainder of the year at current prices. Prices appear to be firmly maintained at 2.20c. for No. 28 black and 3.20c. for No. 28 galvanized. The demand for iron bars continues light, with prices steady at 1.30c. to 1.40c., at mill.

Old Material.—The market continues very dull and dealers see no indication of an early improvement. Transactions between dealers are about as scarce as sales to mills. Local steel mills are well stocked up and are buying only when decided bargains are offered. Iron mills are buying only in small lots as needed. There is practically no demand from the foundry trade. Railroad offerings the past week are understood to have brought fair prices, bids being based on about the present market quotations. The Norfolk & Western Railroad will close October 18 on about its usual tonnage. Dealers' prices per net ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., October 10, 1910.

Pig Iron.—The bulk of the trading during the past week was in pig iron warrants and an aggregate of 10,000 tons of foundry grades was involved in such transactions. These warrants were sold at prices ranging from $11 to $11.50, Birmingham, on a No. 2 foundry basis and on one or more round tonnages it is understood that arrangement was for deliveries to extend well into next year. The free iron recently sold is comparatively small in the aggregate, but without having established a new basis for prices. The largest sale of free iron was 1000 tons of No. 4 foundry for prompt shipment. This iron was sold at $10.50, Birmingham, or at a strictly $11.50 basis for No. 2 foundry. A lot of 500 tons of gray forge for last quarter shipment was sold at $10, Birmingham, and lots of 350 and 200 tons each of No. 2 soft brought $11.50, Birmingham. The damand has come from quite a wide range and all purchases have no doubt resulted from urgent requirements. A number of inquiries for low grades are pending at this time, but with this exception the tonnage soon to be placed is very limited. An increase in the number of inquiries for 1911 deliveries is noted and quotations on such tonnage are fairly uniform. It is understood that a basis of $11.50 would be acceptable to practically all interests for deliveries through the first quarter, but in view of the increase in stock accumulations it is not improbable that a firm offer for a round tonnage at even lower figures would be accepted by certain concerns. The latest stock reports place the aggregate accumulation at approximately 248,000 tons, or an increase of 9000 tons over the aggregate as of August 1. The tonnage now on hand consists of 61,000 tons in warrant, 45,000 tons of free basic iron and 142,000 tons of free foundry iron. The increase in production indicated October 1, was offset during the past

week by the blowing out of the furnace of the Williamson Iron Company, which leaves 15 stacks in blast on foundry grades.

Cast Iron Pipe.—No addition of consequence has been made to the tonnage for early letting and this market is at present without features of special interest. The prices at which latest contracts were placed have not been announced and it is understood that some very low figures were submitted, owing to the sharp competition with foreign producers. We quote water pipe as follows per net ton f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., average $20.50, with $1 per ton extra for gas pipe. These quotations are nominal and no doubt subject to shading on large contracts.

Old Material.—This market continues unusually quiet and prices are belived to have weakened notwithstanding the fact that very little trading has been done during the past week. All parties concerned have apparently determined to pursue a conservative course, and as a result accumulations are not increasing on the yards of dealers or consumers. We quote Dealers' revised asking prices as follows, per gross ton f.o.b. cars here, viz:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

The furnace of the Williamson Iron Company at Birmingham, Ala., has been blown out for relining.

Repairs are being made to the furnace of the Central Iron & Coal Company at Holt, Ala., and operations will be resumed about November 1.

Cincinnati

CINCINNATI, OHIO, October 12, 1910.

Pig Iron.—The recent excellent crop reports have had no appreciable effect on the iron market. If anything, there has been less activity the past few days. The inquiries coming in are generally considered as being merely feelers, although there are some small lots of iron changing hands. Local agencies are working on an inquiry from the Chicago district for a round lot of high silicon for delivery the remainder of this year. A central Indiana melter wants 3000 tons of Northern foundry No. 2 for first half delivery, and there are a number of requests from local territory covering lots of both Southern and Northern foundry ranging from 100 to 1000 tons. The 6000-ton basic inquiry from southern Ohio which has been pending some time, has not yet been closed. For November and December shipment 1000 tons of Southern foundry No. 2 was sold a Northern manufacturer at $11 at furnace, which seems to be the ruling price for the remainder of this year. It is reported that a few Southern furnaces are willing to take on business extending into the first quarter at the same price. However, most of them are indifferent about next year's business and quote on inquiries simply as a matter of courtesy and prices named are from $11.50 to $12, Birmingham, and over for first half shipment. The Northern iron market is still a little soft and it is stated that a central Indiana melter was able to purchase 1000 tons of foundry No. 2 for first half delivery at a price considerably under $14.50, Ironton district, for the last quarter of this year, while $14 is generally quoted. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio Silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—The market is featureless. New business transacted is light and is practically all for shipment before January 1. Prices for spot coke are still weak and in all three fields some immediate shipment furnace coke can be bought around $1.55 to $1.60 per net ton at oven. A few sales are recorded at $1.50. Contract prices on furnace grades run from $1.65 to $1.85 and on foundry grades from $2.10 to $2.25, with a premium for some special brands. Spot foundry coke is available around $2 from some ovens. Contract coke is moving freely, but it is reported that some consumers anticipate a car shortage, and are quietly stocking up as much as can be conveniently carried.

Finished Iron and Steel.—With the exception of rumors of price cutting on the part of some mills, there is nothing interesting in this market. Local agencies deny that 1.40c., Pittsburgh, is being shaded on standard sizes of bars, plates, &c. Business booked is for immediate shipment and there is practically none to be noted for next year's delivery. Warehouse business also is light.

Old Material.—There is yet no sign of early activity in the scrap market. Dealers appear to be buying only bargain lots of scrap and consumers are simply filling their immediate requirements. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Philadelphia

PHILADELPHIA, PA., October 11, 1910.

Notwithstanding easier prices for some brands of foundry iron, a slightly better feeling regarding the pig iron situation prevails. General buying has been a trifle less pronounced, but a few large sales have brought the aggregate somewhat above that of the previous week. There is almost an entire absence of demand for the steel making grades. In finished material, buying continues rather light, with a fair volume of new business being figured on. Prices in practically all grades and classes of rolled products are being well maintained. The old material situation is still in a somewhat uncertain stage. While it is practically certain that the combination buying arrangement of the Eastern mills will be abandoned, details as to what plans will be followed in the future are not available. It is to be noted, however, that one mill formerly in the arrangement is buying heavily in the open market. The movement in coke continues light.

Iron Ore.—The situation is unchanged. No inquiry for next year's supply has developed, consumers being more interested in further postponement or cancellation, if possible, of portions of supplies still to be taken this year. Importations at the port of Philadelphia for the week ending October 8 aggregated 29,313 tons, valued at $83,063.

Pig Iron.—With the exception of fair-sized lots, placed against inquiries from the Pennsylvania Railroad and several of the cast iron pipe foundries in this district, transactions have been on a rather small scale. The Pennsylvania Railroad placed orders for a large share of its coke iron requirements and something over 1200 tons of charcoal iron, to be delivered at its Altoona shops, at terms not made public. It is understood to be still in the market for a portion of its requirements for the last quarter of the year. There has been a better movement in pipe making iron; some 5000 tons of Northern iron were taken by one concern, while several thousand tons, understood to be part Northern and part Southern iron, the latter at $10, Birmingham, basis for forge iron, were taken by another interest, and upward of 1000 tons was taken by a third interest. These sales were all for last quarter delivery, and it is understood that several consumers are in the market for early 1911 requirements. The general run of smaller foundries are buying less actively, due to a certain extent to the fact that they have purchased recently on a more liberal basis. There has, however, been a fair business done in lots ranging up to a few hundred tons, in some instances at prices which show a further concession. Some standard brands of eastern Pennsylvania No. 2 X foundry can now be openly done at $15.75, delivered, with No. 2 plain at $15.25, delivered, certain sellers having decided to accept business at that basis, although others still maintain the $16 basis for No. 2 X, for shipments during the remainder of the year. In instances deliveries are permitted to extend into the first quarter, but as far as strictly first quarter deliveries are concerned, sellers appear to be still holding off, although buyers would place business at the present level of prices. In Virginia foundry grades $13.25, furnace, seems to be the ruling price for both No. 2 X and No. 2 plain foundry, equal to $16 to $16.25, delivered here, according to destination. Very little business has, however, been done. Outside of low grade iron, very little Southern iron has been sold in this territory. The available supply of low grade iron in the South is reported as being well cleaned up and sellers in this district stick pretty closely to the $11.50, Birmingham, basis

THE IRON AND METAL MARKETS

for No. 2 foundry. Forge iron shows little activity; several lots have been sold to the pipe foundries at close to $14.75, delivered, but no interest is taken in the market by the rolling mills. There is practically no demand for the steel making grades. Eastren steel mills have heavy stocks of basic iron on their yards and continue to curtail shipments. Basic is nominally quoted at $15, delivered, although in a trade deal some 1500 tons were taken by one melter at a lower figure. Very little business has been done in low phosphorus iron, small lots moving at unchanged prices. The following range of prices about represents the market for standard brands, delivered in buyers' yards in this vicinity, for shipment during the remainder of the year and, in a few instances, extending into the first quarter of 1911:

Eastern Pennsylvania, No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	16.00 to 16.25
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 14.75
Basic	15.00
Standard low phosphorus	22.50

Ferromanganese. No inquiry has developed in this territory, sellers nominally quoting $39, Baltimore, for 80 per cent., for delivery extending through the first half of next year.

Billets.—Transactions have been confined to small lots for early deliveries. Large consumers still keep out of the market, taking up immediate requirements rather than placing any tonnage for extended delivery. With current orders and specifications against previous contracts, mills in the East keep going at slightly over half of their normal capacity. Open hearth rolling billets are quoted at $26 to $26.50, according to quantity, delivered in this vicinity. Forging billets are quoted at $28, minimum, at Eastern mill, the usual extras for high carbons and special sizes being added.

Plates.—Current orders have been in somewhat smaller volume, and mills have but little tonnage on their books. While some fairly good propositions have recently been figured on, it will be some time until many of them develop into orders. Prompt deliveries are available on practically all classes of material. Prices are being firmly held, 1.55c. being the minimum for ordinary plates in carload lots, delivered in buyers' yards in this vicinity.

Structural Material.—While proposals for several fair sized propositions in bridge and building work will be opened this week, the general run of business is irregular and current orders are mostly of a miscellaneous character. Mills are pretty well fixed with orders as far as the near future is concerned, but will require more business than has recently been placed to maintain their present rate of activity for any length of time. Prices, however, are being well maintained, 1.55c., delivered here, being the minimum quotation for plain shapes delivered in this territory.

Sheets.—A very fair proportion of day to day business is coming out, and the majority of the mills in this district have more business on their books than for some time. Individual orders, however, have not been large and the same urgency for prompt delivery prevails. Prices are unchanged, Eastern makers naming the following range of prices for prompt ordinary business: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Mills note a falling off in specifications against old orders, while the new business offered is principally in small lots for prompt delivery. As a rule mills are not operating much over half their capacity and there is pretty sharp competition for what little tonnage is offered, although there does not seem to be much tendency to further shade prices, which range close to 1.40c., delivered, as a minimum, for refined iron bars, with steel bars firm at 1.60c. to 1.65c., delivered.

Coke.—With contracts covering any material requirements largely placed, the market has drifted into one in which small lot sales make up the bulk of the business. Transactions are largely confined to foundry grades for early delivery, prices for which are firm at $2.25 to $2.50 per net ton, at oven. There has been little demand for furnace coke, which for spot delivery is quoted at $1.60 to $1.65 and for forward shipment $1.65 to $1.85, at oven. The following range of prices per net tone is quoted for deliveries in this territory:

Connellsville furnace	$4.00 to $4.15
Connellsville foundry	4.50 to 4.75
Mountain furnace	3.60 to 3.75
Mountain foundry	4.10 to 4.35

Old Material.—While the abandonment of the present buying arrangement of the Eastern steel mills, on advice of the Government, will neither be confirmed nor denied by those interested, it is to be noted that one of the mills heretofore connected with the arrangement has been quietly making purchases in the open market and has recently taken on 20,000 tons of heavy melting steel, the major portion of which was purchased during the past week. Another outside mill has purchased 2000 tons, the prices ranging from $14.25 down to $14 for No. 1 steel. Outside mills now offer $13.75, delivered, while the associated buyer is understood to be offering $13.50, delivered, for No. 1 steel, without bringing out any business. It is rumored that another plan may be adopted in connection with the former buying arrangement of the steel mills, but this lacks confirmation. Considerable interest is being shown in the railroad lists, on which bids have gone in during the past few days but on which awards have not yet been announced. In the rolling mill grades of scrap business continues dull and in some lines not enough has been done to establish quotations. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.25
Old steel rails, rerolling	16.00 to 16.50
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old steel rails	18.00 to 18.50*
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.25 to 16.75
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machine cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50

* Nominal.

Buffalo

BUFFALO, N. Y., October 11, 1910.

Pig Iron.—Sales for the past week have been considerably better than for a number of weeks, most of them covering deliveries for a short period in 1911 and being chiefly for foundry grades. The total, however, is not large, only a comparatively small proportion of the heavy aggregate of recent inquiry having materialized into orders. A majority of buyers still maintain a hesitating attitude relative to covering for future needs. In basic the inquiry has not been active: one inquiry for 5000 tons was received from Chicago, for delivery before the close of navigation. From the furnacemen's point of view quotations now being made, as shown by current schedules, are on a basis exceedingly favorable to the consumer. In many instances they are now so low as to be a losing proposition to many furnaces. We quote as follows for the remainder of the year, f.o.b. Buffalo:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.50 to 14.75
No. 2 plain	14.25 to 14.50
No. 3 foundry	14.00 to 14.25
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.75 to 15.25
Charcoal	18.50 to 19.00

Finished Iron and Steel.—The last few days have shown considerable improvement over the conditions prevailing for a number of weeks, and a fair volume of business for current requirements in finished products has been placed. A few jobbers are placing contracting in a limited way for deliveries until the end of the year, and there is a little inquiry for contract quotations for the first quarter of the new year. Most of the business transacted, however, is on the immediate requirement basis, and it is not anticipated that there will be any extended buying movement until after election. Business in steel bars, round edge tire, toe calk steel and spring steel has been especially good during the week, and the inquiry on bars for concrete reinforcement has been active and a fair tonnage placed. A considerable tonnage is still in abeyance and may possibly go over until spring before placement. Prices on steel bars and plates are firm and some agencies report a larger percentage of orders placed at 1.45c., Pittsburgh, than a week ago. Prices for cold rolled steel are not quite as steady as they have been. Export business continues good both for contract and current sale. One interest reports a large bar contract recently closed and much business pending. Canadian buyers do not seem to hesitate to contract for their future requirements. In fabricated structural lines business is rather quiet, although a number of structural projects are shortly to be in the market for figures. Plans will be out in about two weeks for the Washington street market building to be erected by the city of Buffalo, which will require about 700 tons of structural steel, and bids are to be received the latter part of this week for the Haberstro store and office building on Broadway, Buffalo, about 150 tons. C. A. Hager, North Collins, N. Y., who was awarded the general contract for the J. N. Adam Memorial Hospital, to be erected by the city of Buffalo at Perrysburg, N. Y., is con-

sidering bids for the structural steel, 200 tons, and Larkin & Sangster, St. Catherines, Ont., contractors for the new Erie Canal locks, a bridge and other canal structures at Lockport, N. Y., are receiving sub-bids for the 1700 tons of structural material required. The Buffalo Structural Steel Company has taken the contract for the fabrication and erection of the 1160 tons of steel for the new Utica Hotel, Utica, N. Y.

Old Material.—The local demand in most lines has been exceedingly limited during the week, mills in this district being pretty heavily stocked. Cast scrap is about the only grade in which there was any activity. Such movement as there was in melting steel and other lines, with the exception of cast scrap, was to outside markets. The prices shown in the accompanying schedule are largely nominal and based on other markets, with freight allowed. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	23.00 to 23.50
Old car wheels	13.50 to 14.00
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	5.75 to 6.00
No. 1 busheling scrap	11.25 to 12.00

St. Louis

ST. LOUIS, October 10, 1910.

The bank clearings for the past week show a satisfactory degree of activity in local trade, as they exceed by nearly $5,000,000 the total for the corresponding period last year. The growing shortage of cars confirms the report that the idle car surplus is now at the lowest level since last spring, notwithstanding the heavy increase in car equipment and extensive repairs, which has been furnishing a large amount of business for local foundries and supply houses. Traveling men who are coming in from extended trips state that they found the foundrymen, as a rule, quite busy.

Coke.—Though most of the larger consumers in St. Louis territory have contracted for wants covering the usual period, there is considerable inquiry for coke from medium to small buyers, one leading house reporting inquiries aggregating 2500 to 2800 tons ranging from one to twenty cars. A leading broker reports an inquiry for 2000 tons. The market is steady at $2.35 to $2.50 per net ton for best selected Connellsville, 72 hour foundry coke, and $2.00 to $2.25 for second best, f.o.b. oven.

Pig Iron.—With most of the leading sellers the past week ruled very quiet. Among the sales reported are the following: A leading broker effected the sale of 1200 tons of 4 to 5 per cent. silicon to an Illinois stove company, for shipment October to March, and to various parties 1000 tons of Southern and Northern gray iron for shipment over the first half of 1911. Another office mentions a sale of 1000 tons of charcoal iron for delivery over the last quarter of 1910 and into the first quarter of 1911. A feature of the situation is that the demand for the most part is for special iron and there is not much inquiry for foundry grades. All offices report scattering inquiries, together with some small sales, and merchant sellers are also having a fair demand from small outside buyers, both by mail and through traveling salesmen. It is claimed by some that stocks at the South are being reduced, but this report is modified by other iron men who assert that it is only a change of ownership from furnacemen to merchant sellers. There is but little improvement in the tone of the market and irregularity in prices still prevails, making it difficult to quote accurately. In general, the leading sellers are offering good brands of $2 Southern foundry for prompt or for shipment to January 1 at $11, Birmingham, though some houses name $11.50 for remainder of the year delivery. Some sales are being made for the first half of 1911, but they are mostly on private terms effected through acceptance of firm bids, with several furnacemen refusing to quote for that delivery. Where price is quoted, $11.50 is named, with $12 as the price asked by some leading interests. Valley iron is quoted at $14, and southern Ohio $14.50, f.o.b. furnace, for shipment over the remainder of the year.

Old Material.—There is no improvement to report concerning the demand for scrap iron and steel. There is, however, more inquiry, but buyers and sellers are apart on prices, the dealers seeking to hold the market up. A leading house reports the purchase for its own account of 1000 tons of relaying rails. The following offerings by the railroads were closed out the past week, bringing fair prices: St. Louis & San Francisco, 506 tons; Wabash, 800 tons. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft.	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.25 to 12.75

The following quotations are per net ton:

Iron fish plates	$12.00 to $12.50
Iron car axles	18.50 to 19.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	10.00 to 10.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	9.00 to 9.50
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.75 to 8.25

The Fruin-Colnon Construction Company has been awarded the contract for the main structure of the new Washington avenue railroad station, which will cost $150,000.

The Eagle Packet Company has ordered two new boats to be built by the Howard shipyards at Jeffersonville, Ind. The machinery for the boat for the St. Louis and Alton trade, which will cost $50,000, will be built by the St. Louis Iron & Machine Company, and the boilers by the John Rohan & Sons Boiler Company. The other boat, to be built later, is intended for the Cape Girardeau trade.

The German Iron Market

BERLIN, September 29, 1910.

The new Pig Iron Syndicate yesterday gave out its price list for the first quarter of 1911. Hematite was fixed at 70 marks; No. 1 foundry at 66 marks and No. 3 at 64 marks. Luxemburg No. 3 foundry was fixed, by agreement with the Luxemburg dealers, at 52 marks. Representatives of the syndicate met here on Monday and arranged terms with the dealers in the various sections of the country. At the same time conferences were held here with furnace owners of the Luxemburg-Lorraine group which resulted in an agreement as to Luxemburg grades of iron; this will prevent any collisions on prices between the Essen syndicate and the furnaces in question. The new prices quoted above denote a rise, except for Luxemburg iron. Yesterday the Siegerland ore mines adopted an advance of 10 marks per carload of 10 tons on ores, making the price 165 marks for brown iron ore and began taking orders for 1911. The Band Iron Association has also adopted the advance of 2.50 marks foreshadowed in last week's letter. The new price is 140 to 145 marks, according to quantities bought; and this price, it is asserted, is the same for export as for the home trade.

In contrast with this stronger tendency of prices in Germany, some reductions of prices were reported from Belgium at the end of last week. Basic steel bars were reduced 2 shillings and bar iron 1 shilling per ton for export at Antwerp. A detailed press report on the Belgian market this week, however, denies that there is any general weakening there. It is asserted, on the contrary, that the general situation continues to improve, notwithstanding the price cuts referred to.

The Steel Syndicate has this week given out a report on the state of business in rails, structural shapes and semi-manufactured steel. Home business in the last named, says the report, has continued satisfactory, and the foreign market shows a better buying tendency, notwithstanding the less favorable news from America and the labor difficulties in England. In heavy steel rails the syndicate has taken some good orders from abroad. The increase in the amount of orders booked, which is described as considerable, is in the main due to better foreign business. The business in grooved rails, as usual at this season, has become more quiet; foreign competitors are fighting sharply for the outside market. The foreign demand for mining rails has lost nothing of its previous briskness, but Belgian competition continues to keep prices down. In structural shapes business has been upon the whole satisfactory; there has been an increase of 90,000 tons in the orders on the books since July. Foreign business in this specialty begins to grow more quiet as the season advances.

A review of the hardware trade mentions an improvement within a month. In most sections of the trade orders

THE IRON AND METAL MARKETS

have been received in larger quantities than hitherto, and the buying movement is described as now being very active. On the other hand, prices are still too low in general to satisfy manufacturers, and in only a few cases have advances been put into force. In builders' hardware the situation appears to be unchanged; but in furniture makers' supplies a considerable improvement is mentioned. From the Solingen cutlery trade a moderate improvement in home business is reported, but export business continues dull. The razor manufacturers continue to complain of the effects of the American tariff law in restricting their trade. The manufacturers of side arms in that region are doing a lively business for export. In knives and scissors the trade is scarcely changed. Business in the Solingen specialties is good, but prices are too low.

Machinery shops are in part happy over the fact that the Prussian railroad administration has just placed orders for above 500 locomotives to be delivered within a year.

New York

NEW YORK, October 12, 1910.

Pig Iron.—While no change for the better is indicated in the developments of the past week, conditions are at least not worse. Consumers who have been following the market closely note that it has yielded little of late. They believe that a certain amount of iron might safely be bought for next year at this level, but see no indication that they will have to pay more later in the year, and therefore hold off. A number of inquiries which have had little or no publicity have been up for three or four weeks, but have not yet resulted in sales. The leading pipe interest, which inquired for 4000 tons of No. 4 iron and 2000 tons each of No. 2 and No. 3 for an Eastern plant, has bought a portion of these amounts. Gray iron foundries here and there have bought in lots of several hundred tons each, and a pipe foundry which recently bought for next year has been in the market for some smaller lots for this year. An inquiry for 3000 tons of basic iron has come from a central Pennsylvania steel plant. Sellers have some hopes of better buying in November, as foundry operations are generally maintained on the scale of recent months and contract deliveries are being taken in most cases. We quote for tidewater deliveries as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.25 to $15.50; Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—The outlook for new business in structural shapes is not quite as promising as was indicated a week ago. While the larger fabricating plants have work ahead which will last well into and in some cases through the winter, projects which will come into the shops in early spring are not developing as could be wished. The railroads have considerable requirements shaped up, but these have not yet come to the estimating stage, and railroad engineers are quite indefinite as to when they will ask for figures. A few railroad jobs have been placed in the past week, including 2000 tons for Philadelphia & Reading track elevation at Port Richmond. The New York Central has placed 1200 tons with the American Bridge Company, but this in reality is a revival of part of an old contract. The 2000 tons on which the New York Central received bids recently for viaduct work in connection with its New York terminal construction will probably go to a Pittsburgh fabricator. The Pennsylvania Railroad has let an overhead bridge at Greensburg, Pa., to the American Bridge Company, and the latter will also build a small bridge for the Lehigh Valley. Levering & Garrigues have taken a contract for the Oppenheim, Collins & Co. store on West Thirty-fourth street, New York, 800 tons, and for a loft building on West Thirty-sixth street, 500 tons. The International Harvester Company's new building at Auburn, N. Y., 700 tons, went to the Groton Bridge Company. The contract for the Crown Cork & Seal Company's warehouse at Highlandtown, near Baltimore, Md., 800 tons, was awarded to Dietrich Bros., Baltimore. Among work in prospect are a hotel at New Haven, Conn., requiring 1800 tons of steel, and a highway bridge at Superior, Wis., which will take 2000 tons. The plans for the large bridges over the Willamette River, Oregon, are nearly ready. About 15,000 tons of steel will be required. The official announcement concerning the Quebec Bridge bids confirms the general supposition that four countries competed—the United States, Canada, Germany and England—one bid coming from each. The award is likely to be delayed for some time and as yet no details of the bids are available. The plate trade is quiet. The domestic movement in bar iron is moderate, but some good export business has developed. Bar iron prices are easy, but nominally unchanged. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—A feature of the market in this commodity is the increased inquiry from private buyers, especially for spring delivery. Some offices have had a larger volume of this kind of inquiry for the past two weeks than for a long time previously. Large water and gas companies are negotiating for a considerable tonnage for spring delivery, and it is understood that a few contracts have been placed. Public lettings are few, and buying for fall delivery is now of small proportions. Carload lots of 6-in. are quoted at $23.50 to $24 per net ton, tidewater. Prices on large lots for spring delivery are held at a higher range than would be quoted for this fall.

Old Material.—For a few days last week a fair degree of activity characterized the scrap market. Sales were made of moderate lots of heavy melting steel and wrought scrap, while some of the local foundries purchased rather good quantities of cast scrap. For the past two or three days, however, the demand has been light and buyers generally appear to have lost interest. Although announcement is made that the combined purchasing arrangement of eastern Pennsylvania steel companies has been abandoned, no effect has yet been observed in the local market. If any inquiries are being received for several steel companies they are closely guarded. Relaying rails are exceedingly quiet. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.75 to $13.25
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	19.00 to 20.00
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.25
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, October 12, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
		Electro-		New	St.	New	St.
Oct.	Lake.	lytic.	Tin.	York.	Louis.	York.	Louis.
6	12.75	12.50	Nominal.	4.40	4.27½	5.60	5.45
7	12.75	12.50	"	4.40	4.27½	5.60	5.45
8	12.80	12.60	"	4.40	4.27½	5.60	5.45
10	12.87½	12.75	"	4.40	4.27½	5.60	5.45
11	12.87½	12.75	"	4.40	4.27½	5.60	5.45
12	12.87½	12.75	"	4.40	4.27½	5.60	5.45

The holiday to-day was generally observed in the metal trade and when business closed last night spot tin in New York was effectively cornered. This condition has existed all the week and prices have been purely nominal. The copber market is stronger. Lead and spelter remain unchanged.

Copper.—The report of the Copper Producers' Association, issued October 7, equaled the best expectations. The statistics, which appear elsewhere show a decided decrease of stocks. The showing was so good that the market immediately responded with some active buying at an advance of ⅛c. The London market has been advancing all the week, but both consumers and sellers in this country acted more conservatively. There was no attempt to inflate prices. Most of the demand was for prompt and November shipment, which indicated that many consumers who were not in actual need of the metal had been waiting to see which way the market would turn. When the market opened on Monday most sellers were quoting ¼c. higher than on Saturday and the advanced price was well maintained all the week. Most sellers are reluctant about taking orders for delivery beyond November 15, as they are figuring that the close of lake navigation, which may occur about that time, will have some effect on the market. Electrolytic copper is now 12.75c. and lake is strong at 12.87½c. The European market is apparently on a good footing, as indicated by the following extract from the latest report of Henry R. Merton & Co., Ltd., London: "The consumption, particularly in Europe, is, however, at an exceptionally high rate and prospects for its continuance are very promising. Manufacturers are constantly securing fresh work, but betray no eagerness to cover their requirements of refined copper so long as the markets show no signs of activity and prices do not tend upward. As soon as any change in this respect is in sight—and indications are not wanting—we may expect a very substantial buying movement on the part of the trade." The London market closed yesterday with best selected copper selling at £60 5s.

THE IRON AND METAL MARKETS

Pig Tin.—Spot tin in New York is so effectively cornered that prices during the week have been largely nominal. The little trading that has been done has been largely between dealers and was of a speculative nature. Bids at 37½c. made on the New York Metal Exchange yesterday failed to find sellers, and it is hard to tell what the actual market is. It is said, however, that spot tin is held a great deal higher than conditions warrant, and if consumers are able to hold out another week or so they will be able to buy the metal cheaper. It is expected that the shipments by next Saturday's steamer from London will be heavy, and some New York dealers who are close to the situation are advised by their London connections that they will at least amount to 1000 tons. The arrival of this metal may relieve the situation. The London market closed yesterday with spot tin selling at £163 15s. and futures £159 15s.

Tin Plates.—The demand for tin plates continues good in this market and the price for 100-lb. coke plates is $3.84.

Lead.—Lead is a little firmer in East St. Louis, where the current price of 4.27½c. was being shaded last Friday and Saturday. The New York market is dull and stagnant but prices are being held very firmly at 4.40c.

Old Metals.—Inquiry has increased, but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Spelter.—The call for spelter is not very good, but prices are being well maintained. The few sales that are being made in New York are for spot shipment from East St. Louis, as stocks are still scarce here and both producers and dealers show some reluctance about carrying any great amount of spelter in the New York market. Some sellers are taking 5.62½c. for spelter for delivery in New York, but it can be bought for 5.60c.

Antimony.—There is so little trading in antimony that prices are entirely nominal. Cookson's is 8.15c.; Hallett's, 7.87½c.; Chinese, 99½ per cent. guaranteed, 7.40c. to 7.50c.; Hungarian grades can be bought at anywhere from 7.20c. to 7.30c., according to the brand. These prices might be shaded.

Metals, St. Louis, October 10.—Lead is quiet at 4.25c. to 4.27½c.; spelter is dull and quoted at 5.37½c. to 5.40c., both East St. Louis. Zinc ore is quoted at $42 to $43 per ton, Joplin, base. Tin is sharply higher and quoted at 37.35c. per pound; antimony (Cookson's), 8.50c.; lake copper, 13.22½c.; electrolytic, 13.05c., all at St. Louis. The demand for finished metals for the past week was lighter than the previous week.

Metals, Chicago, October 11.—The copper market is firmer and the metal is in good demand owing chiefly to figures of production and stocks which are very favorable to the producing interests. Tin has taken another erratic flight upward and Chicago houses are selling small lots at 40c. The reports of lower for lead are not confirmed in this market, as only a slight concession from running quotations can be obtained on orders for 50-ton lots. Spelter is firm but buyers have been able to do 5.40c., East St. Louis, equal to 5.45c. Chicago. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 37½c.; small lots, 40c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.45c. to 5.50c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10⅝c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter, No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

Iron and Industrial Stocks

NEW YORK, October 12, 1910.

Firmness coupled with light transactions has again been the characteristic of the stock market. Some stocks have shown quite important advances, such as International Harvester common, General Electric and Chicago Pneumatic Tool. A conspicuous exception, however, was Sloss-Sheffield common, which sharply receded with rumors of a reduction in the dividend. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	9¼ - 10⅜	Pressed St., pref..	96 - 96⅞
Allis-Chalm., pref.	32⅞ - 34⅞	Railway Spr., com.	34 - 34¼
Beth. Steel, pref...	58⅜ - 58¾	Railway Spr., pref.	99
Can. com.	8⅞ - 8⅞	Republic, com.	31¼ - 32
Can. pref.	68¼ - 70⅜	Republic, pref.	92 - 94
Car & Fdry. com.	48 - 50⅛	Sloss, com.	51 - 56
Car & Fdry. pref.	114½ - 115½	Pipe, com.	16
Steel Foundries	43 - 43⅞	U. S. Steel, com.	68¾ - 71⅜
Colorado Fuel	32⅞ - 34⅛	U. S. Steel, pref.	117½ - 118¾
General Electric..	147 - 152½	Westinghouse Elec.	70 - 73
Gr. N. ore cert.	56½ - 57¾	Va. I., C. & C.	50 - 56
Int. Harv., com.	98½ - 103½	Am. Ship, com.	79
Int. Harv., pref.	121	Chi. Pneu. Tool	38⅝ - 43
Int. Pump, com.	42 - 43	Cambria Steel	41⅞ - 42¾
Int. Pump, pref.	84⅞ - 85	Lake Sup. Corp.	24 - 24⅝
Locomotive, com.	36¾ - 38½	Pa. Steel, pref.	109 - 109½
Locomotive, pref.	103 - 104¼	Warwick	11
Nat. En. & St., com.	16½ - 17¼	Crucible St., com.	12¼ - 12½
Pressed St., com.	33¼ - 34⅜	Crucible St., pref.	77 - 78

Dividends.—The Youngstown Sheet & Tube Company, Youngstown, Ohio, has declared a quarterly dividend of 2 per cent.

The American Rolling Mill Company, Middletown, Ohio, has declared a quarterly dividend of 1½ per cent. on the preferred and 3 per cent. on the common stock, payable October 15. This is an increase of ½ per cent. on the common stock. In 1907 this company paid a stock dividend of 33½ per cent. The company has a funded debt of only $1500, secured by 18 shares of the preferred stock, which is a 6 per cent. cumulative security. The company has an authorized capital of $800,000 preferred and $3,700,100 common stock. Of the preferred stock $765,000 is outstanding, while all of the common is outstanding but $100.

Customs Decisions

Cast Iron Grinders

In sustaining a contention raised by Thomas Prosser & Co., New York, the Board of United States General Appraisers holds that under the terms of the tariff act of 1909, cast iron grinders, which have been finished by machinery after the completion of the casting process, are dutiable under the provisions of paragraph 147, as iron castings advanced in condition subsequent to casting." It is held that the phrase "but not made up into articles" will not operate so as to exclude a finished casting, but applies to such as are made into or form a part of something else.

The conclusions reached by the board are due to the classification imposed by the Collector of Customs at New York on so-called grinding disks upon which duty was assessed at the rate of 45 per cent. under the provision in the act of 1909 for articles in chief value of metal. It was claimed by the importers that the merchandise is entitled to entry under the provisions of paragraph 147, at the rate of 8-10 of 1 cent a pound, plus 2-10 of a cent a pound. This claim the general appraisers uphold. The decision says:

> Unless these articles are excluded by reason of the words above underscored [paragraph 147, of the act of 1909] they would be dutiable as claimed under the said provision. We do not believe that the articles are excluded. The new provision covers castings of iron which have also been chiseled, drilled, machined, or otherwise advanced "if not made up into articles," irrespective of the fact that by such process of chiseling, &c., the castings be ready for use as a wheel or a disk, or anything else, for it is still only a casting chiseled, drilled, or machined, and nothing more. If we are to exclude articles because ready for use then it is impossible to say what would be left to fall within the paragraph. "If two or more castings are fitted or united to make an article, or something be added to complete the casting into a completed article, then there would be reason to exclude such merchandise from the paragraph in question. A finished casting is not excluded, whereas a casting made into something else is. The protest is sustained."

Joseph T. Ryerson & Son, Chicago, contemplate carrying a stock of specialties and machinery at Seattle, Wash., where they have had a branch office for the past four months.

The Machinery Markets

While railroad lists are not in evidence in the machinery market, the railroads are buying in small quantities for replacement. Some orders have been placed by railroad interests in the New York market during the last week, and Philadelphia also reports buying from that source. The announcement last week that the Boston & Maine Railroad would spend $10,000,000 for improvements has given the New England trade some encouragement. Export trade is good in most machinery centers. In Pittsburgh the market is irregular, but on the whole sales of machine tools and general shop equipment are highly satisfactory. In Detroit many new enterprises are being planned, and this condition has resulted in increased inquiries. The market is steadily improving in Chicago, and country shops are liberal customers in that market at present. In Milwaukee manufacturers of motors are having trouble getting enough equipment ahead to make prompt shipments. There is increased activity on the North Pacific Coast and in San Francisco, where many firms report September the best month in the year. There is some talk in the trade about concessions in machine tool prices, but this is mostly among prospective users. Machine tool builders are holding their prices firm and no break is looked for. The trade is eagerly looking forward to the annual meeting of the Machine Tool Builders' Association, which is to be held in New York, October 25 and 26.

New York

NEW YORK, October 11, 1910.

The machinery trade has greatly improved in New York during the last two weeks and good orders are being placed for small lots. Two large steel mills have placed some orders in this market the last week, principally for blacksmith shop equipment, and both the Pennsylvania and the New York Central Lines have been giving out some scattered orders for machine tool equipment. Inquiries are coming before the trade in decidedly better volume and many of them are of a nature to indicate that they will result in business in the near future. Manufacturers of power apparatus whose business fell off noticeably last month are now taking a more optimistic view of the situation and there are reports that inquiries for power equipment for new enterprises have come forward during the week in good volume. Notwithstanding the fact that there are no lists of any size before the trade the outlook is encouraging, as a number of enterprises which will call for the purchasing of machinery promise to materialize very soon.

Foundrymen who cater principally to the machinery trade in making iron and steel castings note an improvement in business, and machinery manufacturers who are taking faith in the future and making up machines for stock are ordering more liberally than inquiries made a month ago presaged.

The Casein Company of America, 11 Pine street, New York, which makes a specialty of manufacturing by-products of milk, is building a plant at Hagarstown, Md., which will be one of the largest plants of its kind in the country. The company has secured a site of 2 acres and is erecting a building equipped for handling milk and cream by modern methods and will make over skimmed milk into by-products. Considerable special machinery will be purchased, in addition to a battery of three 300-hp. boilers. The Casein Company operates 54 plants throughout the United States.

The Duplex Metals Company, 149 Broadway, Singer Building, is making an addition to its works at Chester, Pa., of a one-story building, 50 x 70 ft., where the company will establish its main offices. The company will retain an office and showroom at its present address in New York and will also establish branch offices in St. Louis, Mo., and Portland, Ore.

The Foster Falls Company, Roanoke, Va., has been incorporated, with a capital stock of $100,000, to build a hydroelectric plant to operate mining plants of the Virginia Iron, Coal & Coke Company, Bristol, Va. The water power will be developed at Foster Falls, on New River, Va., and it is estimated that the company will be able to develop from 3000 to 4000 hp. Henry K. McHarg, 40 Wall street, New York, is president; John B. Newton is vice-president and J. W. Cune secretary-treasurer. The two latter are of Roanoke, Va.

The Niagara Machine & Tool Company, Buffalo, N. Y., has commenced work on the extensive blacksmith and iron machine shop of brick and steel to be added to its new plant at Northland avenue and the New York Central Railroad Belt Line Railroad.

The United States Metal Desk Company has been incorporated at Utica, N. Y., by J. Ellsworth Stille, E. J. Warner and S. M. Barney of that city, with a capital stock of $10,000, and will engage in the manufacture of metal furniture. Arrangements are being made for plant and equipment.

The Buffalo Box Factory Company will build a large two-story brick addition to its plant on Babcock and Scoville streets and the Pennsylvania Railroad. The new building will be devoted to the manufacture of corrugated paper shipping cases. Considerable new machinery will be required, some of it special orders for the principal portion of the requirements have already been placed.

The Rutland Transit Company will erect and equip a new Elevator of steel and concrete at Ogdenburg, N. Y., to replace the elevator recently destroyed by fire. Storage capacity, 500,000 bushels, cement bins 76 ft. high; surmounted by steel working cupola, making the total hight of 165 ft. Estimated cost, $350,000.

The St. Lawrence International Electric Railroad & Land Company, Alexandria Bay, N. Y., R. M. Martin, superintendent, will install additional equipment for electric lighting purposes in its power plant, and will soon purchase one 400-hp. Corliss engine and one 200-kw. General Electric generator with other accessories necessary.

The Norwich Pharmacal Company, Norwich, N. Y., will erect and equip a five-story chemical building 50 x 150 ft., with power house of brick and structural iron construction.

The Ansco Company, manufacturer of photographic apparatus and supplies, is erecting a factory building on Charles street, Buffalo, N. Y., to be 60 x 320 ft., four stories, with two four-story wings 26 x 40 ft. of brick and steel construction. A considerable equipment of machinery will be installed.

The Binghamton Motor Car Company, Binghamton, N. Y., has let contract for a two-story fireproof garage and machine shop, 66 x 115 ft.

Business Changes

The plant of the Falls Rivet & Machine Company at Cuyahoga Falls, Ohio, where power, transmission and general machinery is manufactured, has been taken over by Theophilus King and associates and will be conducted under the corporate name of the Falls Clutch & Machine Company. The Kent, Ohio, plant of the Falls Rivet & Machine Company, where rivets, bolts, nuts and washers are manufactured will continue in the hands of the Falls Rivet & Machine Company and will be conducted by Edwin Seedhouse and associates.

Chicago

CHICAGO, ILL., October 11, 1910.

Dealers report a continued moderate improvement in the demand for machine tools. There are no large buyers in the market, but there is an increase in the country trade and in inquiries from manufacturers in this territory who represent the most satisfactory branch of the market. An interesting feature of the trade is the number of sales made to country machine shops. Some of these sales are on a cash basis, but occasionally there are old-fashioned deals in which the seller takes a chattel mortgage for a part of the purchase price. This improvement in the country trade is undoubtedly due to unusually favorable agricultural conditions. The weather has been ideal for maturing the corn crop, creating quality and quantity in the yield and altogether the value of agricultural products has established a new record in this country. This fact has attracted a good deal of attention from machinery dealers who think that it assured a good foundation for business conditions the

THE MACHINERY MARKETS

coming year. There is a fair demand for second-hand tools. Railroad buying is unfortunately absent from the market and the trade has not fully recovered from the loss of automobile business.

The Atchison, Topeka & Santa Fé Railroad is not in the market at the present time for any machine tools, excepting an occasional requisition from the mechanical department. An official of the company states that reports that this company is in the market for an extensive list of tools are misleading.

The movement to secure more careful attention to contracts is looked upon with a great deal of interest among Chicago dealers. Cases are too frequent, especially during a reaction in the market such as we have had the past six months, when buyers try to evade their obligations to take machines which they have purchased. In a case of this kind the unscrupulous buyer generally sets up unjust claims when the machine is shipped to him. He may claim that the manufacturer did not make delivery exactly at the time agreed, or that some attachment to the machine is not satisfactory, or any kind of a claim that will make trouble and give him an excuse to evade prompt payment. It is not always possible for the machine tool builder to make shipment exactly at the moment which is mentioned when an order is taken. Contracts usually give the manufacturer the benefit of any unusual difficulties which delay the completion of an order, and when business is active the buyer never raises any question over a delay of a few weeks. As the dealer operates on a very small margin these misunderstandings are often very expensive to him.

The Chicago Consolidated Brewing & Malting Company, Chicago, is receiving estimates on boilers, stokers and piping for its brewery located in the western section of the city.

Philadelphia

PHILADELPHIA, PA., October 11, 1910.

The market recovers very slowly; in some few instances there has been a slightly better volume of business reported, but the general demand continues irregular. A few more orders have been booked by merchants, in instances for heavier tools, but the character of the business is still largely confined to single tool propositions. No new lists of any importance have come out. There is a scattered demand from the railroads; the Pennsylvania has inquiries out for a 36-in. lathe, while the Baltimore & Ohio is asking for several drill presses and a planer. There is still nothing encouraging in sight in the way of general equipment purchases by either the railroads or industrial establishments, and the trade scarcely expects any pronounced movement on the part of such buyers until after the turn of the year. With general trade conditions still quiet, prospective purchasers of tools are taking a conservative view of the situation and are not placing orders, although in a number of instances propositions have been under consideration for some little time. While there is a better demand for moderate horsepower engines, builders report that orders close up very slowly and bookings recently have not been of an important character. Special tool and machinery builders also note a decline in the demand for the various classes of special equipment made, although in some instances there is a fair volume of business under negotiation. Export trade still drags.

Builders of machinery and general equipment are, for the greater part, less actively engaged. Old orders on hand are being gradually cleaned up and new business does not come in at a rate sufficiently large to equal that completed. There has been little actual curtailment in operation, however, as builders anticipate a better demand before a great while, and have, in quite a few instances, been working in stock orders, which have heretofore been extremely light.

Little change is to be noted in the foundry situation; the demand for machinery castings is light, although a fair volume of general business is coming to the jobbing foundries. The demand for steel castings continues irregular.

The Albert Schade Company, manufacturer and merchant in steam supplies, has purchased a building, 2528 to 2538 North American street, which will be used as its general office, store and warehouse for heavy fittings, valves, &c., and to which it will remove from its present location, 56 North Second street, about November 1. The company is not at present in the market for any machinery equipment, having its various specialties manufactured by outside concerns, but may take up the manufacture of some of its lines at the new location in the future.

The Light Mfg. Company, Pottstown, Pa., which will shortly ask for bids on a new foundry building, states that it will hardly be in a position to take up the matter of equipment for the foundry until early next spring.

Ballinger & Perrot, engineers, are taking revised bids for a six-story concrete manufacturing building, 58 x 100 ft., which the Leo Nieson Company proposes to erect at the northeast corner of Twelfth and Race streets.

Scott & Williams, Inc., manufacturers of knitting machinery, are adding one floor, 45 x 100 ft., to one of their buildings which will be used for assembling and erecting hosiery machinery. Considerable additional equipment has been purchased for installation in the new addition. They are comparatively busy on special knitting machinery for hosiery and underwear, but are doing little on the regular run of knitting machines. The plant is being operated on full time, and the outlook for a good fall season is considered favorable.

The Eagle Iron Works, Wilkes-Barre, Pa., has, it is stated, purchased a site for the erection of a new plant in the immediate vicinity of that city. Particulars regarding the proposed improvements are not available at this time.

The Screw Cutting Company of America, maker of power lead and feed screws, has been reorganized and is now under the direct management of Joseph W. Bramwell, who is vice-president and general manager. There have also been changes made in the shop and department management, as well as the rearrangement of equipment for the general betterment in connection with manufacturing. Mr. Bramwell is well known in this city, having been connected in an engineering capacity for some time with the Reihle Bros. Testing Machine Company and the Philadelphia Machine Tool Company.

The Reading Iron Company, Reading, Pa., has completed its new No. 6 mill at Seventh and Laurel streets, in that city. The machinery, which will enable it to produce wrought iron pipe of the largest sizes, has been tested and the mill will be put in operation at an early date. In its Scott foundry department it is very busy, having under way the construction of a number of sugar mills and cotton presses, as well as general machinery. Foundations are being prepared for additional equipment for its own use, including among other tools a heavy lathe.

The Di-el-ite Mfg. Company, manufacturer of rheostats, insulating joints, dimalites, &c., has removed from its former location, 4901 Stenton avenue, to Armat and Lena streets, where it has 17,000 sq. ft. of floor space for manufacturing purposes, three times as much as at the former location. This concern has abandoned its New York offices, formerly located at 120 Liberty street, and now transacts all its business at its local headquarters.

The Main Belting Company is taking bids for a two-story addition, 17 x 95 ft., to be erected as an extension for general manufacturing purposes of its plant at Thirteenth and Carpenter streets.

Bids will be taken by W. Hunter, chief engineer of the Philadelphia & Reading Railway Company, for work of construction, under contract No. 22, comprising masonry and embankment between Somerset street and Trenton avenue, and under contract No. 23, for bridges ready for ballast, between the same streets. These are appurtenant to the work of abolishing grade crossings on its Port Richmond branch in this city.

New England

BOSTON, MASS., October 11, 1910.

Trade continues rather dull, with some signs of improvement. The Bosch Magneto Company has awarded contracts for a large amount of equipment for the new shops at Springfield, Mass., the orders coming through German dealers, the business apparently having been transacted across the water. The United States Motors Company has placed some orders for the Alden Sampson plant at Pittsfield, Mass., and the General Electric Company has done some buying of equipment for its works in the latter city. The announcement of the great repair shops of the Boston & Maine Railroad, to cost $2,500,000, in addition to the running repair shop already provided for at West Somerville, means the culmination of plans, the fulfillment of which has been awaited for some years. No possibility of further delay exists. Industry generally varies to wide extremes in the degree of prosperity. Improvement is generally looked for all along the line.

The Boston & Maine Railroad will build immediately repair shops to cost equipped $2,500,000. The appropriation has been made and no possibility of delay exists. The engineers are at work on the plans, which, however, have not reached the point where details are available. The General Manager's office makes the official statement that both locomotive and car repair shops will be included in the plant, which will be located in the immediate vicinity of Boston. The effort will be made to secure absolutely modern works, with every facility for handling the road's increasing rolling

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stock. The list of machinery requirements will be a very long one. The money is a part of $10,000,000 just appropriated by the board of directors, which is now under the control of the New York, New Haven & Hartford Railroad. The new management plans to extend the policy so successfully carried out on the New Haven system to the new properties.

The improvements will call for large buying of structural steel and for some rail purchases. New bridges will be built over the Saugus River, the Piscataqua at Portsmouth, N. H., and Fore River, Portland, Maine. The strengthening of bridges in a large way to stand the strain of heavier equipment will be carried out on the White Mountain, Worcester, Nashua & Rochester and Southern divisions, and on the western section of the Fitchburg division. The Worcester, Nashua & Rochester division will be double tracked from Thayer to Nashua. The repair shops at East Fitchburg, Mass., will be equipped for electric power, which will be purchased from a local company. New rolling stock will include 100 locomotives, 50 each of passenger and freight; 300 passenger cars and a 100-ton steam wrecking train. New freight houses will be built at Peabody, Mass.; Berlin, N. H., and at Rutherford avenue, Charlestown, Mass., and additional freight yard facilities will be created at West Lynn, Mass. The electrification of the Hoosac Tunnel, a costly undertaking, is not included in the appropriation.

The F. E. Wells & Son Company, Greenfield, Mass., is building two one-story concrete additions to the pipe tool department. A machine shop building is 64 x 96 ft., and a building for boiler room and blacksmith shop, 32 x 60 ft.

Additions to general manufacturing plants of New England include the following: Lewiston Bleachery & Dye Works, Lewiston, Maine, dye works, 60 x 200 ft., two stories; Hurley Estate, Lynn, Mass., factory building, 50 x 70 ft., three stories; Taylor, Bramley & Co., Chicopee, Mass., addition to textile mill.

The Stockbridge Machine Company, Worcester, Mass., has brought out a new 16-in. back geared shaper, containing various new features, notable among them being the application of the milling machine principle in attaching the cross rail to the column.

The Beaton & Corbin Mfg. Company, Southington, Conn., manufacturer of ceiling and floor plates, will erect a three-story building, 30 x 44 ft., for office and shipping room.

M. I. Smith, Bristol, Conn., manufacturer of hardware, has tentative plans for the erection of a new factory, 40 x 75 ft., two stories, and a boiler house, 31 x 32 ft., but nothing definite has been decided as to building.

H. G. Shepard & Sons, New Haven, Conn., manufacturer of carriage and automobile woodwork, will build an addition 28 x 78 ft., to be devoted to boiler and engine room and to manufacturing space, containing woodworking machinery.

The Blakeman Mfg. Company, Inc., Naugatuck, Conn., has been incorporated with a Connecticut charter to manufacture gas and electric fixtures of all sorts, with factory in Naugatuck. N. A. Olson is the president, C. W. Thompson, secretary and treasurer, F. A. Johnson, manager, and F. R. Blakeman, superintendent.

The Connecticut River Power Company has purchased from the Metropolitan Water Board all power generated at the Wachusett Reservoir dam, Clinton, Mass., and will use the additional unit in connection with its power system, which furnishes electric current to Worcester and Fitchburg, Mass., and other cities and towns. The State of Massachusetts has appropriated $125,000 for the establishment of the power station, which will develop between 2500 and 3000 hp. The reservoir furnishes water to the city of Boston and surrounding cities and towns which comprise the Metropolitan district. Over 100,000,000 gal. a day pass through the aqueduct in which the water wheels will be installed. The contract runs for five years. The matter is of much importance to Worcester, as the company's supply of power is made more secure, and the American Steel & Wire Company, Bradley Car Works and other industries depend upon it for large units.

The Cabot Mfg. Company, Topsham, Maine, will build mills for the Pejepscot Paper Company, to cost $175,000, including the water wheels, but not the pulp making machinery. The plant will supply pulp for the Cabot Company's paper mills.

Cincinnati

CINCINNATI, OHIO, October 11, 1910.

Irregular conditions prevail with the machine tool builders here. Some are complaining that business is very dull, while others are receiving a fair number of orders and are able to keep their forces working on full time. Orders received are from the general trade and are not confined to any particular section of the country. Railroad buying is still extremely light, although a few scattered orders from this source are reported. Some few shops have been compelled to lay off part of their help, but are keeping in close touch with the men thus suspended, as it is generally thought every manufacturer in the city will need a full force before the fall season is over.

Dealers in machinery fittings and supplies continue to enjoy a fairly satisfactory business, and some of them in the manufacturing end of this line are very busy.

The foundries are running along about as usual. One week they will start out with sufficient requisitions on hand to keep them active the entire week, and probably the next Monday will find them with only two or three days' melt, when there is a scuffle to get enough work to keep busy the remainder of the week. This does not apply to a few of the foundries that have contracts which keep them operating practically all of the time.

The new five-story steel and concrete factory of the Eagle Mfg. Company in Cumminsville suburb, Cincinnati, is nearing completion and will be under roof before November 1. The company manufactures special tools and washing machines.

The Carbon Products Company, Cincinnati, has been incorporated, with $100,000 capital stock, to manufacture carbon brushes. Clay B. Steel, the principal incorporator, has headquarters at the Palace Hotel, Cincinnati.

Patrick Farrell, contractor and builder, Second National Bank Building, Cincinnati, has been awarded contract by the Baltimore & Ohio Railroad Company for the construction of several buildings at Chicago Junction, Ohio. They embrace a freight transfer house 24 x 800 ft.; a saw shop 25 x 112 ft.; blacksmith shop 25 x 100 ft.; a supply building 25 x 100 ft., with a 200-ft. platform; scale houses, yard offices, &c., all one story and of mill construction. Work will be commenced at an early date. Mr. Farrell is also just finishing up a very large power house job for the same railroad at Lorain, Ohio, which is of concrete and brick construction.

The American Seeding Machine Company is making some extensive additions to its plant at Springfield, Ohio. An imported French cupola is included in the list of new equipment being installed.

The O. J. Warman Aluminum Foundry & Machine Company, whose plant is in Madisonville, Cincinnati suburb, has incorporated with $15,000 capital stock. No immediate additions to its factory are contemplated.

Plans for the proposed new plant of the United States Electrical Tool Company, which will be erected on the Mount Hope road, Cincinnati, have been drawn up by Architects Sloctemyer & Ihorst. The new building will be two stories, 87 x 180 ft., of brick and steel construction.

The Director of Public Safety, City Hall, Cincinnati, will open bids October 21 for furnishing and delivering a boiler with all attachments for Engine No. 20 of the Fire Department.

Contract for erecting the new foundry of F. E. Myers & Brother, Ashland, Ohio, has been awarded to Schell & Baker of Mansfield, Ohio. The building will be of brick and steel, 140 x 250 ft., one story.

The Wallace Machine & Foundry Company, Lafayette, Ind., has increased its capital stock from $20,000 to $40,000. R. B. Wallace is president of the company.

The Ripley Foundry & Machine Company has been incorporated at Ripley, Ohio, by R. L. Russell, Walter L. Russell, H. L. Russell, Frank M. Russell and Penn Flaugher. The capital stock is $30,000.

The Champion Safety Lock Company, Geneva, Ohio, has increased its capital stock from $75,000 to $100,000.

The Davis-Price Foundry Company's plant at New Cumberland, W. Va., which was recently destroyed by a fire that entailed a loss of about $40,000, will probably be rebuilt.

It is rumored that a large shoe manufacturing company of Lynn, Mass., is considering moving its plant from that point to a location near Cincinnati.

Work on the new plant of the American Rolling Mill Company at Hamilton, Ohio, is being pushed rapidly, and part of the steel framework is already erected.

The Newport Rolling Mill Company, Newport, Ky., is in the market for a 300-kw., 200-volt direct current generator, direct connected to an automatic noncondensing engine, all complete with switchboard and instruments.

The business of the Browning Mfg. Company, Mansfield, Ohio, has been incorporated with $20,000 capital stock. The company advises that it is not making any alterations or improvements.

C. A. Halse, manager of the Felber Biscuit Company, Columbus, Ohio, is having plans drawn for a new three-story factory building equipped with the most modern machinery, sprinkler system, electric power, &c.

Cleveland

CLEVELAND, OHIO, October 11, 1910.

While the local machinery market shows practically no change, the outlook is regarded as somewhat better. One of the most encouraging signs is the increased activity in the automobile trade. Some of the local plants that engage largely in the manufacture of automobile parts have within the past few days received instructions for deliveries on orders that were held up several weeks ago, so that they now have considerable work on hand. Orders for machine tools are largely scattered, coming mostly from smaller machine shops. The demand is largely for small and medium sized milling machines, drill presses, lathes and planers. The most of the larger manufacturing plants are only fairly busy and can get along with their present equipment until orders are more numerous. This condition is delaying purchases by some manufacturers who have been considering the installation of additional machinery. Railroads continue to hold off, about the only business from that source being single tools. The demand for second-hand tools is fair. The number being offered to dealers is not large.

Manufacturers of heavy handling machinery report an improvement in the amount of work in prospect and their estimating departments are busier than they have been for some time.

In the foundry trade the demand is fair, but there is no complaint of a scarcity of molders, which is quite common when the foundries have all the work they can do.

The G. H. Williams Company, Cleveland, maker of clam shell buckets and hoists, has purchased the plant of the Mayo Life Boat Company, Erie, Pa., and within the next few months expects to enlarge it and fit it up for manufacturing its products. At present the Williams Company has its products made by another concern. The Mayo plant is a one-story structure, 65 x 155 ft., recently built and equipped with modern machinery. The company expects to build a 100-ft. extension to this building, to provide room for a structural shop, and will also build a forge shop. The Williams Company reports a good demand for buckets, its orders for the past month having averaged about one bucket a day.

The Dick Mfg. Company, Canton, Ohio, maker of agricultural implements, is preparing plans for erecting an addition to its plant that will double its present capacity. New machinery will be installed.

Bids for coke oven machinery and coal and coke handling machinery for the new ovens of the Bethlehem Steel Company at South Bethlehem, Pa., have been asked for by the Didier March Company of New York, which was awarded the general contract a few months ago.

At the monthly meeting of the Metal Trades Superintendents' and Foremen's Club of Cleveland, October 15, an address on apprentices will be delivered by J. Howard Renshaw of the Cincinnati Continuation School.

Two new manufacturing plants in Sandusky, Ohio, will begin operations during the present month. One is the plant of the Farrell-Cheek Steel Foundry Company, which is near completion. The other is the plant of the Sandusky Auto Parts & Motor Truck Company, which will be ready to start up during the latter part of the month. Another metal working industry is assured for Sandusky in the closing of a deal by the Sandusky Business Men's Association with a new automobile concern to occupy the plant of the Warren Electric Mfg. Company. The name of the company is withheld until the contracts are signed.

The Fremont Stove & Range Company, Fremont, Ohio, recently incorporated with a capital stock of $35,000, has purchased the June foundry plant in that city and will fit it up for the manufacture of its products. The company has elected the following officers: President, R. J. Christy; vice-president, Ed. H. Zurhorst; secretary and treasurer, N. C. Sherwood; general manager, T. H. Conway.

The Fremont Furnace Company is the name of a new concern in Fremont, Ohio, that will build a plant for the manufacture of heating furnaces. A two-story brick building 50 x 101 ft. will be erected. Theodore Harris and J. H. Combs, who are at the head of the enterprise, have a plant at Tecumseh, Mich., which they will remove to Fremont.

In addition to the machine shop equipment for its new plant at Corey, Ala., the list of which was published two weeks ago, the American Steel & Wire Company has issued a supplemental list of about 15 woodworking tools, including planer, band saw, wood trimmers, saw table, jointer, &c.

The Ohio Sash & Door Company, Cleveland, which recently purchased the old plant of the White Sewing Machine Company on Canal Road, will occupy it for manufacturing purposes, removing its manufacturing plant to Cleveland from Oskosh, Wis., as soon as neccessary alterations are made.

The Davis-Price Foundry & Machine Company, New Cumberland, Ohio, will build a new plant in that place to replace the one that was recently burned. A one-story brick structure with up-to-date equipment is planned.

The Mining Safety Device Company, Bowerston, Ohio, is fitting up a plant for the manufacture of machinery for the safe loading and discharge of coal cars on shaft cages.

A new company, headed by John Vocke, will establish a plant in Napoleon, Ohio, for the manufacture of steel barrels.

It is announced from Akron, Ohio, that the American Tire & Rubber Company, recently formed in that city, has decided to build a plant in Kenmore, a short distance from Akron.

The Dusseau Fore & Rear Drive Auto Company, Toledo, Ohio, has been incorporated, with a capital stock of $100,000, by S. V. Dusseau and others.

Pittsburgh

PITTSBURGH, PA., October 11, 1910.

While the market for machinery continues irregular, its condition is far from discouraging. During the past week no ground has been lost, and in some quarters further improvement is reported, with signs of increasing activity at the larger industrial plants.

Announcements of plans for work extensions or other betterments are also becoming more numerous, as partially indicated in the items printed below, and in the Western part of the district, especially, the preparations for such are well under way. At the industrial centers of West Virginia, particularly in the vicinity of Wheeling, and along the rivers of Western Pennsylvania, the activity is pronounced.

Sales of machine tools, as well as shop, foundry and mill equipment in general, are still made almost entirely in small lots or singly; but enough scattered orders have been coming in lately to keep dealers reasonably busy, and some of the leading machinery houses have a line on considerable prospective business, including a number of sizable contracts to be let between now and January 1, or at least shortly thereafter, at various mills.

More than a little quiet buying has recently developed on the part of the coal carrying roads, and this covers a wide range of material, including more electric and pneumatic apparatus than has ordinarily been purchased.

Automobile companies are also beginning to order rather freely from foundries and shops in the districts with which they have dealt largely in the past. Season contracts for castings, forging and manufactured parts will play quite a part in this business from now on, and new concerns coming into the field are looking for desirable connections.

A car house with tools for repair work will be built at North Vandergrift by the Pittsburgh & Allegheny Valley Railway, Leechburg, Pa. The arrangements for this, however, have not yet been fully determined upon.

Improvements in the mining equipment, handling plant, &c., of the McKean Coal Company, Tarentum, Pa., considerably increasing its output, will be made in the near future. Geo. H. Schickler, Pittsburgh, recently acquired an interest in the company and has been elected president.

The Vanadium Mines Company has had plans drawn by S. Diescher & Sons, Pittsburgh, for a reduction plant 75 x 100 ft., two stories, which will be of brick and steel construction.

Machinery houses here will figure on the pumping equipment of a system of modern water works to be installed at Romney, W. Va., the arrangements for which are still incomplete.

Julian Kennedy, Pittsburgh, recently finished plans for the new foundry, 180 x 380 ft., to be added to the plant of the Niles Tool Works, Hamilton, Ohio.

Plans for the large new generating plant to be erected by the Consumers Electrical Company at Wheeling, W. Va., have not yet been drawn, but will be completed and bids on the machinery taken late this fall or early in the coming winter.

Plans are being made for a new manufacturing plant to be built by the Tuna Valley Brick Company at Bradford, Pa.

A movement started some weeks ago to secure a greater number of local industries utilizing the products of the iron, steel and tin plate mills in this vicinity has already gathered head and promises to develop considerable volume. The principal hindrance to a successful issue is the lack of effective co-operation between the different business interests concerned and the failure to agree upon a definite line of campaign, but it is felt that each of these will be secured before a great while. At McKeesport a similar effort is being made.

The chief engineers of the various plants of the American Locomotive Company, accompanied by H. C. Hequembourg, head of the purchasing department, held their annual meet-

ing in Pittsburgh last week, after which a visit was paid to the works of the Cambria Steel Company at Johnstown, Pa.

A letter from Scranton, Pa., states that the Rudesyle Company, of which N. J. Rudesyle is manager, has been organized there at 1537 Gardner avenue, to handle and install boilers, engines, pumps and other steam power plant equipment, also low pressure boilers and auxiliary appliances for heating purposes. Catalogues and prices of standard apparatus are desired. All members of the company are practical operating engineers.

A group of factory buildings, the principal structures in which will be 60 x 400, 60 x 300 and 60 x 100 ft., are to be erected at Coldwater, Ohio, by the New Idea Spreader Company, the headquarters of which are in Maria Stein, Ohio. It is expected that the bulk of the equipment will be supplied by manufacturers of this district.

The construction of water works is under consideration by the authorities at Hazeldell, Pa.

Besides the improvements recently noted, the Westinghouse Air Brake Company will add to the power equipment of its shops at Wilmerding, Pa. A new steam turbine unit is to be installed in the electric generating station, together with auxiliary apparatus.

A machine and forge shop, with tools for maintenance work and repairs to mining machinery, will be built by the Pittsburgh Coal Company at what is known as its Colonial No. 3 Mine.

Detroit

DETROIT, MICH., October 11, 1910.

So many plans for new factory buildings, shop extensions, power plants, waterworks systems, &c., are now coming to a head that representatives of machinery houses have recently been very busy making estimates or direct bids on specifications; and some concerns find that inquiries are arriving faster than they can be taken care of promptly. The better part of the demand is from small plants or those of medium size, and the lighter types of tools sell to the best advantage. Simplicity of parts and operation is also a feature that appeals more strongly to buyers this fall than ever before, automobile companies and gasoline motor manufacturers having taken the lead in this respect. A noteworthy example will be found in present tendencies at the Everett, Metzger, Flanders Company's plants. Equipment of all kinds for sheet metal work has been quite largely wanted of late; fabricators of iron and steel for various structural and ornamental purposes are buying to an increasing extent, and the foundry outfits supplies by local houses find a good market in many other parts of the country as well as here.

From a summary recently printed it appears that, if the next few weeks do not fall below the average, this year will establish a new high record for building operations in and about Detroit. The same may also be said of the State at large. It is felt by leading business men that, in spite of any setbacks which may temporarily retard it, the industrial growth of this section will proceed at a steady pace, with corresponding development along all lines of trade.

Construction contracts have been awarded Buck & Mullen, Muskegon, Mich., on a three-story factory building, 65 x 400 ft., for the Brunswick-Balke-Collender Company.

The Canadian General Electric Company is endeavoring to secure mechanics here, especially horizontal and vertical boring mill hands, for its shops at Peterboro, Ont.

Electric motors, with ratings which aggregate nearly 6000 hp., will be purchased some time this fall for the new shops of the Lake Shore & Michigan Southern Railway. Contracts for the main generating units to be installed in the power station have already been let.

The Detroit Steel Products Company, Detroit, has had a nice line of business lately in its structural department and has added to the force of men employed for that work.

A four-story factory building, 60 x 100 ft., will be remodeled and equipped for the use of Noack & Gorenflo, manufacturing jewelers of this city.

It is reported from Manistee, Mich., that, as the result of inducements offered by the city, two new factories will be built there by the Reid Mfg. Company and the Crown Chemical Company. The former's product will be baker's equipment, and the latter proposes to establish a plant for extracting turpentine from pine stumps.

The Franklin Iron & Metal Company, recently incorporated at Battle Creek, Mich., will handle scrap metal of various kinds on the usual basis.

Interests indentified with the Hillman Electric Light & Water Company, Hillman, Mich., are planning the installation of another power plant at a point not far distant.

An additional three-story factory building is to be erected by the Hargreaves Mfg. Company, Detroit, with a bridge connecting it to the remainder of the plant.

Bids are about to be taken on the new boiler plant for the city of Detroit, reference to which has previously been made. F. E. Mistersky, 40 Atwater street., E., is in charge of the work.

Plans for a large expansion of its power system, involving heavy expenditures for new equipment, are being made by the Grand Rapids-Muskegon Power Company, Grand Rapids, Mich.

The Prescott Company, Menominee, Mich., has been given the contract for the machinery to be installed in a large timber cutting plant which will be erected there by the J. W. Wells Company, in connection with the flooring factory recently completed.

The Bay City Power Company, Bay City, Mich., has been granted authority by the state railroad commission to issue bonds for $500,000 in order to proceed with a project which involves the ultimate purchase of considerable machinery.

An 8-ft. band resaw has been ordered by Mitchell Bros. for their plant at Cadillac, Mich., duplicating equipment already in operation.

In order to provide for the increase in its business, the Moore Plow Implement Company, Greenville, Mich., has added $50,000 to its capital stock.

Wm. Horner, Reed City, Mich., is proceeding with plans for rebuilding, on a more extensive scale, the flooring factory which was recently destroyed by fire.

Mildner & Eisen, whose offices are in the Hammond Building, Detroit, recently completed plans for the new boiler plant to be built by the Tivoli Brewing Company. It will be a two-story structure 50 x 70 ft., of brick construction.

It is stated locally, but without direct authentication, that the Abbott Motor Company, Warren, Ohio, will build a large automobile plant in Detroit, plans to that end being now in course of preparation.

Geo. H. Hayes is reported to be arranging for the construction of a new factory building to be added to the plant of the Chicago Pneumatic Tool Company on Second avenue, cor. Amsterdam, Detroit.

Jas. H. Langley & Ray W. Long of Detroit, with others, have organized the Phoenix Engineering Company, capital stock $10,000.

It is reported from Trenton, Mich. that the business interests there have persuaded the Ayres Gas Engine Company, Rochester, Mich., to remove to that place a share in the enterprise being taken by local capital. This will result in an enlargement of the company's manufacturing facilities.

The Rodgers Boiler & Burner Company, Muskegon, Mich., has met with much success this year in placing its water-jacketed type of refuse burner with large mills. Restrictions on the sale of such apparatus have been removed by recent decisions of the federal courts denying to any one manufacturer exclusive patent rights on the system, and a notable increase in business has been the result.

Figures are being taken on power plant equipment for the new tannery of the Edwin Armstrong Company, Detroit, Mich.

C. Hoertz & Sons, Grand Rapids, Mich., have been awarded the contract for a large new electric generating plant for the Kankakee Power Company, Kankakee, Ill. This does not include the equipment, including hydraulic turbines, which will be purchased as required.

The Houghton Copper Company, Houghton, Mich., has decided upon the use of electric power for driving the hoisting machinery and air compressors required in its operations, current to be obtained from the Houghton County Electric Company. It is expected that this will result in the enlargement of the latter's plant, which is managed by Stone & Webster Company, Boston, Mass. The equipment at present consists of Curtis steam turbine unit of 1500 kw. and General Electric generators of 3500 kw. driven from engines furnished by the Nordberg Mfg. Company, Milwaukee, Wis.

The Hale Motor & Machine Company, Detroit, Mich., advises that its new plant which is being erected on Franklin street is practically completed and will be ready for occupancy by November 1. The dimensions of the main building are 64 x 201 ft., one and two stories. Part of the machinery has been purchased and is now being installed.

Edmunds & Jones, 404 Moffat Building, Detroit, Mich., are having plans prepared for an addition to their automobile lamp factory, 67 x 200 ft., three stories, and a power plant.

THE MACHINERY MARKETS

Milwaukee

MILWAUKEE, WIS., October 10, 1910.

Now that there has been an opportunity of reviewing trade conditions for the opening weeks of the fall season, it is found by leading manufacturers, both in and out of the metal working industries, that the aggregate of business is more satisfactory than was generally realized during the past month. While certain large contracts, upon which attention has been riveted with the expectation that they would be closed by this time, are still out of reach, there has been a reasonably steady influx of the ordinary orders, including repair work, spares, &c., upon which the greatest dependence is placed to keep the shops in operation. An evidence of this is the fact that machinery and parts manufactured for stock do not seem to accumulate very fast, owing to the fact that they are called for almost as soon as listed with district offices and agencies. Motor manufacturers, for example, have found it practically impossible to get far enough ahead with certain frame sizes to keep to the rule of prompt shipments which it was hoped to maintain during the autumn months.

The percentage of actual bookings to inquiries is, however, smaller than it has been for a long time past, and salesmen are working harder for what business they do get. Correspondence is heavy in all lines, and the distribution of advertising literature has assumed proportions never before known.

The Vilter Mfg. Company, Milwaukee, has recently increased the equipment of its machine shops, and other new tools are now on order which will be installed in the near future. For the power plant the company is building a large Corliss engine of its own design, which will embody the latest improvements, and the system of electrical operation in the works is being considerably extended. Business at the present time is reported good. The works are being run day and night, and prospects of securing orders for the remainder of the year are favorable both on Corliss engines and ice making and refrigerating machinery.

The Wisconsin Bridge & Iron Company, Milwaukee, has the contract for the structural work on a new plant 90 x 200 ft., for the J. W. Wells Company, Menominee, Mich.

The Nordberg Mfg. Company, Milwaukee, whose lines of production include both Corliss and poppet valve engines, air compressors, pumps, mine hoists and blowing engines, states that business is picking up slowly but steadily, with indications for a very successful new year.

Work has been started at Stoughton, Wis., on a new woodworking shop, three stories, 55 x 234 ft., to be added to the plant of the Mandt Wagon Company. The building is to be erected this fall for about half its length and extended in the spring.

The Mitchell-Lewis Motor Company, Racine, Wis., is planning its new factory facilities so as to provide for a season's output of 8000 machines. It is the expectation of the management that every one of these cars will be disposed of before it leaves the plant.

It is reported from Marinette, Wis., that the sawmill and planing mill of the Sagola Lumber Company, which recently burned, will probably be replaced by a modernly equipped plant, but no authoritative announcement has been made on the subject.

From the property of the Newport Mining Company of this city, at Ironwood, Mich., upwards of 1,000,000 tons of ore will have been shipped this year by the end of the season, this mine being the largest producer on the Gogebic range. Ben W. Vallat is now general superintendent of the company at Ironwood.

A machine shop for general construction and repair work is being added to the plant of the Rib Lake Lumber Company, Rib Lake, Wis.

A large gasoline engine for operating its hoist and pumps is being installed by the Minnie Mining Company, Benton, Wis. The remainder of the machinery will be driven by motors supplied with current from the plant of the Interstate Power Company, Galena, Ill.

The Benton Mining & Development Company, Benton, Wis., has taken over the property of the Pittsburg-Benton mine, which was owned principally in Pittsburgh, Pa., and will operate it, necessitating the purchase, in due course, of some new equipment.

The 1500 vanners recently sold by the Galigher Machinery Company to the Ray Consolidated and Chino Copper companies, constituting the largest order of the kind ever entered, will be manufactured under contract in the shops of the Allis-Chalmers Company at Chicago, Ill.

A two-story addition will be made to the plant of the Sheboygan Gas Light Company, Sheboygan, Wis., and new equipment provided.

Arrangements are being made at Randolph, Wis., for a new factory building, 100 x 170 ft., to be erected by the Randolph Wagon Works.

It is reported from Chippewa Falls, Wis., that the plant of the Chippewa Falls Chair Company, which burned some time ago, will not be rebuilt there at present.

Bids are being taken by Vaughn & Meyer, Majestic Building, Milwaukee, on motors and other electrical equipment, exclusive of the generating units previously purchased, for the new plant of the Kempsmith Mfg. Company at West Allis, upon the construction of which rapid progress has recently been made.

The Adams Patent Wheel Company, Cassville, Wis., has let contracts for the construction of a new manufacturing plant, with power house.

Among large orders recently taken by the McDonough Mfg. Company, Eau Claire, Wis., in Pacific Coast territory, is one for the complete equipment of a new sawmill to be erected by the Delkana Lumber Company, Delkana, Wash. This includes a 22 x 30 in. heavy duty engine, 8-ft. double cutting band mill, three-block steel carriage with steam set works, steam feed, edger, slasher, trimmer and other machinery.

A company organized by S. O. Bestul and others at Iola, Wis., will build a plant for the manufacture of clothes reels. The initial structure is to be two stories, 40 x 70 ft.

Among orders recently taken by the Milwaukee Locomotive Mfg. Company of this city is one for a 35 hp. machine to be used in the work of driving the great Snake Creek Tunnel near Park City, Utah, where the conditions are such as to render the selection of a locomotive of this type particularly desirable. The contract was placed through the F. C. Richmond Machinery Company, Salt Lake City, Utah, which is busy on numerous other inquiries for similar outfits.

Arrangements are now under way for the construction by the Wisconsin Power Company of a large hydroelectric plant at Prairie du Sac, Wis., on the Wisconsin River. Magnus Swenson, Madison, Wis., is president of the company and has been directing the initial arrangements.

The Racine Tool & Machinery Company, Racine, Wis., is letting contracts for work on its new factory building, 40 x 100 ft., two stories, which will be of brick construction.

It is reported from Delavan, Wis., that a factory is to be erected there by the Star Pointer Pump Works, whose present address is given as Chicago. The first building to be constructed will be a foundry 50 x 200 ft., followed by a machine shop, assembling shop and warehouse.

The project of building a municipal power and lighting plant at New Holstein, Wis., has been defeated, but the matter will be submitted to the electors again.

Contracts are being let on a machine shop, 100 x 200 ft., forge shop 100 x 200 ft., erecting shop, 300 x 300 ft., and general repair shop, 200 x 375 ft., for the new car building plant of the Milwaukee Electric Railway & Light Company, Milwaukee. Other buildings are to be taken up later, including a large power house.

The Kieckhefer Box Company, Milwaukee, is contemplating the erection of a paper mill for the manufacture of all kinds of containers and cartons from wood pulp and manila fiber. Although plans have not been definitely decided upon, it is understood that the building will be about 150 x 400 ft., four or five stories, with a capacity of about 90 tons a day.

The La Crosse Plow Company, La Crosse, Wis., has purchased ground near its present plant upon which it will erect a new foundry during the coming year. The company advises, however, that it will not purchase any new equipment, but will move that now used in its present plant to the new one when completed.

The Hummel & Downing Company, Milwaukee, Wis., is preparing plans for a new factory building 100 x 400 ft., four stories and basement. The first floor will be used as a combination board mill and will have a minimum capacity of 40 tons a day. The other floors will be used for the manufacture of fiber and folding boxes.

St. Louis

ST. LOUIS, MO., October 10, 1910.

Some buyers from Tennessee and Indiana, among others, have visited this city during the past week. One of the leading machinery houses mentions the receipt of some very fair business from old Mexico. Another merchant seller reports the sale of a pumping plant requiring two cars for shipping it, to be forwarded to Kansas City, and is filling an order for a lathe for Texas. An increase in the number of inquiries is mentioned, though there is difficulty experienced in bringing about sales.

As an instance of the notable rearranging of manufacturing districts and progress in St. Louis now, the growth in

importance in this line of the section adjacent to Cass avenue is worth mentioning. The Regal Buggy Company is preparing to move into its new plant near Eleventh and Mullamphy streets, after vacating its old quarters near what will be a terminus of one approach of the municipal free bridge now under construction across the Mississippi. The Turley Machine & Tool Company has under construction a fine new plant in the same neighborhood, which will be equipped with modern machinery for the manufacture of all kinds of cut gears, which is the exclusive specialty of this concern. The Crucible Steel Company of America has also moved into new and more commodious quarters in the same section.

The Brecht Company during the past year has made important improvements in its facilities, having wrecked a number of its old buildings and replaced with modern heavy building construction, which now occupies a good part of the city block.

The large plant of the Mississippi Glass Company in North St. Louis is fairly well occupied and some important improvements in equipment have been recently carried out.

The St. Louis district is becoming quite important in the manufacture of cartridges for rifles, revolvers, &c., and powder. Several good sized factories are now engaged in this line.

Another industry that is gradually assuming large proportions is the making of coal mining and railroad track tools, &c. These plants are located in suburbs of St. Louis. The two factories working on shovels find business very good for this season.

The St. Louis Machine Tool Company, manufacturer of tapping machines, drill presses, &c., is getting its line in good shape and promises to contribute to the growth of St. Louis as a machine tool center.

The Smith-Matteson Aeroplane & Engine Mfg. Company, New York, has leased a building at 6628 Delmar avenue, St. Louis, and will engage in the manufacture of aeroplanes. The equipment of the factory will be begun at once. This makes the second factory in this line established at St. Louis.

Another large concentrating plant will be added to those operating at West Joplin, Mo., through the determination of the Empire Zinc Company to try out the deposits of disseminated zinc and lead ores found there. The milling plant to be erected will handle from 300 to 350 tons per day.

The Luck Cement Post Mold Company, Aurora, Ill., has been incorporated, with a capital stock of $40,000. The incorporators are John G. Birtness, G. H. Klenze and E. W. Schoede.

The National Lock Company, Rockford, Ill., certifies to an increase in capital stock from $150,000 to $250,000.

Noah Twist's elevator at New Berlin, Ill., was destroyed by fire October 3. The elevator was valued at $30,000.

The Rocky Ford Milling & Power Company, Manhattan, Kan., has been reorganized under the name of the Blue River Power Company, and has purchased machinery to duplicate the power plant located 4 miles north of Manhattan, on the Blue River. The new plant will have a capacity of 1000 hp.

A. N. Merrill, Hutchinson, Kan., has started the construction of a factory building at Thirteenth and Monroe streets, in which he will engage in the manufacture of gloves.

Arrangements are being made by Axel O. Ihlseng, Galena, Kan., to build a 600-ton mill on the old Murphy and Empire tracts at North Empire. Previous to the installation of this new mill the Empire Zinc Mines Company will put in a centrifugal pumping plant which will effectually drain the whole tract of 100 acres under lease.

The Rock Grain Company, Hutchinson, Kan., will soon rebuild its elevator at Albert, Barton County, recently destroyed by fire.

An order requiring the Consumers' Gas Company, a Missouri corporation piping gas to St. Louis and other Middle West cities, to pipe Miami, Okla., was issued September 29.

The gas smelter owned by the Lanyon Starr Smelting Company and located at Batesville, Okla., was sold September 29 to the American Metal Company, which took possession October 1. The plant will be enlarged by the expenditure of about $200,000. The Lanyon Starr Smelting Company owns a smelter at Pittsburg, Kan., and will continue in business by starting up its works there. Extensive improvements will, however, be made at their plant before resuming.

The city of Mannsville, Okla., has voted to sell $20,000 in bonds with which to construct a water system. The plant will consist of two steam pumps and a pumphouse, boilers and engines, a water tower, tank and about four miles of water mains. The contract will also call for an equipment for a fire department.

The Santa Fé Railroad has surveyed a site on its tracks at Sulphur, Okla., for a large elevator, which will be rushed to completion.

The R. L. Cole's sawmill, four miles north of Jonesboro, Ark., was destroyed by fire September 24.

The Legislature of Arkansas is about to pass an appropriation for the heating plant for the new capital at Little Rock. The building will be made ready for occupancy prior to January 1.

The Cotton Belt Railroad will build a large viaduct to connect Texarkana proper with Carmichael Hill, spanning the railroad yards and tracks at the Oak street crossing. The viaduct will be 1500 ft. in length and will cost about $200,000.

The Higden Milling Company, Higden, Ark., was organized September 24, with a capital stock of $40,000. The following officers were elected: president, Dr. H. J. Hall; secretary, J. W. Hardy; treasurer, Dr. C. D. Lester; manager, G. W. Davis.

The Reynold Bros. planing mill, Pittsburg, Texas, was destroyed by fire September 22. The loss, including a large quantity of lumber, is estimated at $20,000.

H. T. Weathers, Greenville, Texas, has sold his power plant to the city of Greenville. The consideration is understood to be $4000, and the city will take charge December 1. The city operates with an alternating current and the Weathers' plant with a direct current which will necessitate the proper changes to be made.

The city of Brady, Texas, will build two bridges across the Colorado River, one at Walrip, and the other at Stacy; also a bridge across the San Saba at Voca, and one across Brady Creek. The four bridges call for an expenditure of $42,000.

A location has been secured for the wire goods and reinforcing material factory projected by Charles H. Holt at San Antonio, Texas. A charter for the organization of the company with a capital stock of $500,000 will be applied for.

The acid plant of the Gulf Refining Company at Port Arthur, Texas, was destroyed by fire September 27. The loss of the building and contents is estimated at $20,000.

The plant of the New Orleans Cotton Oil Mill Company at Hagan and Washington avenues, New Orleans, La., was destroyed by fire October 3. The loss is estimated at $42,000, a large part of which is covered by insurance.

The grain elevator of E. C. Buchanan & Co. on Clinton street, Memphis, Tenn., was destroyed by fire October 5, causing a loss on the building and contents of about $60,000, which is partially covered by insurance.

The Moore Mfg. Company, Springfield, Mo., expects to move its plant to some point where power costs and shipping facilities will be more favorable than its present location. The company has not decided as yet where it will go.

Dayton

DAYTON, OHIO, October 10, 1910.

Nearly all manufacturing plants in Dayton are working a full force and some of them have on night shifts. Practically everything made here has a market in all parts of the world, and when orders from one territory are slow in coming in, those from another field help to keep the factories busy, hence, local manufacturers have not noticed any appreciable let-up in business such as reported from other cities whose manufactured lines are not so varied and whose products have a more limited market. Dayton has the largest cash register factory in the world, and its clay-working machinery, large pumping outfits, sewing machines, bicycles, &c., are well known in every country on the globe. It is the home of the first and now the largest aeroplane factory in existence and the diversified manufactured products tend to keep local business on an even basis.

Plans for new factories, as well as additions to existing ones, are being carried out. Local bankers report money in better demand, and taking everything into consideration the situation with manufacturers here is generally satisfactory, especially when compared with other parts of the country.

The C. W. Raymond Company, one of the world's largest manufacturers of clay working machinery, is finishing up a large plant at Bolander street and Broadway. The main building is 100 x 325 ft., two stories, of brick and steel construction, and is equipped with a 40-ft. 10-ton traveling crane. The foundry is of the same construction and measures 105 x 120 ft., one and one-half stories high, and is also equipped with a 10-ton crane and a Sturtevant blower. Most of the foundry equipment, including the cranes, is to be furnished by the Whiting Foundry Equipment Company of Chicago. The car shop, which is now in operation, is 25 x 100 ft., one story, and 30 to 40 cars are now being turned out by the company, using electric drive for the machinery. Other buildings to be erected include a pattern house 30 x 160 ft., a boiler shop 40 x 160 ft., both one story, and an office building 36 x 76 ft., two stories. All buildings are of brick construction with tile roofs, and both the brick and tile used were made on machines of the company's own manufacture. The equipment yet to be provided for includes

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that for the power plant and some special machinery for the main shop. All machinery will have electric drive. The heating contract is also yet to be let. The Raymond Company builds brick machines up to 200,000 daily capacity. It also controls the Youngren patents on producer gas fired kilns, which are claimed to save nearly 60 per cent. in fuel over the ordinary beehive type of kiln.

The Platt Iron Works Company, Dayton, is operating its plant almost up to capacity. It has lately received several orders for large municipal pumping outfits, and among recent shipments was an unusually large sized water wheel for a Pacific Coast customer.

The Davis Sewing Machine Company, Dayton, which has a daily capacity of 750 sewing machines and 500 bicycles, is one of the busiest plants in this section of the country. Orders for bicycles alone for next season already foot up over 125,000. The company also manufactures the Lester automatic screw machine and reports many orders for it from different sections of the country.

It is stated that the National Cash Register Company has plans under way for some extensive additions to its Dayton plant, but building details are not yet available.

The Dayton Lighting Company is installing additional boilers which will double the capacity of its plant.

A one-story brick addition, 46 x 56 ft., to the Dayton Motor Car Company's power house of plant No. 3 is now under construction. Plans were drawn by Architect Wm. E. Russ and the erecting contractors are Engle & Gohn, all of Dayton.

The one-story brick aeroplane factory, now being constructed for the Wright Company, Dayton, is nearly completed, and it will be occupied before December 1. Wm. E. Russ was the architect who drew up the plans for the structure.

The Thomas Mfg. Company, Dayton, manufacturer of cutlery and hardware specialties, is contemplating the erection of a factory building 175 x 250 ft., three stories, during the spring of 1911.

The Dayton Bronze Bearing Company, Dayton, Ohio, has been incorporated with a capital stock of $20,000 by William B. Israel and others. The new company will carry on the business formerly conducted by Israel Brothers, iron and brass founders. The new company will make a specialty of street car and railroad bearings.

San Francisco

SAN FRANCISCO, CAL., October 5, 1910.

The local labor situation remains in about the same condition as before, and its adverse effect on the operation of foundry and machine shops is increasing. An indication of this effect is shown by the fact that large castings have been sent to Los Angeles for machine work, and returned here, at less than the work would have cost in the local market. The local market for metal working tools is accordingly very slow, though some business of an unimportant nature is going on all the time. A few local shops are busy, but none are making any extensive additions to their equipment. Activity is rapidly increasing, however, in other parts of the State, as there is a large volume of general work on hand, and a number of shops are increasing their capacity and replacing old machines. Few tools of the larger types have been sold, but several substantial orders have been booked.

One of the most encouraging features of the market is the increasing demand for woodworking machinery. Recent orders include little in the line of logging or sawmill equipment, as some of the mills are already closing down for the winter, but a general buying movement has commenced among the planing mills all over the State. In this line September was the best month in a year and a half. The demand is especially strong for modern types of heavy high feed machinery, which is rapidly supplanting the older types in wood finishing mills all over the coast. It has been demonstrated that these mills can make money by installing new equipment, and plants which still use older types are unable to compete.

While there are still a few inquiries for road machinery, the rainy season will soon put a stop to improvement work, and the movement is by no means as active as last month. Large rock crushing equipment is also expected to be quiet for the next few months, though deliveries of such machinery on old contracts are still coming forward. The movement of mining machinery is limited almost entirely to small orders. Small railroads in California are still in the market for small lots of rolling stock and general equipment.

There is comparatively little new business in large electrical equipment, though small to medium sized motors, generators, &c., continue in good demand. Inquiries for boilers and small steam power plants are fairly numerous. A few large pumping engines are being installed for water works, but the principal demand in this line is for small units, principally for irrigation. This is about the only department in which the local manufacturers are keeping busy. Machinery of a general nature, however, is in steady demand, with several inquiries for creamery and refrigerating equipment, and the local branches of the two leading laundry machinery houses have booked a large volume of business in the last two months.

A project is under way at San Bernardino, Cal., to install a municipal electric light plant.

The Union Oil Company is preparing to install a water system through its properties in the vicinity of Bakersfield, Cal. Two new boilers are being installed at the main water station and three at another location.

The American Machine & Tool Company has been incorporated at Los Angeles by J. G. McCoy, W. M. McCoy and H. J. Leland.

The Stockton Iron Works, Stockton, Cal., is working on a $75,000 clam shell dredger for the West Rivers Company of San Francisco. It is to be completed within 60 days.

A number of rumors have been circulated of late regarding a large steel manufacturing plant to be erected in the vicinity of Los Angeles and which is said to be backed by foreign capital, but so far no information which can be considered reliable has been given out.

Work will be started shortly on a new iron and steel foundry, to be erected for the Southern Pacific Railroad in connection with its large car repair shops at Sacramento, Cal. It will be one of the largest foundries operated by a railroad on the coast.

The Mery Iron Works, Chico, Cal., which recently announced its intention of moving to Oroville, has purchased a site at Thermalito, Cal. The plant will be entirely rebuilt and new machinery installed.

A new ore mill and electric generating plant will be installed next spring at the Black Bear mine in Siskiyou County, Cal.

The California Mining & Dredging Company, Eureka, Cal., is planning to install a new dredge next year.

John Carter is preparing to erect a machine shop at Lancaster, Cal.

A new boiler house is being erected for the Edison Electric Company at Ocean Park, Cal.

Contracts have been let for extensive improvements to the Union Ice Company's plant at Bakersfield, Cal.

The Keller-Thomason Mfg. Company, Covina, Cal., is putting in a shop for the manufacture of irrigating appliances, cement pipe molds, &c., at Los Angeles.

The Parker Iron Works has been incorporated at San Bernardino, Cal., with a capital stock of $100,000, by W. M. Parker, W. W. Brison, F. A. Maginnis and C. M. Crow. The company has taken over the old machine shop operated by W. M. Parker, which will be remodeled and enlarged for specialized work in the line of refrigerating machinery.

Baker & Hamilton and the Cyclops Iron Works, San Francisco, are furnishing creamery and refrigerating machinery for the Riverdale Creamery, Hanford, Cal.

The California Transportation Company will soon place orders for a large river steamer.

The Sacramento Pipe Works, Sacramento, Cal., has been sold by W. W. Chapin to E. T. Schaw. The plant will be operated independently, having no connection with the Schaw-Batcher Company.

The machine shops of the Southern Pacific Railroad at Tucson, Ariz., were totally destroyed by fire September 29, at an estimated loss of $350,000. The loss included, in addition to machinery, 10 locomotives, 18 oil tenders and four ballast cars. It is announced that the shops will be rebuilt at once.

The Acme Foundry Company, Wm. Victor, manager, Eureka, Cal., will shortly be incorporated, and the plant will be increased by the addition of a number of machine tools.

The town of Modesto, Cal., will soon be in the market for a lot of water works machinery.

Indianapolis

INDIANAPOLIS, IND., October 11, 1910.

The Elkhart Mfg. Company has been incorporated at Elkhart, Ind., with $25,000 capital stock, to manufacture electrical machinery. The directors are Walter Brown, H. A. Albert and H. S. Hubbard.

The Heimberger & Drinkard Veneer Mills, New Albany, Ind., maker of sawed veneers, will install additional machinery to materially increase the capacity of the plant. The company recently increased its capital stock $25,000. Adam Heimberger is president of the company.

The Maxwell-Briscoe-Newby Company, Newcastle, Ind., manufacturer of automobiles, has changed its name to the United Motor Newcastle Company.

The National Time Switch Company, South Bend, Ind.,

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has been incorporated, with $25,000 capital stock, to manufacture electric time switches. The directors are N. C. Morrison, E. L. Betts and Carl Lindewald.

The City Council of Marion, Ind., has issued $75,000 in bonds to raise money with which to build a municipal electric light plant.

The American Gas & Electric Company, with its main plant in Muncie, Ind., has obtained a franchise to supply Eaton, Ind., with electric light and power, the service to be installed within 18 months.

The machine shop, engine and boiler rooms of the Southern Railway at Princeton, Ind., were destroyed by fire October 8, other departments being crippled by the destruction of the electric dynamos and air compressors. A steel crane costing $50,000 was badly damaged. The loss was $200,000. The plant will be rebuilt at once.

Beyer Brothers, Fort Wayne, Ind., are preparing plans for the construction of a large cold storage plant.

The Great American Automobile Company, Indianapolis, Ind., has plans prepared and is receiving bids through H. L. Bass & Co., architects, Indianapolis, for the construction of an automobile factory, 300 x 500 ft., two stories.

Toronto

TORONTO, October 8, 1910.

The enterprise of the country goes ahead and keeps the machinery market in good appetite. The demand for equipment seems almost unaccountably good. So sustained a call for new plants have not been looked forward to from the time it became clear the Western crop would be relatively short. But on the whole the present year's yield will not fall far below that of last year either in tonnage or money value. Agriculture in the East has all but made up for the partial crop failure in the West. Mining activity continues to do its part in the production of wealth. The immigrants, who keep on pouring into the country, are for the most part fore-handed people, and their money tells appreciably in the total buying power that is being exerted. Further, it cannot be too often repeated, Canada's public credit—federal, provincial, municipal—has high rating in the British money market, and the two or three hundred million dollars brought annually into the country makes work for new machinery. At present Canadian machine shops are very busy and there are no desirable machinists in the meager ranks of the unemployed.

Several of the manufacturing towns and cities of Ontario have just published figures showing material gains in assessment and population within the last twelvemonth. Toronto, Hamilton, Brantford, Berlin, Peterborough, Kingston and other places show progress that is largely to be credited to the growth of manufacturing industry.

Giving evidence before the Commission on Industrial and Technical Education at its session in Toronto, G. A. Watts, of the Toronto Foundry Company, said that the development of the foundry industry has been greatly hampered by lack of skilled workers. His company is trying to train men. It rewards men for efficiency by paying them premiums over and above their regular wages.

Robert H. Verity, general superintendent of the Massey-Harris factories, stated before the Commission on Industrial and Technical Education that the growth of the automobile business has made it difficult of late for his company to secure men. He added that his company is preparing plans for a building in which its employees can obtain luncheon and some amusements, in which also some form of technical education will be carried on.

The Steel & Radiation Company of Canada, with a capital stock of $5,000,000, is announced as the latest Canadian merger in the steel and iron group. Two Toronto companies are named—the King Radiator Company and the Expanded Metal & Fireproofing Company—among those to be embraced. The works of these two concerns, in which nearly 300 men are employed, will, it is said, be enlarged. Three other existing companies are to be included, if rumors of the new company's plans are confirmed by events. It is stated that there are to be factories at a number of Canadian points and that steel products—such as structural forms, expanded metal, &c.—used in the building trade and in builders' plants will be made in the company's factories. A blast furnace may be added as part of the new company's operating system.

Half the capital for the Crown Electrical Mfg. Company, which is putting up a factory at Brantford, Ont., has been subscribed locally. The stock thus taken by Brantford parties in this Canadian offshoot of a St. Charles, Ill., business, is $100,000.

The Shawinigan Water & Power Company at Shawinigan Falls, on the St. Maurice River, Quebec, is about to increase its power producing capacity by 75,000 hp. This involves the cutting of a section out of the side of the intake canal 1000 ft. long, and the erecting of a concrete and steel bulkhead at an angle of 60 degrees to the existing bulkhead. From this extension five steel penstocks, each having a capacity of 15,000 hp., will be carried to the power house to be erected on the lower level, to which there will be a head of 150 ft. The power house is to contain five units, consisting of turbine water wheels directly connected to an electrical generator.

The Chapman Engine & Mfg. Company has received incorporation under Ontario laws, the capital stock being $200,000, and the head office being at Dundas, Ont. It will manufacture engines and machinery.

The Verity Plow Company, Brantford, Ont., has let contracts for additions to its works costing $60,000. The Penman Mfg. Company of the same city, will commence shortly upon additions to its works to cost $80,000. It will employ 400 additional hands.

At Guelph, Ont., the Gilson Mfg. Company is building an addition to its factory that will double its capacity. Also the Page Hersey Tube Mill Company there is extending its plant to meet the needs of increasing trade.

At Tharold, Ont., the Colonial Wood Produce Company is building an extension to its plant that will enable its output to be increased by 25 per cent.

At Hamilton, Ont., the following companies are making additions to their factories and works: Canada Shovel & Tool Company, International Harvester Company, F. W. Bird & Son, Canadian Westinghouse Company, Hamilton Bridge Works Company. The last named company, in addition to the making of considerable extensions to its present works, will put up in the East End—where it has purchased a large tract—buildings for the storing of stock and for the manufacture of light structural steel.

The Dowsell Company, Hamilton, which manufactures wringers, washing machines and kindred articles, has changed its name to the Cummer-Dowsell Company and increased its capital stock from $75,000 to $250,000. Extensions of its plant are projected.

William Mackenzie, president of the Canadian Northern Railway Company, stated in a Toronto newspaper interview that a giant plant for the manufacture of paper, pulp and carbide will be established on the Saguenay River, near the Lake St. John Railway in Quebec, a line belonging to the Canadian Northern system. The company which has this undertaking in hand is capitalized, says Mr. Mackenzie, at $10,000,000, but he declines at present to say who the principals are.

The Canada Sugar Refinery Company, Point St. Charles, Montreal, is building a large brick and iron warehouse for receiving raw material and a large structure to be used for melting purposes.

The Appelford Counter Check Book Company has taken out a permit to build a factory in Hamilton, Ont.

Conditional upon the granting of a fixed assessment and other special privileges, the branch of the Penberthy Injector Company's works at Windsor, Ont., will be extended so as to provide for the doubling of the capacity there. Property adjoining the company's present plant has been obtained, and a $20,000 building is to be erected.

Among the companies that have just received charters of incorporation from the Ontario Government are the following: Foley-Rieger Pulp & Paper Company, Thorold, Ont., capital, $50,000; Imperial Electric Company, Windsor, $50,000.

The Newfoundland Government is advertising the fact that for the encouragement of copper smelting in the colony the Customs Act provides for the free importation of smelters, allied machinery and coke, also that a Government bounty will be paid on all copper ore mined and smelted in Newfoundland at the following rates: $1 per ton up to 100 tons; 50 cents per ton for lots of 100 tons up to 500 tons. The shipments of copper ore from the Tilt Cove mine, on the northeast coast, average 50,000 tons per annum, part going to Swansea, Wales, and part to the United States. At Goose Cove, also on the northeast coast, and at York Harbor, on the west coast, active mining for copper is being carried on.

The Joliette Steel & Iron Foundry Company, with a capital stock of $250,000, has been incorporated to carry on business as a Dominion concern, its head office to be at the town of Joliette, Que. Among the powers conferred are those to manufacture steel and iron, to make and deal in motors, generators, electric plants, and to establish blast furnaces, open hearth furnaces, Bessemer converters, &c.

At Mine Centre and Fort Frances, in the Rainy River district of Ontario, manufacturing industries are wanted. Fort Frances will have 30,000 hp. of electrical energy to apply to plants when the hydroelectrical development there is complete. At Mine Centre the people are agitating for an electric smelter. The town is favored by great natural power

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resource and abundance of iron ore that might be economically reducible by electrical processes.

The Penman Mfg. Company, whose product is knitted goods, proposes to add to its existing Canadian factories one in Simcoe, Ont. The intention is, if a suitable building can be obtained, to put in new machinery.

Plans have been filed with the Public Works Department of the Dominion Government for the $4,000,000 dry dock and ship repairing plant at Levis, Que.

The town of Renfrew, Ont., is offering debentures for sale to the amount of $117,000, the proceeds to be applied to the construction of municipal works for the distribution of hydroelectrical energy to manufacturers and other consumers.

The stamps for the mill of the Temiskaming & Hudson Bay Mining Company, Cobalt, Ont., are being made by Fraser & Chalmers, Erith, England, the material being chrome steel, and the crushers, trammels, elevators, &c., are being made by the Allis-Chalmers-Bullock Company. A small transformer house is being built at the mine for the purpose of reducing the high voltage in order to operate the motors running the concentrators.

The Toronto yards of the Canadian Shipbuilding Company have been taken over by the John Inglis Company, which will make use of them in connection with its machine and engine works in their vicinity.

The reduction and smelting works at Trout Mills, Ont., which have been closed down of late, are shortly to become active under new auspices.

In Peterborough, Ont., the William Hamilton Company has secured two large contracts for hydroelectric plants, the Peterborough Canoe Company is extending its factory, and the Collier Electric Company is receiving some large Western orders for electric irons.

A large brick and steel building is being erected for the Central Foundry Company in Port Hope.

At Niagara Falls, Ont., the Canadian Ramapo Company, which manufactures railroad track equipment, is building a large addition to its plant. In that town a branch factory of a company that makes electric lighting equipment is to be established. A furnace company, made up of parties from the United States, has acquired an unused foundry building in the town in which it is to put 25 men to work.

In Toronto, the Canada Foundry Company has recently closed contracts for bridges aggregating $600,000. The Canada Cycle & Motor Company is building a four-story, 90 x 120 ft. addition to its factory, to cost, with equipment, $100,000. The Canada Linseed Oil Company is putting up a three-story brick and concrete mill in Toronto to cost $35,000.

The double tracking of the Canadian Pacific Railway bridge crossing the St. Lawrence at Lachine, a suburb of Montreal, is expected to cost $2,500,000. Existing piers have to be widened and new ones constructed to obtain the necessary additional support. When the work, which has been some months in progress, is completed—in the spring of 1912—it will be one of the finest in the railroad systems of the continent.

Fire damaged the premises of the Percival Plow & Stove Company at Merrickville, Ont., to the amount of $10,000 October 2. The loss is fully covered by insurance.

The Goderich Organ Company's factory at Goderich, Ont., with the plant and stock in the building, was practically destroyed by fire. Loss $100,000, covered by insurance.

The town of Galt, Ont., is offering an issue of $66,000 debentures, the proceeds to be applied to the installation of a plant for distributing hydroelectric energy within the municipality.

The Canada Foundry Company, Toronto, has secured the contract for the iron work in the electric light poles the city is setting up on the principal streets, and on which handsome lamps are to be set. The price is $4.85 per 100 lb.

The Deere Plow Company, whose Canadian works are to be established at Welland, Ont., has already purchased the land specified in the by-laws approved by the rate payers of the contiguous rural municipalities of Humberstone and Crowland last week.

The United Motors Company, having obtained a charter of incorporation, it is expected to go on with its plant at Welland.

The Universal Chimney Cleaner Company is the name of a concern for which incorporation is applied from the Government of New Brunswick. Its headquarters are to be in St. John, its capital stock $499,000. The men identified with the company are well-known residents of the province.

Last spring the city of Windsor, Ont., bought a tract of land to be used for factory sites and began a policy to build up a manufacturing quarter. Another step towards the carrying out of the policy is the approval, given this week, of the Canadian Board of Railroad Commissioners to plans for switching the Essex Terminal Railway line from that factory district to the terminals of the five trunk railroads entering the city.

W. J. Press, mechanical engineer for the National Transcontinental Railway, was in Toronto on Thursday inspecting some machinery purchased here for the railroad. Interviewed on the subject of Canadian machinery, he said: "Two-thirds of the machinery and equipment in the railroad shops at Winnipeg was purchased from Canadian firms. There has been a wonderful improvement in Canadian machinery during the last five or six years, and the time is not far distant when all railroad equipment will be made here. The structural work in the Winnipeg shops is almost completed, but it will be at least nine months before they will be operated. The shops are very modern, and they will be when completed, among the finest, if they are not the finest, in Canada. The equipment alone will cost about $2,000,000."

The Burlington Gasoline Engine Company is building a factory in Burlington, Ont.

A committee of the Town Council of Dundas, Ont., has been appointed to confer with the Hydroelectric Power Commission and the Chapman Engine & Mfg. Company to bring about an arrangement for the supplying of power to the latter through the medium of a municipal distribution plant.

The Town Council of Chatham, Ont., has granted a franchise to the Peninsula Oil & Gas Company to furnish natural gas from the Vienna field at 12 cents per 1000 ft. to manufacturers, which rate at the end of five years may be raised to 14 cents. Rates are also specified for domestic consumers, and the gas used in the public offices of the municipality is to be free.

Sealed proposals for machinery, pumps and motors will be received at the office of the Commissioners of the Transcontinental Railway, Ottawa, Ont., October 18, for the machinery required for the equipment of a roundhouse at Lake Superior Junction, Ont., and for the centrifugal pumps and motors required for the sewage pumphouse at the Winnipeg shops.

The South

NASHVILLE, TENN., October 10, 1910.

Among Southern industries as a whole, inclusive of public service companies, one of the most notable tendencies this season is the consolidation of plants and the establishing of communities of interest along many different lines. The effect of this upon the machinery trade is felt not only in more centralized buying but also in a growing demand for heavier or more efficient machinery. To some extent it would seem to militate against small local shops or machinery building plants having a restricted sales territory that remain independent of any alliances; but, as a matter of fact, practically all such are finding enough to do, and where their trade has been curtailed in one direction an outlet has developed for it in some other way. The growth of manufacturing cities like Birmingham, Nashville, Chattanooga, Charlotte and Atlanta is also exerting a very beneficial influence upon the market, by steadying it and giving it a wider range throughout the year than was possible under the older conditions. Recently this has been especially apparent, and the fall of 1910 can hardly fail to show up very well in respect to the total volume of business transacted, as compared with previous years. For the past week the average has been good and continued improvement may reasonably be anticipated.

Turbines, governors, alternating current generators, exciter units, transformers, switches, oil pumps, &c., will be required this winter by the Ogeechee River Electric Power Company, Rocky Ford, Ga., for a chain of hydroelectric power developments. Tenders of machinery will not be invited, however, until after construction contracts have been let.

If the recommendations of the local board are ratified at the coming election, machinery for a city pumping plant will be purchased some time during the winter at Kirkwood, Ga.

The project for a municipal pumping plant, water and sewage system at College Park, Ga., will be carried to completion in the near future, as the result of a bond issue recently voted for the purpose.

A new woodworking plant is to be built at Ocala, Fla., by the Ocala Lumber & Supply Company.

The Great Falls Power Company has been formed at Nashville, Tenn., by Fielding H. Yost, Dan E. McGugin and others to build a large hydroelectric plant on the Caney Fork River and transmit power to Nashville for use in the factories. Work on the development will begin some time this winter.

A Babcock & Wilcox boiler of 500 hp. is being added to

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the power house equipment of the Meridian Light & Railway Company, Meridian, Miss.

It is reported from Charlotte, N. C., although without official confirmation, that the Southern Railway Company will start work on repair shops there by or before the beginning of the year.

W. H. Patterson, Candler Building, Atlanta, Ga., is preparing plans for a public service system at Greenville, S. C., which comprises water works, electric lighting station and sewage plant.

It is reported from Atlanta, Ga., that extensive improvements are to be undertaken at one of the county buildings, including a pumping plant and the installation of an electric generating set.

Plans for a new viaduct on First avenue, in the vicinity of the Sloss-Sheffield Steel & Iron Company's works have been approved by the authorities at Birmingham, Ala.

High pressure pumping machinery will be required early in the coming year at Haleyville, Ala., if the project now under consideration by the city is carried through.

Arrangements for a new steam boiler and engine plant, together with a gas generating system, are being made at Charleston, S. C., by the Charleston Consolidated Railway, Gas & Electric Company.

Preliminary measures have been taken by the city council, Birmingham, Ala., for the enlargement of the municipal power and pumping plants at North Birmingham.

Preparations are being made to erect a new manufacturing plant for the Bradford Furniture Company, Nashville, Tenn., in place of the structure that burned.

The City Council of Boaz, Ala.. will expend $20,000 for the establishment of a water works system.

The F. S. Royster Guano Company, Norfolk, Va., is building at Montgomery, Ala., a factory structure 181 x 252 ft., which will be used for the preparation of guano for fertilizing purposes.

The Andrews Caoutchouc Brick Company, 40½ Sycamore street, Petersburg, Va., has incorporated with $100,000 capital stock to establish a plant for the manufacture of a composition brick produced chiefly from wood pulp. The company will require one 50-hp. engine, a 75-hp. boiler and other equipment.

The plant of the American Mfg. Company, Chattanooga, Tenn., which was recently burned, causing a total loss of about $40,000, will be rebuilt. The company manufactures harness and builders' hardware specialties and will require some special machinery for the new factory. J. B. Robinson is president, D. M. Kyle, vice-president, and W. N. Kyle, secretary.

Western Canada

WINNIPEG, October 8, 1910.

The Winnipeg Board of Control is calling for tenders, to be received by October 20, for a 15-hp., 60-cycle induction motor and silent chain drive, for an 8-ft. fan at the city's terminal power station.

The Otis-Fensom Elevator Company proposes to erect a machine shop in Winnipeg for manufacturing and adjusting elevator parts.

The Algoma Steel & Bridge Company is building a new bridge over the Red River at Winnipeg. There has been some delay because of backwardness in the delivery of structural material by the Hamilton manufacturers. The new bridge will have double street car tracks, a 26-ft. roadway and sidewalk. The drawbridge will be operated by electricity.

The capital of the Alberta Iron Rolling Mills Company, which proposes to establish a plant at Medicine Hat, Alberta, is $150,000. Of this amount, $10,000 is to be expended on buildings and $80,000 on equipment.

The machine shops of the Canadian Pacific Railway Company at Fort William and those of the Canadian Northern Railway Company at Port Arthur are being extended.

Regina's new street railroad will be ready for the steel in the spring. At a meeting some days ago of the City Council the contract for steel switches was awarded to the United States Steel Products Company.

Law & Von Dohlen, Vancouver, are forming a company with $150,000 capital stock to manufacture the Gray instantaneous automatic water-heater.

The Winnipeg Board of Control will receive sealed tenders up to October 7, for the manufacture and delivery of a motor car for use on standard gauge railroad track.

The city of Prince Albert, Saskatchewan, has under consideration a scheme to develop the power resources of Lacolle Falls. An expert has prepared a report on the undertaking. The cost would be $450,000 and the time required 26 months. The report suggests that, as the hydraulic machinery needed must be of a specially complicated type, owing to the fluctuations of the river, tenders be obtained from European makers, "many of whom," he adds, "we are now in communication with on other matters."

At a meeting of the Medicine Hat (Alberta) City Council the mayor and secretary-treasurer were authorized to sign a contract with Chapman & Walker, Toronto, for a Siemens generator and switchboard for the power plant which the city is building. Crossby gas engines are included in the contract, the price of the whole being about $25,000.

The Southwest

KANSAS CITY, MO., October 10, 1910.

There continues to be a perceptible livening up in trade through the more important industrial districts of the Southwest. Activity in the lead and zinc mining regions is notably pronounced, as compared with the dullness of the late spring and summer; and the development work that has been ordered undertaken in behalf of large mining interests will result in further heavy purchases of equipment, supplies, &c., within the coming months.

At the manufacturing centers, plants utilizing woodworking machinery are among the best customers of salesagencies and dealers. Quite a number of furniture, stave and barrel factories, handle plants, sash and door factories, interior finishing shops, planing mills and the like are either starting up newly or increasing their output. Vehicle builders are in the same class.

From municipalities, central power and lighting stations, traction companies and private water, irrigation or drainage systems the demand remains constant, and in the general industrial field there is a fair amount of buying; so that, taken altogether, the situation appears to be most promising.

Work on an electric power station of considerable size has been started by the Southwestern Interurban Railway, Arkansas City, Ark.

The Ontario Mining Company has begun the erection of a 400-ton ore concentrating plant near Joplin, Mo.

Wesley Kouns, Salina, Kan., who operates a plant for the manufacture of stackers, is reported to have decided upon the erection of a new factory building at Bethel, Kan.

The City Council at Pittsburg, Kan., has engaged an engineer to prepare plans and specifications for the new pumping plant and water distribution system to be installed there during the coming winter.

The St. Marys Machinery Company, St. Marys, Ohio, has the contract for a gas engine to be operated at the municipal power plant in Russell, Kan. Valves, hydrants and other apparatus for the water works system to be installed there will be furnished by the Darling Pump & Machine Company, Oklahoma City, Okla.

It is unofficially reported from Shawnee, Okla., that the Chicago, Rock Island & Pacific Railway will build an electric power plant at its shops there, with a view to operating all of the machinery by means of motors. This system has been partially used heretofore on current supplied by the Shawnee Gas & Electric Company, and it is now desired to extend it.

The installation of a waterworks system, with deep well pumps, is proposed at Eldorado, Okla.

The installation of pumping machinery for municipal service is under consideration at Ellinwood, Kan.

The Paul Stone Company has been organized at Rockport, Texas, to operate a quarry and install machinery for rock crushing.

It is reported from Fairview, Okla., that the city power and lighting plant, which is equipped with two Westinghouse generators of 150 kw. capacity, driven by gas engines from the shops of the Weber Gas Engine Company, Kansas City, is to be enlarged and improved.

The Texas & Pacific Railway Company is adding a new shop to its plant at Marshall, Texas. This will be used for work on trucks.

Arrangements are being completed at the plant of the Greene-Cananea Mining Company, Cananea, Sonora, Mexico, for the installation of two steam turbines and generators of 3700 kw. capacity. A battery of eight large McDougall furnaces is being erected and a new reverberatory plant will be ready for operation within the next few months.

A new mining company, principally composed of the same interests, is now being organized to take over the property of the Live Oak Development Company and extend its operations. For this purpose considerable additional machinery will need to be purchased.

The City Council of Axtell, Kan., is preparing to establish a waterworks system.

Plans have been ordered by the city of Enid, Okla., for the enlargement of its waterworks system.

The Mutual Mfg. Company, Neosho, Mo., is considering

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the erection of a factory at Fort Worth, Texas, at a cost of $150,000, for which it will receive a bonus of $10,000 from the city.

The Blacksmith Fork Light & Power Company, Salt Lake City, Utah, has been incorporated with $100,000 capital stock. The officers of the company are M. S. Browning, president; Alfred Budge, vice-president; A. B. Irvine, secretary and treasurer.

The Northwest

MINNEAPOLIS, MINN., October 10, 1910.

Municipal, town and county contracts for power and pumping machinery, steel towers and tanks, pipe lines, valves, hydrants, bridges, viaducts, culverts, incineration plants, &c., which have been one of the principal supports of the market, are diminishing in number, as the orders for rock crushing, road making and construction equipment did earlier; but whatever losses there have been in this respect are more than compensated for by increasing buying in behalf of shops, foundries, mills and factories of all kinds which are busy on orders for fall, winter and even spring delivery. Low pressure boilers are in considerable demand, as there is now a rush to get heating plants of every description in operating condition before the arrival of cold weather; and purchases of auxiliary apparatus, which were put off, as usual, until the last thing, are being largely made at this time. Sales of electrical machinery continue heavy, motors, controllers, protective devices, transformers, switchboard instruments, &c., being particularly required. Machine tools sell in about the ordinary volume for this season of the year, but inquiries from metal working plants are rather light, most of the equipment needed being for repair shops connected with other industrial enterprises. To this purpose second-hand machinery can be adapted, and some dealers have been making a good feature of that trade.

Work on the great power development in the vicinity of St. Croix Falls, for the General Electric Company of Minneapolis, is being pushed by the Stone & Webster Engineering Corporation, and the wiring of the generating station has been commenced. Electric current from the new turbine units will be available this winter.

G. A. Bingemheimer of the Diamond Iron Works, Minneapolis, who recently returned from an extended trip to the Pacific Coast, including visits to Portland, Seattle and Spokane, found business there rather quiet, but feels that his company is getting a very good share of the trade.

An investigation has recently been made at Custer, S. D., of the feasibility of transmitting power to that district from the hydroelectric plant of the Dakota Power Company at Pactola, S. D., for operating machinery in the mines there, including the mica producing properties of the Westinghouse Electric & Mfg. Company, Pittsburgh. If a transmission line is constructed, it can be made to serve numerous other plants along the way, thereby creating an extensive demand for motors and other equipment adapted to the requirements of the new system.

The American Bridge Company has the contract for constructing two steel frame settling basins of 300,000 gal. capacity at Chisholm, Minn.

Construction work is to be started by or before spring on a new electric traction line to be built through southern Minnesota by the St. Paul Railway Promotion Company, St. Paul, Minn. At a meeting held last week in the offices of the W. J. Hoy Construction Company, where headquarters are temporarily located, Philip W. Herzog was elected president, B. L. Goodkind, vice-president, James Kasson, treasurer, and H. C. Struchen, secretary. W. J. Hoy is one of the directors. Plans for power equipment will be taken up later.

An air compressor and drills have been ordered by the Snowshoe Mining Company, Mullan, Idaho, which recently resumed operations on its property, and additional machinery, including a new hoisting unit, will be needed as development work progresses.

Machinery for a concentrating plant of 100 tons daily capacity will be required in the near future by the Triangle Mining & Development Company, Missoula, Mont., on its property in Clinton, Mont. All of the equipment will be electrically operated on current obtained from the Missoula Light & Water Company's plant at Bonner, Mont., where hydraulic turbines of 3500 hp., built by J. Leffel & Co., Springfield, Ohio, are installed. Other improvements are also to be effected. Development work is now progressing steadily, a large air compressor and drills furnished by the Ingersoll-Rand Company being in service, and additional equipment is to be provided as required.

The Hypotheek Mining Company at Kingston, not far from Wallace, Idaho, has decided to operate its machinery in future by means of electric motors and is arranging for the installation of a generating set to take the place of the steam plant now in service.

A new water works system will be constructed by Onida, S. D., at a cost of $10,000.

The Valentine Brothers Mfg. Company, Minneapolis, Minn., manufacturers of gasoline engines, is having plans prepared for a one-story factory building 80 x 200 ft., to be erected at a cost of $10,000.

The Northern Insulating Company, 1340 University avenue, St. Paul, Minn., manufacturer of a product used for heat insulation, is erecting a large manufacturing plant, the main building of which is 65 x 245 ft., of concrete brick and steel construction. In addition to this there will be a power house 65 x 66 ft. and a warehouse 112 x 266 ft., one story. Contracts for buildings and machinery have all been let.

North Pacific Coast

SEATTLE, WASH., October 7, 1910.

In all branches of the machinery trade there has been frequent occasion lately for remarking upon the fact that the Pacific Coast is not only losing its dependence upon Eastern manufacturers for equipment of any kind, but actually leads in many of the lines peculiar to its principal industries, such as logging, milling, woodworking, mining, canning, &c. In order to realize this one has but to inspect the numerous improvements brought out during the present year by manufacturers located in Portland, Tacoma, Seattle, Everett and other cities of this section and to compare the machinery of their design with other equipment for similar service originated elsewhere in the country. So far as differences in efficiency exist, they are more than likely to be found in favor of the Coast product. When the further fact is considered, also that it has long been the custom of Eastern builders to recognize the severe conditions of service imposed upon machinery in operation all through this territory, as instanced in the timber cutting industry by the heavy logs handled, the speed at which the work is done, &c., and to design their apparatus accordingly, it will be seen that the progress made here within the past decade is worthy of some note.

It is reported from Spokane, Wash., on what appears to be authentic information, that the Washington Steel & Iron Company, whose headquarters are stated to be there, is planning the erection of a furnace plant near Leavenworth, Wash., for the treatment of magnetic iron ore from a property which the company controls.

The Berlin Machine Works, through its district office in Spokane, Wash., where it is represented by A. N. Peel as district manager, has had a good run of business this season, despite the slackness in some lines of the machinery trade, and can show a large number of successful installations in that territory.

The M. A. Phelps Company, Cusick, Wash., has let contracts for the construction and equipment of a large new timber cutting plant to be built on the new branch line of the Idaho & Northern Washington Railway at Pend d'Oreille river crossing.

An extensive woodworking plant, electrically operated, will probably be erected this fall at Elma, Wash., by the Chehalis Fir Door Company.

The Swan-Hamann Company, White Salmon, Wash., has installed an electric generating set for lighting purposes and will probably extend this system, later, throughout the mill for driving machinery by means of motors.

Porter Bros., Spokane, Wash., have secured a large site in Portland, Ore., on which they will build a machine and forge shop, warehouse, &c., for use in the assembling and maintenance of railroad construction outfits. It is located at the foot of Chautauqua street on the tracks of the Oregon Railroad & Navigation Company.

H. L. Neace, Medford, Ore., is interested in quotations on rivetted steel pipe and equipment for hydraulic placer mining.

The Hallidie Machinery Company, Seattle, Wash., is offering a very complete line of second-hand machine tools and power equipment for repair shops, a specialty being made of the logging and sawmill trade.

Manganese sheaves, whose wearing qualities have withstood the most severe tests of service, are being featured this season in the sales of the Columbia Engineering Works, Portland, Ore.

The Moran Company, Seattle, Wash., recently installed in the plant of the Monarch Lumber Company, Portland, Ore., a water tube boiler of 1000 hp. constructed in its shops.

The Coos Bay Mfg. Company, North Bend, Wash., has taken some large season contracts and may extend its production facilities before the end of the current year.

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The Holland-Cock Mfg. Company, Eatonville, Wash., has secured the shops of the C. E. Littell Company, near Tacoma, and is making some improvements. Wood columns and other specialties will be the product of the plant.

A machine shop, in which the equipment will be motor driven, is being erected on the property of the Marsh Mining Company at Burke, Idaho.

The Irvington Machine Works, Portland, Ore., which specialize in woodworking machinery, is offering saw mandrels of a new and improved type which have features of considerable interest to prospective users.

I. L. Skeith, Vancouver, B. C., who was manager for some years of the sawmill machinery department of the Allis-Chalmers Company, Milwaukee, and has more recently been connected with the Sumner Iron Works, Everett, Wash., left last week on an extended trip East in the interest of a new plant, including foundry and machine shops, which will probably be built early in the coming year by another company at a point in British Columbia.

Machinery for ore concentration and other purposes will be required before long by the Blue Grouse Tungsten Company at Loon Lake, Wash.,

The Rand Iron Works, Vancouver, Wash., has been incorporated with $15,000 capital stock to take over a plant which is now in operation. Some new machinery will probably be purchased at a later date. Henry Roe, Masonic Building, Portland, Ore., is president of the company.

The Brown Portable Elevator Company, Portland, Ore., will establish a branch at Saginaw, Mich., where it has secured a building which it is remodeling and fitting up for manufacturing purposes.

The Farther Central West

OMAHA, NEB., October 10, 1910.

Trade during the past week has been fairly active and the outlook for the immediate future is encouraging. Current business, however, still consists almost entirely of purchases made to fulfill requirements that could no longer be neglected, and for the new projects that are under consideration it is difficult to bring negotiations to a close. Owing to the general disposition to wait until after the November elections before making any decisive moves, the two closing months of the year should be relatively very active. Meanwhile, the hand to mouth character of the buying compels the constant placing of small orders, or of conditional season contracts for which billing is made at the time of shipment, and the shops everywhere through this territory are running along with an appearance of prosperity that would indicate better times than actually exist.

Bids on a boiler of 100 to 150 hp., with valves, piping, &c., and a new pumping engine of 2,000,000 gal. daily capacity, will be taken about December 1 or later by the Oskaloosa Water Company, Oskaloosa, Iowa.

The Ft. Dodge Portland Cement Company, recently organized with a capital stock of $3,500,000, which may be addressed in care of F. J. Tischenbanner, Gilmore, Iowa, is planning the construction at that place of cement mills for a capacity of 5000 barrels daily. The main offices of the company, when in operation, are to be located at Ft. Dodge, Iowa.

Among orders recently taken by the McDonnell Iron Works, Des Moines, Iowa, municipal contracts have been prominent.

The water system of the Chicago & Northwestern Railway Company at Marshalltown, Iowa, is to be completely remodeled, necessitating the purchase of some new equipment.

If the water works at Ottumwa, Iowa, are taken over by the city, as now contemplated, new pumping machinery and other equipment will be purchased. The matter is to be decided at the election November 8.

Equipment to be purchased for the new water works system at Limon, Colo., will include a steel tower and tank of 70,000 gal. capacity, two triplex power pumps, two gasoline engines of 25 hp. each and auxiliary apparatus.

New machinery will be provided shortly for the Homestake mine and ore concentrating plant at Georgetown, Colo., which is now under the control of Schofield & White.

The authorities at Price, Utah, have contracted for a high pressure boiler of 150 hp. from the Erie City Iron Works, Erie, Pa., to be installed in the municipal power plant.

Construction work is to be started shortly on a new sampling and ore reduction plant for the Santiago Mining & Tunnel Company, Georgetown, Colo.

The Waterloo Cement Machinery Corporation, Waterloo, Iowa, has increased its capital stock from $50,000 to $150,000. The company now has under course of erection an addition to its plant 45 x 109 ft., of concrete and steel construction, which will be equipped with a 5-ton electric traveling crane. The company advises that it is not in the market for any equipment at the present time.

The Colby Motor Company, Mason City, Iowa, has been organized, with a capital stock of $1,000,000, to engage in the manufacture of automobiles. Forty acres of land near the city have been purchased and the company is planning the construction of a five-story building, 150 x 450 ft. The officers are W. S. Colby, president; A. H. Gale, treasurer, and George Howland, secretary.

The Iowa Falls Gas Company, Iowa Falls, Iowa, has sold its plant and business to F. N. Litton of Chicago and C. M. Butterworth of Detroit. The new owners have taken possession and will improve the plant and make new extensions of service lines.

The Des Moines Saw Mill Company, Des Moines, Iowa, has been incorporated, with a capital stock of $50,000. G. C. Hubbell, Verne Clark and D. D. Langton are the incorporators. The company will erect a large mill at the corner of Ninth and Market streets.

The Union Pacific Railroad Company has taken out building permits at Omoha for storehouses, mills, shops and additions to cost $235,100. The list of improvements includes a sand blast and varnish shop, a chemical storage building, a dry kiln, a substore, a pony sawmill, addition to roundhouse and a mill to cost $160,000. The new buildings will be erected by Geo. B. Swift & Co., contractors, Chicago.

Southern Texas

AUSTIN, TEXAS, October 6, 1910.

The census returns giving the populations of the principal cities of Texas show that the largest percentage of increase over the census of 1900 was in those places where concerted efforts on the part of the citizens had brought about the establishment of manufacturing plants. This is particularly true of Fort Worth which showed an increase of 174 per cent. The lesson promises to be a valuable one for other cities and towns. In San Antonio, Houston, Galveston, El Paso, Austin, Waco and Dallas, and many of the smaller towns, preparations are being made to organize a vigorous campaign for more factories. It is claimed that the time has arrived when Texas should become a much greater manufacturing State than it now is. This factory movement is expected to lead to the investment of considerable home money in manufacturing enterprises.

E. H. Young of Galveston is erecting a cotton-seed delinting plant at Texas City. It will have a daily capacity of about 300 tons of cotton-seed.

W. B. Campbell and associates will erect a fruit and vegetable canning factory at Goliad, Texas, at a cost of about $10,000. Mr. Campbell has donated a site for the proposed plant.

The Harlingen Ice & Gin Company will enlarge its plant at Harlingen, Texas.

The Beaumont Cotton Oil Company has practically finished the erection of its new refinery and other buildings at Beaumont. The plant is equipped with six large presses and when in full operation it will crush 120 tons of seed per day. More than $125,000 is being invested in the enterprise.

The town of Cuero, Texas, is erecting a new pumping plant at the artesian wells from which the municipal water supply is obtained.

The city of El Paso took possession of the water works plant of the International Water Works Company on September 30. Under its municipal ownership the plant and distributing system will be improved in many respects. The pumping station will be rebuilt and the water mains extended.

The sewerage disposal plant that is to be installed by the city of El Paso will cost about $100,000. It was designed by Smith & Co. of Portland, Ore. It is announced that the city of Juarez, Mexico, situated opposite El Paso, will install a similar plant, both as to size and design.

The American Smelting & Refining Company is considering plans for the enlargement of its smelter at El Paso. Furnaces will be added and new equipment installed. It is proposed, it is said, to make this plant the largest copper smelter on the continent. The company recently contracted for smelting the ores of large producing mining companies in New Mexico and Arizona, which creates a necessity for the enlargement of the plant.

The William M. Rice Institute of Houston, of which Edgar Odell Lovett is president, has adopted plans for engineering and power plants. It is announced that they will represent an expenditure of $65,000 for machinery alone. The equipment will consist of three generating plants, in-

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cluding engines and generators, boilers and compressors, and the pumping machinery which will be used to furnish water for the institution.

The Lone Star Brewing Company, San Antonio, will erect a $200,000 ice plant and a $30,000 warehouse. The ice plant will have a daily capacity of 250 tons. James Wahrenberger of San Antonio is the architect who is preparing the plans and specifications for the proposed improvements.

The Davis Coal & Coke Company, Baltimore, Md., which recently entered the Texas coal trade, is equipping two coal barges at Texas City with hoisting machinery. The first steamship, the Jacob Luckenbach, employed in this new trade arrived at Texas City on October 4 with 2800 tons of coal from Baltimore. It is planned by the company to make a specialty of supplying the marine trade, coaling all ships entering the ports of Texas City and Galveston, as well as supplying several of the larger railroad systems in Texas with fuel.

It is announced that the shops of the Southern Pacific Railroad at Tucson, Ariz., which were destroyed by fire September 30, will be rebuilt on a larger scale than before. The total loss, including machinery, equipment and supplies, was about $100,000.

A new glass factory of 21 tons capacity is being erected at Fort Worth, Texas. The company will be known as the Fort Worth Glass Factory and has a capital stock of $100,000.

Government Purchases

WASHINGTON, D. C., October 10, 1910.

The Isthmian Canal Commission, Washington, D. C., will open bids October 14, under Canal Zone, 4762-A, for furnishing two steam pile-driving hammers, total weight 10,150 lb.

Bids will be opened at the Rock Island Arsenal, Rock Island, Ill., October 20, for furnishing one 50-hp. 50-volt compound wound double-connected motor, with pulley, slide rails and starting rheostat 400 rev. per min., and one two-stage belt-driven air compressor having an approximate capacity of 200 cu. ft. of air per min. at 160 rev. per min.

Bids were opened at the U. S. Naval Academy, Annapolis, Md., for furnishing power plant equipment for the Academy. The bidders submitted various alternate bids The bids for the complete work are as follows:

Bidder 1, The D'Olier Engineering Company, Philadelphia, Pa., $132,760; 2, The Lord Electric Company, New York, $165,482; 3, The Camden Heating Company, Camden, N. J., $134,950; 4, The John W. Danforth Company, $141,895; 5, The Evans Admiral Company, New York, $137,136.

The Isthmian Canal Commission opened bids October 1, under Canal Circular 596, as follows:

Class 1, two stony gate valve machines, one right and one left, complete as covered by items 1 to 270 inclusive—Bidder 1, The American Ship Windlass Company, Providence, R. I., $48,000; 2, The D'Olier Engineering Company, Philadelphia, Pa., $33,000; 3, The Poole Engineering & Machine Company, Baltimore, Md., $32,350; 7, The Wheeling Mold & Foundry Company, Wheeling, W. Va., $29,000.

Class 2, for two cylindrical valve machines as covered by items 1 to 142—Bidder 1, The American Ship Windlass Company, Providence, R. I., $8000; 2, The D'Olier Engineering Company, Philadelphia, Pa., $7420; 3, The Poole Engineering & Machine Company, Baltimore, Md., $5520; 6, The Rosedale Foundry & Machine Company, Pittsburgh, Pa., $8000; 7, The Wheeling Mold & Foundry Company, Wheeling, W. Va., $9500.

Captain F. W. Alstaetter, U. S. A., opened bids at Wheeling, W. Va., September 27, for one power house complete with machinery at dam No. 20, Ohio River, as follows:

Lot A—Bidder 1, The G. & W. Mfg. Company, New York, $30,973; 6, Hile & Higgs, Parkersburg, W. Va., $30,500; 9, The New Jersey Foundry & Machine Company, New York, $38,813.

Lot B, for two boilers and accessories—Bidder 1, The G. & W. Mfg. Company, New York, $5600, Heine Safety; 3, The E. Keeler Company, Williamsport, Pa., $4697, Keeler water tube boiler; 5, The Heine Safety Boiler Company, Pittsburgh, Pa., $5000, Heine Safety; 8, The James J. Walker Company, Pittsburgh, Pa., $4980, Heine Safety, and $5665, Heine water tube.

Lot C, one boiler feed pump—Bidder 1, The G. & W. Mfg. Company, $245, Worthington; 8, The James J. Walker Company, Pittsburgh, Pa., $210, Worthington; 9, The New Jersey Foundry & Machine Company, New York, $245, Worthington.

Lot F, one pneumatic displacement pump—Bidder 1, The G. & W. Mfg. Company, New York, $335; 9, The New Jersey Foundry & Machine Company, New York, $365.

The New York Electrical Show

The fourth annual New York Electrical Show, which opened October 10 at Madison Square Garden and will continue until October 20, is not as replete with machinery exhibits as have been some of the previous shows. Nevertheless, there is much to interest machinery manufacturers in general, as a number of large pieces of apparatus electrically operated are on exhibition. The show, on the whole, however, is largely devoted to the display of electric novelties and household specialties.

The exhibit of the General Electric Company is as usual a large one, and is the center of interest to machinery men, many of whom have made the General Electric booth their headquarters during the show. General Electric motors are shown applied to a number of different kinds of equipment, and their adaptability for operating blowers, fan equipment and other apparatus is demonstrated. The American Metal Hose Company, New York, has an interesting exhibit showing a line of flexible metal conduits and piping. The Crane Company, Chicago, is exhibiting electrically operated valves, traps and steam separators, together with other steam supplies. The Cutler-Hammer Company, New York, shows electric switches for various purposes, but gives a large part of its booth over to the exhibition of flat irons, chafing dishes and other household devices. The Edison Storage Battery Company exhibits storage batteries and demonstrates their adaptability for operating electric vehicles and for emergency lighting outfits.

The Electric Testing Apparatus, New York, has an interesting exhibit of electrical testing apparatus. The Golds Mfg. Company is showing a line of motor driven pumps for all purposes. The Joseph Dixon Crucible Company has a fine exhibit of graphite specialties. The Lansden Company, Newark, N. J., is showing a standard 1-ton electric truck for industrial use. The Otis Elevator Company exhibits a smaller type of electric elevator. The Rider-Ericsson Engine Company is demonstrating electrically driven pumps for domestic water supply. The Watson-Stillman Company is exhibiting its line of motor driven turbine pumps. The Independent Electrical Contractors' Association of Greater New York has a comprehensive exhibit showing samples of the work of the members of the association.

Correction.—In the description of the sheet metal straightening and cutting machine of the F. B. Shuster Company, New Haven, Conn., on page 788 of *The Iron Age*, October 6, an error occurred in the first paragraph. In the statement, "Instead of seven rolls it has five," the figures were inverted, for it is one of the features of the new machine that it has seven rolls instead of five.

The lockout and strikes of the bricklayers employed by New York contractors, having work in numerous cities, were ended October 6. An arrangement was reached after several conferences between the international officers of the bricklayers and the Mason Builders' Association of New York that when members of the association have work to do in cities outside of New York which are not covered by the present local trade agreement the union rules must obtain in these towns and cities. The present trade agreement will continue until it expires on December 31.

The Rock Island Plow Company's Growth

The Rock Island Plow Company's factory at Rock Island, Ill., large and modern as it already is, has been taxed to the utmost to supply the rapidly increasing demand for its products. On account of this, and in view of the continued increase in volume of business which the company has every reason to expect in the future, plans have been worked out for a new plant that will treble the present output within the next two or three years.

Such an undertaking takes some time for its accomplishment but contracts have already been awarded for five new buildings. They are as follows:

1. Forge shop. This will be one of the very few buildings in the United States with the monitor style of roof. It is under way and will be ready for use in two or three months. This style of roof not only affords the maximum of light but permits the maximum of ventilation, regardless of the weather. The upper rows of windows, when open, resemble louver boards, shedding rain while permitting the escape of gases and the free entrance of air. The monitor roof slopes to the center instead of the sides, avoiding the accumulation of ice along the eaves, with its attendant annoyance and danger.

2. Pattern and experimental building; three stories.

3. Warehouse; eight stories, six to be erected at once, the others to be added at a later date. This immense building will be equipped with an elaborate trolley system which will greatly facilitate the storing and shipping of goods.

4. Large addition to present foundry. This is now well under way, and the plans contemplate a thorough overhauling of the entire foundry equipment. A modern charging floor will be erected and a double-track trolley system will add greatly to the efficiency of this important department.

5. New building for core-making department. This, of course, will be closely connected with the foundry, and will be entirely modern.

Reinforced concrete will enter largely into the construction of the new buildings. They will be fireproof, and will embody the most advanced ideas in factory construction.

All will be provided with up-to-date sanitary plumbing. In addition to convenient washrooms, shower baths will be installed in the foundry and forge shop. These efforts to improve the surroundings and environment of the employees will no doubt be fully appreciated, and result in attracting the best class of workmen.

Other buildings will follow as fast as they can be reached, and when the entire plant is completed it will be a model one, enormous in area, equipped with the most modern machinery and carefully planned for the purpose of transforming raw materials into finished product by the most approved methods and with the greatest possible saving of time and labor.

To secure the necessary room and make possible this extension of the plant, the company has purchased a large amount of adjacent property and the City Council has vacated portions of several streets. These vacated portions are so located and so surrounded by the company's property that the public will suffer no injury from this action of the city.

The work of getting out goods for the coming season must not wait for the new plant, and the present plant has resumed operations after a very brief shutdown for inventory. Vigorous and careful preparations are being made for taking care of the greatly increased trade confidently expected. New and improved machinery is being installed wherever it will increase the capacity of the shop, and no effort will be spared to make the present factory equal to all demands made upon it pending the completion of the new one.

The Virginia Iron, Coal & Coke Company's Annual Report.—The report of the Virginia Iron, Coal & Coke Company for the year ended June 30, 1910, shows a deficit of $129,927, against a deficit the previous year of $311,730. President Henry K. McHarg says: "During most of the year just passed, we have continued to keep three furnaces in blast and most of our ore mines in operation, and have produced 132,277 tons of coke pig iron and 2,296 tons of charcoal iron. We delivered during the year 142,534 tons of coke iron and 1499 tons of charcoal iron, so that, including the amount on hand July 1, 1909, we had on hand July 1, 1910, 145,737 tons of coke iron and 2397 tons of charcoal iron. We mined 1,128,327 tons of coal and made 275,768 tons of coke. As has always been our practice the iron on hand is carried at cost on our books."

The annual report of the Colorado Fuel & Iron Company, to be published shortly, will show that the year ended June 30 last was one of the most prosperous in the history of the company. Gross earnings amounted to $23,639,813, an increase of $3,295,182, or 11.3 per cent. Net earnings totaled $3,742,615, as compared with net earnings of $2,901,011 for the previous fiscal year, an increase of $841,604, or 29 per cent. The surplus after charges in the last fiscal year amounted to $1,506,819, an increase of $648,443, or 75.5 per cent. The company, on June 30 last, had a profit and loss surplus of $1,039,314.

The German labor troubles in the shipbuilding and other metal working trades have been settled. A cablegram from Hamburg, dated October 6, states that the shipbuilders, who have been on strike for two months, will get an increase in wages equivalent to 4 or 5 cents a day and a reduction in their working hours to 55 hours a week in Hamburg, and 56 in other towns. The changes will begin January 1. The strike involved many thousand workers, who demanded an increase of 10 per cent. in wages and a 53-hour week.

The Executive Committee of the Brotherhood of Machinists has sent to the Interstate Commerce Commission a protest against the recent petition presented to the commission by various railroad labor organizations urging that the proposed advance in freight rates be granted. The protest states that if increased wages are taken as an excuse for higher rates there will be no end and that the general wage question will follow around a circle.

The first bids for 14-inch armor piercing projectiles were opened at the Navy Department October 6. These projectiles are intended for use in the new guns on the 27,000-ton dreadnoughts authorized at the last session of Congress. The lowest bidder was the Firth Sterling Steel Company, which offered to furnish 2,400 14-in. projectiles at $410 each.

The puddling department of the plant of the Wilkes Rolling Mill Company at Sharon, Pa., started last week. This company manufactures iron sheets and tin plates and muck bar.

The Kittanning Iron & Steel Company, Kittanning, Pa., states that its rolling mill has 33 puddling furnaces, not 35 as recently printed. Its Rebecca Furnace is not in blast at present.

The Alco car which won the Vanderbilt Cup race October 1, was largely constructed of chrome vanadium steel, made by the United Steel Company, Canton, Ohio.

Members of the firm of Rogers, Brown & Co., from Cincinnati, Chicago, Buffalo and New York are holding their annual meeting in New York this week.

Personal

Sir Robert A. Hadfield, Sheffield, England, has been spending some time in California for the betterment of his health.

George G. McMurtry, chairman of the American Sheet & Tin Plate Company, will arrive in New York on the Lusitania, October 13. A number of the British guests of the American Iron and Steel Institute will arrive by the same steamer.

The Dominion Government has appointed Charles McDonald, now of Guelph, Ont., to succeed Mr. Fitzmaurice on the Quebec Bridge Commission. Mr. Fitzmaurice, an eminent English construction engineer, has resigned because of continued ill-health. Mr. McDonald, though Canadian born and recently making his home in Canada, made his reputation in the United States. He was chief engineer of the American Bridge Company, and has had to do with some of the largest bridge contracts carried through by that corporation.

Dr. Leonard Waldo, New York, and H. A. Baxter, Syracuse, N. Y., were elected members of the Iron and Steel Institute at the meeting held last month at Buxton, England.

D. B. Meacham, of Rogers, Brown & Co., Cincinnati, arrived in New York this week after a four months absence in Europe.

James A. Campbell, president of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has sailed for Europe on a pleasure trip.

H. L. Williams of Hickman, Williams, & Co., Chicago, and Graham MacFarlane, Louisville Ky., president of the Red River Iron Company, have returned from a vacation trip to Europe during which they together visited points of interest in Germany, France, Holland, and Belgium.

Lee C. Moore, of Lee C. Moore & Co., construction engineers, Lewis Building, Pittsburgh, has returned from Europe.

Melvin H. Campbell, formerly connected with the Standard Chain Company, Pittsburgh, has resigned to accept the position of superintendent of the Spaulding Milling Machine Company, Cleveland, Ohio.

George M. Hunter, for some years assistant manager of the plant of the American Bridge Company at Ambridge, Pa., has been appointed general manager of the new plant to be erected by this company at Gary, Ind.

Robert H. Thompson, who has been chief clerk of the Carnegie Steel Company's Cincinnati, Ohio, office nearly five years, has been promoted to a more responsible position in the New York office of that company, with the same official title.

The Pennsylvania Engineering Works, New Castle, Pa., has recently received a contract from the Dominion Steel Corporation, Sydney, Nova Scotia, for a 15-ton Bessemer converter, which is to be of the same pattern as two converters furnished by the same builder for this plant about three years ago. The Pennsylvania Engineering Works is completing its contract with the Jones & Laughlin Steel Company, Pittsburgh, which includes run out tables for the blooming mill, ladles and metal mixer for the Aliquippa plant. Its contract with the Bethlehem Steel Company, South Bethlehem, Pa., is also showing progress, blast furnace F being nearly completed, while furnace G is about one-half finished. The two 20-ton converters to be used in connection with the Bethlehem Company's open hearth plant will shortly be shipped and it is expected that the new Bessemer plant will be ready for operation November 25. The Pennsylvania Engineering Works is not so busy in its foundry but is operating its machine and boiler shops to capacity on miscellaneous contracts.

The Maxwell-Briscoe Motor Company's Improvements

Rapid transformation of the two plants of the Maxwell-Briscoe Motor Company at Kingsland Point and Tarrytown, N. Y., is being effected by the erection of many new buildings and the reclamation of a large tract, now partially under water, for further building expansion. When these improvements are completed the two plants on opposite shores of Kingsland Cove, will be practically joined and 12 acres will be available to meet the growing pressure upon manufacturing conditions. The company will then have one of the largest plants in the automobile industry. While construction is going on in many parts of the premises the company has been very active in the matter of plant betterment, having expended more than $165,000 in new machinery and equipment.

Incidental to the general plan of factory enlargement which has been necessitated by the growth of business, the company has built a three-story experimental and engineering building, 50 x 175 ft., and installed the most modern machinery, making it unsurpassed by any in the industry. As in every large automobile factory this department is of the greatest moment, the work being reflected in almost every phase of motor car making.

Another feature of the Maxwell betterments, providing a great increase in manufacturing economy, is the new foundry for aluminum work adjoining the present bronze and brass foundry. This building is being made especially adaptable for a new method of pattern making and casting — the invention of Hugh McPhee — which involves only a fractional part of the cost that is necessary in all other methods. The development of this department is one of the many channels by which the Maxwell-Briscoe Motor Company has brought the highest grade of workmanship to the lowest basis of cost. Other branches of its work are being benefited by the construction of a new motor-testing shop, 50 x 125 ft., with a 50,000 gal. gasoline tank set on a concrete cradle; a new parts and repair department, 50 x 200 ft., with saw-tooth roofs; a new administration building of three stories, 50 x 150 ft., a new woodworking shop, 75 x 75 ft., and new receiving and shipping sheds that will accommodate 32 freight cars.

New Bureau of Manufactures Publications

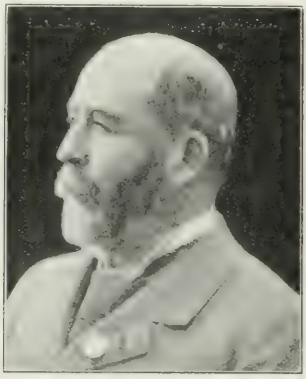
John M. Carson, chief of the Bureau of Manufactures, Department of Labor and Commerce, Washington, D. C., has issued two publications of special interest to manufacturers of machine tools and other machinery. One of these is No. 34 of the Special Agents Series and presents in connected form the reports by Captain Godfrey L. Carden on the machine tool trade in Austria-Hungary, Denmark, Russia, Netherlands and supplementary reports on Italy and France. This publication comprises 179 pages. Those who have followed the reports of Captain Carden, as issued from time to time by the Bureau of Manufactures, will be pleased to have the opportunity to get these reports in this form. The other publication is entitled, Tariff Series No. 3 A, giving the tariff on machinery, machine tools and vehicles in the various countries of Europe, North America, Central America, West Indies, South America, Asia and Australasia. It supplements Tariff Series No. 3, issued in May, 1907, containing all the changes affecting the rates of duty on machinery and vehicles that have since occurred in the various countries covered. It consists of 34 pages.

The blast furnace of the Perry Iron Company, which has been out of blast for relining, was blown in October 3. The cast house was also rebuilt.

Obituary

EDWARD P. MARTIN

The death is announced of a British ironmaster who was particularly well known in the steel trade in the United States—Edward Pritchard Martin, vice-chairman of Guest, Keen & Nettlefolds, Ltd., Birmingham, England, and a past president of the Iron and Steel Institute. Mr. Martin visited this country a number of times, one of these occasions being the New York meeting of the Iron and Steel Institute in October, 1904, and another in connection with the inspection of an Ohio steel plant in the interest of prospective bondholders in England. He was born in 1844 and was the eldest son of George Martin, who for nearly 60 years was mining engineer for the Dowlais Iron Company. In 1860 he was apprenticed to the Dowlais Iron Company and in 1869 he was appointed deputy general manager of the company. He became general manager of the Blaenavon Company in 1874



EDWARD P. MARTIN.

and directed the erection of the Bessemer steel plant at Blaenavon. At the same works he assisted in working out the dephosphorizing process of Thomas and Gilchrist, and for this he was awarded the Bessemer gold medal in 1884. He became general manager of the Dowlais Iron Company in 1882, and on the amalgamation of that company with the Patent Nut & Bolt Company he became vice-chairman and managing director of Guest, Keen & Co. He retired from that position in 1902, but retained a seat on the board of Guest, Keen & Nettlefolds. Mr. Martin was also a director of the Orconera Iron Ore Company, the Rhymney Railway, the South Wales Electrical Power & Distribution Company, and other commercial undertakings. In 1897-99 he was president of the Iron and Steel Institute, and he was also a past president of the Institute of Mechanical Engineers, of the South Wales Institute of Engineers and of the Monmouthshire and South Wales Coal Owners' Association.

EDWARD H. BUSCH, president of the Cincinnati Iron & Steel Company, Cincinnati, Ohio, died October 8, of cancer of the throat, aged 42 years. For some time previous to his death his illness prevented his active participation in business. He was born in Cincinnati, and at the age of 14 entered the employ of Mitchell-Tranter & Co. From this time until his death he was identified with the iron and steel business of his native city. At the time the company by which he was first employed was absorbed by the Republic Iron & Steel Company, he was sales agent and became a stockholder in the purchasing company, with which he remained as assistant to the district sales agent until his resignation in 1889. Then, with others, he organized the Cincinnati Iron Store Company, the name of which was changed to the Cincinnati Iron & Steel Company, and was its president from the time of its organization until he died. He was also a director of the West End Bank & Trust Company, and Receivers and Shippers' Association and a member of the Business Men's Club, all of Cincinnati. He leaves six children.

FRANK P. ELDRIDGE, vice-president of the National Sewing Machine Company, Belvidere, Ill., died October 6, at the Congress Hotel, Chicago, of pneumonia, aged 43 years. He was born in Cleveland, Ohio, was a graduate of the Harvard law school, and resided in Chicago until 18 years ago, when the company of which he is vice-president moved its headquarters to Belvidere. He was a member of the Union League Club, Chicago Athletic Association, Automobile Club and Chicago Yacht Club. He was the only son of B. Eldridge, president of the National Sewing Machine Company.

GEORGE POOLE, president of the Poole Engineering & Machine Company, Baltimore, died September 23, at Hartford, Conn., where he had gone in the hope of recovering from a nervous breakdown. He was 54 years old. He succeeded his father, Robert Poole, deceased, as president of the Robert Poole & Son Company, changing the name of the concern. The Robert Poole & Son Company was the successor of the firm of Poole & Hunt.

C. W. REINOEHL, Steelton, Pa., superintendent of the frog and switch department of the Pennsylvania Steel Company, was almost instantly killed by the upsetting of a large touring car at Buena Vista, N. J., October 9. He was driving the car, the party being on the way to attend the American Street Railway Convention at Atlantic City.

JOHN M. WILLIAMS, president of the Williams Gauge Company, Pittsburgh, died October 9, at his home at Knoxville, Pittsburgh. He leaves a widow and one son.

National Roll & Foundry Company Extensions

The National Roll & Foundry Company, Farmers Bank Building, Pittsburgh, with works at Avonmore, Pa., is making large additions to its plant on account of the heavy increase in its business. In the foundry department a 15-ton air furnace will be added which, with the two furnaces now in use, will give a casting capacity of 45 tons of rolls per day, and will enable the company to supply the largest plate rolls required. Two 30-ton electric cranes are also to be installed in this department. An addition 40 x 80 ft. is being made to the machine shop, in which will be installed motor-driven roll lathes, designed and built by the company, and one 30-ton Alliance electric crane.

Some time ago this company received a contract from the Follansbee Brothers Company, Pittsburgh, for two 30-in. sheet mills, to be installed in its plant at Follansbee, W. Va., and they are now ready for shipment. Each mill has two stands of housings, extra heavy in construction, and designed to withstand and properly distribute all strains. The company is also building 16 30-in. sheet mills for the American Rolling Mill Company, Middletown, Ohio, which will be ready for shipment within the contract time. Eight stands of cold mills for the same plant are finished and ready for shipment.

The hearing of the Buffalo furnace interests before a representative of the Interstate Commerce Commission relative to the proposed increase in freight rates by the railroads on coke between the Connellsville district and Buffalo, which was to have taken place at Buffalo, October 5, has been postponed until October 24, owing to serious sickness in the family of one of the attorneys who is to argue the case.

Steel Works Labor Conditions

Exhaustive Federal Investigation of Wages, Hours and Accidents

One of the most extensive investigations of labor conditions in the iron and steel industry ever undertaken in this country is now under way. It is being conducted by the Bureau of Labor of the Department of Commerce and Labor in pursuance of Resolution No. 237 of the United States Senate calling for full information in regard to wages and hours of labor in iron and steel manufacture. Within the past month the various companies engaged in the manufacture of iron and steel in the United States have received blanks calling for the most detailed information. The Bureau of Labor says in its general instructions to manufacturers:

For the purpose of this investigation the iron and steel industry is to be understood as embracing all departments and operations *within the plant* concerned with the manufacture, storing and handling of the metals and the raw materials until the metal has been shaped in either hot or cold state by rolling, forging, pressing, drawing or casting (except sheet mills for tin and terne plate, which are not desired). Information is also desired for all shops which make repairs or parts for the use of the establishment, but not for those which primarily manufacture for the trade.

A sheet or set of sheets should be filled for each separate department. For instance, blast furnace department, Bessemer department, open hearth department, blooming department, cold rolling department, pattern shop, general repair, internal transportation system, rigging department, &c. It is most earnestly requested that each division of the plant or group of employees which may be clearly distinguished by the work done, or for accounting purposes, be kept separate on these forms.

For the inquiry as to wages the last payroll in May, 1910, is asked for; but in case the plant was shut down or was running with a greatly reduced force at that time the nearest normal payroll may be taken. The blanks for statistics of the wages and hours of labor call for the number of employees; number of days regularly worked per week; rates paid for regular time and overtime; customary hours per day from Monday to Friday, on Saturday and on Sunday; number of men who worked overtime during payroll period, with extra Sunday hours given separately; amount of bonus of premium earned during the payroll period, also deductions from an employee's gross earnings representing amount paid helpers and others; and, finally, the net earnings per employee per hour. Questions are asked as to the frequency of pay days and whether the pay day is later than the termination of the payroll period and how much. Particular inquiry is made as to continuous operations—whether employees are changed from day to night shift and *vice versa*, also how often such changes are made, with details of the arrangements for changing shifts, giving the longest employment period and the longest rest period resulting from such changes. Employers are also asked to furnish complete scales of wages in force in the years 1900, 1905 and 1910, also to state what changes in wages or hours of labor affecting a large proportion of their employees have been made in the 18 months ending June 30, 1910.

Investigation of All Accidents for Two Years

An important department of the inquiry is that into accidents in iron and steel works. A vast amount of labor will be entailed by the filling out of the accident blanks, since they call for details of every accident in iron and steel works in the United States in the two years ending June 30, 1910. The nature of the injury is called for, the number of days' absence from work which resulted and the extent of the injury where permanent, also the number of cases resulting fatally. Employing companies are asked to indicate whether a record is kept of accidents; what provision is made for the care of employees in cases of accident; who bears the expense of treatment; whether compensation is made through insurance companies or directly by the company for loss of time due to accidents; what provision is made for employees totally or partly disabled permanently by accidents; what provision is made for the family or other dependents in case of death by accident. The inquiry also asks for particulars of appliances installed for preventing accidents, with results from their adoption. Another blank refers to any provision made for the retirement of superannuated employees, with details, also particulars of work instituted directly by the company for the welfare of its employees.

General Electric Upheld in Demurrage Protest

The Public Service Commission, second district, announces that it upholds the contention of the General Electric Company in challenging the legality of the steam railroad companies' demurrage rule which applies demurrage on inbound private cars belonging to the General Electric Company after such cars have been removed from the interchange track at Schenectady, N. Y., by the complaining company, and taken by its own power and upon its own tracks into its plant, such rule continuing to apply until the time of actual unloading within the plant. The complaint was made against the New York Central and the Delaware & Hudson. The commission rules as follows:

That these carriers have no lawful right to enter upon the tracks of the General Electric Company, beyond the interchange track, for any purpose, is beyond dispute; and it is well settled in law that the General Electric Company cannot require of either respondent the performance of railroad service upon its industrial tracks.

Such right must arise from ownership, holding by agreement and any extension of control through carrier's operation or carrier's liability. None of these extends to a loaded car delivered upon an interchange track to the car-owning company after removal by that company upon its own tracks by its own power from the interchange or place of delivery. Such a consignee having taken full possession and complete control is entirely free from all interference by the carrier with the disposition of the car or the carload.

Even if upheld the rule is incapable of practical enforcement, since the car and its lading after removal from the interchange track are in the exclusive possession and control of the industrial company, and obviously any requirement by the carrier or a report from the owning industrial company of the time of unloading as a basis for the assessment of demurrage charges could be successfully denied.

The commission further says that this rule is part of the Uniform Demurrage Code, adopted by the National Association of Railway Commissioners, and largely put in effect by carriers throughout the country. Such action, the commission says, has resulted in attainment of uniformity in demurrage rules to a degree which was not deemed possible a few years ago.

In this case the complaint attacked the rule in the demurrage code relating to averaging demurrage, known as rule 9, upon the claim that the rule unjustly and unreasonably separates cars into two classes—box cars (including refrigerating cars) in class 1, and freight cars of all other description in class 2.

The General Electric Company is building for the Indiana Steel Company, Gary, Ind., a seven panel switchboard to control feeders of 220 volts in its coke oven plant. The combined feeder capacity of this switchboard is 22,000 amperes at 220 volts and 25 cycles. The General Electric Company will furnish the entire controlling equipment, among which will be four 6000, six 3000, two 2000 ampere C.K. circuit breakers mechanically interlocked in pairs on the outside logs, and twelve 5000 ampere lever switches. All parts of the equipment consist of stock parts, nothing special being used.

The Philadelphia Foundrymen's Association

Banquet and Entertainment

With delegations from the New England Foundrymen's Association, the Pittsburgh Foundrymen's Association and Newark, N. J., Foundrymen's Association as its guests, the Philadelphia Foundrymen's Association, Philadelphia, Pa., celebrated its 201st regular meeting with an elaborate dinner and entertainment on the evening of October 5th, given under the name of a "Quaker party." The programme was of quite a varied character. Headquarters during the day were maintained at the Manufacturers' Club, where a committee received and entertained the visiting members of the different foundrymen's associations. Early in the day a short business session of the association was held, routine business transacted and the following concerns were elected to membership in the association: Hickman, Williams & Co., Pennsylvania Building, Philadelphia, iron, coal and coke merchants; S. Obermayer Company, foundry supplies, C. Goldman, Philadelphia representative; Philadelphia Chaplet & Mfg. Company, J. I. Fasey, representative; Independent Mfg. Company, core compounds, Philadelphia, S. H. Baird, representative; Primos Chemical Company, Primos, Pa.; John J. Caine, iron and steel merchant, North American Building, Philadelphia; Naylor & Co., pig iron, ore and coke merchants, L. U. Park, representative; Real Estate Trust Building, Philadelphia, and Diller, Caskey & Keene, stove manufacturers, Philadelphia.

Automobile parties were formed during the afternoon, the visitors being taken to historic points of interest about the city. Trips were made to Fairmount Park, League Island Navy Yard and into the surrounding country, extending in one instance to Norristown, Pa., while some of the guests extended their visit over into the following day in order to visit foundry plants. In the evening an informal dinner was served at the House of Kugler, in Chestnut street above Broad street, where covers were laid for 150 members and guests. While the dinner was designated as a "Quaker party"—and plain language dominated in print—the function was fully up to the standard as to hospitality and good cheer, for which the Philadelphia Association has become famous. A feature of the menu was that it was virtually in song, a verse to the tune of "John Brown," especially written for each course, being sung before its service. The opening verse

> Come, all our friends now gathered here
> From dear old Keystone State,
> And those from a foreign shore—
> The old Mosquito State;
> Our Yankee friends, we hail them, too,
> And all of them we greet;
> We'll banish strife from our midst
> And hold communion sweet.

was sung to the tune of "Auld Lang Syne," as a welcome to the guests.

Thomas Devlin, president of the association, acted as toastmaster and welcomed in a few words the visiting foundrymen, guests and members, and then introduced Mayor John E. Reyburn, who took as his topic "The City of Philadelphia." The Mayor's speech dwelt largely on the welfare of the city and the efforts expended to make it not only the most beautiful, but also the most important from a commercial and manufacturing standpoint. Thomas K. Ober of the Sanitary Mfg. Company, Philadelphia, responded to the toast, "The Quaker; Why, Whence, Whither and Wherefore." In the course of his remarks he described the founding of the city of Philadelphia and stated that it was through the influence of the Quaker that it was so conservative. It was the Quaker, he said, who had brought about the building up, not only of the city, but also the great commonwealth of Pennsylvania, making it the greatest diversified manufacturing community in the United States. Louis S. Amonson, president of the People's National Fire Insurance Company, alluded in his address to the conditions now existing in this country between labor and capital, largely due to constant agitation of class against class.

Henry A. Carpenter, Providence, R. I., responded for the New England Foundrymen's Association; Herbert E. Field, Pittsburgh, Pa., responded on behalf of the Pittsburgh Foundrymen's Association, while the sentiments of the Newark Foundrymen's Association were voiced by Arthur E. Barlow of the Barlow Foundry Company, Newark, N. J. Fred. S. Stockwell, secretary of the New England Foundrymen's Association, and other visiting foundrymen also made brief addresses.

Following the speechmaking an extended vaudeville programme was given under the direction of J. Howard Sheeler, which concluded the evening's entertainment. The following general committee had charge of the arrangements for the entertainment and dinner:

Brown, Dr. E. E., chairman, E. E. Brown & Co.
Bickley, Walter T., Penn Steel Casting & Machine Company.
Bernstein, Wm., Bernstein Mfg. Company.
Borgner, Cyrus, Cyrus Borgner Company.
Cook, Edgar S., Warwick Iron & Steel Company.
Coane, W. J., Dixon Crucible Company.
Davies, Geo. C., Pilling & Crane.
Dunning, W. T., Chester Steel Casting Company.
Eynon, Thos. M., Eynon-Evans Mfg. Company.
Haldeman, H. L., Pulaski Iron Company.
Hallowell, W. S., Harrison Safety Boiler Works.
Lewis, Wilfred, Tabor Mfg. Company.
Miller, A. A., *The Iron Age.*
Matlack, Geo. C., Wm. Cramp & Sons Ship & Engine Building Company.
Mott, Abram C., Jr., Abram Cox Stove Company.
MacDonald, Walter T., Schaum & Uhlinger.
Ober, Thos. K., Jr., Sanitary Mfg. Company.
Outerbridge, A. E., Jr., Wm. Sellers & Co.
Plitt, H. M., Plitt & Co.
Ridgway, W. H., C. Ridgway & Sons Company.
Rominger, Geo. C., Girard Iron Works.
Sauter, W. F., Williamson Bros. Company.
Sheeler, J. Howard, Sheeler & Hemsher Company.
Shennan, W. J., Bethlehem Steel Company.
Sheppard, Howard L., Isaac A. Sheppard & Co.
Stacks, H. R., Geo. V. Cresson Company.
Stirling, Jas. S., Hilles & Jones Company.
Thompson, Josiah, J. Thompson & Co.
Wood, Walter, R. D. Wood & Co.

Ex Officio.

Devlin, Thomas, president, Thos. Devlin Mfg. Company.
Evans, Howard, secretary, J. W. Paxson Company.

The Puffer-Hubbard Company's Improvements.—The Puffer-Hubbard Mfg. Company, Minneapolis, Minn., has under construction a new manufacturing plant, having a main building 138 x 296 ft., with a power building 40 x 108 ft. A portion of the main building, 64 x 138 ft., two stories, will be used as a warehouse and office, while the remainder, which is one story, will be devoted to manufacturing purposes, and is divided into two rooms, 64 x 230 ft., one of which will be the woodworking department and the other the steel department. Power will be furnished by an engine directly connected to a generator, and all machines will be electrically driven. The plant will be provided with automatic sprinklers and electric elevators and will be modern in every detail. There will be hot and cold water for the employees, as well as an employees' dining room. Railroad facilities extend the entire length of the property, which is 550 ft., and the eastern portion of the building is served by an independent track with covered platform, 296 ft. long and 14 ft. wide. The company's principal product is wheelbarrows.

The Lackawanna Steel Company now has four furnaces in blast at South Buffalo, two having been blown out in September.

The Crucible Steel Company's Annual Report

The tenth annual report of the Crucible Steel Company of America presents the following comparative table of income, earnings and profits for its fiscal year ending August 31:

	1909-10.	1908-09.
Gross sales	$18,782,729.24	$12,121,651.09
Operating charges:		
Manufacturing cost	$12,549,952.50	$8,060,293.48
Repairs and maintenance	812,751.01	689,774.64
Administrative, selling and general expenses	1,049,034.44	949,315.72
Taxes	88,736.50	89,527.44
Commercial discounts and interest.	149,423.40	128,996.45
	$14,649,897.85	$9,917,907.73
Provision for depreciation and contingencies	609,429.33	208,334.92
	$15,259,327.18	$10,126,242.65
Net manufacturing income	$3,523,402.06	$1,995,408.44
Other income:		
Rentals received	$10,784.45	$12,797.73
Interest on investments	15,158.99	16,720.00
	$25,943.44	$29,517.73
	$3,549,345.50	$2,024,926.17
Interest:		
Purchase money mortgage	$1,245.02	.....
Dividend scrip	12,218.25	.....
	$13,463.27	$10,000.00
Net profit applicable to dividends	$3,535,882.23	$2,014,926.17
Cash dividend paid on preferred stock	1,802,191.87	549,821.25
Undivided earnings for the year	$1,733,690.36	$1,465,104.92
Add previous surplus	3,157,999.19	1,692,894.27
	$4,891,689.55	.....
Deduct scrip dividend of 10 per cent. on preferred stock issued June 30, 1910	2,443,650.00	.....
Total undivided surplus as per balance sheet	$2,448,039.55	$3,157,999.19

The unfilled contracts and orders on hand August 31, 1910, were 115,936 tons, against 91,498 tons August 31, 1909. Total annual wages and salaries (approximately) were $5,604,000, against $4,018,000.

The balance sheet as of August 31, 1910, is as follows:

Assets.

Capital assets:		
Real estate, plant and equipment, good-will, trademarks, &c.		$45,825,663.40
Current assets:		
Inventories of raw materials, manufactured products and stores.	$6,412,947.36	
Taxes and insurance unexpired, &c.	56,670.28	
Investments	191,690.09	
Bonds—Par value $200,234.54		
Stocks—Par value 10,051.82		
Bills receivable	64,325.67	
Accounts receivable (less reserve)	2,201,130.56	
Cash in banks and on hand	791,298.55	
		9,718,062.51
Total		$55,543,725.91

Liabilities.

Preferred stock	$24,436,500.00	
Common stock	24,578,400.00	
		$49,014,900.00
Dividend scrip due June 30, 1920		2,443,650
Current liabilities:		
Accounts payable	$1,119,733.54	
Interest and taxes accrued	39,341.03	
		1,159,074.57
Reserve funds:		
Depreciation and renewal of plants (unexpended balance)	$272,386.75	
Fire insurance	83,388.79	
Contingent	122,286.25	
		478,061.79
Surplus:		
Net profit for the year ending August 31, 1910	$3,535,882.23	
Deduct cash dividends on preferred stock:		
No. 24, 1½ per cent., paid September 30, 1909	$366,547.50	
No. 25, 1¾ per cent., paid December 23, 1909	427,638.75	
No. 26, 1¾ per cent., paid March 31, 1910	427,638.75	
No. 27, 2⅜ per cent., paid June 30, 1910	580,366.87	
		1,802,191.87
		$1,733,690.36
Add surplus as of August 31, 1909		3,157,999.19
		$4,891,689.55
Deduct 10 per cent scrip dividend on preferred stock issued June 30, 1910		2,443,650.00*
Undivided surplus, August 31, 1910		2,448,039.55
Total		$55,543,725.91

* At August 31, 1910, the unpaid dividends accumulated on the preferred stock aggregated 17¾ per cent., of which 1¾ per cent. was paid September 30, 1910.

From the accompanying statement of Chairman Herbert Du Puy and President C. C. Ramsey, the following extracts are taken:

"The ratio of operating charges to gross receipts was 77.99 per cent. in comparison with 81.82 per cent. in the previous year, being a reduction of 3.83 per cent. The ratio of net profits, applicable to dividends, to gross receipts was 18.82 per cent., compared with 16.61 per cent. in the previous year, being an increase of 2.21 per cent. The net profits earned were equivalent to 14.47 per cent. on the preferred stock.

"The expenditure for additional property during the year was $302,266.95, being made up largely through the purchase of 11 acres of ground adjoining, and west of, the Atha Works at Harrison, N. J., which new purchase it is proposed to improve through additions to this plant.

"During the year the company has built its own warehouse in Providence, R. I., to meet the special needs of that city.

"On July 13, 1910, the company secured control of the Norwalk steel plant, located at Norwalk, Ohio. It was placed in operation in August and is now an active producer and will prove to be a profitable adjunct to the company's operating plants."

September Copper Production and Stocks

The report for September of the Copper Producers' Association shows a reduction in stocks of 20,087,531 lb. from September 1 to October 1. The report is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, September 1	168,881,245
Production of marketable copper in the United States from all domestic and foreign sources during September	119,519,983
Deliveries of marketable copper during September:	
For domestic consumption	64,501,018
For export	75,106,496
Total	139,607,514
Stock of marketable copper of all kinds on hand at all points in the United States, October 1	148,793,714

The reduction of stocks is heavier than had been expected. It is due partly to a falling off in production and partly to an increase in deliveries. The curtailment by American copper producers, which was inaugurated August 1, has only shown its effect to a small extent in the figures of refinery production. The full effect may not be seen until another month has passed.

Wm. B. Phillips, director of the Bureau of Economic Geology, University of Texas, Austin, states that the total workable area of coal and lignite in Texas has been taken as 10,200 square miles, with an additional area of 58,300 square miles that may prove to be workable. The coal and lignite area in Texas, proved and probable, is almost as large as the entire State of Missouri.

Electric Steel Refining*

Considerations of Cost Which Determine Its Availability—Results with the Heroult Furnace

BY D. F. CAMPBELL, LONDON.

The use of electricity for the refining of steel has now taken its place amongst established metallurgical processes, and many papers have been written on the subject of electric furnaces, but the author proposes to discuss briefly the general aspects of the subject, and what he considers the probable and possible developments in the immediate future in England. The electric furnace is at present used in various works for the refining of steel from the Bessemer converter in the manufacture of rails and all classes of railroad material and castings, and more commonly in connection with the basic open-hearth process for the manufacture of various products of intermediate quality, castings and tool steel of all kinds. These are the purposes for which it has been most widely adopted, notably in America, Germany, and France, though it is also used for melting and refining charges of cold scrap of cheap quality for the manufacture of tool steel and small castings, and its high efficiency is now generally acknowledged. The refining of steel that had been previously melted was the first use to which the electric furnace was applied commercially; but now that single furnaces have been producing over 200 tons a day for more than sixteen months, it is obvious that the field for the process has widened, and already many furnaces are in construction or operation in this country.

A Widening Field for the Electric Furnace

The author is of opinion that the electric furnace is especially suitable, and will be widely adopted, for any class of work in which raw materials of a high degree of purity are now used. A wider application for rails and sections may occur when working in connection with the Talbot furnace, for the charge can be taken to the electric furnace as soon as the carbon is down and the necessity of removing the sulphur and getting a teeming heat is avoided, as this is done in the electric furnace both economically and completely. Thus the capacity of the Talbot furnace is substantially increased, and this covers the greater cost of electric refining.

Again, in the case of a basic open-hearth plant, using 60 per cent. of molten pig iron and 40 per cent. of scrap, a 40-ton furnace might have 15 tons removed to the electric furnace for refining, and a similar charge put in every two hours. Thus the capacity would be increased, the quality improved, and, in addition, a reduction in the cost of raw materials can also be made in some cases, as a low quality of pig iron can be used.

Similar conditions occur when working in conjunction with an open-hearth plant for making castings, and a thoroughly dead melt and extreme fluidity can be obtained, while the commonest raw materials can be used, and refined completely. This gives economy both in the amount of gits and runners, and also in the reduction of wasters. Even in the case of foundries engaged in ordinary open-hearth casting work, in which the margin of profit is now exceedingly small, the electric furnace is considered necessary for an improvement in quality, while in a small foundry making light and intricate castings from crucible steel, an economy of several pounds per ton may be expected to result from the adoption of the electric furnace, judging from the reduction of the costs in works in Germany where crucible furnaces were replaced by this process.

There is little doubt that crucible steel, Swedish billets, and products of intermediate quality, such as are used for the Sheffield trade and by tube-makers of Staffordshire and South Wales, can be economically replaced by steel refined by electricity, and made in Middlesbrough, Cumberland, or the larger steelworks in the Sheffield and Rotherham districts.

The use of the electric furnace is not likely to become general for rail steel manufacture at the present time, except in cases where the conditions are exceptional. In certain cases, such as at South Chicago, it has been adopted for that purpose owing to the economic conditions, notably the scarcity of good Bessemer ores and the demand for better rails. The electric furnace in such cases may save Bessemer plants from the scrap heap, or, at any rate, prolong the life of present installations, and at the same time make it possible to produce rails of a quality better than the best open-hearth steel, thus avoiding heavy capital expenditure.

A Rapid Rate of Refining

In the electric furnace, almost any degree of refining can be economically effected, and the removal of sulphur, phosphorus and oxygen is especially easy. This is probably due to at least three causes:

1. The intense heating of the slag, which is the place at which refining takes place. Owing to this high temperature and the extreme fluidity of the slag the rate of the refining reaction is very great, because the velocity of reaction rises very quickly for high temperatures and not in direct proportion to the temperature.
2. The extremely basic slag that can be kept in a very fluid state, and the calcium carbide formed by the action of the arc on the calcareous slag, are especially advantageous for desulphurization.
3. The violent motion of the steel, which results from the convection currents produced in the bath, due to the two intensely hot areas caused by the arcs below the electrodes, increases the volume of steel exposed to the hot and fluid slag area, and hence the rate of refining.

Practice with Bessemer and Open Hearth Processes

The usual procedure for the use of the electric furnace in connection with the Bessemer converter is to charge the steel, holding back all slag in the ladle, after putting on the bottom of the furnace, lime and mill scale or iron ore. This produces an oxidizing or dephosphorizing slag, which may be carefully skimmed or poured off. On the bath of steel carbon is thrown to carburize to any required degree, and then a second highly basic and desulphurizing slag is added. The arc acting on the calcareous slag produces calcium carbide, which may combine with sulphur to form calcium sulphide. As neither gases nor air enter the furnace, and the conditions are almost completely reducing, no sulphates are formed, a dead melt is easily obtained, and when the slag is molten and the requisite heat obtained, the steel is teemed. In the open hearth or any oxidizing furnace these reactions cannot take place so completely and efficiently.

With steel from the basic open hearth furnace, the procedure is similar, but when the quantity of phosphorus to be removed is small, it is only necessary to use one refining slag for the elimination of sulphur and any small amount of phosphorus remaining. The usual practice is to put the carbon necessary for carburizing in the bottom of the furnace and then add the steel, and

* A paper read at the Buxton, England, meeting of the Iron and Steel Institute, September 26-30, 1910.

the basic slag materials. As soon as the teeming heat is obtained, the necessary ferroalloys are added and the steel will be completely refined.

Another point of interest is the rarity of blowholes in electric steel when properly made, and this leads to the question of the cause of these troubles. It is well known that any ingot of steel when placed in a vacuum evolves nitrogen, and this is about equally true whether it be made in the crucible, the Bessemer converter, or the electric furnace. Blowholes contain nitrogen, but this is probably not the cause. It is far more probable that they are due to the combination of oxides with the carbon in the process of cooling, and that the carbon monoxide so formed at a high temperature causes blowholes in the cooling steel, and owing to the diminution of volume of the carbon monoxide on cooling, a partial vacuum is formed, and nitrogen is sucked into the blowholes. In electric steel, oxides do not occur in any quantity, and consequently the prime cause of blowholes is reduced.

Again, the quality of electrically refined steel is better than a material of similar chemical composition made in any oxidizing furnace. This is probably due to the reducing conditions under which it is finished.

It must not be forgotten in discussing these special qualities of electrically refined steel, that some inferior material has been made by incompetent melters or in ineffective furnaces, and that the electric, just as much as any other furnace, requires trained men, and most careful designing by metallurgists who have made a special study and had practical experience in this subject.

Factors in the Cost Problem

The question of the cost of applying this process, which must be considered before all others, is more difficult to discuss generally, owing to the great variety of conditions. The following are the chief points, all of which must be carefully considered in each particular case:

1. The possibility of saving in cost of raw materials, since the best qualities of steel can be made from impure raw materials. For example, in the case of refining steel from open hearth furnaces in the South Staffordshire district, the use of local pig iron as compared with hematite iron would effect a saving of several shillings per ton owing to the high railroad rates.

2. Possibility of increasing the output of present furnaces by the addition of electric furnaces with improvement of product. For example, in the case of Talbot and other open hearth furnaces, where a large expense is incurred in the removal of sulphur and getting a teeming heat, the steel can be advantageously transferred to an electric furnace for desulphurization and the output materially increased. The Talbot or other tilting furnace is especially satisfactory owing to the facility with which charges can be transferred to the electric furnace whenever required.

3. Cost of power and possibility of using blast furnace or coke oven gas, exhaust steam, &c., will be the determining factor in regard to deciding whether, in the manufacture of steel, electric refining can be economically adopted. In the case of cheap power or valuable products, scrap may be economically melted and refined in the electric furnace at a current consumption of 700 to 800 kw.-hours per ton, or if the price of power be high, the steel may be merely desulphurized and deoxidized, after melting and dephosphorizing in a basic furnace, with a power consumption of 100 to 150 kw.-hours per ton.

4. The possible reduction of capital expenditure at certain works where the present products are not sufficiently good for modern specifications. This may involve the entire reorganization of the works, but it is often cheaper and more efficient to add an electric furnace to a Bessemer plant than to replace the latter by open hearth furnaces.

Desirable Features in Design

The author does not wish to compare the different types of electric furnace in this paper, but the figures given are taken chiefly from Heroult furnaces in America, England, Germany and France, as this type has been far more widely adopted, and is used in larger units than any other, and single furnaces are now refining 250 tons per day. This furnace is similar to a basic open hearth furnace, and seems to present more simplicity and to embody more of the desirable features of electric furnace design than any other, which, in the author's opinion, are:

1. The best basic open hearth design should be followed as closely as possible. A bottom homogeneous and solid and banks free from embedded electrodes is important, and above all simplicity of design.

2. All electric mechanism, in the form of generators, transformers, &c., should be entirely separate from the furnace, should work under ordinary conditions of standard electrical practice, and should be of standard design, so as to avoid all unnecessary risks and complications.

3. A high power factor must be maintained, thus reducing the capital cost of machinery and increasing the general efficiency of the power house.

4. To avoid excessive cost of refractory materials, the roof should be protected from the direct radiation of the arcs by the electrodes themselves, and the intensely heated area of slag should be as large as possible, to increase the surface of refining action. The Heroult furnace has an advantage over the open hearth furnace in that the heat is applied to the center of the bath, so that the banks are not quite so hot as the middle of the furnace and the wear of refractories is consequently less.

5. The heat should be applied to the slag, as in the basic open hearth furnace, and the temperature of the slag should be maintained above that of the steel, which allows of extreme basicity and fluidity being obtained and gives an intensely active refining action. The conditions in the furnace should be oxidizing, neutral or reducing, at will.

Changes Due to the Electric Furnace

The adoption of electric refining will cause some readjustment in the steel trade. As soon as the Sheffield steel melter has become acquainted with the process and accustomed to the working of electric furnaces, electrically refined steel will largely replace ordinary crucible steel. This has already occurred in Germany and America, where electric furnaces are used to make all classes of special and high-speed steels, the usual practice being to refine metal from a basic open hearth furnace. Large crucible plants and small open hearth furnaces engaged in the manufacture of small and intricate castings, such as motor car parts, &c., may be replaced by electric furnaces, because the high degree of fluidity and dead melt obtained is especially advantageous.

In many cases manufacturers of axles, guns and tubes will abandon the use of Swedish raw materials and refine steel made from low grade ores, thus reducing the value of high grade ore deposits and the quantity imported; for, by the use of electricity, Cleveland stone will produce a steel equal to the best hematite ores. The capacity of many Talbot and basic open hearth plants will be increased and the quality of the product improved, while much of the power that is now going to waste will be utilized for steel refining.

From the electrical engineer's point of view, the electric furnace is an attractive load, as it is more or less in continuous operation. In the case of the Heroult furnace the power factor is 0.88 to 0.90, though much less with large induction furnaces. Single, two or three phase current of any frequency from 20 to 60 has been used without any difficulty, though it is preferable in the case of a two-phase system to transform to three-phase current, which can be done without additional difficulty or expense. The load factor will be most favorable, the usual practice when refining, for example, in a 15-ton furnace, being to use 2000 kw. for 20 minutes after charging, while the steel is being heated. The current is then reduced to about 1500 kw. for 45 to 75 minutes until the steel is ready for teeming. There is then an interval of 10 to 15 minutes during which the furnace is teemed, fettled and charged, which allows the transformers or generators time to cool before the period of overload commences. Current fluctuations occur for a few minutes, while there is an evolution of gas from the steel which makes the bath boil up and touch the electrodes. This, however, is not sufficient to be objectionable, provided that the electrical machinery is properly designed for the purpose, and the extent of these variations is not

so great as in the case of many rolling mills, the fluctuations in voltage being only about 3 per cent. in the South Chicago works, where a 2000-kw. furnace has been working steadily since May, 1909.

Discussion

In the discussion of Mr. Campbell's paper E. H. Saniter said that while he believed in the future of the electric furnace he considered that in many cases it would not sufficiently improve the steel to pay for the extra cost. He doubted if the electric process would be continued at South Chicago for the manufacture of rails. In some special cases the electric furnace would give a saving in raw materials but he did not see any saving where hematite or Cleveland pig iron is used. He thought it time that a good deal more information was given as to the cost of electric refining. As to desulphurizing it could be done without an electric furnace though perhaps not so efficiently. He doubted if the calcium carbide formed in the Heroult furnace has anything to do with desulphurization.

L. Greiner referred to the use of more furnaces and larger units of the Heroult furnace than of any other. Statistics show that there are actually working or being installed 35 induction furnaces and 77 electrode furnaces, the Heroult heading the latter list with 29 furnaces. As to the amount of steel treated it should be remembered that the South Chicago furnaces with 15 tons capacity are fed with liquid steel from a Bessemer converter. At Ugine in France there is an installation of four electric furnaces of two tons capacity each and two of 15 tons capacity on the Girod system. The latter are fed with cold charges; if charged with liquid steel they could easily give 20 tons.

J. H. Heap remarked that the question whether better or cheaper steel could be made by the electric furnace could not be answered by a simple yes or no. The consumption of fuel is an important factor. Under some conditions it is less by one process than by another and vice versa.

F. W. Harbord said that it was plain that the electric furnace could easily compete with the crucible furnace, the only question being whether the quality of electric steel is equal to that of crucible steel. Broadly speaking for 90 per cent. of the purposes for which tool steel is required, an electric steel meets all the conditions. In various intermediate steels such as axles and tires the electric furnace would find a good field. While it is a dear melter it is an economic refiner at high temperatures. For common steels such as rail steel, the electric furnace is certainly not economical, but for high class steel it gives finishing conditions which cannot be obtained in any other way. The great essential is to finish with a non-oxidizing slag, and no other process permits of such control of the condition of the slag.

Mr. Campbell, in closing the discussion, said that he did not expect the electric furnace to be used to a large extent for rails, but in works making railroad material doubtless a great deal of axle and tire steel could be made to advantage in the electric furnace. Finishing in the electric furnace is better than in the Talbot furnace. It is quite true that the electric furnaces at South Chicago are experimental as to rail steel since the rails are now being tested on various railroads. He would not claim that for rail steel the electric furnace has great superiority over other furnaces. Perhaps too much emphasis has been laid on the removal of sulphur and phosphorus. The great point in the electric furnace is the removal of oxygen in addition to sulphur and phosphorus.

The Becker Steel Agency in the United States.—The Becker Steel Company of America has been incorporated under the laws of the State of New York to handle, in the United States, the products of Stahlwerk Becker, A. G., Willich, Germany. The plant of Stahlwerk Becker is claimed to have the most modern equipment in the world for producing high grade steels of all descriptions, particularly alloy steels of difficult fusibility, all steels being electrically melted in Paul Girod furnaces. George B. Norcross is general manager of the Becker Steel Company of America. Offices and warehouses have already been established in New York and Detroit, and the company contemplates establishing further offices and warehouses in all of the principal industrial centers of the United States, so that shipments can be made promptly from the large and well assorted stocks which will be carried. Special attention will be given to all types of alloy steels used in the construction of automobiles, which can be furnished promptly in either bars or forgings.

The Steel Corporation's Unfilled Orders

The statement of unfilled orders on hand September 30, published by the United States Steel Corporation this week, shows a reduction of 379,022 tons last month. The total was 3,158,106 tons against 3,537,128 tons August 31. The reduction in August was 433,803 tons and in July 286,863 tons. The reduction for the third quarter of the year was thus 1,099,688 tons as against 1,144,720 tons in the second quarter and 524,517 tons in the first quarter. The unfilled orders on hand September 30 represented the smallest tonnage in any of the reports made by the Steel Corporation except the figures for September 30, 1904, which were 3,027,436 tons. The complete records of unfilled orders of the Steel Corporation, beginning with the third quarter of 1902, are as follows:

September 30, 1910..	3,158,106	September 30, 1906..	7,936,884
August 31, 1910....	3,537,128	June 30, 1906.....	6,809,859
July 31, 1910.....	3,970,931	March 31, 1906.....	7,018,712
June 30, 1910.....	4,257,794	December 31, 1905..	7,605,086
March 31, 1910.....	5,402,514	September 30, 1905..	5,865,377
December 31, 1909..	5,927,031	June 30, 1905.....	4,829,655
September 30, 1909..	4,796,833	March 31, 1905.....	5,579,560
June 30, 1909.....	4,057,939	December 31, 1904..	4,696,203
March 31, 1909.....	3,542,595	September 30, 1904..	3,027,436
December 31, 1908..	3,603,527	June 30, 1904.....	3,192,277
September 30, 1908..	3,421,977	March 31, 1904.....	4,136,961
June 30, 1908.....	3,313,876	December 31, 1903..	3,215,123
March 31, 1908.....	3,765,343	September 30, 1903..	3,278,742
December 31, 1907..	4,624,552	June 30, 1903.....	4,666,578
September 30, 1907..	6,425,008	March 31, 1903.....	5,410,719
June 30, 1907.....	7,603,878	December 31, 1902..	5,347,523
March 31, 1907.....	8,043,858	September 30, 1902..	4,843,007
December 31, 1906..	8,489,718		

Lackawanna Steel Company's Earnings

The Lackawanna Steel Company and subsidiary companies report for the quarter ended September 30 as follows:

	1910.	Changes.	
Income from operations	$1,251,150	Dec.	$109,541
Income from investments, &c.	189,000	Inc.	108,540
Total income	$1,440,150	Dec.	$1,002
Interest on bonds and notes	437,500	Inc.	30,625
Balance	$1,002,650	Dec.	$31,627
Sinking funds	101,656	Inc.	2,562
Depreciation and renewals	308,638	Dec.	39,946
Total deductions	$410,294	Dec.	$37,383
Surplus	$592,356	Inc.	$5,757
Unfilled orders (gross tons)	261,931	Dec.	144,931
From January 1 to September 30:			
Income from operations	$4,021,493	Inc.	$1,895,269
Income from investments, &c.	867,000	Inc.	625,619
Total income	$4,888,493	Inc.	$2,520,887
Interest on bonds and notes	1,292,083	Inc.	92,708
Balance	$3,596,410	Inc.	$2,428,179
Sinking funds	293,270	Inc.	52,954
Depreciation and renewals	1,016,804	Inc.	184,860
Total deductions	$1,310,074	Inc.	$237,814
Surplus	$2,286,335	Inc.	$2,190,365
Unfilled orders (gross tons)	261,931	Dec.	144,931

The American Iron and Steel Institute

Important Foreign Interests Represented at the New York Meeting—A British View of the Objects of the Institute

The arrival of about 30 prominent European manufacturers of iron and steel in New York this week to participate in the meeting of the American Iron and Steel Institute and in a tour of important steel producing centers is in pursuance of a plan first broached by the president, Elbert H. Gary, at the meeting of the Institute in New York last May. In outlining work and their lines of manufacture will be of interest. Baron Dr. E. von Bodenhausen, a director of Fried Krupp Aktiengesellschaft, is at the head of the commercial department of Krupp's Steel Works, Essen, Germany. He is one of the younger men in that organization, succeeding Dr. A. Schmidt, for many years chief of the commercial department, on the latter's



BARON von BODENHAUSEN | Sir JOHN S. RANDLES | E. SCHALTENBRAND
SYDNEY JESSOP ROBINSON | CARL STEVEN | F. HARLINGHAUSEN

REPRESENTATIVES OF BRITISH AND GERMAN STEEL COMPANIES WHO ARE AMONG THE AMERICAN IRON AND STEEL INSTITUTE'S GUESTS

which the Institute might undertake Judge Gary had said that the relations of the iron and steel industry in the United States to the industry in other countries might properly be within the scope of the Institute. He suggested that matters pertaining to international trade in iron and steel might well be considered at a meeting in the autumn, which representative iron and steel manufacturers of Europe would be invited to attend. Judge Gary's idea was heartily approved by the directors of the Institute and their recommendation was adopted by the members. A committee of arrangements was appointed and under its direction the plans for the New York meeting has taken shape.

The Guests

In *The Iron Age* of October 6 the names of the Institute's guests were given and their business connections. Some further details concerning the visitors death in the past year. Baron von Bodenhausen's department is that of the so-called "peace" products of the great Krupp works, as distinguished from the "war" products, for which these works have so long been famous.

John Scurrah Randles, long connected with iron and steel works and mining in the Cumberland district of England, was for some years chairman of the Moss Bay Hematite Iron & Steel Company, Ltd., of Workington. This and other companies, together with the Cumberland properties of Cammell, Laird & Co., were amalgamated in 1909 when Sir John Randles was made chairman of the board of directors of the Workington Iron & Steel Company, Ltd. This company has 23 blast furnaces and five rail mills, six iron mines and three quarries. Sir John was elected a member of the House of Commons in 1900 and is still a representative

of one of the Cumberland divisions. He was knighted by King Edward in 1905. He is a magistrate in his county and was for two years president of the British Iron Trade Association. His residences are at Stilecroft, Workington, and Surbiton, Surrey. The Workington Iron & Steel Company is also represented by Joseph Ellis, one of its derectors.

E. Schaltenbrand, who has been for the past six years chairman of the board of management of the Stahlwerks Verband, the syndicate which includes practically all the important steel works in Germany, is 44 years old. He is a member of the council and the treasurer of the Verein Deutscher Eisenhuettenleute, the well known German technical society. Before assuming the management of the Stahlwerks Verband he was for nearly twelve years the head of the commercial department of the Gutehofnungshuette, one of the most important of German steel companies. His connection with the iron industry extends over 27 years.

Sydney Jessop Robinson, M.I.M.E., is managing director of William Jessop & Sons, Ltd., Sheffield, England. He is a justice of the peace for Sheffield, a member of the council of the Sheffield Chamber of Commerce, director of the Lancashire, Derbyshire & East Coast Railway, and of J. J. Saville & Co., Ltd., Sheffield. He was master of the Cutlers' Company of Sheffield in 1905 and 1906. He has made upwards of 40 trips between England and the United States, being president of William Jessop & Sons, Inc., of New York, and of the Jessop Steel Company, Washington, Pa. Mr. Robinson is a member of the Iron and Steel Institute.

Col. Sir Charles Allen, V.D., J.P., who is a nephew of the late Sir Henry Bessemer, has been connected with steel manufacture almost since his boyhood. He received his public school education in England and his technical training in Germany. In the Franco-Prussian war he attached himself to an ambulance corps and was in several engagements, including the battle of Sedan. For 15 years he has been colonel commanding the Third West Riding Brigade, Royal Field Artillery, and was among the early volunteers for the war in South Africa. He is chairman of Sir Henry Bessemer & Co., Ltd.; director of the Ebbw Vale Steel, Iron & Coal Company, Ltd., and magistrate for the county of Derbyshire.

F. Harlinghausen is a director of the Phoenix Company and is manager of the wire department at Hamm, Westphalia, these works having been the property of the Westfaelische Union Company, Ltd., before the merger of the latter in the Phoenix Company. Director Harlinghausen has been connected with the Hamm works since 1873 and has been their manager since 1892.

Carl Steven, a director of Felton & Guilleaume Lahmeyerwerke Aktiengesellschaft, at Muelheim on the Ruhr, has particular oversight over the export business of that company, which is an important factor in the wire trade, making a specialty of high grade electrical wires, rail bonds, &c. He became connected with Felton & Guilleaume in 1872. This connection has continued ever since, with the exception of four years, when he was abroad familiarizing himself with the export trade. G. Zapf, also a director of the Felton & Guilleaume Company, is another member of the party.

H. Eisner is a director of the Hahn'sche Werke Aktiengesellschaft, Berlin, Germany, with works at Grossenbaum, Westphalia, this company being an important factor in the German tube trade.

Bolckow, Vaughan & Co., Ltd., Middlesbrough, England, the important Cleveland district manufacturers of pig iron and of rails, shapes and other forms of finished steel, are represented by G. Scoby-Smith, managing director, who is one of the leading members of the British iron trade.

Alfred N. Mosscrop is a director of Dorman, Long & Co., Ltd., Middlesboro, one of the leading steel manufacturing companies of the Cleveland district and well known also as structural engineers and bridge builders. Mr. Mosscrop has been in this country for some time, temporarily residing at Rochester, N. Y.

M. Mannaberg is of the Frodingham Iron & Steel Company, Doncaster, England, which produces pig iron and various basic open hearth steel products, among which are Grey shapes and Friestedt sheet piling.

G. Muir Ritchie is a director of the Cargo Fleet Iron Company, Middlesbrough, England, which in recent years has increased its operations in an important way. It is a manufacturer of rails, shapes and bars, and employs Talbot furnaces in the manufacture of basic steel.

David Colville & Sons, Ltd., of Motherwell, near Glasgow, Scotland, is represented by David Colville, managing director. The firm is prominent as a manufacturer of steel for shipbuilding and general structural purposes.

Stewarts & Lloyds, Ltd., Glasgow, Scotland, are the largest manufacturers of tubes in Great Britain. Their manager, P. N. Cunningham, is a member of the party.

F. Hill and F. W. Manson are, respectively, managing director and director of the Middlesbrough firm of Richard Hill & Co., prominent manufacturers of wire.

John O'Connor is manager of John Brown & Co., Ltd., Sheffield, England, one of the most important manufacturers of steel in that district. The company also owns the Clydebank Engineering & Shipbuilding Works on the Clyde and has a half interest in the Coventry Ordnance Works of Cammell, Laird & Co., Ltd., besides an interest in Harland & Wolff, the Belfast shipbuilding firm. The Sheffield district is also represented by T. Scott-Smith, general manager of Samuel Fox & Co., whose Stocksbridge Works, near Sheffield, produce crucible, Bessemer and open hearth steel.

Harry Steel, Jr., is a director of Steel, Peach & Tozer, Ltd., of Rotherham, Yorkshire, England, which produces steel rails, structural shapes, bars, &c.

Lincoln Chandler of the Metropolitan Amalgamated Railway Carriage & Wagon Company, Ltd., Saltley, Birmingham, is also connected with important bridge building and steel construction firms in Great Britain.

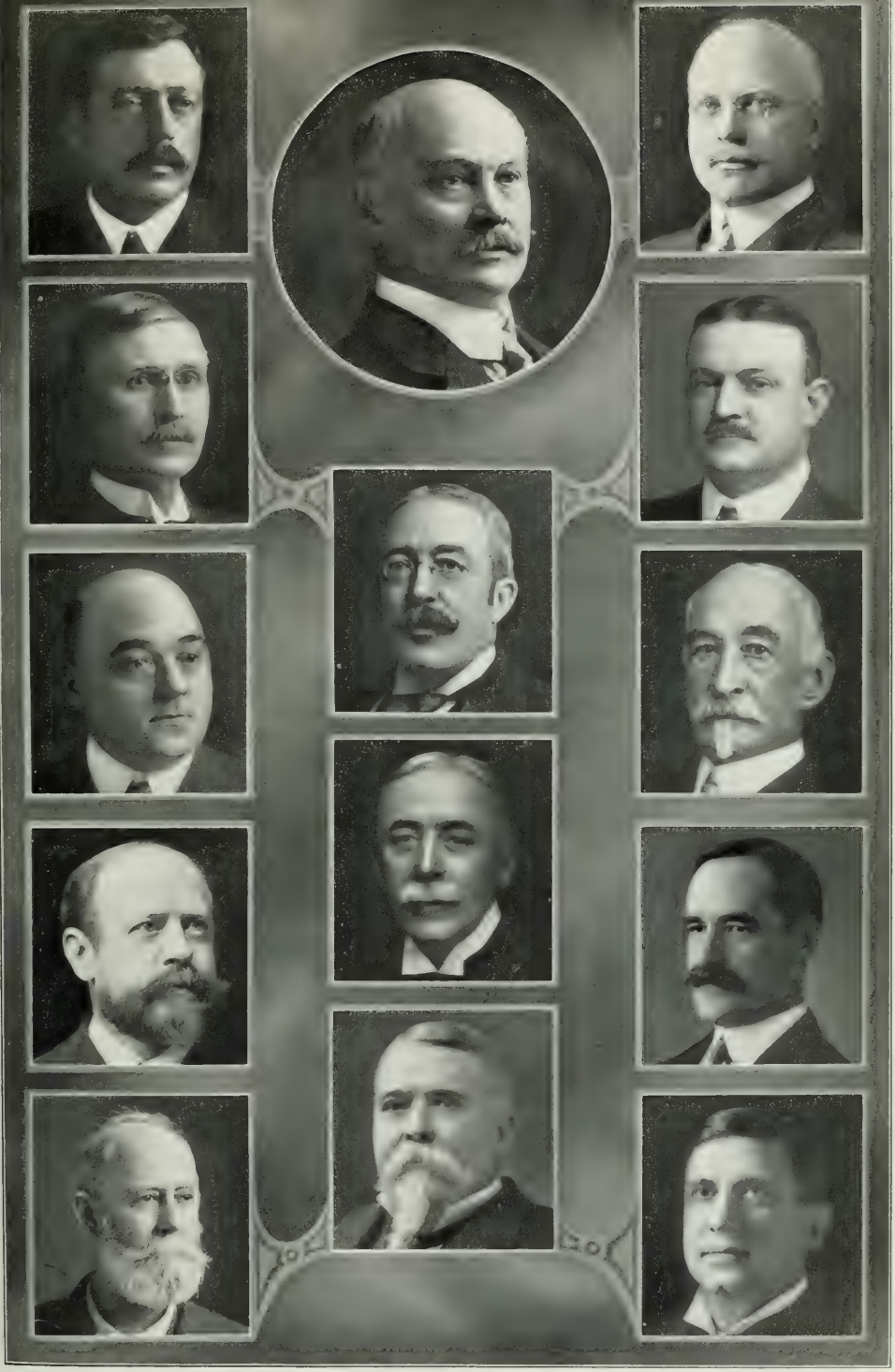
William B. Peat is of the firm of W. B. Peat & Co., London, the leading corporation accounting firm in Great Britain. It acts as auditor for most of the steel companies and for a number of the railroad companies. Mr. Peat is secretary of the British Rail Makers' Association.

T. Frame Thomson, who is chairman of the Otis Steel Company, Ltd., has been in the United States for some time, having his headquarters at the Otis Steel Company's works at Cleveland, Ohio. He will join the English party in New York.

The John Cockerill Company, Seraing, near Liege, Belgium, the leading manufacturer of steel in Belgium, is represented by E. Tonneau. Another important Belgian steel interest, that of the Ougree-Marihaye Company, sends two of its directors, L. Spaak and J. Van Hoegaerden.

France's representatives are R. de Labriolle and Herman Harjes. The former is manager of the Comptoir Exportation des Produits Metallurgiques, which handles for export the products of the principal steel companies of France. It includes all the French rail mills except that of the Acieries de France. M. Harjes is of the banking firm of Morgan, Harjes & Co., Paris.

From Austria come Wilhelm Kestranek, manager, and Dr. Eugen Herz, secretary, of the Prager Eisen-Industrie Gesellschaft, which has works in Bohemia



T. J. DRUMMOND
JOHN A. TOPPING
W. J. FILBERT, Secretary
W. A. ROGERS
POWELL STACKHOUSE, Vice-President

ELBERT H. GARY, President
SAMUEL MATHER
J. A. FARRELL
WILLIS L. KING, Vice-President

W. E. COREY
E. A. S. CLARKE
J. C. MABEN
EDWARD BAILEY, Treasurer
C. M. SCHWAB, Vice-President

OFFICERS, DIRECTORS AND COMMITTEE CHAIRMEN OF THE AMERICAN IRON AND STEEL INSTITUTE

while its chief offices are in Vienna. It is one of the leading steel companies of Austria-Hungary.

The Meeting

The general features of the New York meeting and the tour that is to follow it were given in our issue of October 6. The session for the discussion of papers will open at 10.30 Friday morning, October 14, in the Myrtle room of the Waldorf-Astoria. The address of President Gary, which will touch on the international aspects of the meeting, will be followed by papers by James A. Farrell on "Foreign Relations," by William B. Dickson on "Betterment of Labor Conditions," by Willis L. King on "Contract Obligations," and by Charles Kirchhoff on "The International Metallurgical Congress at Duesseldorf." At the annual banquet Friday evening the visiting delegations will be represented on the programme and the guests will include representatives of railroad and financial interests in New York.

Saturday is given up to an excursion by steamer around New York harbor, starting from the foot of West Forty-second street at 10.45 a.m. The special train for the excursion to Buffalo, Chicago, Pittsburgh and Washington will leave the Grand Central Station, New York, at 7.45 Sunday evening, October 16. The party will number about 75 members and guests. The Chicago programme will include a formal dinner at the Blackstone Hotel Tuesday evening, October 18, and at Pittsburgh two informal entertainments will be provided. Inspections of important steel plants and other industrial operations are being arranged for, as outlined heretofore. The train will reach New York Saturday evening, October 22.

The Iron and Steel Institute American Tours of 1890 and 1904

The visit to this country of representative manufacturers of iron and steel in Great Britain and in the leading iron producing countries of the Continent of Europe recalls two previous occasions on which similar visits were made. In September, 1890, 295 members of the Iron and Steel Institute and 142 members of the Verein Deutscher Eisenhuettenleute crossed the Atlantic to hold the annual autumnal meeting of the Institute in New York. This expedition was in many respects the most remarkable the Institute had ever made. The invitation was extended by the American Institute of Mining Engineers, and in the entertainment of the guests there was hearty co-operation of the iron and steel manufacturers of the United States. The trip was noteworthy for the length of the journey involved and the number of mines and works visited. Owing to the size of the visiting party two excursions were planned. One took in the Southern iron district, making a journey of 4300 miles; the other, which was known as the Northern expedition, covered 4000 miles, and in addition to visits to the Pittsburgh and Chicago districts made a tour of the iron ranges of Michigan and Wisconsin. The general reception committee was presided over by Hon. Abram S. Hewitt, and Andrew Carnegie, on behalf of the American iron trade, gave the address of welcome at the first meeting, which was held October 1 in Chickering Hall, New York. A monumental record of the tour and of the impressions of the visitors was prepared by Sir Lowthian Bell, taking up the greater part of a special volume published by the Iron and Steel Institute under the title "The Iron and Steel Institute in America in 1890."

The second visit of members of the Iron and Steel Institute to the United States was in late October and early November, 1904. At that time the party numbered about 200. Again the invitation was given by the American Institute of Mining Engineers, and there was again hearty co-operation of iron and steel manufacturers in the entertainment of the visitors. After the meeting of the Iron and Steel Institute in New York for the discussion of papers the party started on an excursion to Philadelphia, Washington, Pittsburgh, Cleveland and Buffalo. At Pittsburgh about 90 members separated from the main party and took train for the St. Louis Exposition, this excursion including also a trip to Chicago, with visits to the South Chicago Works. Andrew Carnegie was president of the Institute at the time. The Reception Committee had John Fritz as honorary president and Charles Kirchhoff as chairman.

British Comment on the Work of the American Iron and Steel Institute

The following from the *Iron and Coal Trades Review*, London, of September 23, 1910, is a friendly view of the possibilities of the American Iron and Steel Institute in the cultivation of cordial relations among iron and steel manufacturers of the different countries:

"The technical side of iron and steel manufacture has been dealt with fairly fully in the United States, by such technical bodies as the American Institute of Mining Engineers and the American Society of Mechanical Engineers, but the commercial side has had no exponent. It is a matter of some surprise that as the premier iron and steel manufacturing country an iron and steel institute has not been founded there before. There already exists in America the American Iron and Steel Association, with offices in Philadelphia, whose main function is to collect and disseminate statistics relating to the iron trade in the United States, and in foreign countries. This work has been admirably directed by James M. Swank for a great many years, but it does not cover the field of the new organization. The functions of the American Iron and Steel Institute as we understand them are mainly commercial. They aim to promote cordial relations between manufacturers of iron and steel in the United States, and the forthcoming meeting in New York is of first-rate importance in that it also aims to bring together the commercial heads of iron and steel undertakings throughout the world. This in itself is quite a new departure.

"Just as there are many technical points connected with the details of iron and steel manufacture which can be discussed by technical men, so are there many points connected with the business organization of iron and steel works from which good and mutual benefit can arise from free discussion. Whereas the technical side of iron and steel manufacture has been advanced very greatly in recent years, the methods of doing business have undergone no alteration. It may be urged that no alteration is possible, but this is perhaps a too conservative view. For instance, one question that might be within the scope of the American Iron and Steel Institute to discuss is where does option leave off and a contract begin? It has sometimes been difficult to determine exactly where an option becomes crystallized into a contract, and how far that contract is binding unless cancelled by mutual consent. This is a question of first importance which has hitherto not been definitely defined in this country, and if some uniform procedure could be arranged, not only between different works in this country, but between different iron and steel making countries as well, a solidity could be given to business which is not at present possible. Postponements of deliveries such as those occasioned by the present shipbuilding strike can be met by special provisions. There are other similar problems which continually face the management of iron and steel works. In view of the fact that labor, rates and taxes and other items that make up the cost of iron and steel manufacture are going up, it is to be feared that times may come when few will find industry profitable. This will right itself in the long run, but in the meantime it will be a case of the survival of the strongest.

"The experience of steel makers in this country goes to show that by the formation of local associations a considerable amount of benefit has accrued to the

trade. In the United States it will be remembered that the conferences which led to the formation of the American Iron and Steel Institute were those instituted by Judge Gary in pursuance of his price maintenance policy which was adopted and held to by the American iron trade during the worst times following the panic of 1907. The American organization aims to bring together the captains of industry, who will discuss matters relating to the trade, with authority to act for their respective companies should occasion arise, and it may be that in bringing together international captains of industry, developments may take place in some such direction. This is thrown out more or less as a suggestion. It is not intended to convey that there is any such idea at present in the minds of those responsible for the organization of the American Iron and Steel Institute. At the same time, more can be done by the co-operation of all nations, than is possible through harmonious working in one country alone."

Organization of the American Iron and Steel Institute

OFFICERS.

President, Elbert H. Gary, chairman United States Steel Corporation.

First Vice-President, Powell Stackhouse, chairman Cambria Steel Company.

Second Vice-President, Willis L. King, vice-president Jones & Laughlin Steel Company.

Third Vice-President, Charles M. Schwab, president Bethlehem Steel Company.

Treasurer, Edward Bailey, president Central Iron & Steel Company.

Secretary, W. J. Filbert, comptroller United States Steel Corporation.

Assistant Secretary, Howard H. Cook.

DIRECTORS.

Term expiring 1911.—Wm. E. Corey, president United States Steel Corporation; E. C. Felton, president Pennsylvania Steel Company; Elbert H. Gary, Charles M. Schwab, Powell Stackhouse.

Term expiring 1912.—T. J. Drummond, president Lake Superior Corporation; W. J. Filbert; J. C. Maben, president Sloss-Sheffield Steel & Iron Company; Wm. A. Rogers, Rogers, Brown & Co.; J. F. Welborn, president Colorado Fuel & Iron Company.

Term expiring 1913.—Edward Bailey; E. A. S. Clarke, president Lackawanna Steel Company; Willis L. King; Samuel Mather, Pickands, Mather & Co.; John A. Topping, chairman Republic Iron & Steel Company.

CHAIRMEN OF COMMITTEES.

Committee on Membership.—E. H. Gary.

Committee on Improvement in Methods.—E. H. Gary.

Committee on Foreign Relations.—J. A. Farrell, president United States Steel Products Company.

Committee on New York Meeting.—E. A. S. Clarke.

Benjamin P. Forbes, 409 Superior Avenue, Cleveland, Ohio, is conducting a campaign for improving the lighting of factories by the dry cleaning of windows with his Factory Glasbrite. He urges manufacturers to clean their windows and let in the sunshine, thus protecting the health of the employees, increasing their efficiency and cutting down light bills. He is making a trip through New England establishing additional agencies. He will send by mail to any manufacturer a free sample sufficient to clean 500 sq. ft. of glass.

So far this year twenty ship loads of Panama scrap have arrived in New York and have been sold by the Government. The average cargo is 1100 tons. The average price obtained is $11.25 a ton. The receipts from this source have since January 1, therefore, netted the Government $247,000, less duties and freight.

Industrial Accidents in Massachusetts

The Massachusetts Commission on Compensation for Industrial Accidents, appointed by Governor Draper last June, and consisting of James A. Lowell, chairman; Amos T. Saunders, secretary; Magnus W. Alexander, Henry Howard, and Joseph A. Parks, with Carroll W. Doten as chief investigator, organized early in July for the purpose of carrying out the instructions embodied in a resolve passed by the General Court June 6, which were as follows:

The public good requires a change in the present system of determining the compensation of employees for injuries sustained in industrial accidents, and the commonwealth ought to provide different and more equitable relief. . . . The commission shall investigate the effect of the present laws relating to the liability of employers for injuries received by employees in the course of their employment; shall investigate other laws and systems in operation in other States and countries; shall correspond or confer with commmittees and commissions in other states, considering the same subject; and shall draft an act for the compensation of employees for industrial accidents. . . . The commission shall report in print the draft of an act and a compilation of the data and statistics and such other information as the commission may be possessed of as a result of its investigation and study on or before the second Wednesday in January, 1911.

Pursuant to these instructions, the commission has been holding regular weekly meetings during the summer and has made a careful study of the systems in use in other States and countries, and has started several line of statistical investigation to obtain data in regard to the number and character of accidents in the commonwealth, not possessed by any regular State bureau or commission.

The commission is now holding public hearings in various parts of the State to enable employers, employees and others interested in this matter to present their views and to furnish such information as they may possess for the use of the commission. The first of these hearings was held in the State House, Boston, September 29.

Other hearings were arranged as follows: Lowell, October 7; Springfield, October 14; Pittsfield, October 15; Fall River, October 27, and New Bedford, October 28. It is probable that hearings will be held in other cities in the commonwealth where there is a sufficient demand for them. It is also likely that subsequent hearings will be held in Boston and elsewhere as soon as the commission has prepared the draft of a tentative bill, in order to enable interested parties to make definite suggestions and criticisms.

The commission has realized from the start that the most serious objection to the passage of a compensation act in Massachusetts would be the possible handicap which it might impose upon the industries of the State in competition with those of other States not having such advanced legislation. While the experience of other countries does not seem to warrant the fears entertained in regard to this matter, it has seemed desirable to secure as high a degree of uniformity as possible in the legislation likely to be enacted in the several States now having commissions at work upon this subject. The commission has already attended two conferences with commissions of other States and is engaged at present in making arrangements for another conference, at which it is hoped the seven States having commissions will all be represented. This plan seems to meet with the approval of the several commissions, and such a meeting is likely to be held early in November. If Massachusetts, New York, New Jersey, Ohio, Illinois, Wisconsin and Minnesota can agree upon substantially the same form of legislation, there is no doubt that the fear of interstate competition will be largely removed and that other States will rapidly fall in line.

The new No. 2 furnace of the Wickwire Steel Company, Buffalo, N. Y., was blown in October 1.

The Portable Schwartz Melting Furnace

During the past year the Hawley Down Draft Furnace Company, 736-738 West Monroe street, Chicago, Ill., has developed a portable type of its Schwartz melting furnace. Fig. 1 is an end view of the furnace, showing the tilting gears, and Fig. 2 is a front view, showing the furnace partly tilted and its supports.

The equipment consists of a standard furnace, which is supported by heavy channel irons or other means and is carried from place to place in the foundry by a trolley on the ceiling or wall. The pneumatic hoist, controlled by the lever at the right of Fig. 2, raises and lowers the furnace, and the metal is poured directly into the molds. A specially devised set of gears, the end view of which is shown in Fig. 1 and the front view in Fig. 2, tilt the furnace for pouring. It is claimed for this furnace that the actual pouring is done with much greater facility than is possible with a hand ladle and as the metal is not transferred into ladles it is not necessary for it to be as hot as formerly. For example, under old conditions, if the temperature of pouring was 2200 degrees, the temperature in the furnace had to be 2400 degrees before the metal was poured. This saving of 200 degrees means that the metal need not be brought to any higher temperature than that of pouring, which effects a saving in fuel and time and eliminates unnecessary oxidation loss.

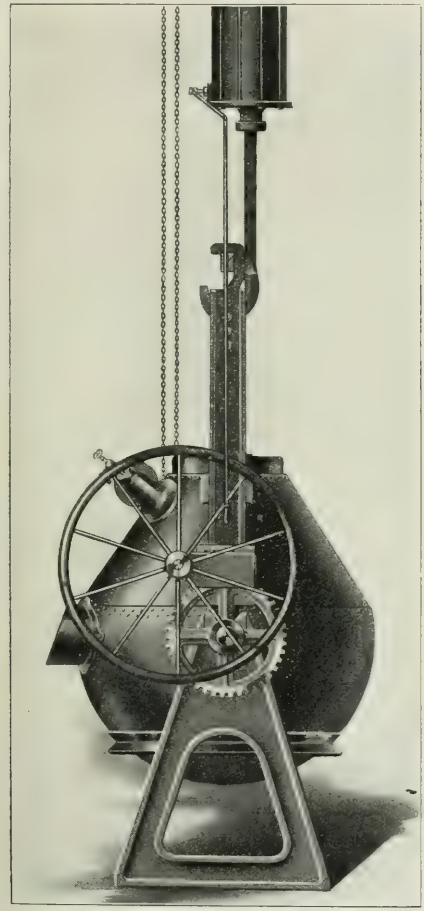


Fig. 1.—An End View of the Schwartz Portable Melting Furnace, Manufactured by the Hawley Down Draft Furnace Company, Chicago, Ill.

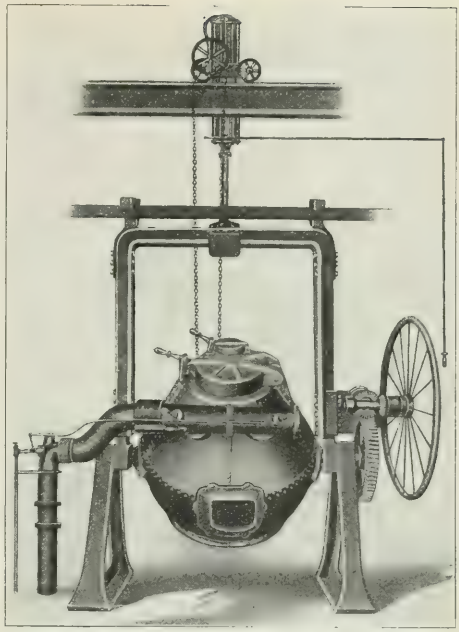


Fig. 2.—Front View of the Furnace, Showing Its Supports.

One of the recent orders received by the Hawley Company for these portable furnaces was for the plant of the Trefileries et Laminoirs du Havre, which is one of the largest foundries of its kind in Europe. In this particular installation an air hoist is attached to each furnace, and this has reduced the time of making castings fully 30 per cent. While the metal is being melted the furnace rests upon two supports of the type usually supplied with the ordinary stationary furnace, but if desired the furnace may be used as a stationary one and the hoist employed for some other purpose in the foundry.

A New Foundry in Ellwood City, Pa.—G. A. Burrows and C. E. Anderson, formerly with the Evans City Foundry Company, Evans City, Pa., and Robert Irwin have formed a partnership under the name of the G. A. Burrows Foundry Company, at Ellwood City, Pa., and have secured a lease on a brick building 50 x 75 ft., located on sidings to the Baltimore & Ohio and Pittsburgh & Lake Erie railroads. A 5-ton J. S. McCormick Company Cupola, a 15 hp. Reid gas engine, a tumbling barrel, a crane, a core oven, etc., are now being installed. The foundry will be in operation about October 25. Robert Irwin is president, G. A. Burrows manager and C. E. Anderson foreman. The foundry will make gray iron machinery castings from one pound to one ton in weight and for the present will sell its product from the office in Ellwood city, Pa., while later on agencies will be established. The erection of a machine shop is a possibility.

A decrease of 22,500 in the number of idle freight cars on the railroads of the United States is reported in the fortnightly bulletin of the American Railway Association, issued as of September 28. The idle list September 14 included 47,076 cars, and September 28 only 24,528 cars. This is the smallest idle list reported at any time since the middle of last March, when all but 17,342 of the freight cars on American and Canadian railways were in demand.

The Blanchard Vertical Spindle Surface Grinder

A Tool Combining Great Driving Power with Ability to Produce Accurate Work

What may be said to be a specialist in the rapid production of true flat surfaces of the highest quality is the Blanchard high power vertical spindle surface grinder, recently placed on the market by the Blanchard Machine Company, Cambridge, Mass., and illustrated herewith. The grinder was originally designed and built to meet a need which arose in its builder's own shops for a grinder of greater power than could

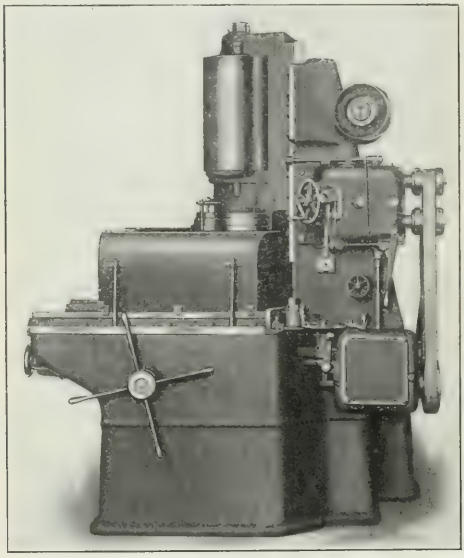


Fig. 1.—General View of the Vertical Spindle Surface Grinder Built by the Blanchard Machine Company, Cambridge, Mass.

be bought in the market, and its performance there was so satisfactory that it was decided to place it regularly on the market. As will be noticed from the engravings, the machine is massive and powerful and it possesses not only the driving power necessary for taking heavy cut but the rigidity and weight to insure accurate work. Two of the special features tending to make rapid production easy for the operator are its centralized control and the power raising and lowering device. Fig. 1 is a general view of the grinder, Fig. 2 is a section of the head and wheel, Fig. 3 is a plan view of the column, head and table and Fig. 4 is a sectional elevation through one of the three supports provided for the column. Figs. 5 and 6 are exterior and interior views, respectively, of the table speed gear box; Fig. 7 is a rear view of the grinder, showing the pump supplying water to the work being ground, while Fig. 8 is another general view with the water guards removed.

The Machine in Detail

In designing the grinder the builder recognized the fact that attempts to combine a traversing and a rotary table generally result in making the latter an unsatisfactory attachment to the former, and also that the majority of the pieces can be handled very efficiently on a large diameter rotary table. It has therefore been designed with a rotary table which is an integral part of the machine. A 24-in. rotary magnetic chuck supported on a sliding table carries the work. This table can be quickly swung clear of the wheel for placing and removing work and as easily returned. The rotating chuck runs on a large diameter ball bearing submerged in an oil bath and is gibbed down securely at the center by a ball thrust bearing, thus enabling overhanging work to be ground without danger of tilting the table. The rotation is accomplished by a splined shaft and wide face bevel and spur gears running in oil baths, the reduction between the shaft and the chuck being in the ratio of 9 to 1. The electrical connections for the chuck are inclosed in a case under the table, where it is impossible for water to reach them. From this point a waterproof steel armored cable passes through the frame of the machine to a switch on the operator's side of the column.

The grinding wheel used is of either the ring or cylinder type and is 16 in. in diameter. It is cemented

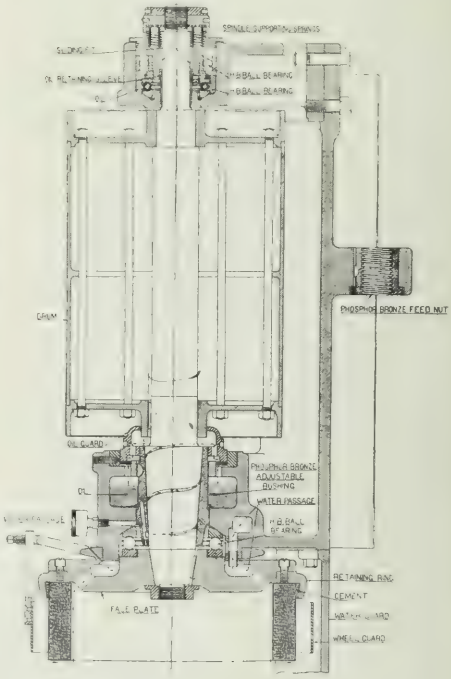


Fig. 2.—Sectional Elevation of the Grinding Head and Wheel.

into a special retaining ring and attached to the face plate by six screws. During the life of the wheel the wheel and the ring are a unit and as six rings are sent with each machine the same number of wheels can be kept mounted and ready for use. When it becomes necessary to change a wheel, the six screws are removed, the wheel changed and the wheels replaced, all of which is only the work of a few minutes.

The spindle is a large diameter steel forging reinforced by the 14-in. cast iron drum for the driving belt.

The face plate is keyed to the lower end on a taper and secured by nut threaded on the spindle. A large size Hess-Bright ball thrust bearing is mounted directly on the face plate and takes the upward thrust due to the pressure of the wheel against the work. This form of thrust bearing is claimed to eliminate all the trouble occurring from the variation of the oil film thickness which occurs where collar or washer thrust bearings are used and is a serious difficulty in obtaining accurate

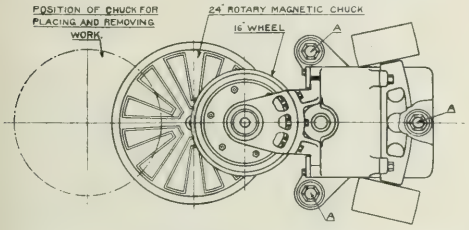


Fig. 3. Plan View of the Column, Head and Table.

work. Directly above the thrust bearing is the main spindle bearing. This is of the large diameter taper type and compensation for wear is secured by turning a thread collar which is self-locking in any position. Surrounding the phosphor bronze bushing of this bearing is a pocket having a capacity of nearly a quart of oil which is rapidly circulated through the bearing while the spindle is in motion. In addition to securing good lubrication this oil carries heat away from the spindle and bushing since it is cooled by the water supplied to wheel, the cored water passage being in close proximity to the oil pocket. A gauge indicates the oil level and permits easy replenishing. Any leakage of oil passes into the thrust bearing chamber and thence into the water coming to the wheel. In addition to the lubrication supplied to the thrust bearing from the main spindle bearing, independent lubrication is provided by a compression grease cup on the front of the head.

Radial and thrust ball bearings at the upper end of the spindle care for the side and vertical loads. The thrust due to the weight of the spindle and revolving parts is transmitted to this upper thrust bearing through eight springs adjusted to press against the cap on the upper end of the spindle with a force slightly in excess of the weight of the revolving parts. In this way everything is kept tight against the main thrust bearing and all possibility of end play eliminated, while the effect of expansion is imperceptible because of the short distance between the lower thrust bearing and the wheel face. The only running joints in the upper box are ball bearings which run in an oil bath having a gauge for indicating the level. The lower and upper bearings are both dust tight and oil retaining and require but little attention.

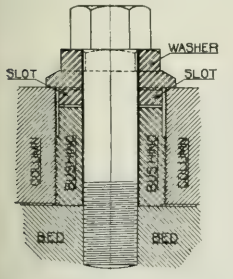


Fig. 4.—Section Through One of the Three Column Supports A, Fig. 3.

The housing for the lower spindle bearing is integral with the main casting of the sliding head, while the upper box fits a bored seat in this casting and is bolted firmly to it. These fastenings are easily accessible and when removed the face plate and the upper bearing, with the drum and spindle, may be taken out. A square slide of massive design secures the head to the column, and the sliding surfaces, which are continuous for the entire length of the head, are grooved to distribute the oil. Conveniently located oilers are provided and are thoroughly protected from water and grit by a continuous iron guard behind the wheel, which is bolted to the under side of the head.

The column is a heavy box section, with internal stiffening ribs, and the walls are thickened in the lower sections. This construction, which is said to be difficult to surpass for rigidity and freedom from deflection, combined with the very long and massive head, secures a rigid support for the grinding wheel spindle. A three-point support is provided on the head for the column, and Fig. 4 shows a sectional elevation through one of these supports. Vertical adjustment at these three points is secured by bushings threaded in the column and bearing on the bed. Large diameter holding down bolts pass through the bushings and are threaded into the bed. The heads of these bolts bear on large washers resting on finished spots on the column and not on the bushings. These washers have a hexagonal portion and serve to turn the bushings by projections which enter slots in their upper end. This construction of the bushings and the washers enables

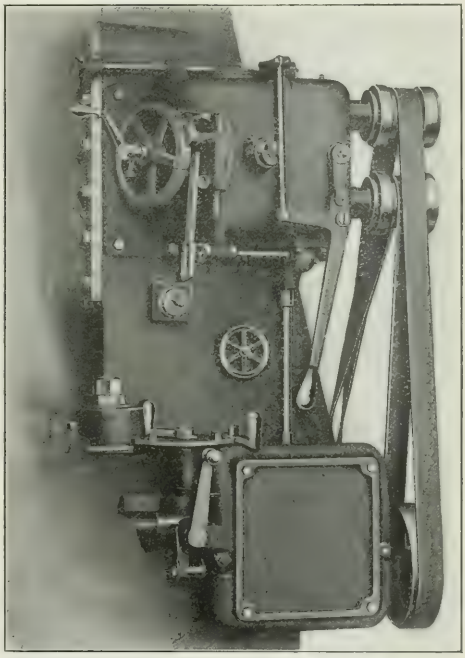


Fig. 5.—Exterior View of the Table Speed Gear Box.

adjustments to be readily made at any time, since all three points are accessible without removing any part of the machine. Although adjustments can be easily made, this feature is not secured at the expense of rigid connections, as all backlash in the bushing threads is taken up by the clamping effect of the central holding down bolts. For convenience in setting the column forward when it is desired to concave saws or similar work graduations are provided on the rear washer.

In feeding the wheel to the work the sliding head is let down by the action of a heavy lead screw located in the recess between the head and the column and running in a phosphor bronze nut fixed in the head. A ball bearing of ample proportions set in a recess screw at its lower end, and steel bevel gears with screw at its lower end, and the steel bevel gears with planed teeth connect with the feed box shaft. The automatic feed consists of a ratchet device feeding once per revolution of the table, and a shield is pro-

vided which may be set to stop the feed at any desired point.

The High Power Drive

The massive spindle construction enables the driving pulley to be placed directly on the spindle and a 5-in. double belt is led from the countershaft to an idler on the front of the column, thence to the drum on the grinding wheel spindle and returns over a similar idler on the rear of the column to the countershaft. The idler pulleys are of the Blanchard self-oiling type with a reservoir having a capacity for about a pint of oil which is rapidly circulated through the bearings while the pulleys are running. These bearings are of ample proportions, are dust proof and are claimed not to throw oil at any speed. The countershaft has ample ring oiling bearings. At a spindle speed of 1000 rev. per min., the peripheral velocity of the wheel is 4190 ft. per min. and the speed of the belt 3670 ft. A belt of the size used is capable of transmitting over 25 hp. at this speed without excessive tension, but if more power is required for grinding large work the belt can be tightened without any danger of the bearing becoming overheated. Ample power is a feature, the

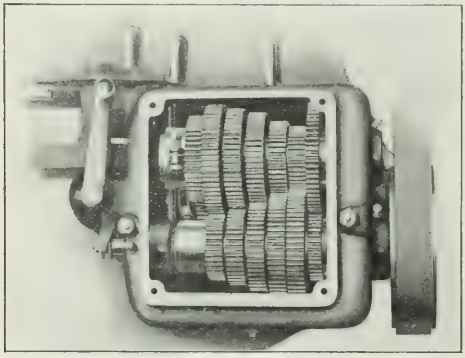


Fig. 6.—Interior View of the Table Speed Gear Box.

importance of which is sometimes overlooked in a machine of this type. Economy in the use of the abrasive requires that the wheel be operated at its highest speed and if it slows under the cut and is still fed against the work the face of the wheel will be crumbled and worn away rapidly. Reducing the rate of feed will cut down the wear on the wheel but at the same time the production is curtailed.

The water circulating pump is driven by a 2-in. double belt from the countershaft and another 2-in. belt is led from a step on the pump pulley over the raising and lowering clutch pulleys to that for the table speed gear box. This drive is very simple as two belts from the countershaft and one small belt on the machine are all that are used. Shifting belts on the cone pulleys are not required as all the table speeds are obtained through gears and the grinding wheel spindle has but one speed.

One of the features helping to make a large output possible is the power mechanism for the elevating and lowering the head. This consists of two friction clutch pulleys, running in opposite directions, which connect with the feed shaft. The pulleys are of the patent self oiling type of the builder and are combined with cone clutches which require no adjustment and are said not to stick or jam. A single lever conveniently located for the operator controls these clutches and enables him to bring the head rapidly to any desired position while overtravel in either direction is prevented by a simple device which returns the operating lever to the neutral position positively when either limit of travel is reached by the head.

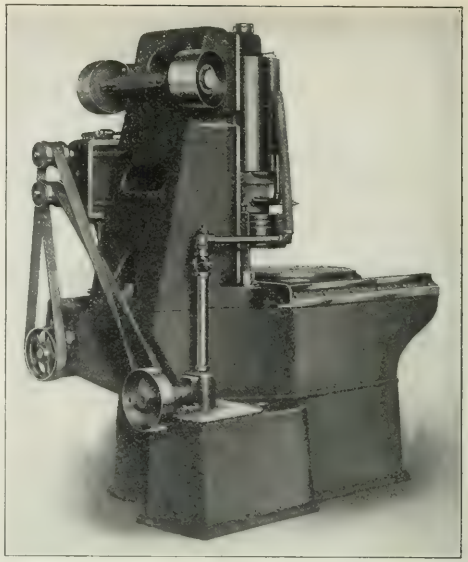


Fig. 7.—Rear View of the Grinder, Showing Pump and Water Supply Pipe.

A constant speed pulley at the right of the machine drives the splined shaft operating the table through a gear box the exterior and interior of which are shown in Figs. 5 and 6, respectively. Eight speeds are available, any one of which can be secured while the grinder is running and an improved type sliding key of ample size connects any one of four gears to the second shaft of the gear box while a similar key in the first shaft has two positions for driving directly or through the back gears. A simple design of friction band which is easily accessible for adjustment relieves any shock due to the sudden engagement of the key and permits a plain jaw clutch to be employed for starting and stopping the table. The levers controlling the rotation of the table and changing its speed are conveniently grouped at the left of the gear box. All the gears are accurately cut, have wide faces and run in oil.

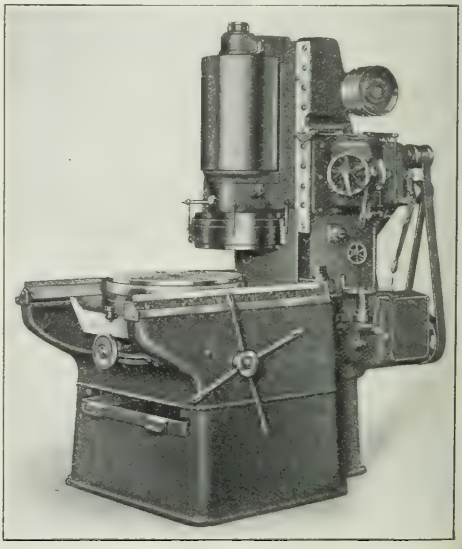


Fig. 8.—View of Machine with Water Guards Removed.

Water Supply and Lubrication

When heavy cuts are being taken it is necessary to have an ample supply of water if the work is to be kept cool. For this purpose a submerged large diameter centrifugal pump, shown in Fig. 7, is provided, which supplies water through a pipe and hose to a cored passage behind the lower spindle bearing in the head. From here it passes down through short tubes into an annular recess in the face plate and then outward and downward to the inner face of the wheel, where it issues with considerable force and is driven across the ground surface in a rapidly moving sheet, thus effectually cooling the work. With the exception of the vertical stiffening ribs the bed is open down to the floor, the lower section being the water tank. A valve with a special seat to prevent damage from grit regulates the supply of water to the grinding wheel and is controlled by a conveniently placed hand wheel. Suitable guards prevent any escape of flying water or spray.

Oil bath lubrication is provided for all the important bearings and all the continuously running gears except those of the pump. Gauges indicating the level of oil in the reservoirs show when attention is necessary.

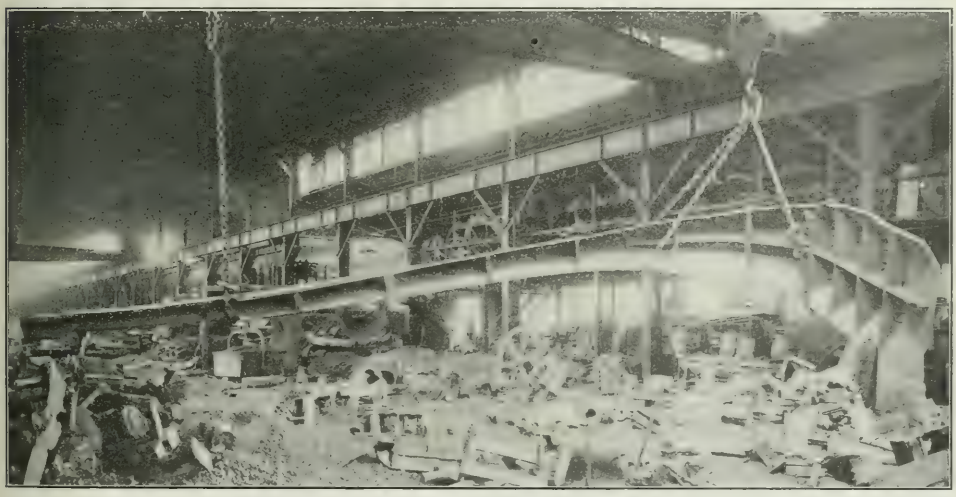
The principal specifications and dimensions of the grinder are given in the subjoined table:

Diameter of grinding wheel, inches	16
Hight of wheel, inches	5
Wearing hight of wheel, inches	3¾
Maximum thickness of wheel rim, inches	1½
Minimum thickness of wheel rim, inches	1
Diameter of rotary magnetic chuck, inches	24
Swing inside of regular guards, inches	30
Maximum hight of work under wheel, inches	12
Speed of grinding wheel, revolutions per minute	1,000
Number of chuck speeds	8
Slowest chuck speed, revolutions per minute	3.5
Fastest chuck speed, revolutions per minute	30
Diameter of drum pulley on spindle, inches	14
Width of driving belt, inches	5
Speed of driving belt, feet per minute	3,670
Minimum diameter of spindle at lower bearing, inches	3
Maximum diameter of spindle at lower bearing, inches	3¾
Length of lower spindle bearing, inches	6½
Diameter of upper end of spindle, inches	3
Weight of spindle and revolving parts, pounds	325
Diameter of countershaft pulleys, inches	14
Width of countershaft pulleys, inches	10
Speed of countershaft, revolutions per minute	525
Capacity of water tank, gallons	64
Diameter water supply pipe, inches	1½
Weight of machine, pounds	6,800

The equipment of the machine includes a countershaft, with tight and loose pulleys, and all the necessary appliances regularly furnished with a machine of this type. If it is desired to keep more than six grinding wheels mounted at a time extra retaining rings can be furnished at a slight cost.

A Large Open Hearth Steel Casting

A very large steel casting which is of interest especially on account of its length and the comparative lightness of its section is illustrated herewith. This casting was recently furnished by the Federal Steel Foundry Company, Chester, Pa., to the William Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., contractor for the construction of the battleship Wyoming. This vessel is one of the largest recently contracted for by the Navy Department, its displacement being 26,000 tons and the horsepower to be developed by its engines 28,000. The casting is intended for the stem of the vessel and is over 51 ft. in length and in some cases only 1¼ in. thick. Its weight is 23,550 lb., and in spite of its bulk the total variation of the casting, which was made in one piece from the pattern was less than ¼ in.



The Casting for the Stem of the Battleship Wyoming, Furnished by the Federal Steel Foundry Company, Chester, Pa

In the physical tests conducted by the Government with specimens taken from the casting, the results showed that the steel had an elastic limit of 44,000 lb., a tensile strength of 86,000 lb., an elongation of 20 per cent. and a reduction in area of 25.2 per cent. In the bending test a bar 1 x ½ in. in section was bent cold through an arc of 140 degrees without fracture.

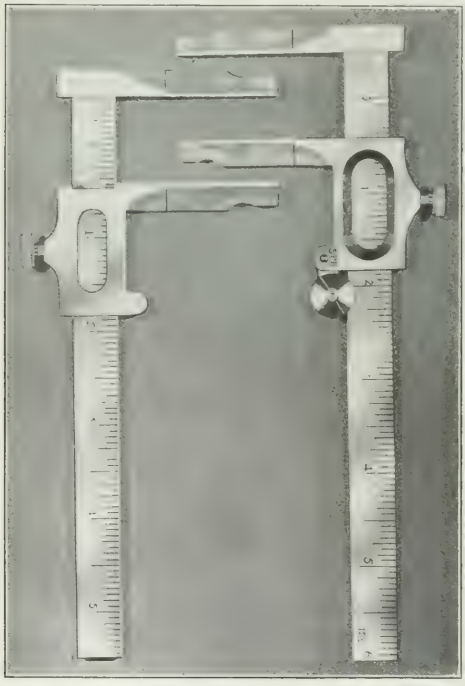
Correction.—In the illustrated description of the Manville four slide wire forming machine which appeared on page 796 of *The Iron Age*, October 6, 1910, the maker's name was, by a typographical error, given in the caption of Fig. 1 as the Manville Machine Company. It should have been the Manville Brothers Company.

The Pressed Steel Car Company recently completed some of the largest steel ore cars in the world, if not the largest, for the Lake Champlain & Moriah Railroad, owned chiefly by the Port Henry Iron Ore Company and Witherbee, Sherman & Co., and located in the Port Henry iron ore region of New York. The cars are 20 ft. 6¼ in. long, inside measurement, and 7 ft. 6 in. wide. Each has a carrying capacity of 60 net tons, or about 10 tons more than the ordinary steel ore car.

New Columbia Calipers

Two new models of Columbia calipers recently added to the line by E. G. Smith, Columbia, Pa., are illustrated herewith. In a general way these new models follow the design of the other sliding or graduated beam calipers of this manufacturer and possess among other advantages long jaws giving large capacity and an increased thickness of the jaws at the measuring surface. The special features about the new models are briefly, in the caliper at the left of the engraving the face is cut where the reading is done which is an advantage when reading from the edge of an incline. When doing this work, it is rather difficult to tell just how near the line the caliper is. This is overcome by cutting a part of the reading surface away. In the other model, the movable jaw has a new adjusting device consisting of a friction wheel with its inner grooved beveled surface bearing against the lower side of the scale where there are no graduations. This makes the instrument very convenient to handle as it can be operated by the same hand that holds the caliper.

The blades of the calipers are from 4 to 14 in. long and are graduated in inches to sixty-fourths and also in the metric system and a vernier attachment enables very accurate measurements to be secured. The shape of the jaws is such that a maximum of strength is secured with the minimum amount of metal, thus giving the instruments a neat appearance. The sliding head has a very even movement and a spring inside it prevents it from slipping of itself when set. In addition to these new models the line includes a number of others of different designs, those with hand and screw operated verniers and some having double jaws so as to be available for both inside and outside work.



Two New Forms of Caliper, Manufactured by E. G. Smith, Columbia, Pa.

The blast furnace of the Youngstown Steel Company, Youngstown, Ohio, was blown out September 30.

An Automatic Coal Railroad

An Interesting Installation of the Automatic Transportation Company's System

In *The Iron Age*, January 6, 1910, announcement was made of a number of automatic transporting devices which had been developed by the Automatic Transportation Company, 6 Lewis Block, Buffalo, N. Y. One of the devices mentioned was an automatic carrier for bulky material, such as ore, coal, gravel and lumber, and an installation recently completed by this company in the mining district of Pennsylvania is illustrated herewith. Fig. 1 shows the cars being loaded at the mouth of a coal mine, Fig. 2 the elevated type of construction, used to give sufficient head room for wagons to pass under the railroads and Fig. 3 the cars at the lower end of the line discharging their load into railroad cars.



Fig. 1.—Loading Cars on the Coal Railroad, Installed by the Automatic Transportation Company, Buffalo, N. Y.

The line in question was installed at Blossburg, Pa., and connects the coal mines of Jenkins Brothers and Nowak Coal Company with the tracks of the New York Central lines. This road is about 1 mile long and the difference in level between the two ends is 553 ft., approximately. It takes the place of the former method of teaming the coal down the mountain road. Starting from the Jenkins coal tipple at the upper end of the line, the track is level for about 140 ft. Then it descends on a 7.45 per cent. grade 1130 ft. long to the Nowak Coal Company's tipple, when the track is again level for 100 ft. Leaving this tipple on a 7.88 per cent. grade, the tracks descend to the base of the hill. Here the grade decreases to about 2½ per cent., and after rounding the curve shown in Fig. 2 the line ascends on a 2 per cent. grade to the power house and tipple at the railroad track.

The line consists of a series of iron posts resting on concrete foundations and capped with malleable iron Ys supporting insulated heavy steel rails 30 in. apart. The electric carriers or motor cars travel on these rails and take the current required for their propulsion directly from the rails instead of from a third rail or overhead trolley wire, as has formerly been

the practice. The point of contact where the current is taken is a V-shaped groove on the under side of the rail, which makes it possible to operate the line regardless of the weather conditions, as snow and sleet on the rails cannot interfere with the electrical contact. The elevation of the railroad varies from a few feet, as shown in Fig. 1, at several points in passing down the mountain, to 12 ft., where it makes the curve, shown in Fig. 2, and at the top of the tipples at the railroad siding in Fig. 3 the line is 31 ft. from the ground. Although the grades are heavy they are practically uniform, as the hight of the upright poles varies with the contour of the surface of the mountain.

The coal is transported in trains consisting of two motor cars which have a capacity of 1 ton each and four trailers that each convey a load of 1½ tons. These trains are controlled either by an operator, who rides on the motor car, or are operated automatically. The time for a round trip from the loading of the cars at the mouth of the mine to carry the load to the railroad tipples, automatically dumping it there and returning to the mouth of the mine, is less than 15 min.

A regular quarterly meeting of the managers of sales of the Illinois Steel Company, Carnegie Steel Company and Tennessee, Coal, Iron & Railroad Company was held in Chicago, October 4 and 5. These meetings have usually been held in Pittsburgh, but on this occasion the managers of sales and department managers of these companies met in Chicago, in recognition of the growing importance of Chicago as a center of the steel industry. The meeting was attended by many department managers as well as managers of sales from all parts of the United States.



Fig. 2.—Elevated Construction at Foot of Mountain to Clear Road.

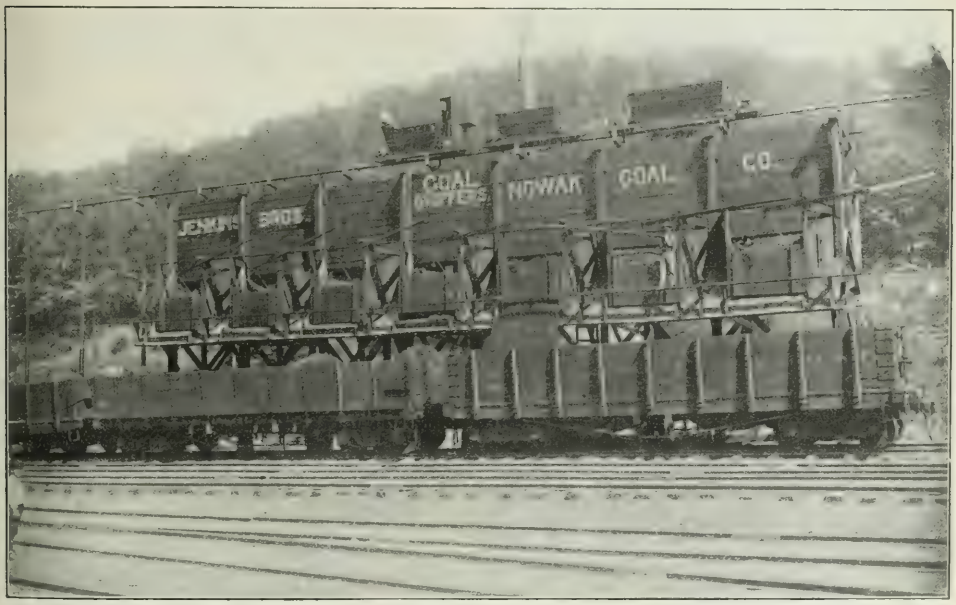


Fig. 3.—Delivering Coal to the Railroad at the Tipple at the End of the Line; Elevation of Track, 31 Ft.

The Casey Aluminum Foundry Company, Chicago, has been incorporated with $20,000 capital stock by Edward F. Casey, Jacob Sandecritz and Charles Weinfeld. The company's plant is located at 3806 South Halsted street.

The Syracuse Gas Producer

Details of a New Model

During the past decade there has been a very marked increase in the use of producer gas for power and numerous types of apparatus for producing gas from coal of both kinds, peat, lignite and other wastes have been developed. The special advantages of this type of power are high economy, safety, the solving of the smoke nuisance problem, the elmination of chimney expense and less labor and space for operating. In an effort to improve upon the existing models, the Syracuse Industrial Gas Company, Vernon, N. Y., has developed the Syracuse producer which is illustrated herewith. Fig. 1 shows the complete plant with the exception of a small exhauster and a gas receiver located near the engine, Fig. 2 is a sectional elevation of the double type baffle scrubber, while Fig. 3 gives details of the water sealed and water cooled purge valve installed in connection with the producer.

Starting at the top of the producer the first point is the charging hopper, which in practically all producers is a double valve arrangement. In the Syracuse producer the lower valve is a metal to metal slide, while the upper one is a sheet metal cover closed against the entrance of air by a water seal. In charging the producer the operator need not kneel or bend over, and before the cover comes into the position where it can be removed the valve must be shut tight. The handle operating the slide valve is fastened to and removed with the cover, which makes it impossible for both to be opened at the same time. The water for the vaporizer first enters the water seal, thus keeping the valve cool and at the same time doing away with any chance of its becoming dry. The sides and top of the producer are inclosed by a double casing, the outer layer of which is easily removed. The entering air supply in all producers should be heated before it enters the fire to at least 158 degrees F. in order to carry enough steam to make good gas. The double shells are efficient for this purpose, as they not only keep the producer room cool, but the heat which ordinarily radiates from a producer of the single shell type is taken up by the incoming air and carried back into the fire. The heat in the gas as it leaves the top of the producer serves to generate the steam supplied to the fire. The gas is thus partially cooled before it passes to the scrubber, and in the latter is completely cooled and cleaned with less water than would otherwise be required.

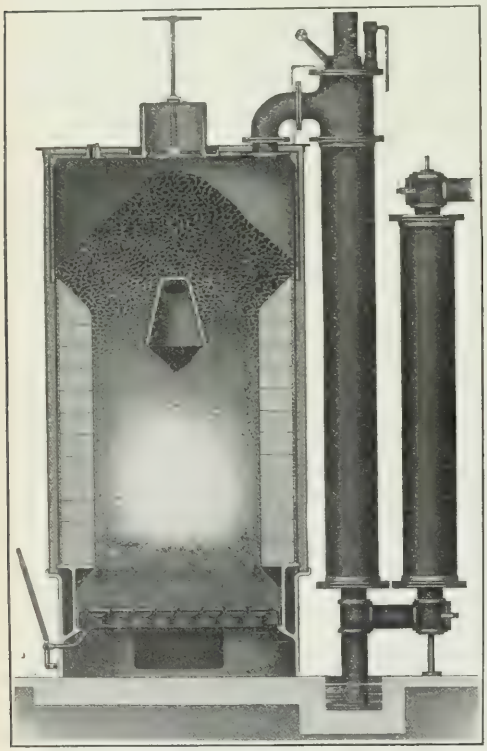


Fig. 1. A New Type of Gas Producer, Built by the Syracuse Industrial Gas Company, Vernon, N. Y.

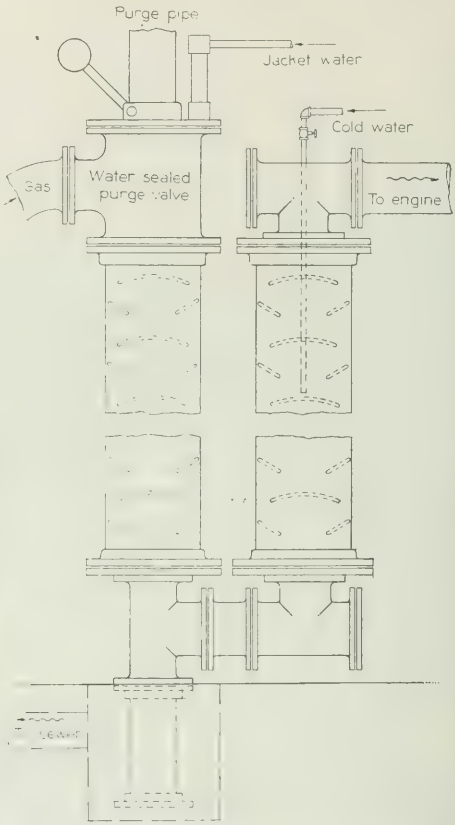


Fig. 2. Sectional Elevation of the Baffle Scrubber Used.

The ash pit and cleaning doors are entirely of cast iron, which prevents the rust and corrosion which occurs if the shell extends down to form the wall of the ash pit and comes in contact with the moist ashes. The grate is of the shaking type operated from the outside by the lever shown at the left of Fig. 1, and the bars are selected to suit the proposed fuel in each particular case. In all producers there is a tendency, it is stated, for the air to creep up close to the brickwork rather than pass through the center of the fuel, and this is increased where the ashes are shaken or ground off at the edges only, and the fuel near the wall is brought down faster and is not so closely packed as that in the center. The grate used in the Syracuse producer is claimed to secure even descent of the fuel over the whole area and keep the middle of the fire as clean as the edge. The upper part of the cast iron base is a water compartment used principally for starting, and is

said to have solved one of the hardest problems in producer operation—namely, the difficulty of starting the producer in the morning because of an insufficient supply of steam. The regulator used supplies water to the vaporizer in proportion to the load on the engine, and there are no moving parts to get out of order or adjustment and all passages may be quickly inspected or cleaned when necessary.

The baffle scrubber shown in Fig. 2 is made double, so that in the first part the water from the jacket may be reused for cleaning the gas. Only a small quantity of cold water is needed in the second stage since a large portion of the heat in the gas and most of the dirt has been removed by the hot engine jacket water in the first stage. It is claimed for this arrangement of scrubbers that in most cases one-half of the customary amount of water used for cleaning is saved.

Upon leaving the producer and before entering the

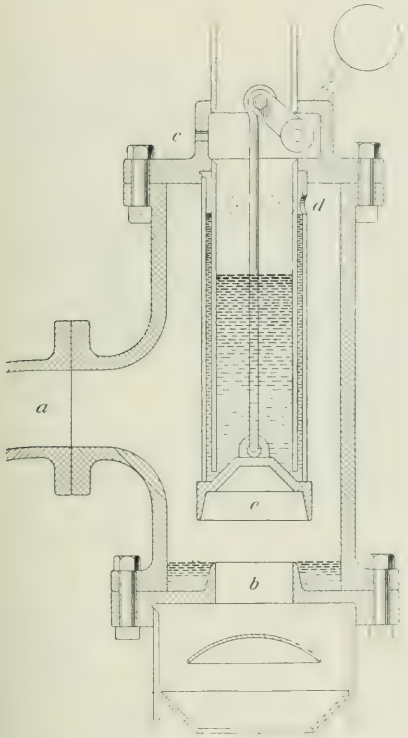


Fig. 3.—Detail of the Water Sealed Purge Valve.

scrubber the gas passes through the water cooled purge valve, the construction of which is shown in Fig. 3. The Underwriters' Rules require that when the plant is not in operation the connection between the generator and the scrubber must be closed, and that between the producer and the vent pipe opened so that the products of combustion can be carried into the open air, and both operations must be accomplished by a mechanical arrangement capable of preventing one happening without the other. It is claimed for the water cooled water sealed valve used in this producer that it will not stick or leak even after long service on hot and dirty gas. The gas enters at the opening *a*, and while the producer is in operation passes down through the opening *b* while water enters the pipe *c*, filling the space above the valve and flowing out through the opening *d*. This makes the seal, which is kept cool by the fresh water supplied to the pipe *c*. When the producer is shut down for the night the valve *e* is dropped over the opening *b*, sealing it and leaving the purge pipe open to the atmosphere. This type of construction is said to possess advantages over some of the valves on the market at the present time where the seal is formed by bringing a cup, the lower edges of which are concave, over the end of the pipe so that it fits over and forms a seal at the opening *b*.

One of the characteristic features of this producer is said to be the method of starting. A small exhauster is connected with the gas pipe near the engine, and while the fire is being brought up to the gas making state the conditions throughout the apparatus are the same as when the engine is running. In this way full load can be thrown upon the engine immediately after starting, while if a blower is used for this purpose it is claimed that the fire will be thin and localized at the start, and the gas will soon give out when the load is placed on the engine. Another advantage of this arrangement is that all the leakage in connection with a suction gas producer plant occurs in starting when the fire is being blown up to a gas making condition, while with the starting arrangements used in the Syracuse gas producer no leakage is said to occur.

The cost of producing power with one of these producers supplying gas to a gas engine is 0.218 cent per brake horsepower per hour, or 51 cents per month of 234 hours using anthracite buckwheat coal at $3.50 per ton. For a gas engine using natural gas at 25 cents per 1000 cu. ft., the figures are 0.375 and 80 cents, respectively, and proportionately higher with various other types of prime movers and fuel until the gasoline engine is reached where the cost per brake horsepower per hour is 1.63 cents and per month $3.81, figured on a consumption of ⅛ gal. of gasoline per brake horsepower per hour and the fuel costing 13 cents per gallon. Electric power is even more expensive, the figures being 2.25 cents and $5.26, when the current is supplied at 3 cents per kilowatt hour.

Lake Ore Shipments to October 1

The statement below gives the shipments of Lake Superior ores in gross tons from Upper Lake ports in September, 1910, with corresponding figures for September, 1909, and a comparison of the shipments in the two years up to October 1. It will be seen that the increase over last year was 5,061,331 tons for the season, while the shipments in September this year were 777,153 tons less than in September, 1909:

	September, 1910.	September, 1909.	To Oct. 1, 1910.	To Oct. 1, 1909.
Escanaba	705,801	948,951	3,868,072	4,002,796
Marquette	439,442	565,949	2,689,219	1,979,517
Ashland	557,858	721,236	3,436,829	2,422,004
Superior	1,256,665	1,057,175	6,484,352	4,743,498
Duluth	2,041,908	2,133,800	11,865,552	9,847,177
Two Harbors	1,272,158	1,623,874	6,756,840	6,644,541
Totals	6,273,832	7,050,985	35,100,864	29,639,533

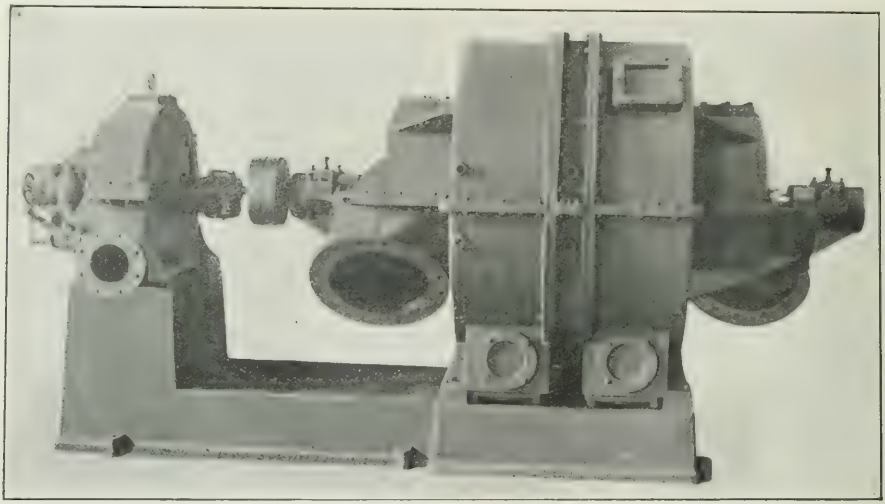
The Dunbar Brothers Company, Bristol, Conn., is completing a new brick and concrete hardening shop, 30 x 50 ft., and is starting work on a power plant which will be pushed to completion as rapidly as possible. These additions, with a three-story building, 32 x 80 ft., just completed, will double the company's manufacturing capacity. Its products are all kinds of small springs made from sheet steel and steel and brass wire, such as clock, valve, snap, organ, sash, blind, screen, flue, governor and door springs.

The Buffalo Steam Pump Company, Buffalo, N. Y., has reopened its St. Louis office. It will be in charge of H. H. Downes, 911 Third National Bank Building, St. Louis. Mr. Downes was transferred from the Buffalo office to St. Louis and has had a wide experience in the company's lines.

The Buffalo Tar Extractor

Details of a Centrifugal Purifier for Producer Gas

Probably the greatest difficulty encountered in operating gas engines with soft coal producer gas is the improper cleaning of the fuel. The raw gas coming from the producer contains a number of impurities, the most detrimental of which is tar, since if there is any tar vapor present in the gas it will condense on any metallic surface, the condensation being greatest wherever there is a sudden change of direction or in velocity. One of the points where the latter is true is the valves of a gas engine, and a continued deposit of tar on these parts may cause bad regulation and eventually prevent governor action entirely. While the gas engine operated with a soft coal producer is said to be superior to the steam operated plant using engines or turbines, the impurities present in the gas have tended to retard the general adoption of the gas engine for power production. Any improvements therefore in the method or apparatus for cleaning producer gas are of general interest to power consumers, as it tends to place the producer operated gas engine in the same class as the other prime movers.



The Centrifugal Tar Extractor for Producer Gas, Built by the Buffalo Forge Company, Buffalo, N. Y.

A portion of the power equipment of the Penn-American Plate Glass Company, Alexandria, Ind., consists of four engines direct connected to a generator, the aggregate horsepower being 1800 and subject to an overload of 10 per cent. These engines are supplied with gas from four 500-hp. soft coal producers of the usual type, and an interesting feature of the installation is that no gas holder is required. The producers are supplied with forced draft by steam jets, which supply sufficient pressure to overcome the resistance of the fuel bed and deliver the raw gas into the main under a pressure of 1½ to 2½ in. of water. Recently considerable difficulty has been experienced in operating the plant, partly due to the fact that the coal had an unusually high volatile content and also to scrubber trouble. These scrubbers consisted of a cylindrical stationary shell, within which was a rotating cylinder provided with numerous exterior blades or paddles, and an ample supply of water was introduced between the two drums.

In March, 1910, these scrubbers were abandoned and a Buffalo turbine tar extractor, manufactured by the Buffalo Forge Company, 490 Broadway, Buffalo, N. Y., was installed. This extractor is of the centrifugal type and comprises an outer cast iron shell, which is divided vertically into two separate stages, each provided with a monel metal rotor. This is the most nearly acidproof construction metal known, with the exception of lead, and is scarcely affected by the action of the sulphuric acid in the gas. All the other interior parts of the scrubber are of cast iron or monel metal and the shell is provided with numerous hand holes for their inspection. The shell is divided horizontally, so that the entire rotor and the shaft, which is mounted on self-aligning spherical ring oiling bearings attached to the shell of the extractor, may be removed without disturbing the bearings or the alignment of the casing. Power for driving the extractor at a speed of 1800 rev. per min. is furnished by a direct connected 60-hp. Terry steam turbine.

Water is thoroughly distributed to all parts of the scrubbers by patented monel metal nozzles at a pressure of about 15 lb. per square inch. These nozzles are of the atomizing type and of simple construction, operating on the centrifugal principle. This type of nozzle is especially adapted for this service, as its interior is free from any obstruction tending to collect foreign material in the water. As an additional precaution the water first passes through two Buffalo pot strainers and then through cored chambers in the shell to the nozzles, which are all accessible from the outside. The beneficial effect of the second stage is shown in the economy of the water consumption, about 85 gal. per minute being used, and the marked increase in the efficiency of the cleaning, the difference of the color of the water of the two stages being very marked.

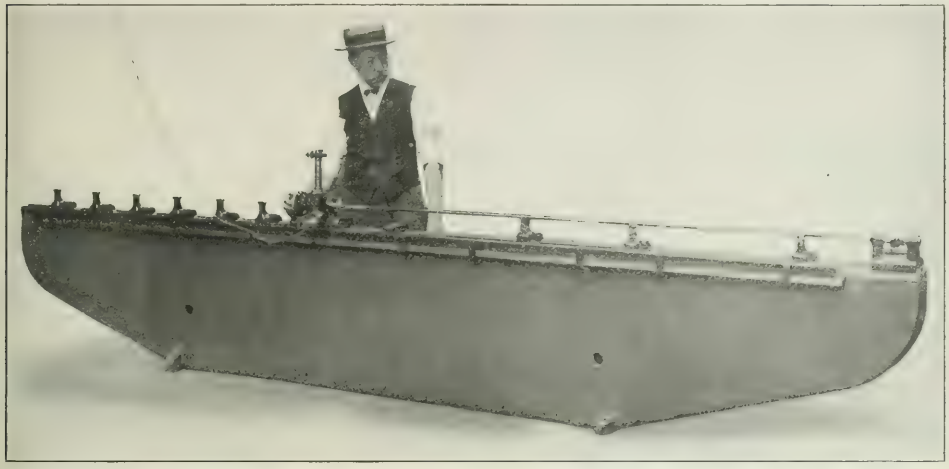
During the five months that the extractor has been in use it is said that not the slightest trace of tar or lampblack has been found in the gas main leading from it, although the four engines have operated continuously 24 hours per day and six days a week. Cleaning the engine at the end of the week was found unnecessary, and the absence of tar in the gas enables the governors to regulate the speed of the engine perfectly. Tests upon the cleaned gas showed only a trace of foreign material, the amount being 0.00031 grains per cubic foot. While part of it was tar and part finely divided lampblack, the amount was so small that it had no effect whatever on the engines. The construction of the rotor is such that there is no collection of tar on any part of it, and it remains as perfectly balanced as the day it was installed. The scrubber is thoroughly cleaned with steam once a week, which requires about half an hour and necessi-

tates no manual work whatever. This is all that has been found necessary to keep the apparatus in good condition.

The Pratt & Whitney 144-In. Measuring Machine

The latest type of measuring machine of the Pratt & Whitney Company, Hartford, Conn., which has just been built in a very unusual size for a customer is illustrated herewith. This machine measures 12 ft. or any part thereof to 0.00005 in. An important improvement in the machine is the raising of the standard bar at the rear to a position nearly level with the surface of the bed. This reduces to the lowest degree any error that may arise from reading the microscope. The principle employed has not been changed.

The delicacy of contact between the measuring faces is obtained by the use of auxiliary jaws holding a small cylindrical drop plug by the pressure of a light helical spring. This spring also operates the sliding spindle, to which one of the auxiliary jaws is attached. The tension of the spring is so adjusted that the instant the calipering surfaces are brought into perfect contact, either directly or through the work, the plug which is held in a horizontal position by friction will swing toward a vertical position, any excess pressure causing it to drop out. An adjusting device for the index line provides for any slight variation of the position of the calipering faces at zero.



A New Model Measuring Machine, Capacity 144 In., Made by the Pratt & Whitney Company, Hartford, Conn.

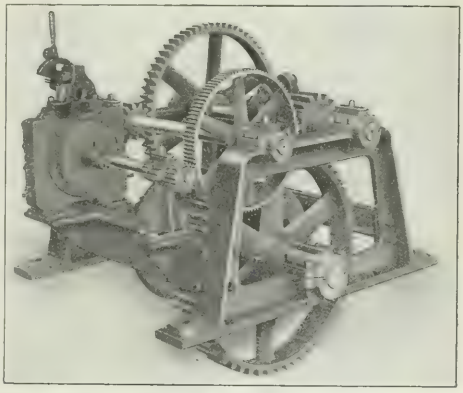
The West Side Foundry Company of Troy, N. Y., has made a substantial addition to its core building, which will increase fully one-third its capacity for making dry sand cores. An addition of 14 ft. to the molding shop has been completed, and the company has otherwise added considerably to its capacity, which is now about 40 tons per day. It is now operating a nickel-plating department and is in a position to do nickel-plating along with its regular casting work.

The Universal Portland Cement Company, Chicago, is making rapid progress in the construction of its No. 6 plant, at Buffington, Ind. Its completion in 1911 will give the company an output of 10,000,000 bbls. of cement per year. During the month of August the company made 687,500 bbls., which surpassed all previous records for one month's production.

The Lane Derrick Turning Gear

The improved type of boom derrick turning gear or slewing engine illustrated herewith has been brought out by the Lane Mfg. Company, Montpelier, Vt. The object of the design has been to avoid the complications and difficulties of operation which have characterized this class of apparatus and to that end friction wheels, rocker frames and twin engine motors have been entirely done away with. Using an inclosed Dake reversing engine connected to the winding drum through reduction gearing, the first pair of which is machine cut, has brought about this simplification of design.

The engine which is of the piston type is started, stopped and reversed by a single lever which has full control of the mechanism. The machine is built both with and without friction grip clutch on the drum pinion as this attachment is required only with very large derricks where the strains set up by the swaying of the load and boom are severe. The friction is adjustable for different degrees of pressure and automatically safeguards the mechanism against excessive strains.



The New Derrick Turning Engine Built by the Lane Mfg. Company, Montpelier, Vt.

The winding drum is 16 in. in diameter and 16 in. through its flanges which are 2 in. high and drilled for wire rope. The turning gear has no dead center and is entirely contained and inclosed in its casing.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square	₰ lb 1.90¢
1½ to 4 in. x ⅛ to 1 in.	₰ lb 2.10¢
1½ to 4 in. x ⅛ to 5-16	₰ lb 2.10¢
Rods—⅜ and 11-16 round and square	₰ lb 2.10¢

Angles:	Cts ₰ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 5-16 in. and ⅜ in.	2.35¢
1½ to 2½ in. x ⅜ in.	2.20¢
1½ to 2¾ in. x 3-16 in. and thicker	2.10¢
1 to 1¾ in. x 3-16 in.	2.20¢
1 to 1¾ x ⅛ in.	2.30¢
⅝ x ¼ in.	2.40¢
⅝ x ⅛ in.	2.50¢
½ x ⅛ in.	3.55¢
½ x 3-32 in.	4.35¢

Tees:

1 in.	2.05¢
1¼ in.	2.15¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.40¢
Bands—1 to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.50¢

Merchant Steel from Store—

	per ₰
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@2.80¢
Best Cast Steel, base price in small lots	12¢

Sheets from Store—

Black	One Pass, C. R. Soft Steel.	R. G. Cleaned.
No. 16	₰ lb 2.50¢	2.70¢
Nos. 18 to 20	₰ lb 2.70¢	2.90¢
Nos. 22 and 24	₰ lb 2.75¢	3.00¢
No. 26	₰ lb 2.85¢	3.10¢
No. 28	₰ lb 2.95¢	3.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₰ lb. 12 @14½¢

Patent Planished, W. Dewees Wood ₰ lb. A, 10¢; B, 9¢ net

Galvanized.

Nos. 12 and 11	₰ lb. 2.95¢
Nos. 22 to 24	₰ lb. 3.30¢
No. 26	₰ lb. 3.40¢
No. 28	₰ lb. 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₰ lb. .3.35¢
No. 26	₰ lb. 3.55¢
No. 28	₰ lb. .3.75¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₰ 100 sq. ft. $4.85	4.80
No. 26	₰ 100 sq. ft. 4.05	4.00
No. 28	₰ 100 sq. ft. 3.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.60
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 .07 lb.	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb coating	$8.50
IX, 20 x 28 with an 8 lb coating	10.50

Seamless Brass Tubes—

List November 17 1908 Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13 1908 Base price 18¢

Copper Tubes—

List November 13 1908 Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 19½¢ ₰ lb

High Brass Rods—

List August 1, 1908 14½¢ ₰ lb

Roll and Sheet Brass—

List August 1, 1908 14½¢ ₰ lb

Brass Wire—

List August 1, 1908 14½¢ ₰ lb

Copper Wire—

Base Price, cash and lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) ₰ 7 8 ¢
Sheet Copper Cold Rolled, 1¢ ₰ lb advance over Hot Rolled
Sheet Copper Polished 24 in. wide and under, 1¢ ₰ square foot
Sheet Copper Polished over 20 in. wide, 2¢ ₰ square foot
Planished Copper, 1¢ ₰ square foot more than Polished

METALS—

Tin—

Straits Pig ₰ lb 36¾@37 ¢

Copper—

Lake Ingot	₰ lb 14¾@15 ¢
Electrolytic	₰ lb 14½@14¾¢
Casting	₰ lb 14¼@14½¢

Spelter—

Western ₰ lb 6½@6¾¢

Zinc.

No. 9, base, casks ₰ lb 8 ¢ | Open ₰ lb 8½¢

Lead.

American Pig	₰ lb 5 @5¼¢
Bar	₰ lb 6¾@6¾¢

Solder.

½ A. ½, guaranteed	₰ lb 22½@23¢
No. 1	₰ lb 20½@20¾¢
Refined	₰ lb 18 @18½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₰ lb @10¢
Hallett's	@10¢
Other Brands	@9½¢

Bismuth—

Per ₰ lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 24¢
Rods & Wire Base Price 31¢
Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₰ lb 10.75@11.00
Copper, Heavy and Wire	₰ lb 10.50@10.75
Copper, Light and Bottoms	₰ lb 9.50@9.75
Brass, Heavy	₰ lb 7.25@7.50
Brass, Light	₰ lb 5.75@6.00
Heavy Machine Composition	₰ lb 9.50@9.75
Clean Brass Turnings	₰ lb 7.00@7.25
Composition Turnings	₰ lb 8.25@8.50
Lead, Heavy	@3.00
Lead, Tea	@3.25
Zinc Scrap	₰ lb @3.75

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THE IRON AGE

Established 1855 — New York, October 20, 1910 — Vol. 86: No. 16

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Railroad Buying Now in Sight

No General Pig Iron Buying Movement as Yet

Some encouragement for the iron trade comes from Chicago. An important Western railroad company which suspended specifications last summer on 23,000 tons of rails that had been bought for delivery this year has now ordered shipment of these rails as well as of track supplies which had also been held up. An Eastern railroad company is in the market there for 30,000 tons of rails for prompt delivery. It is firmly believed in that city that the railroad companies will be permitted to make at least a slight advance in freight rates, and that this is the reason for the loosening up of railroad purchases. Prominent railroad officials have advised steel manufacturers in the past week that a much more liberal policy in placing orders for equipment is to be expected after the election next month, especially if financial conditions become easier. They will not wait until freight rate advances become a reality.

While reports from various sections of the country show some increase in business in all lines of finished products, with transactions now being consummated that could not have been done a few weeks ago, the situation at Pittsburgh appears not to have improved. In that center new orders and specifications on contracts for wire products, wrought pipe and sheets show a slight gain for this month over the corresponding period in September, but other branches of finished products are quiet, with, naturally, some feeling of discouragement. The market on steel billets at Pittsburgh continues weak. The large sale of Bessemer billets referred to last week was made by a Youngstown mill to an Indiana wire maker, shipments to be from 4000 to 7000 tons per month for six months.

The demand for pig iron is spasmodic. Orders for fairly heavy quantities, aggregating over 20,000 tons, have been placed by quite a number of manufacturers of cast iron pipe, and scattered sales have been made to other consuming interests in the several trade centers. The leading radiator interest has closed for probably 20,000 tons of Northern iron for several of its foundries, for deliveries from December to March. A New England foundry has taken 6000 tons to run through the first quarter. No general buying movement, however, has developed, consumers still purchasing for immediate requirements except in those instances in which they have been able to make contracts running into the early part of next year on the

basis of current quotations. More furnaces are receding from their demand for a premium over present prices on such deliveries.

Orders for structural material are below expectations, but a great deal of work is in sight both in the East and West, so that the trade is hopeful of better conditions in the near future. An interesting transaction is a contract placed by the United States Government with the Lackawanna Steel Company for 5000 tons of steel piling to be used in making the coffer dam for raising the Maine in the harbor of Havana. This is the second largest order ever placed for steel piling. Bids close October 31 on the new post-office building at the Pennsylvania Railroad Terminal in this city, which will require 14,000 to 18,000 tons of steel.

American iron and steel manufacturers continue to find the Canadian demand very satisfactory, especially for requirements for agricultural implement factories, some of this material taken by Canada going to the Australian trade.

Ferroalloys are weak. A sale is reported of foreign 80 per cent. ferromanganese at about $38.50, Baltimore, for deliveries extending through the first half of next year. Ferrosilicon is quoted at $54.50, Pittsburgh, for 50 per cent., for forward delivery.

Pig tin is higher, with some excitement among buyers. Ingot copper is again in quite heavy demand, with prices rising.

Keeping Contracts for Steel Products

An important matter considered at the meeting of the American Iron and Steel Institute in New York last week was that of contract obligations in the buying and selling of iron and steel. It is not a new question, but it is still a vexed and vexing one. It would seem that it has been enough talked about and that what is wanted now is a real effort to rid the business of abuses that both seller and buyer recognize, but have not done much to remove. We say seller and buyer, because for practically every failure to keep a contract there is also a failure in contract enforcement. Suits at law to compel a buyer to take out material according to the times and at the price stipulated are rare in the steel trade, and for reasons well known. Then, too, the manufacturing or consuming buyer of steel, as distinguished from the merchant buyer, is in turn a seller, and in his dual capacity may be guilty of both failure to keep and failure to enforce contracts.

It was admitted by the manufacturers of steel who took part in the discussion last week that the responsibility for the existing laxness in respect to contracts is not on one side alone. If buyers have refused to take out material on a falling market, either because they find they require less than they had counted on or, as more often happens, because the price has declined and they can buy at a less price elsewhere, it is true also that manufacturers, through their selling departments, have sold heavily without due regard to the ability of the buyer to consume within the contract period. What is worse, manufacturers have sold without regard to their ability to deliver; they have also been known to fail on deliveries to contract customers, on a rising market, while accepting early delivery business from others who gladly paid a premium. There is no doubt, moreover, that the guaranteeing of prices against declines is an important item in the manufacturer's responsibility for present conditions. These guarantees, as has been suggested, are one of the evils chargeable against the early period of the consolidation régime in the steel industry. Buyers argued at that time that natural laws were to a large extent inoperative—meaning that the unrestrained competition that had previously prevailed was gone—and that the prices asked were in a sense artificial. To stimulate demand under such conditions sellers booked large contracts to which guarantees were attached. As independent mills were established they in turn were compelled to give like guarantees. Further, the practice of making blanket contracts covering a buyer's requirements is chargeable in part with the abuses that are now plaguing the manufacturer.

The American Iron and Steel Institute will do a great service to both manufacturers and consumers of steel if it brings about a return to old-fashioned contract observance in the iron and steel trades. Its first task will be with its own members. It may almost be said that the matter rests entirely with the manufacturers. If they can do away with that type of salesmanship which sells without regard to the seller's ability to deliver or the buyer's ability to consume, they will have taken a long step toward the desired end. A further long step will be the keeping of contract deliveries by the manufacturer when markets are advancing.

It goes without saying that a greater degree of stability and evenness in prices would do much to solve the problem. The speculative element that figures so largely in the trade because of the great swings from low to high prices for steel and down again, is the arch disturber of contract relations. While something has been done toward cutting off the crests and filling up the troughs of our price waves, we must not count too much on abolishing the waves. What is doubtless possible, as was suggested at the Waldorf-Astoria meeting, is the shortening of the sale period, say to three months in the case of merchant buying and to six months as a maximum for manufacturing consumers. There may be exceptional cases in which manufacturing operations require yearly contracts, but there, as has been suggested, provision might be made for cancellations of unspecified tonnages by quarterly periods, with maximum and minimum amounts, the former not to exceed the latter by more than 25 per cent. Whatever the details of any reform plan that may be adopted, they will no doubt be based in general on two propositions that have been brought forward by the manufacturers, namely, short time contracts and the abolition of guarantees against declines. When the buyer has been prevented from buying beyond his requirements and on the other hand the seller has been kept from selling beyond his ability to deliver much will have been done toward the solution of the problem.

No action was taken by the manufacturers at last Friday's meeting, but it is likely that the views brought out at that time will eventually crystallize in the

report of a committee that will be charged with the whole question of contract reform.

The Automobile Controversy

The chief point at issue regarding the economic phase of the pleasure automobile seems to remain hidden. It has not, as yet, appeared in any of the discussions bearing on that subject, advanced by either those interested in the continuation of the great demand for this class of vehicle or by pessimists who see naught but national ruin should investment in this most attractive means of locomotion continue to increase.

It matters little if a person with some accumulated means in either cash or property wishes to divert a part or the whole of such reserve into other channels. We have never stood aghast if our neighbor possessed a horse and carriage nor questioned his consistency when maintaining a means of deriving the benefits from any lawful recreation.

However, from a cold business viewpoint, the trouble with the automobile is not grounded upon the original investment at all but arises from its abnormal depreciation as compared with other machine devices, all the while having no earning capacity. The automobile stands alone in this unfortunate condition, and it rests with both the manufacturer and user to approach a rational zone and understand each other more fully than at present.

The average life of a motor car is three years, assuming that new designs or fashions do not result in the discard of the machine before that term expires into the hands of one interested in the second-hand class. This period of three years may be increased or diminished in consequence of the care given the various devices which compose the complete vehicle and the distance over which the car has been driven. The first cost, large or small, has but meagre influence upon the term of durability, although the milage may be greatly varied at the end of the period according to the purchaser's original outlay.

How is the rapid depreciation to be met and offset? First, by the makers leading instead of being led, and by a cessation of their efforts to produce a vehicle which will traverse roads of all kinds and conditions, up hill and down dale, at express speeds. Second, by users keeping in mind other features of a car than speed per unit of time and distances covered between dawn and twilight. A co-operation such as this would result in devices better adapted to long and reliable service and the elimination of the long distance idea which has all drivers by the ears.

A locomotive, after having been driven 150 miles over carefully aligned rails laid on a smooth road-bed, is taken into the round-house and looked over. The automobile is presumed to have the capacity of traveling thousands of miles with no inspection other than to note the cleanliness of spark-plugs and the amount of water and gasoline in their respective tanks.

The usual driver, skilled or otherwise, is incompetent to properly examine and adjust the parts in the present motor car, and the employment of those fitted to do so would transfer the charges against depreciation over to that of maintenance; thus the ultimate expense would not be changed at all, but a more enduring car might result.

To meet the future, engineers must design to avoid extremes in speeds of revolution and excessive pressures or stresses. The operator must be content with reasonable speeds and distances in a given time and look after the welfare of the car after use with a degree of intelligence possible with simplified mechanisms.

Thus, the term of usefulness will increase, to the detriment of the manufacturer possibly, by reason of a less output of new cars, and his plant will be operated but 60 hours a week, but his business will be steady and enduring, which cannot be said regarding present conditions or the outlook for the immediate future. In return for this sacrifice, if it may be so viewed, the purchaser will realize that his investment will return him some recreation, if nothing else, for a much longer term than at present in vogue. Before this can be brought about the entire industry and the ideas and expectations of users must receive a thorough renovation.

The Quality of Boiler Tubes

At the convention of the American Boiler Manufacturers' Association in Chicago last week, as reported on another page, Secretary Charles S. Blake of the Hartford Steam Boiler Inspection & Insurance Company attacked the quality of boiler tubes. He asserted that the tube manufacturers do not seem to be keeping pace with the progress made by the manufacturers of other material entering into boiler construction and that "tube failures are woefully common." The average steam pressure 25 years ago ran from 80 to 100 lb., and "the tubes in use at that time," he said, "were identical in thickness, except in specific instances, with those in use to-day for pressures of 150 to 175 lb., and the average quality has not improved, so that the standard commercial tube of to-day is no better than, if as good as, the tube of those days."

Mr. Blake occupies too conspicuous a position to have his strictures passed over lightly. His assertions are evidently based upon the findings of the company's inspectors. If they have made such reports without thorough investigation, the manufacturers of boiler tubes are being grievously wronged. If, on the other hand, the facts are precisely as stated, the tube manufacturers should take steps to bring the quality of their product up to the requirements of the times.

Cutting Tool Forms for Heavy Work

Builders of high power machine tools and makers of high speed steels assert that in many shops the old practice in types of cutting tools has been much too closely adhered to in adopting the new steels. The diamond point and other old styles, efficient tools with the common steels, are retained for heavy roughing cuts. The criticism is said to apply most strongly in the older manufacturing communities, though everywhere, probably, the minority and not the majority are the offenders. With metal planers particularly, a very blunt angled tool of the hog nose type is held to effect the best results, rather than tools with sharper cutting angles.

A well-known planer builder has made a great number of practical tests in his study of the question and has reached some interesting conclusions. Ac-

cording to his experience, the blunt angle tool requires more power to drive it than a form such as the diamond point. The latter rolls off long, unbroken chips, while the hog nose comes nearer to tearing off the metal, absorbing more power for the same degree of reduction. But with the blunt angle the steel stands up better. The theory is that the sharp angle generates a very high friction, causing the steel to heat unduly, until it burns and crumbles. With the blunt nose less friction follows, and the tool stands up much longer to its work, even when given a task heavier than is possible for the diamond point to perform. There is less replacement and grinding. In other words, the sharper angle may save some power, but is extravagant in tools. The angle recommended by this investigator is a cutting face practically perpendicular to the work and a clearance not exceeding 4 degrees. The soundness of the contention is accentuated by the fact that, as a result of practical experience rather than consistent test, a great many progressive works have adopted a type of tool similar to that described. Apparently no doubt exists that there should be a sharp differentiation in tool design, as between the two classes of steel and the work they are expected to perform.

Nameless American Machines Abroad

In times past some foreign dealers have chipped the names of American builders from machine tools, and have sold them under their own nameplates. The practice has probably disappeared. Manufacturers very naturally discouraged it. The name of a well-constructed and well-designed machine is too valuable an asset to be surrendered for the aggrandizement of another. But the dealers abroad have never abandoned the idea of appropriating American built tools, names and all, and have endeavored to persuade manufacturers of good lines to do business with them on that basis. In a very few cases they have succeeded in securing high-grade machinery upon which no mark of identity exists except the dealer's nameplate. We doubt if the effort will meet with any adequate rewards for its originators. From the builders' point of view the transaction is distinctly disadvantageous. He may be released from direct responsibility to the customer, but that is a small matter if the machine is a good one. The reputation of machinery spreads rapidly. A tool in successful use in one shop usually results in sales to others. The maker is entitled to the full fruit of his labors.

Correspondence

Efficiency the Criterion for the Wage Rate

To the Editor: Your article in *The Iron Age* of October 13, headed "Paying the Workers," was a fine one; but so much of it as urges, in effect, that efficiency be the criterion for adjusting the wage rate, and as reprobates the practice of cutting rates on workmen, pleased me especially. These two things embody what I have been preaching to factory owners (and others) for years; but it is a doctrine to which the great majority of factory owners seem to be absolutely immune. The cutting of rates on the men is not only unprofitable, but it is extremely unjust; and my observation satisfies me that the exhibition by factory owners of the spirit of injustice which underlies the cutting of rates, is responsible for more than a few of our labor troubles.

The following incident illustrates these two points admirably, and in concrete shape at that. It recurred to me the moment I read your article. A couple of year ago, while in the heart of a unionized district, I called upon a large foundry and machine shop, and was surprised to find as superintendent an able man, but whose open shop principles were known of all men. My face must have evinced the surprise I felt, because he opened up as follows:

> Knowing me for the open shop advocate which I was and still am, you are surprised to find me occupying this position in this locality, are you not? I guess I'll forestall your questions by relating the facts.
>
> When I heard of the vacancy here and applied for the position, I rather expected to have my application turned down on account of my advocacy of open shop principles, though I knew the turndown would be couched in more or less veiled language. But to my surprise, they did not turn me down; on the contrary, they wrote that they were disposed to consider my application favorably, provided I would agree to take no step which might lead to a strike. Now they may have thought that this was a diplomatic way of disposing of my application, but, at any rate, I accepted their condition provided they would agree not to cut a wage rate I made until after they had discharged me; and we commenced on that basis a year ago and I'm here still and likely to remain quite a while.
>
> In the meantime I'm paying my skilled machinists and mechanics generally considerably more than the union rate which my predecessor paid; but my output shows a percentage of increase at least as great as the percentage which I'm paying above the union rate. And I need not tell you that any increase of wages which results in an increased percentage of output equal to the percentage of increase in wages is a very profitable proposition for my owners. Outside of this, my men have found at least one shop in which their "letting out a link" is premiumized by the owners, not penalized, as is mostly the case; hence my men are constantly on the lookout for ways and means in increasing their output. It is invariably recognized in concrete shape by me.

Now, on the other hand, I have found large shops where, for instance, two drill presses, side by side, running at the same speed and the same sized diameter drill, one on iron castings, the other on steel forgings, and both running at the same speed, with the drill boring steel forgings setting the pace, and, needless to say, both men receiving the same wage. Under the circumstances the drill running on iron castings should have been running at least 50 per cent. faster than the same sized drill on steel forgings, the result was the good worker was, in effect, being penalized and the poor workman was being premiumized. Useless to look for good feeling or good results in a shop run on this plan. The men know, even if the owner does not know, when they are receiving a square deal, and the question as to whose fault it is is beyond the men. They do know that it does not pay in concrete shape to do their best, since those who don't receive the same pay.

The points you have raised in your article raise still another point, which is the question of intelligence, real intelligence. And the ignorant application of the individualistic principle makes the principle which is correct in itself seem as though it were at fault; it is the ignorant application of the individualistic principle, not the principle itself, which is the cause of the unrest which pervades the world of labor and eventuates in that rank fallacy, socialism. Real intelligence and the square deal are convertible terms, and real intelligence will reduce manufacturing costs quicker than anything else. A wage clipper is not intelligent, in most cases.

M. H. C. BROMBACHER.

NEW YORK, October 15, 1910.

What Is "Invention"?

To the Editor: Apropos of the article on page 746 of *The Iron Age*, entitled "To Investigate the Patent Laws," in which you speak of "invention," if you can

give a practicable workable definition of that word you would confer a great favor on the Patent Office staff and all who may have dealings with them. About 16 years ago I was cited certain interferences from patents recently issued which I considered ridiculous, themselves being interfered with by such old and well-known (outside of the Patent Office) devices as the frame work of umbrellas, monkey on a stick toy, common double jointed gas brackets, &c., on which I requested a clear definition of the word "invention," on the basis of which the office was founded by act of Congress. In reply I was referred to "Walker on Patents," from which four quotations were sent me, as noted further on in the following extract from a recent letter to an English manufacturing company: "It may surprise you to learn that I was first to design, make and use the combination of rubber and hemp in packing for engine glands when a workman in Leeds,* but never thought of patenting anything at that time, and do not care to do it now, for I am convinced that a valid patent is an utter impossibility according to the dicta of 'Walker on Patents,' adopted as the rule of practice by the United States Patent Office staff. Neither Walker nor the United States or British patent offices can define the word 'invention,' yet they hold that 'a thing to be the subject of a patent must be an invented thing,' which is absurd when they cannot define the meaning of the all-important word. Also, 'The subject of a patent must possess novelty and utility, though these are not alone sufficient basis for a patent,' 'Application of an old device to accomplish new results is not patentable,' 'Aggregation is not patentable.'"

Now, if we define "invention" to mean a designing of some thing or form, differing from any thing or form in the realm of nature, invention is an impossibility, and "application" is the utmost that is left us, and that is tabooed by the Patent Office staff. Though letters patent are frauds, the system is probably the best yet devised to give to one applying some law or form of nature to accomplish certain effects, not previously known to the present generation or the art to which it is applicable, a chance to recompense himself for the benefits conferred on the community by the discoverer and publisher. JOHN W. PAYLER.

DETROIT, MICH., October 10, 1910.

The Du Charme Wrench & Novelty Mfg. Company, Johnstown, Pa., manufacturer of Du Charme patented pipe wrenches, a quick acting pipe vise, fixture wrench, &c., has recently increased its capital stock from $25,000 to $50,000, to provide working capital to carry on a larger business. The company has recently contracted with two of the largest automobile builders to supply them with its patented turret wrench, one of which will be placed in every tool kit sent out with their automobiles. The company is about to manufacture a new combination roller chain pipe cutter and pipe wrench, having a capacity of from ⅛ to 4 in., inclusive. For cutting pipe ordinarily three different cutters would be required to secure the above range of sizes. The tool is intended for severe service and will sell at a popular price.

The Canton Sheet Steel Company, which started to build a rolling mill at Canton, Ohio, in May, 1910, expects to have the plant completed and ready for operation in November. The plant is being equipped with six sheet, six pair and six annealing furnaces, five 38-in. hot and one 44-in. and four 24-in. cold trains of rolls, and three shears. It will have an annual capacity of about 20,000 tons of black and galvanized sheets.

* The time referred to was about 1867. The first patent on such combination was issued by the United States Patent Office in 1873, but whether designed on this side or imported by one who foresaw its financial possibilities better than I is unknown to me.

Obituary

CYRUS H. WOODRUFF, a pioneer manufacturer in the West, died at the home of his daughter in Elgin, Ill., October 12, aged 91 years. He was born at West Stockbridge, Mass., spent his early years on his father's farm, taught school three years, and later engaged in the hardware business at West Stockbridge, where he also held the office of postmaster for 11 years. He became interested in a blast furnace at West Stockbridge, and also served two terms in the Massachusetts Legislature. In 1856 he disposed of his interests there and removed to Illinois, settling at Pecatonica, in the northern part of the State, later removing to Lena, Ill., where he engaged in the lumber business for a time. In 1862 he moved to Dundee, Ill., and became interested in the Illinois Iron & Bolt Works at Carpentersville. In 1868 he moved to Elgin, Ill., and established the Woodruff & Edwards Company, but retained his stock interest in the Illinois Iron & Bolt Company. He leaves two children, a son, Charles H. Woodruff, and a daughter.

MICHAEL BAACKES, one of the pioneers in the wire nail industry in the United States, died at Crefeld, near Duesseldorf, Germany, Tuesday, Oct. 18, aged 62 years. He had been in failing health for two years. Coming to this country from Germany in 1875 he soon became identified with the wire industry, and in the eighties was connected with the Covington, Ky., plant of the H. P. Nail Works, afterward of Cleveland. In the early nineties he organized the Baackes Wire Nail Company at Cleveland, of which he was the head. Several years later the company was absorbed by the Consolidated Steel & Wire Company, and Mr. Baackes continued to manage the plant. When the Consolidated works were taken over by the American Steel & Wire Company in the late nineties Mr. Baackes retired. For the past seven years he has represented the United States Steel Corporation in special work in Europe. He was a brother to Frank Baackes, general sales manager of the American Steel & Wire Company.

ALBERT P. GAHR, vice-president and general manager of the E. A. Kinsey Company, Cincinnati, Ohio, one of the oldest machinery and supply houses in the central West, died October 13 of Bright's disease, aged 43 years. He was born in Madison, Int., but spent most of his business life in Cincinnati, entering the employ of the Kinsey Company about 20 years ago as manager of the railroad supply department, and at its reorganization, eight years later, was appointed to the position he held at the time of his death. He was a member of a number of prominent clubs. A widow survives him.

The Treadwell Engineering Company, Easton, Pa., now owns and controls the plants of the Lebanon Steel Casting Company, Lebanon, Pa., and the Stoever Foundry & Machine Company, Myerstown, Pa. It has also leased the plant of M. H. Treadwell & Co., Lebanon. In addition it is erecting a new plant at Easton, which it expects to have completed this month. The company makes crucible steel castings at Lebanon. Its capital stock is $400,000, all preferred. J. H. Killinger is president, W. G. Farrell is vice-president, M. H. Treadwell is secretary and W. I. Gassert is treasurer.

The Farrell-Cheek Steel Foundry Company has just completed the erection of one 1-ton special Bessemer converter at Sandusky, Ohio, and expects to have it in operation this month. It will have an annual capacity of about 1200 tons of steel castings. The capital stock of the company is $50,000. Herbert Farrell is president and general manager, J. O. Cheek is first vice-president, J. E. Sweet is secretary, J. T. Cheek is treasurer and P. J. Potter is general sales manager.

International Trade in Iron and Steel

Views Interchanged at the Meeting of the American Iron and Steel Institute—President Gary's Address

(With Supplement.)

The meeting of the American Iron and Steel Institute in New York, Friday, October 14, was the most notable gathering in many respects in the recent history of the steel industry. As was indicated in the preliminary publications concerning the meeting it was given an international aspect by the presence of representatives of the iron and steel industries of Great Britain, Germany, France, Belgium and Austria, whose names have already appeared in these columns. The headquarters of the institute for this meeting were at the Waldorf-Astoria, and Friday morning was given over to the registration of members and guests. The sessions were held in the Myrtle Room of the hotel, and were opened by the president of the institute, Elbert H. Gary, at 11 o'clock. The attendance then numbered about 200, and included representatives of practically every steel company in the country and of many important blast furnace and rolling mill companies. In welcoming the guests and in discussing the objects of the meeting, Judge Gary gave the address, which is given in full elsewhere in this issue.

Co-operation in Foreign Trade

The first paper of the morning was by James A. Farrell, president of the United States Steel Products Export Company, on "Foreign Relations." It dealt specifically with the trade relations existing between iron and steel producers in the United States doing an export business and the producers of similar products in other countries who are also engaged in exporting a part of their product. The discussion, which traversed some familiar ground in dealing with the effects of hostile competition and the benefits of friendly relations between competitors, was participated in by E. C. Felton, president of the Pennsylvania Steel Company, Philadelphia; George W. Perkins, J. P. Morgan & Co., New York; E. Schaltenbrand, chairman of the Stahlwerks Verband, Duesseldorf, Germany; E. A. S. Clarke, president of the Lackawanna Steel Company, New York.

Betterment of Labor Conditions

W. B. Dickson, first vice-president of the United States Steel Corporation, presented a paper on "The Betterment of Labor Conditions in the Steel Industry," which took up particularly questions of accident liability and the organization of the work of safeguarding employees against accidents. The paper also dealt with hours of labor, reiterating Mr. Dickson's views as given in his paper at the May, 1910, meeting of the institute on the matter of seven-day labor.

An intermission for luncheon came after the reading of Mr. Dickson's paper, and at the afternoon session it was discussed by Charles Kirchhoff from the standpoint of the Museum of Safety and Sanitation; by E. S. Cook, president of the Warwick Iron & Steel Company, Pottstown, Pa., who described the work done by his company among its foreign laborers and discussed the question of hours of labor at blast furnaces, and by Edward Bailey, president of the Central Iron & Steel Company, Harrisburg, Pa.

Metallurgical Progress

An interesting paper which represented the technical side of the industry was read by Charles Kirchhoff, entitled "The International Metallurgical Congress of 1910 at Duesseldorf." It is given in full elsewhere. The paper was discussed by E. Schaltenbrand, who was one of the officers of the Duesseldorf Congress, and by Prof. Henry M. Howe. Herr Schaltenbrand, referring to Mr. Kirchhoff's statement that nothing revolutionary had been brought forward in the presentation of present practice in Germany, as made at the Duesseldorf Congress, called attention to the fact that new inventions are always attended by depreciation of existing plants. Furthermore, the progressive movements in steel manufacture are now so far international that no country can furnish any surprises. What is incumbent upon manufacturers is to work out in detail all the economies possible in their processes and in business methods. To that end he hoped that the American Iron and Steel Institute and its aims might make for progress, in harmony with the efforts of the various technical associations. Professor Howe congratulated the institute on the admirable review of progress the paper has presented and on having as a member one so well qualified to make it. He commented on the high plane of all the papers of the day, regarding the developments of the meeting as a striking manifestation of the same spirit which has compelled the creation of the Hague Tribunal.

To Make Steel Contracts Binding

An important paper and one on a subject with which the institute is expected to deal in a practical way was that of Willis L. King, vice-president of the Jones & Laughlin Steel Company, on "Contract Obligations." The question is one that has been referred to repeatedly in these columns, and has been particularly pressed upon the thought of steel manufacturers in the past few years. The condition under which requirement contracts have been made for iron and steel products and the development of practices under which contracts have amounted simply to options to be exercised according to the choice of the buyer were taken up by the speaker and remedies suggested. Mr. King was followed by C. M. Schwab, president of the Bethlehem Steel Company; John A. Topping, president of the Republic Iron & Steel Company; Charles S. Price, president of the Cambria Steel Company; H. P. Bope, vice-president of the Carnegie Steel Company, and E. J. Buffington, president of the Illinois Steel Company. The suggestion came out in the discussion that a committee might well be appointed on this subject to draft standard forms of contract and to consider methods of abating the evils which have grown up under the plan of doing business followed in the past few years.

The papers of Messrs. Dickson, Farrell and King, together with portions of the discussions thereon, will appear in a later issue of *The Iron Age*, after those who contributed to these discussions have had opportunity to revise the stenographic report of their remarks.

THE DINNER

A banquet attended by over 200 members of the institute and guests from other countries, given Friday evening in the grand ballroom of the Waldorf-Astoria, was a function of unusual brilliance. In the accompanying Supplement a view is given of the company after places had been taken.

The programme of after-dinner speaking was pre-

ceded by an interesting series of lantern slides and motion pictures. The slides gave an excellent idea of the stupendous work involved in the building of the steel works and the industrial city of Gary out of the scrub pines and sand dunes on the south shore of Lake Michigan, while the moving pictures showed vividly some of the spectacular processes involved in the manufacture of open hearth steel at Gary and the rolling of ingots into rails. Explanations and comments on the views were given by G. G. Thorp, vice-president of the Indiana Steel Company.

Judge Gary in opening the speaking programme said in part:

This is a momentous occasion. There are represented in this room the principal iron and steel manufacturers of America and also a very large percentage of the manufacturers of iron and steel of foreign countries; and in this day, when competition is so great the world over, when men are contesting for pecuniary success, when rivalry is not only emphatic but often destructive, and many times bitter, we in this room advocate the gospel of peace and good-will. Our creed is the Golden Rule, and we practice what we preach. Many kind things have been said during the day concerning the United States Steel Corporation, and that corporation and its representatives have been generously given much credit; but I assure our friends from abroad that the great success of the United States Steel Corporation is largely dependent on and the result of the friendship and co-operation of other great steel and iron manufacturers in this country (applause). Whenever any question of great importance is to be considered, all the leading iron and steel men of this country cheerfully and promptly recognize any request for consultation and lend their influence and effort to the success of whatever object may be sought to be determined.

Charles M. Schwab was called upon by Judge Gary, and gave a warm welcome to the guests from abroad. He referred to the well-known iron and steel masters from across the water, who had been welcomed to this country when its steel industry was but an infant. There was a time when the mills in Europe and the United States were closed against all visitors; but today happily they are open to all.

The New Era in Industry

Sir John Randles, chairman of the Workington Iron & Steel Company, Workington, England, made the first response for the visitors. He said that while some years ago Britons thought they were capable of running the globe so far as manufactures were concerned, and were disposed to think of Americans as hewers of wood and growers of corn and cotton, they now look with admiration on such production figures as Judge Gary presented in his address of the morning as representing the magnificent genius of the American people in iron and steel manufacture. One of the greatest changes in industry is in the attitude of its leaders. One day men entered upon industrial operations to acquire individual wealth—to "make their pile." To-day, speaking for himself and the amalgamation of industries he represented, he regarded himself as a trustee for the workers, in whatever capacity, and for every person who has put his savings into the industry. A change has come, also, in the attitude of manufacturers toward their competitors. The effort is now made to advance on lines of mutual understanding and to abandon the cut-throat or piratical policy. Concluding he said:

It has been the custom in our industries, when we meet, to discuss scientific and technical improvements. These are of value and of great importance, but it is always of value to remember that there is a commercial side which has to do with the market, which must take account of geography, which must take account of financial and even political considerations. All of these things will be attended to and thought of, I take it, by those who represent you in your great industry and by those of us across the sea who see in this new era possibilities in friendly co-operation which $17 steel cannot accomplish. We talk about the time of $17 rails, and you may do so if you like, but what does it mean? It means that when that policy of $17 rails was inaugurated it represented more misery than was caused by the bloodiest battle. It meant an industrial army laid aside and the workers deprived of their sustenance. It meant loss of industry that ought to have been maintained. It meant disaster worse than war. It was war in commerce and a régime which could not prevail. . . . There is no consideration too small to take into account in the development of markets and in the promotion of our common interests, so long as we do not overlap where we have no need to, so long as we do not conflict where we have no conflict. I believe our gatherings together in this manner will stop the destruction caused by the juggernaut of cheapness which strikes at the happiness of thousands of our fellows.

Competition a Natural Law, But Needing Limits

Baron von Bodenhausen turned somewhat the current of thought of the meeting in saying that there are some things about competition that are not as bad as they may seem. One thing is quite certain, and that is that none of the great countries represented in the meeting would have won the standing it now has except that through competition it grew and developed, acquired health and strength, using its forces—its brains and its elbows—to fight its way through. He thought the laws in the United States, which prevent abolishing competition altogether, are healthy ones, being based on the very principles of Nature. Yet there are limits to such restrictions by law, limits beyond which such a law might become a curse. Nature may be depended on to suggest where to draw the line. In the growth of forest trees it must happen that some of the weaker ones will be turned down and overcome; but Nature never allows one tree to overcome them all. So the development of the strength of unit in industry must be with due regard to the strength of the community.

Taking up the question practically the speaker said that when business is declining it is difficult to know what one's competitors are doing. The great damage to the market is less from what one seller or his competitor is doing than from what one is told his competitor is doing. It is, therefore, necessary to know one's competitor, to be friendly with him and know what he is about. It is generally accepted that to know one's customers personally means half of his success; the speaker would say that to know competitors personally means the other half of business success. To have come together as the American and European manufacturers have done at this meeting would keep their competition sound and on a high level and within reasonable and natural limits. In concluding he referred to the tribute paid Judge Gary by his fellow steel manufacturers one year ago as the greatest honor ever bestowed upon a man by his competitors.

An International Commercial Institute Suggested

Wilhelm Kaestranek, who was on the programme for the next response, was detained by illness. G. Scaby-Smith, managing director of Bolckow, Vaughan & Co., Ltd., Middlesbrough, England, was introduced, and referred to his visit in the early eighteen-eighties. Even at that time he and his associates were amazed at the rapid strides the American steel industry was making. On the question of friendly relations between steel manufacturers of the various countries, he said:

I understand your institute concerns itself more immediately with commercial questions. Our past intercourse with you has, I think, proved to us all that it is to our mutual advantage to meet and discuss these problems, which are of equal or greater importance than technical experiences. By doing this we not only enable the producer to have the advantage of the experience of the best appointed works, but we are able to exchange such information as to supply and demand as to prevent overproduction or undesirable scarcity, and hence possibly inflated prices. So far as the gentlemen present from England are able to represent the English views, I believe we are in accord with the idea that arrangements of this character are to the advantage of all. We have come here to learn and be instructed, and I trust that the result of our visit may be to draw us into closer relationship with you.

President Farrell will, I think, bear me out when I say that the European makers are generally prepared to take a reasonable view on all questions affecting their commercial

interests, and, on the other hand, I may say that we have always found the American equally reasonable. We hope that the bond of union inaugurated by the birth of your American Iron and Steel Institute will continue to exist and to extend. Possibly in the near future these gatherings may prove the need of an international iron and steel institute, at which the discussion of commercial and technical questions may be a feature. I am sure that a policy of friendly conference for the exchange of views and experience on such matters can do much to remove the sharpness of undue competition.

L. Spaak, representing the Belgian guests, expressed the hope that the New York meeting, by permitting of a comparison of views on commercial and technical questions, would make those participating in it better acquainted—all with a view to the promotion of amicable international relations and mutual cooperation. The new policy of reciprocal confidence which Judge Gary has brought into the steel industry has proved satisfactory in every direction. There is practically no situation in industry, as in other diplomatic relations, which cannot be solved by the application of this principle. The example set in the United States will be followed in time to come by all business men fully alive to their duty and competitors will learn not to look upon each other as enemies.

R. de Labriolle, speaking for the French representatives, spoke appreciatively of the good results likely to come from such an occasion, and paid a tribute to the foresight with which the affairs of the American Iron and Steel Institute are guided by its president.

E. Schaltenbrand, chairman of the German Steel Syndicate, responded happily in lighter vein, suggesting that as one result of his brief sojourn in New York he had almost made up his mind to open an office there and sell steel the rest of his life.

Wm. B. Peat, the last speaker, responded particularly for Great Britain as the source of some of the strains that had entered potently into American life. He enlarged eloquently upon what had been achieved here by the sons of those who had come over the sea and of their heritage of sound constitutions, healthy intelligence and indomitable perseverance. On the question to which the meeting gave prominence he said: "Unbridled rivalry in commerce unaccompanied by the courtesy of frequent conferences yields as its fruit bitterness between nations and unreasoning jealousy between individuals. We are here as comrades for the good of common industry and to foster friendship begun under such excellent auspices. The day is past when a policy of cut-throat competition is the best either for a country or for individuals. The day has arrived when good feeling between those engaged in competitive commerce will smooth over difficulties which may otherwise prove to be unsurmountable."

EXCURSIONS

The first of the trips for inspection and the gathering of information concerning engineering and industrial operations was a tour of New York harbor. Members of the Institute and their foreign guests took the steamer Commodore at the New York Central's Pier 83, North River, near the foot of Forty-second street, Saturday morning at 11 o'clock. Going down the river the first stop was made at Ellis Island. Here the party landed, and spent some time in going about the United States Immigrant Station and in seeing the procedure followed in passing upon newly arrived immigrants. The course from Ellis Island was down New York Bay to Staten Island and into the Kill von Kull to Newark Bay. Returning by the same passage the boat proceeded to the Narrows, and thence along the Long Island shore of New York Bay to the Bush Terminal. A landing was made here for the inspection of the terminal. Thence the course was along the Brooklyn water front to the United States Navy Yard, then up the East River through Hell Gate into Long Island Sound. Turning back, the course was through the Harlem River and the ship canal to the Hudson River at Spuyten Duyvil, and down the Hudson to the starting point at Pier 83.

The special train for the tour to Buffalo, Gary, Chicago, Pittsburgh and Washington, as heretofore outlined, was taken at the Grand Central Depot Sunday evening, October 16. About 50 members of the Institute went on this excursion, making, with their guests, a party of 75.

Attendants at the Dinner

H. E. Andrews, Col. Sir Charles Allen, John W. Alexander, M. Cochrane Armour.

Joseph G. Butler, Jr., William L. Brown, Frank Baackes, Oliver A. Blackburn, E. J. Buffington, Edward Bailey, Hon. Charles Brooker, John Penn Brock, D. Fairfax Bush, Henry N. Brinsmade, James A. Burden, Fayette T. Brown, Michael Blake, George Bartol, Robert Bentley, Raynal C. Bolling, T. J. Bray, Frank Billings, John G. Batcheller, Horace A. Beale, Jr., Lowell H. Brown, Robert E. Brooke, H. P. Bope.

Clyde M. Carr, John B. Carse, L. E. Cochran, P. N. Cunningham, E. A. S. Clarke, Hiram S. Chamberlain, E. S. Cook, Otis H. Cutler, Bertrand D. Coleman, Theron I. Crane, George G. Crawford, J. J. Campbell, H. H. Cook, W. B. Crawford, Charles C. Cluff.

F. H. Daniels, William H. Donner, T. J. Drummond, W. B. Dickson, Charles Deering, Philip S. Dyer, George F. Downs, James H. Dempsey, H. G. Dalton, Edmund W. Dwight, Thomas Devlin.

Joseph Ellis, R. H. Edmonds, F. H. Eaton, J. S. Elverson.

Alvin I. Findley, E. C. Felton, J. A. Farrell, W. W. Finley, William E. Farrell, Henry S. Fleming, J. W. Fuller, Jr., Lewis W. Francis, B. F. Fackenthal, Jr., Arthur A. Fowler, W. J. Filbert, Joseph H. Frantz, W. K. Fleming, Thomas J. Foster.

Elbert H. Gary, James Gayley, Tracy W. Guthrie, E. G. Grace.

O. N. Hutchinson, Harry E. Higgins, A. F. Huston, F. Hill, Dr. Eugen Herz, Prof. Henry M. Howe, F. Harlinghausen, W. T. Hildrup, Jr., George E. Holton, J. H. Hoyt, Edward M. Hagar, Frank Hitchcock.

Robert L. Ireland.

Jonathan R. Jones, W. L. Jones, Archibald Johnston, Joseph W. Jeffrey, Harry R. Jones, Alexander Jarecki.

Severn P. Ker, Frank G. Kennedy, Jr., Charles Kirchhoff, Willis L. King, Julian Kennedy, H. C. Kamp, David G. Kerr, I. A. Kelley, Thomas W. Kennedy, Fred Krebs.

R. de Labriolle.

Charles L. Miller, Charles F. Miller, Clinton S. Marshall, George F. McKay, Edmund W. Mudge, Thos. McDonald, F. W. Manson, E. F. Marston, George G. McMurtry, Cyrus H. McCormick, Alfred M. Mosscrop, Robert Mather, John Mitchell, C. H. McCullough, Jr., Daniel B. Meacham, Francis C. McMath, Charles MacVeagh, George Mesta, V. Mumford Moore.

Benjamin Nicoll.

Edwin N. Ohl, John O'Connor, Rudolph Ortmann, Edward O'Toole.

John O. Pew, Charles S. Price, William B. Peat, Charles P. Perin, George W. Perkins, Leonard Peckitt, Veryl Preston, Jay Morse Pickands, John A. Penton, Herbert F. Perkins.

W. A. Rogers, David Reeves, Wallace H. Rowe, G. Mure Ritchie, Sir John S. Randles, Charles F. Rand, R. W. Raymond, James H. Reed, John R. Russell, John V. W. Reynders, J. Leonard Replogle, Franklin B. Richards, C. Snelling Robinson, Theodore W. Robinson, Willis J. Root, Charles R. Robinson, John Reis.

Edward Shearson, William B. Schiller, Cameron C. Smith, Isaac M. Scott, E. Schaltenbrand, G. Scoby-Smith, Powell Stackhouse, Charles M. Schwab, L. Spaak, James Speyer, Carl Steven, T. Scott Smith, Harry J. Steel, Jr., James S. Stillman, William Durham Sargent, Arthur J. Singer, Charles J. Singer, Samuel B. Sheldon, Lewis A. Shepard, Richard B. Sheridan, Frank Samuel.

A. W. Thompson, T. Frame Thomson, E. Tonneau, John A. Topping, John M. Taylor, William H. Taylor, Moses Taylor, George G. Thorp, Rodney Thayer, W. A. Thomas.

J. Van Hoegaerden, Dr. Hugo von Noot, E. von Bodenhausen.

Walter Wood, Walter H. Whiteside, Ernest T. Weir, W. R. Walker, Edward H. Worth, W. P. Worth, P. A. B. Widener, W. L. Ward, George W. Watts, F. W. Wood, James C. Wallace, Charles P. Wheeler, George B. Wick, Hartley C. Wolle, E. C. Wallace.

E. M. Zehnder, Charles H. Zehnder, G. Zapf.

INCIDENTS OF THE TOUR

CHICAGO, October 18, 1910.—The special train which left the Grand Central Station, New York, Sunday evening, bearing members of the American Iron and Steel Institute and their European guests, is considered the best appointed train ever sent out by the New York Central lines. It consists of seven compartment sleeping cars, one ordinary sleeper, two private cars, a buffet and smoker, an observation car, a diner and a baggage car. Schedule time was made to Buffalo, and the train was run upon a siding at the Lackawanna Steel Company's plant.

At 9 o'clock Monday morning a train of gondola cars provided with improvised seats took the party over the South Buffalo Railway Company's lines for an in-

spection of the steel works, visiting the by-product coke ovens first, and then, in turn, the gas engine blowing and power houses, rail mill and sheet bar mill. Four out of the seven blast furnaces were in operation. After two hours at the steel works automobiles were taken for a sightseeing trip through Buffalo, ending near the Black Rock Harbor improvements and barge canal lock, which will extend the water front available for lake vessels very considerably, giving a deep water channel in the Niagara River up to North Tonawanda, where the State's construction work on the barge canal ends.

Shortly after noon the special train started for Niagara Falls and the afternoon was spent in inspection of the turbine and electric generator plants on the Canadian and American sides which will have, after the installation of additional machinery now going in, a total of 479,000 hp. The trip through the gorge ended the day's sightseeing and the train left at 5.30 for Gary. The inspection of the Gary plant began at 9 o'clock Tuesday morning and was followed by an automobile ride through the town. The early afternoon was spent at the South Chicago works of the Illinois Steel Company and about 5 o'clock the special train reached the Twelfth street station, Chicago.

To-night a banquet is given at the Blackstone Hotel where the party will pass the night. Wednesday will also be spent in and around Chicago, Thursday and Friday at Pittsburgh and Saturday at Washington.

Personal

A. Campion has resigned the position of secretary of the West of Scotland Iron and Steel Institute, Glasgow, and Ronald G. Jenkins, 124 St. Vincent street, Glasgow, has been appointed to fill the vacancy.

Major John M. Carson, chief of the Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C., sailed for Europe October 13, commissioned by President Taft to straighten out some of the tangles which now interfere with the growth of our exports.

Marcus A. Coolidge, president of the Fitchburg Machine Works, and John Bath of the Bath Grinder Company, both of Fitchburg, Mass., sailed last Saturday for Europe, where they will remain for some time on business for their companies.

Charles Adams, who was formerly superintendent of the Everitt-Metzger-Flanders Company's factory at Port Huron, Mich., has been made manager of production for all of the company's plants.

Rex E. Stafford, who has represented the Allis-Chalmers Company, with headquarters at Buffalo, recently severed that connection to become manager of the Long Grate Bar Company, Buffalo, N. Y.

Chas. S. Buell, who has been identified with some of the largest machinery manufacturers of the country as sales engineer, is now manager in Chicago for the Chandler-Taylor Company, with offices in the Western Union Building.

John O'Brien has resigned as night superintendent of the Mahoning Valley Works of the Republic Iron & Steel Company at Youngstown, Ohio, to become superintendent of the Manitoba Rolling Mills, Winnipeg, Manitoba.

Hugh D. Knox, New Castle, Pa., formerly connected with the Carnegie Steel Company, has been appointed chief chemist of the blast furnace plant of the Lackawanna Steel Company, Buffalo, N. Y.

R H. Wolff, representative for the United States of the Heroult electric furnace, arrived in New York on Sunday from a sojourn in Europe of several months.

Several names have recently been added to the list of honorary members of the American Iron and Steel Institute and it now contains the following: J. Pierpont Morgan, New York City; James M. Swank, general manager American Iron and Steel Association, Philadelphia, Pa.; John Fritz, South Bethlehem, Pa.; Henry M. Howe, New York; Robert Forsyth, Chicago.

G. H. Duthie, formerly a foundryman and machine shop owner and manager, has accepted a position with the Thomas D. Prosser Company, Schmulbach Building, Wheeling, W. Va., and will travel throughout contiguous territory in the sale of its lines, which include pig iron, coke, &c.

Eli Joseph, president of the Joseph Joseph & Bros. Company, New York, has returned from Europe after an absence of several months.

E. R. Evinger, formerly with the National Automatic Tool Company, Richmond, Ind., has accepted the position of superintendent of the Miami Valley Machine Tool Company, Dayton, Ohio.

W. H. Cameron, chief engineer of the Willys-Overland Company, Toledo, Ohio, will sail for London, October 19, to attend the Olympia Show. While abroad he will tour the Continent for a month, visiting various automobile factories, and investigating foreign motor conditions generally.

James A. Campbell, president of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has been elected a member of the Board of Directors of the Lackawanna Steel Company, Buffalo, N. Y. The position also carries with it a place on the Advisory Board of the company.

John Woodward, general manager of the Leetonia Boiler Company, Leetonia, O., has resigned to accept the position of general manager of the Tulsa Boiler & Mfg. Company, Tulsa, Okla.

Press reports to the effect that John Warner and William Ward, formerly owners of the Empire Iron & Steel Company, sold out some months ago to the Garry Iron & Steel Company, also of Youngstown, would build a sheet mill between Struthers and Lowellville, Ohio, are officially denied by John Warner. Neither he nor Mr. Ward contemplates entering the sheet business again in the near future. Reports that the Ohio Iron & Steel Company, operating the Mary Furnace at Lowellville, Ohio, would shortly start the erection of an open hearth steel plant to roll billets, sheet and tin bars, are also untrue. Some months ago the Ohio Iron & Steel Company went into the matter of building an open hearth plant, but, owing to the high cost of materials and the long delays in delivery of machinery, the project was given up for the time being.

A charter has been granted the Reliance Steel Casting Company, Pittsburgh, with a capital of $200,000. The incorporators are Joseph A. Kelly, Pittsburgh; Charles Bailey, Oakmont, Pa., and E. A. Blasdell, Tarentum, Pa. This concern recently took over the plant of the Scaife Foundry & Machine Company, Pittsburgh. A 15-ton open hearth steel furnace has been installed, and the company will engage in the manufacture of a general line of steel castings.

Effective October 17, the wire and wire nail mills of the American Steel & Wire Company, at South Sharon, Pa., which heretofore have been under the jurisdiction of the Cleveland district office of that concern, will now be managed and the product sold from the Pittsburgh district office, located in the Frick Building and in charge of W. L. Hirsch, sales manager.

Maine has joined the list of steel-making States. The Portland Iron & Steel Company, at Portland, began the erection of a 25-gross-ton basic open-hearth furnace in 1909 and completed it last spring. Steel merchant bars and bars for reinforced concrete work are rolled.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct.19, 1910.	Oct.12, 1910.	Sept.21, 1910.	Oct.20, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$15.75*	$15.75	$16.00	$18.75
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	18.25
Foundry No. 2, local, Chicago..	*16.00*	16.00	16.25	19.00
Basic, delivered, eastern Pa....	15.00	15.00	15.00	18.50
Basic, Valley furnace.....	*13.00*	13.10	13.50	17.00
Bessemer, Pittsburgh.....	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh.....	14.15	14.15	14.15	17.15
Lake Superior charcoal, Chicago	*18.00*	18.25	18.25	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh....	*23.50*	24.00	24.50	27.00
Forging billets, Pittsburgh.....	29.00	29.00	29.00	30.00
Open hearth billets, Philadelphia	*26.00*	26.00	26.50	28.60
Wire rods, Pittsburgh.....	**28.50**	28.50	28.00	32.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago....	13.50	13.50	13.50	18.00
Steel rails, melting, Philadelphia	*13.75*	13.75	14.00	18.00
Iron rails, Chicago.....	16.00	16.00	16.00	20.50
Iron rails, Philadelphia.....	18.00	18.00	18.00	21.00
Car wheels, Chicago.....	14.00	14.00	14.00	18.25
Car wheels, Philadelphia.....	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh..	*14.25*	14.25	14.50	18.00
Heavy steel scrap, Chicago.....	12.25	12.25	12.25	16.50
Heavy steel scrap, Philadelphia.	*13.75*	13.75	14.00	18.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.	1.40	1.40	1.40	1.60
Common iron bars, Chicago....	*1.35*	1.35	1.37½	1.55
Common iron bars, Pittsburgh..	1.45	1.45	1.45	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.71
Steel bars, Pittsburgh.....	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh.....	1.40	1.40	1.40	1.50
Beams, tidewater, New York...	1.56	1.56	1.56	1.66
Beams, Pittsburgh.....	1.40	1.40	1.40	1.50
Angles, tidewater, New York...	1.56	1.56	1.56	1.66
Angles, Pittsburgh.....	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh.	*1.30*	1.40	1.40	1.45
Skelp, sheared steel, Pittsburgh.	*1.40*	1.50	1.50	1.55
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	**2.20**	2.20	2.15	2.30
Wire nails, Pittsburgh*.....	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh.....	1.65	1.65	1.65	1.80
Barb wire, galv., Pittsburgh*...	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	**12.87½**	12.87½	12.75	13.00
Electrolytic copper, New York..	**12.80**	12.75	12.50	12.75
Spelter, New York.....	5.60	5.60	5.60	6.25
Spelter, St. Louis.....	5.45	5.45	5.45	6.10
Lead, New York.....	4.40	4.40	4.40	4.40
Lead, St. Louis.....	*4.27½*	4.27½	4.30	4.25
Tin, New York.....	**37.62½**	....	34.55	30.40
Antimony, Hallett, New York...	*7.75*	7.87½	7.87½	8.25
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York...	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala, 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 15 and 16, 1.95c.; Nos. 17 and 21, 2c.; Nos. 22 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.20c. to 3.25c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld } Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.

2, 2½ to 4 in. Lap Weld }

THE IRON AND METAL MARKETS

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, October 19, 1910.—(*By Telegraph.*)

Pig Iron.—The largest sale of the week is one to a local consumer of 9000 tons of malleable Bessemer iron, deliveries being 750 tons a month over all of next year, at about $14, Valley furnace, or $14.90, Pittsburgh. The price is low, observing that deliveries run through the whole of next year, but it is stated that there were special reasons for taking the business. Bessemer iron is neglected, but several lots of basic, ranging from 1000 to 2000 tons, have been sold for delivery over the remainder of this year and into first quarter. We also note a sale of 2000 tons of foundry iron for November and December delivery at $14, Valley furnace. The nominal price of Bessemer is $15, with no business offering; basic is $13; No. 2 foundry about $14 and gray forge about $13.25, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—The whole steel market is weak. Bessemer billets have been offered at $23.50, Pittsburgh, and declined. We quote Bessemer 4 x 4 in. billets at $23.50 to $24; open hearth 4 x 4 in. billets, nominally, $24.50 to $25; Bessemer and open hearth sheet and tin plate bars, $25; forging billets, $29 to $29.50, all f.o.b. cars, Pittsburgh, Youngstown or Wheeling district. Not enough new business is being offered in steel to test prices.

(*By Mail.*)

The new warehouses of the Carnegie Steel Company, at Twelfth and Pike streets, in this city, are about completed, and the company now has a number of salesmen covering the territory in the Pittsburgh district soliciting orders for plates, shapes, bars and other finished materials. The company also maintains similar warehouses at Waverly, N. J., St. Louis and Chicago. The general situation in the iron trade continues very quiet, with consumers placing orders only for such material as they absolutely need for current requirements, or to maintain complete stocks. Faith in the immediate future seems to be lacking, and there is, apparently, a feeling that an open market may come at any time, which would mean lower prices on nearly all lines of finished material than are now ruling. During the week basic iron declined squarely to $13, Valley furnace, and several sales have been made at that price. There is very little new demand for Bessemer, with the market nominally $15, Valley furnace, and a probability that lower prices would be made if any business were offering. The steel market is weak, and a recent sale of upward of 40,000 tons of 4 x 4 in. Bessemer rod billets by a Valley steel interest to an Indiana wire concern is exciting some comment in the trade. New orders and specifications for finished material in the first half of October were about the same as during the same period in September, but on wire products and sheets, also pipe, there has been a slight gain. The market on ferroalloys is weak and 80 per cent. foreign ferromanganese has sold at very close to $38, Baltimore, for first half of the year delivery. There is some inquiry out for foundry coke for next year delivery, and the Baltimore & Ohio Railroad has bought a round tonnage. The scrap trade is slow, with prices weak and inclined to lower values.

Ferromanganese.—The low prices ruling on foreign 80 per cent. ferromanganese are attractive to consumers and a fair amount of inquiry has come out in the past week. We note a sale of about 1500 tons of foreign 80 per cent., deliveries extending through first half of next year, on the basis of about $38.50, Baltimore, and a sale of 300 tons for similar delivery at the same price. There is not much inquiry for prompt shipment, consumers being pretty well covered for remainder of this year. We quote 80 per cent. foreign ferro at $38.50 to $39. Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—In spite of the low prices ruling for ferrosilicon, inquiry is light, and not much material is being sold. For prompt delivery, ferrosilicon is somewhat scarce and brings fully $1 a ton more than for forward delivery. We note a sale of a carload, or about 25 tons, of 50 per cent., for prompt shipment, at about $56.50, delivered, Pittsburgh. We quote 50 per cent. ferrosilicon for forward delivery at $54.50 to $55, Pittsburgh. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—The recent readjustment of discounts on iron and steel pipe to a lower basis is reflected in the skelp market, prices on which have gone off to some extent and are ruling lower in this market than for some months. We note sales of about 2500 tons of grooved steel skelp and about 3500 tons of sheared steel skelp at the lowest prices reached in this market for some time. Revised price quotations are as follows: Grooved steel skelp, 1.30c. to 1.35c.; sheared steel skelp, 1.40c. to 1.45c.; grooved iron skelp, 1.65c. to 1.70c., and sheared iron skelp, 1.75c. to 1.80c., all f.o.b. Pittsburgh, usual terms. It is stated that grooved steel skelp has recently been offered within $3 a ton as low as prices asked for Bessemer 4 x 4 in. billets.

Rods.—The larger consumers of rods are pretty well covered, new inquiry being light and mostly in small lots for prompt shipment. The market is firmer than for some time and we quote Bessemer, open hearth and chain rods at $28.50, Pittsburgh.

Muck Bar.—The Lockhart Iron & Steel Company, operating a muck bar mill at McKees Rocks, Pa., has signed the Sons of Vulcan puddling scale and its muck bar mill has started up. There is still a great scarcity of best grades of muck bar rolled from all pig iron, and very high prices are being obtained. One leading producer has sold in the past two or three weeks 3500 tons of strictly high-grade muck bar, made from all pig iron, on the basis of $31 to $31.50, Pittsburgh. Some Eastern muck bar, made from part scrap, is being offered in this market at $29 to $29.50. We quote best grades of muck bar made from all pig iron at $31 to $31.50, Pittsburgh.

Steel Rails.—No orders of moment have been placed for standard sections, and new orders for light rails in the past week were somewhat lighter than in any one week for some time, the Carnegie Steel Company having taken only about 2500 tons. Export orders for rails are coming in quite freely and a good part of the tonnage rolled at Edgar Thomson Rail Mills of the Carnegie Steel Company is for export trade. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—Nothing definite has been heard regarding the letting of the contract for the Quebec bridge, and the contract for the Long Island Railroad elevated work has not yet been placed. The American Bridge Company has taken a bridge for the Pennsylvania Railroad east of this city, about 1200 tons. Specifications are expected in a few days for the Williamette River work in Oregon. A good deal of new work is known to be under way, but is being held up, and much of it will likely go over until next year. We continue to quote beams and channels up to 15-in. at 1.40c. in large lots and 1.45c. in small lots, f.o.b. Pittsburgh.

Plates.—Nothing further has been heard in regard to the reported inquiry of the Pennsylvania Railroad for 8000 to 10,000 steel cars; the inquiry has not reached the local steel car builders. There has been a dearth of car orders for some time, and all the leading steel car interests are cleaning up work on their books pretty fast. The Woods Run plant of the Pressed Steel Car Company will likely shut down about November 1, but the company has about enough orders to run the McKees Rocks works fairly full to February 1. The contract for the 2500 tons of plates for the new gas holder at Kansas City has not yet been placed. The whole plate trade is very dull and all the mills are badly in need of work. The local market on ¼-in. and

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heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

Sheets.—The sheet trade is showing some betterment in the amount of new orders being placed and specifications are also reported as coming in a little more freely. Some of the sheet mills have entered some good sized contracts for delivery as far ahead as in the first quarter of next year. The market is based on 2.20c. for No. 28 black and 3.20c. for No. 28 galvanized, most of the tonnage recently entered being at these prices. Corrugated roofing sheets are $1.60 and galvanized $2.80 per square on No. 28 gauge, 2½-in. corrugations. The schedule of prices on black and galvanized and on roofing sheets is printed on a previous page.

Tin Plate.—Not much new business is being placed, this being the off season in the tin plate trade, but the mills are pretty comfortably filled through the first quarter of next year, and consumers are specifying fairly well against contracts, except in two or three sections, where specifications have fallen off and in some cases have been held up entirely. The market is firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Specifications against contracts on soft steel bars so far this month have been fairly good. New orders, however, are light and mostly in small lots. Low prices on iron bars are ruling in Chicago and other Western points, and in a good many cases some former consumers of steel bars are now using iron bars on account of the lower cost. The volume of new orders in iron bars is light, the railroads placing very little new business and not specifying very freely against contracts. We continue to quote soft steel bars at 1.40c. in large lots and common iron bars, 1.45c., Pittsburgh.

Spelter.—The market is firmer and prime grades of Western spelter are firm to-day at 5.40c. to 5.42½c., East St. Louis, equal to 5.52½c. and 5.55c., Pittsburgh. A sale of 50 tons is reported to a local consumer at 5.40c., East St. Louis.

Hoops and Bands.—A moderate volume of new orders is being placed and specifications against contracts so far this month have shown an increase over the same period in September. Prices are quite firm and we quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

Cotton Ties.—We quote the market at 77c. per bundle for October shipment and 77½c. for November delivery.

Spikes.—New orders are very dull, the railroads only buying small lots of spikes needed for repair work. The volume of orders in small railroad and boat spikes is only fair, and all the spike mills are badly in need of orders. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—Consumers continue to place orders only for such quantities as are needed for actual wants and are not buying ahead. Regular prices are 1.90c. on structural rivets and 2c. on boiler rivets, but are shaded.

Shafting.—New demand is light and specifications against contracts have been unsatisfactory to the mills for some time, especially for the automobile and implement trades. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—There is a more active new demand for wire nails than for some time and specifications against contracts are coming in at a very good rate. The Youngstown Sheet & Tube Company has started its wire nail mill at East Youngstown on double turn. Demand for cut nails is slightly better and prices are firmer.

Merchant Pipe.—The volume of new business in merchant pipe so far this month has been quite satisfactory, and the leading pipe mills report that they are pretty comfortably filled with business for some time ahead. Jobbers and consumers are taking in larger quantities of pipe and bookings of the mills in October will likely show a good increase over last month. The new discounts on both iron and steel pipe are printed in full on a previous page.

Boiler Tubes.—Some good sized orders for railroad tubes are being placed, but demand for merchant tubes is very dull and has been all this year.

Coke.—The Baltimore & Ohio Railroad has placed a contract for 15,000 to 20,000 tons of foundry coke with the Sackett Coal & Coke Company, deliveries running over first half of next year. There is some inquiry in the market for foundry coke for first half of next year. Output of coke in the Upper and Lower Connellsville regions last week was 350,315 tons, an increase over the previous week of about 5000 tons. We quote standard grades of blast furnace coke for spot shipment at $1.60 to $1.65 and for delivery over the remainder of this year at $1.70 to $1.75 per net ton, at oven. Standard makes of 72-hour foundry coke for spot shipment are held at $2.15 to $2.25 to consumers, and for delivery over the remainder of this year and into the first half of next year $2.25 to $2.50 per net ton, at oven, are being quoted.

Iron and Steel Scrap.—There is not much material moving from dealers to consumers, the latter buying only such quantities of scrap as are necessary to cover actual needs, not being satisfied that even present low prices will be maintained. The very low prices ruling on pig iron have a sympathetic effect on scrap, as a good many concerns are now using more basic iron than formerly, because of the low prices at which it can be obtained. Dealers state that while they are selling a fair tonnage to consumers, prices have reached such a low point that there is very little profit in these sales. The scrap list of the Norfolk & Western Railroad closes to-day (Tuesday), but very little of the scrap offered by this road finds its way into the Pittsburgh district. Prices on bundled sheet scrap, low phosphorus melting stock, cast iron borings and machine shop turnings are weak, and quotations on these grades are slightly reduced. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.75 to 14.00
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	10.00 to 10.25
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	12.00 to 12.25
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.25 to 14.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.50 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00
Heavy steel axle turnings	9.75 to 10.00

We note sales of scrap as follows: 500 tons of No. 1 heavy steel scrap for Steubenville, Ohio, delivery at $14.40; 500 tons for Monessen, Pa., delivery at the same price; 1000 tons of cast iron borings at $8, Pittsburgh; 200 tons of heavy steel axle turnings at $9.80, Pittsburgh, and 800 tons of turnings at $8.25, Pittsburgh.

P. G. Jenks and William Wieman, who have been identified for some time with Banning, Cooper & Co., Ltd., dealers in pig iron and coke, with offices on the fourteenth floor of the Oliver Building, Pittsburgh, have been admitted as members of that company, effective October 17. Mr. Jenks will be treasurer and Mr. Wieman, secretary. S. G. Cooper is president and C. F. Banning is chairman.

Chicago

FISHER BUILDING, October 19, 1910.—(*By Telegraph.*)

The great controversy over freight rates which has disturbed the market for several months appears to have been settled. It is reported on good authority that an understanding has been reached between the railroads and representatives of public interests, with the approval of perhaps a majority of the shipping interests directly involved, in accordance with which the Interstate Commerce Commission will grant the railroads a liberal compromise. Announcement of final settlement is not expected for some time, as the thousands of tariffs which involve advances in rates, both in Eastern and Western territory, have been suspended until February 1. The understanding evidently reached is practically a settlement out of court, which is not unusual in litigation involving such large interests. It is conceded by representatives of the shipping interests that this statement of the case is substantially correct. An important Western road which suspended deliveries last summer on 23,000 tons of rails has now ordered prompt shipment, and will resume extensions and development work which was stopped when the controversy began. An Eastern road is in the market for 30,000 tons of rails for prompt shipment, and other developments in this line are expected in the near future. The general market, however, shows no increased activity. New business last week was light in nearly all

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lines of finished materials. Prices are firmly maintained by all the important mills, especially those which hold a large share of yearly contracts for bars. The plate mills are nearing the end of the business on their books, but it is expected that the large corn crop and other conditions will soon bring in liberal orders for cars from Western roads. Enough business to fill all the structural mills for months is pending in the building field, if the projectors of new buildings in the Western cities could finance their plans.

Pig Iron.—Interest in the pig iron market for the last month has been confined to a few large transactions in Northern iron which has gradually weakened under the pressure of buying interests and has been quoted lower recently than at any time since 1904. Last week, however, no important transactions are reported in this territory. It is understood that the leading radiator interest has closed for a large tonnage of local Northern iron, deliveries at Detroit, Buffalo and other Eastern plants. A considerable tonnage of high phosphorus Northern iron has been purchased at a lower price than the cost of Southern iron. It is understood that over 20,000 tons of Northern iron has been purchased by this interest for deliveries from December to March. The local demand for Northern iron is running in small lots for current delivery. The market for Southern iron remains very quiet. One sale of 1500 tons has been made for first half to a Milwaukee buyer, and a few other transactions have been closed. For the present Southern iron is under a handicap in this market, as the foundries can mix Northern iron and scrap at a lower cost. Although the beginning of the new year is practically only two months away, neither the Southern furnace interests nor the buyers in this territory appear anxious to contract for first quarter until more definite information is available in the financial world. The scrap market has been weak for the past month, in line with condition of the pig iron market. The following quotations are for October, November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The market is quiet, with only occasional inquiries for small lots. The ruling price of open hearth forging billets on small orders is $28, base, Chicago.

Rails and Track Supplies.—A leading Western railroad system, whose officials have been very active in the rate controversy, held up shipments last summer of 23,000 tons of rails, as well as a large tonnage of track supplies. This railroad has now given specifications for shipment of the suspended tonnage, both of rails and track fastenings, and it is expected that other Western roads will soon be in the market with good inquiries. An Eastern trunk line has inquired for 30,000 tons of rails, with the prospect that one-half of this tonnage, or possibly a larger share, will be open hearth rails from the Gary mill, for immediate or early shipment. A number of small orders were taken last week by Chicago mills, amounting to about 5000 tons. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—Only two important contracts were reported closed in the West last week. One was for 1350 tons for shops of the Western Electric Company, at Hawthorn (Chicago), which went to Vierling, McDowell & Co. The other was for 500 tons for the Monroe street bridge, at Spokane, Wash., which was taken by the King Bridge Company, Cleveland, Ohio. The amount of fabricated work in prospect is increasing steadily. The Oregon Trunk Railway will need 2000 tons of bridge work in the near future for its new road in Oregon. The sanitary district of Chicago will be in the market soon for about 3000 tons of bridge work for four bridges across the Chicago River in the heart of the city. There are to be 200-ft. bridges to replace old ones of a shorter span, the sanitary trustees having decided to widen the river to 200 ft. between Van Buren and Adams streets. The leading mills are holding a firm price on plain material, although 1.35c., Pittsburgh, is still heard of from outside mills on light sections. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The sales managers of the plate mills are encouraged by the fact that new inquiries are appearing in the market for cars, all from Eastern roads thus far. The Boston & Maine wants 500 box cars, the Norfolk & Western 500 hoppers and the Delaware, Lackawanna & Western 500 box cars and 500 hoppers. It is expected that the enormous crop which has matured in the West will soon force the Western roads into the market with liberal inquiries for cars. Meantime, prices remain unchanged on plates, with a few Eastern mills quoting 1.35c., Pittsburgh, on narrow sizes. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—There is a fair amount of new business, especially in open hearth sheets, and prices are reported firm. The new differentials on galvanized sheets have encountered less opposition among buyers than was generally expected. In a few cases there have been objections, but not of sufficient force to change the situation. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—New business has been light the past week in all branches of the bar market. Specifications are very satisfactory on agricultural contracts, but the demand from other sources is not conspicuous at the present time. Bar iron is dull and there has been no material increase thus far in railroad buying. The demand for hard steel bars keeps the mills going, but does not accumulate business on the order books. In a few cases outside mills have sold soft steel bars on the basis of 1.35c., Pittsburgh, but the principal mills in the bar trade are holding firm at 1.40c. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—The wire trade continues one of the bright spots in a dull market. Specifications during the first half of October are fully equal to the average for September, which was a very satisfactory month. There has been an increase over former years in the production of field fence, which now amounts to nearly 500,000 tons annually, and the fall trade has been very good. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Specifications from the agricultural trade for special lines of steel indicate very favorable conditions in that line of consumption, but in other directions the market is quiet. Sales from store have not been so active the past week, but a fair amount of business is being done.

Cast Iron Pipe.—Salt Lake City, Utah, has bought 1500 tons of water pipe from the leading cast iron pipe interest, for early shipment. The same interest has made sales the past week of about 1000 tons of culvert and water pipe to railroads. There is a fair run of routine orders, in 25 to 200-ton lots, chiefly from cities which bought early in the year, but require additional lots to complete their work. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—No indications of a revival in demand have appeared thus far in the scrap market. Prices are generally a little weaker, but values have been so low for several months that buyers have been taking into stock whatever material is offered them by dealers, apparently on the theory that scrap at ruling prices is as good as money in the bank. One buyer of steel scrap in this district claims to have a stock that would cover his needs for 8 or 10 months, but continues to purchase each month at his present rate of melting. This buyer recently took 1000 tons of steel scrap at $12, a little below the quality of regular heavy melting steel. A sale of 500 tons of rail crops was made f.o.b. the seller's plant at $13, equal to a little more than $13.50 with switching charges and brokerage add to the price realized. The embargo reported at the plant of the leading buyer of melting steel in this market has been raised and regular deliveries are being accepted again. The lifeless condition of the market is shown by the fact that no change has been made for several weeks in the prices quoted below. When any large buyer comes into the market for a

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round tonnage prices are usually pulled out of balance, and an active market is always erratic in price movements, but there has been no disturbance of this character for many months in the stagnant surface of the Chicago scrap market. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., October 18, 1910.

No important transactions, either in crude or finished materials, have been reported during the week, and a waiting tendency is again becoming more pronounced. The movement in pig iron is still largely confined to the foundry grades, in which a decreased volume of business is to be noted. Steel making grades as well as rolling mill grades continue practically at a standstill. As a rule, however, prices are unchanged and are pretty firmly held at the present level. There has been little new business of any size in rolled steel products; in some lines orders are more numerous, but the tonnage involved is small, and producers in some instances are barely able to maintain the productive rate of 50 to 60 per cent. of their normal capacity. Eastern steel mills are now willing to admit the discontinuance of their recent scrap buying arrangement and several have been buying in the open market. There has been little business done in coke, which for prompt delivery is a trifle easier.

Iron Ore.—Absolutely no interest is being taken in the ore market. Neither offers nor inquiries are to be noted, a waiting policy being followed by both consumer and seller. Importations of foreign ore at this port during the week ending October 15 amounted to 35,301 tons, valued at $124,498.

Pig Iron.—Buying has again quieted down and transactions, since the recent heavy purchases of foundry grades, have been confined largely to small and moderate lots for delivery during the remainder of the year. The most active buyers as well as prospective purchasers are the cast iron pipe makers, who have taken some fair lots and are still in the market for further supplies. The bulk of the sales during the week have been in small lots, carloads up to those of a few hundred tons, the larger tonnages for delivery over the remainder of the year and, in instances, extending into the early months of 1911. While a number of producers are readily obtaining $16, delivered, for standard brands of No. 2 X foundry, for such delivery, buyers are able to do $15.75, delivered, for this grade in some of the well-known brands, for shipment during the remainder of the year. That consumers continue to make small purchases for prompt deliveries indicates that at least the moderate buyers have but little iron in their yards. Producers are making no effort to force sales, but appear satisfied, under the existing market conditions, to keep regular customers supplied with near future requirements. While there has been a fair amount of general inquiry, there is less coming from the large buyers and fewer fresh inquiries are to be noted for over the first quarter and half of next year. Southern iron is being offered for this year's delivery at $11 to $11.50, Birmingham, for No. 2 foundry, with but very light sales, the outside figure can be done for first quarter delivery, but there have been no sales reported. Small sales characterize the business done in Virginia foundry grades, which have been almost exclusively for delivery during the next three months, at $13.25, furnace, which is the usual minimum for either No. 2X or No. 2 plain foundry, although one seller is understood to have shaded that figure for early deliveries. There is still no demand reported for forge iron for rolling mill purposes, although some little iron of this grade has been sold to the pipe foundries; prices are nominally quoted at $14.50 to $14.75, delivered. The demand for the steel-making grades is practically at a standstill, the larger steel mills are curtailing deliveries on basic iron and smaller concerns have covered to a large extent for their requirements this year. Basic is nominally quoted at $15, delivered, and makers contend that any reduction made would fail to bring out any business. Low phosphorus pig iron has been uncalled for during the week and prices are unchanged. The following range of prices about represents the market for standard brands, delivered in buyers' yards in this vicinity during the remainder of the year and in some instances extending into the first quarter of 1911:

Eastern Pennsylvania, No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	16.00 to 16.25
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 14.75
Basic	15.00
Standard low phosphorus	22.50

Ferromanganese.—Several small inquiries have developed from the steel casting makers in this territory, usually running in lots upward of 100 tons. No actual sales are reported. Quotations are unchanged, $39, Baltimore, about representing the market for either prompt or first half shipment.

Billets.—The demand shows little indication of improvement. Consumers continue to place small orders from time to time to cover immediate needs, but show no interest in tonnage for future deliveries. Specifications on old contracts still come out fairly satisfactory and these, together with current orders, enable mills to keep going at an unchanged rate. Eastern makers firmly maintain their recent quotation of $26, delivered in this vicinity, for open hearth rolling billets, and name $28, at Eastern mill, as their minimum for forging billets, the usual extras applying for high carbons and special sizes.

Plates.—Quite a large run of orders is reported by the mills, but the bulk of the business is very small individually and the aggregate is hardly up to the average. The absence of any sizable orders is particularly noticeable. A few fair sized inquiries are reported, but buyers hesitate when it comes to placing orders for forward needs. Makers in this territory hold prices firmly, 1.55c. minimum being maintained for carload lots delivered in buyers' yards in this territory.

Structural Material.—Very few contracts covering any tonnage have been taken, the demand being largely of a small, miscellaneous character. Several pretty fair jobs have been authorized, but contracts for structural work are still held up. The general demand continues irregular. Prices are being well maintained at 1.55c., delivered, for plain shapes delivered in buyers' yards in this vicinity.

Sheets.—Business has been somewhat better, orders received being larger and, in the majority of instances, accompanied with specifications and deliveries urged. Mills are more actively engaged and have a better range of work ahead. Prices are unchanged, Eastern makers naming the following range of prices for ordinary business for prompt shipment: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand continues quiet, both for iron and steel bars, recent business being almost of a retail character. Few inquiries for any tonnage are reported. Specifications are coming out somewhat more freely, however, although mills are unable to increase the recent productive rate. More determination to hold the recent range of prices is to be noted, refined iron bars being held at 1.40c., minimum, delivered in this territory, with steel bars quoted at 1.55c. to 1.60c., delivered.

Coke.—Business has been largely confined to odd lots for early delivery, and in some instances prices for spot foundry coke are easier, $2.15 to $2.35, at ovens, being named, although for reasonable delivery $2.25 to $2.50, ovens, is named, according to grade. A slight movement in spot furnace coke at $1.55, ovens, is reported; forward deliveries are quoted, however, at unchanged prices. The following range of prices is named, per net ton, for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—Eastern steel mills are now willing to admit the dissolution of the recent scrap buying arrangement upon advices received from the Government, and several of the mills have entered the open market. One consumer, who purchased quite freely last week, is now pretty well covered; another purchased 1000 tons of heavy melting steel at $13.75,

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while another consumer offers less than that figure, but has not been able to get any material at the price. Owing to inactivity at the mills requirements are not large and buying in the immediate future is not expected to be heavy. The rolling mill grades remain quiet, No. 1 forge is slightly easier and turnings have been bought at 25c. below recent quotations. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.25
Old steel rails, rerolling	16.00 to 16.50
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.25 to 16.75
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.75 to 12.25
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	9.00 to 9.25
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50

* Nominal.

Charles L. Barrett, formerly president of Barrett & Lawrence, Inc., Bullitt Building, Philadelphia, Pa., and H. J. Hood, formerly sales manager for the same concern, have severed their connection with that corporation and have opened offices at 819 Witherspoon Building, in the same city, under the firm name of Barrett & Co., and will engage in the iron and steel business. They will represent in that territory the Lehigh Foundry Company, Fullerton, Pa.; Mt. Carmel Iron Works, Mt. Carmel, Pa., and Albion Iron Works, and will act as agents for Vickers Sons & Maxim, Elco high speed steel. These concerns were formerly represented by Barrett & Lawrence, Inc.

Cincinnati

CINCINNATI, OHIO, October 19, 1910.—(*By Telegraph.*)

Pig Iron.—The local market is very quiet and reports received from other districts indicate that the same condition exists elsewhere. Local interests do not look for any improvement until after the elections next month. New inquiries figured on include 1100 tons of Southern foundry No. 2 for a central Indiana melter and one for 600 tons each of Northern and Southern foundry for a northern Indiana consumer, both for first half delivery. Purchases being made are only for small lots and for delivery the remainder of this year and first quarter of next. Practically no speculative buying is being done. The two Michigan inquiries totaling 1200 tons of high silicon iron are still pending, and the central Indiana order for 1500 tons of Southern foundry is also held up. For the remainder of this year $11 is generally quoted on Southern iron, and for first half delivery $11.50 is the ruling figure, but concessions have been made on some first quarter contracts. A number of furnaces in the Hanging Rock district are willing to take on this year's business at $14, and are said to be willing to extend deliveries into the first quarter at a small advance over this figure. An inquiry from a St. Louis melter for 2000 tons of Southern foundry for first half delivery is expected to be closed within a few days. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

Coke.—No activity in the coke market is expected here for some time. Spot furnace coke is still weak and sales are only for small lots. Some furnace coke is obtainable in the Connellsville district, for immediate shipment, as low as $1.50, but in the Wise County and Pocahontas fields, $1.55 to $1.65 are the ruling figures for spot delivery. Contract prices for future delivery range from $1.65 to $1.85 at oven. Foundry coke remains the same in all three districts, and is also a slow seller. For prompt shipment as low as $2 can be done on some brands, but the standard grades bring a premium of 10c. to 15c. per ton over this. Contract figures are unchanged and $2.25 oven is a fair price, with some of the special grades quoted higher.

Finished Iron and Steel.—The past few days have seen a slight falling off in the mill business, but warehouse orders are about the same. The average warehouse price on bars is 1.80c. and that on structural material 1.90c. There has been a reduction in the warehouse price of blue annealed sheets. No. 10 gauge sheets are quoted at 2.10c.; No. 12, 2.15c.; No. 14, 2.20c., and No. 16, 2.30c.

Old Material.—Continued dullness characterizes this market. No large amounts of either wrought or cast scrap are changing hands, as consumers of both are only buying small quantities, and dealers appear to be well stocked up and are not making any strong effort to pick up further lots of any kind of scrap. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

At a meeting of the directors of the Cincinnati Iron & Steel Company, October 15, Jas. I. Stephenson was elected president, to succeed the late Edward H. Busch; H. C. Busch was elected vice-president and Jas. A. Sebastiani secretary and treasurer.

Cleveland

CLEVELAND, OHIO, October 18, 1910.

Iron Ore.—Owing to the falling off in shipments boats operated by the shippers will be able to handle about all of the ore brought down in November, and some of the independent vessel managers are planning to have their boats make only one trip next month. It is not expected that the November movement will exceed 2,000,000 tons. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market has apparently settled down to another dull spell and practically no sales or inquiries are reported in this territory. The demand for shipment to points in the western part of Ohio and in Indiana and Michigan is less active than during the previous week or two, inquiries coming only from small consumers for lots of around 200 tons. While a limited number of larger consumers and some of the smaller ones have placed contracts for their foundry iron requirements for the first quarter or first half, the sales in this territory have been far from sufficient to constitute a general buying movement, and furnace interests are not looking for much activity within the next few weeks. Buyers generally are taking little interest in the market. They seem to feel that while prices are about at cost of production and are not likely to go lower, yet there is no indication that there can be an advance for some time, and they wish to hold off as long as possible in placing contracts for next year's delivery, preferring to wait until they can get a better idea as to what business conditions are to be after the first of the year. Some of the producers are adhering firmly to the position they took several weeks ago and are refusing to make quotations for first quarter and first half shipment at less than 50c. above the current market price for the last quarter. For prompt shipment and the remainder of the year we quote, delivered Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.75 to 15.00
Northern foundry, No. 2	14.25 to 14.50
Northern foundry, No. 3	14.00 to 14.25
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—There is no demand for furnace coke and practically no inquiry for foundry grades. Furnace interests are not ready to buy for the first half of next year and foundries are mostly covered with contracts. Prices remain steady, with quotations unchanged. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment, and $1.70 to $1.75 for the remainder of the year. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 for prompt shipment, and $2.25 to $2.50 for delivery through the first half.

Finished Iron and Steel.—Some of the agricultural implement manufacturers have been holding back their specifications on steel bar contracts in order to get the benefit of lower prices should any reduction be made, but they are now in need of the material and are specifying quite freely for their requirements. The outlook in the implement trade is very satisfactory and manufacturers are preparing for a large output for the coming season. Other conditions in

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finished lines show practically no change. Mill agencies are getting a good volume of orders, but they are all for small tonnages, and no large inquiries are coming out. Prices are firm at 1.40c., Pittsburgh, and the leading mills are adhering to that price on plates. The demand for structural material continues fairly active. Fabricators, however, are not buying round lots for specific work, but are placing more frequent orders for small tonnages as the material is needed for fabrication. Bids have been received for the Fowler eight-story building in Detroit, requiring 800 tons. Locally the only new work that has come out is a trestle for the American Shipbuilding Company at Lorain, requiring 100 tons, and a grade crossing elimination bridge to be built by the County Commissioners just outside this city, requiring 300 tons. The Detroit, Toledo & Ironton Railroad, which was figuring on considerable tonnage for bridge construction, has postponed this work until spring. The demand for sheets, both black and galvanized, continues fairly active. The new prices are being well maintained by the mills, but some price cutting is reported by jobbers on the heavier gauges of galvanized sheets, sellers in some cases giving buyers the benefit of the old differentials, thus giving consumers lower prices than they can obtain from the mills. This shading will be eliminated when the present contracts between the jobbers and mills expire. The demand for bar iron is somewhat more active, but prices are not firm. While 1.35c. to 1.40c., Cleveland, is the usual quotation, this could probably be shaded to 1.30c. on an attractive inquiry. The city of Cleveland has authorized the expenditure of $100,000 for cast iron pipe and special castings for the water works department. Bids will be asked for shortly for the pipe, aggregating about 3500 tons.

Old Material.—The demand is still very light and dealers have about given up expectation of any improvement before the first of next year. Prices are weak, but there is not enough business in several grades to make quotations more than nominal. Local mills are buying only in small lots as material is needed and the demand from the foundry trade is also light. Dealers with large stocks on hand are making no efforts to crowd this scrap on the market. Practically no inquiry is coming to local dealers for material to be shipped to other points. Dealers' prices per net ton, f.o.b. Cleveland, are unchanged, being as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 bushelling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., October 17, 1910.

Pig Iron.—An improvement in sentiment is noted, but so far actual trade conditions are practically unchanged. The volume of business transacted the past week was comparatively small and it is quite probable that the tonnage placed was about equally divided between two producing interests. This was by reason of the refusal of others to meet a price of $11, Birmingham, for comparatively early deliveries, which price is apparently considered the market by the trade generally. The schedule of $11.50, Birmingham, for deliveries after January 1, next, has to all appearances been maintained for free iron. One producer reports the sale of approximately 7000 tons for shipment during the first quarter on a strictly $11.50 basis and report is made of unsuccessful efforts to place round lots for that delivery at a lower figure than has just been named. The recent trading in warrants has been light, although it is not understood that any such holdings have been withdrawn from the market. The demand for low grades for spot shipment was the feature of the market during the week and there is now a decided tendency to reduce the differential in price for grades below No. 4 foundry to 25c. per ton. Several small lots of forge and mottled for spot shipment are known to have brought a straight $11.50 basis within the week. So far, the early requirement of low grades by the leading melters has not taken more definite form, but there is known to be a material shortage of all grades below No. 3 foundry in the accumulations now on furnace yards, and the percentage of low grades being produced is very small. The largest single stock of No. 4 foundry in this district is being held firmly at $11, Birmingham, or at a No. 3 foundry price on a strictly $11.50 basis. The price named has so far proved prohibitive, but it is not likely that a concession will be made to move the accumulation. Another addition to the active capacity for foundry grades is to be made during the coming week.

Cast Iron Pipe.—The aggregate of small orders placed with producers so far this month is considerably under that expected, and without new contracts coming up the market is practically featureless. A leading interest announces orders now in hand to cover operations for another month, and the daily output is being moved. However, all producers are not so fortunate, and stocks are becoming much in evidence at the various plants. It is understood that the new plant for Norfolk, Va., will not be built for some time, and that the local plant for the manufacture of Universal pipe (which has been in competition with the regular bell and spigot pipe) will be dismantled, the equipment to be replaced with equipment for the manufacture of soil pipe. We quote nominally, with the market very inactive, at the following, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12 in., average, $20.50, with $1 per ton extra for gas pipe.

Old Material.—Report is made of the sale of a round lot of several grades, but not without a concession on the part of the dealer in the matter of price. Practically no transactions of the regular order have been recorded during the week, and dealers' asking prices are more nominal than at the time of last report. By reason of the lack of interest manifested by the trade, prices have not been adjusted and the market is really in a very uncertain condition. We quote dealers' nominal asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

No. 1 furnace of the Birmingham Coal & Iron Company, Vanderbilt, Ala., plant will be blown in in the next week or 10 days.

The furnace of the Silver Creek Iron Company at Rome, Ga., which has been operated on charcoal for some months, has been blown in on coke. This is in order that a supply of charcoal for operations during next spring may be accumulated.

The plant of the Pan-American Mfg. Company, at Anniston, Ala., will be put into operation about November 1, making stoves and shelf hardware.

The plant of the Beggs Pipe & Foundry Company, at North Birmingham, Ala., has been put into operation, after having been closed down some months for repairs.

St. Louis

ST. LOUIS, MO., October 17, 1910.

While general business, though lacking snap, appears to have a better undertone, the leading iron interests of the city do not count on any material improvement in conditions affecting their lines until after the November elections. Besides the Congressional elections, the uncertainty respecting the result of the State election on the prohibition amendment is exerting an adverse influence on business in the State in general and St. Louis in particular, especially as regards new enterprises and building operations. At the same time all the financial institutions report satisfactory conditions, and bank clearings for the week are again in excess of the same week last year. It is believed that, as the movement of the crops gathers in volume, the earnings of the railroads will enable them to come into the market more generally for supplies and equipment in the near future.

Coke.—The only large transaction reported is the sale of 1500 tons of by-product coke by one of the leading sales agencies, for shipment over the first half of 1911. Another office mentioned a sale of 18 cars of foundry coke for prompt shipment. The market is weaker, and we hear $2.20 named for Connellsville 72-hour foundry for contract and $2.10 per net ton at oven, for prompt shipment, with some special brands held higher. Nearly all the inquiries and the sales, which are mostly small lots, are for prompt shipment. Very little interest is shown by large buyers who usually make long time contracts.

Pig Iron.—A canvass of the various leading sales agencies developed that the aggregate sales of all the offices

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during the week would only make a fair business for any one of them, the largest showing made by any one house being 700 tons of different kinds of iron for various deliveries to several parties. Regarding inquiries, the following are reported: An inquiry for 500 tons of silicon 2½ to 3 per cent. for shipment over the remainder of the year; 500 tons of Northern No. 2 foundry, for shipment over the first half of 1911. Quite a number of tentative inquiries are being made and several bona fide buyers who have been in the market the past week or two have inquiries pending. A large business for the first half of 1911 could be done on the basis of prices for the remainder of the year. There seems to be a lack of confidence in the maintenance of the present stand made by sellers for a premium on 1911 iron. It is claimed that bankers are not favorable to iron collateral based on higher figures than those prevailing, accompanied by the usual margin. With respect to the market it is ruling unchanged at $11, Birmingham, for No. 2, Southern foundry, for shipment over the remainder of the year with special brands held 25 to 50c. per ton higher. For shipment over the first half of 1911, $11.50 is asked, with some furnaces limiting delivery to first quarter, and others asking $12.

Finished Iron and Steel.—Few inquiries are out for standard rails. The inquiry for light rails from lumber interests is not as active, but there continues to be a fair inquiry from coal mines. Structural material is in moderate request for prompt shipment. There is a fair demand for steel bars from wagon and agricultural implement manufacturers, but jobbers are not in the market to any extent. For track material there is only a hand-to-mouth buying.

Old Material.—A little increase in inquiry for foundry grades from consumers is noted by the leading dealers in scrap iron and steel, but the major part of the list is neglected. Cast scrap is a little stronger. There is a fair inquiry for relaying rails, though it is confined mainly to the heavier sections. No railroad lists were reported for the week. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.25 to 12.75

The following quotations are per net ton:

Iron fish plates	$12.00 to $12.50
Iron car axles	18.50 to 19.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	10.00 to 10.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	9.00 to 9.50
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.75 to 8.25

The Charles G. Stifel Estate is erecting a $100,000 building of six stories on Third street and Lucas avenue. It will be a strictly fireproof structure, will be equipped with two electric elevators and supplied with its own heating plant and sprinkling system.

The Santa Fe Railroad is erecting at Topeka, Kan., a general office building, which is to cost $250,000. It is to be seven stories at present, although the construction will be such that as many more stories can be added later.

Buffalo

BUFFALO, N. Y., October 18, 1910.

Pig Iron.—The week has shown a large aggregate of inquiry for 1911 deliveries, and includes some round lots of foundry grades and a moderate amount of malleable. The total of orders placed, however, does not cover any considerable percentage of the aggregate of inquiries, denoting that there is still a good deal of "shopping" being done by the various buying interests, with more passive than active regard to getting business closed. The United States Cast Iron Pipe Company still has inquiries out in this market for good sized tonnages, with only limited placements so far. Notwithstanding the fact that so many consumers are holding off placements, orders amounting to about 15,000 tons, foundry grades, with a small sprinkling of malleable, have been placed during the week, the bookings being made for deliveries for periods of from three to eight months. Sellers are not urgently seeking business for 1911, as prices obtainable are below cost in many instances, and they are holding aloof from extended delivery sales. It is difficult to quote prices, with business running as at present, with a minimum variation of values between the various grades, furnacemen being inclined to concede grades to accord with customers' wishes. We quote the following as representing the market as accurately as possible under these conditions, f.o.b. Buffalo, for deliveries extending over the next six months:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.50 to 14.75
No. 2 plain	14.25 to 14.50
No. 3 foundry	14.00 to 14.25
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.75 to 15.25
Charcoal	18.50 to 19.00

Finished Iron and Steel.—Inquiries in finished products are more numerous. Jobbers' stocks in cold rolled steel and in some sections of hot rolled are apparently becoming low and orders are coming in quite freely for immediate requirements. Small shapes and some sizes of structural are also in demand for stock. Prices are unchanged and firmly held for steel bars and plates and shapes. There has been a noticeable development recently in the demand for iron bars owing to some extent to the firming tendency in steel bars. The export trade to Canada continues extremely good, with heavy demand for agricultural implement material, some of this material taken by Canada going to the Australian trade. In fabricated structural material there is something of a slowing down in demand. Business in structural plates and shapes continues in fairly good volume. Bids are being received this week for steel for a stock house for the Iroquois Brewing Company, about 200 tons, and plans are being prepared by the Lake Shore Railway Company for a four-track lift bridge with 80-ft. channel opening over the Buffalo River, Buffalo requiring about 800 tons of steel. The H. C. Harrower Iron & Steel Works, Buffalo, was low bidder for the steel for the Haberstro store and loft building on Broadway this city, 270 tons.

Old Material.—In general features the market is about the same as last week, although there is a little improvement in some lines, with better feeling and more activity, particularly in old car wheels and cast bearings, for which better prices are obtainable. The aggregate of sales in any line, however, has not been large. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	23.00 to 23.50
Old car wheels	13.75 to 14.25
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.25 to 6.50
No. 1 busheling scrap	11.25 to 12.00

San Francisco

SAN FRANCISCO, CAL., October 13, 1910.

The Pacific Coast market for most lines of finished products continues dormant. Business in San Francisco is probably quieter than elsewhere. The only new feature is a slight reduction in prices by local merchants, following a similar movement on the part of the Eastern mills. The jobbing trade is considerably below normal for this season. Except for one fairly large transaction in rails, new orders booked by mill interests are confined almost entirely to small lots. There are, nevertheless, a number of encouraging features in the outlook, as several large building projects are coming into the market within the next few months and some new rail business is coming up. Prospective requirements of cast iron pipe are large, and the prospects of the oil industry are rapidly improving. There is a strong demand for agricultural implements, and in view of the large crop returns this year it is expected that the manufacturers will soon be in the market for supplies.

Bars.—The continued apathy on the part of large consumers of soft steel bars is hard to understand, but so far the movement has been confined to narrow limits. The distributive business is fair in some quarters, but by no means satisfactory, and it has not been possible to make any great reduction in the stock on hand. Manufacturers through the country have been buying foreign bars to some extent and probably hold a larger tonnage than has been generally known. There is a fair movement of reinforcing steel, but this is purchased mostly in small lots, and foreign material is being used to some extent for this purpose. It is stated by importers that their unsold accumulations in warehouse do not amount to over 800 tons. On foreign bars to arrive

THE IRON AND METAL MARKETS

they are quoting 1.67½c. to 1.70c. by sailing vessel or 1.77c. by steamer, and a base price of 1.78c. on carload lots for immediate delivery from warehouse. Following the downward tendency of the Eastern market, local merchants have made a slight reduction in prices, quoting 2.25c. for iron and 2.45c. for steel. There has, however, been no tendency toward indiscriminate price cutting, the quotations being firmly maintained on all distributive business.

Structural Material.—The situation has not changed materially, most of the fabricators being fairly well occupied with small contracts, while several large jobs are to be given out within a few days. Some new work is also expected shortly at Los Angeles and the principal cities of Oregon and Washington. The volume of local work in hand has not increased materially and no new inquiries of special importance have come up, though a number of plans for large buildings are getting into shape for figuring. Contracts will probably be let in a few weeks for a lot of municipal work, and the Oakland City Hall will be in the market before long. The Masons will erect a large building at Sacramento, Cal., early next year. Arrangements are being made for the construction of the new Alcazar Theater in this city, and plans are being made for a nine-story hotel at Turk and Mason streets. The Levy estate is considering plans for a large theater and office building in Oakland. The plans of the Southern Pacific Railroad for improvements at the Sixteenth street station, Oakland, are announced, and include a large station building, with an elevated track, which will probably require a heavy tonnage of steel. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Rails.—An order for 12,000 tons for the San Pedro, Los Angeles & Salt Lake Railroad, booked by the Colorado Fuel & Iron Company, brings a material increase in the coast tonnage, though the transaction was not closed through the San Francisco office. Aside from this, there is considerable business in view. The Pacific Electric Railway of Los Angeles is planning to lay heavier rails on a part of its system. The California Harbor Commission has placed a contract with the Pennsylvania Steel Company for track supplies for the San Francisco waterfront line, and bids will be opened November 16 for rails for the municipal road on Geary street. A lot of new track will be laid during the coming year in the electric suburban system of the Southern Pacific. The Mojave & Bakersfield Railroad Company has been organized by officials of the Southern Pacific, the object being either to construct a new line between the points named or to double track the present road over Tehachapi Pass. The distance in either case will be about 85 miles and the work will probably be carried out in a short time, as traffic is badly congested on the present line.

Plates.—There is little movement, aside from deliveries on old contracts, and new bookings are falling below the average. Manufacturers of tanks and riveted pipe are keeping very busy, however, and no discouragement is felt regarding the outlook. There is a steady inquiry for riveted pipe for irrigation and reclamation work, and many tanks are being installed for consumers of fuel oil. In view of the large orders placed during the second quarter the movement for the entire year will probably show some increase, notwithstanding the recent dullness.

Merchant Pipe.—The continued dullness of the jobbing trade can only be explained on the ground that consumers as well as merchants have been carrying heavy supplies, which they wish to dispose of before entering the market again. The consuming trades, though dull locally, have been active in the interior, yet sales are on about the same small scale as last month. Jobbers are buying in a very conservative way for immediate needs, and are unlikely to require any heavy tonnage for the remainder of the year. Their prices have been shaded in proportion to the recent reduction announced by the mills. The demand for oil pipe is still small, but shows a slight increase since last month. The disposal of surplus oil and the improved condition of the industry have resulted in a renewal of interest in development, and work on new wells will probably be resumed on a large scale next spring.

Cast Iron Pipe.—Nothing of unusual interest has occurred in the local market, though the movement is increasing a little and several fair inquiries are coming out for municipal work. The city of Santa Cruz, Cal., is in the market for 1950 ft. of 10-in., 1850 ft. of 8-in. and 3500 ft. of 4-in. pipe, and small orders will be placed shortly by the towns of Modesto and Sisson, Cal. Probably the most important item in the coast trade for the coming year will be the pipe for the Bay Cities Water Company of Oakland, which is starting active construction on its system. This company has purchased a small lot from stock for emergency work, and is expected to enter the market at any time for its principal requirements. As the system will cover the entire city of Oakland with pipes adequate for domestic use and fire protection, the tonnage will be largely in excess of that ordered for the San Francisco fire protection system. The city of Eugene, Ore., has ordered a large lot of 4 and 6 in. pipe, and Tacoma, Wash., will be in the market shortly for a lot of 12 and 16 in. pipe.

Pig Iron.—Aside from heavy deliveries of Chinese iron at Irondale, Wash., on old contracts, there is little activity anywhere on the coast. A few foundries in the interior and at north and south coast points are getting a fair volume of work, but local melters are discouraged over the present situation and are buying practically nothing. Local quotations are as follows: Chinese, $23; Continental, $23; English, $23 to $23.50; Scotch, $25.

Old Material.—The only movement of any consequence at present is in cast scrap, even this being comparatively quiet. The demand is limited, but as supplies are closely cleaned up prices are firm. No shipments of steel melting scrap are being made at the moment. There is not much on hand, but in the absence of any local demand the market is weak, in sympathy with Eastern conditions. Little railroad wrought is being offered. Old rails are dull, with little demand from local rolling mills, and there is apparently some pressure to sell. Prices are quoted as follows: Cast iron scrap, per net ton, $18 to $19; steel melting scrap, per gross ton, $9; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

New York

NEW YORK, October 19, 1910.

Pig Iron.—The volume of business in pig iron is larger, but so far no general buying movement has developed. The cast iron pipe interests have been by far the most prominent in making purchases for forward delivery. It is estimated that within the past week over 20,000 tons has been taken by several Eastern pipe manufacturers, some of which is for delivery in the early part of next year. Scattering purchases have been made by foundries in this vicinity and in New England, one taking 6000 tons to run through the first quarter. A feature of the situation is the acceptance of business running into next year by a few more pig iron manufacturers on the basis of prices for this year's delivery. The feeling is becoming stronger that November will see a greatly increased buying movement. It is somewhat noteworthy that sellers are now finding shipments ordered on contracts on which deliveries had been held up for some time. We quote for tidewater deliveries as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—While the present dullness has been accentuated by the persistent withholding of railroad orders for supplies and equipment, it is felt that this only means much heavier buying later. Already the railroads are showing more disposition to come into the market and this, with the reports of excellent crops, encourages the belief that general business conditions will shortly improve, which must have the effect of increasing activity in the iron and steel trades. Prices are firmer and, although transactions closed in the past week have not been numerous, it is largely because deliveries in all lines are good and purchasers do not feel the necessity of ordering far ahead of their requirements. Even steel bars can now be had in 10 days or two weeks as a rule. This trade is receiving liberal specifications on contracts and does not look for much new business before the next buying season, which is December. In the bar iron market it is evident that sentiment has improved, but so far orders and prices have not. The movement in plates is about the same as for the last few weeks but the structural material business closed in the past week has been particularly light. The New York Edison Company placed an order for a transformer building on 140th street, requiring 300 tons, with Levering & Garrigues. The Baltimore & Ohio has let two bridges, one of 400 tons to the McClintic-Marshall Construction Company and one of 200 tons to the American Bridge Company. The latter company also has an order for 600 tons from the Atchison, Topeka & Santa Fé. A highway bridge at Spokane, Wash., 400 tons, has gone to the King Bridge Company. For an addition to the Hochschield, Kohn & Co. store at Baltimore, the Chesapeake Iron Works will furnish 1300 tons of steel. The Knickerbocker Portland Cement Company, Hudson, N. Y., has placed an order for 450 tons for a new building, but it is not reported to whom. Bids close October 31 on the new post-office building at the Pennsylvania terminal in New York. It is variously estimated that 14,000 to 18,000 tons of steel will be required. The general contract for the Washington Irving High School, New York, has been placed with John T. Brady, but the steel has not yet been let. The George A. Fuller Company is asking bids on about 1600 tons for in-

THE IRON AND METAL MARKETS

creasing the hight of the Knickerbocker Trust Company building from the present 9 to 22 stories. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—Although no public lettings of importance are in sight, inquiries from private gas and water companies are a great deal more numerous, and many of the largest buyers are feeling the market for next year. A much better feeling pervades trade circles. While carload lots of 6 in. are quoted at $22.50 to $23.50 per net ton. tidewater, the foundries are strongly disinclined to sell at anything like present prices for delivery next year.

Old Material.—The scrap market is exceedingly quiet. Even the foundries are only purchasing cast scrap in small quantities, merely providing for their daily wants and showing no disposition to purchase for forward delivery. Scrap buyers appear to be waiting for some indication of an improvement in pig iron or else an increase in orders for their own product. Little inquiry is being received here for steel scrap or rolling mill products. A cargo of 1840 tons of miscellaneous scrap from Panama was sold at $9.81, delivered f.o.b. cars Hoboken, N. J. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.50 to 12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	10.50 to 11.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, October 19, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Oct.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
13	12.87½	12.75	37.50	4.40	4.27½	5.60	5.45
14	12.87½	12.75	36.90	4.40	4.27½	5.60	5.45
15	12.87½	12.75	...	4.40	4.27½	5.60	5.45
17	12.87½	12.80	36.30	4.40	4.27½	5.60	5.45
18	12.87½	12.80	36.75	4.40	4.27½	5.60	5.45
19	12.87½	12.80	37.62½	4.40	4.27½	5.60	5.45

Following an advance of £2 15s. in tin in the London market this morning New York prices took a sharp upward turn, and with stocks especially scarce record prices may ensue. Copper is stronger and is selling well. There have been fairly good sales of lead of late. The spelter market continues quiet, but firm.

Copper.—The copper market is steadily but conservatively improving. Consumers are taking hold in a manner that indicates that either some of them have allowed their stocks to run very low or they have a great deal of confidence in the future of the market. The advance of ½c. per pound on both lake and electrolytic, which went into effect about nine days ago, is being well maintained, and it is highly probable that prices will go higher. It is certain that the market has a better tone than it has had at any time since the first of the year, and as sellers show no inclination to manipulate the market, but are willing to let it gain gradually in strength as the result of a healthy demand, it is fair to assume that the outlook is excellent. There has been a very good buying movement all the week. Some large sales of electrolytic were made at 12.87½c., delivered in the Naugatuck Valley, 30 days. The United Metals Selling Company is reported to have done most of the selling, and as this company has held its prices slightly under the rising market, it is not unlikely that they got most of the business. It is hard to state just how much has been sold during the week, as the big selling interests are reluctant about giving out information, but there have been inquiries out for fully 100,000,000 lb. Electrolytic copper is now firm, at 12.80c., and the price for spot copper in New York is 12.87½c. The market has such a strong upward tendency that an advance may be looked for at any time. Exports of copper so far this month have been good, amounting to 14,203 tons. In London to-day the copper market closed with spot copper selling at £57 and futures at £57 18s. 9d. The sales amounted to 900 tons of spot and 1700 tons of futures. The market was easy.

Pig Tin.—The decided scarcity of stocks of pig tin in this market, coupled with the excited condition of the London market, is keeping people interested in the tin trade in a highly nervous state. Following a sharp rise in the London market this morning, when quotations were advanced £2 15s., the New York market began to seesaw excitedly. During the early hours of trading all kinds of quotations were bandied back and forth, without any one getting down to business, and it took considerable time until the market settled to where a quotation of the actual price could be made. A good business was done in tin during the week until yesterday, when the bulls in London took a fresh hold and made it clear that they intended to send prices soaring again. Then consumers here who have been buying in small quantities seemed to get the idea that prices were going up to a prohibitive figure and promptly deserted the market. If they are able to hold out a few days there is relief for them in sight, as the steamer Minnewaska is due on Sunday with a record breaking cargo amounting to 1360 tons. This cargo will be unloaded Monday or Tuesday, and it will at least reduce the strain. The arrivals of tin so far this month have been 1769 tons, while there are 3127 tons afloat. The price of pig tin in New York to-day went to 37.62½c. The London market closed with spot tin selling at £169 and futures at £166. The sales amounted to 650 tons of spot and 1100 tons of futures. The market was strong.

Tin Plates.—The demand for tin plates has eased off slightly, and some can manufacturers who were making up stocks in anticipation of the heavy tomato crop in Maryland and Delaware have been informed that this crop is somewhat disappointing; and accordingly they are materially reducing their requisitions. The price continues unchanged with 100 lb. coke plates at $3.84.

Lead.—A fair demand for lead has developed and some sellers are under the impression that a good buying movement is in sight. Outside sellers of lead in New York have advanced their price five points and are now asking 4.45c. The American Smelting & Refining Company, however, continues to control the situation by offering it at 4.40c. The St. Louis market seems to be especially sensitive and offerings of 4.25c. are reported from there, but most sellers are holding the metal firm at 4.27½c.

Spelter.—The spelter market continues quiet but firm. Buyers are taking no interest in the market, but those who are holding stocks declare that production has fallen off materially and present quotation is a fair price. The metal can be had in New York at 5.60c., and at St. Louis the price is 5.45c. There are some reports of shading in the West, but as a rule the above prices are being well maintained.

Antimony.—The antimony market continues dull and uninteresting, there being only a small demand from the jobbing interests. Cookson's is 8.15c.; Hallett's has receded to 7.75c. Chinese brands can be had at 7.40c. to 7.50c., and Hungarian grades are being sold at as low as 7.12½c.

Old Metals.—The market is strong, but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

Metals, Chicago, October 18.—There has been heavy buying of copper by a few large interests and some of the smelters are reported to have withdrawn quotations. The business done has been chiefly for November shipment, but a fair amount was for December and a few inquiries have been received for January. Tin has weakened slightly. Buyers are making low bids for spelter at East St. Louis, but without any response and it is understood that 5.40c., East St. Louis, is the lowest price actually done, equal to the quotation below for Chicago. Concessions are reported on soft lead, but the price quoted below is the lowest that is reported in this market on standard brands of desilverized lead. We quote Chicago prices as follows: Casting copper, 12⅞c.; lake, 13¼c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c., higher; pig tin, carloads, 37c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb, higher; spelter, 5.45c. to 5.50c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10⅝c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, October 17.—Lead is ruling quiet at 4.25c. to 4.30c.; spelter is steady at 5.40c. to 5.45c. both East St. Louis. Zinc ore is held at $42 to $43 per ton, Joblin base. Tin is quoted at 38c. per lb.; antimony (Cookson's) 8.50c.; lake copper, 13.25c.; electrolytic, 13.50c., all at St. Louis. The demand for finished metals was a little slower, but proved to be an average week's business.

The Machinery Markets

The machinery markets in most industrial centers are gaining slowly in strength. The railroads seem to be taking a little more interest in machinery matters and inquiries from that source are more numerous. In the Farther Central West the railroad purchases are becoming a feature of the trade. The St. Louis & San Francisco Railroad has a small list out in the St. Louis market. In the East the railroad buying is chiefly in small lots for replacement. The trade in second-hand machinery is especially good, and in some sections, particularly in Chicago, a better business in that line could be done if salable stocks were easy to obtain. In Pittsburgh the machinery business is expanding and there is an excellent demand for heavy machinery. The market in Cleveland is dull at present, but a list of 200 tools is being compiled by the Lake Shore Railroad for new shops at Elkhart, Ind., and the trade is looking forward to some business from that source. Excellent reports come from Texas, where there is unusual activity in establishing new public service plants, such as power houses, water works, &c. In sections where trade is not so brisk machinery manufacturers are showing confidence in the future by making up machines for stock. The export trade, especially in mining equipment, continues good.

New York

NEW YORK, October 19, 1910.

There are conflicting reports as to business in the general machinery trade and it is apparent that orders have not been evenly distributed during the last week. Representatives of at least two large New York machinery dealing establishments say that both inquiries and orders have fallen off and similar conditions are said to exist in the New York offices of a number of large machine tool manufacturers. On the other hand, some people are fairly busy. There is an excellent demand for automatic machinery and people who specialize in that line are behind in their orders. This is particularly true of manufacturers of screw machinery. There is also a good demand for forging machinery, such as bolt and nut making equipment, upsetting machines and the like. The railroads are buying in a desultory way. Two orders came into this market from the Baltimore & Ohio Railroad a few days ago and one house has inquiries for three machines from that source. The New York Central Railroad continues to place orders for single machines to be sent to its different repair shops and the Boston & Maine Railroad's purchasing department is feeling the market with a view to placing orders in the near future. The demand for second-hand machinery is active and good prices are being obtained for used machines. Most of the orders coming into the market for that class of equipment are placed by owners of small machine shops who do a general repair business. This would seem to indicate that many manufacturers are having their equipment repaired rather than investing in new machinery.

The Oneida Steel Pulley Company, Oneida, N. Y., which recently acquired the business of the Keystone Pulley Company, Pittsburgh, Pa., is making an extensive addition to its Oneida plant. At present the company has 100,000 sq. ft. of floor space and when the addition now in course of construction is completed the company will occupy 130,000 sq. ft. The company is adding materially to its manufacturing equipment.

The Stephens Mfg. Company, Rome, N. Y., has leased the second floor of a building on Main street, Rome, 60 x 100 ft. in size, and the company will purchase machinery for manufacturing the Diezemann carburetor. The list of machinery that will be required has not as yet been prepared.

The American Foundry & Machine Company, Brooklyn, N. Y., which is controlled by the American Tobacco Company, has been buying in this market during the last two weeks. The company chiefly manufactures tobacco working equipment.

The Max Ams Machine Company, Mt. Vernon, N. Y., has been a liberal customer in this market of late and has placed a number of good orders for machine tools.

The Niagara Machine & Tool Company, Buffalo, N. Y., will equip the forge, blacksmith and machine shop building at its new plant on the New York Central Railroad Belt Line at Northland avenue, with the Harrison Aertube system of heating and ventilating, and has awarded the contract to the Harrison Engineering Company, New York City.

George B. Woodmancy, Randolph, N. Y., will build and equip a power plant at East Randolph to supply electricity for lamps and motors in the village. The Public Service Commission, Second District, has granted permission.

The equipment of the power plant of the J. N. Adam Tuberculosis Hospital to be built by the city of Buffalo at Perrysburg, N. Y., will comprise three 80-hp. water tube boilers, feed pump, compression tank pump, vacuum pump, one 50-kw. and one 20-kw. generators, two 5-hp. motors and three 1-hp. motors. John H. Coxhead, 938 Ellicott square, Buffalo, is architect. C. A. Hager, Holland, N. Y., has general contract for the buildings.

The principal offices and factory of the Telephone Improvement Company, recently incorporated under the laws of the State of New York with a capital stock of $3,000,000, are to be located at Attica, N. Y., which is the home of Frederick C. Stevens, State Superintendent of Public Works, who is one of the directors of the new company and is to be its president. The new company is a consolidation of the North Electric Company of Cleveland, Ohio, and the Telechronometer Company of Rochester, N. Y., and will manufacture telephone message meters, time meters and switchboard improvements under patents which it controls. The other directors are Chas. H. North and James B. Hoge of the North Electric Company of Cleveland, Ohio; Morton E. Lewis and Garrison Babcock of the Telechronometer Company, Rochester, N. Y.; Alfred Stromberg, Chicago, Ill.; Edward E. Clement, Washington, D. C., and Winslow M. Mead, Deputy Superintendent of Public Works, Albany, N. Y.

The Browning Mfg. Company, Cleveland, Ohio, which is to erect a cantilever material handling bridge near Lockport, N. Y., has retained the Scofield Engineering Company of Philadelphia to design and supervise its construction.

The Commercial Register Company, Buffalo, N. Y., has been consolidated with the Benjamin Account System Company, recently incorporated at Rochester, N. Y., with a capital stock of $120,000, and a new manufacturing plant for the combined business will be built at Rochester. The new plant will be equipped with up-to-date woodworking machinery and motors for its electrical operation, Niagara Falls power being used.

The Syracuse Malleable Iron Works, Syracuse, N. Y., has let contracts for erection of foundry, annealing and trimming buildings on North Geddes street, to replace buildings destroyed by fire this summer. They will be of fireproof construction. The Syracuse Bridge Company has the contract for the steel work.

The McCain Construction Company, Mercer, Pa., has been awarded contract for construction of a bridge over the Mohawk River at Utica, N. Y., for the New York Central Railroad, at the west end of its Black River yards.

The Automatic Transportation Company, Buffalo, N. Y., will build an elevated railroad in Summit County, Colo., for transportation of ores from mines. The road will be built with single column Y top rail supports of steel and the ore cars will be operated automatically by electricity.

The Continental Can Company is having plans prepared for an addition to its Syracuse plant on Washington street, that city.

The F. H. Burt Company, Buffalo, manufacturer of paper boxes, which is building a five-story and basement addition to its plant at Myrtle and Hamburg streets, will require considerable box-making machinery for this addition, as well as for the six-story and basement addition to its Niagara street factory, now in course of erection.

Chicago

CHICAGO, ILL., October 18, 1910.

Though unmarked by any individual transactions of unusual importance, last week's trade in machinery lines was of volume and character, indicating that the market is keeping step with general expansion. The leading machine tool houses, encouraged by a broadening demand, hold optimistic views as to the future. Orders are coming out in greater numbers from miscellaneous manufacturing interests, which,

THE MACHINERY MARKETS

until within a few weeks ago, contributed very little to the general volume of business. Business with some houses is less active than others, but the difference is not so pronounced as it was, and all reports agree in representing decided improvement. A fair amount of business is being done in second-hand tools, but considerable difficulty is encountered in securing salable stocks of this kind.

It is understood that all of the tools in the large list of the Transcontinental Railway of Canada for its new shops at Winnipeg, pending since last spring, have been purchased during the last month. A large portion of the equipment was placed with Canadian manufacturers. One of the largest orders placed in this country was that given to Joseph T. Ryerson & Son, Chicago. The order embraced all of the punches and shears, flue shop machinery, steam hammers, hydraulic presses, hydraulic riveting machinery, pumps, accumulators and a large amount of miscellaneous machinery for the boiler and erecting departments. It is understood that the award amounted to about $75,000.

The Commercial Club of Peoria, Ill., is negotiating with a large veneer company which is seeking a suitable location for its plant. The company has a capital stock of $2,000,000 and employs about 350 men. The only bonus sought by the company is a site of 20 acres, in consideration of which it agrees to erect a building 200 x 600 ft., three stories.

The Mattoon Machine & Foundry Company, Mattoon, Ill., has been incorporated with $25,000 capital stock to engage in a general foundry and machine business and specialize in the manufacture of a steam valve recently invented by Charles N. Goon and John Cantlon, Sr., two of the principal incorporators. A site for a plant has been secured adjacent to the Illinois Central Railroad, and building operations will be commenced in a short time.

The Western Electric Company, Chicago, at a special meeting recently held by its directors, authorized the expenditure of $900,000 for extensions and improvements of its Hawthorne plant. The improvements to be made will consist of a new switchboard building and other buildings and improvements about the property.

The National Machine Recorder Company, Marquette Building, Chicago, has greatly increased its manufacturing facilities by the installation of new equipment. The company has leased the entire first floor of the manufacturing building located at 213 Englewood avenue. The company also holds an option on the other four floors of the building, and will in the course of about 90 days occupy two additional floors, at which time considerable new equipment will be purchased.

Bids will be received until October 22 by the city of St. Charles, Ill., for boilers for installation in the electric light plant.

In connection with new additions to its plant, the Kewanee Boiler Company, Kewanee, Ill., is installing four electric traveling Northern cranes, manufactured by the Northern Engineering Works, Detroit. These cranes are of alternating current Northern type E design, ranging in capacity from 5 to 15 tons and 55-ft. span.

The Olson Rug Company, Chicago, has awarded contracts for the construction of a new factory building, 75 x 125 ft., five stories and basement. The building will be equipped with elevators, heating plant and automatic sprinklers, and will be constructed at a cost of about $60,000.

D. S. Pentecost, 79 Dearborn street, Chicago, has completed plans for a one-story blacksmith shop, 25 x 80 ft., to be erected at Armitage avenue and Ballou street, for John O'Neill. The building will be of brick construction with cement floors.

The Stromberg-Carlson Telephone Mfg. Company, Chicago, Ill., and Rochester, N. Y., has purchased the American Telephone Company's entire common battery business, together with all its inventions, patents, patent rights, patent applications, all tools, patterns, drawings, records and everything relating to or used in the manufacture or sale of above mentioned batteries.

I. & S. Lanski, Chicago, are having plans prepared for a four-story factory building, 127 x 165 ft., to be erected at the southwest corner of Morgan and Twenty-first streets. It will be of reinforced concrete, standard brick and mill construction, and will be equipped with automatic sprinkler system, steam heating and electric freight elevators.

The trustees of the Central Mfg. District, Chicago, are about to erect for the J. L. Metz Furniture Company a new factory building, 80 x 160 ft., six stories and basement. The building will be of heavy mill construction and will be equipped with two large electric freight elevators, automatic sprinkler system and a heating plant.

The La Crosse Hay Tool Company, Chicago Heights, Ill., has increased its capital stock from $100,000 to $200,000.

The Moline Pump Company has definitely decided to locate its new plant in Ottumwa, Ill. It will be erected at a cost of $45,000 and will include a two-story warehouse and office building, 80 x 150 ft.; a foundry, 80 x 120 ft.; machine shop, 100 x 200 ft.; engine room, 40 x 60 ft., and a paint shop, 60 x 80 ft.

The D. M. Sechler Carriage Company, Moline, Ill., has decided to change its name, and it will hereafter be known as the D. M. Sechler Implement & Carriage Company. The company is preparing to make extensive repairs and improvements with a view to enlarging the capacity of its plant.

Philadelphia

PHILADELPHIA, PA., October 18, 1910.

Manufacturers in some instances report a slightly better volume of business during the first half of the month, as compared to the same period in September; the demand, however, is still irregular and business is confined to small orders. A good share of the business taken has come from buyers located outside the immediate territory. Few merchants report any betterment in trade conditions. For some few classes of tools there has been a fair amount of inquiry, but prospective buyers postpone purchases as long as possible. From the upper portion of the State, covered by merchants in this territory and usually productive of a fair amount of business, extreme quietness is reported. There has been little in the way of new business from automobile manufacturers and even the recent light demand which has been coming from the railroads in this territory has been less active.

For what little business there is offered competition is sharp and in some instances price cutting is reported. The trade notes, however, that cancellations on orders in hand have recently been less pronounced. A few orders for special equipment for export are reported, but the demand for tools of the standard types is unimportant. Very little change is to be noted in connection with either steel or gray iron foundries. New business comes out slowly and in some instances prices have a tendency to be easy. This is particularly noticeable for some classes of steel castings.

Machine tool builders operate plants on about an even basis, but the lack of fresh orders will, no doubt, have some influence on the situation in some directions. It is to be noted, however, that builders of textile machinery are for the most part pretty well engaged.

The demand for boilers and engines shows no material betterment, although some pretty fair propositions are still under negotiation. That for second-hand power equipment is also dull, while but a moderate demand of a day to day character is reported for second-hand machine tools.

The contract for the addition to the manufacturing plant of the McCaffrey File Company has been awarded to the Charles McCaul Company. A portion of the addition will be used as an extension to its forging department.

Robert C. Gray, formerly secretary and treasurer of the Hartman Company, engineers and machinists, succeeds the late John M. Hartman as president of that company. W. H. Farrell, who was Mr. Gray's assistant, succeeds him as secretary-treasurer. This company finds general business rather irregular of late, although some few departments, particularly that connected with wrought iron pipe work, keep actively engaged.

The Espen-Lucas Machine Works reports the demand so far this month better than that during the same period in September, and orders taken have been more numerous. There has been some scattered business for export, and shipments of foundry cold saws and boring mills have been made to Canada and England. The plant continues fairly busy on a general line of cold saw cutting off machines, boring mills and slab milling machines.

The Zephyr Ventilator Mfg. Company is fairly busy and the coming season promises to be quite active. This concern is developing a new style of its Zephyr ventilator in order to meet the wider scope of ventilation demanded in some districts. This new type will have 42 sq. in. of aperture per running foot and is proportionately larger than the standard type.

The Earle Gear & Machine Company is operating its plant at full capacity. A large amount of cut gear work is on hand, a number in nickel steel for the American Steel & Wire Company running up to 140 in. in diameter. A number of Lea Simplex cold saw cutting off machines are being built for the Lea Engineering Company of New York, as are also quite a number of Lea high duty five pumps. Several tag making machines as well as other special tools are included among the orders recently received.

The Tacony, Frankford & Holmesburg Traction Company, Tacony, Philadelphia, is taking bids for a brick and steel addition to its boiler house at State Road and Robins street.

The Knaut Machine Company, Reading, Pa., which for

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a number of years has been located at 316 Maple street, in that city, has removed to new and larger quarters at 221 South Ninth street. This company makes a specialty of hat making machinery as well as a general line of special machine work.

The Keystone Steel Casting Company, Chester, Pa., which recently made extensive improvements to its plant, contemplates still further extensions in the near future, the details of which are not yet ready for announcement. This concern, which makes a specialty of vanadium, tungsten, manganese, nickel or any alloy crucible steel, is now under the management of R. B. Farquhar, Jr., formerly connected with the Taylor Iron & Steel Company, High Bridge, N. J.

Plans have been prepared for a 12-story building by Joseph E. Sperry, architect, to be erected by the Baltimore Bargain House, Baltimore, Md., at Baltimore, Garrett and Liberty streets. Henry Adams, engineer, will look after the engineering features of the building. Detailed information is not yet available, but it is understood that it is proposed to begin work on the new building early next year.

Announcement has been made in Baltimore, Md., that the contract for the new bottling department for the Monumental Brewing Company, Highlandtown, Baltimore, Md., has been awarded to the Engineering & Contracting Company of that city.

Plans are being prepared by J. E. Laferty, architect, Baltimore, Md., for a large manufacturing building of steel frame and corrugated iron, to be erected for the Baltimore Siegwart Company, which, it is stated, is to be equipped with modern machinery for the manufacture of cement products. The new plant will be built at Curtis Bay, near Baltimore, Md.

Cleveland

CLEVELAND, OHIO, October 18, 1910.

The machine tool market continues dull. Dealers report no change in the volume of orders, but some have been getting more inquiries during the past week. While none of these are large, some are for from four to six tools, being larger than most of the inquiries that have recently come out. Orders are coming from scattered sources and no kind of tools is in particular demand. Machine tool builders generally report the demand light. Some have got pretty well caught up on old orders and have commenced to make tools for stock. A hopeful feeling prevails and builders look for a better demand before they have accumulated many stock machines. Very little business is coming from the automobile trade and only a few single tool orders from the railroads. The demand for second-hand tools is fairly active, coming largely from the smaller shops. Dealers also report the supply business fairly good.

Orders for electrical equipment are rather light, but an improvement in the outlook is noticed. The demand is largely for small equipment. Boiler shops are well filled with orders, but the demand at present is somewhat light.

In the foundry trade conditions are about stationary. While there is not a large amount of new work coming out jobbing foundries are quite busy.

The Lake Shore Railroad list of machine tool equipment for its new shops in Elkhart, Ind., is about completed, and it is expected that it will be out shortly. It is announced that the list will include about 200 tools, practically all for the locomotive shop equipment. Delivery of the machinery will not be wanted before next spring. Orders have been placed for the equipment for the large power plant to be erected in connection with the new shops.

At the time the successful Industrial Exposition was held in Cleveland in the summer of 1909 the need of a permanent exposition hall was impressed on some of the leading business men and the matter, which has been under consideration and investigation since that time, has now taken definite shape. At a meeting of prominent business men at the Chamber of Commerce a few days ago it was decided to go ahead with the project at once, and President George W. Kinney has named a commission of 250 citizens which will take in hand the matter of financing and building the new structure. It is planned to erect a large building containing an auditorium seating 2500 people and an exposition hall capable of housing 10,000. The project will involve an expenditure of about $500,000. F. F. Prentiss, former president of the Chamber of Commerce, is at the head of the movement.

The Bishop & Babcock Company, Cleveland, will make further extensions to its plant. A one-story brick building, 50 x 160 ft., for its model making department, is under way, and plans are being prepared for a large addition to its brass department. This will be a brick building, 50 x 150 ft., four stories and basement. This will include a brass foundry. The company will shortly be in the market for considerable brass working machinery. The equipment for the model department has been purchased. Both buildings will be equipped with sprinkler systems. This company will also rebuild and enlarge its Indianapolis plant, which was badly damaged by fire a few weeks ago. This plant will be 70 x 300 ft., and two stories. As the section of the plant containing the machinery was not seriously damaged by the fire, not much in the way of additional machinery equipment will be required. The Bishop & Babcock Company recently completed other additions to its Cleveland plant that added 2 acres to the floor space in the department devoted to the manufacture of soda fountain equipment.

The Globe Machine & Stamping Company, Cleveland, which recently decided to build a new plant, has acquired a site on West Seventy-sixth street, adjoining the plant of the Standard Welding Company. The site comprises 40,000 sq. ft. The company will at once begin the erection of a portion of its new plant to provide a floor space of 16,000 sq. ft., to be used in the manufacture of tool and battery boxes. The main building, which will contain about 30,000 sq. ft. of floor space, will be built later. This will be used for the stamping, tumbling barrel and special machinery departments. The first section will be ready for occupancy about March 1, and it is the intention to have the entire plant completed in 18 months. It will greatly increase the company's present capacity.

The Marion Shovel & Dredge Company, Marion, Ohio, has broken ground for its new plant, which it is expected will be ready for operation in February. At present four shop buildings will be erected. These will include a machine shop and erecting room, 120 x 210 ft.; a blacksmith and structural shop, 60 x 210 ft.; a carpenter shop, 60 x 112 ft., and a power house, 60 x 100 ft. The plant will have a capacity of 10 shovels per month. A. E. Cheney is general manager and secretary of the company.

The Cleveland Wire Spring Company, Cleveland, which is building an addition to its plant, will use the additional space, amounting to 30,000 sq. ft., for increasing the capacity of its metal goods department. This includes steel barrels, shop boxes, tool racks, steel shelving and other shop furniture.

The Dover Boiler & Construction Company, Canal Dover, Ohio, has been organized by S. W. Dickerson and P. A. Arnold to take over and operate the plant of the Acme Boiler & Construction Company, which recently went into the hands of a receiver. Improvements will be made to the plant.

A contract has been practically closed for the removal of the plant of the Bunting Brass & Bronze Company from Alliance to Toledo, Ohio. The plans provide for the erection of a new plant and the removal of the machinery now in the Alliance plant.

The plant of the Smith Tractor Mfg. Company is being removed from Chicago to Wapakoneta, Ohio, where it will become a part of the plant of the Ohio Steel Wagon Company. A gasoline farm tractor will be manufactured. It is expected that the additional product will in a short time necessitate the enlargement of the present plant.

The Kilby Mfg. Company, Cleveland, reports that it has enough work on hand to keep its plant running full for some time. The company had a good volume of orders for sugar making machinery on its books during the past few months and has recently taken some good orders in other lines.

The West Lock Company has moved from Columbus to a new plant which it has built in London, Ohio. Its new quarters give the company greatly increased facilities for manufacturing its products.

The Peerless Machine & Stamping Company, Cleveland, has been incorporated with a capital stock of $10,000 by William A. Steinbrenner and others.

The Atlas Engineering Company, Cleveland, recently incorporated with a capital stock of $15,000, has bought out the equipment of the Superior Tool & Mfg. Company and has established a plant at Superior avenue and Thirty-first street for repair work. William Bachman is president of the company and J. P. Nystrom manager.

The Zoar Fire Clay Company, in which E. F. Houser and others are interested, is being organized in New Philadelphia, Ohio, to build a brick and sewer pipe plant in Zoar, Ohio.

The Dunham Nutlock & Bolt Company is looking for a site for a plant to manufacture a self-locking nut and bolt, the invention of Samuel Dunham of Steubenville, Ohio. The Akron Chamber of Commerce is making efforts to secure the concern for that city.

It is announced from Toledo, Ohio, that the Dusseau Fore & Rear Drive Auto Company, recently incorporated in that city with a capital stock of $100,000, is planning to build a factory for the manufacture of automobiles and auto trucks.

During the fiscal year ending June 30, 1910, the American Shipbuilding Company built 23 lake boats, having a carrying capacity of 158,500 net tons, and now has 12

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vessels under contract. The company expects to have its new plant at Port Arthur in operation by January 1. This includes a 700-ft. dry dock, steel punch shop building, machine shop, building berth and equipment. At Buffalo the company has completed a 700-ft. dry dock, boiler house and office building. The new forge shop at Lorain, Ohio, capable of making the heaviest forgings that are used in vessel construction, will be in operation by November 1.

The steamer William P. Palmer, named in honor of the president of the American Steel & Wire Company, was launched at the Ecorse plant of the Great Lakes Engineering Works October 15. The Palmer is the last of the three 600-ft. 12,000-ton freighters built at the Ecorse yards this year for the Pittsburgh Steamship Company. This boat will not be placed in commission until next spring.

The McCaskey Register Company, Canton, Ohio, has increased its capital stock from $500,000 to $1,000,000, for the purpose of taking care of the large expansion in its business and providing for additional buildings which are now being constructed.

Cincinnati

CINCINNATI, OHIO, October 18, 1910.

A market report from this section of the country would necessarily have to refer to politics if local conditions are to be followed closely. While not much interest is taken by business men generally in the result of the coming November election, everyone earnestly wishes that it was over with. Business is quiet in many lines and the machine tool trade has been affected to some extent by the unsettled conditions for which there is no tangible reason except political agitation. Close observers, however, predict that the country will commence to experience a period of commercial activity soon after November 8. Weather conditions have been perfect for pushing work on new plants and additions in this territory, and several new factories in the course of construction here will be finished ahead of the scheduled time.

Orders for machine tools continue coming in slowly, but some tool builders appear to be drawing a full share of business. It was rumored last week that one of the larger railroad systems had bought heavily on a list issued some time ago, but investigation proved that only a few emergency tools were purchased.

The December meeting of the Cincinnati Metal Trades Association will be held at the Business Men's Club December 8. This will be the final meeting of the year, and will not only be largely attended by Cincinnati manufacturers but by a great many from other cities. This will be in the nature of a railroad session, and it is planned to have the executive heads of the more important trunk line railroads for speakers. The association feels that the present agitation against the man who has a dollar invested in almost any kind of business industry justifies closer relations between the manufacturer, shipper and the railroads, and it is hoped that the December meeting will materially aid in bringing about this result.

South American trade with Cincinnati manufacturers seems to be on the increase. The Dreses Machine Tool Company made a recent shipment of several radial drills to Buenos Aires, Argentina, and the American Laundry Machinery Company has just received an order for a large laundry outfit from the same point.

Boilers aggregating 1000 hp. will be installed in the Henry street plant of the Christian Moerlein Brewing Company, Cincinnati. B. Baldwin & Co. are drawing the plans for the new addition.

K. Kishi, a mechanical engineer and manager of Andrews & George, machinery importers of Osaka, Japan, is in Cincinnati for the purpose of conferring with several machine tool builders represented by his firm in Japan. The shops visited by him include that of the Lodge & Shipley Machine Tool Company, Cincinnati Shaper Company, Cincinnati Planer Company, Cincinnati Milling Machine Company and the Cincinnati-Bickford Tool Company. It is expected that Mr. Kishi's visit will result in an increased machine tool business with Japan.

The Portable Safety Gate Company is a new Cincinnati incorporation with $10,000 capital stock, to manufacture a residence door device. The incorporators are G. E. Conners, John H. McMakin, C. W. De Armond, T. N. Eller, and Chas. T. Fennel. Temporary offices are at 1009 Mercantile Library Building.

The Grimm Architectural Iron Works Company, Cincinnati, is having plans prepared for a manufacturing plant to be erected on Spring Grove avenue.

The Dick Mfg. Company, Canton, Ohio, has had plans prepared for a new building that will nearly double its output of agricultural implements.

Plans for enlarging the water works at West Carrollton, Ohio, are being prepared by E. F. Layman, civil engineer. A new pumping station and concrete reservoir will be installed.

The new plant of the Victor Safe & Lock Company, in Norwood suburb, is nearly completed and the company expects to move in at an early date. An additional building lot adjoining the site of the new plant has been purchased and it is understood other buildings will be erected some time next year.

A three-story factory building, 168 x 230 ft., will be erected by the Bode Realty Company at 1648-50 Central avenue, Cincinnati, to take the place of a manufacturing structure on the same site that was recently destroyed by fire. The Warner Pole & Top Company, a local manufacturing firm, will occupy the top story.

The Chesapeake & Ohio Railroad Company is rushing work on its new shops near Melbourne, Ky., and the opening of the spring season will probably see them far enough finished to install some of the necessary tools and equipment.

It is reported that the Baltimore & Ohio Railroad Company will soon commence work on a car repair shop at Keyser, W. Va. The main building will be of steel and concrete construction, 50 x 300 ft.

The free public night Continuation School for foremen held its first session Friday night, October 14, at its quarters on Ninth street, Cincinnati. About 50 shop foremen were present, and indications are that the proposition will be a big success during the fall and winter season. Two meetings a week are held and the course mapped out includes a general discussion of shop methods, machines, &c.

The Champion Safety Lock Company, Geneva, Ohio, has increased its capital stock from $75,000 to $100,000. It is understood the company intends to make some additions to its plant.

The Heer Engine Company, Portsmouth, Ohio, has increased its capital stock from $50,000 to $125,000, and advises that $25,000 of this amount will be used for the erection of a new building and the remainder for working capital.

The Fostoria Aluminum Mfg. Company, Fostoria, Ohio, is considering the erection at Mishawaka, Ind., of a concrete foundry building, 65 x 95 ft., and a fire and waterproof office and pattern storage building, 22 x 24 ft. The equipment for the foundry will include oil furnaces for melting brass and aluminum, band saws, molding machines, &c., all of which will be electrically operated.

Pittsburgh

PITTSBURGH, PA., October 18, 1910.

The market for machinery is slowly but steadily gaining in strength and volume. The most gratifying feature of the situation is the fact that the ground won from week to week is held and that the demand shows considerably greater diversity than earlier in the fall.

The railroads continue to delay purchasing on the lists prepared by their equipment departments, but increasing compensation is found in the buying that is being done for manufacturing plants in general, not only here but elsewhere through the country. Any close canvass of inquiries now before the trade would undoubtedly reveal a large aggregate of prospective business, and many of these are such as to indicate that contracts will be closed in the near future.

In the line of equipment for handling heavy material there appears to be a great deal of activity. Crane builders are particularly busy, and manufacturers or agencies concerned in the sale of hoists, steam shovels, dredges, sand pumps and other machinery for excavating or filling, ore, rock and coal handling, &c., have been called upon lately to do much estimating, either for immediate delivery to Southern points and abroad or for next season's requirements of contractors, transportation companies, mining operators and others whose present open season in Northern districts is nearing its close. Preparations of the character last named are being much more generally made than is credited by most observers.

Of all lines of machinery building, however, the manufacture of electrical apparatus easily leads in its present activity. Significant of this is the fact that advertisements for armature winders, testers, installation experts and other men skilled in generator, motor or transformer work, &c., are constantly appearing in the newspapers of the district. Despite all of the drawbacks affecting industrial conditions as a whole, the great shops of East Pittsburgh and Wilmerding are experiencing one of the most prosperous seasons in their history; and, while fall business started is

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a bit slower than anticipated by the trade, every indication points to the fact that it will close strong.

Much interest has been aroused here by the announcement that the contract for the electrification of the Hoosac Tunnel on the line of the Boston & Maine Railway from Rotterdam Junction to Boston, Mass., involving the expenditure of over $1,000,000, has been awarded the Westinghouse Electric & Mfg. Company, Pittsburgh, being the most important work of the kind to be undertaken this year. A power plant equipped with three generating units aggregating 12,000 kw. in capacity will be built near one end of the tunnel, and the initial order also calls for five electric locomotives of the type designed for the Pennsylvania Railroad, together with the equipment necessary to their use. These will be driven by single phase alternating current motors such as have been put in successful service on a number of heavy traction lines.

The Board of Trade at Buckhannon, W. Va., is reported to have made arrangements there for the construction of a glass factory to be operated by a concern whose name has not yet been made public.

The damage recently caused by fire to the plant of the Raymond Mfg. Company, Corry, Pa., will be repaired as soon as possible, and some remodeling and extension of the company's manufacturing facilities is likely to result.

The Tidewater Portland Cement Company, Union Bridge, Md., has placed an order with the Wisconsin Engine Company, Corliss, Wis., for three horizontal cross compound engines, with cylinders 23 and 43 in. by 48-in. stroke, to be operated condensing; speed, 100 rev. per min. Each will be direct connected to a three-phase 60-cycle alternating current generator of 925 k.v.a.

A rotary converter of 1000 kw. is now being installed by the Westinghouse Electric & Mfg. Company in the main power plant of the Little Rock Railway & Electric Company at Little Rock, Ark.

A gas engine driven pumping unit is included in the plans for a new water works station to supply Wheeling Heights, which J. R. Kommer of Pittsburgh has prepared for the city of Wheeling, W. Va. An 80-ft. steel standpipe will also be needed in carrying out the system proposed.

In order to inaugurate the campaign for new industries recently planned, the McKeesport Chamber of Commerce, McKeesport, Pa., has offered a tract of 20 acres to be used for the sites of plants intending to locate there.

The Columbus Motor Car Transportation Company is reported to have been incorporated at Columbus, Ohio, for $100,000.

Ludwig Hommel & Co., whose offices here are in the Lewis Block, represent the Garwood Electric Company, Garwood, N. J., in the sale of that company's motors, which have established an excellent record at various installations in the district for high efficiency and reliability under severe continuous service.

The Fairmont Mining Machine Company, Fairmont, W. Va., is letting contracts which will more than double the present capacity of its shop facilities. A new office building is also to be erected.

The plant of the Barndt & Johnston Auto Supply Company, Columbus, Ohio, is very active at the present time. Additions to the shop force, including body makers, are now being made.

The trade of the Kinnear & Gager Mfg. Company, Columbus, Ohio, in metal ceilings now extends throughout the country, as far as the Pacific coast, where local representatives are maintained. Special features of design, such as an interlocking slip joint and quadruple lock joint, have been largely responsible for the widespread sales. Other products of the company are also in good demand.

Contracts will be placed this month by the Seng Creek Coal Company, Jarrolds Valley, W. Va., for machinery with which to operate its mining equipment and handling plant electrically.

The Pittsburgh office of the United States Cast Iron Pipe & Foundry Company has taken a large contract at Erie, Pa., for material to be used in the extension of the waterworks system to supply the new Wesleyville water and coaling yards of the Lake Shore Railway.

The Pittsburgh Metal Products Company has been incorporated by A. J. Barron, J. A. Beck and Albert K. Little, Pittsburgh, with the stated purpose of manufacturing iron and other metal products and carrying on experiments and research with metals.

The Russell Engine Works, Massillon, Ohio, has been awarded the contract for two new boilers and an engine-driven electric unit of 175 kw. for the new municipal power plant at Carlyle, Ill.

The plant of the Davis-Price Foundry & Machine Company at New Cumberland, W. Va., destroyed by fire recently, will be rebuilt on the old site. Plans are now being made which will be completed within a short time. It is the intention of the company to do this work with its own organization and bids from outside concerns will not be asked.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has awarded contracts for a new erecting shop, 60 x 150 ft., with a crane runway. The company has considerable business on its books and is now working on large contracts for steel castings for the Panama Canal lock gates and the new mills of the American Sheet & Tin Plate Company, Gary, Ind.

The Erie City Iron Works, Erie, Pa., manufacturer of steam engines, boilers and feed water heaters, has been awarded a contract for a pumping station for the Eldred Drainage district, Hardin, Ill. The pumps will have a capacity of 150,000 gal. of water per minute.

The Treadwell Construction Company, Midland, Pa., builders of heavy steel plate and construction work, has recently received orders as follows: One 60-ft. stand pipe, 25 ft. in diameter, for the Superior Steel Company, Carnegie, Pa.; some 90-in. gas mains for No. 1 electric power station at the plant of the Indiana Steel Company, Gary, Ind.; all pipe for the Sharpsville Furnace Company, Sharpsville, Pa., Arthur G. McKee, of Cleveland, being engineer for this work, and a large tank for the Gulf Refining Company for its plant at Bayonne, N. J. The company states that its shops are well filled up and it has about three months' work on hand.

New England

BOSTON, MASS., October 18, 1910.

The supply and tool steel people are receiving numerous but small orders. Their business is improving somewhat, though not equaling that of earlier in the year. The machinery dealers are not busy. The week has been a fairly good one, everything considered, but, as with other lines, it depended on the number rather than the size of the orders. The market for woodworking machinery is not what it should be at this season. Because of the dullness of the lumber business, said to be due to overproduction, the demand for the heavy machinery required by the industry is small, and the market for heavy circular saws is proportionately off. The Boston & Maine Railroad is placing some orders in connection with the equipment of the Hoosac Tunnel at Zylonite, Mass. The company's immediate improvements, amounting to $2,500,000 in addition to the Hoosac Tunnel electrification, are naturally of particular interest to the Boston dealers, because under their territorial rights they will be credited with all sales of the tools which they represent. The purchasing department of the Boston & Maine is now merged in that of the New York, New Haven & Hartford at the South Station, Boston. The effect of this move is being watched keenly by the trade.

The railroads are now generally blamed for a large share of existing business conditions. Their curtailment of purchases has become extraordinary, according to reports received from the traveling salesmen who represent local houses. The common experience is voiced by that of a large dealer in tool steel, having men on the road, who pay special attention to the railroads and other large buyers. In soliciting business in the railroad repair shops a common statement by superintendents is that they have already specified this steel in requisitions. The purchasing agent admits the fact, and explains that the matter has passed him and is in the general manager's office. It has been held up, in common with everything else, excepting where the requisition is for something imperatively needed. The current belief is that buying has been deferred by the railroads until after the Interstate Commerce Commission had settled the freight rate question. According to the dispatches this whole matter will be deferred to February, and it is not believed possible that the condition of rolling stock will permit of any such protracted delay in buying. In New England railroad purchases should be large, but largely confined to the Boston & Maine system.

The Baird Machine Company, Oakville, Conn., manufacturer of special machinery, presses, tumbling barrels and dies, has acquired a tract of land in the vicinity of Bridgeport, Conn., and has engineers at work developing and laying out an entirely new and completely modern plant for the production of its line of machinery. The decision as to location of the works has been reached only after long and careful investigation. Only five years ago a building 40 x 100 ft., and two stories was added, and two years later another structure of similar size was erected. No space remaining immediately adjacent to the buildings, it was first decided to build a large shop to replace the original structure, but this would have been the last unit of contiguous growth unless adjacent land could be acquired, which proved to be impossible. Further progress on expansion was then held up, and a piece of land at Thomaston, Conn., was

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acquired. The fact leaked out, and, being published, resulted in boards of trade, chambers of commerce and other bodies from very many cities, coming forward with offers of inducements to move to their cities. Locations outside of the Naugatuck Valley were not considered, but a number of places in the Valley were investigated, resulting in many wild rumors. The company desired as many as possible of such facilities as trolley and steam railroad sidings, city water, gas, location on a main railroad, and land enough for future expansion and the addition of a foundry. It was not the desire of the officers to leave the vicinity of Waterbury, and time and money were lost in waiting for the development of various propositions in and around the city. A few days ago, after a very earnest effort on the part of the Bridgeport Board of Trade, a piece of land was acquired fulfilling the necessary conditions. The Baird Machine Company was established in 1891, by J. H. Baird, Fred E. Warner and R. T. Lewis, Jr., the last named gentleman dropping out a few months later and Mr. Warner followed him in 1895. In 1901, C. L. Warner entered the business as secretary, treasurer and general manager, Mr. Baird continuing as president. A business employing 15 men in 1905 has grown to 150 at the present time. Persistent increase demands the radical step of moving the industry to a new location where much greater facilities will be available.

The Automatic Machine Company, Bridgeport, Conn., manufacturer of automatic threading lathes, scroll threading lathes, Coulter horizontal nut tapper, wire crimping and wire forming machines and presses, has increased its authorized capital stock from $300,000 to $500,000, $120,000 of the new securities having been issued. The new money is needed because of the rapid growth of the business. The company's sales for the first nine months of this year were over 70 per cent. ahead of 1909, and even with this production a considerable amount of business was lost because of the inability to fill orders. The money will be used for working capital and for new equipment, practically all of which has been contracted for.

The business of the L. L. Hull Company, Clinton, Conn., manufacturer of hardware specialties, has been incorporated with a Connecticut charter. The incorporators are Sturgis G. Redfield, Mary Hill Redfield, M. C. G. Witte and Adella L. Witte. The business was established in 1870. The incorporation means no change in product or management.

The Massachusetts Fan Company, Watertown, Mass., has been awarded the contract for the induced draft apparatus for the Zylonite, Mass., plant of the Boston & Maine Railroad, which will furnish power for the Hoosac Tunnel after its electrification has been completed. The set will be a duplicate of that recently installed for the Housatonic Power Company at Waterbury, Conn. It consists of a battery of two fans, operating either together or independently, with a combined capacity of 234,000 cu. ft. of air per minute at a pressure of 1 in. water column. The wheels are 12 ft. 6 in. in diameter, with floats 5 ft. 5½ in. at the periphery. They are direct connected to the engine, with an intermediate water cooled bearing.

The Universal Boring Machine Company, Hudson, Mass., manufacturer of boring machines, is pushing work on the addition which will double its capacity. The building will be of a temporary nature. The foundations are for a four-story structure, and this will be completed later. The present purpose is to secure additional manufacturing space at the earliest possible moment, for existing facilities will not permit of keeping up with orders.

Henry D. Lloyd has been made manager of the Massachusetts Fan Company, Watertown, Mass., manufacturer of blower and exhaust systems.

New England manufacturers and other shippers are a good deal exercised over the new demurrage rules established by the several great railroad systems of the section. Local statutes in the several States fix a 96-hour limit. But the regulations of the Interstate Commerce Commission make it 48 hours, but with important modifications which in reality serve to extend the average limit well beyond the 48 hours. The 7 a. m. clause reckons the 48 hours as beginning at the first 7 a. m. after placing the shipment on the public delivery tracks, after forwarding the notice of arrival to the consignee. While under local laws no cancellation of demurrage could result from climatic conditions, under the new rule demurrage charges will not be assessed when it is impossible to move freight to or from cars without serious injury to it, or when shipments are frozen, to interfere with removal, or where there are floods or snowdrifts. However, local organizations are protesting vigorously to the Interstate Commerce Commission, against the application of the general rule to New England.

The machine tool builders are watching conditions abroad with the expectation that foreign orders will soon show an important increase. In fact the improvement is already noticeable, so much so that very much more than ordinary effort is being directed with the purpose of getting this business. Those connected with the machinery trade who have been in Europe this summer express a good deal of confidence in the immediate future of business there, in its relation to the machinery builders of America.

W. A. Peck, formerly with the Kilborn & Bishop Company, New Haven, Conn., and the Bullock Mfg. Associates, Springfield, Mass., has begun the manufacture of a line of tools and hardware specialties at 141-145 Brewery street, New Haven.

Detroit

DETROIT, October 18, 1910.

There is now enough business in sight to practically insure a steady run of buying from manufacturers and dealers in this territory for standard lines of equipment of all kinds. The activity in the preparation or completion of plans for new factories, shop and foundry additions, &c., continues unabated, and in the lines most closely related to the metal trades the closing months of the year will undoubtedly witness a degree of expansion approaching, if not equaling, that of last autumn when conditions were wholly unprecedented. The full effect of this, so far as the market for machine tools is concerned, will probably not be felt until some time later; but in the plants producing such equipment there can hardly fail to be enough work on hand, meanwhile, to keep them running steadily. Fabricators in structural iron and steel, in both standard and special shapes, and manufacturers of ornamental metal fittings are all busy; and, while few large contracts have been figured on recently, considerable work is still to come out before cold weather sets in.

The Bennett Axle & Transmission Company has been organized in Detroit by Frank E. Humphrey and Charles Gleason, with a capital stock of $150,000. Concerning the company's plans, no authoritative statement has as yet been made.

The Day Automobile Company was recently incorporated with $200,000 capital stock, to establish a plant in Detroit for the manufacture of an automobile convertible into a road wagon or delivery cart. An output of 1000 machines has been decided upon for next season. The president is Thos. W. Day; vice-president, Hugh Jennings; secretary, Cameron F. Roberts; treasurer, Wallace E. Brown.

The Rose Chemical Company has been organized at Rose City, Mich., and will operate a factory in that vicinity.

An increase has been made in the capital of the Clark Power Wagon Company, Lansing, Mich., and preparations for a heavy season's output are under way.

The Pingree Company, Detroit, recently ordered plans drawn for a six-story factory building, 60 x 100 ft.

The Pontiac Power Company, Pontiac, Mich., will issue bonds to the amount of $114,000 to provide funds for contemplated construction work.

The Calumet & Hecla Mining Company has just completed patterns and will cast in its own foundry at Lake Linden, Mich., the frame of what, it is said, will be the largest ore crusher in the world. This one part will weigh 20 tons.

It is reported from Saginaw, Mich., although without definite information, that the Whipple Electric Company has been organized there to build a power and lighting plant.

Work is now under way on the large new power plant for the Cleveland-Cliffs Iron Company at Negaunee, Mich.

Two boilers, of 150-hp. each, will be among the requirements of the Ohio Dairy Company in consequence of an addition to be made to its plant at Morenci, Mich.

The Volunteer Ore Company, Duluth, Minn., in which Thomas F. Cole and G. A. Tomlinson are interested, is opening up a large mine at Palmer Lake, near Negaunee, Mich., for which a great deal of equipment will be required as development work progresses. Most of this property was formerly owned in Detroit. For the present compressed air and electric current for operating the machinery will be supplied from the power house of the Volunteer mine, which is not far distant.

Some additions, which include the installation of considerable machinery, are to be made to the shops of the Chicago Grand Trunk Railway at Port Huron, Mich.

An increase in its capital stock to $100,000 has been made by the Pardridge Mfg. Company, Detroit, to provide for the growth of the business.

An electric hoist and motor driven air compressor are to be ordered for the property of the Houghton Copper Company, Houghton, Mich., as soon as plans for the new system have been fully determined upon.

Articles of incorporation have been filed by the Clark Engine & Boiler Company, Kalamazoo, Mich. The capital stock given is $200,000.

The construction of a pumping plant is under consideration by the authorities at Mulliken, Mich.

It is reported that the plant of the Aldine Grate & Man-

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tel Company, Grand Rapids, Mich., which was destroyed last week by fire, will be rebuilt for larger capacity.

A new hoisting engine designed to quadruple the capacity of the present system is now being installed in the power plant of the Chief Consolidated Mining Company, Houghton, Mich. It is a duplex 20 x 48 in. machine, with two 6-ft. drums. With the increased activity underground that will result from placing this unit in service, a number of other additions will need to be made to the equipment of the company.

Machinery will be purchased late this fall or early in the winter for the proposed electric power plant at St. Charles, Mich., to be operated by the municipality. A bond issue to cover the expense was recently authorized.

The W. J. Burton Sheet Metal Works, Detroit, is very busy on current orders and has been adding to its force of sheet metal workers and tinners. Other plants of this vicinity, including those that make a specialty of automobile bodies, hoods, fenders, gasoline tanks, &c., have at present about all they can do to keep up with contracts.

The erection of a large timber-cutting plant on Drummond Island in Lake Superior is being planned by A. L. French & Son, Iron Mountain, Mich.

The Michigan Bolt & Nut Works, Detroit, has been incorporated for $300,000.

The announcement is made from Saginaw, Mich., that the Schimmyer Harp Company, Chicago, will establish a plant there.

Preparations are nearly complete for the erection of a new plant at Saginaw, Mich., for the Jackson & Church Company, comprising pattern shop, 60 x 200 ft.; foundry, 100 x 350 ft.; machine shop, 90 x 325 ft.; finishing shop, 90 x 240 ft., and several other buildings, including a separate power house. Electric motor drive is to be used throughout. Steam heating appliances and probably a sprinkler system will be installed.

Plans are expected to be approved shortly by the Michigan Crank Shaft Company for a new factory building, approximately 65 x 140 ft., to be erected in Muskegon, Mich.

The Continental Motor Company, Muskegon, Mich., which has season contracts for gas engines from some of the leading automobile companies and has built up the largest business of that kind in the United States, is completing arrangements that will double its working floor space. Both day and night shifts will be operated continuously during the fall and probably during the winter also.

From Kalkaska, Mich., it is reported that the Freeman Mfg. Company is building a new factory to replace the one destroyed by fire.

The Benton Harbor Malleable Foundry Company, Benton Harbor, Mich., has under construction a new molding and annealing building 60 x 90 ft., but advises that all necessary equipment has been purchased.

The Arthur Colton Company, Detroit, Mich., has purchased a new factory site and will prepare plans in the near future for the erection of a modern machine shop for building special machines and taking care of its special pharmaceutical machinery. Details of equipment to be installed have not been decided upon.

A No. 42 Newten patent cupola has been installed in the foundry of Little Bros., Port Huron, Mich.

The Northern Engineering Works, Detroit, Mich., reports installing the entire equipment, consisting of two Northern cranes and a No. 60 Newten patent cupola, in the new foundry of the Power Specialty Company, Dansville, N. Y.

The Yates-Upholt Brass Company, Plymouth, Mich., is in the market for a complete foundry outfit for making small brass castings. The company will also purchase a double action press, turret lathe and some milling machinery.

St. Louis

ST. LOUIS, October 17, 1910.

While inquiries continue to be fairly numerous, buying orders are mainly for small lots and trade in metal working tools is somewhat slow. The local railroads are displaying a little more interest, and besides the Missouri Pacific, the St. Louis and San Francisco is out with a list, though not nearly as large as that of the first named railroad.

The Copper Back Range Company, recently removed here from Omaha, has started a plant at 717 North Second street, for the manufacture of kitchen ranges. A complete installation of sheet working machinery has been purchased.

The Fayette R. Plumb Company has its new plant on the outer belt line well toward completion and has placed an order for its machine shop outfit, consisting of motor-driven machines made by the American Tool Works Company. The Plumb Company will manufacture axes, hatchets and other edge tools on a large scale. This is the first plant devoted to the making of such lines operated in the West. It is expected the company's enterprise will act as a nucleus which will draw other allied industries to this field. The construction of the buildings is strictly modern. One innovation is the use of white enamel brick for facing the inside shop walls.

The Fulton Iron Works has recently placed an order for two 20-ton Pawling & Harnischfeger cranes for use in an extension to the buildings now under construction.

One of the proming new enterprises here is the Carter Carbureter Company, that started manufacturing its patent automobile carbureter about a year ago. This company is meeting with good success and is much behind with its orders at the present time, and an increase of capacity will soon be required.

The Missouri, Kansas & Texas Railroad has started work on its new large freight warehouses, which will be pushed to completion as rapidly as possible.

The Brown Machinery Company states it is quite busy. There is a good demand for second-hand engines and boilers.

The Smith-Madison Aeroplane & Engine Mfg. Company, St. Louis, contemplates establishing factories in Kansas City and in California.

The Lumberman's Portland Cement Company, Kansas City, Mo., is being reorganized on the basis of an exchange of stock in the old concern at par for the bonds of the new company.

The Haffner Keg Works, Belleville, Ill., was recently destroyed by fire, causing a loss of $5000.

The Hillsboro Grain Company, Hillsboro, Ill., has been incorporated, capital stock $12,000. The president is A. J. Callahan; secretary, Isaac Hill; treasurer, T. H. King. The company will build a large elevator with switching connection with the Big Four Railroad. It will be operated by electric power.

The American Land, Timber & Stave Company, has arranged to establish a sawmill near Bradly's Ferry in Ouachita County, Ark. The company owns 1400 acres of oak timber which it proposes to convert into staves.

The Gulf Cooperage Company, Texarkana, Ark., has recently consumated the purchase of between 2,000,000 and 4,000,000 ft. of oak timber three miles northeast of the city. It will saw this timber into staves and ship them to the finishing mills in Texarkana. The machinery for this work will soon be installed.

The Pelican Oar Factory, Denham Springs, La., which was recently destroyed by fire, will be rebuilt according to the statement of the proprietors, Herlihy & Brown.

The plant of the Adeline Sugar Company at Franklin, La., was totally destroyed by fire October 8. The loss is estimated at $300,000. It was owned by Foster & Sprague and was one of the largest factories of the kind in the country, employing several hundred men.

The H. L. Judd Curtain Pole Mfg. Company, East Chattanooga, Tenn., whose plant was destroyed by fire October 5, causing a loss of $200,000, will rebuild the factory. The company employs 200 men and is the largest of its kind in the country. The loss was fully covered by insurance. The cause of the fire is unknown.

The flouring mill of J. H. Scott, Sweetwater, Tenn., was destroyed by fire of unknown origin October 1.

The flour and sawmills of W. T. Bolley at Jones Mill, Ky., were destroyed by fire October 6. The loss is estimated at $5000.

The cotton gin belonging to J. N. Pittman, Italy, Texas, was burned October 2, entailing a loss of $6000.

The cotton gin plant belonging to J. F. Mondy, near Greenville, Texas, was destroyed by fire October 1, causing a loss of $5000.

The plant of the Farmer's Gin Company, McKinney, Texas, was recently destroyed by fire, causing a loss of about $16,000, partially covered by insurance. The plant was a new one, having been built this fall.

The planing mill of William and G. D. Boyles, Palestine, Texas, was recently destroyed by fire, causing a loss of about $10,000.

The Falls County, Texas, commissioners will rebuild the Highbank bridge over the Brazos River, $18,000 in bonds having been applied for this purpose.

The electric light plant at Hempstead, Texas, is being pushed as fast as possible toward completion, and as soon as the building is erected the machinery will be installed.

The Fox-Harris Machine & Supply Company, Pine Bluff, Ark., is erecting a new building at Fourth and Louisiana streets, which will give it much better facilities for handling its business. The building will be of brick construction, 120 x 154 ft., one story, and will have a railroad track along the front and rear of the building to facilitate the receiving and shipment of material. It is expected that the building will be completed in time for occupancy by the first of the year.

The Neosho Foundry & Plow Works, Neosho, Mo., expects to move its wagon manufacturing department to

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Dallas, Texas. The rest of its manufacturing business will remain at its present location.

The firm of Turner & Barker, Atkins, Ark., have obtained a franchise from the municipality for the construction of an electric light plant to cost $10,000. Financial arrangements are now under way and the machinery equipment will shortly be purchased.

Milwaukee

MILWAUKEE, WIS., October 17, 1910.

Conditions in the machinery trade here at present are rather uneven. Some of the larger manufacturing plants, in consequence of scarcity of orders, have reduced their shop forces, while others find themselves impelled by increasing business to take on more men. All of the plants, however, have enough contracts booked to keep them going in pretty good shape for some time; and it is felt by the majority of business men that immediately following the November elections trade will settle down to a more stable basis. A good many contracts of considerable size are known to be pending in various parts of the country, figures on some of them having been submitted as far back as last spring, and a fair percentage of these are practically certain to be taken by local machinery builders or dealers during the coming month. The revival in the automobile business reported from other market centers, so far as it relates to the demand for parts, has not yet reached here to any appreciable extent; but in other cities of the State, such as Racine and Kenosha, considerable activity is manifested, with numerous additional work improvements being planned.

The Milwaukee Oil Pump & Tank Company, recently incorporated at Milwaukee, is manufacturing a very advanced line of self-measuring pumps and tanks for the storage, measuring and general handling of oils, gasoline, varnishes, &c. The line includes complete systems, both hand and power, for shops, factories, garages, &c. A. J. Roberts is president; C. B. Roberts, Jr., secretary; A. E. Ries, treasurer; and E. A. Bienenstok, general-manager.

The Cutler-Hammer Clutch Company, Milwaukee, is distributing through its sales offices an account of the service rendered by one of its lifting magnets, which was the first of the kind to be put out, having been in operation for three years at the Donora Works of the Carnegie Steel Company and subsequently replaced by a Cutler-Hammer magnet of the latest design. The company's business is steadily gaining in volume and prospects for the future are excellent.

The Sheboygan Light & Railway Company, Sheboygan, Wis., has started work on an addition to its plant, in which two boilers of 250 hp. each and a steam turbine generating set of 1200 kw. are to be installed.

The plant of the Kaukauna Gas, Electric Light & Power Company, Kaukauna, Wis., will be improved and enlarged in capacity.

An appropriation has been made by the city of Menominee, Mich., to cover its share of the expense of constructing a new bridge over the Menominee River, which will be built as soon as the authorities at Marinette, Wis., take similar action.

A three-story extension 30 x 40 ft. will be made to the factory of the Thomas Coaster Toy Company, Sheboygan, Wis.

The Wetmore Adding Machine Company, Milwaukee, has been incorporated for $750,000 capital stock by R. L. Cooley, Frank W. Van Ness and C. P. Wetmore, to engage in the manufacture of computing machines.

The General Mfg. & Machine Company has been organized at Appleton, Wis., by B. P. Pollock, Geo. L. Hart and W. H. Scheel.

A woodworking factory is to be built at Sheboygan, Wis., by the Lakeside Craft Shops. A company to operate the plant was recently organized.

It is stated by L. I. Remond, secretary and treasurer of the Racine Tool & Machine Company, Racine, Wis., that contracts for all of the equipment needed in their new plant have now been placed.

The construction of an incineration plant is under consideration by the authorities at Racine, Wis., and a bond issue to cover the estimated cost will be voted on at the November election.

The Wisconsin Engine Company, Corliss Wis., has recently received a contract for three horizontal cross compound condensing Corliss engines from the Tidewater Portland Cement Company, Union Bridge, Md. The engines will be of different sizes, 23 in., 46 in. and 48 in., direct connected to a 925-k.v.a., 3-phase, 60-cycle alternator. They will be furnished with a special valve gear, cylinders and governors and will be designed for particularly economical performance and close regulation on a variable load.

Indianapolis

INDIANAPOLIS, IND., October 18, 1910.

The Unity Mfg. Company, Indianapolis, has been incorporated with $50,000 capital stock, to do a general manufacturing business and make mechanical devices. The directors are H. C. Ostermeyer, Henry Nicoli, F. M. Reed, J. W. Brooks and O. J. Boulden.

The Chapman Steel Company, 24 Henry street, Indianapolis, has taken out a building permit for a one-story factory building at Madison avenue and the Belt Railroad tracks. It will be of frame and will cost $25,000.

The Prest-O-Lite Company, Indianapolis, is erecting a three-story addition to its factory, the equipment for which is being purchased by H. L. Bass & Co. of Indianapolis.

The Illinois Steel Company in getting license to operate in Indiana, according to the State law, certified that $1,-132,297 of its capital stock of $18,650,000 is represented in its Lake county plant.

Ben R. Wowry has been appointed receiver for the Public Service Corporation of Mooresville, Ind., which supplies electricity and power to the town. The complaining stockholder alleges that the company is insolvent, that the plant is depreciating and expenses exceed the income.

The American Sewer Pipe Company has begun work on its new $125,000 plant at Brazil, Ind. It will manufacture there the largest sewer pipe ever made from clay.

Gary, Ind., four years old, has shown the greatest growth in post-office receipts of any city its size in the United States, and the Government is having plans made for a post-office building to cost $125,000. The first quarterly report, in 1906, showed receipts of $80.17; the report for the last three months, ending with September 30, this year, showed receipts of $9429.92. The increase was such that it has been necessary to move to larger quarters four times.

The M. Rumley Company, Laporte, Ind., manufacturer of threshing and other farm machinery, has put on a night force in order to increase the output of Oil Pull engines from two to three a day, and later in the year four a day. The foundry force of 75 will be increased, it is expected, to 175.

An explosion of a steam boiler October 11 wrecked the lumber and manufacturing plant of Witham & Bowen, Union City, Ind. The loss was $10,000.

The Take-Apart-Radiator Company, Greensburg, Ind., has been incorporated with $25,000 capital stock, to manufacture radiators and other articles. The directors are I. J. Hollinshe, R. Ray Hamilton and E. F. Shelley.

The Superior Ladder Company has been incorporated at Goshen, Ind., with $35,000 capital stock, to manufacture ladders and other articles. The directors are W. O. Valette, Aaron Hartzler and L. W. Vail.

Alfred Ellison has been appointed receiver of the Artificial Coal Company of Anderson, Ind. The company was organized three years ago to make fuel out of clay and chemicals. It did not fulfill the expectations of those who invested in it.

S. D. Helm & Co., Crawfordsville, Ind., manufacturers of sanitary hog and chicken fountains, brooders and other sheet metal products, is erecting a new factory building, 60 x 120 ft., for which considerable sheet metal working machinery will be purchased. Either gasoline or electric motive power will be used.

The Loshbough-Jordan Tool & Machine Company, Elkhart, Ind., is erecting a new machine shop building, 36 x 115 ft., into which it will remove the latter part of November. No additional equipment will be purchased at the present time.

The Motsinger Device Mfg. Company, La Fayette, Ind., has plans prepared for the erection of four new factory buildings. The main building will be 50 x 150 ft., in addition to which there will be a foundry, forge shop and boiler room building, 25 x 100 ft.; a stock and shipping room, 55 x 150 ft., and an office building, 32 x 52 ft. The company is now located at Pendleton, Ind., but was recently induced to remove to La Fayette, Ind., through the efforts of the Young Men's Business Association of that city. The company expects to be located in its new quarters on or before January 15, 1911.

The Wallace Foundry & Machine Company, La Fayette, Ind., has increased its capital stock from $20,000 to $40,000. The increase will be used for additional working capital and to purchase real estate and buildings now occupied by the company.

The Jacobson-Peterson Company, South Bend, Ind., is erecting a new warehouse and office building, 38 x 180 ft., three stories and basement, which will be equipped with electric elevators, bundle chutes and heating plant.

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Toronto

TORONTO, October 14, 1910.

In Ontario the machinery trade continues to be at least up to expectations. Competition from outside is a larger factor than ever. So far as can be gathered from indications other than statistics—of which, of course, the trade of the moment cannot yet be the subject—the importation of machinery keeps on showing increase over that for the corresponding period of last year. The monthly report of the Canadian Department of Trade and Commerce covering July was issued this week. Its showing reflects a marked growth in the imports of machinery. Under the heading Machinery and Machines, the imports for July amounted to $1,630,770 for dutiable articles and $104,501 for free articles, as compared with $1,056,381 and $107,962, respectively, in the month of July, 1909. For the four months ending with July, the imports of machinery, dutiable and free together, amounted to $7,676,177, as compared with $4,534,628 in the corresponding period of 1909. Of electrical apparatus, an item not included in the above, the imports for the same four months amounts to $1,679,106, as compared with $1,100,615 in the corresponding part of 1909. Engines with boilers, not including railroad engines, were imported in the four months to the value of $837,978, as compared with $527,215 in the corresponding four months of 1909. In the four months of this year the imports of agricultural implements amounted to $1,026,076, as against $916,577 last year. This year the automobiles imported in the period under review amounted to $1,714,979, as against $604,092 in 1909. And, as has already been said, it looks as if the currents of importation were running as strong now as they were in these first four months of the fiscal year. It is further to be noted that the bulk of the gain is going to the United States.

The machinery trade, like every other trade, has for months been hampered by deficiency of railroad service, owing to the strike of the Grand Trunk trainmen and conductors in midsummer. The railroads have made progress in the work of relieving the congestion, and delivery is not so retarded as it was.

The Toronto *News* of Thursday makes the statement editorially that the representative of an important Chicago manufacturing concern came to Toronto this week to arrange for the purchase of a 12-acre site there on which to establish Canadian branch works, and that he was so struck with the advocacy of American reciprocity by Government newspapers in Toronto that he wavered in his purpose. Reciprocity arranged, there would probably be no longer a motive for establishing a Canadian branch, as the duty on such articles as his company makes might be greatly reduced or possibly removed altogether.

The plant the Canada Steel Company will erect in Hamilton, Ont., will consist of seven stands of 12-in. rolls, including one stand of splitting rolls. It will be operated entirely by hydroelectric energy, 500 hp. being required. There will be continuous heating. Small angles, reinforced concrete bars, shapes and sections of every variety that can be made from high carbon steel will be turned out. Old rails will be the raw material used, but if soft billets can be obtained at a sufficiently low price the company may manufacture merchant steel bars. It is expected that the plant will be ready for operation by the beginning of next March. The building in which the electrical machinery is to be set up will take the longest time. The Canadian market for such products as the company proposes to manufacture is at present a large one and is certain to expand with the growth of the country. Hamilton was selected, not because it afforded exceptional advantages in the way of cheap power or accessibleness of raw material—for many Ontario towns and cities will be on the transmission lines of the Hydro-Electric Power Commission and old rails are quoted f.o.b. at all points on the railroads—but because Hamilton is an extremely convenient point for the distribution of products such as the company is to make. Any steel billets the company may use will probably have to be imported, as the Steel Company of Canada, whose furnaces are in Hamilton, will be likely to find a sufficient demand for its raw steel from the rolling mills in its own system of industries.

The Canadian Northern Railway Company is planning for the construction next year of repair shops and an elevator at Parry Sound, Ont. The elevator is to have a capacity of 500,000 bushels. Dock improvements at this Georgian Bay port will be rendered necessary for the carrying out of the undertaking, and the Dominion Government will be asked to spend $200,000 on this account. The outlay of railroad company and Government there would amount to about $400,000.

The Commissioners of the Transcontinental Railway are calling for tenders for the construction of the freight sheds and storehouses at Lake Superior Junction, Ont.; Redditt, Man., and Springfield, Man. Lake Superior Junction is the point on the National Transcontinental Road at which the Grand Trunk Pacific branch line to Fort William connects. Information can be obtained from Gordon Grant, chief engineer, Ottawa, Ont. Tenders will be received up to noon, November 8.

Geo. Hachbarn & Co., furniture manufacturers, Berlin, Ont., are building a large three-story addition to their factory.

Alderman McGovern of Port Arthur, Ont., who was visiting in cities of eastern Canada for three weeks, has returned home with the news of plans for doubling the capacity of the Atikokan Iron Company's furnace in Port Arthur and for establishing a foundry in the city to take up a considerable part of the furnace output.

A company that proposes to build and operate a knitting factory in St. Thomas, Ont., asks for a 10-year loan from the city of $30,000. It promises to erect a three-story building, 50 x 196 ft., the cost to be $30,000, and to install $30,000 worth of machinery. It further asks for a fixed assessment of $10,000. The Industrial Committee of the City Council is favorably inclined toward the proposal. The company is described as one engaged in the manufacture of woolens on a large scale in another Canadian town and having excellent financial standing.

Frank Forsyth recently resigned the position of mechanical superintendent at the works of the Lundy Shovel & Tool Company, Peterborough, Ont. He is succeeded by Peter H. F. Spies, late mechanical engineer with Siemens, Ltd., London, England. Mr. Spies will be assisted by W. Jones, late foreman shovel maker with Henry Mills, Victoria Shovel Works, Worcester, England.

The Canadian Government Trade Commission in New Zealand reports that the Canadian machinery received there is too light. This criticism applies to steam machinery and dairying apparatus. It is by the importing trade, however, and not by the consumer that this fault is found. The commissioner adds that as the demand for a different type develops the New Zealand market for Canadian machinery will gradually expand under the tariff preference conceded to Canada. He expresses the opinion that some good live agents could work up a business in automobiles of good appearance, moderate price and good hill climbing faculty. Motor buggies also are wanted, he says, at a fair price.

In the first week of October permits were issued for the erection of new buildings in Toronto of an aggregate value of $340,000.

The contracts let for work on the new General Hospital in Toronto already aggregate $1,000,000.

The Dominion Bridge Company has the contracts to build the bridges for the Canadian Northern Railway Company over the Trent River at Trenton, Ont., and over the Moira at Belleville, Ont.

The Toronto Electric Light Company is erecting a five-story building on Esplanade street, to cost $140,000.

The cheese box factory of E. H. Mann & Co., Peterborough, Ont., was burned October 8, and the machinery was badly damaged.

It is announced that a 200-ft. extension will be made to the buildings of the Canada Iron Corporation at Liverpool, N. S. There is a rumor that a new blast furnace will be added to the company's works there in the near future.

The Diamond Glass Company has decided to build a large factory in Hamilton, Ont.

The Lundy Shovel & Tool Company, Peterborough, Ont., has a drilling plant in readiness to bore for natural gas on its property to use in its own works. It has applied to the City Council for an exclusive franchise to lay pipes in the streets and supply natural gas to customers. A representative of an American syndicate is also seeking to obtain the same exclusive franchise.

The Niagara Bedstead Company, Buffalo, N. Y., will locate a Canadian branch of its works in Brantford, in connection with the Hame & Nott Company. Seventy-five hands are to be employed and the city is to grant a fixed assessment for a specified period.

The Collingwood Shipbuilding Company, Collingwood, Ont., has closed a contract for a steel passenger and freight steamship for the Ontario & Quebec Navigation Company of Picton, Ont. It is to cost $175,000. It will be propelled by twin screws, driven by two quadruple engines of a total of 2000 hp.

It is stated that the Symmes Construction Company, Niagara Falls, Ont., has made arrangements to build a power plant at Sandy Falls in the Porcupine mining field of Northern Ontario, 8000 or 9000 hp. to be produced.

The Port Arthur Wagon Company has deposited $10,000 to the credit of the municipal corporation of Port Arthur, Ont., to guarantee the building and operating of the manufacturing works it has undertaken to establish in that

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city. Work has been begun for the preparation of the site.

Allen Hazen, a New York expert engaged to investigate Ottawa's water supply, has reported that the Ottawa River, the present source of supply, is contaminated by sewage and that 80 per cent. of the water pumped is lost by leakage. He recommends that McGregor's Lake be the natural reservoir drawn upon or that a complete filtration plant be installed. The adoption of the first recommendation would call for an expenditure of $2,400,000 on works, and the adoption of the second would call for an expenditure of $2,300,000. The City Council received the report, but left action upon it for a subsequent meeting.

At its meeting to be held next week the Municipal Council of Weston, Ont., expects to award the contract for the construction of a transformer station for the service the Hydro-Electric Power Commission will supply.

The distribution system of London, Ont., is being pushed to completion as rapidly as possible, the desire being to have everything in readiness to receive and distribute power from the transmission line of the Hydro-Electric Power Commission by December 1.

To the Canada Foundry Company, Toronto, has been awarded the contract for the steel work of the Blackburn Building, now being constructed in Ottawa.

The Montreal Water & Power Company, which is now supplying 157,000 consumers in Montreal and its suburbs, has placed a contract with the New York Continental Jewel Filtration Company for a water purification plant of 30,000,000 gal. capacity. The contract calls for low lift pumps to draw the water from the St. Lawrence at the present pumping station, and also for sedimentary basin and filters.

The Canadian Billings Spencer Works' plant at Welland, Ont., is to be extended.

Kemp & Craise are about to erect a large garage and repair shop in Petrolia, Ont.

The Sherbrooke Railway & Power Company's power plant at Sherbrooke, Que., is approaching completion, and is to be in commercial operation by December 1. Of the 4000 hp. that will be developed, 800 will be used to operate the street railroad and the remainder will be available for industrial purposes. Several important contracts have been made for supplying manufacturers on the company's transmission line, which will extend over a radius of 30 miles.

The carriage factory of S. Fillimore, Southampton, near Amherst, N. S., was destroyed by fire. Total loss, $35,000, on which the insurance was only $6,000.

The Dominion Coal Company is calling for tenders for the erection of a new washing plant to replace the one burned at Port Marien, N. S., three years ago. It may be that a site at Louisbourg will be selected for the new plant. Tenders are being asked also for the construction of a 150-ft. brick stack at No. 2 colliery. A new coal pocket for the storage of coal at that colliery is also to be constructed.

Telfer Bros., Collingwood, Ont., have laid before the municipal corporation there a proposal to take over the disused furniture factory that is on the town's hands. The firm states that its manufacturing business has outgrown its present plant, notwithstanding that additions are made to the latter nearly every year. For the purposes of the business $20,000 would have to be expended on the factory before the machinery could be moved in. Mr. Radford, who has been negotiating with the town for the establishment of a steel industry there, is also endeavoring to come to an arrangement with the town for the acquiring of the furniture factory for use in the manufacture of cutlery. He says that he is associated with H. B. Crandall, president of the Crandall Cutlery Company of Bradford, Pa., in this proposed Collingwood undertaking.

The North American Furniture Company, Ltd., Owen Sound, Ont., has been incorporated with $100,000 capital stock. The company is erecting a new plant, the main building of which is 60 x 400 ft., four stories, together with a boiler room, 40 x 70 ft., and a kiln, 80 x 100 ft. It will be of mill construction and will be equipped throughout with automatic sprinklers. Two boilers with a 250-hp. engine are now being installed, but the company will be in the market in the near future for a full line of equipment for the manufacture of dining room and bedroom furniture.

The South

ATLANTA, GA., October 17, 1910.

The steady, conservative development which marks the progress of Southern industries is bringing out for the fall trade a sufficient number of inquiries to keep dealers fairly busy, and in some of the principal market centers a good many orders have recently been entered. As a whole, however, business is still below normal for the season, and the promise of activity offered at the beginning of autumn has not been fully kept. While manufacturers have a good deal of work in their shops and mills, inclusive of repairs to machinery, they appear to experience difficulty in closing pending contracts until just before the equipment is actually needed for installation, and this keeps the trade somewhat uncertain as to the future, with consequent halting of contemplated plans for extensions and betterments.

For construction material, including contractors' outfits of all kinds, there is a first rate demand; and drainage projects are also responsible for some buying. Miscellaneous purchases, however, still constitute the principal support of the market, and these are quite uniformly scattered among a great variety of industries.

The Westinghouse Air Brake Company, Pittsburgh, Pa., has established a new district office for Southern business in the Candler Building, Atlanta, Ga.

Electric motors will be installed in the plant of the Massee Felton Company, Macon, Ga., and operated on current furnished by the Central Georgia Power Company.

It is stated that the largest automobile truck in the South has just been put in commission by the Cathcart Transfer & Storage Company, built by the Grabowsky Power Wagon Company for use in Atlanta, Ga.

It is reported from Gainesville, Ga., that the Blue Ridge Power Company has been organized to build a hydroelectric plant on the Chattahoochee River, Wm. A. Carlisle being named as the principal incorporator.

It is stated at Glen Alpine, N. C., that J. D. Pitts of that place is preparing to build a hydroelectric plant of 200 kw. on one of the streams in that vicinity.

The project of constructing a municipal power and lighting station is under consideration at Greensboro, N. C.

A new hydroelectric unit is to be placed in the city power plant, at Walhalla, S. C.

The construction of a modern water works system is under consideration by the authorities at Arlington, Tenn.

By order of the city officials, plans for a large new pumping station have been prepared at Chattanooga, Tenn., and the matter of construction may be decided in the near future. Estimates thus far made include expenditures of $11,928 for boilers, $152,833 for pumping and electrical machinery, $5600 for traveling cranes and $9115 for a standpipe and tanks.

Gamble Bros., Louisville, Ky., are reported to have arranged for the installation of a sprinkler system in their woodworking plant.

Advices from Louisville, Ky., are to the effect that plans for a large plant are being contemplated in behalf of the American Automobile Mfg. Company, but definite information is lacking.

The plant at New Albany, Miss., formerly occupied by the New Albany Furniture Mfg. Company will be operated jointly by the International Furniture Company and the Favorite Washer Company. Some improvements are being effected.

The contract for electric generators to be installed in the municipal power plant at Thibodaux, La., has been let to the Ft. Wayne Electric Company, Ft. Wayne, Ind. They will be driven from oil engines supplied by the Diesel Engine Company, St. Louis, Mo.

A bond issue covering the expeditures to be made for a water works system has been authorized at Patterson, La.

The Champion Wire & Iron Works, Louisville, Ky., has recently completed the erection of a new plant which it is now occupying.

The Corinth Chair Company, Corinth, Miss., will shortly move its plant to Mobile, Ala., where 10 acres of ground have been purchased. The company's manufacturing capacity will be materially enlarged.

The Southwest

KANSAS CITY, MO., October 17, 1910.

Business thus far this month has been generally better in nearly all sections of the Southwest, and the outlook grows more encouraging from one week to another.

One of the principal influences affecting the market for building material, construction equipment and machinery for installation in new or improved plants is the work of the commercial organizations of this section in promoting new industries, public utilities and the growth of established manufacturing institutions in the various cities and towns in which they are located. The record of the first nine months of the year has been a phenomenal one in this respect, and there are signs that the coming winter will witness results of even greater magnitude than any heretofore achieved.

It will pay manufacturers throughout the country, who are striving for a share of Southwestern trade, to keep in touch with the work of the local commercial associations and, so far as possible, lend them assistance in securing information of the character that enables them to proceed

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to the best advantage in promoting industrial development. Wherever a local plant is established, it comes into competition with outside concerns in the same line of production, but as the manufacturing interests of the Southwest become more diversified the purchasing power of the various communities is so far increased that the broadening of the market is of general benefit.

J. C. Worley & Co., Kansas City, are in charge of plans for an improved municipal pumping and water distribution system at Cherryvale, Kan., the cost of which will approximate $100,000.

The installation of a pumping engine of 3,000,000 gal. daily lift, with Corliss valve gear, has been decided upon by the municipal authorities at Junction City, Kan. This will more than double the present capacity of the waterworks system.

One of the plants in this section in which great activity prevails at present is that of the Ottawa Car Works, Ottawa, Kan., where more men are being added to the operating force as skilled mechanics and woodworkers can be secured.

Preparations are being made at Camden, Texas, to erect a timber cutting plant of steel frame construction for the W. T. Carter Lumber Company, which will be the largest and most modern of its kind in the State. All of the machinery will probably be driven by means of electric motors, and the plans provide for a steam power plant of large capacity.

Improvements which will necessitate the purchase of some new equipment are to be made in the waterworks system at Anthony, Kan.

It is reported from Miami, Ariz., that the Inspiration Copper Company is preparing to build a 5000-ton concentrating plant. The site, however, remains to be selected and none of the equipment is known to have been ordered.

Some electrical apparatus for the city pumping station, including a large motor, will probably be purchased in the near future at Hobart, Okla.

Steps will need to be taken at once to install a new power plant for the Clarksville Light & Power Company, Clarksville, Texas, to replace the one that recently burned.

A car building and repair plant consisting of several large buildings, the initial unit of which will be 96 x 216 ft., will be built in Oklahoma City, Okla., by the Oklahoma Railway Company.

An ore reduction plant of 100 tons capacity is nearing completion at Kingman, Ariz., for the 'Frisco Mines & Power Company's Tragedy mine.

The contract for a 650-ft. steel bridge across the Cimarron River, near Stillwater, Okla., has been awarded the Weatherford Machine & Foundry Company, Weatherford, Texas.

Improvements of quite an extensive character are to be made in the electric power and pumping station operated by the municipality at Sallisaw, Okla.

It is reported from El Paso, Texas, that the new ore concentrating plant and smelter of the El Paso Tin Mining & Smelting Company is practically completed and will be put in operation about November 1.

The 300-ton furnaces of the Calumet & Arizona Mining Company, at Douglas, Ariz., will be enlarged so as to give them a capacity of 500 tons each, making the aggregate capacity of the plant 3000 tons.

Advices from Pachuca, Hidalgo, Mexico, are to the effect that the plant of the Compania Minera Santa Ana y Anexas is now completely equipped for electrical operation. Among the latest machinery installed is a large hoist built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio.

It is reported from Hallett, Okla., that the purchase of a gas power plant of 100 hp. has been decided upon by the Lewis Industrial Company of that place.

Machinery has been ordered by the Sierra Consolidated Mines Company for a steam driven electric plant at Durazno, Chihuahua, Mexico, and other improvements are contemplated.

The Flagstaff Lumber Mfg. Company, Flagstaff, Ariz., is building the largest timber cutting and finishing plant in that part of the country, equipped with modern power and operating machinery, including two 20 x 30 in. engines. It is nearly ready to operate.

Some new machinery, including a cyanide plant, is to be installed on the property of the Midnight Test Mining Company, Walker, Ariz., and operations resumed. The work at this mine was suspended some time ago, except for the pumping plant, which was kept going in order to keep the lower workings free from water.

The plant of the Electric Light & Power Company, Newton, Kan., which is equipped with two General Electric alternating current generators of 250 kw., driven by the C. & G. Cooper Company's engines, will be doubled in capacity. A condensing outfit is also to be installed.

It is reported from Drexel, Mo., that an electric power plant will be installed there by A. J. Harbison.

An engine driven power plant of 60 kw. is to be installed at Benson, Ariz., by J. E. Collins, whose address is given as Tucson, Ariz.

Plans and specifications covering the installation of a modern system of water works have been prepared at Douglas, Ariz.

Muskogee Industrial Development Company, Muskogee, Okla., has succeeded in raising a fund of $300,000 and has signed contracts with four different companies for the removal of their plants to Muskogee. There will be a stove plant, agricultural implement works, window glass plant and a furniture factory. The work of construction of the different plants will be commenced within the next 30 days.

W. C. Worthen, Pratt, Kan., has sold his interest in the Pratt Machine Shops, and Mawdsley & Mawdsley are now the sole proprietors.

The directors of the Provident Association, Topeka, Kan., will start a box factory on the corner of Fourth and Jackson streets for the purpose of furnishing employment to men and boys temporarily out of work.

G. W. Hill & Sons, Pittsburg, Kan., have built an extension to their marble plant and will install a 3-ton steel traveling crane and a runway, 175 ft.

At a fire which took place October 7, over one-third of the American Metal Company's large plant near La Harpe, Kan., was destroyed. The loss will run up far into the thousands. The cause of the fire is unknown.

Three of the large mills of the E. I. Dupont de Nemours Powder Company, located 5 miles north of Columbus, Kan., were blown up October 7. Over 1000 bbls. of powder were destroyed. The loss is over $25,000.

The Tulsa Stock Yards & Commission Company, Tulsa, Okla., will erect and equip a large institution at Tamaha, Okla. It will be located along the line of the St. Louis & San Francisco Railroad. Natural gas will be used.

The plant of the Oklahoma Iron Works, Tulsa, Okla., suffered extensive damage by fire October 8. It is the largest foundry in the city and employs 200 men.

The elevator of the Independent Grain Company, at Weatherford, Okla., was totally destroyed by fire October 10, causing a loss of $15,000, about two-thirds covered by insurance. The cause of the fire is unknown.

The Jones-Everett Machine Company, Ardmore, Okla., has been organized to do a general machine shop and foundry business. The company has installed a 36-in. cupola and will purchase other equipment.

The Northwest

ST. PAUL, MINN., October 17, 1910.

Purchases of machinery and other apparatus at the present time are largely for the account of plants engaged in the production of equipment of material for building purposes and the construction of large private or public works. Along these lines the trade of Northwestern manufacturers, dealers and sales agencies, up to now, has exceeded expectations, being strongly contrasted with the disappointing conditions in some other fields of industrial progress. Business of all kinds, however, considered as a total, seems to be gradually gaining ground, and the money stringency which was threatened some time ago has not developed, despite the amount of funds needed for moving the crops. For fabricated metal products an excellent demand still exists, and much new business is reported to be in prospect for the immediate future. Consequently local shops that specialize in such material are buying quite freely for their own needs.

Aside from the sources of inquiry above noted, shop tools remain slow of sale.

Power and electrical machinery is being placed in considerable quantity, as heretofore, and installations everywhere are being hurried forward. There has recently been so much of this work requiring completion that manufacturers find difficulty in securing competent men for erecting machinery and placing it in running order.

The Diamond Iron Works, Minneapolis, has had a very successful year thus far in the sale of its horizontal resaw, which possesses a number of features that commend it to users, including an arrangement by means of which the table remains stationary and the saw is raised and lowered to cut different thicknesses.

Lindsay Bros. of Milwaukee, who are among the largest dealers of the Northwest in agricultural implements, farm engines, &c., have arranged for the construction of a new warehouse in Minneapolis.

The Carnegie Fuel Company, besides making the improvements at Superior recently noted in *The Iron*

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Age, has purchased from the Lowry Holding Company, Duluth, Minn., property on the water front at West Duluth, which will be utilized for the construction of additional docks and handling machinery to provide 1,000,000 tons storage capacity.

One or more small pumping units will be required some time this winter at Madison Lake, Minn.

The Power Engineering Company, Minneapolis, has presented a report to the city authorities at Marshalltown, Iowa, by whom it was engaged for the purpose, outlining plans for a hydroelectric plant to be used in municipal lighting service.

The Minneapolis Steel & Machinery Company, Minneapolis, has met with excellent success this year in the sale of its Muenzel gas producer and engine plants for electric power and lighting service. There are now so many installations of these sets at various points in the Northwest that the service record of one is quite likely to sell another in the same vicinity.

The contract for another electric generating unit for the municipal power plant at Alexandria, Minn., the prime mover of which will be an Ideal engine like the one previously installed, has been let to A. L. Ide & Sons, Springfield, Ill.

In a letter from Moscow, Idaho, it is stated that a new plant will probably be built this fall or in the spring by the Michaelson Mfg. Company, whose works for the production of harvesters are now inadequate to the demand.

The Missoula Light & Water Company, Missoula, Mont., has bought the electrical plant at Victor, Mont., and is planning to build a line of power stations between Missoula and Hamilton.

The Westinghouse Electric & Mfg. Company of Pittsburgh, Pa., is doing a good business in the western end of this territory through an office maintained in the Lewiston Building, at Butte, Mont.

A bond issue has been voted at Carter, S. D., to provide funds for a complete water works system, including pumping machinery.

Plans and specifications for a new filtration plant were recently completed at Grand Forks, N. D., and decisive action in the matter will be taken shortly.

A company is being organized at Bozeman, Mont., by J. C. McCarthy and Dr. Carl Schroeter, to erect a gas plant in accordance with the terms of a franchise recently granted.

A bond issue of $75,000 to pay for the installation of water works is proposed at Lewiston, Mont., and the probabilities are that it will be authorized. A plant is now in service, but has proved inadequate to the needs of the city.

Funds will shortly be available at Libby, Mont., for the construction of a municipal water system.

The Northern Welding & Mfg. Company, Minneapolis, Minn., is considering the establishment in the near future of a branch plant in Duluth, Minn., but advises that a definite date has not been decided upon. The company is at present making arrangements for the erection of a new plant in Minneapolis, which it expects to have completed about the first of the year.

Southern Texas

AUSTIN, TEXAS, October 14, 1910.

An unusual amount of activity in the establishment of new public utility plants and the improvement and enlargement of existing ones is taking place in towns and cities all through the Southwest and Mexico. Many towns of comparatively small size are inaugurating modern systems of water works and sewers and electric light plants. This spirit of public improvements is particularly being manifested in Mexico, where some of the larger cities were not provided with modern utility systems and plants until within the last few years. The new era of improvements along these lines has spread to all parts of that country. One effect has been to create a large demand for water works and electrical machinery and pipe. In southern and southwestern Texas, where extensive agricultural development is in progress, the growth of towns has been remarkable in the last few years, and many of these places have taken steps to provide themselves with modern utilities.

The Texas Railroad Commission has issued formal notice that it will take up and consider the proposition of readjusting the rates applying on steel and iron rails and fastenings November 10. It is proposed to establish a maximum rate of $2.10 per ton from Galveston, Texas City, Velasco, Port Arthur and Sabine to points in Texas common point territory.

The Texarkana Clay Products Company is making good progress with its plans for the erection of a plant at Texarkana, to cost $100,000, for the manufacture of bricks and pottery.

The Flatonia Ice, Water & Electric Company expects to have the installation of its new electric light plant at Flatonia, Texas, finished by the latter part of November.

The erection of a plant for the manufacture of fireproofing material at Houston is under consideration by the National Fireproofing Company, Pittsburgh, Pa. It is stated that about $100,000 will be invested in the enterprise.

At an election held at Denison on October 8 it was voted that the city shall issue $50,000 of bonds for the purpose of extending and improving the water works system. It is planned to install new machinery in addition to laying new mains.

The town of Marion, Texas, is arranging to install a water supply system. The water will be pumped into a standpipe to be located at an elevated point on the Guadalupe River, six miles from town, and the water brought in through a pipe line that will be laid that distance.

The glass plant that is being constructed at Texarkana by the Texas Glass Company will cost about $75,000. The company has a capital stock of $100,000.

The City Council of New Braunfels, Texas, has taken preliminary steps toward the installation of a hydroelectric plant on the Comal River, near town, and to erect a new pumping plant and station for the water works system. A dam will be constructed across the river to form a reservoir from which the initial power for generating the electrical energy will be obtained. Another standpipe will be erected to hold a reserve supply of water for the town.

It is announced by E. H. Young, Galveston, whose large cottonseed grinding and crushing plant in that city was recently destroyed by fire, that he will rebuild it, but that he has not definitely decided whether he will locate it at Galveston, Texas City or Port Arthur.

P. W. Quiney, construction quartermaster of the United States Army, Fort Sam Houston, Texas, is receiving bids for the construction of a 300,000-gal. steel tank and trestle and an extension of the water distributing system at that military post.

Arrangements are being made by the City Council of Lubbock, Texas, for the construction of a water works plant and distributing system. E. L. Dalton of Dallas, is the engineer who is in charge of the proposed improvement.

The Lueders Water Supply Company has adopted plans for the construction of a water works plant and distributing system for Lueders, Texas. The water supply will be obtained from a reservoir to be formed by the construction of a dam across Cottonwood Creek.

The Pecos Light & Ice Company will enlarge its plant at Pecos, Texas. Considerable machinery will be installed.

The Temple Iron Works has made arrangements for the removal of its plant from Temple, Texas, to San Angelo. A site and a cash bonus was given the company by San Angelo to obtain the new industry.

The Pecos & Toyah Lake Irrigation Company, which was recently organized with a capital stock of $1,500,000, has adopted plans for the construction of a large system of irrigation near Pecos, Texas. The main canal will be 65 miles long and will provide a water supply for irrigating about 22,000 acres of land. Among the stockholders in this company are F. E. Dobbins, Charles A. Loomis and L. H. Baker of Kansas City, Mo., and Frederick W. Taylor of Lincoln, Neb.

The municipal authorities of Elkhart, Texas, are arranging to issue bonds for the construction of a water works system and electric light plant.

A peanut factory is being installed at Nixon, Texas, by Dew Brothers of that place.

The City Council of Hearne, Texas, will soon submit to the vote of the people of that place the proposition to issue bonds for the construction of a water works plant and distributing system.

K. MacKinzie, Chicago, is organizing a company at Luling, Texas, for the erection of a creamery at that place.

The contract for the construction of a steel viaduct across the Trinity River and bottoms to connect Dallas and the Oak Cliff suburb has been let by the city to Bernard Corrigan, Kansas City, Mo., for $425,000.

The Toyah Valley Alfalfa Milling Company is erecting a new alfalfa mill at Balmorhea, Texas, at a cost of $25,000. The mill is built of steel throughout and is of 50-ton capacity.

William Heinz, Nara Visa, N. M., contemplates erecting a large pickle plant at Tucumcari, N. M.

The Alamogordo Water Power Company of Alamogordo, N. M., will install a hydroelectric plant of 800 hp. in Box Canyon, near Highrolls. It will construct transmission lines to several points in that section and furnish power to industries and farmers.

R. L. Knowles and associates of Farmington, N. M., have adopted plans for the construction of an ice and cold storage plant at Farmington. They will also make improvements to their electric light and power plant.

J. E. Collins, Tucson, Ariz., is making good progress with

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his plans for the installation of an electric light and power plant at Benson, Ariz.

Weaber & Sherkan, Lancaster, Pa., are having plans prepared for a sausage factory which they will erect at Juarez, Mexico, at a cost of $50,000.

The Mayo River Power & Land Company has had surveys made and adopted plans for the erection of three large hydroelectric plants in Mexico. One of the proposed plants will be situated on the Mayo River in the State of Sonora, another on the Humaya River in the State of Sinaloa and the third on the Santiago River in the territory of Tepic. The three plants will have an aggregate capacity of 300,000 hp. It is stated that the company has contracted to provide electric power for operating the mountain division of the Southern Pacific Railroad of Mexico, that is now being constructed down the Pacific Coast of that country and across the Sierra Madres to Orendain, where it will connect with the National Railways of Mexico. The Mayo River Power & Land Company's principal office is in Denver, Colo.

The Valley Reservoir & Canal Company, Chapin, Texas, will soon let the contract for the installation of a large pumping plant. The main canal of this company is now being constructed. When finished the system of irrigation will furnish water for about 200,000 acres in the lower valley of the Rio Grande.

The Farther Central West

OMAHA, NEB., October 17, 1910.

While buying at the present time is chiefly from the general industrial field, metal working plants are coming into the market more and more for machinery, material and supplies, with the result that jobbers and dealers in the several lines have recently put forth greater efforts to secure business than was observable last month, when conditions were not felt to be ripe for any very strenuous selling campaign. Railroad purchases are also becoming a feature of the situation. These have thus far been chiefly for the account of storekeepers' stocks and the repair outfits of the various terminals and junctions or division headquarters; but it has a very appreciable effect in encouraging general activity owing to the close connection existing between all railroad work and other phases of the industrial life of this section.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, has the contract for an elevated steel tank of 70,000 gal. and other equipment for the municipal water system to be installed at Oakley, Kan.

The Dubuque Boat & Boiler Works, Dubuque, Iowa, will furnish three large steel hull vessels for Government service on the lower Missouri River.

The Park Dam Company, recently organized at Eldora, Iowa, is planning the construction of a hydroelectric plant to furnish power and lighting for that community and industries in the vicinity.

It is reported from Mason City, Iowa, although without confirmation, that the Upper Iowa Power Company will install at Decorah an electric generating unit of 600 kw., in order to provide operating current contracted for by a Missouri corporation which will develop iron mines in the vicinity.

The Waterloo Malleable Iron Works, Waterloo, Iowa, is laying the foundations for the additions to its plant, comprising of the grey iron foundry 100 ft., malleable iron foundry 100 ft. and machine shop 80 ft., besides smaller buildings to be used for various purposes in the operation of the establishment.

Construction contracts covering a three-story packing house, 100 x 150 ft., the machinery in which will be driven by electric motors, are to be let about November 1, by the Corn Belt Packing Company, Ft. Dodge, Iowa.

N. A. Nasby and others have organized the Bode, Heat, Light & Power Company, at Bode, Iowa, to establish a public service plant. The initial installation will be an acetylene plant, for which the contract has already been placed.

It is reported on what appears to be authentic information that the Ideal Irrigation Rotary Pump Company will build a manufacturing plant in Omaha, Neb. The company's headquarters are now at Seattle, Wash., where offices are maintained in the Henry Building.

The expenditure of $20,000 for the city pumping system has been authorized at Superior, Neb.

Work is about to start on the construction of the new plant of the Nebraska Portland Cement Company, Superior, Neb.

Parham & Harris, St. Anthony, Idaho, have taken the contract for nine steel and concrete highway bridges to be erected in the vicinity of Idaho Falls, Idaho.

The new electrochemical ore reduction plant of the Western Metals Company, Georgetown, Colo., which is being completely equipped with machinery especially designed for it by the General Electric Company, Schenectady, N. Y., will probably be ready to operate about December 15. Some additional auxiliary apparatus is likely to be needed during the winter.

The Walker Sheet Metal Company, Council Bluffs, Iowa, is erecting a new factory for the manufacture of sheet metal goods of all kinds. The company is in the market for steel cornice brake, gap shears and a gasoline engine and miscellaneous tinners' tools.

The First Implement & Automobile Company, Vinton, Iowa, is erecting a new factory building 50 x 100 ft., one story. Details of equipment to be purchased have not been decided upon, but the company advises it will need a heating plant.

The town of Corydon, Iowa, water and sewer bond issue of $45,000 has been placed.

A five-story flour mill, a large elevator, warehouse, &c., belonging to the estate of John Siebel, Oskaloosa, Ia., were destroyed by fire October 10, due to spontaneous combustion. The loss is over $50,000.

The recently completed electric light plant at Allerton, Iowa, was totally destroyed by fire October 6, with a loss estimated at $8000.

The Woodruff-Kray Company, Davenport, Iowa, will invest $5000 of its capital in Arkansas, to establish a new stove factory. Charles Deman of Marked Tree, Ark., is to be the agent of the company in Arkansas.

The plant of the Sterling Box Mfg. Company, located at East Fourth and Vine streets, Des Moines, Iowa, has been purchased by the Iowa Box & Lumber Company. The new owners of the plant were recently incorporated, and will continue the operation of the factory.

The Des Moines Saw Mill Company, Des Moines, Iowa, has been incorporated by Grover C. Hubbell, D. D. Langton and Verne Clark. The company will erect a building at West Ninth and Vine streets and install it with machinery, giving the plant a capacity of 6,000,000 ft. of lumber annually. Wood for furniture and fixtures and egg-packing boxes will be turned out.

The gas manufacturing department of the Tremont, Neb., Gas & Electric Light Company, was gutted by fire October 8. The loss was $1000, covered by insurance.

North Pacific Coast

PORTLAND, ORE., October 14, 1910.

The requirements of hydroelectric power developments, both for construction work and plant equipment, are again becoming prominent in the machinery market of this territory, owing to the number of plants that have recently been brought to the stage of progress in which one or the other is needed. In quite a few instances the purchase of water turbines, governors, generators and exciter units, &c., will be required before the new year. Eastern manufacturers have some of their best men on the ground, and the engineering details are being very carefully worked out. The closing of the larger contracts will, however, take place mainly in Chicago, New York, Boston or Montreal, where the groups of capital principally interested are centered.

In the line of general industrial buying the situation shows no essential change from what has been reported during the past two or three weeks. Metal working plants continue to do a good business, and the prospects for the coming month are most encouraging.

The work of enlarging the shops of the Oregon Railroad & Navigation Company at La Grande, Ore., is to begin this month, the construction contract having already been let.

Some additional power machinery may be required before spring by the Eastern Oregon Light & Power Company, La Grande, Ore., in consequence of a decision to build an extension of the traction lines under its control. This company represents a consolidation of a number of public service corporations in that vicinity.

An electric power and lighting plant to be operated by the municipality is among the possibilities at Spokane, Wash., where the matter is under consideration by the authorities.

The plant of the Carman Mfg. Company, Tacoma, recently suffered loss from fire, but it did not affect any of the operating departments and there is no equipment that will need to be replaced.

The Standard Iron & Wire Works, Seattle, is having a good run of business this fall in ornamental work for mercantile and other business buildings.

At a meeting recently held in Spokane, Wash., the Constitution Mining & Milling Company was organized to operate the Constitution mine at Kellogg, Idaho. Henry S. Gilbert of that place is one of the principal incorporators and may be addressed for information as to any new machinery needed.

The Washington Steel & Bolt Company, Edmonds,

THE MACHINERY MARKETS

Wash., is preparing to extend its plant and install additional equipment, none of which appears to have been as yet contracted for. It is stated that orders now on hand require operating the plant with full shifts both day and night. The past year has shown an extremely large increase in business and much more can readily be obtained when the enlarged facilities are available.

D. E. Fryer & Co., Seattle, are the agents in this territory for the Kinnear rolling steel doors, which are coming largely into use in industrial plants as a means of fire protection.

A shop building, 40 x 45 ft., will be completed this fall by the Western Mill Company, Seattle. Practically all of the equipment needed has been provided for.

M. H. Lynch and D. E. Servis are reported to have organized at Elma, Wash., the Olympic Railway & Power Company, one of the objects of which will be to establish a central power station to supply electric current to manufacturing plants in the vicinity.

Contracts are now being let for the structural iron and steel work of a large new general storage plant to be built in Seattle by the West Coast Heating Company.

The Olympic Foundry Company, Seattle, has thus far this season maintained a heavy output of iron castings, and the prospects for business during the next few months are very good.

Work on the new steam heating plant of the Eugene Heating & Power Company, Eugene, Ore., which was temporarily halted by a difference with the contractor, is being resumed, and arrangements for the installation of boilers will be made shortly.

The new machine shop now being built in Seattle by the Puget Sound Machinery Depot will be equipped with a very complete line of modern tools, motor-driven, and served throughout its length by a large traveling crane.

An electric power and lighting plant will be purchased for the new eight-story steel frame building which Frank McDermott is to erect in Seattle at the corner of Second and Pike streets.

It is reported from Victoria, B. C., that the Complex Ore Reduction Company of that place will build a zinc smelter at Nelson, B. C.

Watson Bros., Victoria, B. C., are building a steamer for the Alaskan trade which will be propelled by a large gasoline engine.

The Chehalis Fire Door Company, Chehalis, Wash., is erecting a new plant at McCleary, Wash., to be operated in connection with the Henry McCleary Timber Company, from the mills of which the company secures its entire lumber supply. It is the intention of the company to move the machinery and equipment which it now has in operation at its plant in Chehalis and make such additions as are necessary to practically double its present output of 1000 doors per day. The company will also erect a new warehouse, 125 x 450 ft., which will be built alongside and attached to the factory building. All machinery will be operated by direct connected electric motors.

Interior Canada

WINNIPEG, October 15, 1910.

The men behind the recently organized Western Steel & Iron Company, Ltd., are Charles Baskerville, merchant; D. R. Dingwall, wholesale jeweler; Alexander Simmers, agent; C. P. Banning, physician, and others, all of Winnipeg, and this city will be the headquarters of the concern.

In the awful fire that has raged in the Rainy River district the lumber mill of the Rat Portage Lumber Company, Ltd., at Rainy River, said to be the largest plant of its kind in Canada, was burned to the ground. The loss to the mill and the lumber and timber in the vicinity has been enormous. The company is a very strong one and it is likely that steps will be taken at once to erect a new plant, and much new machinery will be required. Several smaller mills on the United States side of the river were also burned, and as it is about the best timber centre in the interior of the Continent it is certain that several new mills will be erected in the near future to replace the mills destroyed. D. C. Cameron, of Winnipeg, is the president of the Rat Portage Lumber Company, Ltd.

It is said that the Big River Lumber Company, Ltd., at Big River, Saskatchewan, will use even more logging machinery than the Prince Albert Lumber Company, Ltd., which has about the largest mill in that province. The plant of the Big River Company was finished just recently, and various articles of machinery are still being installed.

The Canadian Northern Railway will erect a 30-stall round house in St. Boniface, Manitoba.

The Walsh Sash & Door Company, New Westminster, B. C., is planning the erection of a new factory, with a capacity of 1000 doors per day.

The Hallman & Penniston Machinery Company, Vancouver, B. C., has supplied the boiler, saw carriage and edger for the Bailey Lumber Company's new mill at Port Hammond, B. C.

Government Purchases

WASHINGTON, D. C., October 18, 1910.

The Paymaster-General, Navy Department, Washington, D. C., will open bids October 25 under schedule 2969, class 51, for one high speed friction saw.

Bids will be opened October 25 at the office of the Constructing Quartermaster, War Department, New London, Conn., for the construction of a pumping station at Fort Terry, N. Y., including buildings, pumps, gasoline engine, well connections, &c.

The Isthmian Canal Commission, Washington, D. C., circular 608, calls for bids, to be opened October 27, for furnishing the following supplies:

Class 3.—One washer cutting machine.
Class 4.—One portable grinder and six extra wheels.

Bids were opened September 21 by the Inspector of the Second Lighthouse District, Boston, Mass., for installing oil engines and air compressors on light vessels Nos. 3 and 4, as follows:

Richard T. Green Company, $3490 each; Bertelsen & Peterson Engineering Company, $3650 each; Fore River Shipbuilding Company, $4200; Lockwood Mfg. Company, $5645 each.

The Isthmian Canal Commission, Washington, opened bids October 10, under Canal circular 608A, for furnishing belt conveyors and boring machines, as follows:

Class 1.—Two troughing belt conveyors, 36 in.—Bidder 4, Jeffrey Mfg. Company, Columbus, Ohio, $2990; 5, Link-Belt Company, Nicetown, Philadelphia, Pa., $4540; 6, Manning, Maxwell & Moore, New York, $3639.30; 7, Motley, Green & Co., New York, $3725.84; 8, Robins Conveyor Belt Company, New York, $4276; 9, Weller Mfg. Company, Chicago, Ill., $3800.

Bids were opened October 11 at the Bureau of Supplies and Accounts, Navy Department, Washington, as follows:

Class 1.—One motor driven blower—Bidder 63, Harron, Rickard & McCone, San Francisco, Cal., $1210; 97, Manning, Maxwell & Moore, New York, $1737; 49, R. W. Geldert, New York, $1222; 112, P. H. & F. M. Roots Company, New York, $1224; 122, B. F. Sturtevant Company, Hyde Park, Mass., $1560.

Class 61.—One flat turret lathe—Bidder 70, Jones & Lamson Machine Company, Springfield, Vt., $1536; 101, Niles-Bement-Pond Company, New York, $2968; 143, Warner & Swayzey Company, Cleveland, Ohio, $1290.

Class 62.—One flat turret lathe—Bidder 70, Jones & Lamson Machine Company, Springfield, Vt., $1725; 101, Niles-Bement-Pond Company, New York, $2747; 143, Warner & Swayzey Company, Cleveland, Ohio, $1885.

Class 63.—Three geared head lathes—Bidder 12, Fairbanks Company, Washington, D. C., $768, $785, $802 and $840; 51, Garvin Machine Company, New York, $710, $785 and $810; 67, Hendey Machine Company, Torrington, Conn., $960; 77, P. J. Kemp, Baltimore, Md., $859 and $887; 97, Manning, Maxwell & Moore, New York, $960; 101, Niles-Bement-Pond Company, New York, $810; 125, Springfield Machine Tool Company, Springfield, Ohio, $793 and $819.

Class 64.—One No. 2 wire feed screw machine—Bidder 5, Brown & Sharpe Mfg. Company, Providence, R. I., $582.13; 42, Fairbanks Company, Washington, D. C., $490 and $425; 77, P. J. Kemp, Baltimore, Md., $441.50 and $516.50.

Class 71.—One combination turret lathe—Bidder 70, Jones & Lamson Machine Company, Springfield, Vt., $1950; 109, Pratt & Whitney Company, Hartford, Conn., $2578.

Class 81.—One motor driven engine lathe—Bidder 67, Hendey Machine Company, Torrington, Conn., $1083; 77, P. J. Kemp, Baltimore, Md., $780; 109, Pratt & Whitney Company, Hartford, Conn., $1329.

Class 91.—Two stoker steam engines—Bidder 46, G. & W. Mfg. Company, New York, $293; 54, Griscom-Spencer Company, New York, $283 and $125; 97, Manning, Maxwell & Moore, New York, $297; 122, B. F. Sturtevant Company, Hyde Park, Mass., $300.

Class 101.—One sensitive drill press—Bidder 77, P. J. Kemp, Baltimore, Md., $174.75 and $189.75; 97, Manning, Maxwell & Moore, New York, $150.

The Treasury Department has issued regulations allowing the usual drawback of duty on the exportation of Weston direct chain hoists, capacity ¼, ½, 1, 1½, 2, and 3 tons each; Weston geared hoists, capacity 2, 3, 4, 5, 6, 8, 10, and 12 tons each; hoist chains; and tire chains, manufactured by Clinton H. Hobbs, Boston, Mass., from imported materials. In liquidation, the regulations provide that the quantities of imported materials which may be taken as the bases for allowance of drawback may equal the quantities used as declared in the drawback entry after official verification of exported quantities, provided they shall not exceed the quantities shown in the sworn abstract. In the case of tire chains a wastage allowance shall be made not to exceed 12 per cent. of the quantity of imported chain appearing therein. No wastage shall be allowed in connection with the other articles.

Canada's Electrical Developments

Ontario's Cheap Hydro-Electric Power from Niagara

TORONTO, October 14.—In a recent issue of *The Iron Age* mention was made of the fact that Berlin, Ont., had received from the falls of Niagara the first current over the transmission line of the Hydro-Electric Power Commission. On Tuesday of this week the turning on of the power in that town was celebrated. Sir James Whitney, Premier of the Province, assisted by Adam Beck, chairman of the commission, inaugurates the new service. Berlin being the first municipality to be actually supplied with power under the Government scheme, the occasion was one that called forth more than local enthusiasm. Special trains ran from Toronto and large numbers of people gathered from other towns and cities. There was a half-holiday in the town, the streets presented a gay appearance, several bands played, and 10,000 people assembled at the ceremonies. At night there was a monster banquet, to which 500 persons representing the Government and the several municipalities in the power union were invited. All the dishes at the banquet were cooked by electricity transmitted from Niagara Falls. Speeches were made by the Premier and by the chairman of the commission, who reviewed the history of the Government's power policy, the marking out thereof, and the numerous difficulties overcome. The people were asked to rejoice that they were no longer dependent on foreign coal.

Hardly less than an industrial revolution will be wrought if the power scheme answers to the Government's expectations, and if the prospects it now presents to most minds are realized. The rates the commission has been quoting to municipalities are far below those at which power can be generated in separate factories. The changing from steam plants to electrical equipment would seem to be a sure and great economy. Berlin is a factory town. The municipality has for some time owned and operated a power and lighting plant, coal being used for the production of power. Its experience with this undertaking has not been satisfactory, but now that electricity from Niagara Falls is to be supplied at a much lower cost, the expenses will be greatly reduced and customers will get the benefit of the reduction.

The Transmission Lines

The transmission system is not yet quite finished, though it is being rapidly brought to competition. It now reaches most of the towns and cities in the circuit, and is likely to be at all of them before they are respectively quite ready to receive power, the building of their internal distributing plants seeming to go on less rapidly than the construction of the transmission system. At the power house at Niagara Falls the power is received directly from the dynamos of the Ontario Power Company, which has the contract to supply the Hydro-Electric Commission. Under its contract with the commission the company is to be prepared to supply not less than 8000 hp. and not more than 100,000 hp., the price to be $9.40 per horsepower delivered at Niagara Falls, unless the total quantity taken is more than 25,000 hp., when the price is to be $9. The agreement is for a 10-year period, and contains provisions for its renewal, if desired by the commission, for two subsequent 10-year periods. Delivered at the Niagara Falls power house of the commission, the power is to have a tension of 2300 volts. There it is stepped up and transmitted at 120,000 volts. This is the highest voltage at which electricity is anywhere transmitted over so extensive an area.

The contract for building the transmission system from Niagara Falls was given by the commission to the McGuigan Construction Company in November, 1908. The work, now nearly completed, is to cost $1,270,000 for the 298 miles extended over. Two-thirds of the towers are in place. Besides the cost of constructing the transmission lines, $1,200,000 had to be expended on the step-up station at Niagara Falls, the controlling station at Dundas, and the transformers and interswitching stations at other points. This work is also near completion. Further, $400,000 had to be paid for right of way, $150,000 for the building of distributing lines and $160,000 for insulators, &c. The total outlay necessary to bring the commission's plant into existence is $3,300,000, the estimate being $200,000 more than that. About 1000 miles of aluminum wire is used.

Nearly everything used in the system was produced in Canada, Canadian works, or Canadian branches of American works getting the contracts for material and equipment. A double circuit line runs from the step-up station at Niagara Falls to Dundas, where the central distributing station stands. From there the system branches in three directions—one line running northeast to Toronto; one running directly west through Woodstock to London; the third running northwestward to Guelph, and thence westward and south to meet the second branch at London. From London the system proceeds to St. Thomas, and is to be extended to Windsor, whence power is to be cabled across to Detroit. The line has a safety relay switch system that is in use nowhere else.

A Co-operative Municipalities' Undertaking

This public power policy rests on the co-operative principle, the parties co-operating being not individuals or private corporations, but municipalities, some of which are cities, some towns and others villages. The province, through the agency of the Hydro-Electric Power Commission, simply manages the business for the municipal group concerned, and makes the financial arrangements, which arrangements involve the pledging of the provincial credit for the bonds issued. The rates charged by the commission are calculated to cover the whole outlay on purchase, operating and maintenance account and provide for the charges on account of interest and sinking fund, the latter charges holding for 30 years, when the bonds mature and are paid off and the plant becomes the unencumbered property of the partnership of municipalities. The larger the number of municipalities associated together as takers of power from the commission throughout the area of the transmission system, the lower will be the price of power. Windsor's recent inclusion with a demand swollen in Detroit's behalf lowers the rate for all the parties.

Twenty-one municipalities have signed contracts to take power under this arrangement. Besides the 21 now in the scheme, 19 other municipalities traversed by the lines have voted in favor of joining, and all that remains is action by their respective municipal councils. It is expected that the number of municipalities embraced will be materially increased by the time the system is working throughout its present membership. It is also predicted with confidence that their present collective demand for power will be multiplied in a very few years.

One early result of cheap power in that populous and productive region of the richest province in Canada will be a marked increase in the electric railway mileage, interurban as well as intraurban. A very great development of industries is looked for. The system favors the growth of business and towns from small industrial beginnings, as power will be supplied to municipalities and customers in large or extremely small amounts. Thus, places where the largest demand that could be mustered would be too small to induce private enterprise to go into the power business will be able to supply themselves cheaply with

as little as they want, and the small manufacturers among whom that little is distributed will have a chance to build up gradually.

A Regenerator of Industry

The interest of manufacturers in the Government's power policy has grown because their faith has grown with the progress of the scheme toward full realization. That hydro-electric power can be supplied to Toronto manufacturers at not more than half the present cost appears to be all but a proud fact. The estimate of the commissioner's engineer is received with less reserve view that it is seen that the transmission plant can be finished for less than the amount set down for it. Manufacturers who would not promise to throw out their engines and metal motors will not be backward in making such changes when the time comes to renew worn out motive plant. Many will see their way to making the change as soon as the municipal distribution system is ready to supply them from the hydro-electric commissioner's delivery and for motor installation and electrical equipment on manufacturing plant account the demand is expected to become active throughout the region covered by the public transmission system. Manufacturers in Ontario find the present charges on power account unduly heavy.

The coal used for the production of power is all imported. The only run of the mine on bituminous coal is 53 cents per ton under the general tariff, and it is only under the general tariff that any can be imported, as British coal, to which the preferential duty of 53 cents a ton would apply, cannot be brought to Ontario. If it could, surely Nova Scotia coal could, and Nova Scotia coal is never seen in this Province. Bituminous stock coal that will pass through a three-quarter screen is admitted from the United States at 14 cents a ton, but it has limited usefulness in industry. Ontario manufacturers do not relish the idea of paying 53 cents a ton on so necessary an import as coal, when they perceive that their doing so does not enable or induce Canadian coal producers to supply the Ontario market. The riciprocity negotiations now about to be entered upon may result in the removal of the coal duty. But even with that import off the Canadian manufacturer would not be able to make power from coal nearly so cheaply as he can get it from the Hydro-Electric Commission.

At the Berlin celebration there were many exhibits of electrical machinery and supplies made by the principal Ontario manufacturers of such articles.

C. A. C. J.

The new wire rod mill of the Jones & Laughlin Steel Company, at Aliquippa, Pa., is equipped with 16 sets of 9, 10 and 12 in. rolls, and has an annual capacity of about 100,000 gross tons of wire rods. The wire drawing department of the plant has 104 wire drawing blocks, draws wire from 7-16 in. to No. 20 gauge inclusive, and can make about 60,000 tons of wire annually. The wire nail department has 110 machines, and can make about 600,000 kegs of nails annually. The wire rod department was started in August, and the wire drawing and wire nail departments are to begin operations about November 15.

Officials of the Clark Steel Car Company, Pittsburgh, have been in communication with Youngstown, Ohio, builders with a view of building a steel car plant at that place. It is stated the concern desires a location convenient to steel plants, from whom a supply of steel can be secured.

The Pittsburgh Malleable Iron Company, Pittsburgh, has declared a quarterly dividend of 2½ per cent.

Air Supply for Foundry Cupolas

Blast Pressure, Thickness of Coke Bed, Tuyere Area and Other Factors

In *Stahl und Eisen*, Nos. 9, 14 and 17, 1910, installments appear of a long article on the air supply necessary for melting with the cupola. It is by George Buzek of Trzynietz. He begins by saying that the object of blowing air into the cupola in ordinary melting practice is to promote as complete and rapid a consumption of the coke as possible, thereby attaining a violent development of heat, and in consequence rapidly melting and strongly overheating the molten metal. From the theoretical figures on the heat development of carbon when burned to either carbonic acid or carbonic oxide, we note that when compared with the maximum effect when all the carbon goes to carbonic acid, a mixture of half and half of the two gases has already lost 35 per cent. of the heating value of the fuel. If all is carbonic oxide the loss from the theoretical will be 70 per cent. Hence the necessity of obtaining a more or less perfect combustion in the cupola, of watching the cross section in the melting zone, the blast and the coke conditions.

Is $\underline{CO}$ or $\underline{CO_2}$ Formed First? = Carbonic Acid, Carbonic Oxide

There are two theories in regard to the combustion of coke in a cupola: 1, That the carbon is turned at once to carbonic oxide, and this combining with more free oxygen makes more or less carbonic acid; 2, that the carbon is at once converted to carbonic acid and then by subsequent solution of more carbon becomes carbonic oxide. The latter is the more generally accepted. The first theory is based upon the observation that only in the case of an ideal contact of oxygen and carbon is it possible to get carbonic acid, and this is only possible when the fuel is in the form of a gas. Again, as the specific gravity of carbon in the solid state is 5000 times as great as that of oxygen, there can be no pretense of an intimate mixture or contact, as is necessary to form the carbonic acid in question. This gas, by the way, is supposed to be unstable at high temperatures.

Experiments made by Beckerts in this direction have shown that the maximum of carbonic acid is contained in the products of combustion when they are between 950 and 1300 degrees F. As the temperature rises the carbonic acid percentage recedes until at 1800 degrees it is *nil*. Since the temperature before the tuyeres is higher than this, it might be argued that carbonic oxide is formed at once.

In regard to the more generally accepted theory of a carbonic acid formation at first, it may be said that all experiments along this line have been made with the producer rather than the cupola. Thus, in a publication by Schoemann analyses are given of gases taken from different hights of a producer, which show that at the blast entrance the percentage of carbonic acid was 15, the CO 9.7, and the N 75. 3. At 10 in. above this point the figures ran 0.2, 34.1 and 65.7, and the temperature was 2550 degrees F. As the hight rises the relation remains practically constant, but the temperature drops slowly. These results would indicate that the carbonic acid disappears quite rapidly in the process of gas making.

Blast Pressure and Coke Bed

Now, whichever of these theories is correct, the fact remains that in cupola practice a maximum of carbonic acid and minimum of carbonic oxide is desirable; in fact, necessary. Hence it should be the aim of the operator to work accordingly. If we recollect the thin bed of coke in the zone of combustion and the speed of the gases passing through it, we will find them to take only 1-40 sec. doing this, with all the molecular

changes to operate and in a very confined space at that. In former times, when cupolas were operated like blast furnaces—with high blast pressures and heavy coke burdens—the melting was slow and only carbonic oxide was produced. Increasing the quantity of air and reducing the pressure corrected this trouble, particularly when the proper ratio of cupola cross section with air quantity was struck. To get this the author wants only so much air blown in as will burn the coke at the tuyeres and convert any carbonic oxide just above them to carbonic acid. If more air is used the melting zone goes up; if less, then the cupola will run cold independent of the amount of coke charged. The author takes the position that for each cupola a given time requires a given amount of air constantly, independent of the size of the coke bed. He admits, however, after an elaborate calculation, that the rate of melting is dependent upon the thickness of the bed at all times.

Taking the cases where either more or less than the right amount of air is used, we have in the former a consumption of just so much oxygen as will burn up the coke properly, and the excess will be found in the cupola gases passing off. The speed of the air is such that all the carbonic oxide is burned to carbonic acid, and no time is left for the carbonic acid to take up more carbon, and hence the highest temperature probable, and good melting is done.

If too little air is used incomplete combustion takes place, air and coke being in contact too long. Carbonic oxide is formed and a cold run is the consequence. Hence the advisability of a good excess of air over the requirements. If it were possible to cool the gases suddenly just above the melting zone they would show a greater freedom from carbonic oxide. This may be done as a half-way measure by putting in heavy iron charges and letting these run as low as may be dared without burning the iron. This has its disadvantages, and hence the introduction of a second row of tuyeres to burn up any carbonic oxide that has passed up above the bed. Unfortunately an injudicious use of this second row means the formation of another melting zone, with a lot of other difficulties. The author therefore condemns upper tuyeres, holding that all advantages coming from increased melting rates thereby are merely the result of extra amounts of air introduced and not through the burning of any carbonic oxide.

Hight of the Charging Door

In regard to the size of the tuyeres the author holds that for small cupolas one-eighteenth of the cross section is proper, and for large ones half of this is sufficient. When there is danger of rapid bunging up, the tuyere area can be made as large as 20 to 50 per cent. of the cross section. The hight of the cupola from spout to charging door is regarded as a function of the diameter. In fact, the hight should really be taken from the melting zone to the charging door to be more correct. Coke is a poor conductor of heat, but iron a good one. The temperature of the gases leaving the coke bed depends upon the hight of the latter. Hence if a low melting ratio is used so much coke fills the cupola that the metal charged cannot take off all the surplus heat it should. Therefore, a high cupola in this case. If, on the other hand, a high melting ratio is used, the cupola can be lower, as the iron charged is larger in surface for absorption of the heat in comparison with the coke charged. If the coke bed is too thick the temperature of the gases going up will be lower than if this is just right. Charging with long pigs requires a higher cupola than with broken pigs on account of the readier heat absorption of the latter.

Again, the longer the cupola is run the higher the temperature of the interior, and hence for continuous melting the hight of the cupola should be greater than for short heats. The author states that the only way, in his estimation, to charge the cupola correctly, is to keep a constant thickness for the intervening coke layers for any given cupola, and to vary the iron charges accordingly as hot or cold iron is wanted. The present way is to vary the coke and fix the iron charge.

Trade Publications

Runabout.—Metz Company, Waltham, Mass. Folder. Concerned with the 1911 Metz runabout. This car is offered as economical, low priced and practical, and easily handled in city streets. Illustrations and brief specifications are included.

Gear Shields.—The Ironsides Company, Columbus, Ohio. Circular. Concerned with the Ironsides gear shield for electric railroad use. Tests made on a number of these shields when in use are given and a drawing shows the condition of the gear after running 24 miles with an Ironsides gear shield as a lubricant retainer.

Pneumatic Riveters.—The Hanna Engineering Works, 2059 Elston avenue, Chicago, Ill. Instruction book for repair men and operators of the Hanna pneumatic compression riveters. The text covers practically all the points likely to arise during the erection, operation and repairing of this tool, and numerous illustrations are used to supplement the text. Two pages of general information on the subject of riveting complete the book.

Die-Cast Finished Parts.—H. H. Franklin Mfg. Company, Syracuse, N. Y. Booklet. Refers to the use of Franklin die castings as a substitute for machine finished pieces. In the production of these parts molten composition metals are forced into steel molds under high pressure and the metal quickly cooled, after which the finished casting is removed. This process has already been applied to the production of automobile bearings and parts, and the illustrations give an idea of the wide range of work for which it has been used. Among the parts shown are those for census tabulating machines, a newspaper vending machine, gears, segments used in computing machines, parts for soda fountain pumps and a variety of castings for telephone and other electrical work. Different points to be noted by designers of parts to be made in this way, and specifications for the various standard Franklin metals are included.

Automatic Screw Machines.—National Sewing Machine Company, Belvidere, Ill. Catalogue. Size 9 x 12 in.; pages 24. Lists the various styles of National automatic screw machines for forming, drilling and reaming parts from rods of steel or brass automatically. A general description of the machines is given, followed by illustrations and brief specifications of the various machines. *The Iron Age*, May 26, 1910, contained an illustrated description of the No. 3 plain automatic National screw machine. Space is also given to illustrating a hand shaving machine, the tools used on the automatic machines and some of its products.

Motor Trucks.—The American Locomotive Company, 1886 Broadway, New York City. The 1911 motor truck book. Pertains to the Alco truck, for which great economy is claimed. The different parts of the truck are illustrated and described, and a number of views show the truck in use transporting various materials. Figures of the performance of these trucks in actual service are given. One of the trucks hauling iron pipe and fittings exclusively in 52 days traveled 1675 miles and consumed 379 gal. of fuel, while the other, which was in express service around New York City, consumed 268 gal. in covering 1180.9 miles. Brief specifications of the truck complete the book.

Lifting Magnets and Controllers.—The Electric Controller & Mfg. Company, Cleveland, Ohio. Pamphlet and circular. The former contains facts about lifting magnets and shows how a saving in money is effected. The special features of these magnets, such as wide separation of terminals, permanence of insulation and the use of heat radiating ribs on top of the magnet case, are described and the text supplemented by illustrations. The folder describes the Dinkey ventilated controller made for both alternating and direct current circuits in steel mills. The controller is illustrated and its special features are pointed out in the text surrounding the engraving. *The Iron Age*, June 2, 1910, contained an illustrated description of this controller.

Conveyor Belts.—John J. Ridgway, P. O. Box 1855, New York City. Booklet, entitled "How to Buy Conveyor Belts." Describes the points to be considered, the three primary ones being the faoric from which the belt is made, the friction adhesion and the surface covering. These various points are discussed at length and the advantages possessed by the Hinge Edge belts brought out.

Pipe Couplings.—Grip Coupling Company, Morse avenue, Ware, Mass. Circular. Shows the Grip couplings for connecting pipes without threading. These are designed for pipes carrying steam, water, gas, air and chemicals, and are tested to 2400 lb. per square inch. Three special advantages claimed are that they do away with ground joint unions, pipe wrenches and thread-

cutting tools, reduce the amount of labor required by two-thirds and preserve the entire tensile strength of the pipe jointed.

Gasoline Traction Engines.—Buffalo Pitts Company, Buffalo, N. Y. Pamphlet. Describes and illustrates the company's 1911 model Triplex gas traction engine, which has been designed primarily as a tractor for hauling and plowing, but is also equipped with a pulley for driving machinery. In order that the engine can recover speed quickly if the speed is lowered by temporary excess load or other cause, short stroke motors and a multiplicity of cylinders are used, giving at normal speed 720 impulses per minute. Various views of the engine are given, supplemented by a detailed description.

Foundry Chaplets.—The Archibald M. Hall Company, 224 West Maryland street, Indianapolis, Ind. Folder. Deals with different sizes of wrought iron chaplets and chaplet stems. A list of the various sizes made of each and the prices are appended.

Machinery and Supplies.—Lombard Iron Works & Supply Company, Augusta, Ga. Catalogue C. Size 6 x 9 in.; pages 693. Covers an extensive line of machinery and supplies for cotton, cottonseed oil and flour mills, railroads, machinists, blacksmiths, contractors, engineers, plumbers and phosphate mines. The lines included are very complete and cover engines, boilers, pipes and fittings, shafting, pulleys, leather and rubber belting, hose, mill supplies and machine tools. All of these are illustrated and tables of dimensions accompany the engravings. There is a 27-page alphabetical index which renders the finding of any desired article comparatively simple, and a number of tables of useful information complete the catalogue.

Sheet Metal Work.—The W. J. Clark Company, Salem, Ohio. Indexed bulletin. Lists all the various kinds of sheet metal pieces made by this company. These include elevator buckets, joist or timber hangers, post caps, bases, wall boxes, factory furniture, boxes, barrels, kegs, pails, pans, lockers, stools, shelving, benches and couplers for air, steam, gas or water hose. Articles for similar purposes are shown on the same sheet and brief descriptions and specifications supplement the engravings. In addition to the lines shown the company is prepared to execute orders for special work.

Electric Furnace for Heating Bars and Billets.—The Bailey Engineering Company, Alliance, Ohio. Catalogue. Size 6½ x 10 in.; pages 16. Gives general description and specifications for an electric furnace for heating forging stock, which has been designed in response to a demand for low cost electrical energy to operate these furnaces. This furnace utilizes the exhaust steam from the steam forging hammers, which is led into an exhaust steam turbine direct connected to a generator supplying the current required by the furnace. This combination is said to be admirably suited for such service, as in the average plant sufficient exhaust steam is available, which when transformed into electrical energy by the turbo generator and then into heat by the furnace will heat all the metal forged under the hammers. The construction of the furnace is described at length, and there are a number of sectional views.

Machine Handles.—The Cincinnati Ball Crank Company, 1249 Plum street, Cincinnati, Ohio. Booklet. Refers to a line of steel ball crank handles for machines and compound rests, straight machine handles and two ball levers. The different styles of handles are all illustrated and brief specifications of the different sizes made are given on the facing pages in tabular form.

Steam Hammers.—The Buffalo Foundry & Machine Company, Buffalo, N. Y. Catalogue No. 911. Calls attention to the Bell steam hammers, which are made in a number of different sizes and styles. The different models include the double frame guide type and the single frame guide type, both of which are built in all sizes, a combined type built in five sizes with falling weights ranging from 100 to 300 lb., and the open frame built in four sizes with falling weights ranging from 250 to 1500 lb. The four different types are illustrated and brief specifications give the features of the tools. The special advantages claimed for these hammers are the use of a special shock resisting metal, high grade mechanical construction and a design insuring continuous service and economical operation.

Special Machinery and Tools.—American Die & Tool Company, Reading, Pa. Several circulars. Refer to the various tools and pieces of special machinery built by this company, which include air drill rivet reamers for boilermakers, shipbuilders, street car builders and structural ironworkers, punches and dies of all shapes and sizes, the Weiland supplementary carburéter, automobile transmission gears, a metal saw cutting-off machine and a surface die grinder and grinder head combined with plain table. The carbureter is a device that can be attached to any float feed model as a permanent fixture and when properly adjusted is said to require no further attention. Two of its special features are making the old carbureter self-priming and starting the cold motor in freezing weather on the first complete cycle.

Steam Boiler Specialties.—A. W. Cadman Mfg. Company, Pittsburgh, Pa. Catalogue No. 10. Refers to a number of boiler specialties, which include blow-off valves, gauge cocks, slit plug valves and check valves. All of these specialties are illustrated and described and tables giving the various sizes are appended.

The German Iron Market

BERLIN, October 6, 1910.

The market shows further improvement. The trading on the Düsseldorf Exchange on Friday was marked by a firm tendency for pig iron. The advances in prices, corresponding with the new scale adopted by the syndicate, were unusually large. Steelmaking qualities were quoted at 62 to 63 marks, against 59 to 60 previously; German Bessemer, 70 marks, against 62 to 63; German foundry, No. 1, 66 marks, against 65. On the other hand, English hematite fell from 85 to 86 marks to 84 to 86 marks under the influence of market conditions across the Channel. From Belgium, too, the weakness previously reported continues. A dispatch of to-day's date from Brussels states that the export price of basic bars at Antwerp has just dropped 1 to 2 shillings the ton, making the minimum price 96 shillings, f.o.b. Bar iron and heavy plates also dropped 1 shilling, the former to 97 and the latter to 108 shillings.

The German market is regarded as in a good position. The inland demand is visibly increasing. The imports of pig iron from England showed a considerable gain last month, notwithstanding the fact that the German furnaces are turning out more iron than ever before. Ore prices, both home and foreign, remain firm. The long interruption of ore production at Bilbao through recent labor troubles, carried Spanish ore prices to a high level; since the resumption of work a slight reaction has ensued, but the price is still as high as 20½ to 21 marks for 50 per cent. hematite ores delivered at Ruhrort. Considerable quantities of Mediterranean ores were bought in place of Spanish during the strike at Bilbao.

The Steel Trade More Active

Business in steel for further manufacture has grown more active. Consumers are calling for shipments on contracts at a brisk rate; and the impression created is that the manufacturers of finished products are better employed than hitherto. Bars are also more active. Dealers have abandoned their waiting policy and are now buying much more freely. The export trade in bars is somewhat quieter, but manufacturers have succeeded in holding their prices for export at 100 to 102 marks. Bar iron is going off briskly; the foreign business is done at prices nearly equal to the home prices. Considerable work in band iron has come in, and the mills are well employed. There is also a very active trade in cold rolled bands, the price for which has been raised to 202.50 marks. Business in skelp for making steel tubing is quite active, the manufacturers of the latter having placed orders for supplies to the end of the year. The shipbuilders' lockout has very little effect upon the heavy plate trade. Happily the labor difficulty was settled to-day, and henceforth ship plates will be called for delivery at a hurried pace; the orders in hand are heavy. Wire rods have become more active, both home and foreign buying being in larger amounts. The Wire Association has just declared business open for the first quarter of 1911 at unchanged prices. Drawn wire and nail-making qualities are quoted at 14.75 to 15.25 marks per metric hundredweight, and wire nails at 16.25 to 16.75 marks.

The rail market has hardly changed. Foreign orders, however, have been scarcer for a week. Street rails are in fair demand. Heavy rails for export cost 105 to 110 marks on shipboard. Light rails for mines and temporary tramways are quoted at 115 to 120 marks for the inland market and grooved rails at 140 to 145 marks. Steel castings are in very heavy demand. In the hardware trade improvement continues in some branches.

Iron and Industrial Stocks

NEW YORK, October 19, 1910.

The stock market has continued its upward course, heavy advances having been made in quite a number of stocks, especially United States Steel and International Harvester. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	10 - 11	Pressed St., pref..	96½ - 97
Allis-Chalm., pref..	33½ - 35⅞	Railway Spr., com.	34½ - 38½
Beth. Steel, com..	28 - 30⅞	Railway Spr., pref.....	93¾
Beth. Steel, pref..	58¾ - 60¾	Republic, com.....	33 - 34⅞
Can, com.....	8¾ - 9⅛	Republic, pref.....	95 - 97
Can, pref.....	70 - 71	Sloss, com.....	54 - 57
Car & Fdry, com..	50½ - 55⅜	Pipe, com.....	16 - 17½
Car & Fdry, pref..115½-116¼		Pipe, pref.....	56 - 60
Steel Foundries....	44 - 48	U. S. Steel, com...	71⅝ - 77¾
Colorado Fuel.....	34½ - 36¼	U. S. Steel, pref...118⅞-120⅛	
General Electric...152½-155½		Westinghouse Elec.	71½ - 73
Gr. N. ore cert....	57¾ - 60¼	Am. Ship, com.....	79 - 79½
Int. Harv., com....103 -111⅝		Am. Ship, pref....108 -108½	
Int. Harv., pref....122 -124		Chi. Pneu. Tool...	41 -*42½
Int. Pump, com...	43 - 45	Cambria Steel.....	43 - 44½
Int. Pump, pref...	84 - 85½	Lake Sup. Corp....	24½ - 25
Locomotive, com...	39 - 41½	Pa. Steel, pref.....170	
Locomotive, pref.....105		Crucible St., com...	12¼ - 13
Nat. En. & St., com.....	17½	Crucible St., pref..	77½ - 79½
Nat. En. & St., pref.....	84	Harb.-W. Ref., com.....	31½
Pressed St., com...	35 - 36⅞		

* Ex dividend.

The Integrity of Tests of Metals*

Specimens Often Not Representative of the Properties of the Material

BY ALEXANDER E. OUTERBRIDGE, JR.

There is no subject of greater interest and importance in the metallurgical arts than that of testing metals. Upon the integrity of these tests rests the stability of all the immense modern structures composed of iron, steel, bronze and other metals. Human life depends in many instances upon the reliability of tests made in the laboratories of "coupons" cut from full size sections, in some cases, or from small bars—usually cast attached to larger masses—in other cases. These coupons, or test pieces, are supposed to represent fairly the average tensile and transverse strength, the ductility or resilience (*i. e.*, ability to resist shock), the micro structure of the metal and, in a word, to reveal the true physical properties of the material entering into any given structure.

Have we arrived at a degree of perfection in the art of testing metals that enables us to rely with confidence upon such records? I fear not, and I purpose herein to give briefly a few of my reasons for this somewhat pessimistic view.

Why Records Are Often Misleading

So far as the development of various machines for accurately testing the tensile strength, transverse strength, torsional strains, &c., of metals, is concerned, a very high degree of sensitiveness combined with accuracy has been arrived at by many constructors of such apparatus; but if the specimens tested do not in all cases fairly represent the quality of the material in the mass the records may be, and often are, misleading.

My own investigations, extending over a period of nearly 40 years, have convinced me that coupons or test pieces do not always represent truly the strength, molecular structure, resilience, &c., of the material to which they may be attached and to which they are supposed to conform closely in physical properties for the following reasons among others.

Metals in their pure state are not employed in engineering constructions; all are more or less heterogenous compounds or alloys and all alloys (with perhaps the single exception of gold and copper) tend to segregate or separate in the process of cooling from the liquid to the solid condition into richer and poorer alloys, one particular combination usually forming what is known technically as the "eutectic." For example, the standard alloy of silver and copper (9 parts silver, 1 part copper) used for the silver coin of the United States Government, and of many other nations is, of course, prepared with the greatest care, and the molten metal is thoroughly stirred before it is poured into ingots. These ingots are made of the proper width and thickness to enable them to be rolled into strips from which the blanks or planchets for the coin are punched. If an assay be made from chips or filings cut from the center of a silver dollar and an assay also be made from chips cut from the periphery, they will not agree exactly; indeed, cases have been known where the variation in fineness actually exceeded the legal limit of tolerance; or allowance of variation from the standard of nine-tenths fine.

This fact was proven by exhaustive investigations, made many years ago, which resulted in the abandonment of the old method of taking test pieces by cutting chips from the ingots or from the blanks, and substituting therefor what is known as the granulation test method. After the melted alloy has been thoroughly rabbled or stirred, two or more samples of the liquid metal are dipped out from the pot and poured into ice water in order to cool them instantly in the form of granules. Under these conditions there is not time for segregation to occur, and duplicate samples taken from the top and bottom of a crucible containing perhaps 7000 to 10,000 Troy ounces of coin metal will agree in fineness within a few thousandths of 1 per cent.

In the case of the standard gold alloy for coin (9 parts gold, 1 part copper) no precautions of this kind are needed, for the simple reason that this alloy does not segregate, and chips taken from the edge and from the center of a double-eagle will conform to the legal requirements, notwithstanding that they are very much more strict than in the case of silver coin.

An experience of 12 years as an assistant in the Assay Laboratory of the United States Mint (1868-1880) made me familiar with these refinements in metallurgical methods of testing that have been of inestimable value in my after life, which has been devoted to testing commercial metals. The knowledge thus gained has been practically applied in various ways in connection with cast iron, steel and bronzes.

Variations in Cast Iron Due to Rate of Cooling

With respect to cast iron it is no exaggeration to say that the rate of cooling of gray cast iron exerts as important an influence in determining its physical properties as does variation of its chemical constituents within, of course, certain quite wide limits. If a wedge shaped bar be cast of ordinary foundry iron, say, 6 ft. long, 6 in. wide, 6 in. thick at one end, and tapering in thickness to, say, ¼ in. thick, almost every grade of cast iron may be found in the bar by nicking and breaking it into short sections, say, 6 in. long each. At the thick end the fracture will be coarse grained or "open" with very dark color due to the fact that almost all of the carbon is in the graphitic or "free" condition. At the thin end the fracture will be fine grained and light in color because a considerable portion of the carbon will be chemically combined with the iron. If test bars be cut from these different sections, it will be observed that the coarse grained metal is very soft under the tool, while test bars cut from near the thin end will be very hard to turn. Between these two extremes the metal will have intermediate degrees of hardness and of coarse grainedness.

If tensile tests be made from different portions of the casting, it will be found that the strength varies with the structure through an enormous range, as much as 100 per cent. gain often occurring in one portion over another. If the ordinary foundry iron used for the wedge shaped casting be low in silicon (say 1 per cent. or under) the thin end of the wedge will be as white as silver, as hard as steel and as brittle as glass, because a large proportion of the carbon will then be in the combined form.

I have before me two test bars of soft foundry iron used for casting light pulleys, poured from one small hand ladle of iron into companion bars of the same size, viz., 1 x 1 x 15 in. One bar was cooled normally in the green sand mold, the other was cooled very rapidly indeed. Both bars were broken transversely on an ordinary transverse testing machine, using a span of 12 in. One bar, cooled normally, broke under a strain of 2000 lb. (round figures); the other, cooled rapidly, at 4000 lb. exactly. One-half of each bar was then used for tensile tests, being turned to the same dimensions and pulled upon a 100,000-lb. hydraulic testing machine. The bar cooled normally showed tensile strength of 21,500 lb. per square inch. The bar cooled rapidly showed tensile strength of 37,000 lb. per square inch. These particular tests were made 22 years ago, and the results have been corroborated many times since then; also valuable practical use has been made continuously from that time of the knowledge thus gained

* From the *Journal* of the Franklin Institute. The paper was prepared to be delivered as the opening address at the annual autumn session of the Mining and Metallurgical Section.

of the remarkable effect of controlling the cooling of castings of nonuniform sections.

In a paper giving some the foregoing facts, read before the American Society for Testing Materials in 1903, published in their *Proceedings*, Vol. III, page 216, the following conclusions were drawn: "The rate of cooling of cast iron from the fluid to the solid state is such an important factor in determining the physical properties of the metal, that it is just as necessary to know the dimensions of the test bars as it is to know the chemical composition. For the same reason it is equally desirable that standard sizes of test bars should be adopted, which would be suitable for different grades of iron."

It is pleasing to note that the American Society for Testing Materials, through one of its subcommittees, has been endeavoring to bring about uniformity of methods of testing, not only between different manufacturers in the United States, but also in Europe as well, with indications of a successful issue in time.

Castings of iron and other metals are frequently made for the Government as well as for private engineering firms under specifications which sometimes tax the ability of the founder to meet pretty stiff requirements as to strength. In the absence of any specific rules as to the method of molding the test bars or coupons, or even as to their size, the temptation to a foundry foreman, who may have practical knowledge of the facts here noted, to "jockey" with the test bars and thus insure that they will fully meet the requirements, is very great and ought not in the interest of all to be continued longer.

Manipulation of Cast Iron Test Bars

There is still another method, now pretty well known, by which the transverse strength of cast iron test bars can be increased from 25 per cent., even up to nearly 50 per cent., without either rapid cooling of the metal or making any change in method of molding. Instead of simply brushing off the loose sand from the test bars with a wire scratch brush, if they be placed in a tumbling barrel, commonly employed in foundries for cleaning castings and tumbled about therein for a couple of hours, they will all gain largely in transverse strength due, it is thought, partly if not mainly, to the rapid release of cooling strains caused by shocks; and it has long been known that iron castings improve in strength with age, due to gradual release of internal strains. When these peculiar observations were first made known, the custom of cleaning the sand from test bars in the tumbling barrel became very popular, indeed, and finally a few years ago the American Society for Testing Materials found it desirable to incorporate a special clause in its new specifications for cast iron that test bars must not be tumbled or otherwise subjected to mechanical shocks or vibrations before being broken. This was a gratifying tribute to the original discovery.

On the occasion of a visit to a large manufacturing establishment some time before this restricting clause was adopted, I noticed that all of the cast iron transverse test bars had been put through the tumbling mill "to clean them," as I was informed by the boss.

Rate of Cooling in Bronze Test Bars

With regard to test bars for bronze castings, similar restrictions should apply in regard to cooling, for segregation occurs in all commercial bronzes, depending largely upon the rate of cooling from the liquid to the solid state. This segregation changes the molecular structure and affects the tensile strength of the metals. Coupons or test pieces of bronze cooled much more rapidly than the castings to which they may be attached do not reveal the true character of the fracture, or the real strength of the metal. On the contrary, they present to the eye a finer grained, more uniform metal and show abnormal strength in the testing machine. Very recently, indeed, my attention was called to a novel application of this fact by noticing some rather high tensile tests of test bars attached to some important castings made of a special bronze. The fracture of the test pieces was exceedingly fine grained and showed an absolutely uniform or homogeneous structure. On examining very carefully some of the castings with the test bars still attached, it was plainly to be seen that they were poured under very different conditions from the castings themselves, the test bars being cast into iron molds so as to solidify them instantly, while the castings to which they were joined were made in ordinary sand molds.

Test bars thus doctored are, in my judgment, far worse than useless, since they give the purchaser of the castings, who has taken the precaution (involving some trouble and expense) of turning and testing coupons, a false record of the character of the metal in his castings.

Apropos of this, I will venture, in conclusion, to refer to my short paper, entitled "A Study of the Micro Structure of Bronzes," printed in the *Journal* of the Franklin Institute, January, 1899, in which appear a number of photomicrographs of specimens of bronze metals (90 were used in the investigation) cast in sand, and one representing a United States cent in which the crystals are very much finer and the metal is apparently more homogeneous, for there is an absence of the irregular bands of the eutectic alloy so conspicuous in all of the other bronze specimens. It was stated that "this is perhaps partly owing to the fact that coin ingots are always cast in iron molds and the metal is thus suddenly solidified while all of the other specimens were cast in sand molds. This observation may have practical value."

The Necessity of Uniform Methods

The conclusions drawn from these investigations with bronze metals were quite similar to those already noted with respect to investigations in cast iron, and are as follows:

1. Variations in treatment of specimens cause variations in the results, which may be misleading, and it would, therefore, seem desirable that some uniform system should be adopted by all investigators in this field.

2. The rate of cooling of a mass of metal affects the micro structure so that two specimens from the same ladle of metal, one taken from a small casting quickly cooled, the other from a large casting slowly cooled; or two photomicrographs taken from different portions of the same specimen may show variations in micro structure that may lead to error.

It is desirable, therefore, that some uniform size of specimens (and uniform method of molding) should be selected by micro metallurgists as a standard with which to make comparisons.

The actual case cited here, where bronze castings were made in sand molds subject to slow cooling, while the attached coupons for testing were made in iron molds to insure rapid cooling, coming to my notice only a few days ago emphasizes the importance of some concerted action in accordance with the foregoing suggestions looking toward adoption of standard methods for testing metals, and for insuring the integrity of such tests.

Numerous other illustrations might be drawn from my own daily experience and observation, but I think enough have been given to establish a good case. It is one that I have been arguing for a number of year.

The La Belle Iron Works, Steubenville, Ohio, now have both their blast furnaces in operation for the first time in months.

American Electrochemical Society

The Eighteenth General Meeting in Chicago, October 13 to 15

The eighteenth general meeting of the American Electrochemical Society, held in Chicago October 13, 14 and 15, was attended by nearly 200 members and guests. It proved to be one of the most successful meetings the association has ever held. The forenoon of each day was devoted to business sessions, and the remainder of the day to excursion trips and entertainment features. The business meetings were held in the Florentine Room of the Congress Hotel, on Thursday and Friday, but the closing session Saturday morning was held in the lecture hall of the Kent chemical laboratory at the University of Chicago. A special feature of the meeting was a banquet at the Congress Hotel Friday meeting. Large parties of the members took advantage of afternoon excursion trips to points of interest around Chicago, under guidance of Chicago members. Special excursions were also arranged for the ladies by an entertainment committee of Chicago ladies.

Some of the Papers Presented

An interesting feature of the Thursday session was an informal address by the secretary, Prof. J. W. Richards, describing the Hiorth electric furnace which has been in successful operation in Norway.

A short paper was also presented by R. S. Wile, Riverside Metal Refining Company, Connellsville, Pa., at the same session, describing the reduction of tin dross in an electric furnace. In this furnace the dross mixed with the proper percentage of carbon is charged on top of the slag, while the tin as fast as reduced by its contact with the hot slag filters through the slag and collects in the bottom of the furnace, from which it is tapped. Papers were further presented on a method of determining thermal conductivities by Carl Hering, and notes on tribo-luminescence by W. S. Andrews.

At the Friday session an exhaustive paper by A. R. Johnson, on the electrolytic preparation of calcium, gave the results of extensive experimental work at the University of Wisconsin. Efficiency in the electrolytic production of metallic calcium was discussed in a paper by Francis C. Frary, Henry Bicknell and Carl A. Tronson.

The evolution of lead storage batteries was discussed by Pedro A. Salom, who described the various forms of batteries now on the market and reviewed interesting features in their operation and efficiency. A paper by Prof. O. W. Brown and W. G. Bowers proved of considerable interest, as it reviewed tests which have been made with standard types of batteries to determine their loss of efficiency by self-discharge when kept for any length of time under charge.

A paper was also presented at the Friday session by Carl Hambuechen on the practical significance of the overvoltage phenomena. It was pointed out that this is often a very important factor in the corrosion of boilers and other forms of iron or steel which becomes subject to electrolytic action.

A Problem Confronting the Tin Plate Industry

At the Saturday morning session a grave problem which confronts the tin plate industry was discussed by Dr. Edward Gudeman, whose subject was "Corrosion of Metallic Food Containers." The pure food bureaus or commissions of the Federal Government and many of the States are becoming so strict in reference to lead and other metals which may be found in solution in canned goods that the supremacy of the tin can as a food container is seriously threatened. The Federal food bureau in the Department of Agriculture has recently made a ruling on imported food products in tin cans of so strict a character that it will almost prohibit the importation of canned foods, and the various State commissions are following very closely the footsteps of the national authorities. Owing to the fact that Dr. Gudeman spoke from notes, subject to revision in a formal paper, only the following brief summary can be given of the facts which he presented:

Carbonic acid under pressure has been found one of the most powerful acids in the corrosion of metals, and food products usually contain other acids which have a very strong corrosive action on metallic cans. It is apparently a serious question whether the State food commissions, if they pursue their present policy, will not condemn the tin can as a container. Exhaustive experiments are now going on to discover some substitute for tin plated iron or steel which will comply with the present tendency of State and national legislation.

When iron or steel is coated with tin, under conditions which form a perfect bond at every point between the iron and protective coating, the result is a noncorrosive plate which resists perfectly the action of foods or beverages. It is claimed, however, that in ordinary commercial practice in the manufacture of tin plate a scientifically perfect product is not made and cannot be produced within the present commercial limit of cost. The methods that it would be necessary to follow to produce a perfectly noncorrosive tin plate would make the cost of the can alone greater than the present market price of a can and its contents.

Experiments have been carried on with various enameling processes, but it is found that the cost is prohibitory in producing a perfect enamel which will not crack.

Experiments are now under way in the impregnation of an iron sheet with glass. It requires only an extremely thin film of glass to answer the purpose, so thin that it has not been measured in any of the tests, and, owing to the manner in which it is applied, no difficulty is anticipated in the manufacture of cans from this product. The principal difficulty confronting this process is that the most satisfactory material from a physical point of view is lead glass, and it is not yet known whether a sufficient quantity of the lead would be dissolved by food products so that it could be discovered by the pure food commissioners.

Electrostatic Separation

"The Application of Electrostatic Separation to Ore Dressing" was presented by F. S. MacGregor. His paper had been distributed in printed form, and he made an informal talk discussing the features of this process illustrated by stereopticon views. Two plants using it are now in operation, and a third is under construction. One of the completed plants is at Platteville, Wis., and the other at Midvale, Utah. The Wisconsin plant is operated to separate iron pyrite from zinc blende, while the Midvale plant is used to separate zinc from lead ore. The principle which is taken advantage of in this process is that mineral particles are susceptible in varying degrees to an electrostatic charge. Iron pyrite and zinc blende are of almost the same specific gravity, so that they cannot be separated in jigs or other mechanical separators which are so generally used in the mining industry.

At the Utah plant a different purpose is in view in the separation obtained. The zinc in the ore, about 9 per cent., is lost in the smelter, and interferes seriously with the operation of smelting to recover the lead. By the electrostatic process the zinc is separated and recovered as a profitable product, and is also removed as a disturbing element in smelting the lead ore. In the discussion of this paper the statement was made that the amount of zinc lost in the smelting of lead in the United States is equal to the entire commercial production of zinc in this country.

Marcus Ruthenburg of London was on the programme for a paper on "The Electric Furnace and Its Application." He was unable to attend the meeting, but his paper, which was read by the secretary, reviewed briefly the successes obtained in Europe and America in the use of electric furnaces in the smelting and refining of metals, especially in the employment of furnaces in which the slag is used as the resistor for a non-arcing current conducted by carbon electrodes. A notable improvement in the construction of such furnaces which he recommended was the

use of a water jacket on the electrode, and he suggested that the water jacket should be carried down to the surface of the slag. He called attention to the remarkable success which has been obtained in using electric furnaces for the smelting of ores which contain a combination of the base and precious metals.

Several papers were presented on chemical problems at the Saturday session. One was on "The Phenomenon of Crystallization Through Membranes," by Dr. J. H. Walton, Jr. Another, by Dr. L. Kahlenberg, was on "The Relative Basicity of the Metals as Shown by Their Power to Replace One Another in Chemical Compounds." A paper was also read by Dr. David Klein on "The Effect of Water in Causing Chemical Reaction."

Great interest was taken by the members in an exhaustive review by Prof. Robert A. Milliken of experiments he has conducted in "The Isolation of an Ion and a Precision Measurement of Its Charge." He showed as the result of his researches that electric energy is granular in its construction and consists of multiples of the unit of energy carried by an ion. He used lantern slides to illustrate the apparatus by which he had made captives of elusive ions and had measured within a small degree of error the amount of electric energy which is carried by a single ion. His address was received with such interest by the members that he was given the special thanks of the society.

Important German Mergers

Our German correspondent furnishes the following news relative to important mergers:

"The trade is much interested in two mergers. The Lothringer Hüttenverein Aumetz-Friede announces the purchase of the Victor coal mine, which is situated near Dortmund, for 28,000,000 marks. Aumetz-Friede raises its capital by 16,600,000 marks, to carry out the fusion, thus giving it a total capital of 45,000,000 marks. The motive for the merger is interesting on both sides. Aumetz-Friede, which is situated in Lorraine not far from the French frontier, has an insufficient coal supply, and wants to render itself independent of the Coal Syndicate. The owners of the Victor mine, on the other hand, have an allotment in the Coal Syndicate hardly more than half of its producing capacity, and by selling out to the steel company the mine can be operated at once to its full capacity. An interesting point is the fact that its principal owner is the great Gelsenkirchen Company, the second biggest coal and iron company in Germany after Krupps; and it is believed that Gelsenkirchen will take payment for its shares in the stock of Aumetz-Friede, and thus secure one or more seats on the latter's board. This makes another important step toward huge combinations in the iron trade.

"The second fusion is that of the Düsseldorf Röhren und Walzwerke with the great Phönix Company. The latter adds 6,000,000 marks to its capital, already 100,000,000 marks, in order to acquire the tube mill. This operation is another instance of the policy of the biggest iron companies to include as many finished products in their processes of manufacture as possible. Both fusions are also interpreted by the press to mean that the big companies are preparing for the dissolution of the Steel Works Union [Steel Syndicate] two years hence, grave doubts having arisen as to the possibility of renewing it. The compaies are meanwhile strengthening themselves with a view to standing alone."

The Lehigh Valley Railroad Company announces its withdrawal from the car demurrage bureaus in its territory, and will handle demurrage affairs through its own organization after November 1. By this new arrangement the company will be better able to prevent the delay incident to the holding of cars, and will expedite traffic in such a manner as to benefit the railroad, the shippers and the public in general. The same action has been taken by other large roads.

The New York Subway System

An informal meeting of engineers was held at the Engineering Societies' Building, on Monday evening, October 17, to discuss the rapid transit requirements of Greater New York. Frank J. Sprague, past president of the American Institute of Electrical Engineers, under whose auspices the meeting was held, presented a paper which dealt exhaustively with the subway situation.

The first part of the paper was historical. Passing to a consideration of the proposed Tri-borough subway, Mr. Sprague declared that the system was mistakenly conceived and unwisely promoted and that if its construction as now planned was persisted in the result would be financial disaster. The paper contained an approximate estimate of the prospective cost of this route of $170,000,000 for construction and equipment and he went on to say that the annual interest charges on this investment of private capital would require the full fare of 152,000 passengers daily to cover the difference between these charges and those of the present system.

In conclusion the paper made the following recommendations:

Rejection of all bids for the construction alone by the city money of portions of the Tri-borough route and the withdrawal of all present plans and specifications.

Cessation of negotiations relating to general third tracking and extensions of the elevated railroad, considered independently of the subway extensions.

The prompt determination of a new and independent route following in general Lexington and Seventh avenues, with a junction between Forty-second and Thirty-sixth streets, so planned and proportioned that it may be constructed and operated independently of the present subway system, or, if satisfactory arrangements can be made, as an integral part of it, and the preparation of new plans on reduced dimensions, with invitations to bid on this proposed route.

The preparation of a comprehensive plan of subways using the composite system formed by an ultimate union of the present subway system and the proposed Lexington-Seventh avenue line as a nucleus, so designed that the equipment of all underground railroads of New York City can be interchangeably operated.

Abandonment of the proposition for the indefinite possible use of the subway by foreign cars, and the limitation of its use to strictly urban purposes.

William J. Wilgus, formerly vice-president of the New York Central & Hudson River Railroad, opened the discussion and agreed with Mr. Sprague. One of the special points made was that the Tri-borough route as laid out was too large for cars used on the present system and too small for the standard railway cars, and this increased size augmented the cost some $30.000,000, which was wholly useless. Another bad feature of the system as laid out was the lack of physical connection between the Broadway-Lexington avenue line and the Canal street crosstown line leading to the Bridge loop. The system proposed by Mr. Sprague, he said, was not open to these objections, as it provided transfer facilities with the Hudson-Manhattan tunnels and a physical connection with the Canal street crosstown line and others with the present system.

Lewis B. Stillwell, formerly consulting engineer of the Interborough Company and at present consulting engineer of the Hudson-Manhattan Company and past president of the Institute, continuing the discussion said that the route as laid out was faulty. In his opinion it ought to be constructed either as an integral part of the Interborough system or else to compete with it, neither of which was possible under the present arrangements.

William S. Murray, electrical engineer of the New York, New Haven & Hartford Railroad, was the last speaker, and said he was thoroughly in favor of the route proposed by Mr. Sprague.

New Publications

Machine Drawing. By Gardner C. Anthony. Size, 6 x 7½ in.; 104 pages; 127 figures. Cloth bound. Price, $1.50. Published by D. C. Heath & Co., 124 Boylston street, Boston, Mass.

This is the second edition of the book, which forms one of the Technical Drawing Series of the publisher, and is designed to promote exact methods of thought and clear expression in graphic language. It has been the aim of the author to teach and encourage the use of concise, graphic terms by adopting the idiomatic phrases of the engineer and to suggest many useful means for acquiring facility in this form of expression. It recommends certain types of letters, character of titles, size of paper and treatment of subjects to simplify the instruction and avoid the confusion incident to greater freedom in interpretation, but does not aim to instruct the prospective draftsman concerning the best methods of conducting a modern drafting room.

The book is divided into seven chapters and an appendix containing a number of tables. The first two chapters deal with screw threads and bolts and screws, while the next gives general rules for making drawings. Sectional views, dimensioning and technical sketching occupy the next three chapters, while the final one contains a number of examples for practice which have been chosen with a view to obtaining the largest experience consistent with a minimum expenditure of time. The tables given in the appendix include such standard ones as draftsmen are generally required to know and give standard dimensions for screw threads, pipes, pipe flanges, tapers, &c.

Contracts in Engineering.—By James Irwin Tucker. Size, 6 x 9 in.; 307 pages. Cloth bound. Price, $3, net. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York City.

This book deals with the interpretation and writing of engineering-commercial agreements and is an elementary text-book for students in engineering, engineers, contractors and business men. It aims especially to familiarize the engineering students with the major principles of common law relating to contracts and touches other legal branches only incidentally and so far as will materially assist him to grasp the doctrines or contract law applying to that subject. The importance of the principles underlying successful specification writing has been recognized, and as the present commercial tendency of engineering causes contracts of business to demand the attention of the modern engineer about equally with those of engineering-construction, the volume has been divided about equally into three parts, dealing with commercial contracts, specification writing and the elementary principles common to all instruments of this nature. To adapt the book for teaching purposes extensive lists of questions and problems have been introduced, and in outlining the various topics, where too many details or correlated ideas are developed, recourse is had to appendix notes.

The book is divided into nine chapters, the first of which is a general introduction to the subject. Chapter II covers the essentials of contracts, while the next chapter deals with the development of contract principles. Chapter IV discusses the relations of the agent and the independent contractor, while chapter V is devoted to real property. Contracts of sale and transportation and contracts of association are covered in the next two chapters. Chapter VIII is concerned with the various kinds of negotiable paper, while the final chapter deals with the preparing and writing of engineering contracts and specifications. An 18-page appendix serves to amplify the text, and an alphabetical index divided into various classifications, such as agency, contracts, corporation, partnership, property, sales, &c., completes the book.

Hendricks' Commercial Register of the United States.—Size, 7¼ x 10¼ in.; pages, 1342. Cloth bound. Price, $10 net. Published by F. E. Hendricks Company, 74 Lafayette street, New York City.

This is the nineteenth annual edition of this book, which is the most comprehensive and complete so far and contains 400 columns of index matter or 52 columns more than that of last year. This extra matter represents the manufacturers of approximately 5000 articles, which have not appeared in previous issues. The total number of classifications is 35,841, embracing machines, tools, specialties and materials required in the architectural, electrical, engineering, mechanical, mine, railroad and kindred fields. The present edition contains 124 pages in excess of the directory of last year, and as 114 pages of matter were omitted from this edition which appeared in the last one, the total pages of new matter is 238, and represents in all over 350,000 names and addresses.

The simplicity of its classifications is an important feature of the Commercial Register. These are so arranged that the book may be used for either purchasing or mailing purposes. All manufacturers of a particular trade are first classified under a general heading for mailing purposes, and each firm or corporation appears again under as many classifications as the variety of its products requires. Considerable information is given following the names of a number of firms which is of assistance to the buyer and saves the expense of writing to a number of firms for the particular article desired. As far as possible the trade names of all the articles classified are included and appear in parentheses between the names and addresses of the different firms appearing under the classifications.

A Fourth Recalescence in Steel

Data concerning a fourth recalescence in steel were given by Prof. J. O. Arnold in a lecture before the chemical section of the British Association for the Advancement of Science, at Sheffield, England, September 6, 1910. The facts presented, it was explained, were not developed in any recent research, but came from accumulated thermal and micrographic observations extending over nearly 20 years. The author's view is that the fourth phase of recalescence is due to the heat evolved during the segregation of the ultimate micrographic constituents of steel, begun at Ar_3 and completed at Ar_1, during the cooling of an unsaturated steel at a moderate rate, or about 0.5 degree per second. He believes that between the points named the ferrite and hardenite fall out from their state of mutual interpenetration or solid solution into microscopically visible masses. It is suggested that the maximum heat of the fourth phase of recalescence is evolved from a semisaturated steel—namely, iron containing about 0.45 per cent. carbon, and hence having in the cold a micrographic structure consisting of 50 per cent. ferrite and 50 per cent. pearlite.

The National Founders' Association will hold its fourteenth annual convention at the new Hotel La Salle, Chicago, on Wednesday and Thursday, November 16 and 17. On Tuesday evening a meeting of the Administrative Council will take place. On the same evening the annual alumni dinner for members of the Council will be held, and on Wednesday evening the annual banquet for the members of the association. Prominent speakers of national reputation have been engaged for the latter occasion.

A Large Norcross Molding Machine

A Jolt Ramming Model for Heavy Foundry Work

One of the recent products of the Arcade Mfg. Company, Freeport, Ill., is the large Norcross jolt ramming molding machine illustrated herewith. Fig. 1 is a general view of the machine, while, Fig. 2 shows a group of typical castings from molds made on this machine. It was especially designed for use in foundries where heavy loads and long flasks are required since the power is equalized and the load distributed over the entire machine. This is said to be the largest machine of its kind ever built and embodies constructural features that are radical departures from those in existing machines.

Three cylinders have been provided to obviate the difficulty usually experienced in jolting molds which are not accurately centered on the table of the machine. The two end cylinders have the same diameter, 20 in., while the central one is 7½ in. larger. The pistons operate in unison and when loads of from 6 to 8 tons have been placed at the extreme end of the table the results have been the same as if the load was located at the center. The general mechanism of this new model is identical with that of the company's regular type and is claimed to be very simple. No working parts are exposed to the action of the sand. The stroke is the same in both models, namely, ¾ in. The machine is rigidly constructed and its weight is 25,000 lb. When operating at an air pressure of 80 lb. the ramming load capacity is between 40,000 and 45,000 lb. for the machine illustrated, which has a 6 by 12 ft. table, and a base of the same size. There are over 1000 sq. in. of guiding surface and more than 90 sq. in. of contact surfaces divided between the three pistons.

Besides the model illustrated, four other sizes are built. The table in the smallest size measures 6 x 10 ft. and the capacity of it is the same as that of the 6 x 12 ft. table which is from 40,000 to 45,000 lb. The capacity of the next two sizes is the same, 55,000 lb., while the tables are 6½ x 12 ft. and 7 x 14 ft., respectively. The largest machine has a table measuring 7½ x 16 ft. and the ramming load capacity is 75,000 lb. If required a table of even greater length can be furnished. A two cylinder model in which the cylinder diameter is 21 in. and the table 6 x 9 ft. is also built. The capacity of these two machines varies from 32,000 to 35,000 lb.

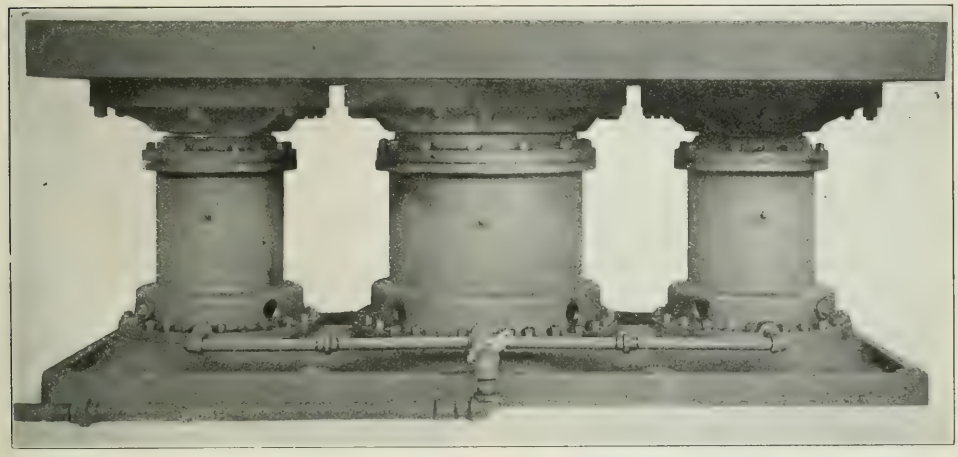


Fig. 1.—A Norcross Jolting Machine with Table Measuring 6 x 12 Ft., Built by the Arcade Mfg. Company, Freeport, Ill.

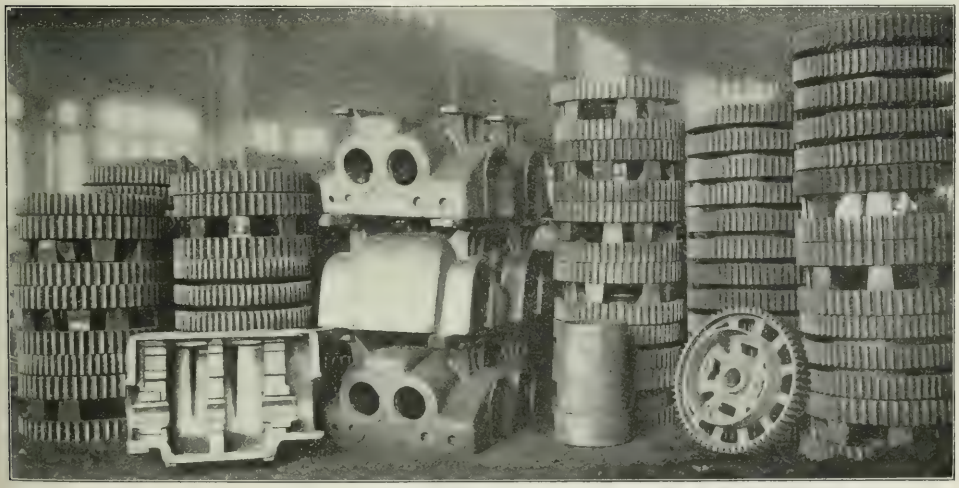


Fig. 2.—A Group of Castings from Molds Made on This Machine.

Co-operation in the Steel Industry*

The Results Already Achieved and Reasons for the Extension of the Policy—The Law of Supply and Demand

BY ELBERT H. GARY.

At this first formal meeting of the American Iron and Steel Institute, it is my privilege and no less my pleasure to felicitate the members on the success which has already been reached as the result of an earnest and untiring effort on the part of each to engender a feeling of affection among the members and to promote the welfare of the institute regardless of any personal or selfish interest. The disposition you have shown, if maintained, will result in benefits that cannot at this time be measured. Especially are we to be congratulated that so many from foreign countries are with us. We realize that these visitors are men of important affairs, and have in their charge and control properties and business of great magnitude which they could not leave even for a short time without considerable sacrifice. We understand they are here to evidence a desire, so far as practicable, to work with us in the endeavor to better the conditions of all.

In behalf of the institute I bid these foreign gentlemen thrice welcome. We are delighted with their presence, and we are proud of their acquaintance. We offer to them our congratulations for their achievements in their own respective countries, personally and as representatives of large aggregations of wealth and business. With no spirit of envy do we read of their prosperity. For many years we have been learning from them, adopting their discoveries and their methods. It shall ever be our aim to co-operate with them in placing and keeping upon a better basis the lines of business in which we are engaged, and in cementing the friendship which exists and which we hope may be permanent, not only as between them and ourselves but as between their countries and our country. Before their departure we hope to give to them proofs of the sincerity of our professions of esteem.

The Growth of the Iron and Steel Industry at Home

The production of iron ore, pig iron, steel and coke in the United States and Canada, the using in all cases round numbers amounted to the following in the years stated:

Iron Ore.

	Tons.		Tons.
1880	7,000,000	1900	27,500,000
1890	16,000,000	1909	53,000,000

Pig Iron.

1880	4,000,000	1900	14,000,000
1890	9,000,000	1909	26,500,000

Steel.

1880	1,250,000	1900	10,000,000
1890	4,300,000	1909	25,000,000

[The increase in the production of steel did not correspond with the increase in the production of pig iron, for the obvious reason that a good deal of scrap was melted, and therefore iron was used the second time.]

Coke.

1880	3,500,000	1900	20,500,000
1890	11,500,000	1909	41,000,000

Possible Future Production

If the ratio of increase during the next 20 years should be the same in each decade over production at the close of the preceding decade as that which took place in the 10 years from 1900 to 1909, there would be produced the following amounts:

Iron Ore.

	Tons.		Tons.
1920	102,000,000	1930	197,000,000

Pig Iron.

1920	50,000,000	1930	94,500,000

Steel.

1920	62,500,000	1930	150,000,000

Coke.

1920	82,000,000	1930	166,000,000

* Presidential address at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

As the figures given begin from a low basis in 1880, it is probable the same ratio of increases for the next 20 years is not justified. However, if the increase in tonnage during that period shall be the same in each decade over the production at the close of the preceding decade as that which took place in the 10 years from 1900 to 1909, inclusive, then and on that basis the production would be:

Iron Ore.

	Tons.		Tons.
1920	78,500,000	1930	104,000,000

Pig Iron.

1920	39,000,000	1930	51,300,000

Steel.

1920	40,000,000	1930	55,000,000

Coke.

1920	61,500,000	1930	82,000,000

Reasons for the New Organization

Reference has been made to the magnitude and growth of the iron and steel industry of America, as evidenced by these figures, for the purpose of emphasizing the importance and the opportunities of the American Iron and Steel Institute, and the necessity for its existence.

There have been for some time other associations which were calculated to develop and improve the iron and steel industry by the accumulation and distribution of statistics, or by the study and discussion of numerous technical questions, and these associations have been very successful and satisfactory; but it has been felt they were not, in practice at least, of sufficient scope and breadth to fully cover all the necessities of those who are engaged in or connected with the iron and steel trade. Due credit has been and will be given to those organizations, and there is no disposition to antagonize or interfere with or detract from any of them. On the contrary, we hope to affiliate with them, directly or indirectly, and assist in the good work in which they are engaged.

It seemed to the great army of individuals who have been particularly interested in successfully conducting this branch of industry that they had not, prior to the formation of this Institute, a common meeting place where it would be appropriate to consider any and all of the important questions which apply to their lines of activity. In some respects, at least, methods had theretofore been unsatisfactory. Each individual was to some extent managing his affairs without regard to the rights or interests of others. The results are well known and have been so frequently referred to as to make it unnecessary to dwell upon them at this time. That it was essential to do something to change and improve these conditions we all insist.

And so this institution was created upon a basis so broad that there is no limit to the good which may be accomplished. Its object is to afford means of communication between members of the iron and steel trades upon matters bearing upon their business affairs. Of course this does not mean the undue advancement of the claims of any member to the prejudice of other members or of any one outside.

As stated by many of you during the period of formation of the Institute, it is intended that ethical questions shall be considered as important as economic or scientific questions. The rights and duties of each member, so far as his conduct relating to this particular department of industry is concerned, and within the lines of propriety, should always be matters for the deliberation of the whole membership of the In-

stitute. The level occupied by the Institute is high, and its management must always be above reproach, and in all the questions which may properly be considered by the Institute the pecuniary interests and the honor of each member are alike involved.

These general references are made because they are in accordanc with the pronounced opinions of the charter members and should be emphasized at the outset.

Primarily the Institute was organized, and should be conducted, for the benefit of its members. It should result in decided pecuniary advantage to all. The opportunities for presentation and discussion of economic or scientific questions are likely to give all a clearer understanding of all the facts and circumstances applicable to the management of the factories, and furnaces, and mills, and their connections, so that every one possessed of the necessary knowledge may deal with reference to the rights of all concerned.

Also the consideration and discussion of ethical questions, particularly affecting those outside of the membership, but connected with or interested in the conduct of their affairs, should be deemed just as essential and should result in material benefit to all.

The Question of Prices

One of the most importnat business matters at this time, and perhaps at all times, is the maintenance of stable conditions in the iron and steel industry; and to this is attached the question of prices. For periods, at least, in the past unsatisfactory conditions have been the rule and not the exception. Violent, sudden and wide fluctuations in prices have occurred, and they have been detrimental to every one connected with the business and to the public generally. The steel and iron industry, more or less recognized as the barometer of trade, has had an influence on general conditions for good or bad, and much of the time for bad. We do not advocate, and never have, fixed unchangeable prices. If they are unreasonably high they should be lowered, and vice versa. If for any good reason at any time we are convinced that the rights and interests of ourselves, our employees, or our customers demand decreases in selling prices or the readjustment of prices, we should be prompt to make them. This does not, however, militate against the general proposition in favor of stability as opposed to demoralization. We know, as a matter of fact, from most careful observation and an abundance of testimony from those directly affected, that the maintenance of fair prices and the prevention of sudden and wide fluctuations is desired by our customers themselves.

The Buyer's Interest in Stability

If you suggest that many members of this Institute are purchasers or consumers of the commodities produced by others, and therefore may object to the position taken, the obvious answer is that they do not object. Many of them purchase with the view of converting or refining and selling the product. Many have stocks of materials on hand from time to time and cannot afford, and do not desire, to have the values of inventories reduced. Besides consumers like to feel that they can depend upon prices which they pay being as low as the prices which their neighbors subsequently pay. We are all purchasers and consumers of one thing or another. We sell certain manufactured products; but we buy a greater variety of products; and we like to feel that we are at all times treated as our neighbors are treated. If we go to the tailor, the butcher, the grocer, the farmer, the railroad company, the steamship line, the telegraph office, the newspaper office, or to any others having for sale that which we need and buy, we are better satisfied if we are certain we are treated like our neighbors, and that there will be no sudden and material decreases immediately after we have bought and before we have had opportunity to consume the product which we have purchased. It is pleasing to note that in much of the business transacted in this country—commercial, financial and industrial—there is a tendency toward an even, steady and continuing basis of action. It would be better for us all, and better for the country, if conditions in all departments of business were more stable and less likely to be disturbed by agitation, doubt or distrust.

The Law of Supply and Demand

It has sometimes been urged that an effort to maintain reasonable prices for iron and steel is contrary to the natural laws of trade; that it is opposed to the law of supply and demand. This we do not admit We do not undertake nor advocate anything unreasonable, unnatural or unfair. Those who oppose the maintenance of fair prices when the volume of business is low, on the ground that it is contrary to the law of supply and demand, make the mistake of supposing that capacity to produce creates supply. The law of supply and demand means the quantity which one possesses and is willing to dispose of and the quantity which another desires to possess and is willing to buy. Capacity to furnish does not create supply; nor does ability to purchase create demand. It is just as illogical to say that because one is able to furnish a given quantity, that is evidence of the supply, as it would be to say that because another can use and has the money to pay for a certain quantity, that constitutes a demand. The whole question should depend upon mutual consideration and decision. The seller should never take advantage of the necessities of the consumer to advance prices unreasonably, nor should advantage be taken of the necessities of the producer to secure his product at an unreasonably low price.

The Policy for Producer and Consumer

What, then, should the manufacturer do at times when the consumers or purchasers are not willing to pay the price demanded, however reasonable it may be? Many of us, at least, believe he should reduce the output to meet the demand, much or little, and wait until those in need are willing to pay what is fair and right. Remember, this assertion is based on the assumption that prices at all times must be fair and reasonable and subject to reductions or changes whenever it is decided they ought to be made. Such reductions, however, should be made only after due consideration and in an orderly way, and not as the result of panic.

On the other hand, if prices are at any time higher than they ought to be, the consumer, whatever his pecuniary ability to pay may be, should wait until the prices are reduced. If the attitude of both seller and purchaser should be as suggested, it would not be long before they would get together on a proper basis, especially if what we advocate shall be carried into actual effect. What has been said is outside of, and without reference to, any question of special privilege or undue advantage or improper control of any commodity which would enable the producer from motives of cupidity or otherwise to fix or maintain unreasonable prices, or to take advantage of the necessities of the consumer. The great aggregations of wealth make this question important; but it may not be appropriate to discuss the same at this time.

Lawful Methods of Co-operation

Now, how shall we bring about the conditions which have been suggested as ideal? The existence of this Institute and the large attendance on this occasion furnish the answer. Real, hearty, cheerful and continued co-operation on the part of the members will secure results which should be entirely satisfactory. Frank and friendly intercourse; full disclosure of his business by each to the others; recognition by all of the rights of each; a disposition to assist and benefit each other so far as practicable and proper; conduct founded on the belief that healthy competition is wiser

and better than destructive competition—all these are desirable and necessary and will be effective.

Some of you may say that in your opinions, based on the past, a fair and just equilibrium cannot be maintained except as the result of some agreement on the part of those who are interested. It is a sufficient answer to make that you have no right to enter into such an agreement, express or implied; that the laws of this country are opposed to it. But, as stated by the Attorney General of the United States in his argument before the Supreme Court in the Standard Oil case, the law does not compel competition; it only prohibits an agreement not to compete. If competitors are in frequent communication and make full disclosure to each other in regard to their business, notifying one another of what they are doing, it will follow as a natural result that no one will take advantage of the information he thus receives to act unjustly or dishonorably toward his neighbor. You know by experience this is so: and it will become more certain as time goes by and each of us realizes more fully his obligations to others and to this Institute.

Co-operation is broadening in its application to specific subjects growing out of the activities of life. We see it in many lines of business outside of our own. We see it in this country and in foreign countries. Especially have we observed it during the last few months in the consideration of some of the matters which have demanded the attention of the Interstate Commerce Commission and other official departments.

Cultivating Relations with Foreign Producers

Co-operation can be, and should be, extended to our business relations with foreign manufacturers and producers. They will meet us half way. Indeed, the presence at this meeting of so many distinguished and representative men from Great Britain, Germany, Austria, France and Belgium, respectively, is positive proof that they believe in this Institute and are friendly to its members, and have high appreciation of the efforts we have been making in the direction of conciliation and co-operation. Whenever and however we may have opportunity to meet these gentlemen and to legitimately co-operate with them in promoting and conserving their interests as well as our own we should do so without hesitation. We must at all times evidence a disposition to reciprocate the friendship which these gentlemen have shown, and to demonstrate to their satisfaction that we believe thoroughly in the doctrine that we are more or less bound together by business connections, and that we enjoy prosperity when they enjoy it, and that we fail of success when they fail. Many who are present will live to see the time when the spirit of co-operation shall extend even to the government of the nations of the earth.

The Welfare of Employees

Again, there is no better way of advancing our own interests than to conduct ourselves in such a way as to make it certain we are endeavoring to promote the welfare of others with whom we come in contact. Uppermost in our minds should be the proper consideration of the rights of our employees. Members of this Institute represent corporations or firms which have in their employ hundreds of thousands of men. Many of these workmen are foreigners, who are not familiar with our language or customs. Some of them have been poor and have had few advantages in their native countries and may not be fully able to protect themselves. Whether this be true or not, we should make it certain that all are so treated that they have the opportunity to be well housed, and well fed, and well clothed. So far as we can we should lend our assistance to the improvement of the conditions of our workmen, and, of course, the wages paid should always be fair and reasonable. All of us have discovered since this Institute was formed that there were many things which we could do for the betterment of the condition of the workingman, and we have been prompt to do them. Particularly have we made great strides toward safeguarding our employees against accidental injury. A continuation of the efforts we have been making in this direction will result in securing a larger measure of confidence on their part, and will bring to us the consciousness that not only have we benefited ourselves pecuniarily, but, what is more important, that we have done the right thing. Certain aspects of this subject will be presented in a special paper.

Co-operation with Customers

Also, we should extend the spirit of co-operation to our customers. We should be sure at all times that we are treating them right. If it is claimed on any occasion by a customer that our prices are too high with respect to any commodity we should promptly take up with him the question for the purpose and with the intention of arriving at a just conclusion. In all cases we advocate the doctrine of co-operation as opposed to independent action. We have found, particularly during the last two or three years, that we are succeeding better as we are brought into closer relations with our customers, giving them our confidence and informing them frankly of our conditions and intentions.

I predict for the Institute a great future. We are ambitious to have it prosper, and shall not be disappointed. So long as we pursue the path we have marked out we shall merit and receive the approval of all who are acquainted with our work. The influence of the Institute for good will be pronounced, and as it is better established and thoroughly known its opinions, as officially expressed on all matters which it may properly consider, will be respected.

For the honor you have conferred upon me personally in electing me your first president and for the cordial support which you have extended without reserve, I thank you sincerely. For your confidence and friendship I am profoundly grateful.

The Youngstown Car Mfg. Company.—Wilkoff Brothers, who recently purchased the plant and equipment of the Youngstown Car Mfg. Company, Youngstown, Ohio, propose to continue the manufacture of steel cars for mine, mill and contractors' uses and also portable track material. An Ohio charter will be applied for, the new owners proposing to operate under the name of the Youngstown Car Mfg. Company. The property consists of 12 acres of land, on which steel and brick buildings, about 80 x 460 ft., divided into erecting and car departments, are located. The establishment will also have close connections with a foundry. The shipping connections are excellent. G. H. Faul, former superintendent of the Youngstown Car Mfg. Company will have charge of the new company's plant. Sales offices will be located in New York, Chicago, Boston, Buffalo and other cities as may be found desirable from time to time.

The Raymond Mfg. Company, Corry, Pa., is completing an addition to its factory of a building 50 x 135 ft., three stories. So far it is only used for storage purposes. On October 11 a fire occurred in this addition, causing a loss of several thousand dollars. By reason of the first-class construction of the company's buildings it was able to confine the fire to the immediate section in which it originated, and therefore no interruption will be caused in manufacturing nor delay in the filling of orders. The importance of this fire has been greatly exaggerated in some of the daily papers. The company manufactures high grade wire springs.

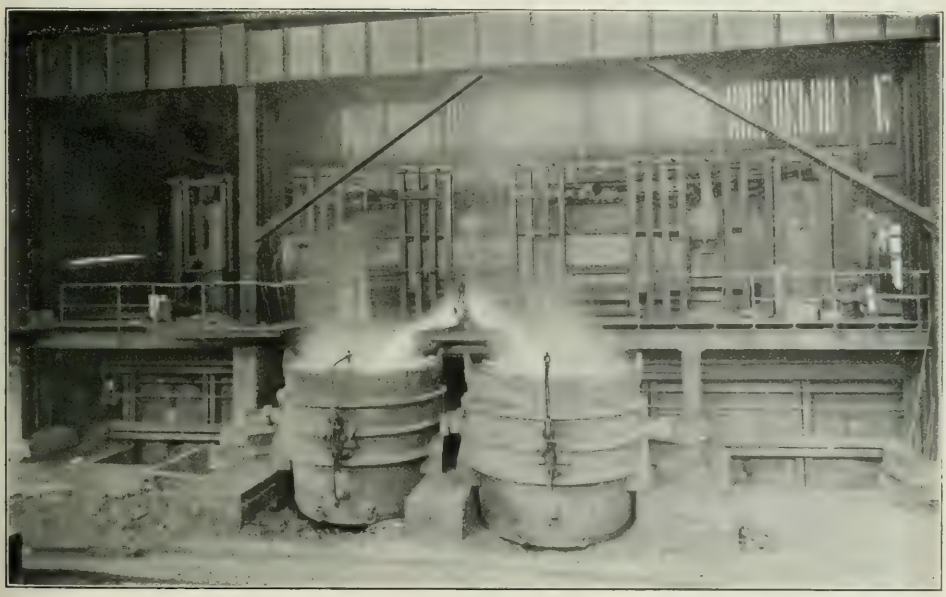
Tapping Steel Into Two Ladles

Noteworthy Record of an Open Hearth Furnace

In the fall of 1909 the Phœnix Iron Company of Phœnixville, Pa., enlarged its steel plant by an additional open hearth furnace. This furnace has just completed its year, and as the results are somewhat unusual they will prove of general interest to manufacturers of open hearth steel.

The furnace is of the standard type, rated at 50 tons. It was run on producer gas, and all the raw material was charged cold, hot metal not being available. The product for the year, which was structural steel, amounted to 43,900 gross tons of ingots. The dimensions of the hearth on the slag line are 36 x 14 ft. Gas chambers are 18 ft. by 11 ft. 6½ in. by 6 ft., and air chambers 18 ft. by 11 ft. 6½ in. by 9 ft. Each gas chamber contains 5500 9-in. brick and each air chamber 8500, making a total of 28,000 standard 9-in. checker brick.

The particular feature of this furnace which makes such an unusual product possible is that very large heats are charged and the steel is tapped simultaneously into two ladles. This arrangement, which is shown in the illustration, is covered by the Maccallum patents. Attached to the buckstays of the furnace on the tapping side, and operated by levers at a convenient distance from the ladles, is a device which controls the flow of steel into either ladle. The usual charge for the furnace is 335,000 lb. of pig and scrap, and the yield of ingots varies from 135 to 140 gross tons. The best weekly record is 1176 gross tons, and the largest heat tapped is 150 gross tons. The usual number of men operate the furnace, and a large saving has been effected in labor, fuel and repairs.



The Maccallum Arrangement for Tapping Steel from a Single Open Hearth Furnace Into Two Ladles.

The Rosedale Foundry & Machine Company, N. S., Pittsburgh, which recently shipped 40 valves, 78 in. in diameter, for use in the lock gates at the Panama Canal, is now working on an order for 80 valves of the same size.

The Ryerson-Gisholt Alliance

A joint announcement has been issued by Joseph T. Ryerson & Son, Chicago, and the Gisholt Machine Company, Madison, Wis., which marks an important event in the machine tool world. Without any corporate consolidation, a unity of interests has been established between these companies, and Edward L. Ryerson and Clyde M. Carr of the former company become directors of the Gisholt Machine Company.

In furtherance of the plans of the associated interests, an immediate expansion of the Madison plant is provided which will greatly enlarge manufacturing facilities. The Gisholt Machine Company has long held a distinctive position in the manufacture of boring mills, turret lathes, &c., while the house of Joseph T. Ryerson & Son is recognized as one of the strongest general machinery distributors. No definite announcement of policy has as yet been made but it is generally understood that the relationship of these organizations presages a development of considerable magnitude in the machine tool field.

A New Canadian Merger.—Under the title of Steel & Radiation, Ltd., a large corporation is to be launched in Canada, having its headquarters in Toronto, which will be a consolidation of a number of concerns now operating in the house heating or building trade. The King Radiator Company and the Expanded Metal & Fireproofing Company have already been taken over, with two other large concerns under consideration, negotiations for which have not yet been completed. It is the intention of the company to start an active selling campaign from coast to coast, operating branches at Winnipeg, Calgary, Vancouver, Quebec and St. John, N. B. It is possible that the new company will erect a plant in Montreal for the manufacture of boilers, radiators, expanded metal, Fenestra metal sash, and other lines connected with the building trade. Considerable American capital will be invested, but the control will be Canadian. S. W. Howard, Toronto, is secretary and treasurer.

The Inland Steel Company's Works

Description of the Indiana Harbor Sheet Mills

The recent starting of eight new sheet mills at the Indiana Harbor Works of the Inland Steel Company, Chicago, making 18 hot mills in operation, calls attention to the remarkable growth of this company. With 18 sheet mills in operation, it is now one of the largest producers of open hearth sheets in the world, and its ability to keep its enlarged plant in full operation the past summer, during a period of general trade reaction, is evidence of the recognition which is given in the trade to the merits of open hearth sheets, the Inland Steel Company using its own basic open hearth steel exclusively in all of its finished products.

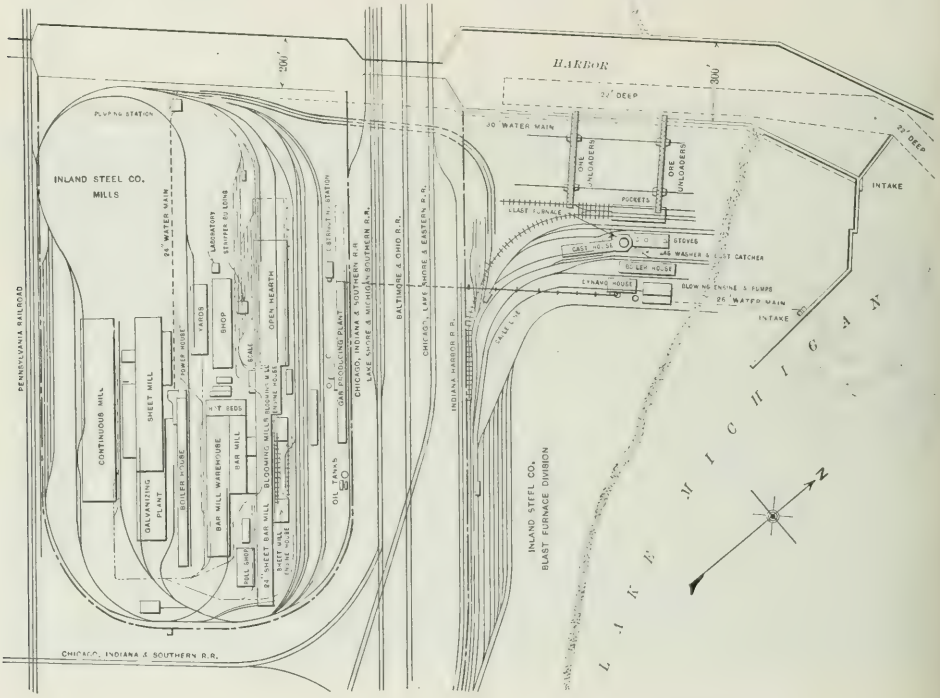


Fig. 1.—Plan of the Inland Steel Company's Works at Indiana Harbor, Ind.

History of the Company's Operations

A mere description of the new sheet mills would be of little interest to the trade without reference to other important links in the chain of operations resulting in the finished sheets. While the sheet mill itself embodies all the improvements known to the art of rolling sheets, the quality of the material used and the mechanical economy in bringing this material up to the sheet mills are primary factors in the success in the sheet department. Good sheets cannot be rolled from poor material and the best management in the sheet mill itself would not insure commercial success if it were not supported by similar progressive management in every process from the iron ore to the sheet warehouse or shipping platform.

There have been no revolutionary changes in recent years in sheet mill construction. In rolling rails, bars, beams and other heavy steel products, the continuous mill has almost eliminated old-fashioned skilled labor. In rolling sheets, however, skilled labor remains the most important factor. The roller and his helper with their tongs take the hot sheet bar from the furnace and pass it back and forth through a stand of rolls, first through a roughing stand and finally through the hot finishing rolls until the operation is completed. The commercial success of the product depends largely upon what the company does to render more efficient the ability and skill of the workman whose steady eye and strong arm complete the operation of rolling.

Along this line the Inland Steel Company has distinguished itself among the large steel works of the United States. Its plant at Indiana Harbor has been built during the past eight years and therefore embodies all the improvements that have been perfected by mill engineers in recent years.

The nucleus of the company's business was established in Chicago in 1873 by the Chicago Steel Works, the first mill in the United States to roll bars and other steel products from old rails. In 1893 this company was succeeded by the Inland Steel Company and the plant was removed to Chicago Heights, Ill., where it is still conducted for the manufacture of hard steel bars or "rail carbon steel."

In 1902 the Inland Company began a new base of operations at Indiana Harbor, Ind., on the shore of Lake Michigan. The advantages of the Chicago district for the manufacture of open hearth steel had become apparent, and the first unit constructed at Indiana Harbor was an open hearth steel plant with a 32-in. blooming mill, a 24-in. universal merchant mill and eight sheet mills. For several years the company purchased in the open market the basic pig iron required

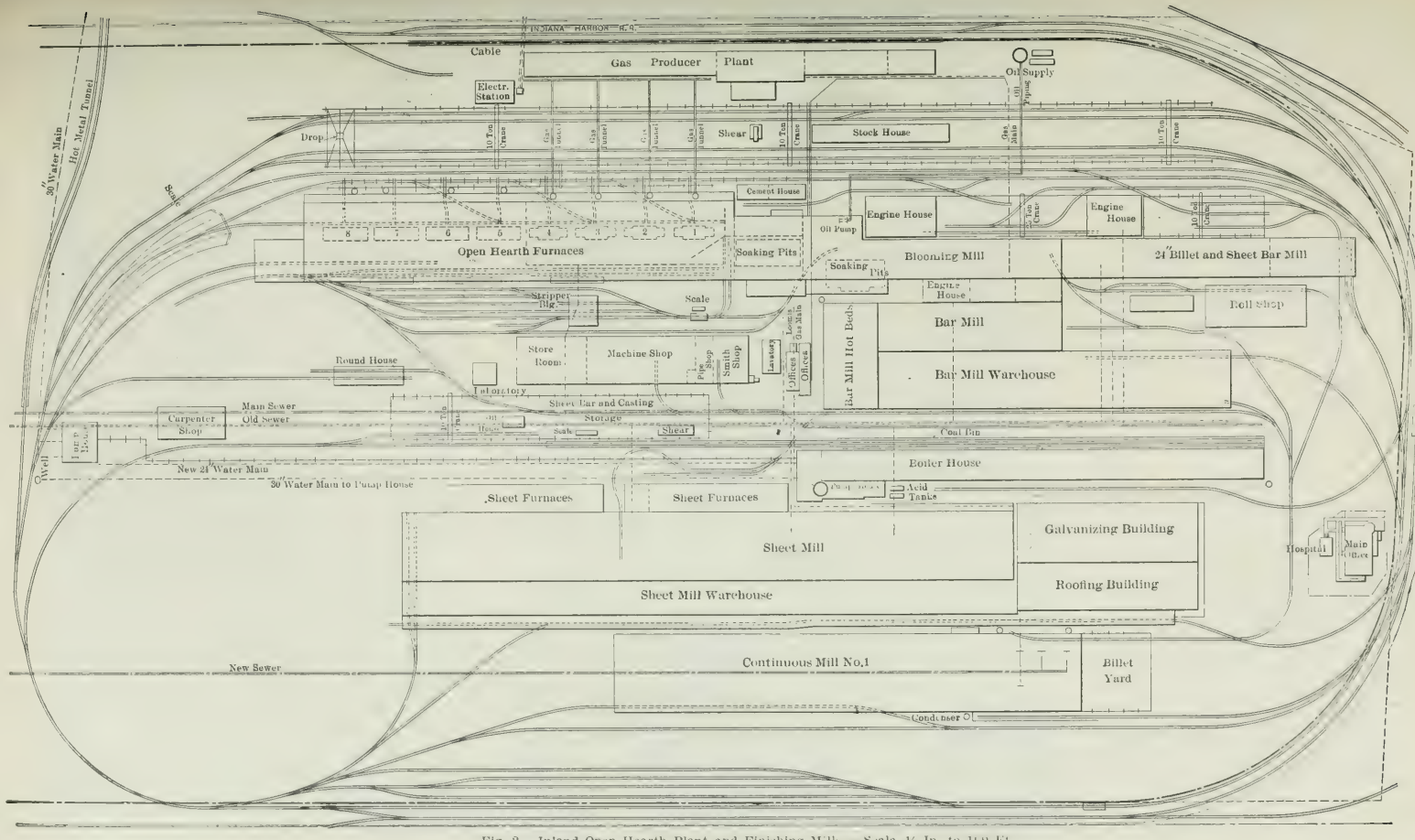


Fig. 2.—Inland Open Hearth Plant and Finishing Mills. Scale, ½ In. to 100 Ft

for its steel plant, but in 1906 it began the construction of a blast furnace, completed in August 1907, in order to obtain a better and more uniform quality of pig iron than could be purchased regularly on the market. In 1907 the company added to its plant a 12-in. continuous bar mill for the rapid production of merchant bars and a 24-in. sheet bar mill. In 1909 it began the construction of two additional open hearth steel furnaces and eight sheet mills, as well as a billet mill to be operated in connection with the blooming and sheet bar mills. This brief historical summary is given to set forth the steady and remarkable growth of the company's operations. Fig. 1 of the accompanying illustrations presents a plan of the entire works, showing the relative location of the blast furnace and the steel plant.

Features of the General Arrangement

A striking feature of the Indiana Harbor steel plant is the general plan of the buildings, Fig. 2, which promotes the use of electric traveling cranes. The buildings are all long and relatively narrow, and run in parallel lines. There are more than 40 electric traveling cranes in use, ranging in capacity from three and one half to 100 tons. Some of them have runways of over 1300 ft. In the sheet mill and warehouse these cranes have a clear run of 1123 ft., and the three cranes which cover the scrap yard have a runway of 1350 ft. This economical method of handling the material in the plant saves the labor of hundreds of men and is a very important link in the chain of production, as it promotes economy in the cost of the finished product.

The blast furnace, known as Madeline Furnace, is located on the shore of the lake at the mouth of a canal running from the lake inland to the Calumet River through a large manufacturing district. Lake Superior ore is brought from the Hibbing district in Minnesota. Two unloading bridges take the ore from the boat and deposit it in the storage yards. This is one of the few furnaces in the United States where the unloaders could take the ore from the boat and dump it directly in the ore bins of the furnace. In practice, however, this is seldom done as it is necessary to carry a large stock of ore. The ore runs very low in phosphorus and sulphur, for basic iron, a fact which facilitates economy and the production of open hearth steel of a very high quality. The blast furnace furnishes its own power. The gas not required for the hot stoves is burned under boilers which supply steam to the blowing engines, and produce 1650 kw. of electrical power in a power plant adjacent to the furnace. This power plant operates the ore unloaders and other machinery connected with the furnace, and also furnishes all of the electrical power required in the steel mill.

The main lines of the Lake Shore and the Baltimore & Ohio railroads pass between the blast furnace and the steel plant, but a physical difficulty of this character does not embarrass the engineers who design a modern steel plant. At the Inland Works a hot metal tunnel extends from the blast furnace under these railroads to the open hearth plant. This is a substantial concrete tunnel, built for standard gauge railroad cars and locomotives. The hot metal from the blast furnace is poured into 25 ton ladles on specially built railroad cars, and the company's locomotives take the cars across from the blast furnace to the steel plant, bringing the cars alongside the elevated charging floor of the open hearth furnace. A crane lifts the ladle of hot metal from the car and sets it on a standard gauge electric car which serves the furnace. Tracks are laid out on the charging floor which enable this charging car to move up promptly to the door of any furnace that is due for a charge of hot metal, and the car is so convenient in its operation that the contents of one ladle are sometimes divided between two furnaces.

One of the features of this plant is in the use of fuel oil for heating. This oil is received through a pipe line from the adjoining town of Whiting, Ind., the center of the enormous pipe line system of the Standard Oil Company, which brings to Whiting the product of all the important oil fields of the country, from Pennsylvania to Kansas and Oklahoma. The oil used is free from sulphur and makes a hot steady flame, which is very desirable in the operation of a steel plant. The open hearth furnaces, the charging cars and other features of the plant are all of standard construction and a detailed description is therefore unnecessary.

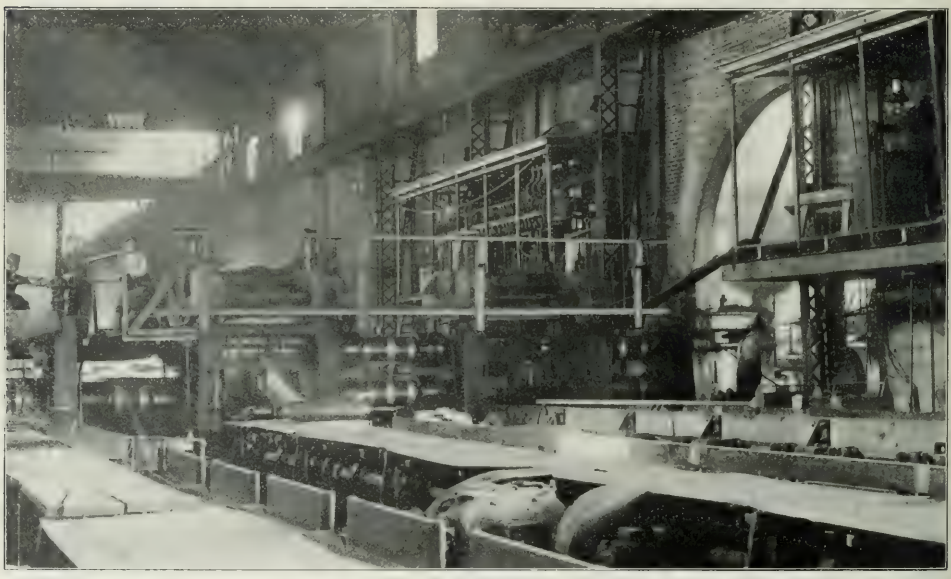


Fig. 3. Billet and Sheet Bar Mill of the Inland Steel Company.

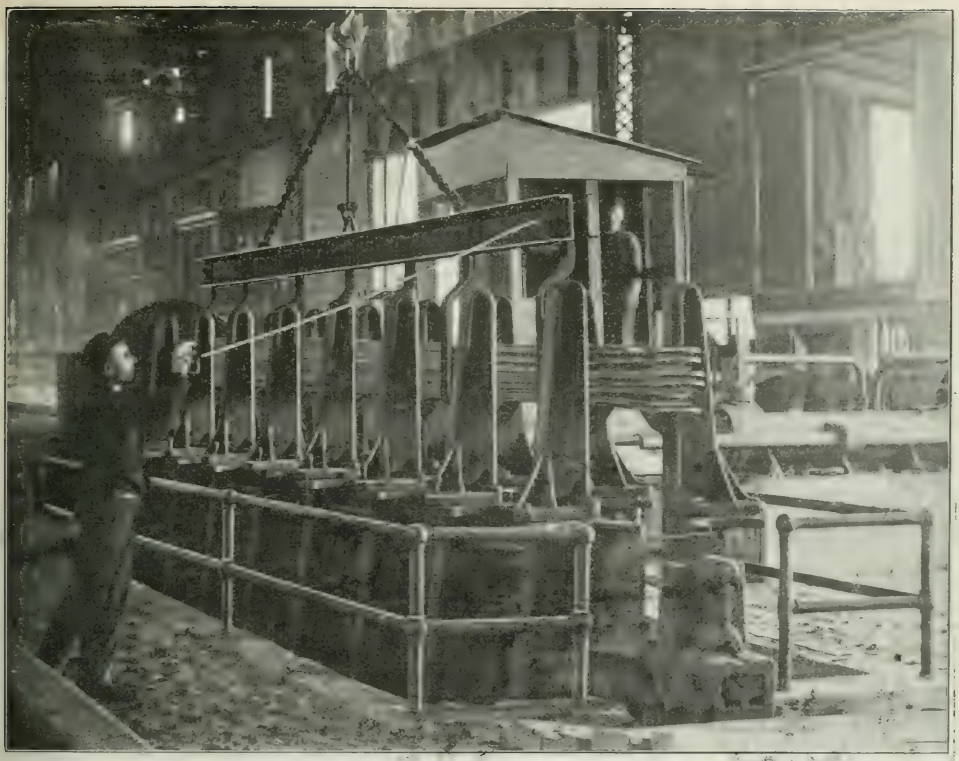


Fig. 4.—Bar Piler in the Inland Works.

The construction of the plant in parallel units, however, makes it a very clean and economical plant in operation and is worthy of special mention.

The Scrap Yard

The scrap yard is among the largest in the United States, with a capacity of 50,000 to 100,000 tons of scrap. It is the first of the parallel units of the steel plant, approaching it from the blast furnace. The yard extends along the Lake Shore and Baltimore & Ohio railroads a distance of 1350 ft., and is covered by one crane runway with three traveling cranes of 10 tons capacity and 89-ft. span. Each crane carries a magnet, used for unloading the scrap from cars as well as for picking material from the stock pile for the charging boxes. A skull cracker is located at the west end of the scrap yard. A steel trestle is erected at the end of the crane runway of sufficient height to

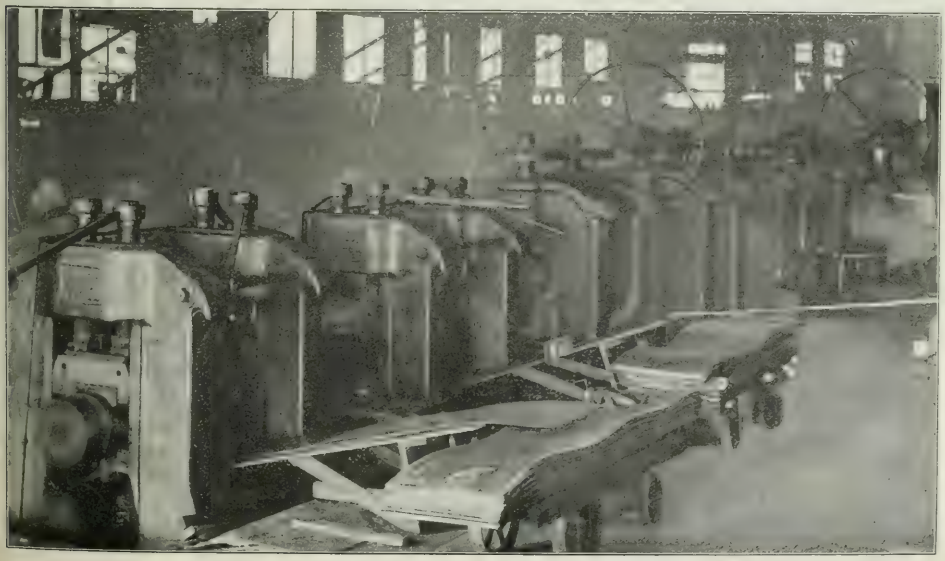


Fig. 5. Stands of Cold Rolling Sheet Mills in the Inland Works.

afford an 80-ft. drop for the ball, which weighs 10,000 pounds. The cranes with their magnets bring the scrap from the pile to the west end where the charging boxes are loaded.

About midway along the yard is located a powerful scrap shear used for cutting long material to charging box length. This shear is of sufficient capacity and strength to cut 7 x 7 in. cold steel. The charging boxes are carried on small standard gauge cars operated by a special locomotive, the gauge of the track being the same as that on the charging floor of the open hearth furnaces, so that scrap is unloaded from cars, deposited on the stock pile, carried from the stock pile to the charging box cars, and delivered at the charging door of the furnace with practically no hand labor except to sort the charge for each box.

The two open hearth furnaces that were completed last summer are of 60 tons capacity. The six original furnaces were formerly rated at 50 tons capacity each, but have been improved to make their capacity 60 tons per heat.

The Steel Plant

The open hearth furnaces, the soaking pits, the blooming mill, billet mill and sheet bar mill are all housed in one building, 60 x 1598 ft., which constitutes one of the building units of the plant. This building is covered by two 100-ton Morgan cranes of 57-ft. span which handle the ladles from the furnaces to the pouring stands where the steel is poured into molds on cars and transferred to the stripper house, from there to the pits and to the blooming mill. There are 12 soaking pits, each with a capacity for holding eight ingots, heated by producer gas. The blooming mill is of the 36-in. universal type, driven by a Mesta engine 5000 hp., the mill tables being driven by motors. After the blooms are cropped and sheared to the length desired, they may pass on in a direct line on the conveyor table to the 24-in. billet mill, or they may be transferred to the table serving the sheet bar mill.

The billet and sheet bar mills, Fig. 3, are both three high mills of the universal type, operated in the same train and by the same engine, and they are operated alternately according to whether the blooms are to be rolled into billets or into sheet bars. The runout table from the billet mill carries the billets to an upcut shear and then to a side conveyor which drops them on a buggy on which they are carried to the finishing mills. The slabs for the jobbing sheet mills are also rolled on the billet mill, which makes billets up to 6 x 6 in. and slabs up to 2 x 13 in. in size.

A different transportation method is followed in handling the sheet bars. The bars pass from the mill on the runout table to the hot saw and into a bar piler, Fig. 4. This is a cradle or frame work consisting of eight pairs of housings with a movable bottom which is raised and lowered by hydraulic cylinders. The bars drop into the piler until about seven tons have been accumulated, or the product of two to three ingots. The hydraulic lift is then operated to raise the pile to the top of the cradle when dogs operated by springs slip under the pile and hold it in this position. An electric traveling crane then picks up the pile and carries it to the cooling bed, the crane having a cradle with nine dogs or fingers to support the pile, so that the bars are kept straight during their movement from the piler to the cooling bed. The same crane is used to pick up the piles from the cooling bed and load them on standard gauge freight cars on which they are carried around to the stock house of the sheet mill.

The next parallel unit of the plant, adjoining the blooming and billet mill, is the original merchant mill of the company, shown on the plan view drawing, Fig. 2, as the "bar mill." This is a universal reversing 24-in. mill with a very wide range of product. It has the capacity to make bars of all sections, up to 20-in.



Fig. 6.—The Inland Galvanizing Department and Sheet Warehouse.

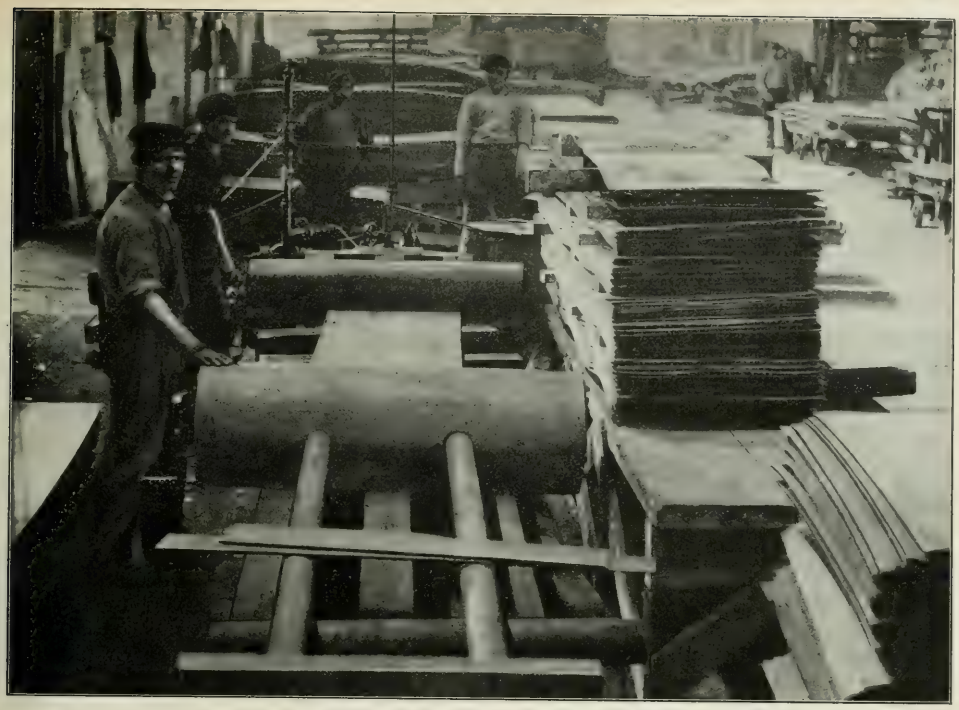


Fig. 7.—Patent Hydraulic Levelers in the Inland Works.

flats, as well as rounds up to 6 in. It rolls structural I-beams and channels up to 13 in., and has proved a valuable unit in the company's plant, owing to the wide range of finished product which it turns out.

The continuous bar mill was described in *The Iron Age* of August 27, 1908. The sheet mill and sheet warehouse lie between it and the older units.

The Sheet Mills

The 18 sheet mills with their furnaces, the driving engines, the annealing pits, the shears, and the galvanizing plant are all housed in an enormous building 100 x 1133 ft. The stock house extends parallel to this building, and just north of it. The sheet bars and slabs are received from the sheet bar mill and are cut to lengths corresponding to the gauge and size of the sheets to be rolled. The heating furnaces extend along the north side of the building. Sixteen of them are combination sheet and pair furnaces of the Swindell type, and are heated by fuel oil. Two are slab furnaces for the jobbing mills, making 18 furnaces in all, corresponding to and set opposite the 18 mills.

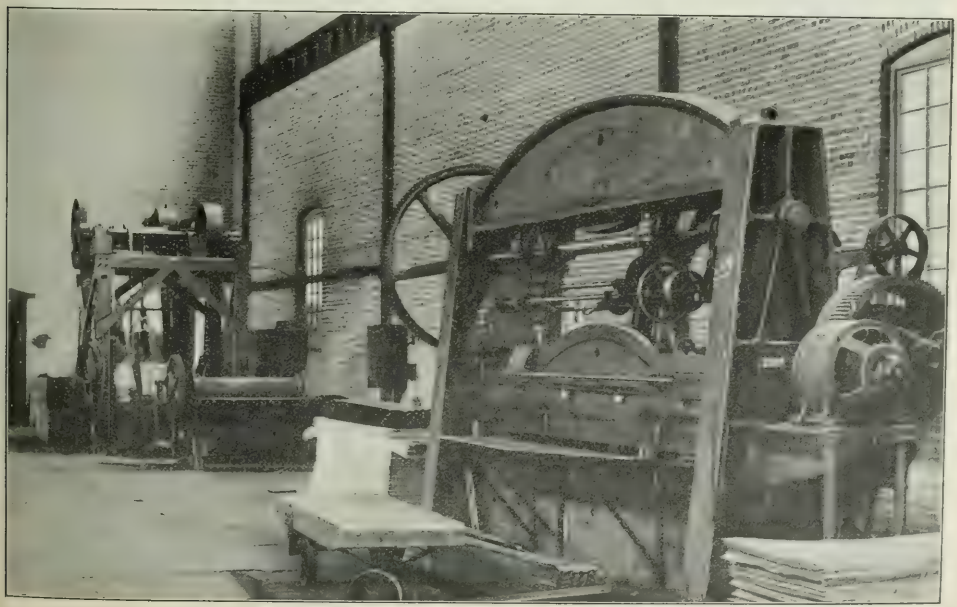


Fig. 8.—Drop Press and Heavy Plate Press in the Inland Works.

In a combination furnace of this type the rear of the furnace or the end farthest removed from the mill is used for heating the bar for the roughing rolls, while the front of the furnace, opposite the mill, is used for reheating the sheet for the finishing passes.

The 18 mills with their corresponding roughing rolls are arranged in two trains, one being the old mill and the other train comprising the 8 new mills. Each train is driven by a steam engine, the two engines being located in the center of the building. In the original train of 10 mills there are two jobbing mills for making sheets of the heavier gauges and one tin mill for rolling black sheets. There are also 7 stands of cold rolls for finishing, Fig. 5, in addition to the 15 regular sheet mills.

In the operation of rolling sheets the sheet bar is cut to a length corresponding to the width of the sheet to be rolled, the width and thickness of the bar corresponding to the length or the gauge of the finished sheet. The bar is passed sideways into the roughing mill by the roller, and is returned above the roll by his assistant for the next pass, this operation being continued until the rough sheet has been rolled down to a thickness of perhaps a quarter of an inch. The sheet is then taken to the hot mill and rolled down to about No. 12 gauge, when it goes back into the furnace for reheating.

In rolling the lighter gauges the sheets are doubled and laid in packs of two, four, eight or sometimes ten sheets. At this stage of the operation the intelligence and experience of the roller become most important, in getting the sheets down to the desired gauge without having them weld together in the rolls. The advantages of open hearth steel are very important in rolling sheets of the lighter gauges, as the soft mild steel of homogeneous quality spreads more evenly under the rolls and thus makes a sheet of uniform gauge throughout. If there were a hard spot in one sheet in a pack it would not spread evenly and would tend to reduce the gauge of the softer sheets under it in the same pack, and for this reason open hearth sheets have been found to run more uniformly in thickness.

It has never been found feasible in sheet mill operation to regulate the gauge of the finished product by any rigid adjustment of the rolls. The gauge is determined by the amount of material in the bar and the width and length to which it is to be rolled. The roller knows he has reached the desired gauge when the sheet has been rolled out to the size corresponding to the bar.

The Annealing and Galvanizing Departments

From the finishing mills the sheets go to the shears which square them up to exact size, the squared sheets being stacked in piles of about 35,000 pounds for annealing. The sheet mill and annealing floor are covered by two 50-ton cranes. There are 18 annealing pits which are heated by fuel oil. A "pack" of about 35,000 pounds of sheets is placed on the bottom of the annealing box and the heavy cover is then lowered over it, to protect the sheets from contact with the flame and gases which might have the effect of oxidizing them. The box with its contents is then lowered into the pit and kept for 12 to 15 hours at a temperature of 1200 to 1300 degrees, when the box is removed to a cooling pit where its burden cools slowly, out of contact with the air.

The annealing floor with its pits is located in the east end of the sheet mill. Beyond it, and occupying the extreme eastern end of the building, is the galvanizing department, Fig. 6. In this department there are four pickling tanks and eight galvanizing pots, all covered by a crane which serves them. After being pickled and washed the sheets go to the galvanizing pots, where they pass, one at a time, through a chain conveyor which carries them slowly through the bath of spelter and discharges them on a conveyor at the opposite side, on which they travel across the

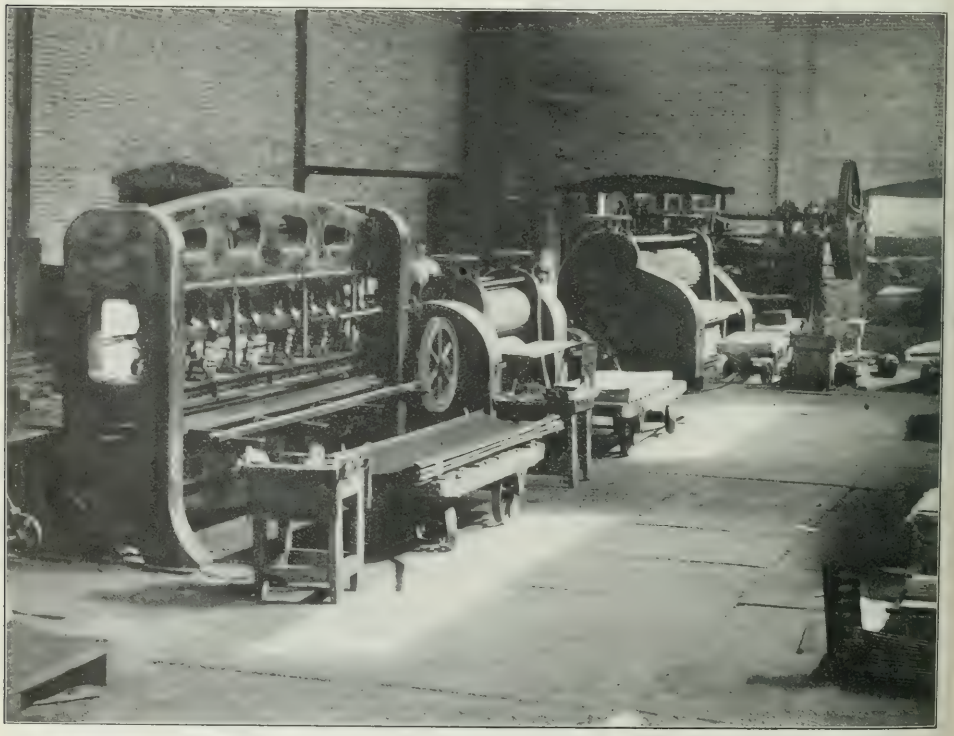


Fig. 9.—Toggle Press and Corrugating Machine in the Inland Works.

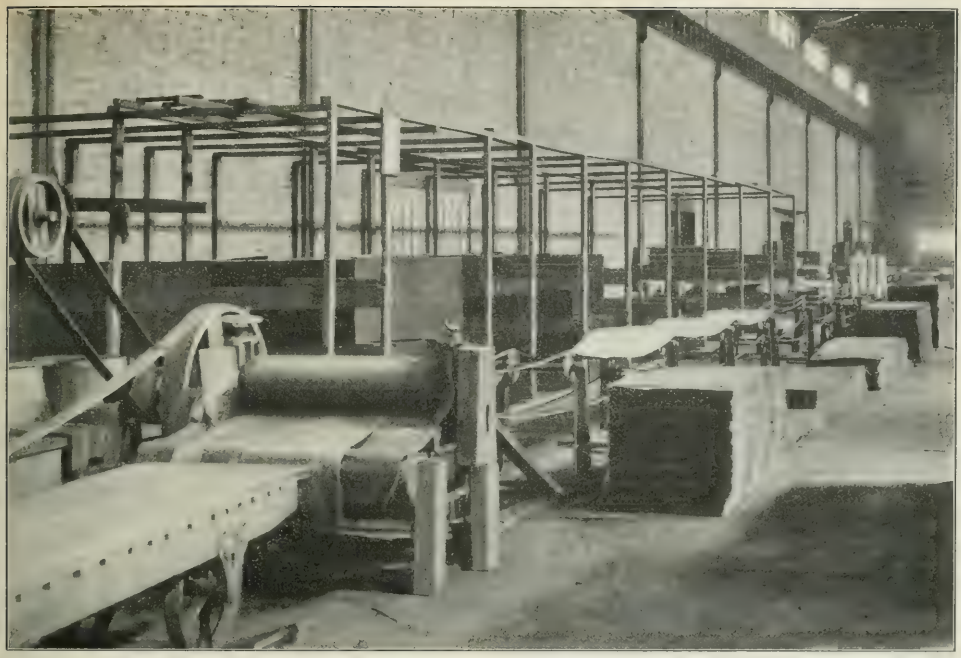


Fig. 10.—Roof Painting Machine in the Inland Works.

building into the inspection and shipping department.

The pickling room for black sheets is located in the northwest corner of the building. In the galvanizing department, the sheets are held in a stationary vertical position in the tank and the solution is agitated by a dasher which rises and falls in an adjoining compartment of the tank. In the black pickling room, however, a bundle of sheets is suspended from a spider which is supported by a steam cylinder. As the spider rises and falls, the bundle of sheets is churned in the tank. There are four arms on this spider, operating over two pickling tanks.

The Sheet Warehouse

The sheet warehouse of these mills is more than a warehouse, being in fact an important link in the system of production. In rolling bars or other products of shaped section, it is necessary to change the rolls of the mill to correspond with the specifications of each order on which the mill is operated. That is to say, these products are only rolled according to the orders and specifications given by the customer. In a merchant sheet mill, however, the orders come from the trade in an almost infinite variety of widths, lengths and gauges. The Inland mills range in width up to 52 in., but a sheet mill cannot be changed like the rolls on other mills. There is a further complication in the fact that when newly turned rolls are put on a sheet mill they will only roll the full width for a few days, as the rolls work together at the end and have a tendency to weld the edges of the sheets. For this reason it is necessary to gradually decrease the width of the stock on a pair of rolls until they are turned again. The ordinary plan in steel mills of adjusting the mill to the specifications of the buyer is therefore impracticable.

The plan followed in the Inland mill is to keep each mill in steady operation on the size and gauge for which it is best adapted, and accumulate a stock in the warehouse of all gauges and sizes. By this plan the mills are kept in steady operation and the buyer does not have to wait for weeks or months until the mill can roll all the sizes or gauges called for in his order. This gives to the enormous Inland warehouse a producing function, since it increases the capacity of the mill. In a commercial sense, the warehouse is also a producer as it attracts the business of the buyer by assuring him better accommodations than if he had to wait for the mill to roll all the sizes and gauges that he specified in an order. This warehouse is used only for carload business and is not designed as an agency to sell less than carload lots "from store."

The loading dock of the sheet warehouse extends the full length of the building, and 30 cars or more can be loaded at one time. The traveling cranes run the entire length of the warehouse, 872 ft.

Finishing Operations in the Warehouse

The east end of this enormous warehouse is devoted to finishing operations of an interesting character. A group of machines, Figs. 7 to 10, is installed here for finishing and fabricating operations. There is a stand of corrugating rolls for making standard corrugated roofing and siding. Another machine of the same character and operating in the same manner makes narrow corrugations, or crimped sheets. Another machine operating on the same principle has a pair of rolls which give a brick face finish. A drop press makes a rock face finish and there are also presses and brakes for making roof capping and other special forms which jobbers carry in stock. A painting machine for painting black sheets has a pair of rolls to paint sheets quickly on both sides. The company is enlarging its operations from time to time in this department, installing machines to make any form or character of work for which there is a regular demand from the trade.

The general policy of the company has been to develop its plant step by step, adding new units as rapidly as the trade will sustain them and the capital becomes available for further operation. One of the chief aims of the management has been to build up a strong, harmonious organization. The plant is kept in continuous operation year after year by following the market, through unprofitable periods as well as prosperous seasons. In this way the organization is kept together and the men in the mill are given continuous employment.

The International Congress at Düsseldorf, Germany*

Its Papers a Resume of German Progress in Fuel Economy and in the Manufacture of Iron and Steel—European and American Conditions Approximating

BY C. KIRCHHOFF, NEW YORK.

The Fifth International Congress of Mining, Metallurgy, Applied Mechanics and Practical Geology was held this year in June at Düsseldorf, Germany. As compared with the first gathering at Paris in 1878, the attendance of delegates, the high character, variety and scope of the papers illustrated well the wonderful progress made since then. Now there is an army of trained scientific observers in close touch with practice where once they might have been counted on the fingers of both hands. An international exchange of experience has developed which is lifting the iron and steel industry to a much higher plane, expressed in better and more uniform quality of products, in enlarged and broadened range of uses, in a more complete utilization of raw materials, in the suppression of waste, in much improved working conditions of labor, and in more intelligent and, therefore, more satisfactory co-operation between buyer and seller. There is a much quicker recognition of the merits of improvements, which is best illustrated by the extraordinary rapidity with which the gas engine and the electrical drive have become well nigh universal.

Germany's Economy of Fuel Against American Economy of Labor

Having invited the Congress to come to Germany, the hosts arranged for a splendidly complete series of papers detailing in nearly all the departments the technical progress made during the past decade in their own country. Naturally it reflects the peculiar conditions, some of which are characteristic of Germany as a whole, like the relatively low wages and the abundance and the high professional standard of the technical administrative and commercial staff. Other conditions differ in different parts of that country, like the cost of raw materials, the cost of assembling and marketing, so that emphasis is placed upon certain considerations in one section which are relegated to a more secondary position in others.

Fuel economy in all the districts, and in some sections, like Upper Silesia and the Saar district, the necessity to manufacture a moderately fair blast furnace coke from rather unpromising coal, have been among the chief problems of the German iron industry. The persistence and skill with which they have been solved are among the proudest achievements of German managers and engineers. For decades the indifference of American iron masters to the value of economics along the same lines was the marvel of unprejudiced observers, even after making due allowance for potent mitigating circumstances.

For a long time those who had wrestled with the problems of one country could not understand the seeming indifference to them of the producers in another. Twenty years ago our European friends came over, wondered at our labor-saving appliances and our craze for tonnage, went home and figured that with their cheap labor the costly appliances would not justify increased interest, sinking funds, and repairs, and that order books into which tonnage dribbled by hundreds of tons would not permit of installing plant which fed on blocks of thousands.

A Connellsville coke maker whose coal was costing him 50 to 60 cents a ton could see little inducement in building by-product ovens and costly recovery plant with uncertainties as to marketing by-products when his principal object was to double output at short notice in boom times and gather in additional coal acreage in times of depression.

European and American Basic Conditions Approximating

But the tendency has been in recent years to so modify basic conditions on both sides of the Atlantic that the point of view of captains of industry has steadily approached. Wages have been rising in Germany, and the burdens of social legislation are adding to them more and more. Home consumption and foreign outlets have expanded so that the unit of output has grown larger, and "American" mills of relatively enormous capacity and cost no longer have any terrors.

We are rapidly adopting European methods of coking; we are looking after steam economy, even in Pittsburgh; we are well started in the introduction of the modern gas engine, and are in the front rank in applying the electric drive.

It almost looks, too, as though a condition which has long favored industrial undertakings abroad from our point of view may have some influence with us. In those countries in Europe in which 30 years ago the State required the railroads, capital accumulating has had no outlet in perfecting and extending the railroads and has been driven into industrial investment. While there is no public demand for State ownership of the railroads in this country, it does look as though a larger proportion than hitherto of our annual savings will seek employment in other directions, unless a more reasonable attitude toward the common carriers is made to prevail.

However, to me one striking fact, while watching technical and economic developments in the steel industry of the principal industrial countries, has been that methods and plants are becoming almost internationally uniform. The provincialisms, if I may so term them, due to exclusive attention to local conditions are disappearing, and he who could once return from a trip to a foreign country with swelling pride concerning great achievements at home and a somewhat languid interest in what was being accomplished elsewhere, must be content now with a relatively small and narrow budget of glorification and a pretty small array of items to justify posing as a reformer.

German Progress in Coke Oven Design

Let me state at the outstart that the Düsseldorf Congress did not bring out any new developments sensational in their character; no new departures which might give promise of those revolutions in the steel industry of which we hear every day, but which really occur at such very rare intervals. No better illustration of how much patient and persistent effort and how much time is required to perfect a really revolutionary invention could be furnished than the splendid record of the basic Bessemer process in Germany. W. Esser's paper before the Congress is a brilliant presentation of the modern methods and should be studied by those who desire to appreciate

* Read at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

wherein lies the strength of Germany's steel industry. I shall not follow him into details because the basic Bessemer process has never found a footing in our own country owing to the fact that our raw materials call for other methods.

During the past few decades the Germans have been the leaders in studying fuel economy and beginning with the first stage, the manufacture of coke, they have continued to make steady progress. A very elaborate paper before the Congress was that of Prof. Fr. Herbst, of Aix-la-Chapelle, on "Modern Coke Ovens and the Development of the Mechanical Appliances." Coke oven gas is being utilized more and more on the Continent to drive gas engines and is being employed also for heating open hearth furnaces. There has been a good deal of activity in utilizing coke oven gas for lighting, heating and power for communities and a very comprehensive scheme is being seriously considered to distribute power from a central plant to a number of Rheinish cities. The lead which we took in this country, of making gas the principal product with coke as an incidental, is being followed in Europe. With the many varied purposes, adaptation to them has been reflected in the design and operation of coke ovens.

The higher value of the surplus gas has given increased vogue to the oven types with regeneration, and one of the principal aims of coke oven builders has been to overcome the irregularity of heating in the regenerative ovens incident to the reversing. This is sought by a maximum division of the flues and more careful combustion, or by the plan of obviating the reversing altogether.

Herbst reviews in detail the betterments made in the Otto regenerative oven, in the Koppers and in the Collin. He refers to recent experience with the Kros oven which is being built by Salan & Birkholz of Essen. It has given encouraging results so far as mitigating the influence of reversing is concerned and has brought about a decrease in the time of coking from 44 to 28 hours. He reports on the new Coppee oven, on that of the Rheinische Chamotten und Dinas Werke and on the Ries inclined oven of the Stettiner Chamotte Fabrik.

Professor Herbst devotes a good deal of attention to recent improvements in stamping machines, noting among others the Méguin machine with electro magnetic lifting device. He deals also with charging and leveling machinery, with devices for getting rid of the gas during charging, with improved oven doors and discharging and quenching appliances.

Flue Dust Briquetting

In the preparation of iron ore for the blast furnace, relatively little has been done thus far in Germany. Attention has been directed more particularly to briquetting flue dust. Prof. G. Franke, of Berlin, in a paper on the subject, estimates that 10 plants with a capacity of 700,000 tons per year handle over 500,000 tons of flue dust, leaving only a relatively small balance for ores. There are in operation the Schumacher chloride of magnesium process, the Tigler lime, the Trainer cell pitch methods, the Ronay high-pressure process and the Scoria process. Nodulizing has not attracted much attention.

By-Product Recovery in Coking

There has been much earnest work in the direction of improving the methods of recovering the by-products in coking. A close analysis of this branch, bordering as it does on the chemical industry, was submitted by O. Rau, of Aix-la-Chapelle. Coke oven engineers who at first adopted methods borrowed from the field of illuminating gas manufacture have worked along lines aiming at a more direct adaptation to the conditions affecting the coking industry. The removal of the tar is based upon the fact that above 80 degrees Celsius, tar is in the gas in the form of a fog which needs only to be forced into the form of sufficiently large and heavy drops. This is effected either by the centrifugal method adopted by Brunck or by a tar jet used by Otto. It is a necessary preliminary for the direct sulphate process of recovering the ammonia in the coke oven gas introduced into practice on a large scale both by Otto and by Koppers, with highly satisfactory results as to increased yield and lowered costs.

Burkheiser separates the ammonia by sulphurous acid, utilizing the sulphuretted hydrogen in the oven gas and obtains a mixture of sulphate and sulphite of ammonia, which has made good records as a fertilizer. The question of marketing of the tar, benzole and ammonia is receiving eager attention, and there has been some uneasiness over the rapid expansion of the industry producing fixed nitrogen in various forms. Of the total production of coal in Germany during 1909, 76 per cent. was fired direct, 4 per cent. was coked without by-product recovery, 16 per cent. was coked with by-product recovery and 4 per cent. was used for the manufacture of illuminating gas with by-product recovery. In the United States 87 per cent. was fired direct, 10 per cent. was coked without recovery, 2 per cent. was coked with recovery, and 1 per cent. was manufactured into lighting gas with by-product recovery. Or, as Rau puts it rather significantly, Germany utilizes 20 per cent. of its coal rationally, while the United States so handles only 3 per cent.

The Use of Blast Furnace Waste Gases

An important achievement of the past 10 years has been better utilization of the waste gas from blast furnaces, the principal phase of which has been the development of power. It was recognized soon after the introduction of the gas engine driven with blast furnace gas that cleaning of the gas was very important. Curt Grosse of Metz has collected for the Congress the latest information on the subject. How rapidly the appreciation of its value has spread may be realized from his estimate that now over 63 per cent. of all the gas coming from German blast furnaces is cleaned. Improvements in detail have been made in the coolers and automatic removal of the slimers has been worked out, but the main reliance is upon the mechanically operated apparatus of the Zschocke, Theisen, Bian and Schwarz types, the general plan followed being to remove the dust in two successive stages, the first to obtain gas suitable for the heating of stoves and for combustion under boilers, while the second aims at as thorough a cleaning as is possible for the gas for engine purposes. The tendency is to concentrate the whole apparatus, with the exception of the dust catchers, in one central plant where there are a number of blast furnaces.

Herr Grosse has collected data which show that the saving in coke through a gas cleaning plant varies from 20 to 55 kg. per ton of pig iron and that the temperature of the blast was increased from 60 to 100 degrees Celsius. The time required to heat the stoves was cut down nearly one half while the time during which the stoves could be kept on blast increased thirty minutes. When running on cleaned gas the stoves use about 42 to 44 per cent. of the furnace gas. Adding 16 to 18 per cent. for the other requirements of the furnace there would be available about 37 to 42 per cent. for steel works and rolling mills and for any other outside uses. The life of the hot blast stoves is longer, but it must be taken into consideration that since the cooled and cleaned gas has a considerably higher calorific power and needs a longer path the stoves must be considerably higher. Recently stoves up to 40 meters (125 ft.) in hight have been built.

The Advance in Basic Open Hearth Practice

The open hearth process has been making rapid progress in Europe, and notably so in Germany, and

several papers were brought forward before the Congress, the most comprehensive being that of R. Genzmer, of Julienhuette, Upper Silesia. He deals more particularly with the pig and ore process, which has made headway so rapidly since the use of direct metal, and is conquering a place in Germany in competition with the basic Bessemer, on irons carrying a relatively high percentage of phosphorus. The mixer is playing a more and more important part, there being a growing tendency to utilize it for preliminary refining, particularly when the mixer is well heated. Additions of ore and of lime are employed to practically get rid of the silicon, while sulphur is reduced by about one-half.

At the Georgs Marienhuette at Osnabrueck a 150-ton mixer, heated with blast furnace gas, is used; a second 250-ton mixer being under construction, which together will then serve three 50-ton open hearth furnaces, there being five in all. About 5 to 6 per cent. of ore and 3 to 4 per cent. of lime are added, the iron carrying 3.80 per cent. of carbon, 2.75 per cent. of manganese, 0.4 per cent. of phosphorus, 0.6 per cent. of silicon, 0.05 per cent. of sulphur and 0.4 per cent. of copper. The iron delivered by the mixer contains 3.50 per cent. of carbon, 1.2 per cent. of manganese, 0.08 per cent. of silicon, 0.15 per cent. of phosphorus and 0.02 per cent. of sulphur. Using 70 per cent. pig and 30 per cent. scrap, the addition of ore in the open hearth is 16 to 17 per cent., of whose iron contents 83 per cent. is recovered. It is expected that when the second mixer is in operation it will be possible to produce with these open hearth furnaces about 800 to 850 tons of steel per day. Labor has been decreased, the consumption of lime, dolmite and ore have been lessened, and the yield in good ingots has been 103 to 104 per cent. The consumption of coal for the open hearth furnaces using the Kerpely producer has been 16.3 per cent.

An interesting recent development has been the introduction of the Hoesch process, a modification of the Bertrand Thiel process, which has been elaborately reported on recently by Dr. Springorum. It is in operation at Hoesch and at Hoerde and is being installed at Friedenshuette and at Koenigshuette in Upper Silesia. The process is the outgrowth of work done under the Bertrand Thiel method at Hoerde, where it was found, however, that in consequence of the low temperature and the heavy lime additions in the primary furnace there were large accretions, while the high temperatures in the finishing furnace caused the latter to suffer rapidly. It was decided therefore to work in one furnace, the method being the following: After the furnace has been charged with lime and ore the liquid metal is added and the reaction starts at once. After it has ceased to boil and is sufficiently hot, the charge is tapped with a ladle and the slag is easily poured off. After again charging the furnace with lime, ore and scrap, the metal is again poured into the furnace. The finishing takes only a short time because the fresh slag acts rapidly and the charge is quickly brought up to the highest temperature.

At Hoerde the iron is taken from the same mixer which supplies the basic Bessemer plant, and contains about 1.85 per cent. of phosphorus, 1 to 1.50 per cent. of manganese, 0.25 to 0.60 per cent. of silicon and 0.1 to 0.15 per cent. of sulphur. In the first heat the phosphorus is brought down to 0.1 to 0.3 per cent., and what is extremely important, the slag which is produced carries from 20 to 26 per cent. of phosphoric acid, of which 80 to 90 per cent. is soluble as citrate, so that it is readily marketable for fertilizing purposes. The yield of phosporic slag is 12.6 per cent. of the weight of the ingots. During the fiscal year 1908-1909 there were charged 48,463 tons of material, exclusive of ore, consisting of 74.72 per cent. of pig iron, 0.25 per cent. of Speigeleisen, 0.48 per cent. of ferromanganese, 0.02 per cent. of ferrosilicon, 0.17 per cent. of scrap iron and 24 per cent. of steel scrap. The yield was 50,606 tons of ingots or 104.42 per cent. There was also charged 11,011 tons of ores and mill cinder, the yield being 93 per cent. of its iron contents. The average analysis of the steel was 0.07 per cent. of carbon, 0.02 per cent. of phosphorus, 0.44 per cent. of manganese, and 0.055 per cent. of sulphur. The cost is equal to that of a basic Bessemer plant with basic pig at 53 marks a ton, on the basis of 30-ton open hearth furnaces. With larger furnaces it would probably be lower. With higher prices of basic pig, the Hoesch process would gain relatively.

On the electro metallurgy of steel there was only one paper at Düsseldorf which went over much trodden ground and did not bring out any discussion. Two modern plants, however, were accessible to the delegates—the Lindenberg at Remscheid and the Becker.

Those who have been accustomed to hear the deathknell rung of the puddling furnace in former years, will hesitate now to bid farewell to the crucible. With its high temperatures and its reducing atmosphere the electric furnace has made available means for the certain production of steel of high quality, chemically and structurally, which will prove of splendid service to many industries.

Manufactures Now More Than Half Our Exports

Manufactures now form, for the first time in the history of the country's commerce, more than one half of the total exports of the United States. In the eight months ending with August the figures of the Bureau of Statistics of the Department of Commerce and Labor show that out of a total exportation of $1,027,000,000 manufactures amounted to $542,750,000, or 52.8 per cent. of the whole.

One year ago, out of a total export of $989,000,000 in the eight months, manufactures contributed $475,000,000, or but 48 per cent.; two years ago their share was $472,000,000, out of a total of $1,075,000,000, or 44 per cent. of the total; 10 years ago, taking the figures for the entire year, manufactures formed 35½ per cent.; 20 years ago, 21 per cent. and 30 years ago, 15 per cent. of the total exports of domestic merchandise.

These increases in values of manufactures exported are, it is proper to add, the result, in most cases, at least, of increased quantities of merchandise exported and not the result of higher prices, since, as shown by a statement recently issued by the Bureau of Statistics, prices of both exports and imports show a downward tendency in recent months.

The Modern Water Supply Company.—This company has moved from the German National Bank Building to a storeroom at 210 Wood street, Pittsburgh. It has on display various types of water system for city, suburban, country or small town homes, hotels or factories; also electric lighting plants and gas and gasoline engines. In one window, in a glass cylinder, a Perry pneumatic pump works continuously, the compressor being driven by a motor automatically controlled, so that when the air pressure falls to a certain point the motor starts, pumps the pressure up to a predetermined point and cuts out. On one side of the room the Modern hydro-pneumatic water systems are demonstrated. A gas engine, deep and shallow well pump, a hot air engine and hand pump are all connected to a pressure tank and can be started up to show how each one works. On the other side of the room is a complete electric light plant driven by a gas engine that can supply the office with lights and run the motor for the air compressor. The company is sales agent for the Perry pneumatic water systems, the Fairbanks-Morse gas and gasoline engines, the Rider-Ericsson hot air engines, the Standard pumping engines and the Sanitary Pump Company.

Black Plate, Tin Plate and Terne Plate Production in 1909

The production of black plates, or sheets, for tinning, and the production of tin plates and terne plates in the United States in the calendar year 1909 have been compiled by the American Iron and Steel Association.

Black Plates, or Sheets, for Tinning.—The production of black plates, or sheets, for tinning in 1909 amounted to 606,844 gross tons, against 513,771 tons in 1908, an increase of 93,073 tons, or over 18.1 per cent. The production in 1909 was much the largest in our history. The year of next largest production was 1906. The following table gives the production by States in the last three years in gross tons:

States.—Gross tons.	1907.	1908.	1909.
Pennsylvania	253,807	278,163	309,344
Maryland and West Virginia	95,939	92,860	115,866
Ohio, Indiana and Illinois	154,326	142,748	181,634
Totals	504,072	513,771	606,844

Of the total production in 1909, about 4261 tons were rolled from iron and about 602,583 tons were rolled from steel, while in 1908 about 2954 tons were rolled from iron and about 510,817 tons from steel. In 1907 about 3161 tons were rolled from iron and about 500,911 tons from steel. In 1909 there were 31 active black plate works, as compared with 28 in 1908 and 31 in 1907. The number of idle black plate works in 1909 was 9, as compared with 13 in 1908 and 10 in 1907.

The following table gives the production of black plates, or sheets, for tinning in the United States from 1894 to 1909. Prior to 1894 the statistics of the production of black plates, or sheets, for tinning were not separately classified:

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894	52,359	1900	315,000	1906	576,079
1895	129,615	1901	398,026	1907	504,072
1896	185,387	1902	365,743	1908	513,771
1897	271,886	1903	490,652	1909	606,844
1898	345,254	1904	472,569	...	...
1899	375,000	1905	507,587	...	...

Tin Plates and Terne Plates.—We estimate the production of tin plates and terne plates in 1909 as amounting to 1,373,011,000 lb., or 612,951 gross tons, as compared with 1,203,075,000 lb., or 537,087 tons, in 1908, an increase of 169,936,000 lb., or 75,864 tons. Of the total in 1909, 1,182,081,000 lb. were tin plates, as compared with 1,048,896,000 lb. in 1908, an increase of 133,185,000 lb., and 190,930,000 lb. were terne plates, as compared with 154,179,000 lb. in 1908, an increase of 36,751,000 lb. The following table gives the production by States in 1909; also the total production in the three previous years:

States.—Pounds.	Tin plates.	Terne plates.	Total.
Pennsylvania	671,003,000	48,756,000	719,759,000
New York and West Virginia	179,130,000	62,431,000	241,561,000
Ohio, Indiana, Illinois and Michigan	331,948,000	79,743,000	411,691,000
Totals for 1909	1,182,081,000	190,930,000	1,373,011,000
Totals for 1908	1,048,896,000	154,179,000	1,203,075,000
Totals for 1907	996,650,000	156,447,000	1,153,097,000
Totals for 1906	1,100,373,000	193,367,000	1,293,740,000

Combining tin plates and terne plates, Pennsylvania made over 52.4 per cent. of the total in 1909, against over 54.6 per cent. in 1908. All the tin plates produced in 1909 were made of steel, but of the 190,930,000 lb. of terne plates about 8,054,900 lb. were made of iron and about 182,875,100 lb. were made of steel, as compared with about 6,560,500 lb. of iron and about 147,618,500 lb. of steel terne plates in 1908. In 1909 the iron terne plates were made in Pennsylvania, Ohio and West Virginia. About 26,628,000 lb. of the tin plates made in 1909 were consumed by the makers in the manufacture of stamped ware, against about 26,217,000 lb. in 1908. In addition to tin and terne plates small quantities of pure lead coated and aluminum coated steel sheets for special roofing purposes were produced in both 1908 and 1909.

The number of active plants in 1909 was 34 and the number of idle plants was 11.

The National Machine Tool Builders' Association

The programme for the ninth annual meeting of the National Machine Tool Builders' Association, which is to be held at the Hotel Astor, New York, October 25 and 26, has been issued. The first session, on the morning of the 25th, will be given up to routine matters, such as the enrollment of new members, selection of convention committees, call for resolutions and reports of officers.

Reports will be received from standing committees, as follows: Patent Committee, C. L. Taylor, chairman; Committee on Revision of Constitution, A. H. Tuechter, chairman; Apprenticeship Committee, E. P. Bullard, Jr., chairman; Cancellation of Orders, also Dealers' Commissions Committee, C. Wood Walter, chairman.

The afternoon of the same day has been set aside for meetings of the several section committees.

On the morning of the second day papers will be read and addresses made as follows:

"Who Should Pay the Expenses of a Representative from the Factory When Sent Out at Request of the Dealer to Help Close a Deal?" by F. L. Eberhardt, Gould & Eberhardt, Newark, N. J., and C. H. Norton, Norton Grinding Company, Worcester, Mass.

"The Use of Ball or Roller Bearings in Machine Tool Construction," by Henry Hess, Hess-Bright Mfg. Company, Philadelphia, Pa.

"Advertising—Large Space in a Few Papers *vs.* Small Space in a Number of Papers," by Thomas H. Moore, advertising manager, John Wanamaker, Philadelphia, Pa.

"Concrete *vs.* Wood Flooring," by James N. Heald, Heald Machine Company, Worcester, Mass.

The afternoon session will open with addresses on "The Design and Construction of Machine Tools from the User's Standpoint," by C. K. Lassiter, mechanical superintendent, American Locomotive Company, and John Riddell, General Electric Company, Schenectady, N. Y.

Reports of convention committees will then be received, followed by the report of the Nominating Committee, election of officers and selection of the place of the next convention.

A striking commentary upon the work accomplished during the year is the increase of membership, the result of the unremitting efforts of Secretary Charles E. Hildreth. The programme gives a list of 17 applicants for membership, who are in addition to those admitted at the Rochester convention last spring. The new list follows:

Acme Machine Tool Company, Cincinnati, Ohio.
Blanchard Machine Company, Cambridge, Mass.
Blount, J. G., Company, Everett, Mass.
Cleveland Planer Works, Cleveland, Ohio.
Fay Machine Tool Company, Philadelphia, Pa.
Frontier Iron Works, Buffalo, N. Y.
Gardner Machine Company, Beloit, Wis.
Gleason Works, Rochester, N. Y.
Grant & Wood Mfg. Company, Detroit, Mich.
Knight, W. B., Mfg. Company, St. Louis, Mo.
Lapointe Machine Tool Company, Hudson, Mass.
Lea Equipment Company, New York City.
Lees-Bradner Company, Cleveland, Ohio.
Morse Twist Drill & Machine Company, New Bedford, Mass.
National Machine Company, Hartford, Conn.
Ransom Mfg. Company, Oshkosh, Wis.
Robbins Machine Company, Worcester, Mass.

Holland is arranging to abandon free trade. The Minister of Finance is expected to bring forward a tariff for ratification by Parliament.

The Hawley Automatic Annealing Furnace

A Recent Model in Which Electric Motors Control All Operations

A new type of annealing furnace has been recently perfected by the Hawley Down Draft Furnace Company, 736 West Monroe street, Chicago, Ill., which is the invention of Cliff Bleyer, its general manager. The remarkable feature of this furnace is that its entire operation is automatic, the mechanical work being performed by electric motors, which are controlled by a clock, so that each charge of castings is retained in the furnace for the length of time required by the character of the work. A furnace of this character is

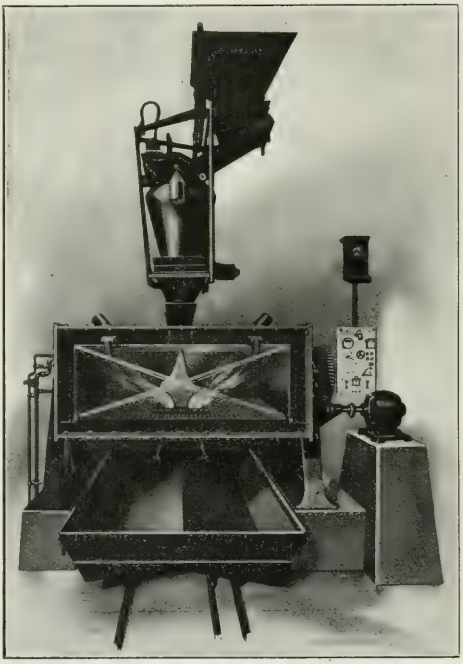


Fig. 1.—General View of an Automatic Annealing Furnace, Designed by the Hawley Down Draft Furnace Company, Chicago, Ill.

especially adapted for light castings, like cartridge shells, which must be handled economically in large quantities, but is also suited for any kind of small gray iron or metal castings requiring a short annealing period. The charge is automatically weighed into the furnace, discharged by a tilting movement, and the truck which carries the annealed castings away operates automatically on a track, discharging its load at any point for which the mechanism may be adjusted and returning to its station under the furnace. Fig. 1 is a general view of the plant and Fig. 2 shows the furnace tilted to discharge its load.

The furnace is fed from an overhead hopper of sufficient capacity to keep the plant in continuous operation. The material may be conveyed to it by any desired means, but in one plant where the system is being installed the tumbling barrels in the foundry discharge the castings directly on a belt conveyor, which carries them to the hopper. From the hopper the castings are weighed by an automatic scale, which can be adjusted to weigh charges in any amount from 50 to 500 lb. The movements of this scale are synchronized with those of the furnace through a connection with the electric clock, and a fresh charge may be dropped into the furnace immediately after the succeeding lot of castings has been discharged or an interval may be allowed to recover any heat which may have been lost by the discharging movement of the furnace. The mechanism of the automatic scale is of the standard type for automatic weighing and has been adopted in this system of automatic annealing, as the charge can be regulated to the amount best suited to the capacity of the furnace and the character of the material to be annealed. The castings drop from the hopper into the scale and from the latter to the furnace by a sliding movement, the pitch of the slide being adapted to the character of the material handled, so that the castings are not damaged by a direct drop.

Its mechanical operation is the principal novel feature of the furnace. It is heated by two fuel oil burners of the type used in metal melting furnaces, as it has been found that these will maintain a constant temperature within the required range, especially if strained oil is used. It is said that once the proper heat has been attained in starting the furnace no further attention is required except an inspection every 8 or 10 hours. The flame enters the bottom of the furnace, but is deflected, as shown in Fig. 1, toward the outlet, so that it does not come in contact with the castings.

Six heavy cast iron plates bolted together form the oblong shell of the furnace proper, which is lined with from 4 to 8 in. of firebrick, according to the capacity of the furnace. An interlining of asbestos varying in thickness from ½ to ⅞ in. is interposed between the shell and the firebrick lining, and serves to retain the heat and keep the annealing room cool. The furnace is swung on two cast steel trunnions similar in design to those employed on the company's tilting metal melting furnaces. The tilting of the furnace is accomplished by gears operated by two electric motors both of which are controlled by the electric clock shown at the right of Fig. 1. One of the motors controls the discharging movement of the furnace, and its return to the loading position through an arc of 90 degrees. The other tilts the furnace backward and forward through an arc of 45 degrees and turns the castings. This movement secures a uniform heat treatment for the castings on all sides by changing their position in the furnace and their points of contact with each other. The control of this motor by the electric clock makes it possible to turn the castings once in the middle of the heat and at such other intervals as may be suited to the character of the work.

The wedge-shaped brick projecting upward from the bottom of the furnace at the center is another ingenious feature. As will be noticed from Fig. 1, the face of this brick is curved, its purpose being to act as a slide to break the fall of the castings when a charge is dropped into the furnace. This is accomplished by the curved face of the brick, which arrests the descending movement of the charge slowly, so that the castings are deposited in the furnace without any sudden jar which would cause breakage or damage. This brick also serves as a flame deflector to protect the castings from direct contact with the flame, and is one of the patented features of the furnace. In common with the lining of the furnace it is subject to wear, but it is inexpensive and can be easily replaced. The furnace lining is designed according to the character of the work to be handled, and in the case of small castings they are evenly spaced on the floor of the furnace.

The automatic motor operated truck which carries away the annealed castings has a hopper shaped car mounted upon it to receive the material from the furnace. This motor is so wired that the truck can travel automatically any required distance to deposit the castings at the point where further operations are

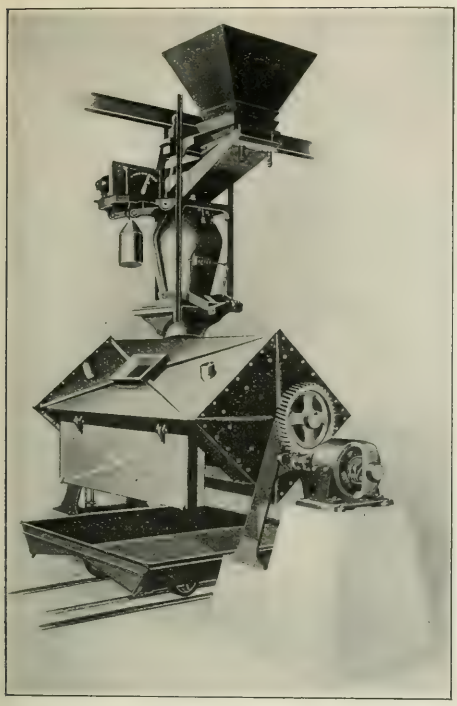


Fig. 2.—The Furnace Tilted to Discharge Its Load of Castings.

to be carried on. The truck drops its charge automatically on either side of the track at the desired point, and at the same time this discharging movement reverses the motor and carries the truck back to its original position under the furnace.

The electric clock is of the standard design employed for controlling the movements of automatic machinery, and either the minute or the hour hand may be used to close the circuits by making contact with a set of plugs placed in the face of the clock. Where the character of the castings is such that an annealing period of less than an hour is required the minute hand is used, but if a longer period is necessary the series of plugs are designed to make contact with the hour hand. This clock is the master key of the entire system of mechanism connected with the operation of the furnace.

If the annealing period is 30 min. for each charge, the sequence of operations would be as follows: The two oil burners which heat the furnace would be started and the proper annealing heat secured. If the furnace was ready for the first charge at 9 a.m., the first plug in the series would be set to make contact with the minute hand at that time. This closes the circuit controlling the automatic scale, which weighs the amount of castings for which it has been adjusted from the hopper and drops the charge into the furnace. At 9.15 the minute hand makes contact with the second plug, which operates the tilting motor, and the furnace is moved forward and backward through an angle of 45 degrees on either side of the vertical, and the castings are turned to make the annealing process uniform. Fifteen minutes later, or at 9.30, when the annealing of the charge has been completed, the minute hand makes contact with the next plug, which closes the circuit controlling the motor for discharging the furnace. This tilts the furnace to an angle of 90 degrees, which releases two cams on the front door of the furnace, permitting it to open and drop the charge on the truck, as shown in Fig. 2. The action of the furnace in returning to its original position after discharging the castings closes the truck motor circuit and sends it on its journey with the annealed castings. A short interval is required by the furnace to recover the heat lost by opening the door and discharging its burden, and a very satisfactory way of regulating this is to hold the furnace empty until the truck has returned. When it resumes its position under the furnace the circuit operating the automatic scale is closed and the furnace recharged. This series of operations is repeated continuously day and night until the firebrick lining requires renewal.

The counter register shown in Fig. 2 in front of the hopper is attached to the automatic scale, so that every charge weighed into the furnace is recorded and the amount of material that is passed through the furnace is shown at any time. This serves as a check on the foundry and finishing departments and also gives an exact record of the amount of material handled. Although an occasional inspection, every 8 or 10 hours, is sufficient to keep the temperature of the furnace uniform, an electric thermometer is wired to show the temperature of the interior of each furnace in a plant at all times. To facilitate the supervision of a plant where several furnaces are in operation these and other recording devices are placed in the superintendent's office.

The Chester Steel Casting Company's Improvements.—The Chester Steel Casting Company, Chester, Pa., is making extensive improvements to its annealing department in connection with its manufacture of cementation steel. Considerable betterments have been made in this department from time to time, both in the way of simplifying the method of manufacture and systematizing the course of production. With the improvements now about completed, this company will be enabled to make deliveries on cementation steel of high quality in about one-half the time previously required. In connection with the manufacture of general steel castings, the company has evolved a system of microscopical tests, of which photographic reproductions showing various grades of steel castings are being distributed to its customers. By a special system of shop management, the progress of work under way is followed from day to day, and thus more accuracy in delivery dates is possible.

The Association of Iron and Steel Electrical Engineers will hold its annual convention in Hotel Schenley, Pittsburgh, October 17 to 20. A day and a half of the convention will be devoted to the discussion of safety devices and methods of prevention of accidents. A lecture will be given on the subject of "Safety" by Dr. W. H. Tolman, director American Museum of Safety, at the Carnegie Institute, Pittsburgh, on the evening of October 18. The Standardization Committee, of which L. R. Palmer, Jones & Laughlin Steel Company, is chairman, has in hand a standard crane specification. The officers of the association are as follows: F. P. Townsend, National Tube Company, president; L. R. Palmer, Jones & Laughlin Steel Company, first vice-president; P. D. Brown, Carnegie Steel Company, second vice-president; E. W. Yearnsley, Midvale Steel Company, treasurer; James Farrington, La Belle Iron Works, secretary.

The Empire Iron & Steel Company, Niles, Ohio, now has the exclusive sale of the Griffiths galvanized charcoal iron sheets, made by the Griffiths Charcoal Iron Mills, Washington, Pa. It will carry a complete stock of merchant sizes and will be able to furnish promptly to the trade genuine iron tin plate, such as has been used very largely by the Government on post-office buildings throughout the country.

American Boiler Manufacturers' Association

Twenty-second Annual Convention, Chicago, October 10 to 13

The twenty-second annual convention of the American Boiler Manufacturers' Association was held at the Auditorium Hotel, Chicago, October 10, 11, 12 and 13. The attendance was large for this organization, comprising boiler manufacturers from all parts of the country, as well as from Canada, and representatives of manufacturers of boiler makers' supplies, many of whom were accompanied by ladies. Among visitors and guests of honor were Gen. George Uhler, supervising inspector general, Steamboat Inspection Service, Washington, D. C.; Joseph McNeill, chief inspector and chairman Board of Boiler Rules, Boston, Mass.; Arthur E. Brown, representative of the International Association of Master Boiler Makers, Louisville, Ky., and Capt. Harold P. Norton, United States Navy.

MONDAY'S SESSIONS

President E. D. Meier called the convention to order. The address of welcome to the city of Chicago, in the absence of Mayor Busse, was made by Assistant Corporation Counsel George M. Bagby, who talked entertainingly and departed widely from the stereotyped speech on such occasions, incidentally suggesting that the boiler manufacturers' turn their attention to the task of abating the smoke nuisance which afflicts Chicago, St. Louis, Cincinnati, Pittsburgh and other cities. He was replied to by President Meier, who conceded to Chicago everything of pre-eminence she claims, and in regard to the smoke abatement said that it is unfortunate that the cities named use a fuel which not only contains much smoke to the pound of coal, but requires by reason of its lesser content of British thermal unit more pounds to be burned under the boilers to produce the same efficiency than the coal used in the Eastern sections of the country. The convention went into executive session for the remainder of the morning.

In the afternoon the open meeting was resumed. The following were admitted to membership: G. A. Schust, Fort Wayne, Ind.; Wholey Boiler Works, Providence, R. I.; F. G. Fernstrum, Menominee Boiler Works, Menominee, Mich.; John Nooter Boiler Works Company, St. Louis, Mo.; Missouri Boiler Works Company, Kansas City, Kan.

Andrew Jack of Manistee, Mich., was introduced to the convention as the oldest living boiler maker in the country. He displayed an old invoice showing purchases by him of boiler plate at 9 cents a pound of Joseph T. Ryerson, Chicago, in November, 1868.

For the information of the convention Mr. McNeill stated that the Massachusetts Board of Boiler Rules is constituted as follows:

> The chief inspector of the boiler inspection department of the district police, who shall be its chairman; one member representing the boiler using interests; one member representing the boiler manufacturing interests; one member representing the boiler insurance interests; and one member who is an operating engineer.

The usual committees were appointed, after which a communication was read from E. Leonard & Sons, London, Canada, urging the association to take steps toward the standardization of boilers. In the discussion which followed it was generally conceded that standardization is becoming a necessity, as it has been found to be in various other lines. Messrs. Ryan, Ashley and Riley were named as a committee to investigate and report on this subject.

Topical Questions Discussed

The chairman of the Committee on Topical Questions made a report submitting a number for discussion, to which the remainder of the session was devoted. Among those presented by the committee and discussed were the following:

> If boards or commissions of boiler rules are created, should the majority of its members consist of engineers or boilermakers?

This was fully discussed, and the association members decided that they considered boiler manufacturers better fitted to perform such duties than engineers, who had not had practical knowledge of making boilers, and that in any event the majority of the members of such boards or commissions should be practical boilermakers and engineers.

> Should the details of manufacture of boilers be regulated by such boards?

The consensus of opinion was that necessarily such must be the case. The details must be fixed and standardized.

> Does any other line of manufacture specify so minutely the methods of workmanship and quality, quantity and locality of materials?

This again is a growing necessity of modern industrial conditions and follows a necessary sequence from the establishment of certain standards which are considered in the previous question. Where it is not undertaken and carried out by government boards or commissions it is done by voluntary associations of manufacturers of the same class and type of goods.

> Does "public safety" depend upon destroying the right of a manufacturer to build a good boiler in his own reputable way, knowing that it is the equal, at least, of a boiler prescribed by a commission?

This question was admitted, as were the prior ones, as illustrating a type of objections to the board or commission plan that have to be explained and met. It was satisfactorily answered by quoting from the Massachusetts law approved May 14, 1909, as follows:

> Section 26. . . . When a person desires to manufacture a special type of boiler the design of which is not covered by the rules formulated by the Board of Boiler Rules, he shall submit drawings and specifications of such boiler to said board, which, if it approves, shall permit the construction of the same.

> What changes, if any, should be made in the Massachusetts Boiler Rules?

After considering this question, the conclusion was that such inquiry can only be answered by any one who is interested in it bringing up specific questions. This association is not aware of any necessary changes, but is prepared to take up any special questions when they arise.

Mr. Ashley of the Muskegon Boiler Works said that last summer when at Edmonton, in Alberta, making boiler drawings for his company, he had occasion to discuss various provisions of the provincial boiler rules as compared with some rules on this side of the line, and the provincial inspectors took exception to the Massachusetts rules, in respect to giving a fixed distance from the flange of the head and from the top row of boiler tubes to the rear to be braced on the heads of horizontal tubular boilers. Their own rules give a formula for computing these distances, and they contended that it was not right to give fixed dimensions, as these respective distances would vary according to thickness of head used, the pressure for which the boiler is to be constructed, &c. It seemed to Mr. Ashley that this point was well taken, as the distances in question can be expressed by a simple formula and computed easily, as, for instance, staybolt bracing, and that the Massachusetts rules would conform more to theory and be nearer correct in practice by having these dimensions computed instead of giving fixed dimensions to cover all cases.

Is it difficult to make caulking tight where the bevel shear is used?

It was generally agreed that it is not more difficult to do so than with the use of planers, provided the material used is right, the shears are kept sharp as they should be, and the work is well laid out.

TUESDAY'S SESSIONS

The Committee on Place of Next Meeting, 1911, through M. A. Ryan, chairman, reported in favor of Boston, Mass., and the convention accordingly selected that city.

The report of the Nominating Committee was submitted by its chairman, James Lappan, recommending the re-election of the present officers. The report was adopted and officers re-elected accordingly, as follows:

President, E. D. Meier, New York, N. Y.; secretary, J. D. Farasey, Cleveland, Ohio; treasurer, Joseph F. Wangler, St. Louis, Mo.; first vice-president, T. M. Rees, Pittsburgh, Pa.; second vice-president, J. Don Smith, Charleston, S. C.; third vice-president, W. A. Brunner, Phillipsburg, N. J.; fourth vice-president, H. D. MacKinnon, Bay City, Mich.; fifth vice-president, M. A. Ryan, Duluth, Minn.

Arthur E. Brown, special representative from the International Association of Master Boilermakers, briefly reviewed the progress of the boilermaking industry, and the vastly increased efficiencies of the present as compared with past times, especially in locomotive boilers, and marine engines on the ocean liners, and reminded his hearers that the objects of the two associations, his own and the American Boilermakers' Association are kindred inasmuch as both seek for the betterment of materials and processes and workmanship, and expressed the hope for a closer affiliation of the two bodies.

Gen. George Uhler spoke of the important work of the Board of Supervising Inspectors, of the benefit derived from suggestions of boiler manufacturers and of the formulation of specifications for boiler plate, which had been persisted in by the board notwithstanding objections from plate makers. He feels assured that to-day the Department of Commerce and Labor is getting the best boiler plate that is made in the world in marine boilers, and he believed it is also the case with land boilers. With all precautions taken, some irregularities will creep in at times, as perfection cannot ever be expected in human affairs, but the board had taken all reasonable precautions to get the best material.

Regarding the relative merits of the spring pop safety valve and the lever type, General Uhler said that while the board had held varying opinions on this subject, yet the majority had decided that the old lever type safety valve is an efficient and satisfactory type of valve for smooth water practice. In reply to an inquiry by Captain Rees, he said that according to existing law the only value that can be allowed to-day for a triple riveted butt strap joint, of whatever gauge or thickness of material, is the value that is allowed by that section of the law that provides that the triple riveted shall be given 20 per cent. additional to the single riveted joint. No greater value is allowed for triple riveted or quadruple riveted than for double riveted with the holes punched. This has been brought to the attention of the proper authorities, but will require an enactment by Congress before any change can be effected in the law. Until changed the board has no discretion in the matter but must execute the law as it is.

General Uhler referred to the fact that Charles Lukens had brought to the attention of the department the imperfect results arising from certain methods of testing by coupons taken from the edge of the plate, illustrating it by a diagram, which the members of the board felt had given them valuable information, as it was most desirable to get accurate results as to the value of a plate.

Abrogation of Agreement with Plate Makers

President Meier called attention to the fact that after the consummation of the joint agreement of December 15, 1905, between the American Steel Plate Association and the American Boiler Manufacturers' Association there had been manifested on occasions persistent activity on the part of individual members of the Steel Plate Association although not by the Association itself, which tended to devitalize that agreement, by such members making different specifications and arguing for them, notably in the American Society of Testing Materials, resulting in that society raising the limit of sulphur and phosphorus in flange steel. It had, therefore, by resolution of the American Boiler Manufacturers' Association adopted at Detroit, 1909, been determined to abrogate the agreement of December 15, 1905, relating to the percentage of sulphur and phosphorus in steel plates intended for use in steam boilers and return to the original American Boiler Manufacturers' Association specifications of 1889, which fix 0.03 per cent. maximum for sulphur and 0.04 per cent. maximum for phosphorus.

Due to delay in receiving the official copy of the above resolution of the Detroit convention, the American Steel Plate Association had not yet been notified of the abrogation of the December 15, 1905, agreement as referred to, but such action would now be taken.

Boiler Explosions

The following questions relating to causes of boiler explosions were discussed:

Do you know of boilers having ruptured or exploded under 15 years of service, where the cause was due primarily to design, faulty material, or poor workmanship?

Are not the great majority of explosions (except where the cause is fully known) due to frequent expansion and contraction in order to clean and repair, extending over a period of more than 15 years?

Will not rules for inspection, proper methods of cooling, cleaning and reheating boilers, decrease explosions in a greater ration than rules for the manufacture?

Joseph H. McNeill stated that while in many cases the boiler explosions resulted from a combination of conditions, which included material, workmanship, operation, care and maintenance, yet there is no question that individual cases of boiler explosions could be instanced which had resulted directly from faulty construction. He cited as an illustration a case where the shell plate fractured at the longitudinal joints, the boiler being of double butt strap, triple riveted construction. The fracture in this case extended between the rivet holes in the outer row, and careful investigation showed that the shell of the boiler at the joint did not conform to a true circle; also, the rivet holes had been punched almost full size, and in addition to the portion of the plate which fractured clear through incipient cracks were found at the rivet extending longitudinally with the boiler. He said that the prevention of steam boiler explosions is a general proposition, in which the owner of the steam boiler, as well as the manufacturer and the engineer in charge, must all contribute their quota of care in their various lines, which can only be done by united effort, as expressed and carried out by proper legal enactment.

Boiler Tubes Criticised

Charles S. Blake, secretary of the Hartford Steam Boiler Inspection & Insurance Company, stated that he thought the responsibility for explosions should be shared between boiler manufacturers, engineers and owners. He remarked incidentally that the manufacturers of tubes do not seem to be keeping up with the progress made by the manufacturers of other material entering into boiler construction. Higher pressures are being carried to-day than ever before, and the

tubes have not kept pace with the march of improvement. Twenty-five years ago the average pressures ran from 80 to 100 lb., and the tubes in use at that time were identical in thickness, except in specific instances, with those in use to-day for pressures of 150 to 175 lb., and the average quality has not improved, so that the standard commercial tube of to-day is no better than, if as good as, the tube of those days. Tubes should be stamped so that their source of origin could be located and the responsibility laid where it belongs when a casualty occurs through tube ruptures due to defect in manufacture. Tube failures are wofully common. Theoretically, a tube will stand a greater internal pressure than external, but as a matter of practice a tube which is subjected to internal pressure more commonly fails than in the tube subjected to external pressure. If the tube is defective in weld, with external pressure the tendency is to close the opening; with internal pressure the tendency is to open it. He thought the great trouble with tubes was not so much in the material as in the imperfect welding. He believed that more boilers explode under 15 years' use than over that period.

Colonel Meier told of a case in his experience where rupture of tubes had grown to be a chronic source of complaint at one plant, and he sent a man in quietly to see what he could learn as to the cause, and it was found that the engineer desiring to cool down quickly had been in the habit of throwing open the fire doors and suddenly cooling the tubes, hence the trouble. The tubes ruptured square off outside of the sheet. In another case the tubes had become choked with carbon deposits due to the use of an objectionable compound composed of a poor grade of oil and sorghum molasses; when the use of this was discontinued the trouble abated at once. The boiler manufacturers must ask the insurance men to protect them by helping to stop such bad practices.

John J. Main, Toronto, Canada, instances cases of explosions, of which he presented photographs, some of which were due to faulty material, where the steel by analysis showed too high sulphur, and some were due to both faulty material and workmanship, the boiler not being a true round and permitting constant moving away from and returning to the circular form because of a long sheet underneath and two sheets overhead. The larger number of cases he had been called upon by the Government to investigate and report upon were caused absolutely by faulty operation, mostly in the case of locomotive boilers, due to low water. The speaker thought that there are too many poor boilers made, and this demonstrates the necessity for a uniform specification to have the backing of law throughout the Dominion of Canada.

Capt. H. P. Norton, representing the Bureau of Steam Engineering, United States Navy, said that in the navy very few boiler explosions have been due to faulty material, because of rigid compliance with their own specifications; the greater proportion of accidents are due to carelessness or ignorance by attendants who have overlooked some of the regulations.

Jas. T. Foord, chief inspector, Hartford Steam Boiler Inspection Insurance Company, stated that he had come latterly more and more to the conviction that the hydrostatic test was no good when applied to the lighter grades of material, especially from ⅜ up to ¾ in., in which cases 150 per cent. of hydrostatic pressure pretty nearly meets the elastic limit of the material. The application of such a test means strain, and he was about ready to abandon it.

John J. Main, Toronto, remarked that he thought it was all right to take the test coupon of a plate from the edge, because the edge was where the strain would ordinarily be felt, where the pressure will take place. That is the weak place, because there the hole is drilled or punched.

Practice in Punching and Reaming

The afternoon was occupied partly by an executive session, at which certain reports of committees, &c., were read and discussed, after which the following question was presented for discussion:

There seems to be a very wide range in engineers' ideas of what amount of metal is necessary to be taken out after a hole is punched in a plate. To remove all doubt as to the possibility of a fracture from that operation an answer to the following is suggested: Is a hole enlarged ⅛ or 1-16 in. all around sufficient? Is a hole enlarged ¼ or ⅛ in. all around sufficient? Is a hole enlarged ⅜ or 3-16 in. all around sufficient?

Mr. Main remarked that he knew of tests made in England some 18 or 20 years ago as to the difference between punching and reaming a hole or drilling it, which established that a ¾ in. hole would require to be punched ½ in. in diameter in order to make it equal to a drilled hole, and a punched hole ¾ in. in diameter would not stand within 20 per cent. as much as a drilled hole; but in a reamed hole, taking out ⅛ in. all around would eliminate all the damaged part of the plate, and it would then stand just as good a physical test as the drilled hole would. Any practical man, however, will admit that it depends largely upon the condition of the punch and the die. These must be absolutely sharp and clean cutting.

President Meier appointed as Committee on Uniform Specifications for the ensuing year the following: M. A. Ryan, chairman; H. D. Mackinnon, M. A. Broderick, Geo. N. Riley, A. J. Schaaf, R. E. Ashley, Dennis Wholey, T. M. Rees. Mr. Ryan, in declining appointment, moved that Col. Meier be named as chairman of the committee, and the motion was carried unanimously.

Secretary Farasey read a letter written by Capt. T. M. Rees while abroad, referring to the matter of the relative merits of the lever and the spring pop safety valve, in marine practice, in regard to which it appeared that an interesting hearing had been had before the Board of Inspectors of Steam Vessels. Capt. Rees thought that this would be an interesting topic for discussion at next year's meeting in Boston.

ENTERTAINMENTS

An early start was made Wednesday morning in a special Pullman train for Gary, Ind., where the party was received and shown every courtesy by F. T. Bentley, traffic manager of the Illinois Steel Company, and P. W. O'Brien, and J. B. Arnold, of the sales department, while B. L. Cogshall, of the general superintendent's office acted as guide. The route taken was to the ore docks, blast furnaces, open hearth steel furnaces and rail and merchant mills. The immense establishment impressed all the party with its magnitude and importance, the most interesting feature being the great extent to which machinery had minimized human hands, and still there was work for so many human hands to do.

In the afternoon a visit was made to the plant of Joseph T. Ryerson & Son, which proved a very pleasant feature of the week's entertainment. Luncheon was served to about 160 members of the association at the Ryerson dining hall on Thursday, after which the entire party was shown through the plant. At the luncheon impromptu speeches were made by several members of the association. Souvenir "guides to Chicago" were given to the members and a box of candy to each of the ladies. The party was then taken by automobiles on a sight seeing trip to the park systems of the city.

Tuesday evening the members and ladies enjoyed a theatre party and special entertainment features were provided for the ladies.

A short session was held late Wednesday afternoon, at which the customary resolutions of thanks were adopted. The convention then adjourned *sine die*.

THE BANQUET

The banquet at the Auditorium Hotel on Thursday night was an elaborate affair, at which Capt. James Lappan of Pittsburgh officiated as toastmaster. The speakers were as follows: Assistant Corporation Counsel Howard Hayes, Chicago; M. A. Ryan, Duluth, Minn.; Capt. Harold P. Norton, U. S. N., Washington, D. C.; John J. Main, Toronto, Canada; Gen. George Uhler, Washington, D. C.; Arthur E. Brown, Louisville, Ky.; George N. Riley, Pittsburgh, Pa.; W. H. S. Bateman, Philadelphia, Pa.; Joseph H. McNeill, Boston, Mass.; James D. Farasey, Cleveland, Ohio; Miss A. B. Chute, the only lady boiler manufacturer, Youngstown, Ohio.

The Chicago Pneumatic Tool Company, as usual on these occasions, distributed handsome souvenirs, the one this time being a pin bearing the American flag on a shield, with old Fort Dearborn in the center, as a remembrance of the visit to Chicago.

The Supplymen's Association elected officers on Thursday, as follows: W. O. Duntley, president, Chicago; J. T. Corbett, vice-president, Chicago; W. H. S. Bateman, secretary, Philadelphia, Pa.; H. B. Hare, treasurer, Cleveland, Ohio. Executive Committee: D. J. Champion, Cleveland, Ohio, chairman; Thomas Aldcorn, New York; F. B. Slocum, Brooklyn, N. Y.; C. M. Chamberlain, Chicago; R. S. Groves, Philadelphia.

The Entertainment Committee was composed of the following:

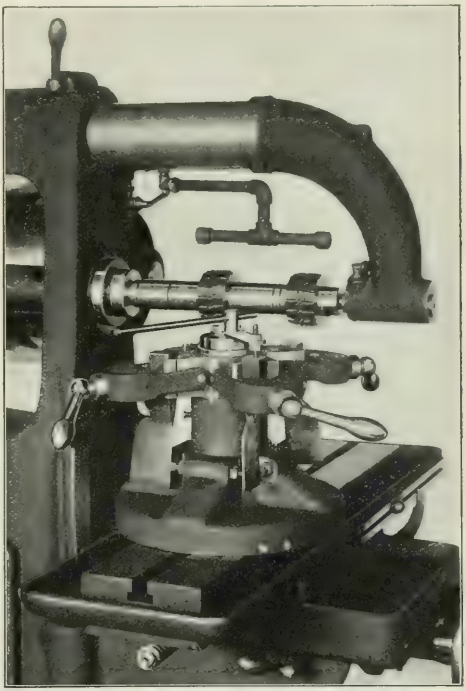
W. O. Duntley, Chicago Pneumatic Tool Company.
J. T. Corbett, Joseph T. Ryerson & Son.
W. B. Simpson, A. M. Castle & Co.
Geo. A. Rees, Chicago Pneumatic Tool Company.
Thomas Plunkett, Revere Rubber Company.
W. A. Dowler, Revere Rubber Company.
John D. Hurley, Independent Pneumatic Tool Company.
G. L. Birting, Worth Bros. Company.
T. L. Dodd, Worth Bros. Company.
E. T. Hendee, Joseph T. Ryerson & Son.
A. M. Mueller, Joseph T. Ryerson & Son.
W. H. Dangel, Scully Steel & Iron Company.
L. M. Henoch, Scully Steel & Iron Company.
P. J. Hamler, Hamler Boiler & Tank Company.
C. K. Kroeschell, Kroeschell Bros. Company.
L. P. Mercer, Parkesburg Iron Company.
L. R. Phillips, National Tube Company.
C. M. Chamberlain, A. M. Castle & Co.
Charles Heggie, Scully Steel & Iron Company.
Joseph Mohr, John Mohr & Sons.
Albert Mohr, John Mohr & Sons.
G. S. Wood, G. S. Wood & Co.
Henry Pratt, Henry Pratt Company.
Geo. Haffner, Charles Haffner Company.
Charles Peck, Sharkey & Peck.
George Hibben, Hibben Boiler & Tank Company.
M. E. Herbert, Herbert Heater Company.
Edward Mohr, John Mohr & Sons.
C. A. Carscadin, Kirby Equipment Company.

Heavy Steel Shells for Ore Crushing.—The Inter Ocean Steel Company, Railway Exchange Building, Chicago, is distributing illustrated circulars showing highly creditable work done, August 15, in its recently completed plant at Chicago Heights, Ill. The work consists of steel shells to be used in crushing ore. They were made from solid ingots and are weldless. The shells measure 54 in. outside diameter and 44 in. inside diameter, are 20 in. wide across the face, have a minimum thickness of 5 in., and the shipped weight of each is 4404 lb. They were forged under a 5000-ton press and rolled in tire rolling machines. The section is stated to be the heaviest ring section ever rolled. The plant is equipped to forge and roll rings of larger diameter and width than heretofore attempted.

The West Penn Steel Company, Brackenridge, Pa., is now prepared to furnish homogeneous open hearth steel sheets, fuil pickled, full cold rolled, stretcher leveled, and resquared up to 48 x 144 in., and in gauges Nos. 10 to 20; also lighter gauges of these sheets in smaller sizes.

A New Garvin Milling Machine Attachment

For general work in milling pieces which require a quartering index, the Garvin Machine Company, Spring and Varick streets, New York City, has designed a special attachment. In the accompanying engraving it is shown holding a lather's hatchet which has its head grooved at right angles thus producing a checkered face. When doing this work a piece is placed in the attachment under the hight gauge. The attachment is a four-division index fixture, having a large diameter indexing ring and a long locking bolt, which is operated by a handle on top of the attachment. After the hatchet is put in place and clamped by a binder, it is revolved through an arc of 90 degrees



A Milling Machine Attachment for Pieces Requiring a Quartering Index, Made by the Garvin Machine Company, New York City

and passed under the cutters. After passing the first cutter it is revolved another quarter revolution and goes under the other cutter, these two passes completing the squaring operation. When the attachment is loaded with four hatchets, each passage completes an operation.

The attachment is also adapted for squaring the shanks of taps, reamers, bolts, studs and work of a similar nature. When work of this kind is being done, interchangeable and easily removed half bushings are used for holding the work. In all cases it will be noticed that the cut is against the attachment and the clamp merely holds the work in place. A standard extending to the extreme top of the attachment serves as a pivot for it to swivel on, and the rotating casting fits over it in such a way that all trouble from chips is said to be entirely eliminated.

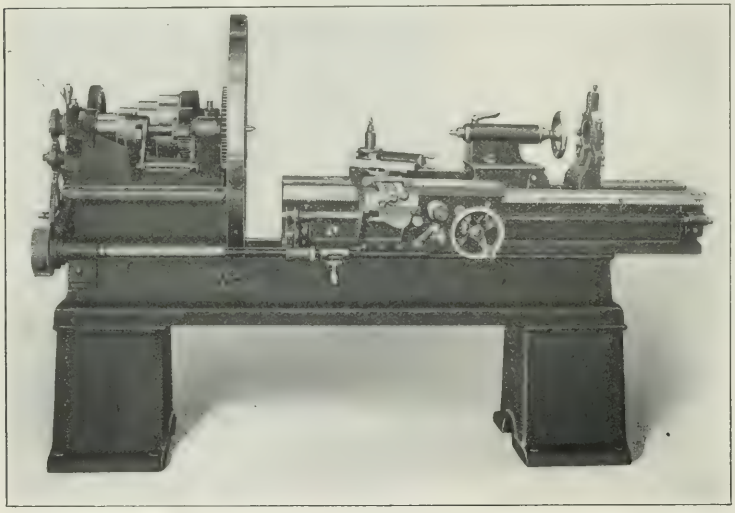
In the engraving, the attachment is shown fitted on the No. 21 back geared milling machine of its maker, which was illustrated in *The Iron Age*, May 16, 1907, but its design is such that it can be easily applied to any medium sized milling machine. The weight of the attachment is 125 lb.

The New Fay & Scott Gap Lathe

With a view to meeting the demands of automobile garages, as well as supplying a tool for general manufacturing purposes, Fay & Scott, Dexter, Maine, have brought out the extension gap lathe shown in the accompanying illustration. The tool is known as the 14-28-in. size and in a general way the construction follows the same lines as the 24-46-in. model illustrated in *The Iron Age,* March 28, 1907, and other sizes of its builders, although it possesses a number of new features which have not been incorporated in the earlier machines.

The upper bed has power movement instead of through the hand feed screw on the back, the power being controlled by a small handle, which is shown hanging about midway of the lathe. This handle is attached to a half nut, which is lifted into mesh with the thread on the feed rod. A double bearing for the triple gear shaft has been substituted for the single one formerly employed. The bracket, supporting the overhanging carriage used in connection with the full swing diameter in the gap, is in turn supported by a second bracket which has a bearing against the apron. This is supported against the upper bed by an adjustable gib.

The lathe is equipped with a double plate apron



A New Gap Lathe, Swinging 14-28 In., Built by Fay & Scott, Dexter, Maine

having a bevel gear drive with reverse feeds, which are positively locked out when cutting threads. The inside front bracket of the bed is flat, giving bearings for the waist of the carriage; the back gear lever has positive locking device; the headstock is furnished with double back gears and a three-step cone pulley or is equipped with motor drive. The dimensions of the machine follow:

Swing over shear, inches	14¼
Swing over carriage, inches	8¼
Swing through gap, inches	20
Distance between closed centers, 8-ft. bed, inches	63
Distance between extended centers, 8-ft. bed, inches	94
Width of driving belt, inches	2¼
Diameter smallest cone, inches	3⅛
Diameter largest cone, inches	8
Ratio of single back gears	10 to 1
Ratio of triple back gears	24 to 1
Diameter of hole through spindle, inches	1⅝
Front head spindle bearing, inches	2⅜ x 3¼
Rear head spindle bearing, inches	1¾ x 2¼
Diameter threaded nose head spindle, inches	2⅜
Head spindle nose, U. S. threads, per inch	8
Morse taper of centers, No.	2
Tail spindle diameter, inches	1⅞
Tail spindle travel, inches	4½
Range of threads cut	4 to 64
Diameter of countershaft pulleys, inches	10
Face of countershaft pulleys, inches	3
Speed of countershaft, revolutions per minute	210-235
Angular travel of compound rest, inches	2¾
Threads per inch on lead screw	8
Weight, 8-ft. bed, pounds	2,000
Weight per extra foot of bed, pounds	100

The equipment regularly furnished with the lathe includes a double friction countershaft, plain or compound and center rests, full swing and dog driving face plates, wrenches, and a complete set of change gears. The following accessories can be furnished at a slight extra cost: Taper attachment, follow rest, friction head, double back gears, turrets fitted to carriage or bed and an oil pan.

Abrasive Wheels in Foundries*

Their Proper Installation and Practical Uses

BY CHARLES G. SMITH.

The first thing necessary in the successful adoption of a grinding equipment of any size is the disposition on the part of the management of the institution making the installation to operate under conditions to produce practical results.

Controlling Safety to the Operator

The method of controlling the factor of safety to the operator should be determined; whether by safety collars, which are tapered if possible on the concave side ¾ in. to the foot, so that the wheels may be tapered convexly accordingly (in this case, where the nature of the work will permit, the maximum amount of wheel exposed beyond the edge or rim of these collars should be 2 in. and the collars changed as the wheels wear), or by use of substantial hoods in cases where it is necessary to use wheels with straight sides, owing to the nature of work to be ground, or by using both hoods and collars.

Where possible, the general results will be more satisfactory where the safety collars are used; and should a wheel break in service, these collars (which should be at least ¾ in. thick and made from steel castings for wheels 24 in. in diameter) will hold the pieces together. Unless it is necessary to have more than 2 in. of the wheel exposed beyond the rim of the collars, there are extremely few exceptions where a piece of wheel is liable to break away from outside of the collar, and the piece would be so small that it would cause no serious injury to the operator.

After determining a wheel of a certain size and face which is to be used, it is necessary to have machines solidly set on good foundations with a heavy spindle in long bearings that can be kept well lubricated, having all vibration eliminated, when carrying the load of the wheels with the additional weight of the heaviest safety collars that are to be used with them. For a 24 x 2 in. wheel with these safety collars the spindle should be at least 2¾ in. between the flanges

* From a paper read, October 3, before the Pittsburgh Foundrymen's Association. The author is president of the Pittsburgh Emery Wheel Company.

where the wheel is mounted and for 24 in. wheels heavier than this, the spindle should be at least 2½ in. diameter with bearings not less than 12 in. long. This applies to floor stands for foundry practice, especially where the work is of the heavier nature.

In all steel foundries, excepting crucible plants where nothing but very small castings are made, and many malleable iron foundries where there is sufficient work of a heavy nature, the most economical machines that can be installed are swing frame grinders, and great care should be had in the installation of these machines, as the writer has seen many of them installed that did not produce practical results because of the installation of a machine entirely too light and without sufficient power and not run under proper speed conditions. These machines should be driven with flat belts, having a spindle at least 2 in. in diameter where the wheel is mounted and carrying an 18, 20 or 24 in. wheel, and the wheel spindle driven by at least a 4 in. double belt. These machines have not proved economical in iron foundries.

Ample Power Should Be Provided

After investing in such an equipment as mentioned above, there should be ample power driving these machines to keep the wheel operating under the proper speed while it is at its highest pressure of service. On the floor stand operating two 24 in. wheels, where two strong men are working, there should be at least 10 hp. and on a swing frame grinder operating one 20 in. wheel of 2 or 2½ in. face, if driven by belt power, the countershaft should be driven by a 6 in. belt, as there are many cases in the foundries where the driving belt from the line shaft to the countershaft is comparatively short to enable the wheel arm to project under the crane, so as to make possible the placing of castings by the crane under the wheel.

In operating one of these machines with a motor connected to the countershaft, which must drive the belts and absorb the friction necessary, not less than a 7½ hp. motor should be used, preferably a 10 hp., but where the motor is mounted on a bracket at the elbow of this machine, the belt being connected directly from the motor pulley to the pulley on the wheel head, a 7½ hp. motor is ample and in some cases 5 hp. has proved entirely satisfactory, in which cases an alternating current motor has been used. This will enable the operator to remove fins, gates and pads very rapidly, and the stronger the man the faster his record.

The adoption of the safety collars has brought about this economical condition more than any other factor, in that it has enabled the adoption of speeds which bring results with safety. The practical safe limit for running abrasive wheels with straight sides is 5000 ft. per min. peripheral speed, and even then it is quite hazardous, and unless these wheels are carefully protected with hoods it is really criminal for any one who is operating either a large or fair sized grinding equipment to attempt the adoption of wheels with straight sides. With the safety collars as described above, properly used, it is more safe to operate at 6500 ft. per min. than to operate the straight wheels at 5000 ft., with the additional advantage that the same wheel on the same material will produce practically 170 per cent. in general results of what can be secured from the same wheel at 5000 ft.

Any one operating in accordance with all of the above stipulations will secure the highest degree of efficiency obtainable in foundry work, and the writer's experience has been that 6500 ft. has proved to be the most economical speed at which to run. As this speed is approached the conditions improve and so far as it is surpassed conditions appear to retard, and this speed is also very safe as the percentage of wheels that break which are made by the manufacturers of good wheels is very small.

Cup or Tub Wheels to Be Avoided

The use of cup wheels or, as sometimes called, tub wheels, should at all times be avoided, as this is the most dangerous practice in the abrasive line, and in their stead, where it is necessary to do face grinding, a good substantial chuck should be used, with a cylinder wheel which has no back. It is apparent that with a cup or tub wheel which, for instance, may be 12 in. in diameter, 6 in. high, with a 2 in. or more thickness of rim, and a back 1 or 1½ in. thick, the centrifugal strain of this heavy rim pulling on this much lighter binding point, which is but 1½ in. thick at the spindle, compels the running of these wheels very slowly to keep within any reasonable lines of safety whatever; whereas, were this wheel made without the back and the cylinder completely surrounded with an adjustable chuck, whereby the wheel can be fed forward as worn, a higher speed can be maintained with perfect safety. A cup wheel should not be run more than 3500 or 3800 ft. per min., depending on the thickness of the rim, whereas a ring wheel may be run approximately 5000 ft. per min.

Where Natural and Where Artificial Abrasives Seem Preferable

Open hearth converter, manganese and crucible steel castings, as well as other forms of steel products, such as forgings, etc., also malleable iron, after it has been annealed, are ground much faster and more economically with the natural abrasives, either in the emery or corundum or a combination of the two in various percentages, and it is necessary to be thoroughly acquainted with the local conditions, such as the percentages of carbon, manganese, etc., and the general conditions under which the wheels run, in order to secure the proper wheel in the necessary proportions and sizes of the abrasive grain, and their relative proportions to the ingredients of the bond, as there are many factors to be considered in determining this point, too many for consideration at this time.

Gray iron castings, also those made in hard white iron, before annealing, and from brass, may be ground to better advantage by the artificial abrasives, principally carborundum. There are cases in chilled work where both alundum and carborundum have given very satisfactory results, and in some cases in castings such as stove plate, the adamite, also adamite mixed with corundum, have proved very satisfactory, and in such cases as the grinding of manganese, safe and vault doors, and door frames, where the work is operated purely by machine feeding, the alundum appears to have given better service up to date.

There are many details in this practice that cannot be covered in a document short enough to be of interest to you in one evening. Some of these details are as follows: The difference in the international and external grinding of hard castings, either with very high carbon or with high manganese; grinding of car wheels, either chilled iron or steel; grinding of frogs and switches and other surface work, all of which must be done in power-fed machines. The reason why some of these are successful grinding propositions and others are not. Toolroom work and the differences between the requirements of hand and machine grinding.

Then there come such other topics as the grinding of edge tools, plows, automobile crankshafts, guide bars and other types of edge or face work, each of which has its specific details.

European advices state that American shipbuilding companies are not likely to bid for the construction of the two battleships proposed for the Chilean navy, as, despite representations by American and German interests, the Chileans, have not altered the original specifications, which favor British builders in calling for certain equipment of British manufacture. The bids will be opened October 30.

The New Haven Sand-Blast Tumbling Barrel

A New Self-Contained Device for Cleaning Small Castings and Forgings Rapidly

The sand-blast barrel shown in the engravings built by the New Haven Sand-Blast Company, New Haven, Conn., contains new principles for this type of machine. Its inventor, C. A. Dreisbach, has developed a self-contained barrel in which sand or steel shot is used over and over again without leaving the barrel, being returned automatically to the hopper. The nozzles, either four to six in number, are set in a line parallel to the axis of the barrel and consequently the work as it is tumbled cannot escape the blast. The barrel is 36 in. in diameter and 4 ft. long, inside dimensions. Air pressure may be applied according to the work required. Fig. 1 shows the front of the machine with the door and its hinge and trunnion locking mechanism. Fig. 2 is a rear view with the drive, the support of the head and the expansion chamber. Fig. 3 reveals the interior of the barrel with its hopper and nozzles. Fig. 4 is a photograph of a few styles of castings done by the barrel before and after cleaning.

The barrel is mounted on rolls driven through bevel gears from a clutch pulley shaft at the rate of 3 rev. per min. which reduces the breakage of castings to the smallest degree possible. The head at the rear, mounted on heavy cross bars, is stationary and carries the hopper, nozzles and exhausts. The door revolves with the barrel, being mounted on a trunnion carried by the hinge. The barrel consists of two cylindrical chambers one within the other and fastened together. The inner barrel which is interchangeable is made up of steel plates perforated at frequent intervals and may be replaced when worn. These perforations are clearly visible in Fig. 3.

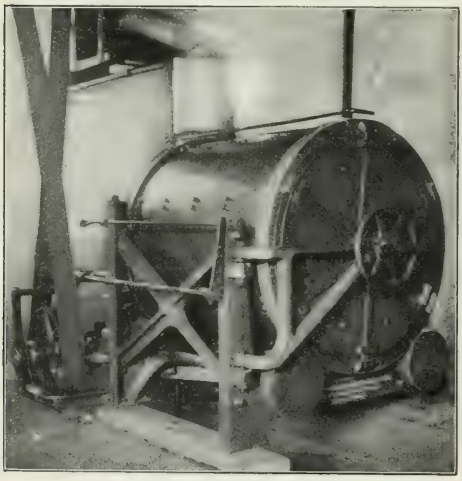


Fig. 1.—The New Sand Blast Tumbling Barrel, Built by the New Haven Sand Blast Company, New Haven, Conn.

The exterior barrel has eight longitudinal buckets extending its entire length. The sand or shot delivered by the blast, after doing its work, passes by gravity through the perforations at the bottom of the chamber and is caught in the buckets and carried to the top of the barrel, and is delivered also by gravitation through the same perforations to the hopper in the inner barrel, where it is screened and made ready for use again. The dust is carried away by an exhaust passing through an expansion chamber which acts as a separator; any usable particles are removed from the air and returned by gravity to the barrel. A lining ring closes the joints between the barrel and the stationary head. The door fits tightly, being held in position by a series of bolts locked or unlocked by a quarter turn of a small wheel on the door. In consequence the barrel is dust proof. The door being sustained by a hinge brings no weight upon the operator as he opens or closes it. All control of the machine is from the front through levers, one of which operates the driving clutch, another regulates the sand, and the third the air.

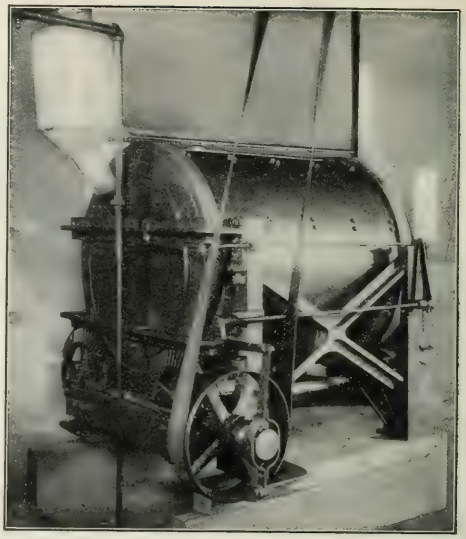


Fig. 2.—Rear View of the Barrel, Showing Drive, Support for Hood and Expansion Chamber.

The barrel is set up from the floor so that it may be unloaded into a wheelbarrow with a minimum of effort. The castings, forgings, or other work are placed in the barrel in the usual way and the steel shot or sand is thrown in at random reaching the hopper by the buckets. Where sand is used it is not necessary to place sand in the barrel with each lot of castings, one charge of sand cleaning six or seven charges of castings. As steel shot does not wear down as quickly as sand, one charge in the barrel lasts indefinitely. The nozzles constitute the only parts which need re-

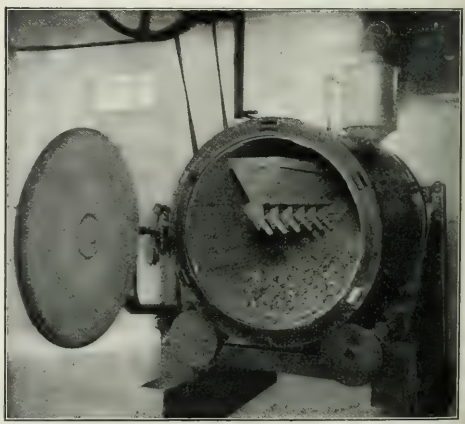


Fig. 3.—Interior of the Barrel, Showing Hopper, Nozzles and Perforations.

placing. They are inexpensive, being made from rough castings, either of malleable or chilled gray iron, and snap in and out of place easily.

Fig. 4 shows a number of pieces before and after cleaning in the barrel. A and B show two castings before cleaning and C D and E similar castings after they have been sand blasted. In one charge of the barrel 71 pieces such as these of gray iron weighing

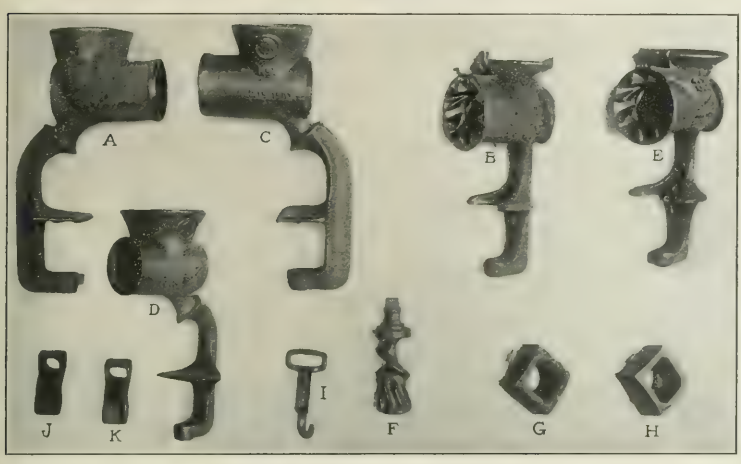


Fig. 4.—Specimen Pieces Cleaned in the Barrel.

altogether 153 lb. have been cleaned in 5 min. F shows another cleaned casting which is of gray iron and 423 lb. of these have been cleaned at one charge in 20 min. G and H show another form of casting before and after cleaning. This is malleable iron and 410 lb. were cleaned in one charge in 20 min. I shows a cleaned casting of which 300 lb. were blasted in 15 min., which also is malleable iron. J and K represent another piece before and after cleaning. This is malleable iron and 400 lb. were cleaned in 15 min. in one charge.

The Nuttall Company's Street Railway Exhibit

The R. D. Nuttall Company, Pittsburgh, Pa., had a very interesting exhibit last week at the convention of the American Street and Interurban Railway Association, Atlantic City, N. J. The exhibit extended through from the main building to a section of Machinery Hall, with a reception space in the Main Building and a display of apparatus in Machinery Hall.

A pneumatic pantograph trolley of its latest type, for service where conditions provide low clearance, was shown in operation. This is used on the New York Central lines. Ball bearing bases, types Nos. 11, 13 and 14, for interurban railway service, were also shown, as well as air compressor gears and pinions, street railway gears and pinions, and automobile transmission apparatus. Another interesting feature of the exhibit was furnished by the butt welded, reinforced trolley poles. These combine strength and resiliency, being built so as to withstand much abuse. When bent they can be straightened out cold, and put into good condition for service. Seamless trolley poles were also shown.

The following representatives of the company were in attendance during the convention: F. A. Estep, president; Milton Rupert, assistant to president; J. S. Monroe, Cincinnati; G. A. Martin, Pittsburgh; G. E. Watts, Atlanta; S. K. Colby, San Francisco, and G. W. Provost, T. S. Cluly, W. J. Armstrong, A. H. Englam, J. E. Titus, J. W. Porter, Max Berg, E. R. Mason, all of Pittsburgh.

The Philadelphia Foundry Foremen

The first monthly meeting since the summer recess of the Associated Foundry Foremen of Philadelphia and Vicinity was held at its headquarters in the Odd Fellows' Temple, Philadelphia, Pa., on the evening of October 11. President C. R. Brown was in the chair. After a brief address by that officer, routine business was transacted and reports of various committees were received, the most important being that of the Entertainment Committee in connection with the recent banquet so successfully given by the association. Applications for membership were favorably acted upon as follows: For active membership, John Butterworth, Penn Steel Castings & Machine Company, and Thomas F. Brown, Chester Steel Castings Company, both of Chester, Pa. For associate membership, William Elton, J. W. Paxson Company, and Edward Walsh, Richard Walsh & Sons, both of Philadelphia, and Charles M. Goldman, Philadelphia representative of the S. Obermayer Company, Cincinnati.

Nominations for officers for the ensuing year were made as follows: For president, Clarence R. Brown, E. E. Brown & Co., renominated; for vice-president, Joseph Whitehead, Abram Cox Stove Company; for treasurer, George M. Benkert, Fairmount Foundry Company, renominated; for secretary, D. M. Kittenger, Pencoyd Iron Works, renominated. The election will be held at the November meeting. Following the appointment of Thomas Smith, A. J. Wallace and Joseph Whitehead as Auditing Committee, a paper prepared by Abram C. Mott, president of the Abram Cox Stove Company, Philadelphia, on "The Ideal Foundry Foreman," was read by Joseph Whitehead. A general discussion ensued.

The American Shipbuilding Company's Annual Meeting.—Stockholders of the American Shipbuilding Company held their annual meeting at 15 Exchange Place, Jersey City, October 13. They re-elected the old Board of Directors and the directors re-elected President James C. Wallace and the old officers of the company. Gross earnings for the year ending June 30, 1910, were $1,980,654. Deducting for dividends of 7 per cent. on the preferred stock and 4 per cent. on the common, cost of maintenance and the rebuilding of docks, the net earnings were $834,322. In the previous year the gross earnings were $1,257,722, no dividend was paid on the common stock, and the net earnings were $325,078. The company's surplus June 30, 1910, was $7,003,974.

Referring to reports that the Youngstown Sheet & Tube Company, Youngstown, Ohio, would shortly start work on the building of an open hearth steel plant to contain six 50-ton furnaces, the official statement is made that it is not having plans prepared for any additions at this time. It is probable that in the course of a year the company may commence work on an open hearth plant, but as yet no definite action has been taken.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1 1/2 in. round and square	₩ lb 1.90¢
1 1/2 to 4 in. x 1/4 to 1 in.	
1 1/2 to 4 in. x 1/4 to 5/16 in.	₩ lb 2.10¢
Rods—3/8 and 11/16 round and square	₩ lb 2.10¢

Angles:	Cts ₩ lb
3 in. x 3 in. and larger	2.10¢
3 in. x 2 1/2 in. and 3 in.	2.35¢
1 1/2 to 2 1/2 in. x 3 in.	2.20¢
1 1/2 to 2 1/4 in. x 3-16 in. and thicker	2.10¢
1 to 2 1/4 in. x 3-16 in.	2.20¢
1 to 2 1/4 in. x 1/8 in.	2.30¢
7/8 x 1/8 in.	2.40¢
3/4 x 1/8 in.	2.50¢
5/8 x 1/8 in.	2.75¢
1/2 x 3-32 in.	3.35¢

Tees:	
1 in.	2.65¢
1 1/4 in.	2.45¢
1 1/2 to 2 in. x 1/4 in.	2.15¢
1 1/2 to 2 1/2 x 5-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.40¢
Bands—1 in. to 6 in. x 3/16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H B & S" Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ₩ lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C R Soft Steel	R. G. Cleaned
No. 16	₩ lb 2.35¢	2.85¢
Nos. 18 to 20	₩ lb 2.70¢	2.90¢
Nos. 22 and 24	₩ lb 2.75¢	3.00¢
No. 26	₩ lb 2.80¢	3.10¢
No. 28	₩ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14 1/2¢

Parent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ lb 2.95¢
Nos. 22 to 24	₩ lb 3.30¢
No. 26	₩ lb 3.50¢
No. 28	₩ lb 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—Galvanized.

Nos. 22 and 24	₩ lb 5.75¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2 1/2 in. corrugated.	Painted	Galv'd
No. 24	₩ 100 sq. ft. 3.85	4.80
No. 26	₩ 100 sq. ft. 3.50	4.40
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:

IC, 14 x 20	$6.35
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	₩ lb.
IX, 14 x 20	6.5

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb	$4.10
IX, 14 x 20	5.10

American Terne Plates—

IC, 20 x 28, with an 8 lb. coating	$8.70
IX, 20 x 28, with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 12 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19 3/4¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14 1/4¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14 1/4¢ ₩ lb

Brass Wire—

List August 1, 1908 14 1/4¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot

Planished Copper, 1¢ ₩ square foot more than Polished

METALS—

Tin—

Straits Pig ₩ lb 37 @37 1/2¢

Copper—

Lake Ingot	₩ lb 14 3/8@15 ¢
Electrolytic	₩ lb 14 1/2@14 3/4¢
Casting	₩ lb 14 1/4@14 1/2¢

Spelter—

Western ₩ lb 6 1/4@6 1/2¢

Zinc.

No. 9, base, casks ₩ lb 8 ¢ | Open ₩ lb 8 1/2¢

Lead.

American Pig	₩ lb 5 @5 1/2¢
Bar	₩ lb 6 3/4@6 1/2¢

Solder.

½ A, guaranteed ₩ lb 22 1/2@23 ¢

No. 1 ₩ lb 20 @21 ¢

Refined ₩ lb 18 1/2@18 1/2¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ₩ lb ..@10¢

Hallett's ..@10¢

Other Brands ..@9 1/2¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in Ingot for remelting ..24¢

Rods & Wire Base Price 31¢

Sheets Base Price 33¢

Old Metals.

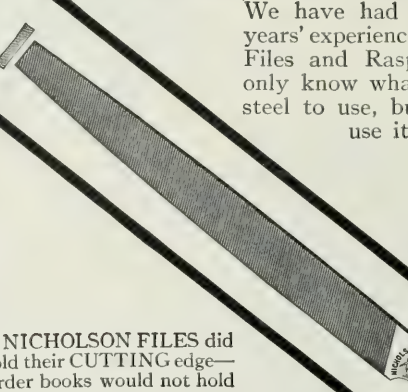
Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 10.75@11.00
Copper, Heavy and Wire	₩ lb 10.50@10.75
Copper, Light and Bottoms	₩ lb 9.50@9.75
Brass, Heavy	₩ lb 7.25@7.50
Brass, Light	₩ lb 5.75@6.00
Heavy Mechine Composition	₩ lb 9.50@9.75
Clean Brass Turnings	₩ lb 7.00@7.25
Composition Turnings	₩ lb 8.25@8.50
Lead, Heavy	₩ lb ..@8.50
Lead, Tea	₩ lb ..@3.25
Zinc Scrap	₩ lb ..@3.75

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THE IRON AGE

Established 1855

New York, October 27, 1910

VOL. 86: No. 17

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Betterment Expected

Actual Demand for Iron and Steel Little Changed

Pig Iron Buying at Lower Prices, with Activity Greatest in Eastern Districts

The feeling is general that iron trade conditions, while they may not change decidedly for the better in the near future, are not likely to grow worse. Consumption in all lines apart from the railroads has been maintained with steadiness in the past two months, and it is expected that whatever improvement comes this year will be almost exactly measured by the business the railroads place. Rail requirements for 1911 are being made up, and in the case of several important roads will be close to the total taken this year, with the proviso that the outcome of the rate hearings is such as to strengthen railroad credit.

The Steel Corporation's report showing earnings of $37,365,000 for the third quarter of the year, or only 7 per cent. less than for the second quarter, was better than might have been expected from the slowing down of output since the middle of the year. The comparison is favorable, also, with the third quarter of 1909, when with a larger output at somewhat lower prices the total was $38,247,000.

For the fourth quarter a considerable falling off is to be expected in earnings; as to unfilled orders the same can be said unless large rail contracts come in to offset the steady reduction in other products. The Steel Corporation is now operating 65 per cent. of its blast furnace capacity, 48 furnaces being idle, against 45 at the opening of the month.

Pig iron buying has increased in the past week, but again prices have suffered, and another has been added to the succession of bottoms. Activity has been greatest east of the Alleghenies, Buffalo furnaces taking a good share of the business in foundry grades. Pipe works and stove works in eastern Pennsylvania have bought round lots. Several important buyers are asking for iron for first quarter and first half of 1911, and Northern furnaces are selling for those deliveries at 1910 prices, while Southern furnaces are holding for 25c. to 50c. more.

Foundries have been coming into the market in series, and the demand is thus spread out in a way most to the advantage of the buyer. For months there has been no concurrence of inquiry from many directions—the sort of inquiry on which prices advance or at least stiffen.

The market for steel making pig iron staggers under heavy accumulations in Central Western furnace yards. A sale of 3000 tons and one of 5000 tons of basic iron are reported for the first quarter of 1911, at delivered prices netting less than $13, at Valley furnace.

The market for billets and sheet bars is very weak and leading makers are more aggressive. In one case open hearth sheet bars have been offered at $24.70, delivered at Pittsburgh.

In steel products the rate of new business is little changed. Wrought pipe mills find a good demand for so late in the year. In line pipe two contracts have been closed, one for 15 miles of 6-in. pipe and the other for 8 miles of 2-in. pipe.

Plate mills are figuring on 10,000 to 11,000 tons of plates and shapes for the new battleship to be built by the Government and 2500 tons of plates for torpedo boats.

The American Sheet & Tin Plate Company is operating 85 per cent. of its capacity and turning out the largest product in its history.

Rail orders include 3500 tons for the Erie and 5000 tons for the Pennsylvania for this year. Two Western roads are in the market for 1000 cars each.

While steel bars are held at 1.40c. in Pittsburgh territory, delivered prices have been made on some shipments farther west netting 50c. to $1 a ton less at mill.

In structural lines there is some slowing down. The building season is drawing to a close, and railroad bridge work is not expected to come out in large volume soon. The Long Island track elevation work, nearly 12,000 tons, as finally decided, has been awarded to the Fort Pitt Bridge Works. The Quebec Bridge Commission may take another month to consider the various designs submitted. On the commission's design the award seems to lie between the British and Canadian works, on the score of price.

While coke for spot shipment has sold at $1.50, a sale of 15,000 tons for November is reported at $1.55, and 15,000 to 20,000 tons was taken for the first half of 1911 at $1.75 for furnace coke.

Lake ore shipments are tapering off and 75 per cent. of the fleet will stop by November 15. The total for 1910 is now put at close to the 1909 figure, which was 42,600,000 tons, while early estimates were around 50,000,000 tons.

Co-operation in International Steel Trade

The officers of the American Iron and Steel Institute can take much satisfaction from the success of their first undertaking. They set out to hold a conference with European manufacturers of iron and steel and to have them as their guests during the meeting and for some days following, on a trip covering important steel producing districts of the United States. All the carefully laid plans have been carried out in a way more than meeting expectations. The foreign delegation was not as large as it would have been had not the time appointed conflicted with the annual meetings of important companies abroad, but it was representative. Its members were given an opportunity to meet the leaders of the American steel trade and for some days to share with them the experiences of travel and observation of steel works construction and practice in the United States. The enterprise of local committees made them well acquainted with the progress and standing of three important industrial cities, albeit some of the literature put in their hands showed the touch of the American boaster.

As indicated in what has already appeared in these columns this last party of European iron and steel manufacturers to visit this country was unique in being composed almost entirely of representatives of the commercial side of the industry. Heretofore the operating or engineering departments have been represented in similar excursions. The fact was not disguised that a definite object was aimed at in inviting the foreign guests. President Gary's address at the meeting of October 14 plainly said that the policy of co-operation which has been to some extent operative in the domestic steel industry could be and should be extended to the relations of American steel manufacturers with foreign manufacturers. "They will meet us half way," he said, and the foreign guests who spoke at the New York and Chicago dinners freely confirmed Judge Gary's confidence. Some of them said, speaking for their own companies, that they would willingly co-operate in Judge Gary's proposals whenever called upon. G. Scoby-Smith, a managing director of Bolckow, Vaughan & Co., Ltd., of Middlesbrough, England, said of the value of international conferences between commercial heads of the steel industry:

> They not only enable the producer to have the advantage of the experiences of the best appointed works, but they permit us to exchange such information as to supply and demand as to prevent overproduction or undesirable scarcity, and hence possibly inflated prices. So far as the gentlemen present from England are able to represent the English views, I believe we are in accord with the idea that arrangements of this character are to the advantage of all. . . . Possibly in the near future these gatherings may prove the need of an international iron and steel institute, at which the discussion of commercial and technical questions may be a feature. I am sure that a policy of friendly conference for the exchange of views and experience on such matters can do much to remove the sharpness of undue competition.

Speaking also at the Waldorf-Astoria dinner, Sir John S. Randles, of the Workington Iron & Steel Company, referred to the new era of friendly co-operation as having possibilities beyond anything that could be accomplished by $17 rails:

> We talk about the time of $17 rails, and you may do so if you like, but what does it mean? It means that when that policy of $17 rails was inaugurated it represented more misery than was caused by the bloodiest battle. It meant an industrial army laid aside and the workers deprived of their sustenance. It meant loss of industry that ought to have been maintained. It meant disaster worse than war. It was war in commerce and a régime which could not prevail.

Then he added: "I believe our gatherings together in this manner will stop the destruction caused by the juggernaut of cheapness, which strikes at the happiness of thousands of our fellows." From the representatives of the German steel industry also came expressions favorable to co-operation. E. Schaltenbrand, chairman of the managing committee of the Stahlwerks Verband, spoke of the benefits already realized from a frank exchange of views and explanations of business policy by those engaged in the international steel trade. Baron von Bodenhausen, of the Krupp works, while asserting the continuing vitality and potency of competition, believed that for competitors in the international steel trade to come together and to know and esteem each other would keep their competition sound, on a high level and within reasonable limits.

These expressions and the friendly reception given to Judge Gary's views by the British manufacturers whom he met at Sheffield, England, last year and at London previously, indicate plainly that the policy of co-operation is making headway. Moreover, what counts more than the friendly utterances of social occasions, various departments of the international steel trade are now conducted on a basis practically exemplifying the co-operative principle. There can be no

doubt, too, that the New York meeting will result in its further extension.

It might be suggested, since the United States Steel Corporation does almost all the export steel business from this country that it, rather than the so-called independent steel companies, is interested in co-operating with foreign producers. However, even steel companies engaged wholly in the domestic trade must have the liveliest interest in any policy which permits the marketing at a profit of an increasing proportion of the total production of American steel in world markets.

As to the practical form the friendly sentiments expressed at the New York meeting will take in the struggle for orders in outer markets, time will give more light. There will be objection to leaving to manufacturers in any industry to decide what is a "fair and reasonable" price for their product. On the other hand are the unreasonable levels reached in boom periods under the operation of so-called "natural" laws, and the profitless prices which result from cut-throat competition induced by producing far in excess of the market's ability to absorb. Somewhere between the two lies tenable ground.

There is one factor in the international steel trade which cannot be ignored in any practical consideration of co-operation by manufacturers. By a striking coincidence it was referred to in two papers read at the October 14 meeting in New York. Mr. Kirchhoff, reviewing the Düsseldorf Congress, said that basic conditions in the steel industry of the United States and that of Europe are steadily approximating. Labor is growing dearer in Europe, so that the industry there must have, and is adopting, American labor saving methods and equipment and reaching the American standard of output. On the other hand the United States is looking after economies in the European way —in the use of steam, blast furnace gases and the products of coke making. Mr. Farrell laid stress on the fact that well equipped works in the industry, wherever located, show little differences in advantages, when all is summed up. It is not, therefore, a case of nursing crippled concerns or of bolstering the weak, but rather of preventing the strongest from using their strength to destroy each other. It is also the abolition of the old-time strategy of preventing a rival from taking business even at severe loss to one's self. Thus viewed the new movement is far from having the odious aspect of monopoly.

But when all is said, the real test of this undertaking of the American Iron and Steel Institute is in its fruits. If at the same time that it benefits its members and their foreign competitors, it benefits the consumers of steel and the army of men employed in the manufacture of steel, it will prove itself one of the great conserving forces of modern industry.

The High Price of Pig Tin

The excitement in the pig tin market during the last two weeks has kept consumers in need of a supply in a highly nervous state, and the uncertainty as to future prices is the cause of further anxiety. This state of affairs is lamentable because of the fact that the existing situation is largely, if not wholly, due to the operations of people who are not directly interested in either the production or the consumption of pig tin. In other words, the market here is in the hands of speculators who have been more farsighted than the consumers, and the latter are contributing to the bank account of people whose only interest in the market is to influence price fluctuations.

While it is generally admitted that pig tin is in relatively better demand than other metals, there seems no doubt that with spot tin prices hovering dangerously near 38 cents a pound, the market is inflated and the metal has a fictitious value. Of course the London syndicate of speculators has helped to send the market upward here, but it will be remembered that late in August, when stocks were tightly cornered in London, this market did not respond to the violent fluctuations there, and pig tin for October delivery could be had as low as 34.50 cents. Shortly afterward the corner in the American supply of tin developed, with the result that the price of October tin early this week was put up to 37.62 cents. It may be well to state that the leading American consumer has not participated in this corner, but, on the contrary, endeavored to break the market in London by shipping tin there and has tried to relieve the tension here by selling to other American consumers.

It is not necessary to enter into a discussion as to the statistical condition of the metal to find the basis of these high prices. It is true that the limited supplies here have assisted the speculators in putting up the market, but nevertheless the present prices are artificial and brought about by speculative interests. The only remedy for this is for consumers to study the market more closely, in order that their purchases may be made at more normal prices. A close watch should be kept on the speculative buyers and sellers of tin by those who actually use the metal, and a more intelligent study of the conditions relating to production and consumption would go far toward keeping the market in better balance.

A Prosperous Year for Farmers

One of the encouraging features of the business situation is that the farmers of the United States have enjoyed an unusually prosperous year. The wheat crop has made about an average yield and commands a good price. The oats crop, an important item in cereal production, is understood to have surpassed all former records. There were unfavorable reports during the early summer regarding corn, but August and September proved ideal months for maturing this cereal, and it is estimated by good authorities that the yield and quality are the best the country has ever produced. In the South the cotton crop is somewhat short in yield, but brings a high price which assures large returns to the planters. On the whole, the year has undoubtedly proved the most profitable in the history of American agriculture.

Rumors of speculative tendencies among the farmers contributed materially to the disquieting literature that was in circulation early in the year. It was charged that they were mortgaging their farms to buy automobiles in their efforts to emulate the style of city folks. Later investigation disposed of this rumor, as it was found that the farmer seldom purchased an automobile except for cash. While many people in the cities and smaller towns have strained their moderate incomes in order to maintain their social or business

position in the community, the farmer gets a valuable service from an automobile which makes it an asset rather than a liability to him, and there have been few cases where his investment is a matter of concern to the public.

A more serious question is whether the tendency to speculate in Western lands has gone to the length that would make it a factor in the financial situation. When the Comptroller of the Currency inaugurated more rigid rules for the inspection of national banks, many cases were discovered where Western banks had exceeded the bounds of prudence in their loans to men who were engaged in such speculations. Prompt corrective measures were applied but it is not known how far this same evil may have extended in the management of State banks. Those who are familiar with the actual business of selling lands of this character insist that it is not a matter of public moment. While the farmers, especially in the prairie States, have invested a very large amount of money in unimproved Western or Canadian lands, only a small part of the total is borrowed money. Practically all of it has come from surplus funds which the farmers have accumulated from the profits of their crops. There may be cases where the bankers would prefer to keep these funds in their own control, and much of the discussion on this subject may have had its origin in such instances.

It is a fact of great importance in the economic progress of the country that the farmers, especially in the Mississippi Valley, are accumulating a large surplus of idle money. They do not have savings banks in which to keep it, and in the older States east of the Missouri River commercial banks do not pay interest on deposits, except when they issue interest bearing certificates for a definite length of time. A surprisingly large number of farmers in the prosperous prairie States are carrying their surplus funds in these certificates. The amount of money that has gone into "foreign" land investments is probably a small factor in the aggregate cash reserve of the farmers. The temptation to put surplus funds into investments of this character is a very strong one. The best lands in Illinois and Iowa now command $200 per acre and few of the holders are willing to sell. The farmer with surplus funds seldom understands the stock or bond market and prefers to take a chance on land because for years he has seen land steadily increase in value. Speculation in grain on the Board of Trade is no longer popular, and the swindling promoter of oil or mining stocks finds that his returns are better among school teachers, doctors and professional people in the cities than among farmers.

The high and steadily advancing prices which the farmers have obtained for their products in the past 10 years may have far reaching results in the financial world. The financial houses which market the bonds of railroads and municipalities have found it more and more difficult in recent years to place these bonds in New England and other investment territory which they formerly relied upon. The annual savings fund of the country appears inadequate to meet the demands upon it, and rates of interest have been advancing. New England is no longer making enormous profits in the construction of Western railroads, and no other unusual source of income has taken the place of railroad promotion. As the country becomes older and competition increases, the returns grow less from investments in manufacturing and other ordinary enterprises. It is possible that the annual savings fund of New England is actually decreasing, or at least is not growing as rapidly as the demands upon it.

The farmers, however, especially in the prairie States, find themselves in the possession of a steadily increasing savings fund in the annual profits of their crops. A larger and larger share of the annual increment of wealth is passing into the control of an exceedingly conservative class of people, who know of no safe place to invest it except in land, which pays them a return of less than 4 per cent. It is possible that the railroads and the financial houses which market municipal bonds have overlooked this great change in the flow of money, which is carrying the surplus of the country to the Corn Belt rather than to New England. If the attention of the farmers could be attracted to high-class bonds it might make a great difference in their attitude toward corporate interests.

Correspondence

The Early Manufacture of Beams in Pittsburgh

To the Editor: In *The Iron Age* of September 29, 1910, there appeared an article entitled "The Manufacture of Rolled H-Beams," by G. E. Moore, being a reprint of a paper read at the meeting of the Iron and Steel Institute at Buxton, England, September, 1910. As there are several additions that should have appeared in the paragraph with the subtitle, "Pittsburgh Designs of 20 Years Ago," we desire to make proper mention of them now, as Pittsburgh had the distinction of rolling beams as early as 1883.

Joseph S. Seaman, now president of the Seaman, Sleeth Company, Forty-first street and Allegheny Valley Railway, Pittsburgh, early in 1883 erected in the plant located at the above point and operated under the name of James B. Young & Co., a 10-in. train, which on February 28, 1883, rolled the first 3-in. I-beam, a section of which Mr. Seaman has to-day. A special section designed to take the place of the H-beam was also rolled there. Andrew Carnegie and Henry Phipps, both at that time actively identified with the steel industry, witnessed these operations. On May 26, 1885, Mr. Seaman received patent No. 318,513 on his invention, and on April 2, 1889, patent No. 400,495. Between 1885 and 1889 there was installed in the plant of the Pennsylvania Steel Company, Steelton, Pa., a 22-in. train which rolled beams under Mr. Seaman's method. The rolling of beams as early as 1883, and there being a patent issued as early as 1885, therefore entitle Mr. Seaman to his claim for being the original inventor of rolls specially designed to manufacture structural shapes on a universal mill, as his patent precedes the German patent by several years.

PITTSBURGH.

The General Welding Company, 355-357 Fourteenth street, Hoboken, N. J., has been organized by André Beltzer, to manufacture new and improved welding machines and blow pipes of all kinds, oxy-acetylene, oxy-illuminating gas, oxy-benzine, &c. The company owns the sole rights in the United States for Mr. Beltzer's new and successful process of brazing aluminum and aluminum castings and will manufacture fluxes and brazing sticks for all welding and brazing purposes. Mr. Beltzer is a pioneer in oxy-acetylene welding in this country and was one of the proprietors of the Beltzer-Delcampe Welding Company, from which he withdrew last spring.

The National Machine Tool Builders

The Opening Session Disposes of the Questions of Noncancellation of Orders and Dealers' Commissions

The annual meeting of the National Machine Tool Builders' Association was opened Tuesday morning at Hotel Astor, New York, with an attendance without precedent in size. This large attendance was due partly to the interest in the announced programme, and partly to the greater membership, a growth of 50 per cent. having been achieved during the year. President Fred A. Geier was in the chair, and Secretary Charles E. Hildreth occupied his official desk. Most of the morning was given over to association business, including reports of various committees. The association adopted a resolution calling for the use of the following statement in connection with all matter relating to sales of machinery by manufacturers and dealers:

"Kindly note that all our proposals, quotations and acceptances of orders are made with the mutual understanding that orders are not subject to cancellation, provided shipment is made at time specified."

The vote was on the recommendation of the committee having this question in hand, presented and prepared by C. Wood Walter, Cincinnati, Ohio, which set forth the deep research which had been given the subject since the meeting in Rochester. The recommendation followed a joint meeting of this committee with a similar representation from the National Supply and Machinery Dealers' Association, and embodied the sentiment as voiced by the action of the Joint Committee. The purpose is to make this the beginning of a campaign of education.

Mr. Walter, for the same committee, made a report that finally disposes of the matter of dealers' commissions, which has been under consideration for several years. The report set forth that the problem is one for individual settlement between the manufacturer and his dealers and not for action by the association. The report was accepted. The vote indorses the view held by the committee.

Addresses on the subject, "Who Should Pay the Expenses of a Representative from the Factory When Sent Out at the Request of the Dealer to Help Close a Deal?" were made, in executive session, by F. L. Eberhardt, Gould & Eberhardt, Newark, N. J., and C. H. Norton, Norton Grinding Company, Worcester, Mass. The afternoon was devoted to meetings of the various committees representing the several types of machinery

The Turin Exposition.—The United States Government is to participate officially in the International Exposition to be held at Turin, Italy, in 1911. It has arranged for the construction of a building, and has also reserved for the use of American exhibitors 10,000 sq. m. of space in the various general galleries of the exposition. The exposition, as planned, will be the greatest ever held in Italy, and its promoters are expecting extensive support from American manufacturers. It will open April 15 and close October 31. The last day for filing applications for space and admission at Turin is December 31, 1910. The members of the American commission to the exposition are: Francis B. Loomis, Department of State, commissioner general, and Albert H. Michelson, American Consul at Turin, deputy commissioner.

Portland cement cupels for assaying ores have been tested at the School of Mines at the University of Utah, Salt Lake City, and the report states that Portland cement represents a cheap and convenient substitute for the bone ash commonly used. When neat cement with from 6 to 10 per cent. of moisture is used a strong cupel is secured that does not check and will absorb its own weight of litharge. The silver loss due to absorption is about the same for cement as for 60 mesh bone ash the difference being insignificant compared with that due to a slight increase in temperature. Cupels made of a mixture of cement and bone ash are said to give a smaller silver loss than either one alone and the physical properties of the cupel are also superior. The process of cupellation is dependent upon the fact that the capillarity of the cupel is wet with respect to litharge and dry with respect to lead and the precious metals. Consequently the physical surface of the cupel has an important bearing on the absorption losses.

One Hundred Years' Production of Pig Iron in the United States

The production of pig iron in the United States in the past 100 years is shown in the appended table, taken from the *Bulletin* of the American Iron and Steel Association. Prior to 1854 the statistics given were compiled by various Government and other statistical agencies. For 1854 and all succeeding years the statistics have been gathered by the American Iron and Steel Association. The statistics for 1810, 1840, and 1850 are for census years. The figures for 1820 and 1830 are estimates made by early statisticians. Census statistics for these years are wanting.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1810....	53,908	1863....	846,075	1887....	6,417,148
1820....	20,000	1864....	1,014,282	1888....	6,489,738
1828....	130,000	1865....	831,770	1889....	7,603,642
1829....	142,000	1866....	1,205,663	1890....	9,202,703
1830....	165,000	1867....	1,305,023	1891....	8,279,870
1831....	191,000	1868....	1,431,250	1892....	9,157,000
1832....	200,000	1869....	1,711,287	1893....	7,124,502
1840....	286,903	1870....	1,665,179	1894....	6,657,388
1842....	215,000	1871....	1,706,793	1895....	9,446,308
1846....	765,000	1872....	2,548,713	1896....	8,623,127
1847....	800,000	1873....	2,560,963	1897....	9,652,680
1848....	800,000	1874....	2,401,262	1898....	11,773,934
1849....	650,000	1875....	2,023,733	1899....	13,620,703
1850....	563,755	1876....	1,868,961	1900....	13,789,242
1852....	500,000	1877....	2,066,594	1901....	15,878,354
1854....	657,337	1878....	2,301,215	1902....	17,821,307
1855....	700,159	1879....	2,741,853	1903....	18,009,252
1856....	788,515	1880....	3,835,191	1904....	16,497,033
1857....	712,640	1881....	4,144,254	1905....	22,992,380
1858....	629,548	1882....	4,623,323	1906....	25,307,191
1859....	750,560	1883....	4,595,510	1907....	25,781,361
1860....	821,223	1884....	4,097,868	1908....	15,936,018
1861....	653,165	1885....	4,044,526	1909....	25,795,471
1862....	703,270	1886....	5,683,329		

The White Star liner Olympic, the largest vessel in the world, was successfully launched from Harland & Wolff's shipyard at Belfast, Ireland, October 20. Her tonnage is 45,000. She has been building for 22 months, and it will be some eight months more before she is ready for her trial trip. Her principal dimensions are as follows: Length over all 882½ ft.; breadth over all 92½ ft.; height from bottom of keel to boat deck 97 ft. The number of steel decks is 11 and the number of water-tight bulkheads 15. Her sister ship, the Titanic, is well advanced and is to be launched soon. The vessels will be driven by a combination of reciprocating engines and low-pressure turbines. The speed is to be 22 knots an hour.

The T. H. Symington Company, Baltimore, Md., announces that its Chicago office will be moved November 1 from the Railway Exchange to Suite 623-625 People's Gas Building. In addition to the Symington journal boxes this company also handles the Farlow draft gear, center and side bearings for cars and an extensive line of miscellaneous malleable castings.

The Penn Bridge Company, Beaver Falls, Pa., has appointed Norton & Potter its Eastern agents, with offices in the Hudson Terminal Building, New York.

The American Iron and Steel Institute Tour

Features of the Inspection of Works in the Buffalo, Chicago and Pittsburgh Districts on a Memorable Excursion

The special train bearing members of the American Iron and Steel Institute and their foreign guests reached Jersey City at 9.40 p.m., Saturday, October 22, and the excursion feature of the most memorable of international meetings of iron and steel manufacturers was at an end. A distance of nearly 2500 miles had been covered, and in five days three important iron and steel districts had been visited while a sixth day had been devoted to the National Capital. Three evening functions had been enjoyed and a visit paid to one of the country's great natural spectacles.

Tours of engineering societies and of manufacturers' associations are not rare, and there have been international gatherings on both sides of the water. But it is probable that no such excursion was ever made whose members had the degree of comfort in railroad travel afforded those who journeyed on the institute train last week, or had the opportunity to see important industrial works under such favorable auspices.

Rare weather conditions prevailed throughout the week. Not a single arrangement needed to be changed After five days of clear skies and summer air, with heat at times rather oppressive, the only rain of the trip came Friday night and early Saturday morning; but after the arrival at Washington the clouds lifted and the last day of the six proved almost perfect. Concerning the management of the trip in every particular the foreign guests were unstinted in expressions of praise, and those of the American members of the party who made the tour without having any of the responsibilities borne by the general and local committees were equally appreciative. The exactness with which the schedule was lived up to with so large a number of appointments through the week and so many possibilities of the unexpected was a marvel of good management.

AT BUFFALO AND NIAGARA

The ground covered at Buffalo and Niagara Falls was referred to briefly in *The Iron Age* of October 20. The inspection of the Lackawanna Steel Company's works was under the conduct of President Clarke, Vice-President McCullough, General Superintendent George F. Downs and Arthur J. Singer, assistant to the president. The coke oven plant, rail mill and sheet bar mill, to which special attention was paid, have been described in these columns. The frame work of the new merchant mill was seen to be well on toward completion. This mill, which is being designed and installed by the Morgan Construction Company, Worcester, Mass., will roll ¼ to ¾ in. rounds, squares up to ¾ in., and 1½-in. flats ¼ to ½ in. There will be six roughing stands and a Belgian mill of four stands. To increase the finishing capacity two additional stands will be provided, duplicating the last two stands of the Belgian mill, the expectation being that an output of 300 tons a day will be reached. The continuous roughing mill and the Belgian mill will each have its own engine. Thirty-foot billets will be the raw material of the new mill and a continuous heating furnace of the Morgan type is being built.

An automobile trip through Buffalo's business and residence districts followed the steel works inspection, and after passing through Delaware Park the automobiles were left at Bridge street. A short walk brought in sight the new Government ship lock in Black Rock Harbor, Niagara River. The harbor, which might more properly be called a canal, is 3⅛ miles long by 100 to 400 ft. wide, lying along the Niagara River front of Buffalo, generally parallel to the Niagara River and separated from it by Bird Island pier and Squaw Island. The Erie Canal, which lies between Black Rock Harbor and the main shore, is being changed to a ship canal, and the lock which is now being built is one of the largest ship canal locks in the world. Its construction called for the largest cofferdam ever built, and this was made possible by the development of steel sheet piling. The cofferdam is 947 ft. long, 245 ft. wide, outside dimensions, at one end and 260 ft. at the other. The piling is of 40 to 50 ft. lengths. It was furnished by the Lackawanna Steel Company, the total amount being 6352 net tons. The wall of the cofferdam is made of two lines of sheet piling 30 ft. apart, with division walls at 30-ft. intervals, forming 30-ft. pockets. These pockets are filled with clay to form the solid wall of the cofferdam. The completion in 1912 of the work the Government is now doing, the appropriation for which was $5,000,000, will give in place of the present Erie Canal a channel averaging 200 ft. in width and not less than 23 ft. deep, navigable for lake vessels of the largest size, from the head of Niagara River to and including the north end of Tonawanda Harbor. The State's work on the $101,000,000 barge canal ends at North Tonawanda. The Government work means a very important addition to the water front of Buffalo and its suburbs on the north, and the building of docks on which large vessels can discharge their cargoes will make available manufacturing sites for which of late the demand has been greater than the supply.

Boarding their train near Black Rock Harbor, the members of the Institute and their guests proceeded to Niagara Falls, luncheon being served en route. Trolley cars conveyed them to the two power houses on the American side of the Niagara Falls Power Company, where 21 generators are in operation, each capable of delivering 5000 electrical horsepower. Each generator is driven by an independent water turbine receiving its supply of water through an independent steel penstock. Coming to the Canadian side, the visitors were taken first to the intake works above the Falls, and later to the generating station below the Falls, of the Ontario Power Company. The water is carried in two 18-ft. conduits of steel and concrete for a distance of a mile to the generating station. Seven generators are now in operation, and three others are under contract to the Canadian General Electric Company. It is stated that of the 800,000-hp. of Niagara power permitted to be taken under the present treaty between the United States and Canada, the different plants have now available, or will have when machinery now being installed is running, a total of 479,000 hp.

From the generating and distributing stations of the Ontario Power Company the tourists were taken in trolley cars for a trip around the Niagara River Gorge and Whirlpool Rapids, on the Canadian side, crossing the bridge at Lewiston and returning by the Gorge on the American side. It was the remark of many that never had the Falls been seen to better advantage, the effect being enhanced by a clear October sky, bright sun and the splendid coloring of autumn foliage.

At 5 o'clock the train was under way, and the journey to Gary had begun over the Michigan Central Railroad by way of Detroit.

IN THE CHICAGO DISTRICT

In the approach to Gary, Ind., early Tuesday morning, the visitors had the opportunity to see the shifting character of the lake shore sands, which with their scrub oak and scrub pine made up the landscape of the Gary district when the founders of the stupendous steel enterprise there first went upon the ground. A mountain of coke has been accumulated in the Gary yard as a hedge against car shortage and other contingencies growing out of the long distance separating the plant from its sources of fuel supply. As at the Lackawanna plant at Buffalo, the tour of the Gary plant was made by the use of a train of gondola cars which the party left at intervals as some part of the works was reached which called for close inspection. The extensive by-product coke oven plant now going up at Gary was seen first. The erection of the ovens is carried on under cover of a roof supported by steel framework, this as protection against inclement weather. The plant will consist of 560 ovens, located immediately east of the blast furnaces and steel works, and the output of by-product coke is expected to reach 160,000 tons a month. It is of interest to note that the advisability of depending entirely upon by-product coke at this plant has been established by recent tests. One of the Gary furnaces was operated throughout the month of August on a mixture of which 96 per cent. was Mesaba ore. The fuel was by-product coke from the Joliet ovens, made from coal of which 80 per cent. was Pocahontas and 20 per cent. was sixth pool coal from the Pittsburgh district. The average output of pig iron was about 500 tons a day, while the coke consumption per ton of pig iron was held below 2100 lb.

At the ore docks the operation of the Hulett unloaders was seen. The buckets are rated at 10 tons capacity, but as a rule take 12 tons at a "grab." While spectacular records have not been strained for, the Gary unloaders have taken out 12,000 tons from a vessel in eight hours. The famous gas blowing engine house and gas engine electric power house at Gary were visited in turn. Their equipment has already been thoroughly described. One of the open hearth units of 14 furnaces was inspected by running the visitors' train from end to end of the building over the charging floor. The rolling operations which excited the admiration of the visitors, were those of the blooming mill, rail mill and billet mill. The equipment of these is without precedent in works of this character, both as to massiveness and uniqueness of construction, notably the four tandem blooming stands and the prodigious size and power of the combined hydraulic and pneumatic device controlling the lifting table at the 40-in. three-high blooming mill, in which the piece is given five passes. In the continuous billet mill a feature of interest was the twist in the guides, by which after the first, third and fifth passes the billet is given a quarter turn. There are six trains of 24-in. rolls in the billet mill, making it the largest pure continuous mill in existence.

South Chicago, Chicago and West Pullman Industries

Following the inspection of the Gary works automobiles were taken for a ride through the city. This disclosed progress in town building which was beyond the expectations even of the American members of the party. Some of the buildings are excellent examples of architecture, both brick and concrete structures being represented in the public and semi-public buildings. The institute train left Gary at 12.30 for the South Chicago Works of the Illinois Steel Company and luncheon was served en route. The inspection of the South Works occupied about two hours. The feature of greatest interest was the 15-ton Heroult electric furnace which was seen in operation, though the visit was not timed for a cast. The tour of the South Works ended near the structural mill at the north end of the plant where a special train on the Illinois Central was taken for the Twelfth street station of that road in Chicago. Tuesday night was spent at the Blackstone Hotel, which was headquarters during the stay in Chicago.

Wednesday's tour was made in automobiles, leaving the Hotel at 9.30 a.m. A half hour's ride brought the visitors to the McCormick plant of the International Harvester Company, at Blue Island and Western avenues. The twine mill in which about 900 operatives are employed and which produces about 22,000 carloads of binder twine a year, was visited first and then in succession the bolt shop, knife shop and binder room. In the last named the manufacture of the binding parts of grain binders is carried on, as well as the testing of knotters. The malleable foundry, which last year produced 29,572 tons of castings of an average weight of 7 ounces per piece, was also visited. An inspection of the Armour plant at the Union Stock Yards followed the visit to the McCormick Works, and later the South Shore Country Club was visited and luncheon was served. In the afternoon a special train was taken for the Pullman Company's car works at West Pullman, the tour of which occupied about an hour.

The Chicago Dinner

The dinner on Tuesday evening at the Blackstone Hotel, the latest and most notable addition to the list of Chicago's hotels, was one of lavish appointments, and the after dinner speaking showed perhaps more freedom than that of the Waldorf-Astoria banquet at New York. The acquaintance of several days had created a sense of *camaraderie* which put all at their ease. One of the attractions at the tables was a decorators' model of a blast furnace with double skip hoist, and the realism was enhanced by the tapping of the furnace, there being a miniature car alongside for receiving the molten metal and a locomotive at hand to draw it to the steel works. Among the banqueters were a number of Chicago manufacturers and representatives of railroad companies.

President E. J. Buffington of the Illinois Steel Company, the toastmaster of the evening, made apt introductory remarks and presented as the first speaker Governor Charles E. Deneen of Illinois. The latter was followed by E. J. Brundage, Chicago corporation counsel, who represented the Mayor in a word of greeting.

Chairman E. H. Gary of the United States Steel Corporation spoke of the progress made in the United States in the past decade in improving the methods and morals of men, and to the important economic and ethical questions which have arisen out of present day conditions. "It is not important," he said, "to consider the merits or methods of individuals who have been prominent in the crusade for the betterment of conditions. It is time for all to take a decided stand on the great questions which involve the life and health, safety and happiness of the whole people." In conclusion the speaker said:

> I still think that there is some danger of going beyond the bounds of necessity and propriety and reason in our efforts to correct abuses and to establish conditions which we deem proper. Many of us realize that it is time to thoroughly build up and steadfastly maintain a constructive policy in this country. We should remember that the large majority of the people believe in the right and intend to do the right; that they are not altogether selfish nor unmindful of the welfare of others; that they love their country and will endeavor to serve its best interests; that they are honest, earnest and patriotic.

Sir Charles Allen of the Ebbw Vale Steel Company, England, a nephew of Sir Henry Bessemer, made a happy response, saying for one thing that he had formed a very good opinion of America, for he could not help thinking that his brethren here go on the principle that if they do not enjoy themselves in this life they will suffer for it in the next. Referring to Sir Henry Bessemer, he said the latter had told him

in a conversation shortly before his death that had it been possible for him to have been placed in the center of London at 20 years of age, without a farthing, he felt convinced he could have done much more good for the world than he had done and would have made a much larger fortune. Of the early operations of the original Bessemer company, the speaker said that after a test of rails on the London & Northwestern Railroad an order for 200 tons was given by the road; this was considered so magnificent a stroke of fortune that the works were closed down for a week's holiday. Sir Charles Allen paid a warm tribute to President Farrell of the United States Steel Products Company in the following:

He has the regard of every steel maker in England and on the Continent, and I can assure you that he can justly claim to be the pioneer in introducing a system whereby the "survival of the fittest" will disappear and in the future "live and let live" will prevail. One cannot read his paper, presented at the New York meeting, without grasping the importance of every sentence it contains on the principle of co-operation. And so far as the members of the iron and steel trade in England and America are concerned, I am perfectly convinced that this principle will work smoothly for years to come.

E. Schaltenbrand, Duesseldorf, Germany, said among other things: "We in Germany are learning from our American friends to derive profits out of the forming of big units; we learn from them to reduce the cost of production by making large quantities, by working on a large scale. On the other hand, we pride ourselves that our American friends can learn from us economical ways and the reduction of the cost of production by applying scientific methods."

The other speakers were Judge C. C. Kohlsaat, Chicago; R. de Labriolle, Paris; George W. Perkins, New York; Baron von Bodenhausen, Essen, Germany; L. Spaak, Ougree, Belgium; and Sir John Randles, Workington, England. Just before the party broke up, the toastmaster introduced Theodore W. Robinson, vice-president of the Illinois Steel Co., who explained the allegory of the shield he had devised for the American Iron and Steel Institute.

AT PITTSBURGH

Leaving Chicago at 6.30 p.m. Wednesday, over the Pennsylvania Lines, the special train arrived at the Pennsylvania station in Pittsburgh about 9 o'clock Thursday morning. By street cars the party was taken through Liberty, Wood and Water streets to the boat landing on the Monongahela River, where the steamer I. C. Woodward was in waiting. The characteristic Pittsburgh fog hung over the city early in the morning, but soon lifted and the day proved to be as favorable as its predecessors. A special landing had been built for the guests at the South Side works of the Jones & Laughlin Steel Company, this being the first plant visited. The nine Talbot open hearth furnaces, five rated at 180 tons and four at 225 tons a day, were all in operation, and the visitors stopped long enough to see metal poured from three furnaces. The chain works, the Keystone structural works and other departments were visited in turn, the trip being made by train, the visitors being provided with seats on flat cars. The five Eliza blast furnaces and the Soho furnace were all in operation. At the Eliza plant attention was called to stack No. 4, which was blown in a few weeks ago after complete rebuilding. The tearing down of the furnace and its complete rebuilding were accomplished in the remarkably short period of 97 days. The No. 4 furnace and one other of the Eliza group are now equipped with the Kennedy closed top, the purpose of their reconstruction being to obviate the emissions of flue dust which for several years have been a cause of court action against the Jones & Laughlin Steel Company by residents in the neighborhood. The reconstructed shells are of 1-in. plates, as against ½-in. and ¾-in. plates used for the original furnaces, which were equipped with explosion doors and other top vents through which gases and ore dust issued when slips occurred. The remaining three furnaces of the Eliza group will be rebuilt and equipped in the same manner as the No. 4 stack.

The Jones & Laughlin inspection ended at Hazelwood, where the party again embarked on the steamer for a trip up the Monongahela. Various plants were pointed out on the way, including the Carrie furnaces and the Edgar Thomson, Homestead and Duquesne works of the Carnegie Steel Company, the Braddock and Rankin plants of the American Steel & Wire Company, the United States and Wood works of the American Sheet & Tin Plate Company, the National and Boston departments of the National Tube Company, and the plants of the McClintic-Marshall Construction Company, Monongahela Iron & Steel Company, Harbison-Walker Refractories Company and Mesta Machine Company. The steamer passed through one lock, No. 2, formerly known as the Port Perry lock. Early in the afternoon, after lunch had been served on board, the steamer turned about and at 2.30 the Homestead Steel Works were reached, this being the end of the river trip.

The armor plate department at Homestead was visited first, operations there being timed so that the forging of an 80-ton ingot could be seen. The ingot, 27 in. thick, was taken to the 12,000-ton Bethlehem press and given the first of the series of forgings required to bring it down to a thickness of 11 in. The finished plate will form part of the side armor of one of the new battleships for the Argentine Republic. It is of nickel chrome steel, containing 3½ per cent. nickel, 1 per cent. chrome, with carbon running from 0.26 to 0.35 per cent. Passing from the forging department, the party visited the tempering shop and witnessed the quenching of material 2 in. in thickness which will be used as protective deck plates.

A number of the visitors who had expressed a desire to see the Mesta Machine Company's works were taken in automobiles to West Homestead, where an hour was spent in an inspection of the steel and gray iron foundries and the extensive machine shop. The latter is to be considerably enlarged and the present steel foundry alongside of it will be abandoned and a large new steel foundry erected, in continuation of the present gray iron foundry building, which is 300 ft. long. The ultimate length of the foundry department will be 900 ft. The machine shop is now engaged on heavy rolling mill engine work, condensers and heavy gears. It is equipped with machinery of the heaviest type, notably a large gear cutting machine and a horizontal boring mill, the latter being driven by a 150-hp. motor. Some account was given the visitors of special features of the 600-hp. Mesta heavy duty gas engine the company has recently built, the designing of which represents more than two years of work by its engineering department. The engine is shown in operation direct connected to a 400-kw. generator, which supplies all the electric power required by the plant. Using natural gas at 12 cents per 1000 cu. ft., the new engine has thus far resulted in a saving of about $800 a month from the cost of operating the steam engine which it has displaced.

Social Features

The members of the party were taken from Homestead in automobiles to the Hotel Schenley, and that hotel was headquarters throughout the stay in Pittsburgh. An informal dinner was given Thursday evening at 7 o'clock and there was a brief speaking programme, with somewhat less formality than attended the addresses at the New York and Chicago dinners. Willis L. King, chairman of the Pittsburgh committee, presided, and was given an enthusiastic reception. He introduced the Pittsburgh city solicitor, Charles J. O'Brien, who greeted the guests as the representative of Mayor William A. Magee. Col. Samuel Hardin

Church, secretary of the Board of Trustees of the Carnegie Institute, gave an invitation to all the guests to visit the Institute on the following day, and Dr. A. A. Hammerslag, director of the Carnegie Technical School, gave an invitation to visit that institution. On behalf of the foreign visitors responses were made by William B. Peat and G. Mure Ritchie. President Gary was introduced as the last speaker of the evening and in impromptu remarks paid a tribute to Pittsburgh industry and Pittsburgh industrial leaders. It was not surprising that the Pittsburgh papers of the next morning gave prominence to what Judge Gary said of the pre-eminence of Pittsburgh in iron and steel, particularly these sentences: "I sometimes hear loose statements of the possibility of decrease in the growth of the iron and steel industry in Pittsburgh. I have heard other cities spoken of in respect to steel making to the detriment of Pittsburgh. In my opinion Pittsburgh is, and will continue to be, the great steel and iron center of the world."

The Pittsburgh dinner, like that at Chicago, was made more enjoyable by the addition to the party of a number of representatives of local iron and steel industries. In this way the foreign visitors were brought directly in contact with those best able to inform them concerning local development.

The Friday morning programme included visits to the Carnegie Technical School, art department, museum, library and music hall, the entire forenoon being devoted to these features. In the afternoon conveyances were taken for a trip to the Westinghouse Electric & Mfg. Company's works at East Pittsburgh. The final social function of the tour came on Friday evening, consisting of an informal dinner in the banquet hall of the Hotel Schenley, followed by a vaudeville entertainment. The mutual regard engendered by the companionship of the preceding days found free and eloquent expression at the conclusion of the entertainment. On behalf of the guests from other countries, G. Scoby-Smith paid a high tribute of appreciation to E. A. S. Clarke and J. A. Farrell of the General Committee of Arrangements, whose talent for organizing and executing plans for the comfort and entertainment of the party had been so signally in evidence from the beginning. E. Schaltenbrand followed Mr. Scoby-Smith, and gracefully complimented Mr. Clarke and Mr. Farrell, to whom he referred as the "managing angels" of the excursion, who had demonstrated supernatural powers in being everywhere at one and the same time. Messrs. Clarke and Farrell responded fittingly to calls for their appearance, and the former as chairman referred to the work done by John A. Topping, the third member of the General Committee, who was prevented from making the trip by the occurrence of the annual meeting of his company. Mr. Clarke also spoke of the efficient service of Howard H. Cook, assistant secretary of the Institute.

There was general and genuine regret at the impending severance of the relations which the New York meeting and the days of travel following it had cemented. Several members of the party left it at Pittsburgh, but there were about 65 who went on to Washington Friday night to participate in the one day's programme out of the six that had in it no steel works sights or sounds.

AT WASHINGTON

The new union depot at Washington, just northeast of the Capitol building, and itself one of the famous structures of the national capital, was reached shortly after 10 o'clock Saturday morning. It is 760 ft. long and 343 ft. wide, the passenger concourse, 760 ft. in length, being the largest room in the world under one roof. Proceeding to the White House in automobiles the visitors were received in the East room by President Taft. Judge Gary addressed the President briefly and after the latter's response the members of the party were presented to him individually. The President referred to the basic character of the iron and steel industry, and to its importance as indicating by its condition the presence or absence of prosperity in business generally. He hoped that such meetings of representatives of the industry from different countries would result in benefit, particularly in the reduction of the cost of production. Washington newspapers in their account of the call intimated that it had some significance in connection with the Government investigation of consolidations in the steel industry—about as stupidly misleading a statement as could have been framed.

A Visit to the Bureau of Standards

The sightseeing trip following the visit to the White House included the portions of the city commonly considered most attractive, and in addition the buildings far out to the northwest, reached by way of Connecticut avenue extension—those occupied by the Bureau of Standards. The three buildings are of substantial construction, and are splendidly equipped for the important work carried on by Director Stratton and his staff of 15 engineers. The visitors were taken in groups to the various laboratories. They were impressed with the extent and thoroughness of the work carried on and the amount of equipment employed at this early stage of the work of the bureau. The standards of length and mass shown in the main building probably received more general attention from the visitors than any other feature. The recent reproductions of the standard yard made in X section from an alloy of iridium and platinum where shown alongside of original standards brought to this country from abroad, and the methods of preserving and copying official standards were explained. The work done in thermometry and pyrometry and the apparatus used in determining standards for high temperatures, were of special interest as bearing on the heat treatment of iron and steel. The investigations of engineering and structural materials heretofore carried on at Watertown Arsenal were transferred to Washington early this year, and the apparatus and photographs and drawings of specimens of steel from ingots and rails were shown. In what is known as the West Laboratory a new line of investigation is the electrolytic decomposition of reinforced concrete. For the testing of engineering materials a large room is set aside for the Emery testing machine now under construction, which will have a capacity of 1,150,000 lb. tension and 2,300,000 lb. compression.

In the main building an interesting explanation was given of the methods of preparing standard samples of steel, iron and other materials, these being used as checks by chemists connected with the various manufacturing companies. The standard samples of iron ore, pig iron and steel thus far prepared were exhibited. Some of the visitors found the electrical laboratories of particular interest, as well as the equipment of the bolometric laboratory. Other departments visited represented length measurements by means of light waves, spectroscopic work and polariscopic and photometric investigations.

On the return to the union depot the party was taken through Rock Creek Park, thence through a portion of the residence section, and finally to the Washington Monument, Smithsonian Institution and other points of interest.

Leaving Washington at 4.10 p.m. the special train reached Jersey City at 9.40. The representatives of the foreign countries spent Sunday in New York and a number of them sailed on Tuesday, October 25. A party of 10, conducted by Frank Baackes, vice-president and general sales manager of the American Steel & Wire Company, made a trip on Monday to the Worcester, Mass., works of that company. Several of the guests will remain in this country a week or two.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct.26, 1910.	Oct.19, 1910.	Sept.28, 1910.	Oct.27, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$15.75*	$15.75	$16.00	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	*16.00*	16.00	16.25	19.00
Basic, delivered, eastern Pa.	15.00	15.00	15.00	19.00
Basic, Valley furnace	*13.00*	13.00	13.50	17.00
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	14.15	14.15	14.15	17.15
Lake Superior charcoal, Chicago	*18.00*	18.00	18.25	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*23.50*	23.50	24.00	27.00
Forging billets, Pittsburgh	29.00	29.00	29.00	30.00
Open hearth billets, Philadelphia	26.00	26.00	26.00	28.00
Wire rods, Pittsburgh	**28.50**	28.50	28.00	32.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	*13.75*	13.75	14.00	18.00
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	14.00	14.00	14.00	18.25
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	18.00
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.75*	13.75	14.00	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.40	1.40	1.40	1.60
Common iron bars, Chicago	*1.35*	1.35	1.37½	1.55
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	*1.30*	1.30	1.40	1.45
Skelp, sheared steel, Pittsburgh	*1.40*	1.40	1.50	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents	Cents.
Sheets, black, No. 28, Pittsburgh	**2.20**	2.20	2.15	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**12.87½**	12.87½	12.75	13.25
Electrolytic copper, New York	**12.80**	12.80	12.50	12.87½
Spelter, New York	5.60	5.60	5.60	6.30
Spelter, St. Louis	5.45	5.45	5.45	6.10
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	4.27½	4.27½	4.27½	4.25
Tin, New York	**36.15**	37.62½	35.12½	30.50
Antimony, Hallett, New York	7.75	7.75	7.87½	8.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 15 and 16, 1.95c.; Nos. 17 and 21, 2c.; Nos. 22 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.20c. to 3.25c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in	72	58	68	54
½ in	75	63	71	59
¾ to 1½ in	79	69	75	65
2 to 3 in	80	70	76	66
Lap Weld.				
2 in	76	66	72	62
2½ to 4 in	78	68	74	64
4½ to 6 in	77	67	73	63
7 to 12 in	75	59	71	55
13 to 15 in	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
¼, ¾, ⅜ in	69	59	65	55
½ in	74	68	70	64
¾ to 1½ in	78	72	74	68
2 to 3 in	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in	75	69	71	65
2½ to 4 in	77	71	73	67
4½ to 6 in	76	70	72	66
7 to 8 in	69	59	65	55
9 to 12 in	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in	64	58	60	54
¾ to 1½ in	67	61	63	57
2 to 3 in	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in	65	59	61	55
2½ to 4 in	67	61	63	57
4½ to 6 in	66	60	62	56
7 to 8 in	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt
2, 2½ to 4 in.	Lap Weld	or Lap Weld as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, October 26, 1910.—(*By Telegraph.*)

Pig Iron.—The low prices ruling are becoming attractive to consumers and some business has been placed. A sheet and tin plate maker in the Wheeling district has bought about 5000 tons of basic iron for first quarter delivery from a nearby furnace which has a low rate of freight, at a price netting the seller about $13.50 at furnace; if the iron came from a Valley furnace it would figure out only $12.75 at furnace. A Canton, Ohio, consumer has bought 3000 tons of basic, also for first quarter delivery, which will probably come from a furnace having a lower rate of freight than the Valley furnaces. A local steel casting interest is in the market for 1500 tons of standard Bessemer iron, 250 tons a month, for first half, which is the first inquiry of any note for Bessemer in this market for some time. A local plumbing supply interest has bought 2000 tons of Northern No. 2 foundry iron at a price slightly under $14 at Valley furnace. Heavy stocks of iron are piled at the Valley furnaces. Bessemer iron remains nominally at $15; basic is $13; No. 2 foundry about $14, and gray forge $13.25, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Steel.—No new business of moment is being offered in billets, or sheet and tin bars. Consumers of sheet and tin bars are specifying liberally on their contracts, but are believed to be piling them for use in first quarter, as prices for that delivery have not yet been settled. Bessemer billets are weak. Open hearth sheet bars are being offered by one or two outside open hearth plants at slightly less than $25 delivered, Pittsburgh. We quote Bessemer 4 x 4 in. billets at $23.50 to $24; open hearth 4 x 4 in. billets, $24 to $24.50; Bessemer and open hearth sheet and tin plate bars, $25; forging billets, $29 to $29.50, all f.o.b. cars, Pittsburgh, Youngstown or Wheeling district.

(*By Mail.*)

The eagerness of some of the blast furnace owners in the Central West to sell pig iron, even at present low prices, is shown in the recent purchases by the Pittsburgh Malleable Iron Company of this city. It has placed two lots of 3000 tons each of malleable Bessemer iron, for delivery through all of 1911, at $14, at Valley furnace, or $14.90, Pittsburgh. It also secured 3000 tons of charcoal iron for the same delivery and at a very low price. It is claimed, and with good reason, that present selling prices of malleable Bessemer, basic and foundry iron are below cost to the merchant furnaces that have to buy ore and coke in the open market, but in spite of this there are quite a number of furnaces that seem willing to sell for long time delivery at today's market. The Westinghouse Air Brake Company has inquiries out for a small tonnage of gray forge and malleable iron, but it is probable that it will buy 15,000 to 20,000 tons, deliveries to run through first quarter of 1911. There is practically no inquiry for Bessemer iron, the market being nominally $15, at Valley furnace, with a certainty that this price would be shaded if any large business was offering. The steel market continues very weak, with the leading makers inclined to go after business more aggressively and to name lower prices. A good deal of steel, mostly open hearth, is in the hands of middlemen, who are offering it at lower prices than the large steel interests have heretofore been inclined to meet. One open hearth plant is offering open hearth sheet bars on the basis of $24, at mill, or $24.70, Pittsburgh. Leading interests, such as Carnegie Steel Company, Jones & Laughlin and Republic, report that specifications against contracts in the last week have been heavier than in any one week for some time, and this is the most encouraging feature of the situation. The report that the Interstate Commerce Commission has practically decided to allow the Western railroads to advance freights, effective February 1, cannot be confirmed here, but is believed to be true. There is not much hope, however, of material improvement in the railroad demand until after the turn of the year, and it may not come until second quarter.

Ferromanganese.—Some new inquiry is in the market and a sale of 600 tons, equal monthly deliveries over first half of 1911, is reported at a price between $38.50 and $39, Baltimore. Consumers are pretty well covered for this year, and most of the new inquiry is for first quarter and first half. The freight rate from Baltimore is $1.95, for delivery in Pittsburgh district.

Ferrosilicon.—Prices for forward delivery are lower than for prompt shipment, this material being somewhat scarce for spot delivery. There is not much new inquiry. We quote 50 per cent. ferrosilicon for forward delivery at $54.50 to $55, Pittsburgh. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—A sale of about 2000 tons of sheared steel skelp has been made on the basis of about 1.40c., Pittsburgh. We quote: Grooved steel skelp, 1.30c. to 1.35c.; sheared steel skelp, 1.40c. to 1.45c.; grooved iron skelp, 1.65c. to 1.70c., and sheared iron skelp, 1.75c. to 1.80c., all f.o.b. Pittsburgh, usual terms.

Rods.—The market continues quite firm. Several large consumers of chain rods are now figuring on their supply for first half of next year. We continue to quote Bessemer, chain and open hearth rods at $28.50, Pittsburgh.

Muck Bar.—This material continues scarce and high prices are being asked for best grades. The two or three concerns in the Pittsburgh district that make muck bar for the open market are pretty well sold up for some time ahead. We quote best grades, made from all pig iron, at $31 to $31.50, Pittsburgh. Eastern muck bar, made from part scrap, is being offered in this market at $29 to $29.50.

Steel Rails.—New orders for light steel rails and specifications against contracts in the past week were better, the Carnegie Steel Company having booked about 3000 tons. The company has also received good contracts for standard sections for export, and it appears likely that in the future a good deal of the foreign business in standard sections secured by the United States Steel Products Company will be rolled at the Edgar Thomson Works of the Carnegie Company. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—New business has been very light. The McClintic-Marshall Construction Company has taken two railroad bridges, about 600 tons, and the American Bridge Company has secured contracts for about 2000 tons of railroad bridge work. We continue to quote beams and channels up to 15-in. at 1.40c. in large lots and 1.45c. in small lots, f.o.b. Pittsburgh.

Plates.—Inquiries have been received by local plate mills for the new battleship to be built by the Government and which will require 10,000 to 11,000 tons of plates, shapes and bars. Inquiries are also being figured on for about 2500 tons of plates for two torpedo boats. The contract for the gas holder at Kansas City was placed with R. D. Wood & Co. at Philadelphia, and the plates, about 2000 tons, will likely be furnished by an Eastern mill. Inquiries are in the market from two Western roads for 1000 cars for each, but whether they will be placed remains to be seen. Current business in plates continues light, and none of the mills is able to run full. The local market on ¼-in. and heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

Sheets.—The volume of new business continues to show an increase, consumers having pretty definitely decided that they are safe in placing contracts at to-day's prices for delivery through first quarter of next year. The American Sheet & Tin Plate Company is operating close to 80 per cent. of its sheet mill capacity. The market is firm, very little being heard of any cutting. The market is based on 2.20c. for No. 28 black and 3.20c. for No. 28 galvanized, most of the tonnage recently entered being at these prices. Corrugated roofing sheets are $1.60 and galvanized $2.80 per square on No. 28 gauge, 2½-in. corrugations. The schedule

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of prices on black and galvanized and on roofing sheets is printed on a previous page.

Tin Plate.—Specifications against contracts are active, but little new business is being placed, this being the dull season in the tin plate trade. The American Sheet & Tin Plate Company is operating to about 85 per cent. of its tin plate capacity, and is turning out more product than ever before in its history. The market is firm. We continue to quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—New business in both iron and steel bars has been light. Specifications against contracts from the implement makers are fairly satisfactory, but from other consumers, such as the railroads, are not coming in very freely. The local market on steel bars is strong at 1.40c., but for some points of delivery, notably in the Chicago district, this is being shaded as a basing price. We quote soft steel bars at 1.40c. in large lots and common iron bars at about 1.45c., Pittsburgh. Prices on the latter are weak and would likely be shaded on desirable specifications.

Spelter.—The market continues quite firm, and prime grades of Western are held at 5.42½c., East St. Louis, equal to 5.55c., Pittsburgh.

Hoops and Bands.—A fair amount of new business is being placed in small lots, but the mills are running mostly on specifications against old contracts which are coming in at a fairly satisfactory rate. Prices are firm and we quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

Cotton Ties.—Prices are unchanged, being 77c. per bundle for October delivery and 77½c. for November shipment.

Spikes.—Very little new business is being placed, the railroads only giving out scattered orders for small lots for repair work. The demand for small railroad and boat spikes is also dull. All the spike makers are complaining about the present unsatisfactory business. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—New orders continue mostly for small lots to cover actual needs, but specifications on contracts are coming in fairly well. Regular prices of 1.90c. on structural rivets and 2c. on boiler rivets are shaded.

Shafting.—The new demand is very dull and is mostly in small lots to cover current needs. There is no improvement in specifications against contracts, which have been unsatisfactory for some time. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—New orders being placed for wire nails and also specifications against contracts are heavier now than at any period for some months. One leading maker of wire nails reports that it is running double turn and is about two weeks behind in shipments. The demand for cut nails is also better. There is very little buying in plain wire, as the season is pretty well over.

Merchant Pipe.—The volume of new business being entered by the pipe mills is quite heavy, being larger than expected so late in the year. Jobbers and consumers are sending in urgent requests for prompt shipments, showing that stocks are very low. The Barnsdall interests have placed a contract for 15 miles of 6-in. and the Ohio Fuel Supply Company 8 miles of 2-in., both for gas lines. It is stated that the new discounts on both iron and steel pipe, printed in full on a previous page, are being firmly maintained.

Boiler Tubes.—A fair amount of new business is being placed in railroad tubes, one leading mill reporting that it has more orders on its books at present for railroad tubes than at any period for some months. The new demand for merchant tubes continues very dull.

Coke.—A local interest bought late last week about 15,000 tons of standard grade furnace coke for November delivery at $1.55 at oven, the lowest price reached in furnace coke of standard make for a long time. Another consumer has also bought 15,000 to 20,000 tons of furnace coke for delivery during the first half of 1911 at the reported price of $1.75 at oven. Another deal involving a large tonnage of furnace coke has been closed on a sliding scale basis, so many tons of coke for 1 ton of basic iron. The output of coke in the Upper and Lower Connellsville regions last week was 351,988 net tons, an increase over the previous week of about 1500 tons. We quote standard grades of blast furnace coke for spot shipment at $1.55 to $1.60 and for delivery over the remainder of this year at $1.70 per net ton, at oven. Standard makes of 72-hour foundry coke for spot shipment are held at $2.15 to $2.25 to consumers, and for delivery over the remainder of this year and into the first half of next year $2.25 to $2.50 per net ton, at oven, are being quoted.

Iron and Steel Scrap.—New inquiries from consumers in the past week have been a little better and some dealers are asking about 25c. a ton higher for heavy steel scrap than they were quoting last week. There is a fair demand for heavy melting stock, machine shop turnings and cast iron borings, but prices continue low. The sale of 800 tons of turnings noted in this report last week at $8.25, Pittsburgh, should have read $9.65, delivered, or about $8.60, Pittsburgh. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.75 to 14.00
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	10.00 to 10.25
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	12.00 to 12.25
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.25 to 14.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.50 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00
Heavy steel axle turnings	9.75 to 10.00

Chicago

FISHER BUILDING, October 26, 1910.—(*By Telegraph.*)

The market has not responded to any notable extent to the private advices that are current regarding a settlement of the railroad controversy. There has been improvement in several lines of finished materials the past week, but it comes chiefly from other sources. There has been a marked increase in the number of orders from store for small lots, and the mills also report an increased demand for sheets. Specifications for bars are about normal and there is more new business. The distribution of hardware is normal and carries with it a movement of wire products about equal to the ordinary rate of consumption. A very large amount of structural business is in the hands of architects throughout the West, but the closing of contracts awaits a more favorable money market and it is not expected that much new business in this line will be placed with fabricators until after the election. Difficulty in placing municipal bonds has restricted to some extent the tonnage of water pipe that has gone into the ground the past year and the condition of the bond market will have a considerable bearing on the amount of municipal business that is placed the coming year. Inquiries have appeared from Western roads for prices on track supplies for 1911, but rail contracts for next year are held in abeyance. The purchasing departments of the railroads have not been released from the restrictions that were put on their activities last summer and they continue buying materials and supplies in small lots for immediate shipment. The scrap market is steady and dealers show more confidence.

Pig Iron.—A thresher interest at Racine has inquired for 7000 tons of foundry iron, half Northern and half Southern, for delivery during the first half of 1911. Another buyer west of Chicago inquires for 1000 tons of Southern for first half. A Chicago foundry is in the market for 2000 tons of Northern and another local buyer for 500 tons. There are two inquiries in this territory from points outside of Chicago for Northern foundry iron, one for 1200 and another for 800 tons. There is a steady improvement in the number of small orders, from 100 to 500 tons, for both Northern and Southern iron. There has been a notable tendency among foundries this year to purchase in small lots for prompt or early shipment, rather than on contracts for extended delivery. The steady accumulation of stocks at furnaces has encouraged this policy, as well as the fact that during the past year the market has receded after several of the largest buyers in this territory had made purchases for extended deliveries. The malleable foundries bought liberally in January and February for the last half of this year and now have large stocks and iron still due them on contracts at a cost from $2 to $3 higher than current prices. They are pursuing a conservative policy at the present time and have bought very little iron for next year. The opinion is expressed in the trade that not more than

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5 per cent. of the iron needed for the first half of 1911 has been purchased in this territory. Recent developments in the financial world have created a better feeling in the market, and it is evident that large buyers are watching conditions closely. The following quotations are for October, November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The market is quiet with only an occasional inquiry for forging billets, on which the price is maintained for current orders at $28, base, Chicago.

Rails and Track Supplies.—Inquiries have appeared in the market for track supplies for 1911 shipment, but no large inquiries for rails are reported and actual sales last week were light. With a few exceptions, Western roads have all the rails they need for this year and it is natural that they should defer until a little later the placing of contracts for next year. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—Only a small aggregate amount of structural work was closed last week. Investors in large projects will probably wait until after election before closing. It is understood, however, that money is becoming easier and this is a very important factor in the market for fabricated material. The Hubbard Steel Foundry Company, Chicago, has let a contract for additions to its steel foundry at East Chicago requiring 300 tons of steel. This business was placed with the Worden-Allen Company, Milwaukee. The James Stewart Company has taken two general contracts on which the fabricated work is not reported placed. One is the Burns Theatre at Colorado Springs, Colo., 550 tons, and the other the St. Mary's Academy at Denver, 620 tons. The general contract for a new hotel at French Lick Springs, Ind., has been let to W. E. Stilwell, La Fayette, but the steel order, 824 tons, has not been placed. There is a good run of small orders for fabricated work. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Scattering orders are heard from in the market for small lots of cars, but no large inquiries are reported as yet from important Western railroad systems. The smaller independent mills continue to shade prices on such sizes of plates as they roll, but the larger manufacturers continue to hold 1.40c., Pittsburgh. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Encouraging reports come from the sheet mills, as new business is increasing and specifications are also more satisfactory. Many requests are received to anticipate shipments and the tone of the market is improving. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Specifications for soft steel bars are running about normal and there is a little improvement in new business from casual buyers. Improvement is also noted in the demand for hard steel bars. The railroads have not changed their policy materially in the purchase of bar iron, their business coming generally in 100-ton lots for early shipment. The bar iron market, however, is a little firmer, and concessions on soft steel bars are only heard of in exceptional cases, usually from small mills, which do not take yearly contract business. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—The hardware trade is running on a normal basis, the average of reports from jobbers indicating that they are doing a little more this fall than a year ago. This carries with it a normal distribution of wire products. Owing to the fact that the capacity of the mills of the country is in excess of normal consumption, there are reports that independent mills are making concessions on desirable business, but the leading interest reports prices firm. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.85c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Shipments of merchant steel into this territory during September exceeded all former records for that month both in the amount and the value. The same condition was reported for the month of August, but September shipments exceeded those of August. There has been a material quickening in the past few days in the demand from store, coming chiefly in small orders, which foot up a relatively large tonnage.

Cast Iron Pipe.—Detroit is the only city that has come into the market thus far with specifications for any large tonnage of water pipe for winter shipment. Important developments in this market are not expected until after the election, as the activity of municipalities has been checked this fall by high interest rates and the difficulty in selling municipal bonds. Cities with the highest credit have been unable to borrow at 4 per cent., and even 4½ per cent. bonds have not been taken freely by investors. Improvement in the money market will undoubtedly bring out a large amount of water pipe business during the winter. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The market is very quiet, with practically no change in prices. This branch of trade has established a record this fall for holding several months at a practically stagnant level of values. One reason for this peculiar condition is that there has been a ready market for certain controlling lines of material at prices fixed by the buyer. Heavy melting steel, for example, has been going since last summer at about $12.50, delivered, and No. 1 railroad wrought around $12. Other grades of material have settled into a ratio of values corresponding to these two lines, and there will be no change in the general level until the buyers of these two grades raise their bids to attract a larger tonnage, unless the steel foundry interests or other large buyers come in for an unusual tonnage. A notable feature the past week which reflects a change in the tone of the market is that dealers are not peddling scrap over the telephone. Buyers get many inquiries from dealers who want to know when they will be in the market, but it would seem that either shipments have fallen off or scrap is easier to place when it arrives. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Birmingham

BIRMINGHAM, ALA., October 24, 1910.

Pig Iron.—October has been rather a keen disappointment to the pig iron producers here. With large crops assured, and with such good prospects for heavy traffic, it had been thought that the railroads would have begun their long delayed buying movement, but thus far there is little evidence of a real desire to place orders for anything that

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can well be deferred even a few weeks longer. The consequence is that prices remain pretty well at low level. Practically none of the 1911 rail tonnage has as yet been placed, and the iron and steel makers of Birmingham are living in the hope that when this buying begins there will come the better demand for other iron and steel products that was looked for this month. All the pipe producers—water, gas and sanitary—have been taking small lots of pig iron the past week, but practically only at concessions below the $11.50 schedule. No orders of consequence were placed for 1911, though there are still some good inquiries afloat from large buyers, and these buyers would doubtless close if a schedule of $11 would be made for the first half. There has been no material change in production in the week just closed. Sloss-Sheffield blew out one stack on the Tennessee River, but put in another there. It is stated that one company will blow out a stack this coming week, but it is expected that the stack at Holt will go in, making an offset there. So, all told there is little change to record, either in production, shipments, or volume of new business.

Cast Iron Pipe.—The makers of water and gas pipe continue to run along on fairly full capacity, depending upon the hand-to-mouth buying that has sustained them for some months. There is virtually no appreciable margin of profit in pipe at this time, and therefore no particular inducements are being made in any direction to land big orders for forward delivery. The production of sanitary pipe will probably be increased. This correspondence last week mentioned an increase in output in two directions, and it is reported this week that one other large manufacturer will add nearly 50 per cent. to his capacity, due largely to the heavy call for export on which better prices are said to be realized than prevail just now in the local trade. We quote water pipe as follows, f.o.b. cars foundries in this immediate district: 4 to 6 in., $22; 8 to 12 in., $21; over 12-in., average, $20, with the usual differential of $1 per ton for gas pipe.

Old Material.—The scrap market has fallen back into its summer dullness. Nominal prices are about as follows:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., October 25, 1910.

A shade better feeling is observable in the pig iron market and a little more business of a forward character has been transacted at unchanged prices. The demand for finished materials is still quiet, but a more expectant feeling is noted. The railroads in this territory will probably soon come into the market for rail requirements for next year, and it is believed that the tonnage taken will compare favorably with that for this year. The trade also takes considerable encouragement from the reports that the railroads will become more active general buyers at an early date. Steel billets are in light demand, with a tendency toward easier prices. Very little business has been done in old materials and prices of some grades are weak. The demand for coke continues irregular.

Iron Ore.—There has been an entire absence of business. It is also interesting to note that there were no importations of foreign ore at this port during the week, the first occurrence of this character for a long period.

Pig Iron.—There is a greater disposition to place orders for requirements over the first quarter of next year, but it cannot be said that any real movement in this direction has set in, although the trade does not believe that it can be long delayed. More inquiry for early 1911 delivery is reported, but sellers are not overly anxious to accept business, either at to-day's prices or at a slight advance, which has in a few cases been obtained. Outside of buying by the cast iron pipe and stove interests, business has been small; the former consumers placed orders for about 6000 tons of low grade Northern iron for delivery during the remainder of this year at prices ranging from $14.25 to $14.50, delivered. Stove manufacturers took an aggregate of 4000 tons for first quarter of next year, mostly low silicon 2 X at $15.75, delivered. In a few instances $16, delivered, has been done for moderate lots of No. 2 X for first quarter, and in a few exceptional cases even a better price was obtained. For this year's shipment $15.75, delivered, appears to be the minimum for standard brands of Eastern No. 2 X foundry, and this is now pretty generally believed to represent the bottom. One of the Delaware River cast iron pipe makers is out with an inquiry for 5000 tons of low grade foundry iron for January and February delivery, expected to be closed during the week. A sale of a round lot of charcoal iron as well as a good quantity of foundry iron for first half delivery had also been reported, but few sellers are disposed to accept business for delivery extending beyond the first quarter. Virginia makers, as a rule, will not sell beyond January, although in instances orders from regular customers, on which the delivery has been more extended, have been taken, usually at an advance over prices which are acceptable for deliveries during the next three months. For spot delivery $13, furnace, has been done in a few cases, but the general market for Virginia 2 X or 2 plain foundry, three months delivery, is $13.25, furnace equal to $16 to $16.25, delivered in this vicinity. Very little movement in Southern iron has been reported. While the demand for forge iron has not been active, a few small sales to rolling mills have been made; one lot of 500 tons for this year's shipment was closed at $14.50, delivered. The larger consumers of steel making iron show no interest in the market; early purchases, at the present rate of consumption, are sufficient in some instances not only to run them through the remainder of the year but the early months of 1911. Several of the smaller buyers have inquiries out, one for December and first quarter delivery, and another for January-February requirements, but in neither case is the tonnage large, and, as the buyers' ideas are about 50c. under recent quotations, no business has resulted. The present price, $15, delivered, is purely nominal and it is difficult to say what the price would be should any real demand develop. While there has been no demand in this district for low phosphorus pig, small sales for delivery outside have been made at equal to $22.50, delivered here. Producers of pig iron are not forcing business, being rather inclined to take as little business as possible at low prices, with a view of curtailing production after the turn of the year should there be no improvement in demand or prices. The following range represents the market for standard brands delivered in buyers' yards in this vicinity, for shipment during the remainder of the year, or in some instances for the first quarter of 1911:

Eastern Pennsylvania, No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	16.00 to 16.25
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 14.75
Basic	15.00
Low phosphorus	22.50

Ferromanganese.—There is still some inquiry for small lots for delivery in this territory, but little business has been closed. Quotations are unchanged, $39, Baltimore, representing the price for either near future or first half of next year shipment.

Billets.—The billet situation shows no change; consumers continue to place orders for small lots for early delivery and show no interest in the forward market. Mills in the East are operating at about half capacity and have little business ahead. Open hearth rolling billets delivered in this territory are still quoted in ordinary lots at $26, but this price could probably be shaded for desirable business. Forging billets continue in fair demand and are firm at $28, Eastern mill, with the usual extras for high carbons and special sizes.

Plates.—While there is still a comparatively good number of orders, few exceed 100 tons, and the aggregate is still below the tonnage for the corresponding period last month. There is an absence of any inquiry for sizable tonnage, although consumers would contract for moderate lots for extended delivery if makers would accept such business. Prices are apparently being well maintained, although efforts have been made to get concessions, but without success, 1.55c., delivered in this territory, representing the minimum for ordinary plates delivered in buyers' yards.

Structural Material.—Makers report the demand during the week to have been less active, the bulk of the business placed being in small lots for early delivery. Little new business of any size has developed. Bids are being taken against revised plans for the Union League addition, which will require about 1000 tons. Several small buildings to be erected in this and nearby cities are also being figured on, but immediate business is light and mills are gradually catching up on orders on hand. Prices appear to be well maintained, at 1.55c., delivered, for plain shapes.

Sheets.—A better demand, particularly for prompt deliveries, is noted. Nearby mills have a larger volume of business on their books and the situation looks more encouraging, although consumers still withhold orders for extended delivery, placing business from time to time in small lots, as requirements develop, and then urging delivery. Prices are being well maintained, Eastern makers naming the following range for prompt deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

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Bars.—There is little snap to the demand, consumers placing orders, as a rule, for small lots for early delivery. Not enough demand has developed in refined iron bars to test the market and quotations range from 1.40c. to 1.45c., delivered in this territory, for business of an ordinary character. There has been a little better demand for steel bars, particularly from agricultural implement makers, and prices are pretty well maintained at 1.55c., delivered in this vicinity.

Coke.—Foundry coke has been the more active and some little business, both for prompt and forward delivery, is reported. Spot foundry coke has been sold down as low as $2, at oven, but the better grades bring $2.15 to $2.20. Forward deliveries command from $2.25 to $2.50, at oven, according to quality. There has been no demand for furnace coke for forward delivery, but a few sales of prompt coke of this grade have been made at $1.50 to $1.55, at oven, with forward at $1.60 to $1.85. The following range of prices, per net ton, delivery in this vicinity, about represents the market:

Connellsville furnace coke	$3.85 to $4.10
Foundry coke	4.40 to 4.75
Mountain furnace coke	3.45 to 3.70
Foundry coke	4.00 to 4.35

Old Material.—The market is somewhat weaker, owing to the absence of any material demand. In the majority of cases consumers are well supplied and show but little interest in the market, and tenders by sellers frequently go begging. No movement in heavy steel melting scrap is reported; several consumers make offering prices of 25c. to 50c. below the market, knowing that sellers are not likely to accept such propositions. With productive capacity at about half normal, and mills pretty well supplied, consumers feel that they can afford to await developments. A sale of a few hundred tons of low phosphorus scrap at $19 for first quarter delivery is reported. A round lot of old car wheels has been sold at the market. Rolling mill grades are generally dull. Railroad wrought and No. 1 forge and borings have been sold in small lots at prices lower than quoted last week. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.75 to $14.25
Old steel rails, rerolling	16.00 to 16.50
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.50 to 12.00
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	8.75 to 9.25
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

St. Louis

ST. LOUIS, MO., October 24, 1910.

The notice that 1300 metal workers of the Missouri Pacific system went out from its shops on a strike October 21 caused some concern to be felt in business circles at the close of the week. General business, as represented by transactions with the leading banks, is reported as fairly satisfactory, and the demand for money for the movement of the cotton crop is very heavy.

Coke.—All the leading sales agencies, with a single exception, report a dull market. The seller referred to closed a contract for 2000 tons of foundry coke, for shipment over the first half of 1911. Merchant sellers, with also but one exception, were doing but little business, but this house stated that it was getting a fair run of orders for small lots, mainly from outside buyers. While Eastern markets are said to be weaker, there are no lower prices quoted here, though bids under the market are sometimes submitted. Car shortage in the coke districts is becoming more pronounced, and it is believed that it may result in advancing prices in distributing markets. We quote standard Connellsville, 72-hour foundry at $2.25 per net ton at oven for either prompt or contract delivery.

Pig Iron.—With some of the principal offices the past week has ruled exceptionally dull. Others, however, secured some contracts—in fact, in the case of a leading house, some business was done that, it was intimated, reached a quite large volume, but particulars could not be learned. Admission of the sale of one lot of 900 tons of Southern No. 2 foundry was, however, made. Another house reports having a local inquiry for 2000 tons of No. 2 soft foundry for shipment over the first half of 1911, and other inquiries totalling 3000 to 3500 tons, practically all for Southern iron and for first half of 1911. A sale of 500 tons of Lake Superior charcoal iron was reported for shipment over the remainder of this year and first quarter of 1911. Another house reports sales to various buyers of 700 tons of Southern No. 2 foundry, for shipment over the first half of 1911, together with inquiries as follows: One for 1500 tons and two for 1000 tons each, all Southern No. 2 foundry, for shipment over the first half of 1911. The market continues weak and irregular, most of the business being worked on the basis of firm offers and this naturally results in shading prices. Well-known brands, especially those having a desirable analysis, are held with a show of firmness at outside figures, but with little buying resulting. As previously reported, several furnaces refuse to name prices for shipment beyond New Years. We quote Southern No. 2 foundry at $11, Birmingham, for shipment over the remainedr of the year, with special brands held 25c. to 50c. per ton higher. For shipment over the first half of 1911, $11.50 is asked, but it is intimated that some furnaces are accepting 25c. per ton less on firm bids.

Old Material.—Consumers are not in the market, except to secure such lots as may be picked up at attractive figures No large tonnage can be worked at market prices. There is some business passing between dealers at low prices. No railroad lists were reported last week. The market is weaker and in some instances lower. Relaying rails have declined in price. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

The freight houses of the Clover Leaf-Alton Railroad Company in East St. Louis were destroyed by fire October 20, causing a loss conservatively estimated at $500,000, all of which is covered by insurance.

Ground will be broken early next year for the $1,000,000 Barnes Hospital, to be erected at Forest Park and Kings Highway boulevards. The plans have been accepted by the trustees of the fund and will soon be submitted for bids.

C. J. Crawford, president of the Puxico Iron Company, states that progress is being made in reopening Pilot Knob. The company will be ready to ship ore as soon as the repairs are completed on the blast furnace of the St. Louis Blast Furnace Company, which will be about November 1.

Cleveland

CLEVELAND, OHIO, October 25, 1910.

Iron Ore.—Weather conditions have been so favorable during the entire month that the plans of the shippers to have an early closing of the season of navigation have not been interfered with. Boats are being tied up gradually and it is expected that by the middle of November 75 per cent. of the vessel tonnage will be out of commission. The total ore movement for the season will be very close to that of 1909. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The local market shows a little improvement. Some sales are reported and better inquiry is coming from northern and central Ohio consumers, who have shown little interest in the market for several weeks past. A local furnace has sold 1000 tons of No. 2 foundry to a central Ohio consumer for first half delivery, and the same concern is in the market for 1000 tons of Southern foundry. We also note the sale of 500 tons of No. 2 Southern in central Ohio at $11.50, Birmingham, for the first half delivery. A northern Ohio manufacturer is in the market for 1000 tons of No. 2 Northern for the first half and about 200 tons of high silicon. A northern Ohio pipe works has an inquiry out for 1000 tons of Nos. 3 and 4 foundry iron for November and December delivery. Another inquiry is from

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a Canton consumer for 1800 tons of malleable iron, for delivery through the second quarter and last half of next year. Other smaller inquiries are reported. Some consumers who have not come out with definite inquiries are feeling the market. The general sentiment appears a little better, but producers are not looking for any higher prices for some time. The minimum quotation on No. 2 foundry for the first half is $14, at furnace, but some producers still decline to meet this price. For Cleveland delivery for the first half this grade is quoted at $14.50, delivered. Southern iron is firm at $11.50, Birmingham, for the first half. For prompt shipment and for the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.75 to 15.00
Northern foundry, No. 2	14.25 to 14.50
Northern foundry, No. 3	14.00 to 14.25
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—The market is very quiet, the only demand being for small lots of spot foundry coke. Furnaces seem to be in no hurry in placing their contracts for their first half requirements, but are showing some interest in prices. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment, and $1.70 to $1.75 for the remainder of the year. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 for spot shipment and $2.25 to $2.50 for the remainder of the year and the first half.

Finished Iron and Steel.—General reports indicate that the sentiment is better. Actual orders, however, show little, if any, change. Mill agencies report a good volume of orders for steel bars, plates and structural material, but these are all for small tonnages for immediate requirements. In many cases orders are accompanied by the request that shipments be rushed. Stocks in manufacturers' hands are generally low, so that the feeling prevails that as soon as general business conditions become more active and buyers become convinced that present prices will be maintained, the demand in finished lines will be quickly stimulated. Steel bar specifications are fair and prices are being firmly maintained. The demand for twisted bars for concrete construction work continues quite active. In structural lines not much new work requiring round tonnages is in prospect, with the exception of a few buildings previously noted, which are still in the hands of architects, and for which bids will be received shortly. Local fabricators are quite well filled with small work, the material for which is being bought in small lots as needed. Structural prices are being firmly maintained at 1.40c., Pittsburgh. While the demand for plates is light, a local mill has enough orders on hand to keep it running full for about 30 days. Boiler shops in this territory are well filled with work, and while new orders are not numerous, some report an improvement. The only shading on plates is by mills making the smaller sizes. Sheets are fairly firm and mills are getting a good volume of specifications on contracts. Some new contracts have been closed for delivery through the remainder of the year. The demand for iron bars is only moderate and prices are not firm. We quote iron bars at 1.35c., at mill. At a meeting of rivet manufacturers last week the present quotations on rivets of 1.90c., base, for structural, and 2c. for boiler rivets, were reaffirmed. These prices have been generally shaded for some time. The usual concessions are still being made for the remainder of the year, but makers announce their intention to take no orders for delivery after January 1 at less than the regular prices.

Old Material.—The demand continues very light for all grades. Mills are buying only in small lots as they need material, and these requirements are small, as some of the local mills still have good sized stocks on hand. Some producers are holding back their scrap for better prices and the belief is quite common among dealers that the railroads are not placing all of their tonnage on the market. Dealers appear to have no trouble in buying scrap at prices that permit them to make sales at ruling quotations and leave a fair margin of profit. No change is noted in prices. Dealers' prices per net ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Steel plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

The German Iron Market

BERLIN, October 13, 1910.

Dealers south of the Rhine have raised the price of bars from stock by 5 marks, and the Rhenish-Westphalian group of foundries turning out commercial castings have voted an immediate advance of 2 marks per metric hundredweight, or 10 per cent. on the piece price. This exhausts the list of the week's price advances. From the Belgian market a Brussels dispatch of to-day's date reports a continuance of the reaction previously mentioned in this correspondence. The Belgian blast furnaces have had to curtail their output owing to overproduction and prices have this week further fallen 1 franc; a similar fall occurred in plates for export.

Germany's production of pig iron in September was 1,232,477 metric tons, against 1,262,804 tons in August and 1,068,346 tons in September, 1909. While the aggregate production last month was less than in August, the daily output of the furnaces made a further gain of 347 tons. It would appear probable, therefore, that October will establish a new record in production. The shipments of the Steel Works Union for September in rails, structural shapes and semimanufactured steel amounted to 449,082 tons, being 2493 tons more than in August and 10,178 tons more than in September, 1909. The shipments of steel for further manufacture were 19,078 tons more than in August, and more than for any other month since March. In this specialty the shipments are considerably in excess of the allotments, but the movement in rails and structural shapes is so much below the allotments that the total shortage in shipments for all three classes is nearly 13½ per cent.

A report upon conditions in the Upper Silesian iron district indicates that business is improving there. Consumers and dealers are showing a greater willingness to buy at the higher prices now ruling. This is particularly the case with bars.

Negotiations have been opened for the renewal of the combination controlling plates for shipbuilding, which expires at the end of the year. It is expected that the renewal will be adopted without serious difficulty, as the arrangement has been a satisfactory one for the mills concerned. The great lockout in the shipbuilding trade has ended at most of the yards and better trade in plates from that quarter should soon manifest itself.

Cincinnati

CINCINNATI, OHIO, October 26, 1910.—(*By Telegraph.*)

Pig Iron.—The week opens with a much better feeling generally entertained. Inquiries are more numerous, and while a large percentage of them may be simply feelers, the receipt of them shows much more interest on the part of prospective buyers. The small tonnage business for nearby delivery is improving and a few round lots of iron have also changed hands. One sale was made this week to a Western melter of 2400 tons of Southern No. 2 at $11, Birmingham, for November-December shipment. Inquiries include 1500 tons of Northern and Southern No. 2 foundry, for a northern Ohio melter. A Northwestern manufacturer wants 2500 tons of various grades and will probably purchase Southern iron. An Eastern pipe maker has inquiries here for 2500 tons each of No. 3 foundry and gray forge. A nearby firm wants about 1000 tons of analysis iron and a local user is asking for 800 tons of foundry iron, all for first half delivery. Several fair-sized requests for quotations have also come in from the St. Louis district. Practically all the inquiries recently mentioned are still pending, but early action on some of them is expected. Southern No. 2 foundry, is quoted at $11, Birmingham district, for November-December shipment and at $11.50 for the first half of next year, but this last named figure is understood to have been shaded on a few contracts extending into the first quarter. Northern iron still hovers around $14, Ironton, for this year, with an advance of 50c. per ton asked for first half of next, but first quarter contracts can be made with some interests at $14.25. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—A few inquiries for small lots of foundry coke for first half delivery are being received, but actual business

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being booked is very light. In furnace coke there is practically nothing being done. Some low grade furnace coke for spot shipment is still to be obtained in all three fields around $1.50 to $1.55 per net ton, at oven. Contract prices range from $1.65 to $1.85. Standard brands of foundry coke can be bought for future delivery around $2.15 to $2.30, although some spot shipment foundry grades are obtainable at $2, at oven.

Coal.—Both domestic and steam coal is firm, and the matter of prompt shipment on some grades is a vexing problem. Pocahontas lump is quoted at $2.25, f.o.b. mines, but delivery cannot be promised under 30 days. Pocahontas nut is quoted at $1.50, run-of-mines, $1.25, and slack, 90c. to $1, and prompt shipment can be made of any of these grades. Kentucky run-of-mine can be bought at $1.25 and slack at 70c., all f.o.b. mines.

Finished Iron and Steel.—Little new business is being booked by the mill agencies, but the movement of carload lots on contract is reasonably good. Retail warehouse specifications are not coming in any faster than during the previous three weeks. The warehouse price on bars is 1.80c. and on structural material 1.90c.

Old Material.—The market continues very quiet. The railroads in this vicinity will not sell at prevailing figures and dealers show no inclination to offer more. A Northwestern railroad system is said to have sold a round tonnage of scrap last week, but local firms were not successful in getting any part of the lot. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Buffalo

BUFFALO, N. Y., October 25, 1910.

Pig Iron.—New business has been coming in quite freely during the past week or 10 days, the orders booked by Buffalo district furnaces aggregating 40,000 to 50,000 tons, covering No. 2 X, No. 2 plain, Nos. 3 and 4 foundry and malleable, for deliveries running through the current quarter and first quarter of 1911, and in some instances through first half. The bulk of the tonnage taken was of foundry grades, although there was a fair proportion of malleable; practically no basic was ordered, the inquiry for steel making iron being limited. Most of the 1911 business taken has been contracted for on what the furnaces consider an extremely low price basis, it being necessary to cut prices to the bone to meet Southern iron competition at tidewater. Undoubtedly a much larger tonnage could have been booked but for the fact that some furnace interests are not inclined to accept current schedule rates (which have been hammered to rock bottom) for extended 1911 deliveries. It is understood that the United States Radiator Company, which has been in the market for a large tonnage, has not yet placed contracts. Stove foundries are very busy, more so than two years past, and have placed orders in good volume. For deliveries over the remainder of the year and running through the first half of 1911 we quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.25 to 14.75
No. 2 plain	14.00 to 14.25
No. 3 foundry	13.75 to 14.00
Gray forge	13.75 to 14.00
Malleable	14.25 to 14.75
Basic	14.25 to 14.75
Charcoal	18.00 to 18.50

Finished Iron and Steel.—The sentiment along general lines is better and the outlook continues to improve and a good volume of inquiry for current business is coming in. One of the leading interests reports more tonnage closed during the past two weeks than for the preceding six weeks. Steel bar prices are unchanged and firm at 1.40c. base, Pittsburgh. It is understood that the tonnage of bar material for which the Merchants' Despatch Transportation Company was in the market for its East Rochester shops, between 400 and 500 tons, was placed for iron bars at less than 1.40c. The Solvay Process Company, Syracuse, has placed an order for 275 tons of reinforcing bars for its new buildings. There has been active buying of wire nails during the past 30 days and it now develops that most of the tonnage has been placed with two of the older and larger independent wire nail interests. It is understood that a price which would net 5c. per keg under the current price of $1.70 was made on this tonnage. An order has been placed during the week by one of the larger Canadian manufacturers for 1000 tons of tin plate, delivery to be made during the next three months, the order being taken by the New York office of the United States Steel Products Company. There appears to be considerable activity in the demand in this branch of production as there are a number of other inquiries in the market and owing to the rapid advance in price of pig tin and the fear that it is going to be further advanced, tin plate users are taking active steps to cover their requirements for the forepart of next year. The local office of the leading interest reports an additional contract tonnage for bar material has been closed during the week for Canadian export and that business in all lines is coming forward in good volume from the Canadian market. In structural lines the amount of new business developing has been small. Plans are to be out shortly for a warehouse and store building for the H. D. Taylor Company, Buffalo, requiring about 100 tons of steel, and the Electrode Company of America is arranging to build a manufacturing plant at Niagara Falls which will take about 100 tons. The plans for the Haberstro Estate's store and loft building, Buffalo, are being revised and will be refigured. The contract for the steel work in the Y. M. C. A. Building, Erie, Pa., about 275 tons, was taken by the T. H. Brooks Company, Cleveland. The structural steel for the International Harvester Company's buildings at Auburn, N. Y., about 500 tons, was placed with the Eastern Steel Company.

Old Material.—The market is quiet, with no material change in conditions or prices. Deliveries on contracts are being taken by consumers, but very little new business is developing, such as there is being of the hand-to-mouth character. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	23.00 to 23.50
Old car wheels	13.75 to 14.25
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.25 to 6.50
No. 1 busheling scrap	11.25 to 12.00

New York

NEW YORK, October 26, 1910.

Pig Iron.—Business keeps up at a fair rate, with prices slightly lower. Four or five considerable users of pig iron have been inquiring for iron for delivery in the first two or three months of 1911. Where business is closed it is done quietly and information concerning the size of transactions and prices is not available in a number of cases. Pipe makers have been buying, as has been the case nearly every week this fall. One eastern Pennsylvania pipe foundry is inquiring for 5000 tons for January and February. Last month it bought from 6000 to 7000 tons. Business is being done with a variety of foundries, including electrical and railroad equipment manufacturers. There is also further buying for radiator works. Some inquiry is reported from New England machinery foundries, and in that section some Virginia iron has been placed. The basis was $13, at furnace, for No. 2 X, this representing a higher delivered price than has ruled for iron from other districts. The premium was paid because a certain percentage of Virginia iron was desired for the mixture. Shipments on contracts are, as a rule, satisfactory to producers, and the foundry trade is evidently in fair shape. Complaints of decreasing demand for castings are heard, but they are not general. Buyers of pig iron have been coming into the market in groups from time to time and thus the demand is distributed in a way that turns out to the buyers' advantage. There has been all along an absence of any large amount of simultaneous inquiry from all directions, which is the sort of inquiry on which markets advance or at least stiffen up. Quotations for tidewater deliveries are as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.25 to $15.50; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—In spite of some expectations to the contrary, the railroads are not likely to become an important buying factor in the immediate future, and the building season is drawing to a close. Altogether there is little prospect of much increased activity in finished iron and steel for two months at least. Last week was particularly quiet in most lines, but the bar iron trade reports some increase in tonnage. Structural material orders have been very scarce and interest has been lost in the New York Subway for some months to come, as the bids on city construction closing this week cannot bring out inquiries for steel for a good while. Prices generally continue firm, however, and

THE IRON AND METAL MARKETS

will probably remain so. Milliken Bros. obtained the contract for the extension to the Knickerbocker Trust Company Building, New York, 1600 tons. Contract for the steel for the Washington Irving High School, 2500 tons, has not yet been placed. The Long Island Railroad work, to require from 6000 to 12,000 tons, has gone to the Fort Pitt Bridge Company, and the latter is also reported to have the Jamaica bridge, 400 tons. In the West there are inquiries for two buildings, each requiring about 800 tons, one for the Knights of Columbus in San Francisco, and one, a hotel, at French Lick Springs. The Belmont Iron Works has taken 450 tons for an apartment building at Atlantic City, and the Phoenix Bridge Company, 240 tons for turntables for the Pennsylvania Railroad. No award has been made on the 800 tons for the Fowler Estate Building in Detroit. Quotations continue as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c.

Cast Iron Pipe.—The city of New York will open bids November 2 on 3500 tons of pipe of various sizes to be purchased directly from manufacturers, the pipe being intended for the city supply and not for any specific contract job. Pipe manufacturers are now receiving frequent orders for small quantities. Some orders call for several hundred tons, but they are usually for much smaller quantities. The demand for next year is becoming still more pronounced. Fairly large inquiries are being received, some of which call for delivery through the first half and even as far as October. Buyers, however, are endeavoring to place such contracts at present prices. The foundries show a strong disinclination to sell on this level for distant delivery. Carload lots of 6-in. continue to be quoted at $22.50 to $23.50 per net ton, tidewater.

Old Material.—The demand is better for the general list, especially for heavy melting steel scrap, of which sales of 25,000 to 30,000 tons are reported. Old car wheels, which have long been neglected, are receiving more attention, but holders are not parting with them to any considerable extent, being confident that considerably higher prices may be realized. Cast scrap is moving a little more freely. A sale of 1000 tons of Panama scrap was made last Thursday at $9.36, f.o.b. cars, Hoboken. Other bids on this scrap were $8.01, $8.71, $9.11 and $9.35. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$13.00 to $13.25
Old girder and T rails for melting	12.00 to 12.25
Heavy melting steel scrap	12.00 to 12.25
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	14.50 to 15.00
Wrought iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	13.00 to 13.50
No. 1 yard wrought, short	12.00 to 12.50
Light iron	5.50 to 6.00
Cast borings	7.00 to 7.50
Wrought turnings	7.00 to 7.50
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	13.00 to 13.50
Stove plate	10.00 to 10.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

Metal Market

NEW YORK, October 26, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
		Electro-		New	St.	New	St.
Oct.	Lake.	lytic.	Tin.	York.	Louis.	York.	Louis.
20	12.87½	12.80	37.35	4.40	4.27½	5.60	5.45
21	12.87½	12.80	36.90	4.40	4.27½	5.60	5.45
22	12.87½	12.80		4.40	4.27½	5.60	5.45
24	12.87½	12.80	36.15	4.40	4.27½	5.60	5.45
25	12.87½	12.80	35.75	4.40	4.28½	5.60	5.45
26	12.87½	12.80	36.15	4.40	4.27½	5.60	5.45

Pig tin is lower, but stocks are not any too plentiful. Copper is strong and selling well. The lead market is slightly firmer. Spelter continues quiet, but prices are being upheld.

Copper.—The buying movement continues and the market is steadily strengthening as a result. It would be hard to make an estimate of the amount of copper that has been bought within the last two weeks, as most of the large selling interests are reticent about stating just how much business they have done. It is generally conceded that newspaper reports have been greatly exaggerated, a conservative estimate being about 100,000,000 lb. Both buyers and sellers are taking a safe and sane stand, as no attempt has been made to push prices beyond a normal figure. Electrolytic copper can still be had at around 12.80c., and this price might even be shaded by some sellers. Lake is selling at 12.87½c. Copper consumption abroad is especially good, as can be judged from the following report of Henry R. Merton & Co., Ltd., of London: "There is no abatement in the demand for refined copper, which remains abnormally large and regular, and testifies to the continuance of the excellent consumption in Europe. Large orders have again been distributed for manufactured copper of all descriptions, and the requirements of sulphate makers are also considerable, promising heavy deliveries of copper from English warehouses during the next few months." The London market closed to-day with spot copper selling at £51 1s. 3d. and futures selling at £58 2s. 6d. The sales amounted to 450 tons of spot and 750 tons of futures.

Pig Tin.—Prices have eased up, but this does not mean that the people in control of the situation have let go. It is said here that the speculators in London, who have been sending the market up to record figures, have decided that it would be a good policy to lower quotations somewhat. The arrival of the steamer Minnewaska on Saturday with 1300 tons of tin slightly relieved the tension here, but there was such a decidedly good consuming demand that most of the cargo was called for before the steamer was unloaded. The market here now is in such a state that even the dealers are timid and all the business that has been done during the last week was buying by consumers who were in actual need of the metal. The market took an upward turn this afternoon and sales were made in New York at 36.15c., and consumers showed considerable anxiety to buy. The London market closed with spot tin selling at £164 10s. and futures selling at £164 7s. 6d. Sales amounted to 270 tons of spot and 520 tons of futures. The market was strong.

Tin Plates.—The market continues quiet and there is talk in the trade of possible lower prices. The high price of pig tin, however, would seem to discourage any movement in that direction. The price for 100-lb. coke plates is $3.84.

Lead.—Lead is firmer, and a good demand has developed. Large contractors are the principal buyers. It is evident that a great deal of outdoor contracting has been done during the last few weeks because of the open weather. The St. Louis market is firmer than it has been in some weeks and sellers there are asking 4.27½c. The leading interest seems to control the situation here by holding the metal at 4.40c., while outside interests are quoting up to 4.45c.

Spelter.—Buyers are taking spelter only as they need it, but sellers are holding the price decidedly firm at 5.60c. If any buying movement develops it is probable that the price will be advanced.

Antimony.—Antimony is very quiet. Cookson's is selling at 8.15c., Hallett's at 7.75c. and Chinese brands are being offered at 7.40c. to 7.50c., while Hungarian grades can be had as low as 7.12½c.

Old Metals.—The market is much stronger. Dealers' selling prices are as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, October 25.—The liberal buying of copper by large consumers and other conditions in the trade have made the market firm at the prices quoted last week. Tin continues very erratic. Lead is reported a little firmer at East St. Louis without any change in the Chicago market. Spelter is advancing; close observers of the market express the opinion that the price is being manipulated, as reports of actual production do not confirm the rumors of decreased output. The spread between spelter and lead is considered abnormal, as an indication that the advance is not due wholly to consumptive demand. We quote Chicago prices as follows: Casting copper, 12⅞c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c., higher; pig tin, carloads, 37c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.60c. to 5.65c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10⅝c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, October 24.—Lead is firm at 4.25c.; spelter is strong and higher at 5.50c. to 5.60c., both East St. Louis. Zinc ore is excited and higher, being quoted at $43 to $44 per ton, Joplin base. Tin is quoted at 37.85c. per pound; antimony (Cookson's), 8.50c.; lake copper,

13.35c.; electrolytic, 13.32½c., all at St. Louis. The demand for finished metals showed some improvement over the previous week, though business for this month is not equal to September. Some increase in railroad buying is noted.

Iron and Industrial Stocks

NEW YORK, October 26, 1910.

The stock market maintained its strength and iron and industrial stocks steadily advanced until Monday, when some setback occurred. A notable exception to the general advance was Sloss-Sheffield common, which experienced a sharp decline. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	10 - 10¼	Pressed St., pref..	95¾- 96
Allis-Chalm., pref..	33 - 33½	Railway Spr., com.	35 - 37
Beth. Steel, com...	29½- 34⅞	Republic, com.....	33¼- 35⅝
Beth. Steel, pref..	60⅝- 64½	Republic, pref....	96⅛- 97⅜
Can. com.....	9 - 9¾	Sloss, com.....	50½- 57⅝
Can. pref.....	70 - 74½	Pipe, com.....	17 - 18½
Car & Fdry, com..	52½- 55¼	Pipe, pref.....	55⅝
Car & Fdry, pref.....115		U. S. Steel, com...	75¾- 79⅞
Steel Foundries...	45¾- 49⅞	U. S. Steel, pref...119 - 120⅝
Colorado Fuel.....	33½- 35¾	Westinghouse Elec.	71 - 75½
General Electric...	154 -156½	Va. I., C. & C.....	54 - 55
Gr. N. ore cert....	58½- 61⅝	Am. Ship, com.....	781- 79½
Int. Harv., com...108½-114¾		Am. Ship, pref....108½-110
Int. Harv., pref...123½-124½		Chi. Pneu. Tool...	40½- 42
Int. Pump, com...	43½- 44½	Cambria Steel.....	43⅞- 45
Int. Pump, pref.....	84*	Lake Sup. Corp...	23⅞- 25¼
Locomotive, com..	40 - 42	Pa. Steel, pref....106½-110
Locomotive, pref.....106		Warwick	54 - 55
Nat. En. & St.,com.	17⅝- 18	Crucible St., com...	127⅝- 133⅛
Nat. En. & St.,pref.	60½- 62¼	Crucible St., pref..	78⅞- 80½
Pressed St., com..	34½- 35⅞	Harb.-W. Ref., com.....	32

* Ex dividend.

Dividends.—The Warwick Iron & Steel Company has declared a semiannual dividend of 4 per cent., an increase of 1 per cent. over the last declaration, payable November 15. The policy of the company heretofore has been to place all its surplus earnings over and above 6 per cent. per annum into a fund for operating expenses, which policy was adopted until a fixed amount had been set aside. This now having been done it was decided to increase the dividend.

The Cambria Steel Company has declared the regular quarterly dividend of 1¼ per cent., payable November 15.

The American Steel Foundries has declared 1¼ per cent. regular quarterly dividend, payable November 15.

The United States Steel Corporation has declared the regular quarterly dividends of 1¾ per cent. on the preferred stock, payable November 29, and 1¼ per cent. on the common stock, payable December 30.

The Attorney General of the United States has announced that he will not make any report on the United States Steel Corporation under the Stanley resolution until the Supreme Court has decided the Standard Oil and American Tobacco cases in which the validity of the laws affecting large corporations is involved. He states that after receiving the court's instruction of the laws he can make a definite and intelligent report on the questions raised.

The Canton Sheet Steel Company, which began the construction of a rolling mill at Canton, Ohio, in May, 1910, expects to have the works completed and ready for operation in November. The plant is being equipped with six sheet, six pair, and six annealing furnaces, five 38-in. hot and one 44-in. and four 24-in. cold trains of rolls, and three shears. It will have an annual capacity of about 20,000 tons of black and galvanized sheets.

The recent annual dinner of the Comité des Forges de France, Paris, was made the occasion of paying a tribute to Pierre Martin, one of the pioneers in the introduction of the open hearth steel furnace. It had been ascertained that M. Martin was in straitened circumstances, and an international subscription was started, the total contributions amounting to over £8,000.

The Bethlehem Steel Company, South Bethlehem, Pa., states that no definite plans have yet been made in regard to extensions or improvements in 1911. Reports have been in circulation that the company would expend $5,000,000 in new construction next year, including blast furnaces, coke ovens, &c.

The Desirability of Uniform Statutes Affecting Corporations

An address on the timely subject of uniform Statutes affecting corporations was delivered by A. Parker Nevin, general counsel of the National Association of Manufacturers at the annual convention of the American Hardware Association, at Atlantic City, on October 19. Mr. Nevin stated that the fact that over 400,000 corporations had been organized in America was conclusive proof of the permanency of the corporation as the normal vehicle for American business enterprises. He laid stress on the fact that the regulation of the ordinary business corporation was purely a State right, and that the difference in the statutes affecting corporations arose from the State policy on this subject, which was entirely within their inherent rights.

The value of Federal charters, he said, was somewhat overestimated, as it would not obviate many of the objections claimed. The dissimilarities and general chaos among the States, with respect to their statutes regulating the incorporation and organization of business companies, was a curious comment on our jurisprudence. The most sensible, direct and practical method to overcome the disadvantages of conflicting statutes was to secure a uniform statute for the States to adopt as soon as possible.

He paid high compliment to the work of the Uniform State Law Commissioners, who now have a draft for a uniform incorporation act under preparation. He added that the National Association of Manufacturers has a standing Committee on Uniform State Law, which is acting in cordial co-operation with the commissioners, and has rendered them great assistance in their work of constructive State legislation along uniform lines.

The E. W. Bliss Company, Brooklyn, N. Y., has received at the Brussels Exhibition the highest awards and grand prize, thus denoting the high standard of its machinery. The company's exhibit was a large one, as will be observed by referring to the description published in *The Iron Age* of August 18.

The Chilean Government has decided to postpone until December 30 the time for the opening of bids for the construction of two battleships of 24,000 tons. American and German shipbuilding interests had requested the postponement from October 30, the date set for the opening of tenders.

O. A. Blackburn, vice-president of the Sharon Steel Hoop Company, Sharon, Pa., has sold his stock to Frank H. Buhl and others of Sharon, Pa., and will retire from the company November 1. He has made some plans for future business connections, but these are not ready to be announced.

Practically the entire corporation tax, for the year, exceeding $27,000,000, has been collected by the United States Treasury Department. The officials declare that it was collected with less annoyance and was paid apparently with less reluctance than any other internal revenue tax imposed.

About 1500 boilermakers in the Pittsburgh district who have been on a strike since August 1 have returned to work. The inside boilermen have been given an advance of about 5 per cent. in wages and the outside men 10 per cent.

Orders have been placed by the Jones & Laughlin Steel Company with the Cutler-Hammer Electric Company, Milwaukee, Wis., for two 50-in. lifting magnets to be installed at the Aliquippa plant.

The Machinery Markets

The convention of the National Machine Tool Builders' Association, now in session in New York, is attracting much attention in the machinery trade. Persons interested in all classes of machinery equipment are in attendance, with a view to getting a line on the machinery outlook. The machine tool men in general report a very good business, and manufacturers of automatic equipment, as well as makers of lathes and planers, are as a rule behind in their orders. It is the consensus of opinion among machinery men in attendance that a good winter's business is in sight, and most of those whose shops are up to date, as far as deliveries are concerned, declare that they are making machines for stock with a view to a good future business. In the general trade the railroads are becoming more active. The Baltimore & Ohio Railroad is out for a fair sized list of machinery, and a large order has been placed by the Missouri Pacific Railroad. There is renewed activity in the trade in Detroit and a steady influx of orders, especially for gear cutting machinery, and automatic screw machinery is coming into that market. The Chicago market has been enlivened by railroad buying, and a list from the Wabash Railroad is out in St. Louis. There is increased activity in the South and in the Northwest. In the latter territory power plant equipment is in especially good demand. A single tool business is being done in Philadelphia and Cleveland, but there are good inquiries in both those markets. Reports from Cincinnati show that the outlook is becoming brighter there, and dealers in railroad supplies are stocking up in anticipation of a good buying movement. The export business is especially good.

New York

NEW YORK, October 26, 1910.

Business in the New York machinery market is only fairly good. One large New York machine tool house booked an order for an extensive line of machine tools for the Missouri Pacific Railroad, but beyond that there has been very little buying. Inquiries that have been made in this market during the last four weeks, which should result in buying, have not materialized as far as orders are concerned. It is a noticeable fact that many of those inquiring for small lots of new tools have compromised by purchasing second-hand equipment. If only a small proportion of the inquiries now before the trade result in business some good buying should ensue within the next two weeks, but most dealers are somewhat doubtful as to the intention of the inquiries. The fact that there is such a good volume of inquiries and such a small volume of business is taken to indicate that manufacturers in general are holding off because of the tightness of the money market. They seem willing enough to buy and their inquiries indicate that they need equipment, but they are timid about spending the money. Machinery dealers in general are also a little wary about extending credit. On the whole, if manufacturers would take a more optimistic view of the business situation there is no doubt that a good buying movement would result. This condition is not true in all branches of the machinery trade, as there are some lines in which manufacturers are especially busy. Dealers in electric motors and small power plants have enough to do while the market in heavy power equipment is being neglected. Manufacturers of cranes are reporting a lull in business, but, on the other hand, manufacturers of coal handling equipment and contractors' machinery, such as hoisting engines, dredges and the like, are as busy as they have been at any time this year. This "spotty" condition of trade makes it hard to sum up the real situation.

The affairs of the Commercial Iron Works of Penn Yan, N. Y., whose plant on Lake street was destroyed by fire several months ago, with the exception of the molding room, are being reorganized and the plant will be rebuilt. A new company has been formed and will be incorporated at once with a capital stock of $30,000, under the name of the Commercial Iron Works Company. Among the directors are Wm. M. Patterson, Wm. N. Wise and Wm. T. Morris.

The Augustine Automatic Rotary Engine Company, Buffalo, N. Y., is having plans prepared for extensive additions to its plant at Elmwood avenue and the Erie Railroad. Two buildings will be erected at once—a power house, 50 x 50 ft., two stories, and a factory wing, 35 x 100 ft., three stories, and in the near future two other factory buildings, 35 x 250 and 35 x 350 ft., three stories, will be built; construction, reinforced concrete; cost, approximating $100,000.

The Geo. A. Otis Company, 818 Main street, Buffalo, N. Y., manufacturer of beds, will build a two-story brick factory at Florida and Jefferson streets.

The Globe Elevator Company, Buffalo, N. Y., whose grain elevator at Niagara and Wayne streets and the Michigan Central Railroad was completely destroyed by fire recently, will build and equip a new elevator and mill on the Erie Railroad, extending from Kentucky street to Tennessee street. Entire equipment of new elevating and milling machinery will be required. Millard P. Ryley is president. General offices, 722-723 Chamber of Commerce Building.

The Loeser Bros. Company, 330 Howard street, Buffalo, N. Y., dealer in scrap materials, will erect a two-story and basement warehouse, 82 x 97 ft., at Depew, N. Y., with New York Central Railroad switch connections. Some equipment will be installed in the way of presses, baling machinery, elevators, &c.

Plans are being prepared by State Engineer Frank M. Williams, Albany, N. Y., for a steel bridge to be constructed over the Erie Canal at South Washington street, Rome, N. Y.

The Frisbie-Stansfield Knitting Company, Utica, N. Y., will erect a four-story and basement factory, 54 x 154 ft., with power house 35 x 45 ft., on a site recently purchased at South and St. Vincent streets, that city.

The Atlas Works of the Standard Oil Company, Buffalo, N. Y., is adding a one-story brick flange shop to its plant on Elk and Babcock streets and the Buffalo Creek Railroad.

The New York Construction Company, 1328 Broadway, New York City, were low bidders, at $11,524, for the electric work and feeder cable for the power house equipment for the New York State Training School for Girls at Hudson, N. Y.

The Seneca Power Company, Baldwinsville, N. Y., will erect and equip a power house 50 x 80 ft., one story, of brick construction.

The city of Rochester, N. Y., is having plans and specifications prepared for a refuse incineration plant, the erection of which is contemplated in the near future.

The Bingham Trunk Company, Buffalo, N. Y., is building a two-story factory and warehouse adjoining its present location at Mechanic and Baker streets.

The Iroquois Brewing Company, Buffalo, N. Y., is building a $150,000 addition to its plant on Pratt street for stockhouse and bottling works. Considerable new equipment will be required.

The business of the Fillmore Avenue Foundry & Iron Works is increasing so rapidly that further facilities in buildings and equipment are to be provided at once, in addition to the building improvements completed this summer. Lyman P. Hubbell, president, Fillmore avenue and Pennsylvania Railroad.

The J. W. Storandt Mfg. Company, now located at 322 St. Paul street, Rochester, N. Y., has purchased a site on Lyell avenue, on which it will erect a factory for the manufacture of showcases.

Plans have been completed for the building of a power plant on Buden's Pond for Wm. C. Geer of Troy, N. Y., to furnish power for the operation of the plants of the Troy Knitting Company and the Albia Box & Paper Company, both of which are located on Pawling avenue. A 42-in. steel flume will be constructed.

The Aluminum Casting Company is adding to its foundry plant at Elmwood and Hertel avenues and the Erie Railroad, a power house and heating building, brick and concrete construction.

THE MACHINERY MARKETS

Chicago

CHICAGO, ILL., October 25, 1910.

The machinery market has been quiet the past week. There is a fair amount of current business, especially in second-hand tools, and some of the houses which handle special lines have done better than the average. There are signs of more activity among the railroads. Several small lots of tools have been purchased recently by large railroad systems and dealers have hopes of a buying movement in this quarter that will add considerable strength to the market.

There is more or less complaint of collections being slow in the machinery trade. Where sales have been made on 30 or 60 days' time, buyers are often taking a month or two longer. A slight change in conditions in this respect makes a great difference in the finances of the machinery dealer as he operates on a small margin of profit and machine tools run into large amounts of money. If the buyers who want additional time would give notes the situation would adjust itself, as the dealer would have no difficulty in discounting good paper of this character at his bank. The best class of buyers, however, are reluctant to give notes, and it is a delicate matter for the dealer to crowd them, especially when they are regular customers. Hopes are expressed in the Chicago trade that the manufacturers at their annual convention may be able to make substantial progress on the question of credits in the machinery trade.

The Atchison, Topeka & Santa Fé Railway has recently purchased a small lot of tools, amounting to about $15,000, without sending out a general list to the trade.

The Lake Shore & Michigan Southern is reported to have made an initial purchase of about $25,000 worth of tools for the new Elkhart shops, but Chicago houses were not given an opportunity to figure on the business, which was closed at Cleveland.

The Baltimore & Ohio is in the market for a small list of tools amounting to $10,000 to $15,000.

The Pennsylvania Railroad, which issued a large list last summer covering tools wanted for various shops on the system, apparently has never closed for the entire list, having made only a few small purchases of equipment that was urgently required.

Reports that the Missouri Pacific has closed on the large list issued by that company some time ago are in line with expectations of greater activity among the railroads, but it does not appear that the bids of Chicago dealers have been accepted on the Missouri Pacific list.

The branch office of the H. A. Stocker Machinery Company in Milwaukee has been opened in the Merrill Building, in that city. It was announced some time ago in this correspondence that this company would open a Milwaukee branch, in charge of Robert C. Tate.

The Bishop-Eberle Mfg. Company, St. Louis, Mo., manufacturer of Security steel furnaces, sheet iron air tight heaters, tinware and metal specialties, has recently completed at New Athens, Ill., a new factory building 60 x 120 ft., for which the entire equipment has been purchased.

Voltz Brothers, Chicago, manufacturers of carriages, have plans prepared for a two-story factory building, 50 x 103 ft., to be erected on Forquer street, near Halstead street.

The Goss Printing Press Company, Chicago, has plans prepared for the erection of a two-story addition, 64 x 208 ft., to its plant at Fifteenth street and Ashland avenue.

The La Crosse Hay Tool Company, Chicago Heights, Ill., advises that its recent increase in capital stock from $100,000 to $200,000 was not made for the purpose of making improvements immediately.

The Wilson Machine Company, Des Moines, Ill., has purchased the plant of the Crescent Furnace & Foundry Company of that city, which it will incorporate under the title of the Wilson Foundry Company, with a $10,000 capital stock.

The National Lock Company, Rockford, Ill., advises that its recent increase of capital stock from $150,000 to $250,000 was for the purpose of extra working capital.

The Clinton Gas & Electric Company, Clinton, Ill., is erecting a new addition to its engine room 45 x 72 ft., which will be equipped, when completed, with two new Murray-Corliss 400-hp. engines, direct connected to two 3-phase, 60-cycle, 1100-volt generators, with 200-kw. capacity. A new switchboard will also be installed. In addition to this the company is erecting a new smokestack of reinforced concrete construction, 131 ft., with a 9-ft. base and a 7-ft. top. The company has recently installed two new Sterling boilers, and two more will be installed early in the spring, replacing the old boilers now in use.

The Marseilles Mfg. Company, Marseilles, Ill., has increased its capital stock from $250,000 to $750,000 and will hereafter be known as the Marseilles Company. The company has moved its general offices and works to its new plant at East Moline, Ill., which is now in operation. It represents an investment of more than $500,000 and is equipped in every detail with every possible modern appliance for rapid, accurate and economical manufacture. In addition to other agricultural machinery it will manufacture the Success manure spreader.

Philadelphia

PHILADELPHIA, PA., October 25, 1910.

Merchants report a somewhat better volume of business. While there has been no important fresh demand, they have been sucessful in closing up some of the propositions which have been pending for some time. Transactions have been of the single tool character and cover a pretty fair range of the usual standard tools, generally in medium sizes. Milling machines have probably had the more extensive sale, both for early and near future delivery. From the manufacturers' standpoint the market shows but little change; the demand is still scattered and while plants continue to be operated on an even basis, stocks of tools are increasing and in instances a more pronounced effort to market some lines is noted. As far as inquiries are concerned, very little betterment is reported; in few instances quotations for certain equipment are being quietly asked, but there is little of importance on which prices have openly been requested. Immediate business on the part of the railroads is still dull, although a more hopeful feeling in reference to the railroad situation is to be noted. If the expected buying movement in the near future on the part of the railroads develops, it is believed that it will extend to requirements in the way of machine tools and shop equipment, while more active conditions in the iron and steel trade generally would result in a better demand for tools on the part of industrial establishments generally.

Manufacturers of special tools report a fair inquiry with moderate resulting orders, which come out irregularly, however, and, while better than last month, are still below the average. Export business is still very light.

The demand for second-hand tools, machinery, boilers and engines continues to drag. Sales are irregular and confined to no particular line. That for second-hand engines is the least active. Manufacturers of the larger power equipment have a fair amount of inquiry pending, but report that it is difficult to close.

Very little change is to be noted in the foundry trade. The demand for machinery castings is light, although a moderate amount of general and municipal work is pending. Steel casting plants report conditions unchanged, with little inquiry of an important nature.

The Bethlehem Steel Company, Bethlehem, Pa., has, it is reported, awarded a contract for the erection of an addition to its projectile plant to H. E. Havens, of this city.

The National Water Power Company has been chartered under the laws of the State of Delaware, with a capital of $500,000, to construct windmills, waterwheels and motors of various descriptions. The incorporators are Walter H. Fieroe, John W. Fieroe and M. Beyer of Atlantic City, N. J., and H. W. Davis of Wilmington, Del.

Revised plans for the proposed addition to the Union League have been prepared and estimates for the construction are now being taken. The addition will be eight stories, 100 x 113 ft., of steel and stone construction, conforming with the addition recently completed.

Operations on demolition of a number of dwellings at Twelfth and Wood streets have been started to provide for the erection of a large commercial building to be built on the site, which measures 72 x 200 ft., for the Smaltz-Goodwin Company. The John Bird Company has the contract.

The Department of Docks, Wharves & Ferries, city of Philadelphia, contemplates the purchase of an additional ice boat for harbor service. City Councils have approved the department's budget for next year, including $250,000 for a new ice boat, to replace one of the older type now in service.

The Reading Steam Heat & Power Company, Reading, Pa., has made a number of improvements to its plant during the summer months. Its service line in that city has been extended and a number of automatic stokers and other facilities added to its plant.

The Temple Iron & Steel Company has been incorporated under the laws of the State of Delaware, with a capital stock of $500,000, to manufacture iron and steel. The incorporators named are Alfred J. Gemmer, W. H. Fleming and W. M. Davis, Philadelphia, Pa. Particulars regarding this company are not available at this time.

Plans have been outlined for the abolishment of a large number of grade crossings in the southern section of the city, and are now under consideration by the Pennsylvania and Baltimore & Ohio Railroads and city officials. They in-

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clude the elevation of the tracks of the former company's road on Washington avenue west of Broad street; the extension of the Belt Line along the Delaware and Schuylkill rivers, and the elevation of a number of the branch roads in the lower section of the city, which have been a detriment to the growth of that section. An ordinance covering a large amount of the proposed work is in the course of preparation and will later be presented to city councils for action.

Dienelt & Eisenhardt, Inc., is very busy in all departments. Recent orders for some of its specialties have been numerous, including among others orders for 24 special bag machines, 4 special dead stroke hammers and a large Lovekin pipe expanding machine for Detroit, Mich., parties. Owing to the inactivity of the railroads the demand for hydraulic jacks is reported light. Shipments against orders go forward steadily. This concern has recently purchased additional machine tool equipment and has sufficient business on its books to keep the plant actively engaged for many months.

The Eastern Light & Fuel Company is taking proposals for the erection of a building, 70 x 111 ft., two stories, to be erected at Glassboro, N. J., for use as a gas manufacturing plant. This plant will be used as a central producing station for its extensive system in South New Jersey, embracing service to 27 towns. It will have a productive capacity of 1,200,000 cu. ft. of gas per day, working under the high-pressure system. A gas holder of 1,000,000 cu. ft. capacity, is in course of erection. Its general requirements in the way of equipment have been provided, although additional needs are anticipated in some directions.

The Standard Pressed Steel Company reports a large number of orders, but as a rule they are small individually, customers buying from hand to mouth rather than carry any material stock. There has been a very good demand for export trade in pressed steel shaft hangers and good orders from Holland, Sweden, France, Australia and South America are to be noted. The demand for countershaft hangers is easier. All departments of this concern's plant are being operated at full capacity with considerable business ahead.

To provide for expansion in its operations the Schade Valve Mfg. Company, now located at 56-58 North Second street, Philadelphia, Pa., has increased its capital stock. After alterations are completed the company will move to its new property at American, above Cumberland street, which it recently acquired. With the increased shipping and storage facilities the company will be in a better position to handle its growing business.

New England

BOSTON, MASS., October 25, 1910.

Manufacturers of heavy machinery state that inquiries received during the week indicate an increased interest on the part of the railroads, and the expectation is that they will be much more conspicuous in the market in the immediate future. The Boston dealers have experienced no change in conditions. The business transacted has been for small lots and single tools. The boiler manufacturers report a market having little business in sight, but qualify the statement by the reminder that the same condition existed a year ago this time, which was soon followed by a season of exceptional activity. The consensus of opinion among the machinery people, and those of allied industries, is that improvement is to be expected from now on. The difference of estimate is as to the degree of improvement.

The Hendey Machine Company, Torrington, Conn., is building a new erecting shop, 100 x 160 ft., one story, with saw tooth roof, and a storehouse, 60 x 120 ft., four stories. The company is now employing close to 700 men. With these buildings over 220,000 sq. ft. of floor space has been added in a little more than 10 years.

The wire industry of Worcester, Mass., is prosperous. The plants of the American Steel & Wire Company are operating at about 80 per cent. capacity, with a lively demand for specialties, including springs, electric cable and wire rope, but with a lesser demand from the general manufacturing trade for those products which they consume in large quantities. The plant of the Morgan Spring Company is operating at full capacity, and those of the Wright Wire Company and the Spencer Wire Company at about 90 per cent., the latter's figures being perhaps a little better than this. As a rule orders are not large, but their number cause the total to reach excellent figures. Deliveries are better, however, the accumulations of orders on the books having diminished materially. No great amount of new building or other extensions are planned. The Spencer Wire Company is adding a watch spring department, which will require some extension of the works. This company has just acquired another considerable tract of land adjacent to its Worcester property, which will permit of large growth later.

The report of the last four months of the employment department of the Boston Branch, National Metal Trades Association, shows some very slight improvement in September as compared with August. In June there were 312 applications, 172 men were sent to employers and 132 were hired. In July of the 381 applicants, 254 were sent and 162 hired. In August the applicants dropped to 338, and 194 were sent and 65 hired. September showed that 392 applicants were registered of whom 202 were sent and 91 hired. While quite a number of men are out of employment in Boston and the metropolitan district, the percentage of high-class mechanics is small. The United Shoe Machinery Company and others have absorbed most of the good men who became idle because of the absorption of the Wonder Worker Machinery Company by the United Company.

The plans of the New London Ship & Engine Company, New London, Conn., are being carried along rapidly. The enterprise will occupy the plant recently the property of the Eastern Shipbuilding Company, Groton, Conn., directly across the river from New London. Work on a new machine shop is beginning. The building will be 114 x 164 ft., two stories, of steel and brick with concrete foundations. Other buildings are planned, but details are not entirely decided upon. The formal organization has been effected. Laurence Y. Spear, Mattapan, Mass., is the president; Frank T. Cable, Wallaston, Mass., and Thomas A. Scott, New London, vice-presidents; George C. Davison, Hingham, Mass., secretary and treasurer; Frank L. Brake, Wollaston, assistant treasurer. Isaac L. Rice, New York, is chairman of the board of directors, which consists of Elihu B. Frost, Stacy C. Richmond, Henry K. Carse and William H. Reeves, New London, and Messrs. Scott, Reeves, Spear, Cable and Davison. Mr. Rice is president of the Electric Boat Company, New York, builder of submarine boats, and Messrs. Spear, Cable and Davison are the practical men, and are now located with the Fore River Shipbuilding Company, Quincy, Mass. The business will be closely identified with the Electric Boat Company and its allied interests. The statement is made that all interior machinery for submarines now building by the Electric Boat Company for this government and those that may be contracted for in the future will be produced at the Groton works, together with submarine machinery for other governments, including existing contracts with the British government. Torpedoes of a new design will be manufactured, and a new oil burning combustion engine of German design.

The Oven Equipment & Mfg. Company, Stamford, Conn., manufacturer of sectional ovens and inclosed flame gas burners, has increased its capital stock from $100,000 to $200,000, the new funds to be used for the extension of the business.

The Hendey Machine Company, Torrington, Conn., has brought out a new threading attachment for lathes, the purpose being to procure rapid thread cutting. It will permit of thread cutting on work held between centers of maximum lengths of 16¾ in. in 14-in. machine with 6-ft. bed, 34½ in. in 16-in. lathe with 8-ft. bed. and 32¼ in. in 18-in. machine with 8-ft. bed.

John J. Adams, Worcester, Mass., manufacturer of cutting dies and machinery and doing a general machinist's business, is putting in the foundations for a shop building at Mechanic and Mercantile streets and will complete the structure next spring. The building will be 75 x 115 ft. and five stories. Mr. Adams will not occupy the entire edifice in the beginning and will rent it for industrial purposes. When he has moved new equipment will be required.

The Connecticut Clasp Company, Bridgeport, Conn., is erecting a factory building, 40 x 66 ft. and three stories, which will be used for increasing the manufacturing capacity. The company produces corset clasps.

The Capewell Horse Nail Company, Hartford, Conn., manufacturer of horseshoe nails, will erect an addition immediately, to be 40 x 64 ft. and one story. The continuous growth of the business, which is increasing rapidly this year, has made it necessary to secure enlarged facilities, and further additions are planned for next spring.

The site of the new plant of the Baird Machine Company, Oakville, Mass., will be in West Stratford, Conn., an immediate suburb of Bridgeport, where 10 acres of land have been acquired.

The Swift River Box Company, North Dana, Mass., which was burned recently, will rebuild. The mills of the Fabyan Company, Stafford Springs, Conn., were burned October 18, with a loss exceeding $75,000. The statement is made that they will be rebuilt. The plant of the Connecticut Glue Company, Danbury, Conn., a subsidiary company of the American Hatter & Furriers Corporation, was destroyed by fire October 20, with a loss of $150,000. The Judson L. Thompson Mfg. Company, Waltham, Mass., will build an addition 48 x 80 ft., one story and basement. The chemical plant of the Frost Finishing Company at West Barrington, R. I., will be rebuilt in that town unless the protest of townspeople prevail.

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Cincinnati

CINCINNATI, OHIO, October 25, 1910.

The general business outlook is becoming brighter. Within the past few days two of the larger trunk line railroads have made purchases of machine tools on lists that have been held up for some time. Only a few firms here received any of this business, but the fact that it was placed shows that the railroads are gaining confidence and that the long expected buying movement may begin at any time. Manufacturers and dealers in railroad supplies are also stocking up in anticipation of a general opening up of business from their railroad customers.

The foundry interests appear to be overcoming their timidity about the future and those who are not now operating up to capacity are quietly preparing to take care of business which they seem to feel sure will commence to come in right after the November elections.

A large number of local machine tool builders are attending the National Machine Tool Builders' Association meeting in New York this week, and judging from the expressions made by some of the leading members before leaving among the numerous reforms that an effort will be made to bring about, will be the insertion of a noncancellation clause in all machine tool contracts.

Woodworking and sawmill machinery moves slowly. Few large plants are being erected and only the smaller machines are in demand.

Local boilermakers report a decided improvement, but state a large part of their present work is for repair jobs.

The Cincinnati Iron & Steel Company, Cincinnati, confirms the published report that it has leased the Union Sheet & Tin Plate Company's plant at Marietta, Ohio. The mill will be started up at an early date rolling merchantable sizes of sheets.

The Seinsheimer Paper Company, Cincinnati, has had plans prepared for a reinforced concrete warehouse which will have two stories and a basement and will measure about 175 ft. square. The estimated construction cost is nearly $50,000.

The John J. Bruce Company's foundry on Colerain avenue, Cincinnati, is operating up to capacity. The company makes a specialty of railroad castings.

The Tudor Boiler Mfg. Company, Cincinnati, was the successful bidder for furnishing and installing four 150-hp. boilers in the City Hall. This company reports its business for September as being better than any month for over two years. Orders received are principally from Cincinnati and nearby customers.

The Machine Parts Company has been incorporated at Elyria, Ohio, with $125,000 capital stock, by O. G. Dunn, J. S. George, W. T. Parsch and J. W. Parsch. No building plans have yet been announced.

The Proctor & Gamble Company is increasing the capacity of its power plant, and is also adding to its machine shop at Ivorydale, Cincinnati suburb.

The Cincinnati Iron & Steel Company reports its machinery business as being very good. Recent orders include a number of its 14-in. lathes, to be shipped to Canada; a 5-ton hand-power crane, for the W. G. Duncan Coal Company, Greenville, Ky.; a four-motor, 10-ton crane, for the Victor Safe & Lock Company, Cincinnati; a 14-in. lathe, for F. W. Perkins, Malone, N. Y., and a Cisco lathe, for the Pfau Mfg. Company, Cincinnati.

The Standard Glass Block Company has been incorporated at Frankfort, Ky., with $200,000 capital stock for the purpose of manufacturing glass blocks. The incorporators are F. J. Arbogast, George C. Shaw, C. E. Collins and S. F. Hoge, all of Frankfort.

The Phillips Sheet & Tin Plate Company, with plants at Clarksburg and Weirton, W. Va., has increased its capital stock from $2,500,000 to $5,000,000.

Work has commenced on the new steam shovel shops of the Marion Shovel & Dredge Company, Marion, Ohio, recently mentioned. The Bellefontaine Bridge & Steel Company, Bellefontaine, Ohio, has contract for the structural steel work. There will be three buildings in all.

The city of Columbus, Ohio, awarded contracts last week for the equipment to be installed in the Scioto River pumping station. The Platt Iron Works Company, Dayton, Ohio, will furnish two motor-driven centrifugal pumps, one of 20,000,000 gal, daily capacity, and the other 5,000,000 gal. capacity. The Burke Mfg. Company, Erie, Pa., obtained the order for two 250-hp. synchronous motors to drive the pumps. The installation work will commence as soon as this equipment can be delivered by the manufacturers.

The Independent Steel Company of America, Kenova, W. Va., is contemplating the installation of a heating system to take care of eight buildings, for which considerable equipment will be required. It is investigating the vacuum system of direct heating and also the fan blast system. The contract is expected to be let at an early date.

The Pfau Mfg. Company's Norwood plant is operating to full capacity, but is unable to keep up with orders coming in for its line of plumbing equipment and supplies.

Plans have been completed for the two-story addition to the plant of the F. B. Richter Company, Cincinnati, recently mentioned, but the actual work of construction will not be commenced before the spring season. The company manufactures engineers' and plumbers' specialties.

The United States Coupling Company, Columbus, Ohio, recently incorporated, advises that it will not erect a factory at present for the manufacture of its uniform compression pipe couplings, but that it expects to make the coupling of pressed steel, at which time it will probably erect a new plant.

The business of the Ripley Foundry & Machine Company, Ripley, Ohio, has been incorporated with $10,000 capital stock. The company has an established business and does not contemplate making any improvements at the present time.

The Norwalk Drilling Tool Company, Norwalk, Ohio, has been organized and a very complete equipment secured for the manufacture of drilling and fishing tools for oil, gas and artesian well drilling. James Cavanaugh is general manager and expert mechanics have been engaged in every department. This company has no connection whatever with any company or individual previously engaged in this business in Norwalk.

The Champion Iron Company, Kenton, Ohio, has been awarded the contract for the construction of 130 new cells at the Ohio Penitentiary, the contract price being $37,254.

Cleveland

CLEVELAND, OHIO, October 25, 1910.

While the local machinery market is not showing a great deal of life the demand is somewhat more active than a month ago and the outlook shows some improvement. Orders for machine tools are very scattered and are almost entirely for single tools or for small lots. Most of this business is coming from larger manufacturing plants or from new concerns that are starting small plants. Small machine shops that have been engaged largely in automobile work are not very busy at present and few of these are adding to their equipment. More new companies are being formed than for some time past to engage in manufacturing in metal working lines, and a more active demand from this source is expected shortly. General conditions among manufacturers show little change. While plants are not crowded with orders the majority are comfortably filled with work. The demand for gas engines is quite active. Makers of transmission machinery report a fair volume of business. In heavy handling machinery some good business is in prospect. The demand for electric motors in small sizes, which has been somewhat quiet recently, has improved during the past two weeks. There is a fair demand for good second-hand tools, but the number being offered to dealers is not large.

In the foundry trade the demand for small light gray castings continues fairly active and local jobbing foundries making that kind of castings are well filled with work, but the demand for medium and heavy castings is light.

With the object of securing new industrial enterprises for Cleveland 29 members of the Cleveland Chamber of Commerce, headed by D. T. Croxton, president of the Cleveland Furnace Company, have banded themselves together as a Committee on Industrial Development. This committee will make special efforts to secure plants in this city for the manufacture of products largely used here, but manufactured here only in a small way, if at all. The committee has found that the following products are not made in the city at all or only in small quantities, not sufficient to supply the local demand: Radiators, structural steel, tool steel, sheet copper, light boilers, light engines, manganese and vanadium steel castings, large valves and fittings.

Plans have been prepared for additions to the water works system in Cleveland and the Water Works Department of the city will advertise for bids shortly for the new equipment required. Two 25,000,000-gal. pumping engines will be purchased for the Kirkland pumping station, to replace the present two 15,000,000-gal. low duty engines. The plans also provide for the erection of a high pressure pumping station with four centrifugal units, with a capacity of 10,000 gal. per minute and a 270 lb. pressure. It has not yet been decided whether to install gas engines or electric motors for the 2000 hp. that will be required.

The Reliance Electric & Engineering Company, Cleveland, has received an order for 25 Reliance motors for driving machine tools recently ordered by the Chicago Railway Company. This is in addition to a contract for 105 motors

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for the same company, just completed. The Reliance Company has also just received an order for a number of Reliance adjustable speed motors for new threading machines to be installed in the addition to the tube mills of the A. M. Byers Company, Pittsburgh.

The Standard Welding Company, Cleveland, will in a few days occupy the addition to its plant, now under construction, which will give it 85,000 sq. ft. more of floor space, increasing its capacity about 50 per cent. The company reports a growing demand for tubing for various purposes, and this department of the plant is very busy. The steady growth of the motor truck business is noticed by the company in the recent large increase in orders for bands and other parts for commercial vehicles.

The Hill Clutch Company, Cleveland, recently received an order for some very heavy power transmission machinery, consisting of 8 and 10 in. rolling mill type of bearings, the English system of rope drives, shafting, couplings, &c., for installation in the H. P. Works of the American Steel & Wire Company in Cleveland.

The Buckeye Aluminum Company, manufacturer of aluminum kitchen ware, will move from Doylestown to Wooster, Ohio, having reached an agreement with the Board of Trade of the latter city to erect a new plant and agreeing to employ an average of 75 men for 10 years. The company will be given a factory site and a bonus of $12,000. The erection of the new factory will be started at once, and it is expected to have it in full operation by next April.

The Bruce-Macbeth Engine Company, Cleveland, reports recent sales as follows: One 75-hp. four-cylinder natural gas engine to the People's Milk Company, Buffalo, N. Y.; one 135-hp. four-cylinder producer gas engine, also fitted for gasoline, to the village of Salamanca, for the municipal water and light plant, this being the fourth order for engines for this plant; three 150-hp. four-cylinder natural gas engines, each to be direct connected to 100-kva. direct current generators, and one 35-hp. two-cylinder natural gas engine to be direct connected to a 25-kw. generator, to the County Commissioners of Mahoning County, Ohio, for lighting the jail and new court house at Youngstown, Ohio; two 80-hp. twin cylinder natural gas engines to the C. L. Flacus Glass Company, Tarentum, Pa., being the fourth order from this company; one 165-hp. four-cylinder producer gas engine, to be direct connected to a 100-kva. direct current generator, for the new lighting plant being erected by J. W. Ellsworth for the village of Hudson, Ohio; two 200-hp. four-cylinder natural gas engines for the Institute of Feeble Minded, Polk, Pa.; one 55-hp. two-cylinder natural gas engine for the Faultless Rubber Company, Ashland, Ohio; one 30-hp. producer gas engine to Prather & Niemeyer, Clear Spring, Md.; one 65-hp. four-cylinder producer gas engine to the Spanogle-Yeager Milling Company, Reedsville, Pa.; one 35-hp. two-cylinder natural gas engine to the National Glove Company, Columbus, Ohio; one 135-hp. four-cylinder natural gas engine, for belt drive to generator, to the Elmore Mfg. Company, Clyde, Ohio.

Anton Burchard, engineer, Cleveland, has prepared plans for a new plant to be erected by the Clarke Carter Automobile Company in Jackson, Mich., for which contracts will be placed shortly. A three-story brick building, 48 x 166 ft., will be built. As this company's product is an assembling proposition little equipment will be required outside of an elevator and heating plant.

The Suspension Roller Bearing Company, Sandusky, Ohio, has been incorporated, with a capital stock of $250,000, by E. A. Boyer of New York City and others. As a result of negotiations with the Sandusky Business Men's Association it is announced that the company will erect a large plant in Sandusky for the manufacture of roller bearings. A 10-acre site has been secured for that purpose.

The Forth Motor Car Company, recently organized by C. R. Forth and others of Mansfield, Ohio, has closed a deal to locate in Bucyrus, Ohio, taking over the steam shovel plant in that city. The company will do only assembling at the start, but expects to gradually work into the manufacturing end.

The International Store Service Company, which has taken over the patents of the Bilt-Rite Mfg. Company of Minneapolis, expects to establish a plant in Canton, Ohio, within the next month for the manufacture of a cash carrier system for use in stores. The company has a capital stock of $150,000.

The O. O. Poorman Machine Company, builder of sheet corrugating machinery, has moved from Dayton, Ohio, to a new plant that it has just completed in New Breman, Ohio.

Oscar Lear will build a two-story factory building at 288 East Long street, Columbus, Ohio, for the manufacture of automobile trucks.

The American Seeding Machine Company, Springfield, Ohio, will erect a new foundry building, 105 x 200 ft.

L. A. Cobb, president of the Columbian Hardware Company, Cleveland, has been appointed receiver of that company as the result of suit brought by a stockholder, the company consenting to the request. The company's plant will continue in operation.

The Champion Safety Lock Company, Geneva, Ohio, recently increased its capital stock from $75,000 to $100,000, to take care of extensive plant additions. It has also recently purchased a large adjoining plant, giving it about three times its present factory floor space, and is now laying this out for a large extension to its line of hardware.

Detroit

DETROIT, MICH., October 25, 1910.

The activity recently noted continues practically without abatement, and in some lines of the machinery trade there has been notable improvement within the past fortnight. Inquiries in general are also of a character to indicate that considerable further business may be looked for from the same or similar sources, so that manufacturers and dealers in these several lines anticipate a steady influx of orders for at least three or four months to come.

Despite the heavy purchases made last spring gear cutting machinery is being more generally called for than ever before, and while there is at present a decided preponderance of inquiries over orders, there are unquestionably a large number of bookings to be made by the first of the year. Automatic screw machines will also be needed in increasing quantities. One thing that holds back purchases on this account is the difficulty of securing skilled men for handling them, local papers being full of advertisements which meet with comparatively little response.

Just at present manufacturers, jobbers and dealers in various lines are looking to the upper peninsula for a good share of their trade, the activity there in new construction, equipment and other improvements being quite pronounced. Nearly all of the large mining companies are buying freely, and local foundries, machine shops, woodworking plants, &c., are deriving more of their supplies than ever before from Detroit and other cities of lower Michigan.

Spence Brothers, Saginaw, Mich., have been awarded the contract for erecting a three-story leather factory for the F. W. Carlisle Company of that city, which is to be equipped with the most modern machinery, including electric motor drive. It is probable that sprinklers and a very complete system of fire protection will also be installed.

A large new sawmill for the Geoffrey von Platten Lumber Company is nearing completion at Iron Mountain, Mich., and it is stated locally that this will be followed by the erection of a hardwood flooring factory.

Work has been started on a group of manufacturing buildings which will constitute the plant of the newly organized Pontiac Motor-cycle Company, Pontiac, Mich., of which Robert M. Brownson is president, James B. Book, Jr., secretary, and Harry L. Stanton treasurer.

Construction work is about to begin on a new two-story pumping station, 40 x 40 ft., for the city of Wyandotte, Mich.

It is reported from Marion, Ind., that the City Council has ordered the purchase of additional boilers and pumping machinery for the municipal water works system.

A five-story addition, 64 x 80 ft., equipped with power and woodworking machinery, will be erected by the Woodward Furniture Company, Owosso, Mich. It is stated locally that the extent and character of the apparatus required has not yet been fully decided upon.

The Detroit Metal Forming Company has been organized here and incorporated for $25,000. No plans have as yet been announced.

It is reported that Scherer & Wadsworth, Detroit, are about to let contracts for a three-story automobile factory, 64 x 400 ft. The details of the equipment have not yet been fully outlined.

Work has been nearly completed on the new power plant for the Chief Consolidated Mine Company, near Houghton, Mich. The boilers were recently placed on their foundations and heavy hoisting machinery is being installed.

The Nelson-Peterson Mfg. Company, Detroit, has doubled its capital stock.

A hydroelectric plant for power and lighting will be constructed in the near future by C. G. Hart, Honor, Mich. The plans are still to be worked out.

It is stated locally that the Detroit Dearborn Motor Car Company, Dearborn, Mich., is planning the construction of a manufacturing plant 45 x 300 ft.

It is reliably reported that not less than 100 of the new factory buildings of this city have been equipped with the Fenestra solid wrought steel window frames and sashes of the Detroit Steel Products Company's manufacture.

It is probable that the construction of a modern system

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of water works, including electrically operated pumping machinery, will be undertaken in the spring at Homer, Mich.

A pumping plant is to be installed at Painesville, Ohio, by the Lake Shore & Michigan Southern Railroad, to provide for watering locomotives and other service.

The Wolverine Aluminum & Brass Foundry Company, Jackson, Mich., has just completed the erection of a new foundry building containing six melting furnaces of the crucible type. The other equipment consists of an Adams molding machine, Hammer core machine, Wright band saw, Globe rattler, Sterling grinder and miscellaneous equipment.

The Ehinger-Vogt Company, Palmyra, Mich., has recently completed the construction of a new factory building which will be equipped with a blower system. Other equipment to be installed includes an automatic lathe and a power feed rip saw.

The Michigan Products Company, Grand Rapids, Mich., has moved into new and larger quarters on Market street, where it has better facilities for handling its order work of machined products.

The Northern Engineering Works, Detroit, Mich., is completing an addition to its crane erecting shop. The new building is approximately 60 x 160 ft., of fireproof structural steel and brick construction and having steel sash. Three cranes and two overhead trolley runs will serve the floor. Electric and pneumatic hoists will be used. The machinery has been installed and the building will be occupied this month. A new storage yard for structural steel has been laid out alongside the addition and is covered by a 60-ft. span three-motor electric Northern Gantry crane of special construction. The company reports the largest demand for its products in its history.

Pittsburgh

PITTSBURGH, PA., October 25, 1910.

In this district new projects are not as numerous as they have ordinarily been during the fall season and the orders now being entered are principally for the account of plant improvements. Machinery builders look more to other sections of the country for their business and in many cases their representation through branch offices or traveling salesmen is being materially strengthened.

The demand for machine tools, while not at all brisk, is better than it was a month ago. Boring mills, drill presses, shapers and planers have been quite largely called for of late and the use of milling machines, grinders, gear cutters, &c., is being extended. For lathes there has recently been about the usual inquiry ranging from small speed lathes up to engine lathes of the heaviest pattern. Indications now point to the fact that during the winter there will be more of the latter required in this district than at any previous time, owing to the improvements being made at plants where heavy machinery is built.

In respect to equipment for furnaces, ovens and mills, the situation is somewhat complicated. A few of the companies that depend especially upon this class of trade seem to be doing a very good business, while with others work is slack. A good deal of business is, however, in prospect, and the probabilities are that all of the principal manufacturers in this line will have about as much as they can do before many months have elapsed.

Dealers in various auxiliary apparatus, fittings, shop and foundry supplies, are having a good run of business and a relatively high level of prices is being maintained. Sales this year cover a wide stretch of territory and the demand appears to be very evenly distributed throughout the country. It has also been appreciably reinforced by orders for foreign delivery, the latter having come mainly through the large export and trading companies.

The Climax Box Company, Pittsburgh, has been incorporated by William Hoerl, W. L. Emmerick, L. Zaller and others, to establish and operate a box factory. No definite plans have, however, as yet been made public.

The Canton-Hughes Pump Company, Canton, Ohio, is installing a 6,000,000-gal. pumping engine at Bloomington, Ill., the contract having been taken in competition with the leading builders of such engines.

The Pittsburgh Coal Company, Pittsburgh, Pa., is letting contracts for the erection of a thoroughly modern steam power plant at Export, Pa.; also for the construction and equipment of a machine and forge shop to be used in repair work at one of its principal mines.

The Erie City Iron Works, Erie, Pa., has been awarded the contract for a 115-hp. four-valve engine, 24-in. single-suction volute pump and surface condenser, to be installed in the municipal power and pumping station at Jacksonville, Ill.

The Union Iron Works, Erie, Pa., has completed plans for a number of improvements which include the erection of a new office building. The contract for the latter has already been let.

The Erie Foundry Company, Erie, Pa., which does a large business in castings for the motor car trade, is making a specialty of finished automatic cylinders, and with the increased activity in this line prospects for the remainder of the fall and winter months are exceptionally good.

Improvements, including the erection of an additional shop, are being made to the plant of the Burke Electric Company, Erie, Pa. The demand for motors of the company's manufacture has been particularly strong this season.

The Reed Mfg. Company, Erie, Pa., is materially increasing its facilities for the production of vises, pipe wrenches, &c., a new three-story building being in course of erection.

The F. S. Love Mfg. Company, Johnstown, Pa., is extending its system of electric drive, the installation of some new machinery having recently been provided for.

The Ohio Valley Enamel Company has been organized at Pittsburgh, Pa., by H. Hindley, Joseph R. Paull and J. Barrier, to operate a plant for the manufacture of enamel and galvanized wares.

In connection with plans for the new electric power plant of the American Locomotive Works, Pittsburgh, as recently made, it is stated that the management has decided to eliminate, as far as possible, the use of all shafting, belting, &c., and to drive the machinery in future directly by means of motors. Several large lists for this purpose are expected to come out in the near future.

The Pittsburgh Machinery & Equipment Company, Fulton Building, Pittsburgh, now represents in Western Pennsylvania the following concerns: Erie Engine Works, Erie, Pa., builders of plain slide valve and automatic engines, boilers, and feed water heaters; Ohio Ceramic Engineering Company, Cleveland, Ohio, Lakewood concrete mixers, which replace the McKelvey mixer, buckets, contractors' cars, &c.; Davenport Locomotive Works, Davenport, Iowa, narrow and standard gauge locomotives, and National Hoisting Engine Company, Harrison, N. J., hoisting engines. The Pittsburgh Machinery & Equipment Company deals exclusively in second-hand contractors' equipment and has a complete stock of hoisting engines, buckets, pumps, air compressors, &c., ready for prompt shipments.

The Hall Steam Pump Company, Pittsburgh, is building two hydraulic pressure pumps for the Babcock & Wilcox Boiler Company to be made entirely of steel castings. The water end of each pump will weigh 12 tons. This duplex pump will have 6-in. plungers and 42-in. stroke, and will be operated by a Corliss engine to a pressure of 2000 lb. per sq. in. The Hall Company also has a contract for a crank and flywheel dry vacuum pump, for export to Manzenilla, Mexico. The cylinders will be 44 x 36 in., and when completed the pump will weigh 35 tons.

Indianapolis

INDIANAPOLIS, IND., October 25, 1910.

The Central Steel Company, Indianapolis, has been dissolved. It owned a rolling mill property in the city which was abandoned as a manufacturing industry several years ago and the machinery sold more recently. The land and buildings on it have been sold to the Wabash Realty & Loan Company of Terre Haute, Ind., and it is planned to build large cold storage houses.

The Santo Specialty Company, Indianapolis, has been incorporated with $40,000 capital stock, to manufacture housecleaning machinery. The directors are C. N. Van Cleave, Albert Cox and M. B. Rattay.

The Maxwell-Briscoe Indianapolis Company has changed its name to the United Motors Indianapolis Company.

The Hamner Mfg. Company, Indianapolis, has been incorporated with $10,000 capital stock, to manufacture vehicles. The directors are John S. Hamner, Roscoe S. Parr and Jacob H. Allen.

The Carbon Coal and Clay Company has been organized at Indianapolis, with $50,000 capital stock, to develop coal and clay properties. The directors are W. C. Shoemaker, A. A. St. Clair, J. N. Balch, C. H. Ehrmann and W. R. Mayo.

The Trinidad Mines Company, Indianapolis, has been incorporated, with $125,000 capital stock, to operate mines in Guerrero, Mexico. The directors are F. O. Dorsey, L. D. Hay, J. N. Carey, Henry Jameson and O. V. Jameson.

The Kokomo Junior Tire Company has been incorporated at Kokomo, Ind., with $10,000 capital stock, to manufacture tires. The directors are A. L. Sprangle, J. C. Dewees and J. E. Palethorpe.

The Indiana Power Company, Indianapolis, has increased its capital stock from $25,000 to $50,000. R. B. Spellman is president of the company.

THE MACHINERY MARKETS

The Forse Mfg. Company of Anderson, Ind., has increased its capital stock from $6500 to $20,000. W. H. Forse, Jr., is president of the company.

The American Peats Product Company has completed a plant at Lakeville, Ind., in the great marsh lands of the northern part of the State. The factory, which is in the heart of a swamp, cost $100,000, and will use about 10 tons of raw product a day. The muck will be made into peat by chemical process. J. H. Van Glahn, the inventor of the machinery, is manager of the factory. The company will build other factories in Canada and in Maine and Minnesota.

The Diamond Automobile Company, at South Bend, Ind., suffered a fire October 18 that caused a loss of about $50,000. The flames were confined to the paint shop, which was destroyed, along with 32 partly finished automobiles. There was $10,000 insurance.

The Hartman Mfg. Company, Richmond, Ind., has increased its capital stock from $25,000 to $50,000.

The Gosport Electric Company has been incorporated at Gosport, Ind., with $10,000 capital stock, to supply municipal and domestic lighting. The directors are Louvent Lowenberg, C. J. Kiefer, R. H. Wold, Charles Abraham and W. J. Stroder.

The Elkhart Dry Battery & Signal Company, Elkhart, Ind., has changed its name to the Elkhart Electro-Corno Company.

W. F. Stillwell, Lafayette, Ind., has secured the contract for an addition to the French Lick Springs Hotel, French Lick, Ind., to cost $225,000, exclusive of plumbing, heating and elevators, the contracts for which have not been let. The building will be of reinforced concrete construction, seven stories, 100 x 287 ft.

The Morgan Register Company, Anderson, Ind., has been incorporated with $100,000 capital stock. The directors are F. A. Morgan, H. A. Mansfield and H. C. Stilwell. The company will manufacture registering and ventilating devices for cars.

The Cement Tile Company, Monticello, Ind., has been incorporated, with $20,000 capital stock, to manufacture sewer and drain tile. The directors are J. D. Timmons, T. W. O'Connor, W. F. Brucker, I. N. Cash and E. E. Sluss.

The Backstay Machine & Leather Company, Union City, Ind., has been incorporated, with $120,000 capital stock, to manufacture car and carriage machinery and parts. The directors are R. C. Schemmel, R. L. Hill, S. H. Clark and B. P. Southard.

The Maxwell-Briscoe Motor Company, New Castle, Ind., is contemplating the erection of extensions to its factory during the spring of 1911.

St. Louis

ST. LOUIS, MO., October 24, 1910.

The Missouri Pacific Railway placed its order against the list issued several weeks ago, and practically all the business went to a large New York house, the only items excepted being some special tools. The list was reduced somewhat under the original specification, but the machines purchased nevertheless constitute probably one of the largest single tool orders placed by any buyer during the last few years.

The Wabash Railroad has resurrected a small list, originally issued several months ago, and evidently intends to buy now.

The Missouri, Kansas & Texas Railroad has been buying some tools from time to time, and all indications point to more or less steady buying by the St. Louis trunk lines from now on. This is looked on by the trade as a good augury and a decidedly more optimistic feeling prevails among the machine tool houses as a result.

The awakening of the agricultural population to the fine increase in efficiency of land properly treated with fertilizer is resulting in a large increase in the production of fertilizers. As an instance of this is cited the large new fertilizer plant now nearing completion on the Missouri Pacific belt line, being built by the National Utilization Company, whose headquarters are at Norfolk, Va. This plant will operate mainly on leather scrap, and has some 50 carloads already on its premises. The machinery used is all special and made according to the Company's own designs.

Mattemann & Wheeler are starting up a general repair shop and have just purchased their machine tool outfit.

The Ludlow Saylor Wire Company, manufacturer of wire cloth and other specialties, finds business quite satisfactory.

Several new adding machine propositions are being developed here. The Moon Hopkins Billing Machine Company has a large force of men at work on its combined typewriter and calculating machine, and the Duplex Adding Machine Company has a good size shop developing its new machine. The good supply of high grade mechanics suitable for this delicate class of work has been educated up in St. Louis within the last 10 years and more and more enterprises of this grade are being taken hold of constantly.

Business with the frog and switch shops is picking up nicely. Up to a few weeks ago there plants were rather dull, due to the railroads' policy of retrenchment. The various structural shops also find business good.

The St. Louis Axle Company is rapidly getting its plant back into shape after the fire suffered recently and will put in some equipment.

The Terminal Railroad has an inquiry out for one or two tools. This is the Union Terminal System, operating most of the switching facilities on both sides of the river, is owned jointly by all the trunk lines entering St. Louis, and provides a terminal service. The Terminal Association is making arrangements now to invest several million dollars in new freight yards in what is known as the Ranken tract, about 2 miles west of the Union Station. It is proposed to put up a strictly modern system of warehouses as soon as permission can be obtained from the Municipal Assembly.

The Bayer Steam Soot Blower Company, St. Louis, has been incorporated. Capital stock fully paid, $4000. The incorporators are Frank X. Bayer, Leo. J. Bayer, August V. Bayer and Frank A. Bayer. The company will manufacture boiler cleaners.

The Charter Oak Stove & Range Company, St. Louis, has filed a statement with the Secretary of State, increasing its capital stock from $200,000 to $400,000.

The Monarch Supply Company, St. Louis, has been incorporated with a capital stock of $6000, fully paid. The incorporators are Alfred M. Lane, Oscar W. Hoappaw and J. G. Tucker. The company will engage in the manufacture and sale of building appliances.

The Essmueller Mill Furnishing Company, St. Louis, finds that its improved facilities at its new factory, which was designed and built for its special requirements, is resulting in a steady increase of business.

The Superior Motor Sales Company, St. Louis, has been incorporated; capital stock, two-thirds paid, $75,000. The incorporators are Murray M. Baker of Peoria, Ill.; Oliver L. Garrison, Oliver L. Garrison, Jr., and others of St. Louis. The company will engage in the manufacture and sale of automobiles.

The Reliance Milling Company, Murphysboro, Ill., of which the Messrs. Sauer are the proprietors, intends to further increase the capacity of the mill by the purchase of additional machinery.

The Bunch Elevator at Pine Bluff, Ark., is to be reopened by the W. B. Worthan Company of Little Rock, Ark. New machinery will be installed and the plant generally overhauled.

The Helena Rock Company, Helena, Ark., recently incorporated with a capital stock of $25,000, will soon begin active operations at its quarry. The machinery has been purchased and the company expects to begin quarrying sandstone within the next few weeks.

R. L. Williams, Hot Springs, Ark., is making arrangements to establish a flour mill in that city. The mill will be operated by electricity and have a capacity of 40 barrels.

The United Mill Works, Stuttgart, Ark., has been incorporated with a capital stock of $50,000, of which $14,700 has been subscribed. The incorporators are Ray O. Burke, J. I. Porter, Jerome L. Tindall and others.

The Lumber & Mfg. Company, Trumann, Ark., has begun the erection of a large veneer and sawmill plant, which when completed will represent an investment of over $200,000 and give employment to about 200 men.

The Poinsett Lumber Company, a new corporation doing business in Arkansas, will erect a large mill at Trumann, Ark. Virgil Norman of Harrisburg, Ark., who will be the general superintendent of the plant, states that more than 200 men will be employed at the mill and in the yards, besides men employed in the woods cutting timber and getting the logs to the mill.

Charles Hochmeister of Dagonia, Ind., will erect a box factory at Gravette, Ark., in the near future.

The Abbeville Sugar Company, Ltd., Abbeville, La., has received a proposition from capitalists at St. Mary, La., to erect a 600-ton refinery at Abbeville, provided local interests will furnish $30,000 of the capital stock, and with the proposition carries a promise to furnish a bond guaranteeing the completion of the contract.

The Parlin & Orendorff Company has broken ground in St. Louis for the erection of a new six-story fireproof building, 80 x 155 ft. The building will be equipped with electric elevators and with the Parlin & Orendorff system of steam heating, with vacuum system attached, and high pressure boilers.

The Hot Blast Oil Burner Company, Springfield, Mo., has been incorporated with $15,000 capital stock by W. A.

THE MACHINERY MARKETS

C. Murphy, J. W. Roberts, A. S. Cowden and C. A. Hubbard.

Toronto

TORONTO, October 22, 1910.

The weather has been an important favorable factor in business. It has been all that the transportation interests could desire for the movement of the crop to market, whether by rail or water, and it has enabled outdoor work of all kinds to be carried on as actively as ever. The free marketing of the crop means the brisker circulation of money. With money more plentiful and the weather pleasant, the tone of trade improves. The conditions are healthful for the machinery trade. The bank statement just issued for the month of September, indicates that the bankers of the country see no reason to be stinted in their supply of funds to the industries.

A party of Montreal bankers, brokers, manufacturers and merchants visited Shawinigan Falls a week ago. The new power plant which the Shawinigan Falls Water & Power Company is adding to its system was inspected. That plant, which will produce 75,000 hp., will not be completed in less than a year. Its total cost is placed at $2,225,000. The party also visited the Northern Aluminum Company's works, the Shawinigan Cartridge Company's works and the new mill of the Shawinigan Cotton Company.

At a meeting of the Montreal Light, Heat & Power Company's directors on Monday an item of expenditure passed was $200,000 to provide for the street lighting contract obtained from the city. This covers the installation of lamp and station equipment.

A meeting of the shareholders of the Canada Starch Company, Brantford, Ont., is called for October 26 to consider a proposed bond issue of $500,000 to provide money for extending operations.

On Monday the contract was awarded for the construction of a four-story silk and cotton manufacturing plant at Beauport, near Quebec. It will give employment to 400 hands.

The new power house of the Saraguay Light, Heat & Power Company at Cote des Neiges, Montreal, is nearing completion. Machinery will be put in at once.

The Acme Motor Carriage & Machinery Company is the name of a corporation in which are merged certain existing industries. Its chief places of business are in Hamilton, Ont., its proposed capital $1,000,000. The Baynes Carriage Company of Hamilton and the American Good Roads Machinery Company of Goderich, Ont., are to be embraced in the new company. Persons connected with the automobile industry in Detroit are said to be prominent in the affairs of the new concern. Automobiles are to be built in the factory of the Baynes Carriage Company, which is to be enlarged for the purpose.

The Industrial Committee of Woodstock, Ont., has been in correspondence with 10 industrial concerns that were seeking a location for new manufacturing works. Of these, as has been mentioned in a former issue, three entered into an arrangement to establish plants in the town—the Canadian Linderman Company, the Woodstock Textile Company and the Fibre Folding Package Company. Others were Workman and Ward, the Caillards, makers of roller wire blinds; the Ratchet Wrench Company, the Taylor-Scott Company, Toronto; a brass and iron bedstead company of Glasgow, Scotland; a company in the same business in the United States and a tile manufacturing company. Whether the negotiations with any of these concerns will yet come to anything remains to be seen.

The Caster Milling Company has been incorporated under Ontario laws, with a capital stock of $300,000 and chief place of business St. Mary's, Ont.

At Owen Sound, Ont., the Corbet Foundry & Machinery Company is erecting a new building. William Kennedy & Sons are extending their works for the manufacture of iron and steel castings and turbine water wheels, and the North American Furniture Company is putting up a new factory.

The United Produce Company has taken over the Toronto Cold Storage Company's plant and the Palmerstone Pork Packing Company's plant. Extensive improvements are to be made in the Toronto plant. The company's capital stock is $1,000,000.

The Ottawa Car Company has obtained a permit for the erection of a new factory in Amherst street, Ottawa.

Hamilton & Stott, St. Thomas, Ont., have the contract for installing a central heating plant for the Helena Costume Company, London, Ont. The plant put in will be the Johns-Manville tile conduit system.

Plans have been completed by the Strauss Bascule Bridge Company, Quebec, Que., for a steel and concrete bridge to span the Princess Louise docks there. It is to be 88 ft. long. Clarke & Monds, Toronto, have the contract for building the power development works near Auburn, Ont.

The City Council of London, Ont., has accepted the tenders of the National Meter Company and the Trident Company for supplying the water meters required by the city.

Tenders are invited for the construction of a foundry building at Penetang, Ont., the dimensions to be 60 x 525 ft. Address W. H. Hewson, secretary, Penetang, Ont.

United Motors, Ltd., is the name of a company that has been incorporated in Ontario to manufacture motor cars, bicycles, horse carriages, aeroplanes and dirigible airships. Its chief place of business is to be in Welland, Ont., and its capital stock $200,000.

The Rubber Special Machine Company has been incorporated. Its capital stock is $40,000 and head office is in Toronto.

The E. Long Mfg. Company, Orillia, Ont., has now all the machinery installed in the new foundry it has erected in that town.

The Industrial Committee of St. Thomas, Ont., has come to an agreement with the Monarch Knitting Company for the establishment of a $60,000 branch factory in the city. The ratepayers will vote on the proposal to have the city lend the company $30,000 for five years.

The City Council of Brantford, Ont., has passed by-laws granting a fixed assessment to the Ham & Nott Company for the Niagara Bedstead Company; confirming an agreement between the city and the Crown Electrical Company; and confirming are agreement between the city and the Brantford Emery Wheel Company.

The St. Lawrence Sugar Refining Company is adding to its works at Maisonneuve, a suburb of Montreal, a new boiler house to cost $20,798 and a factory building to cost $39,000.

Machinery is being set up in the new factory of the Rowen-Ogg Shoe Company at Guelph, Ont. It is expected that the plant will be ready for operation when the heating outfit is installed by the city.

Stewart & Hewitson, Port Arthur, Ont., have the contract for the construction of a steel and concrete bridge over the Ottawa River at Mattawat. The bridge will be 2700 ft. long and the piers 50 ft. high; the cost is about $300,000.

The Canada Producer & Gas Engine Company, Guelph, Ont., has under construction a considerable number of engines of 125 hp., and is also busy on gasoline engines of much smaller power for agricultural and domestic use. Its drafting departments are now engaged upon a pattern for a digger engine capable of developing 200 or 300 hp.

The Collier Electric Company has decided to go into the manufacture of the Bissell electric motor, for sewing machines, at its factory in Peterborough, Ont. The company has been importing motors from Toledo, but the 12-month period within which the importation of a patented article is allowed being near expiration, the company will now begin to manufacture. Mr. Collier has invented an electric water heater that is also to be manufactured by the company.

The Canadian Commercial Motor Car Company has been organized in Windsor, Ont., to manufacture commercial motor vehicles to be sold exclusively in Canada. A delivery truck of 1800 lb. capacity will be one of the lines turned out. The capital is $40,000.

On Tuesday 20 cars of machinery were shipped from the Waterous Engine Works, Brantford, Ont., to the Pacific coast of Canada. The shipment will go to New York and from that port will be forwarded by water to its destination.

A meeting of the shareholders of the Silliker Car Company, Halifax, N. S., to consider an offer made in behalf of the new controlling interest to purchase the whole business. J. B. Douglas, one of the parties in the controlling syndicate, says that $400,000 will be added to the company's capital.

The Ontario Wind Engine & Pump Company is building a boiler and paint room at its works in Toronto.

The Canada Metal Company, Toronto, has taken out a permit to put up a two-story building to cost $35,000.

J. P. Fillingham, formerly assistant superintendent of the Reo factory at Lansing, Mich., has been appointed general superintendent of the Reo Motor Car Company of Canada at St. Catharines, Ont.

The George Anderson Company, an English concern, will establish a branch in Montreal, where cranes and stone machinery will be made.

The Cockshutt Plow Company, Brantford, Ont., will erect a warehouse in Brandon, Man., this autumn.

The Chipman-Holton Company, Hamilton, Ont., has secured property on which to build a factory in Welland, Ont.

The ratepayers of Tillsenburg, Ont., have voted in favor of a by-law to raise $25,000 to build an electric power station for the distribution of power supplied by the Hydro-Electric Power Commission.

THE MACHINERY MARKETS

Farand & Delorme, Ltd., is the name of a company incorporated under the Dominion laws to take over and carry on the business of Farand & Delorme, coppersmiths, Montreal, and to produce and trade in metals, machinery, engines, boilers, &c., the capital stock to be $100,000, and the chief place of business in Montreal.

The Wilson Bros. Motor Company, with a capital stock of $50,000, has been incorporated as a Dominion company, with its head office in Montreal.

According to the estimate of the City Architect's department, the total values of buildings constructed this year in Toronto will be $20,000,000, which is $2,000,000 more than was expended on new buildings last year.

The new building for the Burlington Gasoline Engine Company, Burlington, Ont., has been completed, and the machinery is now being installed. The new engine has been inspected in place by the expert of the A. R. Williams Machinery Company, Toronto.

The *Daily News* of Port Arthur, Ont., states on what it represents to be reliable authority that the work of building a foundry to be operated in connection with the Atikokan Iron Company's furnace in that city will be begun this year. The enlargement of the company's pig iron making capacity is also expected to be begun this year.

The annual statement of the Canada Cycle & Motor Company, Toronto, shows profits of $144,000, which is 18 per cent. on the company's capital stock of $800,000.

The Ontario Iron & Steel Company, Welland, Ont., adopted the Amalgamated Association wage scale for its rolling mill and 50 men struck. This caused the closing down of the mill.

The town of Galt, Ont., has sold debentures to the amount of $66,660, the proceeds to be used in the construction of works for the distribution of power supplied by the Hydro-Electric Power Commission.

The Bridge Superintendent for the County of Hastings, Ont., has reported that 250 of the bridges in the county cannot safely be subjected to the strain of carrying traction engines, and as the statute requires that municipalities must provide bridges to support loads of 8 tons, the county authorities contemplate an outlay on new bridge-building account of not less than $600,000 in the next few years. The Belleville *Ontario* urges that concrete be used in the new structure, maintaining that steel bridges have no such permanency.

A large paper mill is to be erected at Lac au Sable, in the Saguenay region of Quebec Province, by Price Bros., Ltd., Quebec, the company offering a large bond issue, of which it is thought part of the proceeds will be used in the building of the mill, which is to have a daily output of 150 tons.

Seven proposals for the establishment of new industries in Berlin, Ont., were considered by the Industrial Committee of the Town Council at its meeting this week. Two were considered favorable and will be taken up. One is from a concern manufacturing automobiles, and the other from a maker of gasoline engines.

The Dayton Scale Company, Dayton, Ohio, has purchased a lot with 200 ft. frontage in the northern part of Toronto, on which is to be erected a branch factory.

It is announced that the Canada Metal Company, Ltd., Toronto, will establish a plant in Winnipeg as soon as the necessary arrangements can be completed. A large amount of the work formerly done in Toronto will be done in Winnipeg. As the West grows the demand for this work will increase, and it is expected that the plant will be a big one. For the beginning of the enterprise the company has purchased the Winnipeg plant of the Ontario Engine & Pump Company. The latter company, desiring to extend its plant, had decided to locate in another part of the city, where a $100,000 plant will be established.

San Francisco

SAN FRANCISCO, October 19, 1910.

Some curtailment of business is noted in many of the principal lines of machinery, and local dealers are becoming convinced that the next four or five months will be extremely quiet. The decrease is partly due to the beginning of the rainy season, which will within the next 30 days cause the suspension of much construction and development work and will necessitate the closing of many sawmills, mines, &c. The demand for irrigating machinery is also likely to be somewhat curtailed during the winter.

After a few weeks of moderate activity the machine tool business has relapsed into its former dull condition and any revival in this line will depend upon a final adjustment of labor conditions. A few tools are being sold, but the total movement is extremely small. Parties who have been closely in touch with the trade estimate the entire machine tool sales on the Pacific Coast for the current year at less than half the normal volume and can see no likelihood of improvement, at least in regard to large tools, for many months. While the railroads are building some new shops, their purchases of tools have been practically nil, and there is an apparent determination on their part to withhold orders as long as possible. It is stated that the equipment of the shops recently burned at Tucson, Ariz., will be replaced by old machinery from other points. The navy yard at Mare Island, Cal., is rushed with work, and is badly in need of more tools, but no business of any consequence is expected from this quarter before the next session of Congress. The demand for woodworking machinery has also dropped off. Inquiries are coming up all the time, but only the larger interests appear to have capital for the installations desired. It is expected, however, that some substantial orders will be booked for installation in the spring.

There is very little movement in mining machinery. A few stamp mills, hoists, &c., are being placed, but of the numerous inquiries in the market the majority are of an indefinite nature and lead to nothing in the way of business.

Pumping machinery is still an important feature with local manufacturers, and while most of the business for some time has been small, some fairly important orders will probably be placed shortly. The gas engine manufacturers are getting the usual quota of orders from Australia, New Zealand, &c., which, with a fair local demand for stationary and marine engines, keep them well occupied. Local shops are doing considerable marine work, principally in the way of repairs, though it is reported that a large passenger steamer for Northern interests will be built here.

Specialized equipment for various manufacturing purposes is in better demand than for some time. Many local industries which have been under serious difficulties for the last two years, are commencing a new period of growth, and there is a general disposition in all lines to install machinery of improved types. This field, however, is highly diversified and the business consists of small and scattered orders.

The San Diego Gas & Electric Company is awaiting the delivery of a 60-ton crane, the order for which has been placed with the local office of Manning, Maxwell & Moore. Several cranes of the same type were recently ordered by the Southern Pacific Railroad.

The San Joaquin Light & Power Company has placed an order with the General Electric Company for a 2000-kw. Curtis turbine generator, to be installed at Bakersfield, Cal.

The Honolulu Land Company, Honolulu, T. H., has ordered a 1000-kw. generator from the General Electric Company. It will be operated by a Corliss engine.

The round house and machine shop of the Sierra Railway Company, Jamestown, Cal., were destroyed by fire October 6.

A large amount of new machinery is to be installed at the Port Kenyon salmon cannery on Eel River, Cal.

Air compressing equipment is being installed at many Government fog signal stations along the Pacific Coast, replacing the old steam signals. A large order for gas engines for this purpose has been placed with a local firm.

The Machinery Supply Company has been incorporated in San Francisco, with a capital stock of $50,000, by H. C. Wybro, R. B. Elder and G. W. Hollister.

Plans have been made for a well equipped ordnance shop at Fort Winfield Scott, San Francisco, and contracts for the building will be let about the end of this month.

An addition to the Southern Pacific Machine Shop at Dunsmuir Cal., has been completed, and a lot of new equipment is to be installed.

The town of Long Beach, Cal., is in the market for a sewage pumping plant with vertical Westinghouse motor.

The California Pipe & Steel Company has been incorporated at Bakersfield, Cal., with a capital of $25,000, by L. P. Welch, T. P. Finn, J. E. Graves and R. A. Finn.

The town of Bakersfield, Cal., is in the market for a heavy steam roller and some other road machinery.

The Corona Rock Company, Corona, Cal., is preparing to install three large crushers. A new air compressor and several compressed air drills will also be added.

Plans are being drawn for another large dredger for the Natomas Consolidated of California, to be used on the Feather River division, near Oroville, Cal.

The town of Modesto, Cal., has taken figures on a number of turbine pumps, to be directly connected to steam turbines and electric motors, and including two large units for the water works.

A 250-hp. electric hoist is to be installed shortly at the Claremont shaft of the Goldfield Consolidated Mining Company, Goldfield, Nev.

The Atchison, Topeka & Santa Fé Railway System is installing a power plant at Barstow, Cal., for which all the necessary equipment has been contracted.

The Keller & Thompson Mfg. Company, Covina, Cal., manufacturers of irrigation appliances, is moving its plant to Los Angeles where it has purchased a site upon which it is erecting a plant consisting of a shop and foundry buildings.

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Milwaukee

MILWAUKEE, WIS., October 24, 1910.

The demand for power and electrical machinery, air compressors, pumps and apparatus auxiliary to these several lines, which unexpectedly fell off about the first of the month, shows signs of revival within three or four weeks at the most, as a number of enterprises are now under way that will call for considerable equipment of this character.

Inquiries from the mining districts are strong at present, as compared with the demand created by other industries, and this now keeps a number of plants going here that would otherwise find business very dull. Crushing and cement making machinery, which is largely handled by the same companies, also appears to be wanted, and the call for equipment to be installed in various sections of the United States as well as abroad gives considerable support to the local market.

Manufacturers of machinery for handling heavy parts or bulk material also report more work in prospect than there was a few weeks ago, and in some instances it has been necessary to increase the force of their engineering departments, particularly for estimating and drafting of preliminary plans.

The foundry trade in the vicinity of Milwaukee and the State at large is not what was anticipated for this season of the year, but all of the plants, both large and small, are reasonably busy. Some are even crowded with work, but this is due almost entirely to their having taken season contracts which frequently provide for their full capacities. A good deal of business in this line has been derived from manufacturers of motor cars, auto trucks, gasoline engines and traction machinery.

The A. L. Streich & Brother Company, wagon manufacturer, Oshkosh, Wis., will make some improvements in its plant, the work at present, however, being limited to a new four-story warehouse, 45 x 137 ft.

In connection with the plans for the new paper mill to be erected here by the Kieckhefer Box Company, as recently mentioned, it is stated that the new power plant provided for the present establishment will be sufficient to supply current to the mill. A large line of induction motors, paper making machinery, pumps, &c., will, however, be needed as soon as the project is in definite form.

Machine tool manufacturers of this city are reported to be figuring on some equipment for the new car shops to be built at Rockford, Ill., by the Rockford & Interurban Railway.

A line of motors is to be purchased in the near future for the new factory of the S. W. Miller Piano Company, Sheboygan, Wis.

The Wisconsin Bridge & Iron Company, Milwaukee, is building for the Hancock Consolidated Mining Company, Hancock, Mich., one of the largest steel frame shaft houses ever constructed, with bins to hold 2000 tons. The ultimate hoisting equipment of the shaft will equal 3000 tons daily and equipment is to be provided as the necessity arises. For handling the material as it comes from the shaft, three crushers of the Farrell type are being provided.

The purchase of an electric generating unit is being considered by the Thomas Coaster Toy Company, Sheboygan, Wis.

The four new digesters to be installed in the enlarged plant of the Wausau Sulphate Fibre Company at Mosinee, Wis., will be 9 x 26 ft. and made of a seamless welded steel. They have been ordered from Germany where apparatus of this character is said to have been perfected to a greater extent than in the United States.

The Nordberg Mfg. Company, Milwaukee, will build a motor-driven compressor for the Houghton Copper Company, Houghton, Mich. It is to have a capacity of 1500 cu. ft. of free air per min. and operate at 80 rev. per min.

The Muenter Mfg. Company, which was recently organized at Fond du Lac, Wis., by Otto R. Muenter, E. H. Cameron and Hugh Cameron, will establish a woodworking plant.

The city of Wausau, Wis., is letting contracts for enlarging its power and pumping plant and provision for new equipment will be made in the near future.

The American Hydraulic Air Compressor Company has been organized at Milwaukee with $500,000 capital stock by Arthur C. Lingelbach, Alfred O. Girard and Robert C. Loewe. Preliminary plans for a large manufacturing plant are now in progress.

The pumping plant at North Fond du Lac, Wis., where the shops of the Soo Line are located, will probably be taken over by the village and considerably improved. An election on the question is to be held in the near future.

The Lindermann Box & Veneer Company, Eau Claire, Wis., is reported to have finally decided upon the construction of a steel and concrete building equipped for double the capacity of the one that burned last spring. Thoroughly modern machinery driven by electric motors will be installed.

The Racine Mfg. Company, Racine, Wis., is increasing its capital stock from $400,000 to $600,000 to provide for the growth in the business and improvements in the plant.

The Filer & Stowell Company, Milwaukee, has installed the complete machinery for the new mill of the Wisconsin Lumber Company, Huttig, Ark., which is the most thoroughly modern of its kind of any thus far built in the Southwest.

The Stephenson Motor Car Company has removed its plant to South Milwaukee and will occupy buildings formerly used for a wrench factory which was located there.

A very complete line of woodworking machinery, blower system, &c., will be required for the Hardwood Products Company, Neenah, Wis., whose plans, however, have not yet been fully formulated.

The National Wagon Stock Company, of which Frank Mitchell, Racine, Wis., is president, is taking measures to rebuild the mill operated by that concern in the vicinity of Little Rock, Ark., which recently burned.

The plant of the Northern Hydro-Electric Company at Green Bay, Wis., at High Falls on the Peshtigo River will shortly be put in commercial operation supplying power to the street railroad and lighting systems of Green Bay, to Marinette and other cities and to a large number of industrial plants in that section of Wisconsin and Michigan.

The Fred Alden & Sons Company, Ladysmith, Wis., will rebuild the woodworking and enameling plant at Bruce that was destroyed by fire.

The Allis-Chalmers Company is the lowest bidder and promises the earliest delivery on a new pumping engine for the city of Lowell, Mass. In its design the product of the Milwaukee company is also the most massive by an average of about 50 tons.

The D. J. Murray Mfg. Company, Wausau, Wis., has been awarded the contract for the machinery equipment of the new sawmill to be built by the Wright Lumber Company, Merrill, Wis., in place of the one that burned some time ago. The power machinery of the old plant was principally saved and will again be put in service.

The Tomahawk Box Company, Tomahawk, Wis., has ordered new machinery from the Linderman Machine Company, Muskegon, Mich., by means of which its output will be considerably increased.

The Wisconsin Engine Company, Corliss, Wis., is preparing to install a 12,000,000 gal. pumping engine in the new Runyan water works station at Perth Amboy, N. J.

The new machine shops to be built by Hartman, Nelson & Zapfe, Green Bay, Wis., will probably not be erected until spring.

Electric power with motors for driving its machinery, is being installed by the Raleigh Mining Company, Buncomb, Wis.

The Consolidated Sheet Metal Works, Milwaukee, has been awarded the contract for all of the sheet metal to be used in the large new plant of the Phoenix Knitting Works of this city.

The mill at Schofield, Wis., which burned last summer, is to be rebuilt by the Brooks & Ross Lumber Company and furnished with thoroughly modern equipment. Electric power will probably be used.

C. H. Tegen, Manitowoc, Wis., has prepared plans for a garage and machine shop to be erected by Wm. Gabeman at that place.

A separate power plant with boilers and engine is to be erected in connection with the new two-story factory 40 x 56 ft., to be built by F. A. Dennett, Sheboygan, Wis., for the Lakeside Craft shops.

A foundry 60 x 150 ft., is to be erected, probably in the spring, by the Porcelain Enameling Association of America, Sheboygan, Wis.

The Laursen Automatic Pump Company, Eau Claire, Wis., has been incorporated with $200,000 capital stock to manufacture a newly patented automatic pump. The officers of the company are L. A. Larsen, president; Edward Falbe, vice-president; Frank R. Farr, secretary; Amery J. Edminister, treasurer. The pump is the invention of Mr. Laursen who resides at Holcombe, Wis.

The Racine Mfg. Company, Racine, Wis., has increased its capital stock from $400,000 to $600,000.

The South

NASHVILLE, TENN., October 25, 1910.

It has been a source of frequent remark lately by manufacturers and dealers of this section that business conditions all through the Southern States are more favorable than the situation elsewhere in the country would appear to warrant; and the present state of the market, both for machinery and supplies, shows that the South has developed not only a large but also a relatively constant purchasing power. While

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there are few important lists to be figured on, a fairly steady stream of small orders continues to come in, particularly from the interior districts, where favorable crop conditions have loosened up considerable money for the improvement of the country shops, mills and factories in which local capital is invested.

Another factor of increasing value is the fact that the county, town and municipal bonds issued for various public utilities can be disposed of to much better advantage than a few years ago, owing to the good credit which they now have in the financial centers of the country. Funds made available in consequence of bond issues voted at the early fall elections are now being extensively utilized in the purchase of machinery and other equipment.

One thing which hampers the further development of Southern industries is the difficulty in securing skilled mechanics, foundrymen and factory or mill hands. This tends to widen the market for automatic and semiautomatic machinery, or tools that are at least very simple in their design and operation, which enable operators to get along with ordinary labor in place of men who have served a regular apprenticeship. This situation is one that should be taken into account by tool builders who seek an outlet for their product here.

W. C. Wing of the Kimberly-Wing Company, is in the market for an engine, generator, switchboard, &c., for a lighting system at Cedars, Miss. The headquarters of the company are at Neenah, Wis., its mill at Cedars being operated as a branch.

The Montgomery Show Case Company, Montgomery, Ala., is doubling the capacity of its plant by means of an addition and the installation of new machinery.

Plans are in course of preparation at Lockport, La., for a pumping plant and complete system of water distribution, including the erection of an elevated steel tank.

The Orleans Mfg. Company, New Orleans, La., is planning the erection of a five-story factory building the machinery in which will probably be driven by electric motors.

The Case-Fowler Company, whose headquarters are at Chattanooga, Tenn., is now making arrangements for the erection and equipment of a new timber cutting plant at Macon, Ga.

The authorities at Fort Meyers, Fla., are having plans and specifications drawn for a modern system of water works of moderate capacity.

While no definite plans appear as yet to have been decided upon, the plant of the Bering Mfg. Company, Pawnee, La., will probably be rebuilt in somewhat larger capacity and arranged for electric motor drive.

Machinery is now being installed in the new mill of W. C. Wood & Co., Collins, Miss., which was erected to replace one of inferior design and capacity that burned some months ago.

In consequence of the rapid industrial growth of Bogalusa, La., C. W. Goodyear, Jr., and others, have organized the Bogalusa Public Service Company to build a power plant and interurban railway system. For the generating stations steam turbine units will probably be provided, although it is possible that satisfactory arrangements will be made at the beginning for power from the plant of one of the large lumber companies in the vicinity.

The plant of the J. L. Judd Mfg. Company, Chattanooga, Tenn., recently burned and it is reported that rebuilding will be undertaken along the most modern lines.

The Southern Equipment Company, North Birmingham, Ala., is figuring on a proposition which involves a motor-driven centrifugal pump working against 150 lb. pressure and having a daily capacity of 1,000,000 gal., also electrical machinery and an air compressor.

The authorities at Germantown, Tenn., have under consideration the construction of a pumping plant and water works system.

The installation of machinery for municipal power and pumping service will probably be decided upon in the near future at Orlando, Fla. Preliminary plans and estimates are now being made.

Recommendations for improvements in the water supply system of North Birmingham, Ala., include an electric generating set, motor-driven pump, air compressor and auxiliary mechanical and electrical apparatus. No definite plans have, however, been decided upon.

The capacity of the Graysonia-Nashville Company's box factory at Nashville, Tenn., is being doubled by the installation of new and improved machinery.

The Business Men's League, Montgomery, Ala., is in the midst of a very active campaign to secure new industries for that city. The location of a number of new plants there has been practically decided upon and others are reported to be in prospect. One of the inducements is the assurance of electric power at relatively low cost.

It is anticipated at Americus, Ga., that a bond issue will be voted there shortly to provide funds for the municipal power and lighting plant.

The woodworking shop of the Georgia Railway & Electric Company's car building and repair plant at Atlanta, Ga., will be remodeled. A new machine shop has just been completed and equipment provided.

The Specialty Mfg. Company, Chattanooga, Tenn., has been incorporated with $40,000 capital stock. Incorporators: C. H. Royaly, G. C. Breeden, H. D. Huffaker and others.

The Foster Falls Power Company, Roanoke, Va., is constructing a concrete dam 30 ft. high by 1000 ft. long, across the New River at Foster Falls, Va., to develop hydroelectric power to the amount of 3500 to 4000 hp. The power so developed will be used principally in operating washers, pumps and other machinery at the different iron ore mining operations of the Virginia Iron, Coal & Coke Company in the vicinity of Foster Falls. The estimated cost of the construction of the dam, power house and installation of the necessary machinery at the power plant and the different mining operations referred to will amount to $350,000.

The Central West

OMAHA, NEB., October 25, 1910.

Plants for the manufacture of cement and of machinery to be used for cement or clay products, pipe, tile and building material have recently been among the best customers of local dealers, and more business is in prospect from this class of trade. The shops that make a specialty of such equipment, which have been grouped in several centers of production like Waterloo, Iowa, are nearly all running to their capacity and where this is not required by current orders, manufacturing for stock is being undertaken, as there is every indication that the demand during the late winter and spring will be extremely heavy. Manufacturers of boxes, crates and other wooden or fibre packages, cans, pails, tins, &c., are also finding their facilities taxed and there will be considerable buying on this account both for plants already established and others that are to be started in the spring. Outside of these lines, trade is rather quiet.

The Ottumwa Railway & Light Company, Ottumwa, Iowa, is building a power plant 34 x 112 ft., of brick and concrete construction.

The Iowa Engineering Company, Clinton, Iowa, recently submitted the complete plans for a water works and sewerage system at Corydon, Iowa, the construction of which will be proceeded with as soon as funds from a bond issue are available for the purpose.

The Bridgeport Electric Light & Power Company has been organized at Bridgeport, Neb., to establish a public service plant.

The pumping station at Kearney, Neb., will be acquired by the city at a valuation of $125,000 and improvements made in its equipment as soon as practicable.

Bonds for the municipal lighting system have been voted at Bladen, Neb.

Plans have been prepared by the Kokomo Consolidated Mining Company, Kokomo, Colo., for the installation of electric power and the operation of all of its machinery by means of electric motors.

H. K. Seeman, Denver, Colo., has installed on his property near Central City, Colo., an air compressor of the Norwalk Iron Works Company's build. Development work is to be proceeded with and more machinery installed later on as it is required.

The Denver Mining & Reduction Company is building a concentrating plant of 100 tons capacity at Blackhawk, Colo.

Thomas S. Shepperd, Denver, Colo., has been awarded the contract for the complete water works system at Lowell, Wyo.

The Tintic Mines Company has ordered from the Chicago Pneumatic Tool Company, through the F. C. Richmond Machinery Company, Salt Lake City, Utah, a tandem compound gasoline-driven air compressor. This is the first machine of the type to be installed in the famous Tintic mining district of Utah.

M. S. Browning, Salt Lake City, Utah, has organized the Blacksmith Fork Light & Power Company, which will undertake the construction of a hydro-electric plant on Bear River. No arrangement for the machinery required has as yet been made.

It is reported from Chadron, Neb., that the plant of the Chadron Electric Light & Power Company, which has passed under the control of new interests, will be extensively remodeled and increased in capacity.

An engineer has been engaged to prepare plans for the proposed water works system at Ephraim, Utah, and the purchase of equipment may be taken up about November 15.

The Commercial Club, Murray, Utah, is interested in a

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proposition to establish a can manufacturing plant at that place.

Additional machinery will be provided this fall or early in the winter for the property of the Big Indian Mining Company, Georgetown, Colo.

Besides the machinery in its concentrating mill, which is electrically operated, the Silver King Coalition Company, Park City, Utah, has installed a Worthington four-stage centrifugal pump, direct driven from a motor supplied by the General Electric Company, Schenectady, N. Y. An electric haulage system is also being completed, and the equipment in the machine shop will be arranged for motor drive. This is a good illustration of modern power tendencies at the plants of the large mining companies.

The Iowa Falls Gas Company, Iowa Falls, Iowa, has purchased the plant of the Iowa Gas Company, which will be improved and extended.

The Blue River Power Company has been organized to develop the unused power of the Rocky Ford Milling & Power Company at its plant northwest of Manhattan, Kan. The company has installed a hydroelectric plant which delivers its current to the Manhattan Light, Ice & Power Company, which in turn distributes it over the town of Manhattan. All necessary equipment has been purchased.

The Iowa Central Railway Company is erecting an addition to its machine shop at Fort Dodge, Iowa, which will be equipped with tools transferred from the roundhouse.

The Hawkins Mfg. Company has located a plant at Des Moines, Iowa, for the manufacture of the Corn King silo.

The Fremont, Neb., electric light and gas plant will be improved at an expenditure of $150,000. Improvements will consist of new buildings and equipment and the laying of new mains.

The Bittendorf Tool Company, Davenport, Iowa, has been incorporated with a capital stock of $10,000. Until the stated annual election on the second Monday in January, the following parties are to be the officers: president, P. W. Reck; secretary, W. O. Calvert; treasurer, J. E. Brownlee. The company will engage in the manufacturing of tools.

The Northwest

MINNEAPOLIS, MINN., October 24, 1910.

The coming spring will witness a greater degree of activity in the construction of electric traction lines and the equipment of generating stations used both for railroad and local power and lighting service, than has ever been known in this part of the country, as numerous plans are now under way which will culminate at that time. Inquiries for the machinery needed in these various projects are already being put out and there is considerable estimating that will be needed to be done during the winter months.

Most of the shops and factories of the Northwest are fairly busy, but few of them find it necessary to add to their present equipment. Orders for machinery to be used in connection with new enterprises, however, are now being taken up and representatives of the leading manufacturers in these lines have recently received instructions for deliveries on contracts, the execution of which was temporarily delayed at the beginning of the fall season until it could be learned what the tendencies were for the next few months.

Apart from the conditions above noted the market is without any features of interest. At the various centers of distribution there is a steady run of business, but it is mostly of a routine character and covers small orders of material needed for immediate use.

It has been practically decided at Chisholm, Minn., to expend $80,000 for improvements to the water works system, including the erection of a new pumping station, purchase of machinery and the installation of a filtration plant.

Equipment will be required by or before spring for a hydro-electric plant of 750 kw., to be erected at a point in Northern Minnesota by the National Power & Development Company, whose headquarters are in the Torrey Building at Duluth, Minn. A pulp and paper mill is also to be built and furnished with electric current from the power plant.

The Cloquet Electric Company, Cloquet, Minn., is installing new machinery in its plant.

The purchasing of additional pumping machinery is under consideration by the authorities at Owatonna, Minn.

The Water & Light Commission, Fairmont, Minn., is about to let contract for a gas producer and engine of 300 hp., an alternating current generator, three-phase, 2300 volts, switchboard, motor-driven pump of 1,000,000 gals. daily capacity and triplex power and rotary pumps of designs approved by the Underwriters Associations.

The Capital City Lumber Company, St. Paul, Minn., will build a sash and door factory at Midway, Minn.

The construction of a municipal pumping plant will probably be undertaken by or before spring at Baltic, S. D.

The East Coeur d'Alene Mining Company has organized to operate in the vicinity of Mullan, Idaho, and will install equipment for opening up a new mine there.

The Rock Rose Mining & Milling Company, located at Grass Valley near Helena, Mont., will install a pump for de-watering its main shaft and other machinery is to be provided as development work is carried further.

Work has been commenced on a new sampling plant at Washoe for the Anaconda Copper Mining Company, Butte, Mont., to replace the one that burned.

The Western Mfg. & Building Company, Aberdeen, S. D., has been incorporated with $100,000 capital stock for the manufacture of sashes, doors, moldings and interior finishings. The company is now considering the erection of a factory which it expects to have ready for occupancy by the first of the year. The officers of the company are: L. L. Cummings, president and W. H. Prendergast, secretary.

The Southwest

KANSAS CITY, MO., October 24, 1910.

Scattered buying in behalf of Southwestern railroads and interurban traction lines for motive power, shop and other mechanical equipment, as well as rolling stock and its various accessories, now stands in the aggregate for a very considerable volume of business, and has come to be one of the controlling features of the present situation. This business, however, needs to be very closely followed up at the headquarters of the various roads, for, while the material is in most every instance destined for interior points, very little can be learned at any of these points in relation to impending purchases until after the deals have been practically closed.

The activity in bridge building and other structural work, which has been responsible for heavy expenditures within the past few months, was also but a forerunner of what will be required for the immediate future. In connection with this, sales of fabricators' and contractors' outfits, including air compressors and pneumatic tools, have attained noteworthy proportions.

A great deal of miscellaneous machinery and equipment has been purchased all through the season for shipment to points in Mexico, and inquiries now in the hands of sales agents and dealers indicate that there is to be no lessening of this demand, which is rapidly growing in importance as a factor in the industrial welfare of the Southwest.

With local manufacturers, including those of the metal working trades, the situation is regarded as generally satisfactory, taking into consideration the conditions reported from the East. Enough work is now on hand to keep shops going nearly if not quite to their normal capacities, and there appears to be no difficulty in finding funds for improvements or extensions in any department as they are needed. All are, however, proceeding along very conservative lines, and the buying now being done in behalf of local plants is for present rather than future requirements.

The Mexico, Santa Fé & Perry Traction Company, Mexico, Mo., has decided upon the erection of a new power house, work upon which is to be started during the late winter or early spring. It will probably be located at Santa Fé, Mo., and equipped with electric generators driven by gas engines. The company's repair shops are also being located at that point.

Additions involving the ultimate purchase of considerable machinery will need to be made to the power system of the Atchison Railway, Light & Power Company, Atchison, Kan., upon completion of an interurban railroad system, the preliminary work on which will be done this fall.

The Wichita Railroad & Light Company, Wichita, Kan., has awarded contracts for the erection of a repair shop, 62 x 300 ft., which will be of steel frame construction. This is designed on the unit system, so as to provide for making future extensions without any necessity for remodeling the plant.

The Missouri Valley Bridge & Iron Company, Leavenworth, Kan., has been awarded the contract for a 400-ft. steel bridge at Camp Verde, Ariz.

The Helena Rock Company has been organized at Helena, Ark., to operate stone quarries at Heber, Ark. J. B. Miles, Jr., is general manager. Considerable machinery will need to be at once provided for.

H. M. Davis and F. M. Flannagan, Stanton, Tex., are reorganizing the Whitehill Mining Company and will erect a 50-ton ore reduction plant on the property under their control at Paradise, Ariz.

The Butler Mfg. Company, Kansas City, has completed plans for the construction and equipment of a sheet metal plant.

The Penn Bridge Company, through its representatives at

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Dallas, Texas, has taken the contract for a 50,000-gal. steel tank and tower to be erected for the new water works system at Russell, Kan.

An event of considerable interest in this section is the starting up of the Wisconsin Lumber Company's new timber cutting plant at Huttig, Ark., the machinery in which is of the most modern design. The power house equipment includes boilers furnished by the Casey & Hedges Company, Chattanooga, Tenn.; an engine from the Erie City Iron Works, Erie, Pa., and a Westinghouse electric generator.

The Griffin Wheel Company has awarded the contract for a new office building in connection with its Kansas City branch.

El Tajo Mining Company, San Sebastian Jalisco, Mexico, has ordered a sectionalized power plant, including two generators of 100 kw. capacity, from the Westinghouse Electric & Mfg. Company, driven by Pelton water wheels. The machinery in the company's ore reduction mill will be operated by means of Westinghouse induction motors.

The Vernon Telephone, Light & Power Company, Vernon, Texas, is contemplating changes in its power plant which involve the addition of machinery to double the present capacity.

The installation of a 2,000,000-gal. turbine pump is being planned for the water works system at Salina, Kan., which is owned by a private corporation.

It is reported that the Southern Pacific Railway will immediately provide facilities to replace those afforded at Tucson, Ariz., which recently burned.

The Lufkin Foundry & Machine Company, Lufkin, Texas, is among the bidders for the equipment of the new steel frame mill to be erected at Camden, Texas, by W. T. Carter & Brother of Houston, Texas. Tenders of machinery have also been made by the McDonough Mfg. Company, Eau Claire, Wis.; the Diamond Iron Works, Minneapolis, Minn.; the Allis-Chalmers Company and the Filer & Stowell Company, Milwaukee, Wis.

A bond issue has been voted at Lufkin, Texas, to provide funds for the construction of a modern pumping plant and water works system.

A new boiler and engine have been installed in the plant of the Davidson-Mattox Company, Osceola, Ark.

An electric pumping plant is being installed at a depth of 1000 ft. in the mine of the Arizona Central Copper Company, Dewey, Ariz. Development work will be steadily pushed and additional machinery is likely to be required before spring.

The Mena Box & Mfg. Company, Mena, Ark., has been doing a heavy business this season and is adding to its equipment. Further machinery will be installed as needed.

A boiler with oil burning furnace, Corliss engine and an electric generator of 150 kw. are to be added to the municipal plant at McPherson, Kan., which is now equipped with General Electric alternators and Ball and Buckeye engines. The boilers at present installed were furnished by the Erie City Iron Works, Erie, Pa.

A large stave factory is being erected near Camden, Ark., by the American Land, Timber & Stave Company. Most of the machinery required will be removed from Onalaska.

Bonds to provide for the water works system have been voted at Mannsville, Okla.

A concentrating mill is being completed and a new hoisting unit installed at the main shaft of the Mildred Gold Mining Company, Congress, Ariz. The development work that is now to be undertaken will call later on for the installation of some additional machinery.

Machinery will be required shortly for a large hydroelectric plant which the Great Western Power Company, Tucson, Ariz., is constructing at Sabine Canyon. The equipment may have already been purchased.

The Oklahoma Iron Works, Tulsa, Okla., advises that its recent loss by fire was confined to its foundry building and patterns and does not exceed $2500.

The A. H. Davis gin at Crescent, Okla., was destroyed by fire from an unknown cause October 13.

The five-stand cotton gin belonging to Henry Kimball, situated at Elmer, Okla., was destroyed by fire October 18. The plant was valued at $12,000, fully covered by insurance. The gin will be rebuilt.

The Katy Mill & Elevator Company, Caddo, Okla., has been incorporated. Capital stock, $7500. Incorporators are J. A. Hartzog, D. M. Wilson, C. C. Tarver and others.

The Tulsa Boiler & Mfg. Company, Tulsa, Okla., has practically completed the construction of its new plant. The company, formerly operated under the name of the Robinson Boiler & Mfg. Company, Robinson, Ill., but was induced to remove to Tulsa through the efforts of the Commercial Club, which donated a 10-acre site and a cash bonus of $15,000. The plant consists of a boiler and tank shop and machine and forge shop, and all necessary equipment has been provided for. The company will build all kinds of boilers, tanks, stills, stacks and general steel plate construction.

North Pacific Coast

TACOMA, WASH., October 21, 1910.

So much of the buying being done at present is in behalf of large construction companies that anything in the nature of equipment for such purposes, including contractors' outfits, sells to excellent advantage; and, for at least some months, this will constitute one of the principal dependencies of the market. In all lines of production, however, there continues to be a steady, if rather, gradual gain, and the unfavorable labor conditions farther south are bringing to the principal cities of the north coast considerable work which would ordinarily be outside of their province.

The Tacoma Ornamental Iron Works, Tacoma, Wash., which makes a specialty of bronze parts as well as iron, steel and wire work of various descriptions, has taken a good many important contracts during the current year. This company acts in the same capacity as structural engineers and is prepared to carry through every detail of the contracts which it undertakes. Work on a new plant at Union and Center streets is now under way and the completion of this will give the concern much greater facilities.

The West Coast Steel Works, Tacoma, Wash., whose organization was reported some time ago, is featuring in its sales contractors' equipment of various kinds as well as structural steel and the standard line of bolts, rivets, &c., which it manufactures. An engineering staff is maintained to handle all structural problems. The officers of the company are on Pacific avenue and Twenty-first street, Tocoma. J. R. Turner is president and manager, N. W. Graybill is vice-president and W. H. Reid, secretary and treasurer.

It is stated that the Washington Iron Works, Seattle, has taken a number of contracts lately for complete sawmill equipments and other woodworking machinery to be shipped to the Far East, including the island of Java.

The Three Pines Lumber Company is planning the construction of a modern mill at Three Pines, Ore.

It will not be necessary for the Complex Ore Company, Victoria, B. C., whose plans for a zinc smelter at Nelson, B. C., were recently mentioned, to build its own power plant as the city of Nelson has leased its old electric generating station for the purpose. Direct current will be used in the operation of the works.

The Fred W. Wolf Company of Chicago, Ill., which maintains a district sale office in Seattle at 914 First avenue South, now has a large number of installations to its credit in this territory of the engine-driven refrigerating machines which it manufactures. A full stock of fittings is carried at the Seattle branch.

Plans are now being prepared for a new municipal pumping station for service at Lincoln Heights, Spokane, Wash. A motor-driven centrifugal pump with capacity of 3,000,000 gal. daily is to be installed.

The Garwood Electric Company of Garwood, N. J., whose projects have come to be well known in this territory, are represented on the north coast by the Montilius Price Company, Seattle, Wash.

H. W. Gocker of 910 Twenty-fourth avenue, South, is the moving spirit in the incorporation of a new woodworking establishment, known as the Fulton Machine Works, Seattle, the full plans of which have not yet been made public.

The Ballard Drop Forge Company, Ballard, Wash., in addition to the projects which its name implies, is manufacturing steel bands for large wooden pipes and tanks; also bolts, nuts, &c. In these varied lines business has been good all through the season.

Sixty additional stamps for ore crushing are to be installed in the spring by the Alaska Perseverence Gold Mining Company, Juneau, Alaska.

The construction of a sash and door factory, dry kiln, furniture factory and shingle mill will follow the completion of a large sawmill now being built by the Columbia Valley Lumber Company at Wauna, Wash. The headquarters of the company are in the Spalding Building, Portland, Ore.

It is reported from Portland Ore., that the Hydro Patent Power Company has been incorporated by Norman R. Smith, Frank Becker and C. M. Idleman to manufacture and sell hydroelectric machinery. Shops are to be built in due course in Portland or vicinity.

A new boiler and engine have been added to the municipal plant at Forest Grove, Ore., which will supply current for a commercial day load, the power to be utilized in local industries.

The Bellingham Mfg. Company will build a woodworking plant and sawmill at Bellingham, Wash.

Gyratory rock breakers, Chilian mills, tube mills, classifiers, pumps, filters, tanks, &c., will be required for the new 1000-ton ore reduction and cyanide plant to be built by the Northwestern Power & Reduction Company at Republic, Wash.

THE MACHINERY MARKETS

North Texas

DALLAS, TEXAS, October 21, 1910.

With the opening of the fall season indications are that there will be great activity in all lines of industry. The establishment of new factories in various sections of this State and the adjoining States of Oklahoma and Arkansas assures a healthy trade in all kinds of machinery and equipment. One can hardly glance over a paper from any of the smaller towns and cities of north Texas without observing items regarding the erection of a factory of some character, the voting of bonds for some public improvement or some important project now under way or soon to be started.

One of the main reasons for this great activity is the fact that farmers are securing more money for their crops this year than ever before. Owing to the extremely dry weather which has prevailed here for the past two years crops are not as good as they have been, but this is offset by the prices being received. When farmers have money business men have confidence and are willing to invest their money in all kinds of enterprises.

One of the biggest local improvements on which work will start probably about November 1 is a concrete viaduct to connect the main city of Dallas with that portion lying across the Trinity River. Contract for its construction was recently awarded to Corrigan, Lee & Halpin of Kansas City. The structure is to be nearly 6000 ft. in length, 40 ft. wide and built entirely of reinforced concrete.

Another improvement is the construction of a large reservoir as an adjunct to the local water works system. Work on a large dam has been under way for months, and at a recent meeting of the Board of Commissioners of the city Secretary Winslett was authorized to advertise for bids for the construction of a pumping station. The building will only cost about $30,000, but as soon as work on this is under way the city will be in the market for boilers, engines, cranes, pipe, &c.

Work on the erection of a 20-story hotel building is to begin here about December 1. August A. Busch of St. Louis is the leading capitalist behind the enterprise. It is to be of steel construction and will cost $1,000,000.

The charter of the Pecos & Toyah Lake Irrigation Company, Pecos, Texas, has been filed for record with the Secretary of State. This company has a capital stock of $1,500,000 and owns 30,984 acres of land. Of this land 22,000 acres is to be irrigated and placed in cultivation and 8738 acres is to be used for reservoir purposes. The directors of the company are F. H. Dobbins, Charles A. Loomis and L. H. Baker of Kansas City, and Frederick W. Taylor of Lincoln, Neb. The company is now in the market for pumping machinery and pipe of all kinds and sizes. It is proposed to build a ditch 65 miles long and pump water from the Pecos River for the irrigation of the land to be placed on the market.

Work has been begun on the building to be used by the Taylor Gas Company and it will soon be ready for the installing of machinery.

At a special election held recently at Denison a bond issue of $50,000 was authorized for water works improvement. Additional pumping capacity will be added and the mains extended.

Bridge bonds in the sum of $50,000 have been voted by McCollugh County, Texas. Four bridges in different sections of that county are to be constructed. Those interested should address the County Judge at Brady, Texas.

President L. W. Chase of the Taylor Waterworks Company, Taylor, is having plans drawn for improvements to be made to the company's system. Another large reservoir is to be constructed and additional pumps are to be installed.

On November 10 a special election is to be held at Terrell, Texas, to vote on the question of issuing bonds for the extension of the sewage system of that place.

Bartlett, Texas, is erecting a pumping plant and power house near the artesian well recently drilled, and a double pumping plant is to be installed. One plant will be run by electricity and a 20-hp. gasoline engine will be installed. An air compressor is also to be installed with the view of increasing the capacity of the well.

Ground has been broken at Dallas for the erection of a five-story building to be used by the Lincoln Paint & Color Company as a paint factory, which is to be equipped with modern paint making machinery, and, it is said, will be the first exclusive paint factory in Texas.

Indications are that by the end of the year active work on the construction of an interurban railroad line from Dallas to Terrell, Texas, a distance of 33 miles, will be well under way. A good deal of preliminary work has already been done and the company will soon be in the market for power plant, machinery, ties and rolling stock equipment. C. L. Wakefield, Dallas, is secretary of the new company.

The Texas City Land Company, Texas City, Texas, is contemplating the enlargement of its electric light plant.

H. L. Dales' (Burnett, Texas) cotton gin, one of the largest in the State, was destroyed by fire October 14.

The cotton gin owned by the McKinney Cotton Oil Mill Company, McKinney, Texas, was destroyed by fire October 15.

The Texas Sugar Refining Company, San Antonio, Texas, announces that $1,000,000 of the $1,800,000 capital stock of the company has been subscribed, and contracts for the designing of the plant and erection of the work have been entered into. The plans of the company contemplate the erection at Texas City, on Galveston Bay, of one of the largest independent sugar refineries in the country.

The stockholders of the Clarksville Ice & Light Company, Clarksville, Texas, are arranging for the reorganization of the company with a view to rebuilding the plant recently destroyed by fire. It is contemplated to build a plant with double the capacity of the old one. Work will begin in the near future on the buildings and orders will be placed for the machinery for both plants.

The plant of the Airblast Gin Company, Baird, Texas, was burned October 18.

The Laferia Sugar Company, Brownville, Texas, a recently organized company with a capital stock of $2,000,000, which owns 6000 acres of land near Laferia, Texas, is having plans drawn for a 3000-ton capacity sugar house in units of 1000 tons each, costing $750,000. One unit will be built in the near future. Several St. Louis capitalists are interested in the new enterprise.

Government Purchases

WASHINGTON, D. C., October 24, 1910.

The Paymaster-General, Navy Department, Washington, will open bids November 1, under schedule 2994, for two radial drills, and under schedule 2993, for one geared head motor-driven lathe.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids November 15, for two flat turret lathes, schedule 2992; 50 pneumatic hammers, schedule 3011.

The Isthmian Canal Commission, Washington, opened bids October 14 as follows:

Class 1.—One condenser with air and circulating pump—Bidder 1, Alberger Condenser Company, New York, $2750; 10, M. T. Davidson Company, Brooklyn, N. Y., $3150; 23, Manning, Maxwell & Moore, New York, $2800; 37, Platt Iron Works Company, Dayton, Ohio, $2600 and $2800; 53, Vermilye & Power, New York, $2675; 55, Wheeler Condenser & Engineering Company, Carteret, N. J., $2745; 56, C. H. Wheeler Mfg. Company, Philadelphia, Pa., $2348; 58, Williamson Brothers, Philadelphia, Pa., $2998; 59, H. R. Worthington, New York, $2346 and $2086.

Class 2.—One engine lathe and one driving motor—Bidder 16, Garvin Machine Company, New York, $1980; 31, Niles-Bement-Pond Company, $2152 and $1760; 52, Vandyke-Churchill Company, New York, $1897.

Class 3.—One valve reseating machine—Bidder 12, Drew Machinery Agency, Manchester, N. H., $125 and $137.50; 15, Fox Brothers & Co., New York, $125 and $89; 17, R. W. Geldart, New York, $125; 22, Manhattan Supply Company, New York, $135; 23, Manning, Maxwell & Moore, New York, $125; 24, Material Supply Company, Oradell, N. J., $125; 41, H. A. Rogers Company, New York, $125; 43, R. B. Sherman, New York, $125; 50, Universal Trading Company, New York, $125; 53, Vermilye & Power, New York, $125.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids October 18, as follows:

Schedule 2931, class 61.—One electrical driven concrete mixer—Bidder 10, W. E. Austin Machinery Company, Atlanta, Ga., $1425 and $1200; 74, Milwaukee Concrete Mixer & Machinery Company, Milwaukee, Wis., $1185; 86, Municipal Engineering & Construction Company, Chicago, Ill., $1200; 96, Lakewood Metal Company, Baltimore, Md., $122; 103, J. J. Shannon & Son, Philadelphia, Pa., informal, $106; Standard Scale & Supply Company, $1070 and $890.

Class 71.—One No. 4 plain high power milling machine—Bidder 17, Brown & Sharpe Mfg. Company, Providence, R. I., $1777.50, $1979.50, $1956 and $1982; 30, Cincinnati Milling Machine Company, Cincinnati, Ohio, $2059.85; 70, Jabez P. Kent, Baltimore, Md., $2060; 80, Manning, Maxwell & Moore, New York, $2011; 30, Niles-Bement-Pond Company, New York, $1620.

The following bids were opened by the Depot Quartermaster, New York City, under schedule No. 134, October 14, for one pump, Worthington or equal duplex, 10 x 12 x 12 in., extra heavy water end with piston rod in two sections, steam end steel and water end bronze:

Bidder 1, Buffalo Steam Pump Company, New York City, $520 each; 2, The Griscom-Spencer Company, New York City, $754.21 each; 3, Manning, Maxwell & Moore, New York City, $770.92 each; 4, Frank McSwegan & Sons, New York City, $788.59 each; 5, Vermilye & Power, New York City, $759 each; 6, Warren Steam Pump Company, New York City, $800 each; 7, Henry R. Worthington, New York City, $550 each.

The Sloss-Sheffield Steel & Iron Company's Lady Ensley Furnace, at Sheffield, Ala., was blown out for repairs October 15.

Obituary

CHARLES H. ZUG

Charles H. Zug, president of the Zug Iron & Steel Company, Pittsburgh, died suddenly October 21, aged 78 years, from an abscess on the brain. He was born in Carlisle, Pa., but had lived in Pittsburgh from his boyhood. He was the only son of Christopher Zug, founder of the old firm of Graff, Lindsay & Co., which became Zug, Lindsay & Co. in 1844, and Zug & Painter in 1854. After the last named firm dissolved, in 1864, the elder Zug organized the firm of Zug & Co., which was changed to the Zug Iron & Steel Company in 1906.

Mr. Zug received his early education in Pittsburgh,



CHARLES HENRY ZUG.

after which he took a course at Brown University, then entered in business with his father, who died in 1902. For many years prior to his father's death, Charles was the active head of the business. He was deeply interested in benevolent and religious work. He leaves a widow, three daughters and one son, Prof. George Breed Zug of Chicago University.

FRANCIS WILLIAM CLEMSON, Woburn, Mass., head of the Clemson Knife Company of that place, died suddenly, October 18, while hunting in the Maine woods. He was born in Arlington, Mass., 62 years ago, the son of William Clemson, the founder of the firm of Woodrough & Clemson, succeeded by Henshaw, Woodrough & Clemson, manufacturers of saws and belt knives. The son learned his trade in his father's works and for 35 years, until his death, was identified with the trade, including the establishment of the Clemson Knife Company. He leaves a son and two daughters.

PETER GENDRON, vice-president of the Gendron Wheel Company, Toledo, Ohio, died October 23, aged 66. He was the inventor of the original iron vehicle wheel upon which he secured 72 patents. He was born in Coaticook, Province of Quebec, Canada. The works at Toledo are among the most important in that city.

JOHN E. DOAK, vice-president and general manager of the Doak Gas Engine Company of San Francisco and Oakland, Cal., died October 5, aged 47 years. The business of the company will continue undisturbed, Wm. Letts Oliver being president.

CLIFFORD H. DOAN, special representative of the American Tool Works Company, Cincinnati, Ohio, and brother of J. B. Doan, vice-president and general manager of that company, died October 22, after a long illness at Christ's Hospital, Cincinnati, aged 37 years.

The Youngstown Sheet & Tube Company's Relief Plan

President James A. Campbell, of the Youngstown Sheet & Tube Company, Youngstown, Ohio, after giving the subject of accident relief his earnest consideration, placed before the stockholders at the last annual meeting an outline of his plan, which met with their hearty approval.

This relief is a purely voluntary one, and the money needed will be furnished entirely by the company, without any contribution whatsoever from the workmen. The purpose of the plan is to insure to employees of every department definite and adequate compensation for injuries resulting from accidents occurring to them while engaged in the performance of their duties, and also to provide compensation to the widows and children and their relatives who may be dependent upon any employee whose death results from such accident.

The benefits provided will be paid regardless of legal liability on the part of the company, it being the policy of the Youngstown Sheet & Tube Company to render every assistance possible to its employees, especially at a time when it is most needed, and to see that they get promptly every dollar that they are entitled to under this plan and are not subjected to the delays, uncertainties, and costs of litigation, attorney fees, and other needless expenses, which quite frequently, under the present method of settlement, leaves very little, if anything, for the injured employee. It will not be necessary, the company states, for employees to retain the services of attorneys or anyone else to collect the amount of money that will be paid them under this plan of relief, the company being desirous of dealing directly with its workmen, and making prompt settlement of all claims.

The Westinghouse Foundries.—Press reports are premature that the various Westinghouse interests at Pittsburgh will concentrate their entire foundry operations at Trafford City, Pa., and build one or more large foundries at that place. It is stated officially that while this has been under consideration no definite decision has yet been reached. At present the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company have most of their castings made at Trafford City, but the Westinghouse Electric & Mfg. Company also maintains foundries on the North Side of Pittsburgh and in Cleveland, Ohio. Should it be decided to concentrate all foundry operations at Trafford City, the foundries now operated at East Pittsburgh, North Side of Pittsburgh, and Cleveland would be abandoned, and the greater part of the equipment moved to Trafford City.

The country's exports for the month of September, according to the report of the Department of Commerce and Labor recently issued, exceeded the imports by $51,500,000, the largest credit balance which has been shown for the month of September in any year since 1900. The exports, amounting to more than $168,800,000, were the largest ever recorded in the month of September, while the imports were smaller than for the same month last year. For the nine months ended September 30 our foreign trade now shows a credit balance of a little more than $50,500,000, while at the end of the previous month there had been a small adverse balance.

The American Railway Association committee on relations between railroads, in its statement of car surpluses and shortages as of October 12, reports a decrease in surplus of 8,734 cars, bringing the total down to 33,735, while the shortage was 20,419, making a net surplus of 13,316 cars.

The Oliver Chilled Plow Works Doubling Its Capacity

The Oliver Chilled Plow Works, South Bend, Ind., has improvements under construction or recently completed which will double the capacity of its plant. An extension has been made to the foundry building, 130 x 350 ft., making the foundry 240 x 818 ft., with an L 110 x 130 ft., with a total floor space of 210,620 sq. ft. A cupola for gray iron has been added, making a total of four, all of which have been moved into a three-story charging building to which the pig iron and coke are now brought by an electric industrial railway and the molten iron then conveyed to different parts of foundry by the same method. Two additional furnaces and a third stack have been installed in the part of the foundry devoted to malleable castings, making six furnaces and three stacks in all.

A large addition has been made to the forge shop and a new tempering room erected, greatly enlarging the capacity of those two departments. To relieve the congested condition in the assembling department, a three-story assembling building is being erected in U shape, the total size of which is 85 x 720 ft., three stories, with a total floor space of 138,600 sq. ft. All of these additions, with the exception of the new charging room for the gray iron cupolas and the new assembly building, are in use at the present time but the remaining new work will be completed by January 1 and the equipment installed.

The Pacific Hardware & Steel Company's Improvements

The Pacific Hardware & Steel Company, Portland, Ore., has completed the construction of its new iron warehouse, 100 x 200 ft., and its wholesale hardware jobbing house, 132 x 200 ft., four stories and basement, will be completed by December 1. The former is equipped with electric traveling cranes and modern conveniences for the handling of heavy material, while the latter is provided with hydraulic lifts, elevators and dumb waiters to facilitate the receiving and delivery of goods. The buildings have 300 ft. of trackage with facilities for loading six cars at one time.

The buildings are adjacent to the company's rolling mill which is in regular operation. The company also has a sash weight foundry for the manufacture of sash weights for its trade. Stock for the iron warehouse is now arriving. The steamer Aztec, with 3000 tons of general hardware, is due to arrive in Portland November 5 to 10. This steamer sailed from New York and Philadelphia with a large portion of the opening stock, which it is anticipated will be in shape by December 15. The Portland branch will hereafter be the Northwest headquarters of the company and will be under the charge of A. C. Callan assisted by G. Rueger, formerly manager of the company's Seattle branch, which has been discontinued.

A Remarkable Range for Wireless Telegraphy.—On a recent voyage from Bombay to England a message was received at the wireless station at the North Foreland, England, from the tramp steamer Nonsuch which is the first to be fitted with wireless apparatus. At the time the message was sent the steamer was 15 miles south of Cape de Gaa at the southwest corner of Spain, a position about 940 nautical miles from North Foreland. This distance across the obstacle of the entire countries of France and Spain and the Pyrenees Mountains is a remarkable range for wireless from a ship. The owners of the ship also received a message through the station at Ushant sent from the ship when off Cape Roca near Lisbon, Portugal, a distance of 610 nautical miles.

The Buffalo Coke Rate Hearing.—At a hearing before Allan P. Matthews, examiner for the Interstate Commerce Commission, at Buffalo, October 24, the taking of testimony in the complaint of the iron and steel companies of the Buffalo district against the railroad companies operating between the Connellsville coke fields and Buffalo and the Niagara frontier concerning the increase in the freight rate on coke between those districts was proceeded with. The amended complaint states that from 1901 to 1902 the rate from Connellsville to Buffalo was $1.50. It was then raised to $1.60, at which figure it remained until 1907, when it was advanced to $1.65, that rate continuing until April of this year, when it was further advanced to $1.85. The proceeding was begun at the time the railroads announced this last increase, it being claimed by the iron and steel interests of Buffalo that the new rate is excessive and unreasonable and a discrimination in favor of the Pittsburgh and Gary districts. The rate from Connellsville to Pittsburgh is 75 cents, and to Gary $2.60 per ton, or 4.6 mills per ton mile to Gary against 5 mills to Buffalo. The testimony introduced by the railroads in defense of the increased rate was to prove that it was necessary to equalize the rates from the Connellsville district to eastern Pennsylvania furnaces, that had demanded a lower rate, and the raising of the Buffalo rate was deemed the best and fairest solution of the matter. Further hearing of the case was postponed until November 7, to take place before the same commission at Buffalo.

Sunday Labor at Iron and Steel Works.—President E. H. Gary of the American Iron and Steel Institute has appointed the following committee to investigate the question of seven-day labor in continuous processes in the iron and steel industry: E. A. S. Clarke, president Lackawanna Steel Company; William B. Schiller, president National Tube Company; F. W. Wood, president Maryland Steel Company; George G. Crawford, president Tennessee Coal, Iron & Railroad Company; J. A. Campbell, president Youngstown Sheet & Tube Company. The appointment of this committee is in pursuance of a resolution passed at the meeting of the Institute held in New York, May 27, 1910, at which a paper was read by William B. Dickson, first vice-president of the United States Steel Corporation, advocating the elimination as far as possible of Sunday labor at iron and steel works, and such an arrangement of work as would give employees one day of rest in each week.

The Lewis Foundry & Machine Company, Groveton, Pa., near Pittsburgh, is completing a five-stand 9-in. roll train for rolling rounds, squares, flats, &c.; two vertical shears driven by General Electric Company's motors to cut 2½-in. material, and two small cropping shears, also driven by General Electric motors, for shipment to the Western Steel Corporation, Seattle, Wash. The mill will be shipped early in November, and the shears in the latter part of that month. The Lewis Company is fairly busy in its roll department, and has some good business booked for even depth chilled rolls, which are a specialty of the company.

The National Society for the Promotion of Industrial Education will hold its fourth annual convention at Boston, Mass., November 17 to 19. The day sessions on Thursday will be held at Perkins Hall, 264 Boylston street; the day sessions on Friday and Saturday in the hall of the Boston Public Library and the Friday evening session at the Massachusetts Institute of Technology. The headquarters of the society will be at Hotel Lenox, Boylston street. The office of the Boston Convention Committee is room 1115, 101 Tremont street.

Heat, Light and Power in Buildings

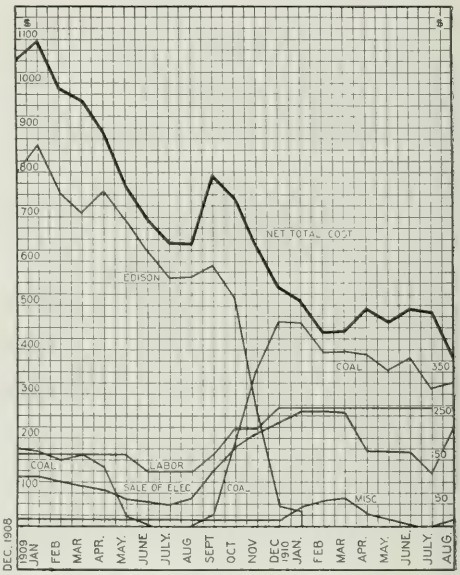
Some Operating Details of the Modern Structure

At a meeting held recently in Washington, D. C., of the National Association of Building Managers, an extensive paper, entitled "Heat, Light and Power in Buildings," was read by C. M. Ripley, vice-president of the Engineering Supervision Company., 43 West Thirty-fourth street, New York. The bulk of the paper was given over to enumeration in detail of the coal and other costs of the building plant, labor charges and miscellaneous expenses and related figures, all compared with the electric output and other features of building service, in 16 different buildings, all but one of which are in New York. A special point of the statistics was the identification of each building by name and location, a fact calculated to inspire confidence in the accuracy of the figures. The accompanying table, prepared by Mr. Ripley, summarizes the information given in the paper, which strongly advocates the use of independent power plants as against the purchase of electric current from central plants.

A graphic presentation of the saving in cost of building service in using an independent power plant as against the purchase of current is given in connection with the Monolith Building, New York, and is reproduced herewith.

The Monolith Building, 43-45 West Thirty-fourth street, 300 ft. deep, 50 ft. on Thirty-fourth street and 30 ft. on Thirty-fifth street, thus extending the whole block. The accompanying curve shows the detailed operating cost on the building manager's book for the past twenty months. Three different kinds of operation are shown during this period, as follows: From December, 1908, to October, 1909, the building was on Edison service exclusively. From October, 1909, to January, 1910, they were starting up the new electric plant, using some Edison and some of their own electricity. During the remainder of the time they were using their own electricity exclusively. The total net cost is the heavy black line at the top, and is obtained by adding all operating expenses for the entire twenty months and subtracting therefrom the entire income from the sale of electricity to tenants and neighbors. It is this difference month by month that locates the points on this curve.

The author also contributed to the paper data obtained from the operation of pumps in the Security Mutual Life Insurance Company's building in Binghamton, N. Y. The observations cover the use of an electric pump and also a steam pump for pumping water for use in the hydraulic elevator system. A series of



Costs of Operation, Monolith Building.

four different tests were run, one a week. The electric elevator pump was used one week and the steam elevator pump the next. The coal consumption, electric output and number of elevator trips were carefully noted. The accompanying table gives, in brief, the result of a typical test run for two five-day periods:

Comparative Performance of Hydraulic Elevator Pumps.

	Electric pump, May 3 to 7.	Steam pump, May 10 to 14.
Coal burned, tons	17.3	20
Number of elevator trips	3,937	3,363
Kilowatt-hours of electricity	4,780	3,230

Name, location.	Size.	Stories.	Kind.	Age.	Plant equipment.	Gross yearly cost of engineering department.	Receipts from sale of electricity and steam.	Actual net cost engineering department.	Net cost if buying electricity.	Saved by plant.	Value of electric plant.	Saving in per cent. on investment	Years for electric plant to pay for itself.
1. Terminal Building, 103 Park avenue	100 x 100 Corner.	12	Office	3	E. H.	$8,466	$400	$8,066	$11,667	$3,601	$12,000	30	3½
2. Monolith Building, 43-45 W. Thirty-fourth street	40 x 200 Inside.	13	Office	3	E. H.	9,000	3,000	6,000	10,252	4,252	13,000	33	3
3. Acker, Merrall & Condit, Fifth avenue and Thirty-fifth st.	86 x 150 Corner.	11	Office	3	H. I.	21,116	Electric plant is now being installed.			5,500 Guar't'd.	16,000	33	3
4. ——, on lower Broadway	50 x 150 Corner.	12	Office	2	E. H.	8,541	1,710	6,831	9,281	2,450	14,000	20	5
5. Sohmer Building, Fifth avenue and Twenty-second st.	29 x 110 Corner.	12	Office	10	E. H.	3,732	943	2,789	5,000	2,211	9,000	25	4
6. Security Mutual Life, Binghamton, N. Y.	70 x 140 Corner.	10	Office	7	E. H.	9,570	600	8,970	13,000	4,230	15,000	35	3
7. ——, daily New York evening newspaper	60 x 100 Inside.	10	Office	4	H.	23,000	...	....	....	....	....	..	..
8. Landsdorf, Spring and Crosby streets	100 x 100 Corner.	12	Loft	3	E. H.	7,867	2,835	5,032	9,970	4,938	8,300	60	2
9. A textile building downtown.	100 x 100 Corner.	12	Loft	9	H.	12,544	2,000	10,544	10,544	....	....	..	..
10. 213 Grand street	50 x 92 Irreg.	9	Loft	1	E. H.	Receipts from tenants more than gross operating cost.							
11. Weil & Mayer, 580-600 B'way	150 x 200 Inside.	12	Loft	10	E. H.	19,328	13,336	5,992	15,044	9,052	20,000	45	2
12. Hendrik Hudson, Riverside and 110th street	100 x 200	9	Apt.	3	H.	10,672	4,059	6,613	6,613	....	....	..	..
13. Hotel Hargrave, Seventy-second street & Columbus ave.	50 x 200 Inside.	12	Hotel	5	E. H. I.	14,108	0	14,108	22,524	8,416	13,000	65	2
14. Another hotel uptown	50 x 100 Inside.	12	Hotel	4	E. H. I.	21,600	A wasteful plant now being reorganized.						
15. Reisenweber's, Eighth avenue and Fifty-eighth street	50 x 120 Corner.	7	Hotel	7	H. I.	12,988	0	12,988	....	....	....	..	..
16. French Hospital, West Thirty-fourth street	100 x 100 Inside.	8	Hosp.	4	H. E.	13,070 in 1908 } 8,160 in 1909 }	$4,910 saved annually since.						

E.—Electric plant. H. Heating plant. I.—Ice plant.

The conclusion obtained from the test was that 18 per cent. more service was delivered with 16 per cent. less fuel when the electric pumps were used, or about 40 per cent. in their favor. It was noted that the electric pumps saved $8.05 in the five-day test, but if the additional 1550 kwhr. to run these pumps had been bought from the electric company at 5 cents per kwhr., it would cost $77.50. Or if the electricity were bought as low as 3 cents per kwhr., the electricity would have cost $43.50, entirely wiping out the saving of $8 in the fuel bill which the electric pumping effected.

When figuring the capacity required for pumping in the case of the lofty building, it is often overlooked that, in pumping the water supply for a 12-story building, about four times as much energy is required as pumping for a 6-story building. This results from the fact that one building requires twice as much water as the other, and that this double amount must, in turn, be forced to about twice the average hight, making four times the service as compared with a 6-story building.

The paper concluded with a strong argument for enlisting the services of the consulting engineer before deciding on the equipment of a given plant.

The Anniversary Number of "Grits and Grinds"

The anniversary number of "Grits and Grinds," published by the Norton Company, Worcester, Mass., has just been received. It is a notable issue of an interesting publication, commemorating the first birthday of "Grits and Grinds," the tenth birthday of the Norton Grinding Company, and the twenty-fifth anniversary of the Norton Company. In the beginning is a complete roster of the employees of the Norton Company in Worcester; Niagara Falls, N. Y.; Chippewa, Canada, and those at Wesseling, Germany, who went from Worcester, together with the members of the company's office forces at New York and Chicago. There is also a roster of the Norton Grinding Company.

The historical data are of exceptional interest, including the principal events in the remarkable history of a great and successful industry. The illustrations are most complete. Many hundreds of faces are pictured, including the board of officers, the superintendents and other important men throughout the plants; the office force, and employees who have served the company from 10 to 20 years, and another group with a 20 years and longer service behind them, and others who date even from the beginning of the company's manufacturing days. The various plants are strikingly shown, and the groups of medals won at various international expositions are reproduced. The Norton Grinding Company is similarly featured. The several types of its grinding machines are shown, illustrating a historical and reminiscent article by Charles H. Norton.

A chapter of the issue is devoted to the Pike Mfg. Company, Pike, N. H., with photographs of Edwin B. Pike and E. Bertram Pike, with the statement that in 1910 the Norton Company acquired an interest in the company, which since 1901 has acted as selling agent for the India oil stones manufactured at Worcester. Another section, with photographs, is given over to Schuchardt & Schutte and Alfred Schutte, who have acted as the company's exclusive representatives on the Continent of Europe for nearly 20 years.

Steel Passenger Cars.—The first lot of all steel suburban cars built for the Pennsylvania Railroad Company has just been received by the company. They have been sent to New York where they will be used in the suburban service out of the Pennsylvania Station. The Pennsylvania Railroad will shortly have available for use on its lines east and west, solid trains of steel passenger cars. This includes some 600 Pullman parlor and sleeping cars as well as a large number of suburban cars such as the company's shops are just beginning to turn out. An order for 40 all-steel vestibule passenger cars has been placed with the Pullman Company by the Lehigh Valley Railroad. They are to be delivered in March and April of next year.

Foundrymen's Meetings

Executive officials of the various organizations of foundrymen recently held a meeting in the Fort Pitt Hotel, Pittsburgh, and preliminary arrangements were made for the annual convention of the American Foundrymen's Association to be held in Pittsburgh the week of March 23, 1911. A stockholders' meeting of the recently incorporated Foundry & Machine Exhibition Company was also held and a permanent organization effected with the following officers: George R. Rayner, Carborundum Company, Niagara Falls, N. Y., president; E. H. Morgan, Arcade Mfg. Company, Freeport, Ill., vice-president; J. S. McCormick Company, Pittsburgh, treasurer; C. E. Hoyt, Lewis Institute, Chicago, secretary. The annual meeting of the executive committee of the Foundry & Manufacturers' Supply Association was also held in Pittsburgh October 11, at which it was decided to dissolve the Foundry & Manufacturers' Supply Association, the Foundry Machine & Exhibition Company, incorporated under the laws of Pennsylvania taking its place. A resolution was adopted as follows: "*Resolved,* that the Foundry and Manufacturers' Supply Association be disbanded and that the treasurer be empowered to remit all funds in his hands to members, pro rata, after defraying the standing liabilities; the foregoing resolution to be submitted to the membership not later than October 20, in writing, the ballot being returnable not later than October 30; the acquiescence of members not returning ballots will be taken for granted." A committee consisting of S. T. Johnston, of the Obermayer Company, Chicago; R. W. Turnbull, Henry E. Pridmore Company, and F. N. Perkins, was appointed to wind up the affairs of the association.

The Schrade Cutlery Company.—On October 13 George Schrade, president of the Schrade Cutlery Company, Walden, N. Y., sold to J. Louis Schrade all his interest in the company and retired from it. At a subsequent meeting of the Board of Directors new officers were elected. The officers and directors of the company are now as follows: J. Louis Schrade, president; Philip Hasbrouck, vice-president; William Schrade, treasurer; Irving H. Loughran, secretary; Jacob Herman, director. J. Louis Schrade was one of the organizers of the company in 1904, has been treasurer from that time and has been practically in charge of and managed the company. William Schrade will become more active in the company as treasurer and superintendent of the factory.

The Quebec Bridge.—Ottawa advices state that a question of design is largely involved in the tenders for the Quebec Bridge, now being considered by the commission. This figures more largely than does the lowest tender. Each company bidding was authorized to submit its tender either upon the plan of the commission or its own designs, and they have all followed the latter course. It will take fully another month to figure out the plans and decide as to which is the best.

The Globe Mfg. Company and the Taunton Wire Nail Company have been consolidated under the title of the Globe-Taunton Nail Company. The company manufactures wire nails, tacks, &c., at Taunton, Mass.

Contract Obligations in the Iron Trade*

How They May Be Better Kept and Enforced

BY WILLIS L. KING.†

The great writers and thinkers of the twentieth century practically agree that the world is growing better in all things that pertain to the well being of man individually and collectively. They assert that the Golden Rule is not now regarded as a platitude or impracticable theory, but is actually being constantly applied in the settlement of many questions which have heretofore caused much friction and enmity among men. They believe, and apparently with good reason, so great is this feeling of tolerance and fairness, that war between civilized nations is now impossible and that no question so serious can arise between nations which conference or arbitration cannot speedily and amicably settle.

As manufacturers of iron and steel it is well worth our while to consider whether the business world, and especially our own business, has kept pace with this trend for better things; for I feel sure we would not willingly be laggards, but rather lead in all that stands for betterment in our great and important industry.

Betterment in the Steel Industry

The most casual observer cannot fail to notice a change for the better in our business ethics during the past 10 years, but only the men who have had an active part in business under former and present conditions can appreciate in full measure the improvement in business morals. This is perhaps most apparent in the treatment of and consideration for the workmen in this great industry. No expense is now spared in the installation of better and safer machinery and methods. The hours of labor are reduced whenever possible, and the sanitary housing and education of the men and their families are constantly being considered and improved. Old age and disability pensions are the rule rather than the exception. Large sums are also being constantly expended for the foundation and support of schools, churches, hospitals and other institutions which serve to better the physical and moral condition of the workmen. In fact, a spirit of fairness and an effort to do the right thing is everywhere apparent in the relation of employers toward their employees.

This same spirit is evident in the consideration displayed among the steel manufacturers toward each other. The old system of undue and unreasonable rivalry for business and jealousy in the success of others has passed and given way to mutual regard and forbearance, even to the extent of freely exchanging information regarding new processes and machinery, and otherwise helping along the common good and general stability of the industry.

It has come to be accepted that no manufacturer can long be prosperous unless his fellows are also prosperous, and that whatever makes for the well being of one must be shared in by all, if the maximum good is to be secured. Toward the buyers and consumers of steel products the manufacturers are pursuing a broad and liberal policy. They believe that fair prices and reasonable stability are better in the long run for all concerned than violent fluctuations. No effort is made to advance prices unduly, in periods of excess demand, nor to force their product on a market beyond its consuming power.

Laxity in Contract Observance

These conditions would seem to be ideal and leave nothing to be desired; but it would be both rash and untruthful to say that we have reached perfection or that better things cannot be attained, and the object of this paper is to lay before you what a parson might call a "schism" in business principles or a doctor an "obsession," but which as a layman I would call a laxity or indifference to the moral obligations of a contract, only lately apparent, but I am glad to say not by any means common.

I anticipate the astonishment this statement will produce in the minds of our distinguished guests and fellow manufacturers from abroad, and hasten to assure them that the steel and iron manufacturers of this country hold sacred and keep inviolate any contract as against themselves; but it is the party of the other part to whom I refer, the buyers of steel products, some of whom have lately developed a growing tendency to regard a contract of purchase in the nature of an option, to be exercised if the market advances, but to be canceled or reduced if it should not prove favorable.

A study of this tendency cannot fail to be interesting and should be instructive; for, strange as it may appear, it does not seem to have obtained foothold in any other manufacturing or commercial line. Logically we are led to the conclusion that either there is something inherent in the present conduct of the steel industry which has fostered such a tendency, or that the buyers of steel products have a different standard of business ethics than other buyers. But neither of these premises seems to be tenable; for with our knowledge of the conditions we cannot admit the one and are unwilling to believe the other.

The responsibility for this lapse must, of course, be divided between the manufacturer and his customer, for the legal status of a contract is well defined and the manufacturer in condoning the action of the buyer is equally guilty. The remedy, however, lies with the manufacturer, and if this association will take the position that so far as its influence goes a contract shall be a contract, it will undoubtedly receive the loyal support of all manufacturers, and also of all legitimate and careful buyers; because their customers in turn will then carry out their engagements and the menace of speculative purchases will be eliminated.

Reasons for Contract Abuses

I think it will be proper to consider first some of the reasons of the buyers for this recent departure from well established law and precedent, and while I must confess I cannot find any good or logical reason, for nothing in my opinion can excuse a failure in contract obligations, yet I think we must assume that successful business men of long experience and high character certainly feel they have some sort of reason for such a position, and must also assume that they are unwilling to be considered as opposed to the integrity of a contract; but I take it that such men would perhaps seek justification.

First, because the large steel makers own and operate their own mines and are not obliged to contract for their ore, coke and other raw material on the market as in former years. Therefore, in reducing the price or cancelling a contract they do not now suffer an actual loss beyond the possibility of an increase in wages.

Second, that the demand has fallen off since the contract was made and those to whom they have resold do not take out the material, and they should, therefore, be made whole by the manufacturer, who is perhaps better able to bear the loss.

Third, that the market for steel products for the last few years has not been subject to the frequent and violent fluctuations of former times, and their opportunity to "buy cheap and sell dear" is so restricted that a contract now should be elastic both in price and tonnage, whenever it proves unfavorable to them.

I shall not attempt to argue or refute these claims,

* A paper read at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

† Vice-President of the Jones & Laughlin Steel Company, Pittsburgh, Pa.

because they are so evidently wrong in premises and illogical in application that any discussion seems unnecessary, but will hasten to answer as best I can the very pertinent inquiry as to why the steel makers have allowed this abuse, when control rested in them. In my opinion, their indifference can be laid to three things:

First, to the fact that in times of large demand business is so prosperous that the loss of tonnage can readily be replaced; and conversely, in times of small demand, competition for business perhaps justifies temporarily a lapse in contract obligations.

Second, to a reluctance in bringing suit in court, with its attendant annoyance, delay and expense.

Finally, to the fear that such a course would bar any future business relations.

These reasons are no more weighty than those set forth on the other side, and I submit should no longer be allowed to stand in the way of a business principle so vital and necessary to the welfare of this great industry.

In these days of large tonnages, contracts are not only necessary but cover the larger proportion of the business done in steel products, and any temporizing with a principle so vital as the inviolability of a contract must inevitably result in a lowering of the moral tone of the industry, and cause great loss and uncertainty in its operations.

I need not remind you of the inefficiency of individual effort in a matter of this kind nor tell you that only concerted action can accomplish the desired result, and I regard our industry most fortunate in having a great organization, such as the American Iron and Steel Institute, to which all such questions may safely be submitted for discussion. I believe this question is above all others in importance to the interests represented here to-day, and beg to express the hope that, after a full discussion by the members, such action will be suggested and put into effect as will for all time correct this tendency to belittle the moral obligations of a contract.

Personal

B. R. McDonald, formerly sales manager in New Orleans for the Casey & Hedges Company, Chattanooga, manufacturer of boilers and plumbers' supplies, has been transferred to Cincinnati, Ohio, and will have charge of all the central Western territory.

Joseph Schaeffers, for a number of years connected with the Simplex Automobile Company, and later with J. M. Ellsworth, 518 West Twenty-second street, New York, in the building of motor cars, has taken the American agency of the Lindenberg Steel Mills, Remscheid-Hasten, Germany, manufacturer of high grade tool steels, high speed steels and alloyed steels of every description. Mr. Schaeffers has opened offices at 1451 Broadway, New York, and stockrooms in South Brooklyn.

R. W. Dull, Aurora, Ill., has resigned as chief engineer for the Stephens-Adamson Mfg. Company, Aurora, Ill., to engage in business as a consulting engineer.

John Lambert, Chicago, was elected a director of the Republic Iron & Steel Company at the annual meeting of the stockholders, held in Jersey City, October 19. He succeeds Leonard C. Hanna, Cleveland, who declined re-election, having determined to retire from corporation activity generally. Oakleigh Thorne, president of the Trust Company of America, New York, was elected a director to fill a vacancy. The other retiring directors were re-elected.

John I. Rogers, who resigned last year from the Midvale Steel Company, Philadelphia, to take up professional practice in consultation work and design, has opened a New York office in the City Investing Building, at 165 Broadway, and will now use it as his main office. He is giving particular attention to forging by the steel hammer, the drop hammer and the hydraulic press; of special rolling, such as railroad tires and rolled wheels; of the use and manufacture of alloy steels; of machine shops and power plants, and of general iron and steel works engineering.

W. W. Stephens, president of the Stephens-Adamson Mfg. Company, Aurora, Ill., sailed October 15 for a six weeks' vacation in Europe.

George W. Crawford has been elected a member of the Board of Directors of the Crucible Steel Company of America to fill the vacancy caused by the resignation of J. D. Lyon. Other members of the board were re-elected.

W. C. McAdoo, who has been selling agent for the Steel Kote Paint Company in the Philadelphia district, has been made general manager of the paint department of the Schoellkopf, Hartford & Hanna Company, manufacturer of protective paints, 30 Church street, New York. Associated with him is C. H. Spotts as assistant manager.

E. Peter Jones and W. Llewellyn Jones of the Wolverhampton Corrugated Iron Company, Ltd., Wolverhampton and Ellesmere Port, Cheshire, England, are making a brief visit to this country.

After an illness of some weeks, L. H. Bregenzer, general superintendent of the Keystone Steel Foundry Company, Avonmore, Pa., has returned to his duties.

William C. Franz, general manager of the Lake Superior Corporation, was the guest of honor at a banquet given at Sault Ste. Marie, Ont., October 21, by the citizens. The occasion was the practical completion of the four new plants upon whose construction and equipment the corporation has been engaged for upward of a year—the additional blast furnaces, the coke ovens, the gas power plant, and the structural steel plant. It is expected that these new works, whose total cost will be about $6,000,000, will be ready for operation before the end of the year. Among those present were members of the Canadian Government, prominent Canadian bankers and business men from various parts of Canada as well as England.

Fritz von Stumm of Neunkirchen, Germany, is making a tour of American iron and steel centers.

Andrew Carnegie arrived in New York October 23 from Europe and will remain in this country until next spring.

Henry Dreses, president of the Dreses Machine Tool Company, Cincinnati, Ohio, arrived home last week after an absence of several months on a business and pleasure tour through Europe.

John Fritz, Bethlehem, Pa., the dean of the iron trade of America, has accepted an invitation to attend a testimonial dinner to be given in his honor by the Manufacturers' Club, Philadelphia, Pa., on the evening of November 17. In tendering this invitation, it was the desire of the club to express to Mr. Fritz the full appreciation of the manufacturers of Pennsylvania for the great work he has done in the development of the iron and steel industries of that State and of the country at large. Andrew Carnegie is honorary chairman of the Committee of Arrangements, with Isaac Clothier, Charles M. Schwab, W. E. Corey, Charles Kirchhoff and John Birkinbine as associates, the active chairman being Nathan T. Folwell, president of the club.

The population of Portland, Me., is 58,571, an increase of 8,426 over 1900; Brockton, Mass., 56,878, an increase of 16,815; Fitchburg, Mass., 37,836, an increase of 6,295; West Hoboken, N. J., 35,403, an increase of 12,309; Lima, Ohio, 30,508, an increase of 8,785; Hamilton, Ohio, 35,278, an increase of 11,365; Lorain, Ohio, 28,883, an increase of 12,855.

International Competition in the Steel Industry*

"Foreign Relations" from the American Standpoint

BY J. A. FARRELL.†

The subject of "Foreign Relations" is closely allied to reciprocity. To those, especially our foreign friends, who have practiced it for many years, and have had experience in its application and philosophy, my treatment of some of the elementary principles may seem to lack the extended study and experience which the subject deserves. As reciprocity among nations is one of the most important questions now engaging the attention of political economists, so is mutual intercourse in the steel industry and the development of friendly commercial relations at home and abroad a matter which merits the most earnest consideration and the best endeavors of the master minds of the industry.

There was a time when the secrets of production as well as of distribution were jealously guarded. The dissemination of metallurgical, chemical and mechanical knowledge was left to the technical societies and little attention was paid to economic and commercial changes. The various manufacturers had nothing in common with one another commercially, and as a consequence of aggression by the stronger ones, or improvements or inventions resulting in lower costs of production, the industry periodically lapsed into a state of ruinous competition.

A Better International Feeling

A gradual evolution, however, has taken place and in these later days commercial intercourse in the industry has been greatly developed. The vast progress made in science in recent years has resulted in an enormous industrial development and the production of a volume of manufactures far in excess of the dreams of the pioneers in the industries. The ever increasing output of the great manufacturing nations imperatively demands ever expanding markets, and the problem of finding adequate outlets for the production of the great industry is one of peculiar interest to us all.

We have come to appreciate the fact that the methods of peace are more profitable, to everyone concerned, than the methods of war. The old delusion that there is advantage in preventing one's rival from doing business, no matter at what cost, is giving way to more enlightened views and methods. The technical features of iron and steel manufacturing have made material advances and the commercial side is undergoing many alterations, and while there is a long road to travel in getting away from ruthless competition, progress is being rapidly made in the adoption of more co-operative methods.

Just as the nations have found it necessary to confer to the ends of peace and prosperity, it is natural that the great national groups of industries represented here by many of the commercial heads of the leading iron and steel manufacturing undertakings throughout the world should meet each other and discuss matters of common interest, to the eventual betterment of the industry. For as steel is the barometer of trade any improvement in the conditions of the steel industry must ultimately be reflected throughout the consuming markets of the world, which are dependent on the manufacturing nations, alike for the steel which is to them the sinews of war and for the upbuilding and support of industries and utilities that make for civilization and progress.

The spirit of the times in the steel industry is in harmony with a policy of good will. Such a policy, in order to be equitable and enduring, must be sufficiently comprehensive to ensure approximately equal advantages to call the parties affected. We have all been bending our energies to the upbuilding of our factories, and have succeeded beyond any dreams or prophecy; but, while we have been doing this, have we given as much effort to the consideration of a rational mode of disposing of the production, and to the wisdom and importance of peaceful rivalry? All of these are incidental necessities as relating to the conservation of our raw materials.

Amity in the Steel Trade Making Progress

While at first many in this country as well as abroad doubted the practicability of amity in the steel trade, it is doubtful if there are many to-day who would deny the wisdom of safeguarding the industry from the disastrous results of destructive competition, or who would be so incredulous as to question the benefits accruing from an interchange of views and a policy of mutual consideration, having for its object the promotion of peaceful methods of trade expansion, and the interchange of information for mutual benefit, and for the continued improvement of manufacturing and labor conditions.

The presence of our honored guests recalls many occasions when the manufacturers of Great Britain and Continental Europe have discussed measures to the resulting benefit of the industry, and consequently to the benefit of the world, which is so largely dependent on steel in many forms. Such general exchanges of opinion as to new developments in the greatest of the world's industries bring closer together each succeeding year the principals of the steel trade of the leading manufacturing nations.

In view of the diversity of ores, of labor conditions, of economic principles, of business ethics, of manufacturing difficulties, the recovery and treatment of by-products, and of various other distinctions and differences in methods of production and of distribution, the manufacturers of each country are coming to recognize that co-operation with their neighbors and with manufacturers in other countries tends to promote business amenities, notwithstanding that they are in competition for the trade of the world.

Technical Questions Less Prominent

However, in recent years it has been noticeable that at meetings of the Iron and Steel Institute and of German, French, Belgian, Russian and other European technical associations, papers on scientific subjects are not infrequently "taken as read." In fact, the consideration of technical problems has, to some extent, given place to the discussion of business matters, economics, and even politics as affecting the welfare of the industry, as by reason of the difficulty of further reducing costs and the gradual awakening all around of the leaders of the industry in the various countries, the advantages possessed by the steel manufacturers of any country over the others have largely disappeared.

The question whether one country can produce iron and steel more cheaply than another is disposed of by the commonly accepted fact that the best equipped industries, wherever located, have little, if any, advantage over one another. Certain it is that we in this country

* A paper read at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

† President United States Steel Products Company.

are not laboring under any delusions as to our prowess or advantage over our foreign competitors, and in the matter of gas engines, by-product coke ovens, briquetting of ores, and other scientific and mechanical developments, we have learned and can still learn a great deal from our foreign friends. Such being the case, it is not surprising that the leaders of the industry both at home and abroad should be largely occupied with questions of a commercial character, which are at present of as great, if not greater, importance to the welfare of the industry than those of a technical character.

How Sales Departments Dissipate Operating Savings

Without any desire to belittle the practical value and importance of effecting a saving in cost of production, however small, it has always seemed particularly hard upon the men who have accomplished what may appear as an insignificant reduction of the previous month's costs of producing pig iron, or of ingots, or of wire rods, to have this saving in mill costs dissipated by the sales department "quietly meeting the market" with a reduction of $1 or $2 per ton at the first sign of any cloud on the commercial horizon.

Good salesmanship and sound business principles in the conduct of the selling of iron and steel are just as essential and vital to the prosperity and continued success of the industry as low costs and up-to-date machinery and manufacturing practice. Old traditions die hard, but are not necessarily entitled to respect because of their hoary age.

It ought to be self-evident not only that none of us can do all the business, but that it would be unfortunate if any one of us could. Starting out with the conviction that one's competitors will probably secure their share of the business any way, it has always seemed that a policy of live and let live is likely to produce better results than one of trying to make business impossible, or at least unattractive, to one's competitors. A saner policy would seem to be one of conserving prices at a reasonably remunerative level, and of adjusting production to the requirements of consumption, in these days of craze for construction of new plants and extension of old ones without reference to whether there is a market for the increased production.

Better Market Methods in Europe

In recent years such common sense views of the commercial side of the questions have prevailed among our friends abroad, and the manner in which they, notwithstanding the diversity of their opinions, characteristics and tongues, have succeeded in creating stability of prices and conditions, would seem to dispose of any theory that the steel manufacturers of this country could not, if they so desired, bring to bear on the question of the conduct of their commercial operations the same comparative intelligence as our European friends. It would seem that this question is one which is very prominently before us, and that the commercial aspect of the steel industry must eventually take an important place in the deliberations of the various iron and steel associations.

The world's market for steel may be likened to a huge reservoir, into which the entire production of the steel mills is poured; and, notwithstanding that it is, so to speak, divided off by bulkheads, you cannot pour into one compartment more than it can hold without its overflowing into other compartments; consequently, any unusual effort to wrest the natural markets from the manufacturer, who, by reasons of geographical proximity or political or financial affiliations, is reasonably entitled to them, means that a corresponding tonnage must be disposed of by him elsewhere in the natural market of his competitors.

This would be a form of unnatural aggression which would be as unprofitable as it would be unwise. Trade of all descriptions must follow the lines of least resistance in order to secure the best results. In Europe for many years the steel industry and its allied lines, by reason of organization, have intelligently dealt with the disturbing effects of recurring periods of excessive supplies to which the steel industry has been subject. Regulated production and systematic distribution have permitted each of the manufacturers to obtain a reasonable and profitable share of this business. It is such a self-evident principle of economics that it receives governmental sanction and support. This satisfactory condition is likewise attributed in part to the maintenance of confidence on the part of both producers and consumers, due to the absence of fear that the markets were in danger of being raided with the object of capturing an unnatural share of trade.

Foreign Methods a Pattern for the United States

How to insure similar conditions in this country is a question worthy of serious consideration, and as the functions of this Institute are more or less commercial there are many points which can be discussed with mutual benefit. The problem of how to dispose of our products without demoralizing the markets of our competitors will, I believe, practically be solved by a policy of conciliation and consideration. It has often been said that "steel is either a prince or a pauper." Under conditions of extreme competition the latter is inevitable, but experience has proved that with co-operation as the guiding policy steel need never be a pauper nor yet occasionally a prince, and normal conditions may be maintained to the mutual benefit of manufacturer, merchant, consumer and laborer.

In Europe the advantages of co-operation and the disastrous possibilities of destructive competition have been amply demonstrated. For many years excessive competition kept the steel industry in Germany down to a low level of prices, wages and production. In recent years, however, there has been a marked improvement, due to the formation of the Stahlwerks Verband, which, by including in a single association the principal producers of Germany, has been able to maintain reasonable prices in their home market, resulting in increased consumption, and at the same time to largely increase their trade with foreign markets.

In this connection it is well to note a radical difference between the conditions prevailing in Europe and those which are possible in this country. The right of European manufacturers to organize for the protection of their mutual interests is not only recognized, but is encouraged and fostered, the manufacturers being thereby enabled to maintain a higher level of wages, to furnish material to consumers at equitable rates and to maintain stable prices. The formation of the German Steel Works Union and the successful results accomplished by it were largely due to the efforts of the banking interests of Germany, who realized that it was essential to the welfare of the railroads and other interests allied with or dependent upon the steel industry, that ruinous competition among steel manufacturers should be discouraged. Similar results largely actuated the financiers who organized the large consolidations of manufacturing interests in this country.

In Germany the establishment of the Steel Works Union rendered possible the resumption of operations by mills built during the years 1900 to 1902, but which had lain idle for several years following the collapse of 1903, as orders, whether plentiful or scarce, were allotted to its various constituent companies in proportion to their manufacturing capacity and requirements.

Similarly, the remarkable increase in the production and consumption of steel in this country, accompanied by general prosperity and higher wages, during the period from 1903 to 1907, was largely due to stability of prices, which resulted from the large consolidations of manufacturing companies at a time when ruthless

competition had been carried to a point where it threatened disaster to the entire industry.

Accommodating Production to Demand

One of the most serious economic questions under consideration in foreign manufacturing centers, and one which is no less vital to this country, is that of accommodating production to demand in times of trade relaxation, and it is remarkable that the opinion of the foremost men of the steel industry is that this and similar problems can only be solved by co-operation, which they regard as essential to the maintenance of the equilibrium of the world's markets.

European steel makers—that is to say, the manufacturers of Great Britain, Germany, France, Belgium, Austro-Hungary, Russia, Italy and Spain—have come to recognize that the policy of consideration for competitors has been in recent years one of the fundamental principles of the steel trade of Europe. It is a business proposition and not one of sentiment. No one who has studied the industrial conditions of Europe can reach a conclusion unfavorable to the combined effect of preserving the expediencies as well as the comities of intercourse in the steel world.

Hence, let us develop a policy of mutual consideration of the interests of our foreign brethren as well as our domestic competitors, which, more than any other factor, will enable each manufacturing country to maintain the volume of its business to which it is reasonably entitled.

At a dinner given to Judge Gary in Sheffield in 1909 by the leading steel manufacturers of Great Britain, it was recalled that the financial crisis of 1907 and 1908 had wrecked but few iron and steel firms, and this was largely attributed to his skill and wisdom in promoting friendly relations with the trade at a time when drastic price reductions would have caused widespread disaster. That this policy could be applied to the industry here, or of the whole world, with equally good results under similar conditions, was accepted as a tenable doctrine, which would eventually result in the betterment of business everywhere.

What Co-operation Will Do

The ultimate result of a general adoption of this policy would be to insure stability of prices and continuous production, commensurate with the requirements of consumption. The absence of ruinous dumping of surplus products in times of depression, and the pursuance of a conservative and steady policy toward the securing of business at fair prices, likewise refraining from the temptation of advancing prices excessively in times of great demand, must tend to obviate heavy reductions, which experience has always shown to be the inevitable result of excessive advances.

This progressive policy would remove the principal cause of the recurring depressions in the steel industry, and in consequence would permit of its continual expansion and advancement along natural lines. The feeling of security and commercial peace which would be promoted by the continuous stability of the world's chief industry would be reflected in all branches of trade.

A general adoption of the principle of co-operation in place of ruinous competition, resulting in more stable conditions in the steel industry, would naturally enable manufacturers to carry out plans for the betterment of conditions of labor, which the changeable conditions of the steel industry have heretofore impeded, such as pensions, insurance against accidents and amelioration of working conditions. It would enable the refinement of practice, improvement of plants and the installation of safety appliances. It would ultimately permit of reduction in costs, and it has been the history of every industry, including the steel industry, that reductions in cost of manufacture are invariably reflected in the prices to the consumer. Thus the consumer must eventually benefit and without reducing the fair and normal profit to the manufacturer.

The manufacturers of each country have much to learn from the others, and this assemblage can do much for the welfare of the industry, its allied lines, and for consumers the world over, who must profit by each succeeding development tending to reduce costs, facilitate distribution or ameliorate the conditions of labor. The natural rivalry to excel has produced results in production and operation which have amazed the pioneers of the industries, who were themselves engaged in creating records a generation or two ago.

The names of Bessemer, Krupp and others will stand for all time as monuments to the development from the age of iron to the age of steel. The pulses of the world have been quickened and civilization has assumed a new meaning during the developments of the past 20 years. Every year new uses for steel are found, to lighten the burden of the world's works or to enhance the luxury of its living. It is the predominant factor in the progress of nations, whether by the arts of peace or the weapons of war; yet, whatever may have been the developments and progress during our lifetime, it is safe to assume that the age of steel has but begun and that the future holds more surprises than the past.

Stevens Engineering Lecture Course

The Stevens Engineering Society of the Stevens Institute of Technology, Hoboken, N. J., announces an extended lecture course for the season of 1910-1911. It began Tuesday, October 18, and will close Tuesday, April 4. Among the lecturers are Dr. Alexander C. Humphreys, president of the Institute; Irving E. Moultrop, engineer in charge of construction and installation for the Boston-Edison Electric Company; Dr. R. W. Raymond, secretary American Institute of Mining Engineers; Dr. David T. Day, U. S. Geological Survey; Dr. James Douglas of Phelps, Dodge & Co.; Carl Hering, electric furnace expert; Dr. William Campbell, association professor of metallurgy, Columbia University; Dr. A. Stanley Mackenzie, professor of physics, Stevens Institute; George E. Hulse, chief engineer Safety Car Heating & Lighting Company.

An Obermayer Foundry Exhibit.—The S. Obermayer Company made an exhibit of foundry equipment and supplies at its factory, Eighteenth and Rockwell streets, Chicago, October 26. The factory was in full operation, showing methods used in the making of plumbago, sea coal facing, core compounds and other lines of facings; also such supplies as snap and iron flasks, stripper frames, riddles, bellows, sprue cutters, &c. One entire floor was devoted to a working exhibit of core ovens, tumbling barrels, magnetic separators, core machines, &c. In the showrooms a complete display was made of small foundry equipment and accessories. A lunch was served to visitors. The company's local representatives comprise S. T. Johnston, O. C. Olson, C. M. Barker, J. E. Evans, Fred J. Brunner, J. Thorner, J. J. McDevitt, O. J. Peterson and F. H. Dodge.

For use during the cold weather when the trains of the Pennsylvania Railroad entering the New York station through the electrified tunnel zone are disconnected from their steam locomotives and taken across the Jersey meadows and through the tunnels by electric locomotives, steam generated in electric boilers will be used to maintain the temperature in the cars and keep the train connections from freezing. These boilers, which will utilize the 600-volt direct current from the third rail, are capable of generating steam at a pressure of 80 lb.

A New Acme Turret Lathe Turning Tool

The latest design of turning tool for turret lathes made by the Acme Machine Tool Company, Cincinnati, Ohio, is illustrated herewith. This tool is made in two sizes, the larger for turret lathes having spindles 2¼ in. in diameter, and the smaller for those where this dimension is 1½ in., and it is claimed that it will turn up to the full capacity of the lathe on which it is used. Fig. 1 is an end view of the tool, which gives a

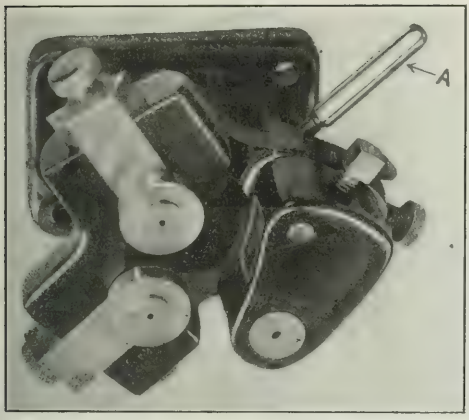


Fig. 1. A New Turret Lathe Turning Tool Made by the Acme Machine Tool Company, Cincinnati, Ohio.

clear idea of the construction of the various parts, while Fig. 2 is a general view, showing the tool mounted on a lathe turret.

The tool has roller back rests mounted on independently adjustable slides. The tool post is made with a wide slot and also has two screw holes to allow the tool to be clamped in either a backward or a forward position, and the cutter to be set ahead of or following the roller back rests. A knurled screw controls the adjustment for the different sizes of work, and when the proper adjustment has been made it is

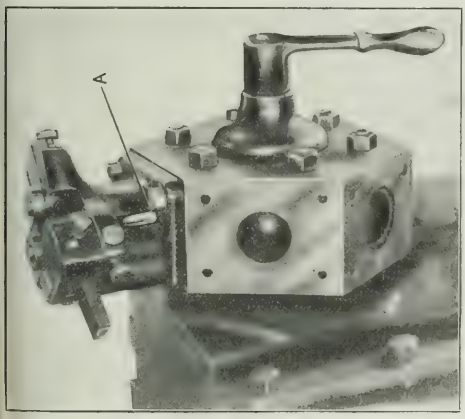


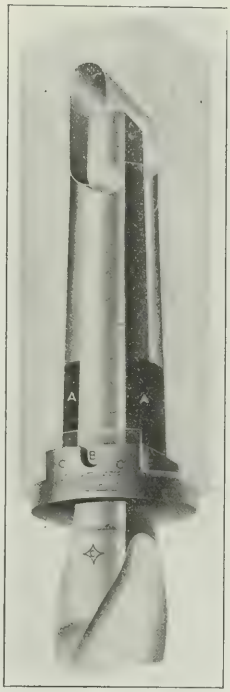
Fig. 2.—The Tool Clamped in Position on a Lathe Turret.

clamped securely to the body of the tool by a threaded stud with the lever marked A. When this lever is loosened the tool post has a slight outward movement which lifts the cutter from the work to prevent marring when the tool is withdrawn from service.

In mounting the tool on the turret, as shown in Fig. 2, it is centered in the circular recess shown on the turret face and bolted securely in place by the bolts passing into the holes shown at the four corners of the face. There is a hole through the central stem of the turret of the same diameter as the face holes, which allows work to be turned up to the full length of the carriage travel with a minimum overhang of the turret tool.

A New Drive for Cleveland Flat Twist Drills

Numerous attempts have been made to solve the problem of using and driving twist drills forged or twisted from flat bars of high speed steel. Among the lines along which efforts have been made are designing chucks to hold and drive the rough end of the flat steel bar, twisting and machining the ends of the bar to form taper shanks fitting the regular taper sockets and fastening taper shanks to the ends of the flat twist drill either by riveting or soldering. Application has been recently made by the Cleveland Twist Drill Company, Cleveland, Ohio, for patents on a new device for driving flat taper shanks which are tapered both on the flat sides and the round edges and has as its object the overcoming of the difficulties previously encountered as well as providing additional driving strength.



The New Paragon Collet for Flat Taper Shank Drills, Made by the Cleveland Twist Drill Company, Cleveland, Ohio.

Formerly the shanks regularly furnished on this company's Paragon flat twist drills were tapered on the round edges and the flat sides and were driven by sleeves or sockets of a special type. The interior of the sockets had a flat taper hole which fitted the drill shanks accurately and were tapered on the outside to fit the standard taper sockets or spindles. When large diameter flat twist drills having No. 6 shanks were used, this drive possessed the disadvantage of making necessary an extension reducing socket to adapt the large taper shanks to the drill press spindles, the tapers of which are seldom larger than No. 6. To adapt the Paragon drills having No. 5 and No. 6 shanks for use with this new drive the shanks have been redesigned so that the length is the same as the regular taper shank and the round edges have the regular Morse taper as formerly. When this shank is inserted in the spindle, the upper end fits into and is driven by the flat slot in the spindle in the same way as the tang of an ordinary taper shank drill. While this alone is a strong and practical drive it is open to the objection that the shank on its two flat sides at the lower end of the spindle is unsupported with possibilities of vibration and wear between the shank and the spindle. To guard against this and at the same time to furnish a powerful drive at the lower end of the shank where its cross section is a maximum, a new and original type

of socket known as the Paragon collet has been evolved.

This collet which forms the basis of the new drive consists of two lugs AA projecting upward from a flat disk in which a rectangular hole is cut to receive the drill shank. The outside surfaces of these lugs are rounded and ground to the standard taper while the flat inner surfaces are tapered to fit a flat taper drill shank. If the collet should stick in the spindle at any time, the point of a drift key inserted in the groove B will readily release it. When the collet is on the shank the combination gives practically an interchangeable taper shank with an unusually long tang. An extension C projecting from the circular base of the collet furnishes additional driving power. This projection mortises into a slot cut across the end of the spindle and conforms to standard forms now being supplied in the spindles of heavy duty drill presses. A glance at the engraving will show that this tongue and groove drive at the large end of the shank is much stronger than the drive on the tang. Without this extension the collets will fit any standard drill press spindle or socket and this type will be furnished to purchasers whose spindles are not fitted with slots when this requirement is specified. Of course this drive will not have the additional strength afforded by these extensions which seem to produce an almost perfect drive for large sized flat twist drills.

House Organs Desired.—The Free Public Library of Newark, N. J., of which John Cotton Dana is librarian, is making a collection of house organs in connection with the very large collection of catalogues of manufacturers which it now has in its technical department in the main library, with a selection from them in its branch for business men in the center of the city. This collection will be described in the near future in an illustrated article in one of the local newspapers of a large circulation. The library would like to get sample copies of house organs at least, and if possible to be placed upon the mailing list of all of them.

J. H. Williams & Co.'s No. 6 Shop

There is no heating problem connected with a forge shop; rather is it a problem of getting rid of the heat and adequate ventilation becomes very important. The latest addition to the works of J. H. Williams & Co., Brooklyn, N. Y., makers of drop forgings, known as the No. 6 shop, is unique for the arrangement made to dissipate the heat and has other features that make for the convenience and comfort of the workmen. The building itself, which is 50 x 100 ft., is of simple and inexpensive construction, its sole purpose being the exclusion of the elements. The sides are of corrugated iron supported by a steel frame. Under the eaves the hight is 24 ft.; the roof is of five-in-eight pitch and is surmounted at the center by a monitor 10 ft. high. The high interior space and the ample monitor provide for the removal of the heat and gases, and a natural circulation is secured by that which is the most interesting feature of the building,

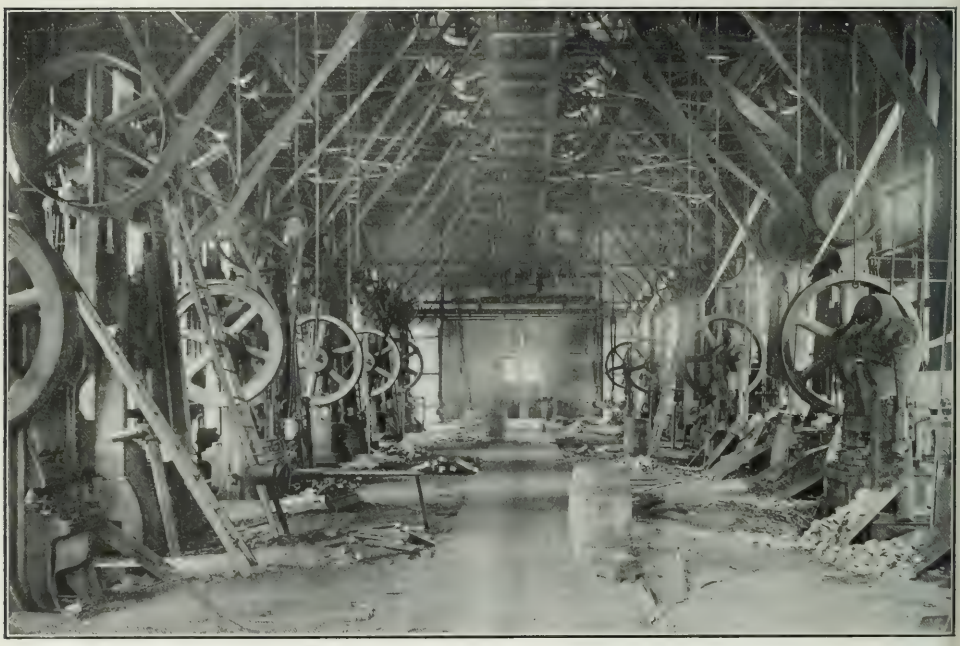


Fig. 1.—Interior View of the No. 6 Shop of J. H. Williams & Co., Brooklyn, N. Y.

an opening entirely around the sides at the ground level and 18 in. high. In other words, the walls are not carried down clear to the ground. In severe winter weather, when so much opening might be uncomfortable, it can be entirely or partly closed in by frames which are made to fit in the openings.

The building contains six 3000-lb. hammers, five 1000-lb. and three 1500-lb. hammers. Five of these were built by the United Engineering & Foundry Company, Pittsburgh, Pa.; five by the Waterbury Farrel Foundry & Equipment Company, Waterbury, Conn., and four by the E. W. Bliss Company, Brooklyn, N. Y. They are arranged in two rows lengthwise of the building, leaving a wide aisle between, so that there is space for the stacking of completed product while it is cooling and for its ready removal through the large doorway at the center of one end. Alternating with the hammers are 12 trimming presses, part of which were built by the United Engineering & Foundry Company and part by the E. W. Bliss Company. The hammers handling the heaviest work are served by jib cranes, with Yale & Towne chain blocks for handling the work

between the furnaces and the hammers and presses. Each hammer has for a foundation 6 ft. of concrete resting on 16 piles driven down 27 to 30 ft. This extensive provision for a firm foundation was necessary, as the shop is located on filled ground and it was necessary to go to a considerable depth to insure stability.

The furnaces are all oil fired and it is interesting to know that in the seven or eight years that fuel oil has been used instead of coal it has been found not only cheaper than coal by some 25 per cent., but cleaner

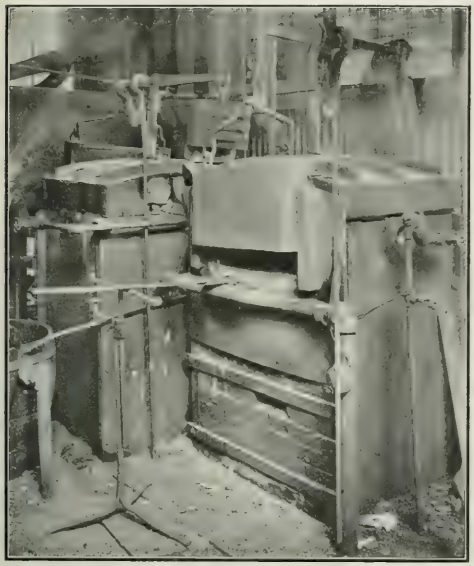


Fig. 2.—One of the Oil Fired Heating Furnaces Used in the Shop.

and more convenient from every standpoint. It is not necessary to keep the fires over night or over Sundays and holidays. The high temperature secured accomplishes the requisite heating of the work in shorter time and there is not the annoyance of handling coal and ashes. As far as the company has gone in tests with producer gas, although it does not claim its conclusions to be decisive, it has satisfied itself that oil is cheaper than gas and gives a higher furnace temperature. The furnaces are of the company's own design and are placed so that the heat issuing from their openings does not play on the backs of the operators. For the smaller work, however, where pieces are inserted and withdrawn more frequently, the furnaces are placed in the usual way, with the opening facing the hammer. The oil is atomized into the furnaces by compressed air obtained from one of the other shops. The usual jets of air blast for cooling the operator and for blowing scale from the dies are provided and are supplied through two blower systems, one on each side of the shop, each driven by a 20-hp. motor.

The hammers and presses are driven in four groups by sections of shafting running along the center at a considerable elevation and each driven by a 40-hp. motor. From these main shafts belts are carried diagonally to the countershafts directly over the machines. Under the motors and main shafts is a suspended runway reached by a ladder at one end, from which the motors are accessible for attention and the shafting for oiling.

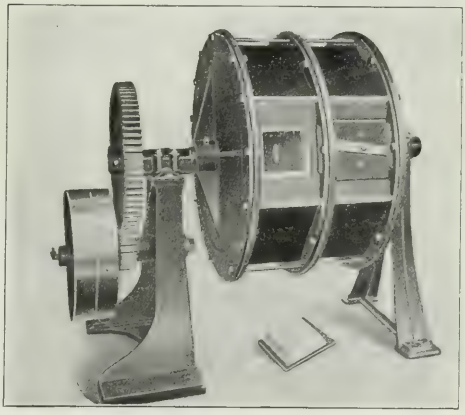
William J. Harvey has been appointed receiver of the Keystone Nail Company of Pittsburgh, works at Rochester, Pa., and manufacturer of galvanized wire nails. The liabilities are estimated at $65,000 and assets at $44,815.94, of which $18,362.18 is machinery and real estate.

The Globe-Abbott Tumbling Barrel

A new horizontal tumbling barrel for burnishing with steel balls has been added to the line made by the Globe Machine & Stamping Company, Cleveland, Ohio. This, known as the Globe-Abbott tumbling barrel, is intended for burnishing articles that are to be plated and for polishing articles that have already been plated or others which it is only desired to brighten. One of the special advantages claimed for this barrel is that with it almost as fine a surface can be secured by burnishing as could be obtained by buffing, and that the process can be applied to small articles, which would be both difficult and expensive to buff. The machine is the outcome of long experiment on the part of its maker and is simple in construction, easily handled and has proved effective in doing the work for which it is designed.

The barrel is of cast iron, lined with maple wood, and has an octagonal cross section. The barrels are made in three styles, either single, double or triple. The driving pulley is 18 in. in diameter, with a 3-in. face, and runs at a speed of 60 rev. per min., while the barrel is driven through the gears, which have a ratio of 4 to 1 at 15 rev. per min. The cover can be removed and replaced very quickly and the cross bar shown on the cover passes under ribs projecting from the edge of the barrel, so that a slight turn of the cross bars either fastens or releases the cover.

The process of burnishing itself is extremely simple if ordinary precautions are taken. A safety valve is attached to the barrel to relieve the high pressure caused by the heat generated during the process of tumbling and thus preventing the barrel from exploding. There should always be enough steel balls, which range in size from ⅛ to ¼ in. in diameter, in the



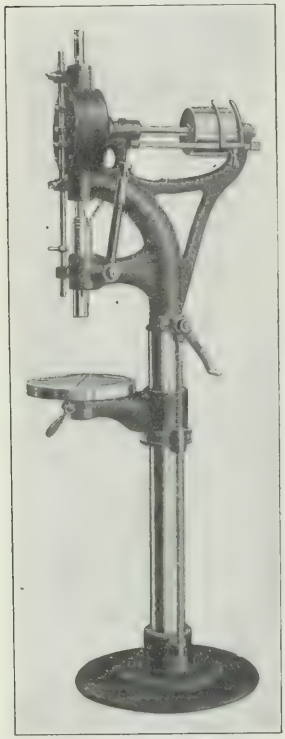
A New Tumbling Barrel, Using Steel Balls, Made by the Globe Machine & Stamping Company, Cleveland, Ohio.

barrel so that the articles to be burnished do not rub against one another. A safe rule is to use two pails of balls for each pail of material, and the smaller the balls are the better and quicker the burnishing. A pail of hot water is needed for each pail of material, and before adding the water about 6 oz. of soap chips are dissolved in it.

The machines are made with three sizes of barrels, 24 in. in diameter by 8 in. wide, 30 in. in diameter by 8 in. wide and 30 in. in diameter by 16 in. wide, each being made with single, double or triple barrels. The machine illustrated is of the double barrel type, with the middle size of barrel, and weighs 1800 lb The floor space occupied is 42 x 62 in.

The Frontier Drilling and Tapping Machine

A new machine for drilling and tapping which is being placed on the market by the Frontier Iron Works, Letchworth and Grant streets, Buffalo, N. Y., is illustrated herewith. While the tool in a general way follows the design of the Modern 20-in. drill press illustrated in *The Iron Age*, May 19, 1910, it embodies several new and practical features.



A New High Speed Geared 16 In Drilling and Tapping Machine, Made by the Frontier Iron Works, Buffalo, N. Y.

The driving gear mechanism is contained in a circular case shown in the head. On the driving shaft a disk 8½ in. in diameter is mounted in which three rows of steel involute gear teeth are inserted and furnish the speed changes. The center row has 13, the middle 24 and the outside one 34 teeth. Two pinions with a clutch between are mounted on the spindle, and the pinions are held in position by yokes connected to a tube shown on the outside of the case, the clutch engaging with the pinion. Forward and reverse motion is secured by the handle shown on the vertical shaft, a movement up or down changing the direction of the rotation of the spindle.

When used for drilling, the lower pinion is disengaged by lowering the yoke tube when it is between any two rows of teeth on the driving disk. Three changes of speed can be secured by moving the upper pinion and clutch together, and this can be done when the machine is in motion. Its capacity for drilling is a ¾-in. hole and for tapping a ⅝-in. hole. The table is slotted so that jigs holding the pieces being drilled and tapped can be bolted to it.

The principal dimensions of the tool are as follows:

Diameter of column, inches	4
Hight of drill, inches	78
Traverse of spindle, inches	4½
Maximum distance between spindle and table, inches	36
Diameter of spindle through sleeve, inches	1⅛
Morse taper of hole in spindle	No. 2

The tool is recommended as being especially serviceable for all kinds of manufacturing plants and repair shops and is guaranteed by the builder to do accurate work.

The Disposal of City Waste.—The Destructor Company, 111 Broadway, New York, has recently issued an attractive bulletin describing the 300 ton per day Heenan high temperature refuse destructor, which it has completed for the city of Milwaukee, together with a copy of the official tests of the apparatus. One of these furnaces has also been in successful operation for over two years in the Borough of Richmond, N. Y., destroying the mixed collection in an absolutely sanitary and economical manner. The cities of Buffalo, N. Y.; Westmount, Canada, Seattle, Wash.; and Vancouver, B. C., also have high temperature destructors. The company is now installing a 60-ton plant at Montgomery, Ala.

The Steel Corporation's Quarterly Statement

The United States Steel Corporation has issued its statement of earnings, covering its subsidiary companies, for the quarter ending September 30, 1910. It compares as follows with the corresponding quarter of 1909:

	1910.	1909.
July earnings	$12,132,188	$12,530,770
August earnings	13,132,755	12,437,754
September earnings	12,100,244	13,278,383
Total after deducting all expenses incident to operations, including ordinary repairs and maintenance of plants, employees' bonus funds and interest on bonds and fixed charges of subsidiary companies	$37,365,187	$38,246,907
Less charges and appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies	$760,907	$506,717
Depreciation, reserve and extraordinary replacement funds	5,555,555	6,885,171
	$6,316,462	$7,391,888
Net earnings	$31,048,725	$30,855,019
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,824,146	$5,885,900
Sinking funds on the U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	475,316	413,562
Balance	$7,311,962	$7,311,962
	$23,736,763	$23,543,057
Dividends for the quarter on stocks of U. S. Steel Corporation:		
Preferred, 1¾ per cent.	$6,304,919	$6,304,919
Common, 1¼ per cent. (1 per cent. in 1909)	6,353,781	5,083,025
Surplus for the quarter	$11,078,063	$11,387,944
Less appropriation on account of expenditures made and to be made on authorized appropriations for new plants, construction, &c.	7,500,000	10,000,000
Balance of surplus for the quarter.	$3,578,063	$2,155,113
Unfilled orders on hand September 30, tons	3,158,106	4,796,833

The earnings for the quarter ending June 30, 1910, were $40,170,960, and for the quarter ending March 31 were $37,616,876.

The unfilled orders June 30, 1910, were 4,257,794 tons, and March 31 were 5,402,514 tons.

An important use of concrete in engineering structures is exemplified in its adoption to strengthen the old wrought iron trestle approaches to the Danville, Ill., railroad bridge and also the St. Charles bridge. These structures which were built many years ago were constructed of Phoenix columns with diagonal tie rods and with the great increase in train weight, which has come about in recent years, it has become necessary either to strengthen the trestles or remove them altogether. The former course was followed and the columns encased in concrete. Tests of the compression members reinforced in this way show that the addition of the concrete has increased their strength fully 50 per cent.

The Banner Iron Works, St. Louis, Mo., now expects to have the 2-gross-ton side-blown Bessemer converter which it began to erect some time ago completed and ready for operation this month or next.

The Avey Ball Bearing Drill Press

A new type of ball bearing sensitive drill press in the design of which careful consideration has been given to securing the four essential factors of convenience, range, strength and speed has been brought out by the Cincinnati Pulley Machinery Company, Cincinnati, Ohio. Four different sizes, having one, two, three and four spindles, respectively, are built and the accompanying engravings show the single spindle or No. 1 machine. Fig. 1 is a general view of the tool and Fig. 2 shows the countershaft and the four-step cone pulley.

The model illustrated is designed to handle work up to the limit of the capacity of drills having a No. 1 taper shank, the largest size of which is 37-64 in. in diameter. The machine is ball bearing throughout and all the cones and ball races are of steel, hardened and accurately ground. The bearings are of the four-point contact type. This design permits the drill to be run at the maximum speeds which high speed twist drills are capable of, and at the same time requires the minimum of oiling and power.

The spindle of the machine is of crucible steel 7/8 in. in diameter, ground and bored to conform to the No. 1 Morse standard taper. The spindle sleeve is graduated and a stop collar mounted thereon which may be set to drill holes of any predetermined depth, not exceeding the traverse of the spindle which is 12½ in., without using a scale. This collar is held in place by a fixed clamp screw and thus no wrench or screw driver is required. Another advantage of this arrangement is that the vibration experienced when the stop collar is placed at the top of the spindle is said to be eliminated.

The construction of the rack, pinion and shaft for the feed lever in one solid piece is a decided advantage over the practice of using a sleeve held in place by a set screw as the strain is very great when heavy work is being done. The traverse of the feed rack is 5 in. The upper and lower columns and the countershaft brackets are tongued and grooved thus assuring alignment and interchangeability.

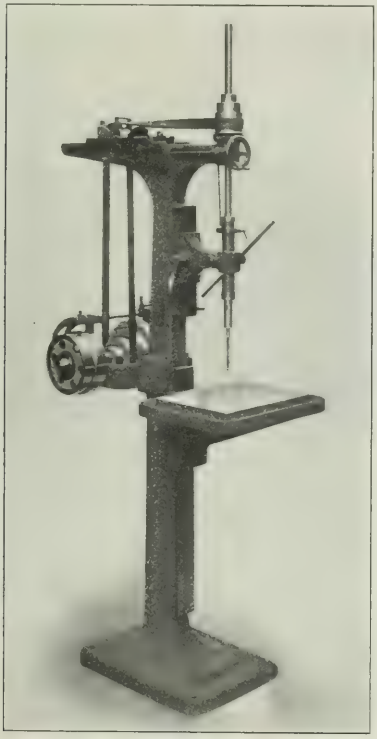


Fig. 1.—The Avey No. 1 Ball Bearing Drill Press, Built by the Cincinnati Pulley Machinery Company, Cincinnati, Ohio.

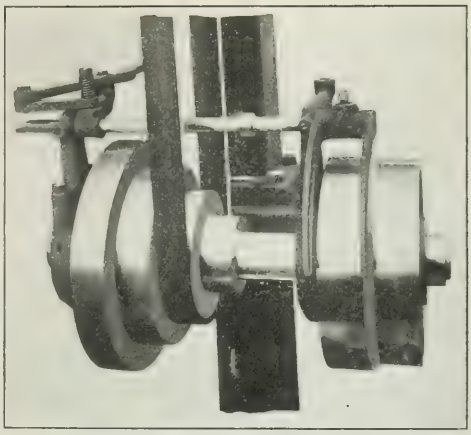


Fig. 2. Detail of the Countershaft on the Avey Drill Press.

The drill has four changes of speed obtained from the four-step cone pulley on the countershaft shown in Fig. 2 which drives by a 1¼-in. belt to a single pulley on the spindle. When changing speeds the adjustment of the belt is taken care of by a carriage on the back yoke in which two idler pulleys are mounted. The movement of this carriage is controlled by a screw feed regulated by the hand wheel just below the driving pulley on the spindle as shown in Fig. 1. The location of this wheel at a point most convenient for the operator enables adjustments to be quickly and conveniently made while it also possesses the advantage of securing a positive and precise belt tension. The slight changes in belt tensions required when changing from one size of twist drill to another are readily secured by a slight turn of the hand wheel.

The distance between the center of the spindle and the column face is the same in all four models namely, 6¼ in. and the distance between spindle centers in the three multiple spindle types is 9 in. The working surface of the tables in the different models is 15 in. from front to rear in all cases and the length is 18, 25, 34 and 43 in. The weights of the four sizes of drill are 400, 550, 740 and 950 lb., respectively.

A complete and up to date edition of the revised French tariff has been prepared by the Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C. The usefulness of the work to business men in this country is enhanced by the fact that all tariff rates are given in our money and weights, as well as in the French units. Much practical information concerning customs formalities is included. Franco-American tariff relations during the last 20 years are discussed in the introduction. The new French law did not repeal preceding tariffs. It merely amended those sections that were deemed unsatisfactory.

London advices report that leading shipbuilders have offered to build vessels similar to the Mauretania and Lusitania for two-thirds of the initial cost of the Cunard flyers. The builders will also undertake that the cost of maintenance of the new boats shall be one-third less than the amount required to run the Mauretania or Lusitania.

The Greaves-Klusman 15-In. Engine Lathe

A Machine Adapted for All Classes of Work

The 15-in. heavy standard engine lathe built by Greaves, Klusman & Co., Cook and Alfred streets, Cincinnati, Ohio, is illustrated herewith. This tool is said to embody in its design the latest and best ideas and while possessing ample power for heavy reduction work is also convenient and quick in operation on the lighter class of work, thus meeting the requirements of the manufacturing shop, tool room and repair shop. The special features of the lathe are a new design of tailstock, a rigid double plate box apron and independent geared feeds. Fig. 1 is a general view of the lathe and Fig. 2 a sectional view of the tailstock, while Fig. 3 shows the double plate box type apron and Fig. 4 is a sectional elevation of the headstock showing the independent geared feed mechanism.

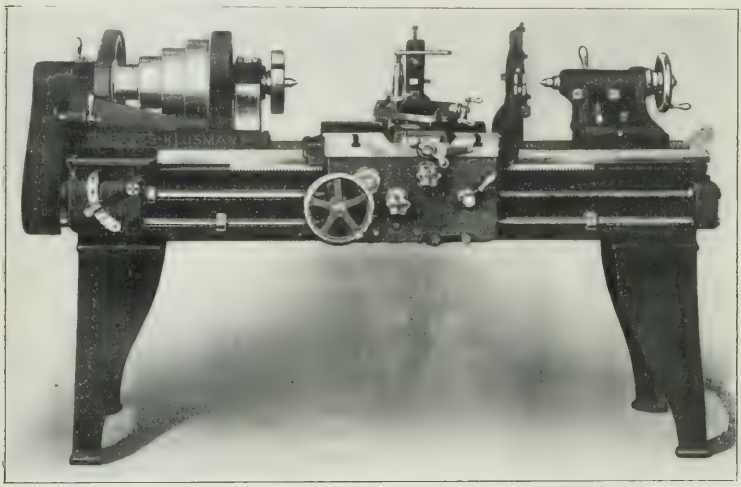


Fig. 1. The 15-In. Heavy Standard Engine Lathe, Built by Greaves, Klusman & Co., Cincinnati, Ohio.

The sectional view of the tailstock, Fig. 2, shows clearly the entirely new design and construction. This permits a spindle one-third longer than usual to be used which telescopes through a thimble at the rear with a full length bearing in the barrel at the forward limit of its travel. The spindle is gripped by double plug clamps at both ends of the barrel making it more rigid than in the ordinary tailstock and this double clamping device is operated by a single handle. The very rigid double plate box construction of the apron with bearings at each end for the studs is apparent from an inspection of Fig. 3. All the gears are of steel with coarse pitch and the strength is equal to the driving power of the lathe. Frictions operate both the longitudinal and cross feeds which are reversed by the lever shown at the front of the apron and the feed rod and lead screw cannot be engaged at the same time. The feed rod is supported at each end of the apron thus maintaining alignment and relieving the bearing of all strain due to sagging of the feed rod when the carriage is at either end of the bed. The rack pinion can be disengaged when the lathe is to be used for screw cutting which releases all gearing that would otherwise be running and adding to the friction of the carriage.

As shown by the sectional view of the headstock, Fig. 4, five independent geared feeds ranging from 10 to 160 in. per minute are instantly available, and these can be changed while the tool is in operation. The steel feed gears are of coarse pitch and run in an oil bath. The feed mechanism is easy and simple to operate; the feed changes are obtained by shifting the feed lever which is conveniently located under the headstock at the right end. An automatic stop in either direction is also furnished for the feed rod.

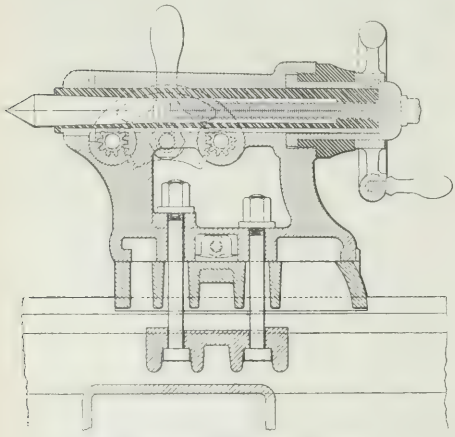


Fig. 2.—Sectional View of the Tailstock.

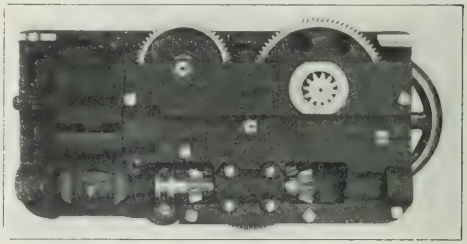


Fig. 3.—Rear View of the Double Plate Box Type Apron.

The bed is very wide and deep and all twisting strains on the Vs are cared for by heavy reinforcements underneath them which extend the full length of the bed and also below the top of the girths. The side walls above the top of the girths are about three times as thick as below. The carriage is extra heavy with a full length bearing on each V and a wide flat bearing inside the outer one. This provides substantial support directly under the tool rest and shortens the bridge of the carriage which is of unusual width and depth. A conveniently operated eccentric clamp locks the carriage.

The headstock is massive, webbed throughout its

length and is not weakened to make room for the reverse plate. To eliminate overhang of the tool when turning large diameters, the center line of both head and tailstocks is placed back of the center line of the bed, which permits a deep web between the headstock housings and a large diameter cone pulley which gives exceptional driving power. The spindle is high carbon steel, ground, and runs in large phosphor bronze bearings.

The compound rest is very substantial. The cross feed and top slides have taper gibs and micrometer dials. For thread cutting the lathe is fitted with a chasing dial to permit the thread to be caught at any point without reversing the lead screw. This also enables both countershaft pulleys to run forward and provides a wide range of speeds. All threads from 2 to 48, including an 11½ pipe thread, can be cut.

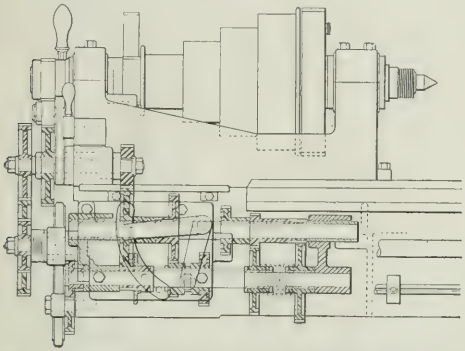


Fig. 4.—Sectional Elevation of the Headstock, Showing the Independent Geared Feed Mechanism.

The following table gives the principal dimensions and specifications of the lathe:

Swing over bed, in.	16⅜
Swing over carriage, in.	11¼
Distance between centers, in.	36
Diameter front spindle bearing, in.	2 13/16
Length front of spindle bearing, in.	4½
Diameter rear spindle bearing, in.	2 5/16
Length rear spindle bearing, in.	3¾
Diameter of hole through spindle, in.	1½
Diameter smallest step of cone pulley, in.	4⅛
Diameter largest step of cone pulley, in.	10½
Face of cone pulley steps, in.	2⅞
Width of driving belt, in.	2¾
Ratio of back gears	12¼ to 1
Number of spindle speeds	16
Maximum spindle speed, rev. per min.	510
Minimum spindle speed, rev. per min.	5½
Diameter of spindle nose, in.	2¾
Length of spindle nose, in.	2
U. S. standard threads on spindle nose, per in.	6
Morse taper of centers	No. 4
Diameter of tailstock spindle, in.	1 13/16
Length of tailstock spindle, in.	13¼
Traverse of tailstock spindle, in.	6¾
Length of carriage, in.	24¾
Width of carriage bridge, in.	6½
Travel of compound rest, in.	4
Diameter of countershaft pulley, in.	12
Width of belt, in.	3½
Number of countershaft speeds	2
Minimum countershaft speed, rev. per min.	170
Maximum countershaft speed, rev. per min.	200
Size of tools taken, in.	⅝ x 1⅛
Weight of machine on skids, lb.	2,100
Weight boxed, lb.	2,500

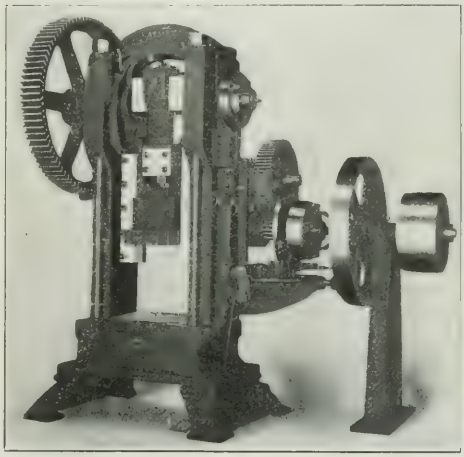
The regular equipment furnished with the machine includes compound rest, large and small face plates, steady and follow rests, set of change gears, countershaft with two self-oiling pulleys and self-oiling hangers, and wrenches. If desired a plain rest can be substituted for the compound one. Other accessories such as a taper attachment, a turret on the carriage or shears, an oil pan bed, oil pump and tubing and draw-in collet attachment can be furnished at a slight additional cost.

Gas Appliance Exhibition.—The National Commercial Gas Association will hold an exhibition in Boston, Mass., from December 5 to 13, inclusive. It will be held in the Mechanics' Building, Huntington avenue. A circular from R. C. Ware, chairman of the Exhibition Committee, 24 West street, Boston, gives full information relative to the charge made for spaces and regulations regarding the shipments of exhibits. It is claimed that an exceptionally good opportunity is here offered for manufacturers of gas engines to get in touch with the gas men of the country, especially if an exhibit is made of an operating gas engine and gas furnace. The scope of the exhibition covers all kinds of gas appliances. It is held purely in the interests of the gas industry.

The Niagara Double Back Geared Power Press

A straight sided press made by the Niagara Machine & Tool Works, Buffalo, N. Y., is shown in the accompanying illustration. One of the special features of this tool is an automatic friction clutch designed for presses handling heavy work, which controls the motion of the machine.

The Niagara friction clutch employed possesses a number of novel features. Ordinarily a drop weight is used to throw the friction clutch into engagement and frequently does not exert enough force to fully engage the clutch and prevent its slipping while the press is working. Other objections are that undue wear on the clutch parts is caused and the press may not go over the center. In the new clutch no drop weight is used and it is thrown into engagement by a positive mechanism consisting of a series of links and levers, which causes the clutch to be fully engaged before the press commences to work.



The No. 512 Power Press with Automatic Friction Clutch, Made by the Niagara Machine & Tool Works, Buffalo, N. Y.

The clutch can be tripped either by the foot treadle, in which case the motion will stop at the highest point of the stroke after making a complete revolution, or it can be operated by a hand lever. When the latter is the case the motion of the slide can be stopped or started at any point of the up or down stroke. Moving the upper end of the clutch operating rod out of line with the upper cam slide serves to disengage the power mechanism.

The press, known as No. 512, is a straight sided double back geared press, with four steel tie rods in the frame. The distance between the uprights is 28 in. and the ratio of gearing is 25 to 1. The net weight of the machine is approximately 30,000 lb.

The Style C Hammer Core Machine

The latest core making machine to be added to the Hammer line made by the Brown Speciality Machine Company, Chicago, Ill., is the style C which is illustrated herewith. Fig. 1 is a general view of the machine, and Fig. 2 is one showing the interior after the hopper cover has been removed.

The machine is of the same general type as the other styles of Hammer core machines which have been on the market for the last 10 years, but the distinguishing feature is the addition of back gears which when in mesh give a ratio of three turns of the power wheel to one of the bit. These gears are meshed when making cores larger than 3 in. and for those 3 in. and

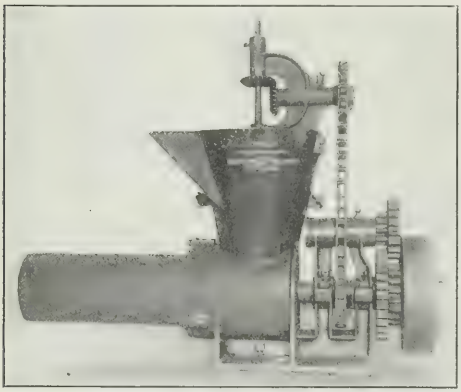


Fig. 1.—The New Style C Hammer Core Machine Made by the Brown Specialty Machine Company, Chicago, Ill.

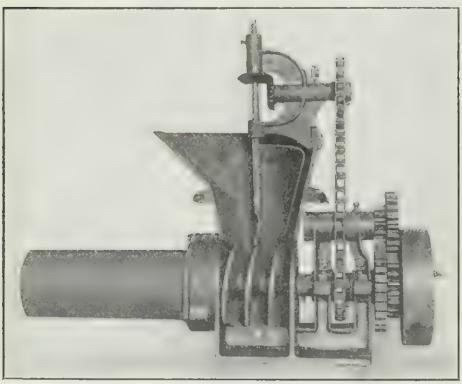


Fig. 2. View of the Machine with the Hopper Cover Removed.

smaller, the gears are not meshed and the power wheel and bit are directly connected.

Fig. 2 shows the machine with the hopper cover removed. The vertical force feed shown in this engraving is applied in the same way as in the former machines and to this feature the success of the Hammer core machine is said to be largely due. This vertical force feed assures a continual and uniform supply of sand which eliminates the formation of soft spots in the core and the clogging of sand in the hopper is prevented and is one of the patented features of the Hammer machines.

The cores are vented by a pin which is machined on each bit. This is also a patented feature and is said to be the most efficient way known for venting stock cores. The output of this machine includes round cores, the diameters of which range from ⅜ to 7 in. and square cores measuring from ⅜ in. to 5 in. on a side. With special dies, round cores as large as 11 in. in diameter can be made as well as rectangular ones 7½ in. square.

The Newton Duplex Rod Boring Machine

Larger Output and Increased Rigidity of the Spindles Are Two of Its Features

A new design of duplex rod boring machine has been recently developed by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., and is illustrated herewith. It was specially sought to secure a maximum output from high speed steel tools and by increasing the rigidity of the spindle supports to adapt the machine to boring a greater variety of parts than the former designs. Fig. 1 is a general view of the machine and Fig. 2 shows the same machine with the gear guards removed.

As will be noticed from the engravings, the body of the machine proper consists of a massive base the top surface of which is machined and slotted for the reception of bolts. This is used for the working surface and measures 16 ft. 6½ in. long by 24 in. wide and is surrounded by an oil pan. Three uprights of massive proportions are attached to this base and support the rail which is of box type construction and of exceptionally heavy section internally braced by a large number of heavy ribs. This rail also serves as a reservoir for the lubricant.

The section of the spindle saddle is also very heavy and it has an angular bearing on the lower surface of the rail, thus insuring a closer contact with heavier pressures and the top bearing is a square one, the adjustment being made by a bronze taper shoe on the top and at the rear by a gib bolted to the saddle. The adjusting nut is shown at A in Fig. 1 fitted to the hook bolt engaging the inside of the shear to hold the saddle in any predetermined position on the rail and at B is shown the pinion, the solid end of which is squared for the fitting of a removable ratchet for adjusting the saddle crosswise.

The spindles are each 4¼ in. in diameter and revolve in bushed bearings in the sleeve which has a bearing of 28½ in. over all. The outer diameter of the sleeve is 5¾ in. and the length of the spindle feed and hand vertical adjustment is 16 in. A No. 6 Morse taper is fitted on the spindle. The drive for the spindles is by a worm and worm wheel, the former of hardened steel with roller thrust bearings and the latter of bronze with teeth of steep lead, both being encased for continuous lubrication. An extension of the spindle fitting in the rack sleeve revolves in brass bushings and presses against a fiber washer which takes the thrust. The upper end of this spindle and rack sleeve are encased and protected from dust and dirt by the cover C which also serves as a support for the counterweight. An important feature of this design is that the thrust of the driving worm is taken by bearings cast solid with the saddle.

For ordinary work the drive is through spur gears from the four-step cone pulley at D and where desired back gears for motor or belt connection are placed which give a spindle rotation having a range of 10 to 1. When motor driven, a General Electric type CQ 10 10-hp. 220-volt motor having a speed range of from 400 to 1200 rev. per min. has been employed. This enables stud pin holes to be drilled and the projections for oil cups to be finished both externally and internally, which is a very valuable feature in repair shops which do not have enough boring to keep the machine busy on the one operation. Motion for the feed is taken through spiral gears, one of which is mounted on the spindle sleeve at F and the other is keyed to the hori-

zontal pull pin shaft at G. Four pull pin gears, giving the same number of changes of feed which range from 0.0023 to 0.0118 in. per revolution of the spindle, are mounted on the shaft and this motion is transmitted to the rack sleeve through the worm and worm wheel H and I, respectively. This feed motion is clutched at H by a tooth clutch which enables either power feed or hand elevation to be used.

The saddles can be adjusted on the rails from a minimum distance between spindle centers of 30 in. to a maximum of 11 ft. 4 in. The distance from the table to the bottom of the spindle in its highest position is 25½ in. At J is clearly shown the auxiliary support for the spindles which has a bearing on each upright and is provided with hand elevation through a worm and worm wheel by the mechanism at this point. The particular purpose of this bearing is to support the spindle securely at its lowest possible point when cutting, which permits modern cup cutters capable of taking cuts from ½ to ¾ in. to be used when boring the rods. This eliminates the necessity of drilling a pilot hole and saves the center which can be used later as a body for inserted tooth cutters or for gear blanks.

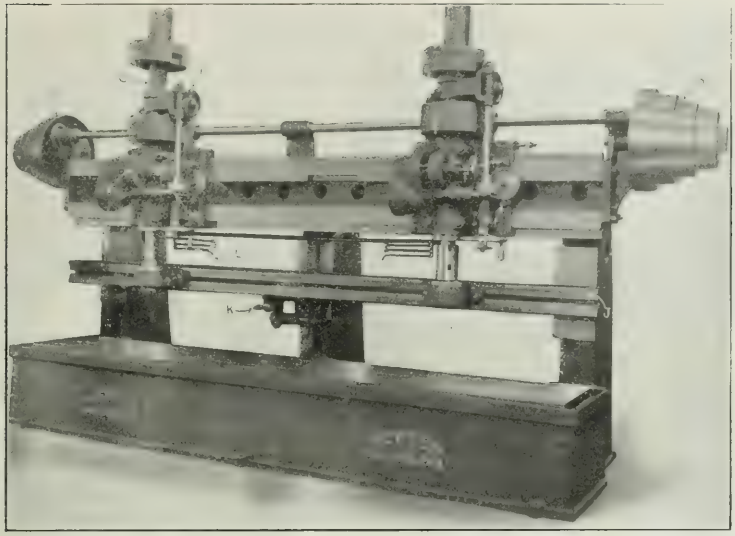


Fig. 1.—A Special Duplex Machine for Boring Rods Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

The floor space required by the machine measures 14 ft. 2 in. by 5 ft. 5 in. and the approximate net weight is 28,500 lb. The machine is furnished complete with pumps, piping and attachments for lubrication and the lubricant is delivered to the cutters by the floating pipes shown at L.

Several of these machines are in use at the present time. Some of the work done by them includes boring 10-in. holes through both ends of a 5-in. rod simultaneously. This was done in 20 minutes at one cut, the second operation being a reaming cut which completed the boring.

Merger of German Electric Companies.—In 1900 there were seven large electrical manufacturing companies in Germany, which in the early part of 1909 had been reduced through consolidation to four. Recent foreign advices indicate the beginning of a further combination of German electrical engineering industries. It is reported that the Zurich Bank for Electrical Enterprises, which was originally formed as an investment and promoting concern by the Allgemeine Elektrizitats Gesellschaft of Berlin, recently made an offer for an exchange of stock with the Lahmeyer Electric Company, which offer has been accepted. This company holds $4,000,000 in stock of the Felton and Guilleaume-Lahmeyer Werke, so that it is seen that the Allgemeine Gesellschaft, through the Zurich Bank for Electrical Enterprises, has obtained an interest in the heretofore independent company, although not a controlling one, as the total capitalization is about $13,750,000. Other consolidations are reported to be in progress which when completed will reduce the seven independent electrical companies of a decade ago to two. The situation as it now exists in Germany very much resembles that in this country.

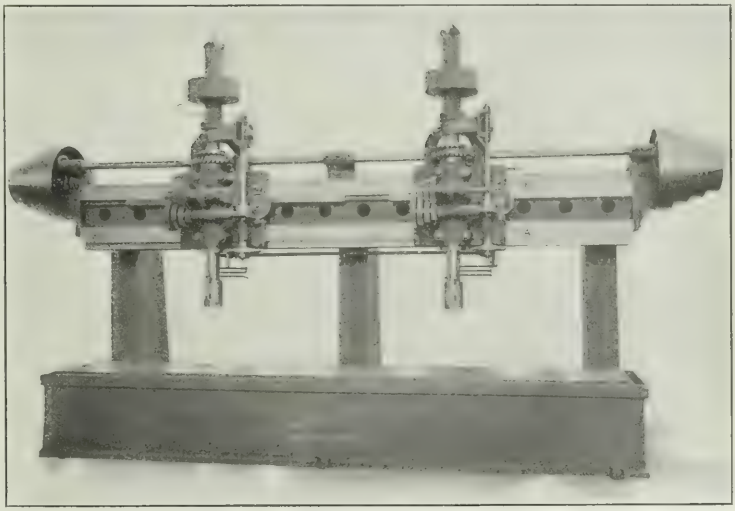


Fig. 2.—A Partly Assembled Machine, Showing the Heads Without Their Gear Covers.

The Lodge & Shipley Axle Drilling Lathe

Equipped with a Special Attachment to Revolve the Drill

An interesting special drilling attachment has been recently completed by the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, which is illustrated herewith. Figs. 1 and 2 are front and rear views respectively of one of its 30 in. by 30 ft. motor driven patent head lathes fitted with the attachment for drilling 4-in. holes longitudinally through the centers of steel axles 10 in. in diameter, and Fig. 3 is a detail of the special steady rest employed.

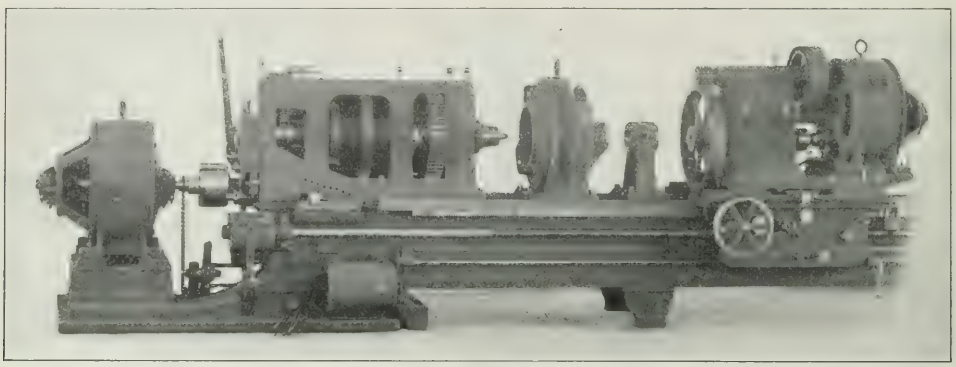


Fig. 1. Front View of the Lathe with Gear Covers Removed.



Fig. 2.—Rear View, Showing Lubricant Pump and Piping.

Two Views of a 30 In. Lathe Equipped with a Special Axle Drilling Attachment, Made by the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.

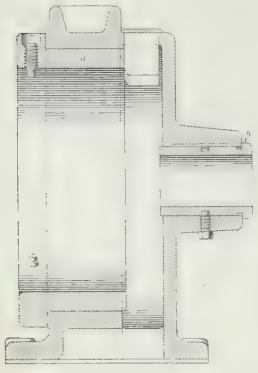


Fig. 3.—Details of the Special Steady Rest.

The special drilling attachment is mounted upon the carriage of the lathe, and consists of a heavy bracket with a train of gears driven from a direct connected adjustable speed 4¾-hp. motor. All of the gears are completely covered to protect the operator, and in Fig. 1 some of the gear covers are removed to show the gearing of the headstock and the special drilling attachment on the carriage better. The main driving shaft in this bracket carries the drill and is in exact alignment with the lathe spindle.

To care for the unusual end thrust required in driving a 4-in. drill, the headstock has a special tie piece across the top which is fastened to the caps of each of the four headstock bearings. The use of this tie plate furnishes support for the bearings from above as well as below, thus keeping them in position. Six mechanical changes of speed are available by gearing in the headstock, and these are doubled by a 2 to 1 speed variation in the 10-hp. main driving motor. The front and rear covers of these gears are bolted to either side of the tie piece.

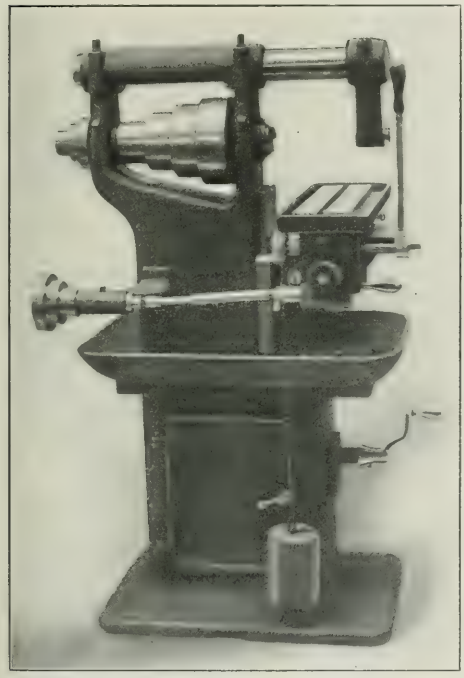
In operation one end of the axle to be drilled is gripped in a chuck, which is not shown on the lathe spindle, and the other end is carried in the special steady rest shown in Figs. 1 and 2, between the headstock and the carriage, and in detail in Fig. 3. The portion of the steady rest carrying the end of the axle has a large annular bearing, *a*, within the circumference of the rest, so that this portion revolves with the axle. The other side of the rest supports the drill in a bushing, *b*, which revolves with the drill. The bushing shown in place is for a 4-in. drill, while those on the floor in Fig. 2 are for a 2-in. drill. A drill rest and guide with a revolving bushing to support the drill approximately at its center is employed between the steady rest and the carriage. Although these drill bushings are free to revolve, endwise movement is prevented by a set screw, the tip of which enters an annular groove

around the center of the bushing. In this way the work revolves in one direction, and the drill in the opposite one which gives great accuracy and high productive speed.

The arrangement of the pump and piping of the lubricating system is shown in Fig. 2. The former is placed near the end of the headstock, and is positively driven from the motor shaft by a chain. This pump forces the lubricant through the piping at the back of the bed and up to the center of the main driving shaft of the drilling attachment. From here it passes through the drill itself and is discharged at its tip. The joint in the piping just below the carriage is fitted with a stuffing box, so that the rear section of pipe telescopes the adjoining one, thus making a good joint and insuring proper lubrication of the drill regardless of the position of the carriage. A pan, which is not shown, extends under and around the whole machine and retains the lubricant and chips.

The Bickford & Washburn No. 1 Miller

To meet the demand for a plain milling machine of medium size and price, Bickford & Washburn, Inc., 12



The New No. 1 Milling Machine, Built by Bickford & Washburn, Inc., Greenfield, Mass.

Chapman street, Greenfield, Mass., have designed the No. 1 milling machine illustrated herewith. It embodies several features which should appeal to manufacturers who desire to increase the efficiency of their equipment. Among these are a novel type of power feed and quick return of the carriage when the feed stops.

The table drops 7½ in. from the center of the spindle and has movement in three directions, the distances being 15 in. horizontally, 7 in. vertically and 3 in. transversely. The working surface of the table measures 8 x 23½ in. The spindle is bored for a No. 10 Brown & Sharpe taper and runs in bronze bearings which have adjustment to compensate for wear. Graduated collars free to set in any position are provided for the elevating and cross feed screws. The entire feed mechanism is protected by a guard which is not shown in the illustration. The table has a large oil channel extending around it and the outer edge is planed off flush with the platen which has a T slot for a ⅝-in. bolt through its center. Either a drip oil cup or a pump is furnished for the machine in which case the tank will be placed in the base.

One of the novel features of the machine is the use of a rack which is a quarter section of a screw and is constantly in mesh with a worm gear. This gives a smoothness of cut which is claimed not to be found in the ordinary rack feed machine as the tendency to chatter is prevented by the curved teeth of this peculiar form of rack. The worm gear is driven by a short worm wheel and gear from the feed shaft which is of the regular type.

Another special feature is the provision for a quick return of the carriage when the feed stops. This is very desirable at many times especially when the machine is used on such work as fluting taps or reamers. The quick return is accomplished by a short drum on the cross shaft which has a worm gear meshing with the rack. As this drum revolves it winds up a wire cable attached to a suspended weight which when the feed is released immediately falls and, unwinding the cable, returns the machine table. The exact place at which the table will stop is determined by a special clamp which makes it easy to adjust the length of the wire cable.

A crank handle is used interchangeably on the elevating screw and the cross and table feeds; the latter have a device for keeping the crank from falling off. A hand lever is also furnished for use on the feed shaft to provide hand feed for light rapid work.

The main driving belt of the machine is 2½ in. wide and the feed belt 1 in. wide. The net weight of this machine is 900 lb. and at the present time the makers are working on patterns for a No. 2 machine which will be almost identical with the one illustrated, but the weight will be approximately 600 lb. greater and it will have back gears.

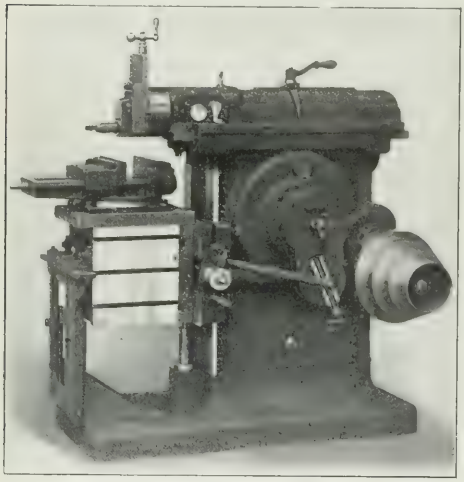
The Cost of Motor Cars.—A most interesting tabulation of prices in connection with the automobile industry has been made public by the Association of Licensed Automobile Manufacturers. It is a careful compilation of figures recorded by the association for each year since 1903, and gives the average price of automobiles for each year since that time. It increased from 1903 to 1907, but since then has gradually declined not because of any radical reduction in the price of individual makes, but by the great increase in the number of cars selling at $1500 or less. The figures tend to show that the trend in manufacturing has been to give more each year for the same list price than to make any great cut in the selling figure. There has been a tremendous increase in the making of what are termed moderate priced cars and a normal and healthy increase in the number of the higher priced machines produced. From $1133.37, the average price for cars in 1903, the figures increased to $2137.56 in 1907, and since this time decreased until the first six months of the present year show $1545.93 as the average retail list price of cars.

The fourth annual convention of the Iron and Steel Electrical Engineers, held at the Hotel Schenley, Pittsburgh, last week, elected officers as follows: Lew R. Palmer, electrical engineer of the South Side plant of the Jones & Laughlin Steel Company, president; E. R. Shover of Youngstown, Ohio, vice-president; C. W. Parkhurst of Johnstown, Pa., second vice-president; E. W. Yearsley of Sparrows Point, Md., treasurer, and John Farrington, secretary. The latter two were re-elected.

The Stockbridge 16-In. Back Geared Shaper

The new 16-in. back geared shaper of the Stockbridge Machine Company, Worcester, Mass., shown in the accompanying engraving, was designed for toolroom work, as well as for use as a productive shop tool from which hard service is required. The machine is of heavy, rigid construction, weighing 2850 lb., and embodies several new ideas, conspicuous among which is the manner of attaching the cross rail to the column, patterned after that familiar in milling machine practice. In this construction one gib is cast solid with the cross rail, thus adding to its stiffness as well as obviating the possibility of its tipping away from the column when the adjusting gib on the working side of the machine is loosened. No time is lost in going around the machine to tighten and loosen binder bolts when the cross rail is lowered or raised, since when the gib binder screws on the working side of the shaper are tightened the cross rail is locked to the column.

The rocker arm is of special design. The slide ribs



A New 16-In. Back Geared Shaper Built by the Stockbridge Machine Company, Worcester, Mass.

are of cored U-shape, to secure added strength, while the slot in the rocker arm is of exceptional depth and width to provide a large surface for the crank block. The ram is carried around in a semicircle on the top and the sides are built straight down, which, combined with internal ribbing, insures strength and stiffness. The head is graduated and can be adjusted to any angle, being locked in place by two bolts, one at either side. Taper packings running the entire length of the column and adjustable from either end by screws provide for any wear in the ramways.

The cross feed is automatic in either direction and adjustments may be made while the machine is in motion. The cross feed is so constructed that there is no necessity of changing the position of the cross feed rod when it is desired to reverse the direction of the feed. The reversing is accomplished by moving the block in the slide to one side or the other of the center, the slide having a reciprocating motion. The bar screw is fitted with a graduated collar reading to 0.001 in.

Either hand or automatic down feed of the head is furnished. The head slide has a graduated collar reading to 0.001 in., and can always be set at zero, regardless of the position of the screw. The base of the machine extends out well in front and has slots for strapping work. An angle iron is provided for bolting to the base, which carries a sliding upright that adjusts itself automatically to the hight of the knee and, setting up two bolts, locks the slide in position. In conjunction with this the knee is hooked over the saddle, which takes the forward thrust, that otherwise would come on the bolts that fasten the knee to the saddle. The former is raised and lowered by bevel gears and a telescopic screw having ball thrust bearings.

The cone pulley is supported on a self-oiling bearing built out from the side of the column. All the pull of the belt comes on this bearing, thus relieving the driving shaft from this strain. The driving shafts are carried through the column and are supported at either end by self-oiling bushed boxes. All the change gears are steel. The four-step cone pulley with back gears gives eight changes of ram speed.

The details of the machine follow:

Length of stroke, inches	16¾
Vertical travel of table, inches	14¾
Horizontal travel, inches	23
Minimum distance between ram and table, inches	2½
Maximum distance between ram and table, inches	17
Head feed, inches	6½
Working surface of table top, inches	14¾ x 13½
Length of ram bearing in table, inches	30
Length of ram, inches	36
Width of ram bearing in column, inches	10¼
Speed of countershaft, revolutions per minute	300
Weight of machine, pounds	2,850

In common with the 24-in. shaper illustrated in *The Iron Age*, March 24, 1910, and all the others made by this company, the machine is equipped with the Stockbridge two-piece crank. This crank, it is claimed, delivers all the power developed by the driving shaft to the tool point and in addition secures an even cutting speed throughout the length of the cut, with a quick return of between three and four to one. No jar is sustained by the machine due to this high rate of return, as the speed, while great during the middle of the stroke, is gradually accelerated and retarded by the construction used and the stroke is thus reversed easily and smoothly.

The Seymour Mfg. Company Enlarging

The Seymour Mfg. Company, Seymour, Ind., has completed plans for building a large addition and making other improvements which have been found necessary on account of its increasing business and the addition of several new lines. The new building will be 50 x 300 ft. and will be of fireproof construction throughout, with fire hydrants installed at various places about the building.

When the improvements have been completed all the machinery will be removed from the present factory building, which will be converted into a warehouse. The spoke department will be transferred to a building on an adjacent street, which will also be remodeled and arranged to accommodate a large amount of machinery. The new building will be equipped for the manufacture of grain cradles, posthole diggers, scythe snathes and other tools. The power plant will be moved nearer the present building and the machinery in the departments in which the metal tools are manufactured will be operated by motors. Upon completion of the new buildings the company will have over 33,000 sq. ft. of floor space, and the capacity of the factory will be enlarged about one-third. The new equipment to be installed will not be purchased until spring.

The Best Mfg. Company, Pittsburgh, has awarded a contract for the installation of a complete industrial track system at its new plant at Oakmont, Pa., to C. E. Brosius, Pittsburgh, representative of the Atlas Car Mfg. Company. The installation includes 2000 ft. of track, turntables, switches, mill cars and equipment.

Tool Steel Welding

An Economy Possible in the Use of High Speed Steel

BY WILLIAM F. STANTON.*

The use of high speed steel for lathe and planer tools by progressive machine shops is so general that it is hardly necessary to touch upon its economy as a time and money saver in comparison with the ordinary carbon steel tools used before the process of making high speed steel was known. The principal objection to its use lies in the initial cost, which is so much greater than the ordinary tool steel that even now some shops still use the old style tools. A number of experiments have been made in welding high speed to ordinary machinery steel, and it was only a little over a year ago that the problem was solved. At a recent meeting of the Master Blacksmiths' Association at Niagara Falls, the matter was up for discussion and there was considerable argument both pro and con. Many of the delegates were not convinced that the method described was a success, and quite a number also confused it with the proposition of brazing high speed steel on machinery steel, which makes it impossible to put a tool made by this process back into the furnace for retempering.

For the past nine months the writer has been welding a cutting edge of high speed steel on tools made from common machinery steel costing less than 4

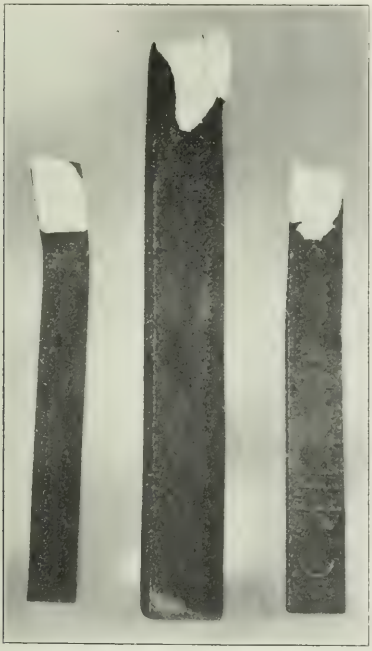


Fig. 1.—Lathe and Planer Tools, Consisting of a High Speed Steel Cutting Edge Welded to a Body of Machinery Steel, Made at the Shops of the J. A. Fay & Egan Company, Cincinnati, Ohio.

cents per pound, in the shops of the J. A. Fay & Egan Company, Cincinnati, Ohio. Fig. 1 shows some lathe and planer tools made in this way by welding to common steel a piece of high speed steel made from the butts or ends of tools which have become too short for use in the tool posts. In this time very little has been spent by this company for high speed steel, as there was on hand a large accumulation of discarded tools that ordinarily would have been sold for scrap.

In making tools by this process the first step is to cut a piece of ordinary machinery steel along the curved line shown at the upper ends of the tools in Fig. 1 and a piece of high speed steel shaped to fit this cut. The bar of common steel is brought almost to a white heat, a flux is applied and the piece of high speed steel is laid in place cold. In a few seconds this piece of high speed steel will adhere sufficiently, so that the tool can be replaced in the furnace and the whole brought back to a fluxing heat. When this heat has been reached the tool is placed in a cast iron form of the same shape as the tool, as shown in Fig. 2. Pressure is applied to the piece of high speed steel with an ordinary screw press until the welding heat is gone, or for about 30 sec. The tool can then be tempered and ground exactly the same as if the whole piece was of high speed steel.

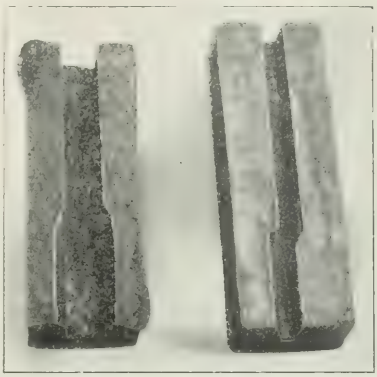


Fig. 2.—The Iron Molds in Which the Tools Are Placed After They Have Been Heated.

At first, following the example of previous experiments, a Lafitte welding plate was used, but recently satisfactory results have been obtained with several ordinary fluxes. As will be noticed from Fig. 1, the weld shows plainly and at first the writer had many misgivings as to the success of the experiment, but after welding over 400 tools, with very few failures, he is convinced that as a money saving proposition it is something that should not be overlooked by shops in which there are a number of lathes, planers or shapers. A few ounces of steel costing, perhaps, 85 cents per pound, will put a cutting edge on a tool that will answer the purpose just as well as if the whole tool was made of the same material, and when this is worn off the process can be repeated as often as desired without entailing considerable work by the blacksmith. The whole secret of the process lies in welding by compression instead of concussion, which is the ordinary way, and applying the piece of high speed steel when it is cold to the machinery steel when the latter has been brought almost to a white heat.

* Master blacksmith, the J. A. Fay & Egan Company, Cincinnati, Ohio.

Many members of the American Institute of Mining Engineers sailed October 21 from New York on the Prinz August Wilhelm for a special trip to the Panama Canal Zone. The regular technical session will be held on board during the voyage. Numerous papers will be read and regular business transacted. A stop of nine days will be made on the Isthmus. The itinerary includes trips by special train to Gatun Dam, the Culebra cut, the locks and dam at San Miguel and Miraflores. Two days will be spent in Havana and three days at Kingston, Jamaica. Among those in the party are David Williams and Charles Kirchhoff.

The Ohio Employers' Liability Law

The State Commission Gives a Hearing in Cincinnati

The Ohio Employers' Liability Commission held its first session in Cincinnati, October 13, 14 and 15. Representatives of a number of prominent manufacturing companies of the vicinity attended the hearing for the purpose of answering questions propounded by the commission relative to the Norris-Matthews law enacted April 7, some extracts from which are as follows:

Extracts from the Ohio Law

Sec. 6242. That in all actions brought to recover from an employer for personal injuries suffered by his employee or for death resulting to such employee from such personal injuries, while in the employ of such employer, arising from the negligence of such employer or any of such employer's officers, agents or employees, it shall be held in addition to the liability now existing by law that any person in the employ of such employer, in any way having power or authority in directing or controlling any other employee of such employer, is not the fellow servant, but superior to such other employee. . . .

Sec. 6243. That if the employee of any such employer shall receive any personal injury by reason of any defect or unsafe condition in any ways, works, boats, wharves, plant, machinery, appliances or tools, except simple tools, in any way connected with or in any way used in the business of the employer, such employer shall be deemed to have had knowledge of such defect, before and at the time such injury was so sustained, and when the fact of such defect shall be made to appear upon trial of an action brought by such employee or his personal or legal representatives, against any such employer for damages, on account of such injuries so received, the same shall be prima facie evidence of neglect on the part of such employer; but the employer may show by way of defense that such defect was not discoverable in the exercise of ordinary care.

Sec. 6245. That in any such action when it shall appear that the injury or death was caused in whole or in part by any of the following, to wit: The neglect of such employer in failing to properly furnish, maintain, construct, guard, repair, inspect or protect any of the ways, works, boats, wharves, plant, machinery, appliances or tools, in any way connected with or in any way used in the business of the employer, in any manner required by statute or law of the State or United States; any defective or unsafe condition in the ways, works, boats, wharves, plant, machinery, appliances or tools, except simple tools, in any way connected with or in any way used in the business of the employer, the fact that such employee continued in said employment with knowledge of such negligent omission or want of care or such defective or unsafe condition shall not be a defense unless by the terms of his employment it was expressly made the duty of such employee to report such neglect or such defective or unsafe condition to the employer and the evidence discloses that such employee failed so to report, and that the employer was not otherwise possessed of knowledge of such negligent, unsafe or defective condition.

Sec. 6245-1. That in all such actions hereafter brought, the fact that the employee may have been guilty of contributory negligence shall not bar a recovery where his contributory negligence is slight and the negligence of the employer is gross in comparison. But the damages shall be diminished by the jury in proportion to the amount of negligence attributable to such employee. Provided that no such employee who may be injured or killed shall be held in any degree to have been guilty of contributory negligence in any case where the violation of such employer of any statute or law of the State or United States enacted for the safety of employees in any way contributed to the injury or death of such employee, unless by the terms of his employment it was expressly made the duty of such employee to report such violation to the employer, and the evidence shows that such employee failed so to report and that the employer was not possessed of knowledge of such violation. All questions of negligence, contributory negligence and assumption of risk shall be for the jury, under the instruction of the court.

Sec. 6245-3. That in all such actions any contract, rule, regulation or device whatsoever, the purpose or intent of which shall be to enable any employer to exempt himself or itself from any liability created by this act, shall to that extent be void; provided that in any action brought against any employer under or by virtue of any other provision of this act, such employer may set off therein any sum he or it has contributed or paid to any insurance, relief, benefit or indemnity that may have been paid to the injured employee or the person entitled thereto on account of the injury or death for which said action was brought.

Sec. 10,770. When the death of a person is caused by wrongful act, neglect or default such as would have entitled the party injured to maintain an action and recover damages in respect thereof, if death had not ensued, . . . the corporation which, or the person who would have been liable, if death had not ensued, or the administrator or executor of the estate of such person, as such administrator or executor shall be liable to an action for damages, notwithstanding the death of the person injured, and although the death was caused under circumstances which make it in law murder in the first or second degree, or manslaughter.

Sec. 10,772 Such action shall be for the exclusive benefit of the wife, or husband, and children, or if there be neither of them, then of the parents and next of kin of the person whose death was so caused. It must be brought in the name of the personal representative of the deceased person; and where it shall appear that any such action is for the benefit of children, widow, widower, mother, father, brother or sister, the jury may give such damages, not exceeding in any case $10,000, and where it shall appear that any such action is for the benefit of a widow and one or more minor children the jury may give such damages, not exceeding in any case $12,000, as the jury may think proportioned to the pecuniary injury resulting from such death, to the persons respectively for whose benefit the action was brought.

The Questions Asked by the Commission

The questions asked by the commission were as follows:

1. What is your opinion as to the fairness of the law in this State with regard to liability of employers for accidents to their employees? What, if any, are your suggestions to the amendment of the law?
2. What is your opinion of the operation and adequacy of the labor law of this State in relation to the prevention of accidents, and what, if any, are your suggestions for its amendment in that regard?
3. Is the court and jury system for fixing the responsibility for industrial accidents now existing in the State satisfactory in its operation? If you answer no, state why.
4. Are you in favor of a system under which all accidents to employees shall be compensated for without regard to negligence, but under which the compensation paid shall be limited in amount? Please state reasons for your answer.
5. If you are in favor of such a plan, are you of opinion that the expense should be borne by the employer, employee and State?
6. What is your experience as to the value of relief associations of employees?

Extracts from the answers made by metal working Cincinnati employers to these questions are given below, the letters of the alphabet indicating the answers made by the same company or firm to the several questions:

Answers to Question 1

Employer A.—In my opinion the present law of the State of Ohio is unfair for the following reasons: 1. If the aggregate loss caused by industrial accidents is to become a part of the cost of the product to be paid for by the consumer, any movement looking toward the permanent establishment of such a policy must recognize two essential elements: 1. Equalization of the burden. 2. Rendering indemnification certain. Under the present law an employer might suffer a heavy loss, which by reason of competition he would not be able to include in the price of commodities, but which he would be required himself to bear. The present Ohio law increases the cost of liability insurance to the employer and guarantees the employee nothing except the right to maintain an action. When we consider that 24 per cent. of the employers employ 10 men or less; 25 per cent. more than 10 or less than 20; 31 per cent. more than 20 or less than 50; 5 per cent. more than 50 or less than 100; 7 per cent. more than 100 or less than 200; 5 per cent. more than 200 or less than 300; that only 3 per cent. employ more than 300, it must be apparent that a very ordinary industrial accident would not only involve the manufacturer in endless litigation, but also that it might mean ruin to him and inadequate compensation to the workman.

The present law leaves open the possibility of diverting into improper channels the amount which is actually expended, and which should in justice go to the employee.

In many cases the employer might be held for sub-

stantial amounts aggregating $12,000 in a single case, but in only a small percentage of the cases would the compensation be just or fair.

The present law encourages and fosters the contingent fee system, and in most cases a very large and unreasonable part of the amount awarded to the claimant would go to the attorney. It does not lessen the strenuous efforts put forth by indemnity companies to drive a hard bargain. Compensation should be proportioned to the actual financial loss to the injured and the unit upon which the right to recover is found should be the actual wage, the current earnings of the workman. This system means economy in administration, the liability is certain, the amount readily ascertained, while under the present law the liability of the employer in most cases is a difficult matter to determine.

Under the present law juries will give all sorts of verdicts, sometimes absurdly low, and other times, probably, unconscionably high. It goes beyond all reasonable requirements and awards damages to an employee who may have co-operated with his employer in the breach of duty.

Section 6245-3 provides that any contract between employer and employee exempting the employer from liability is void. The relation existing between employer and employee is not completely defined under the present law, while all prior laws and decisions pertaining to this very question are either repealed or inapplicable, and it does not limit the rules of liability to industrial occupations. It extends the doctrine of superior servants to employees of other branches where no such relation exists, irrespective of the duties to be performed.

Employer B.—We believe the present law to be unfair to the employer in that it creates an unknown liability, it throws the entire burden of responsibility for any accident on the employer and specifically prohibits him from entering into any agreement with the employee to limit or share such responsibility.

We believe a law should be passed fixing a limit of damages for each kind of injury in various classes of employment, creating a fund to be contributed to by the State, the employer and the employee from which fund the State should pay the damages fixed by the law.

Employer C.—Unfair. Adds a greater responsibility to employers than the laws of most of the States do: 1. In regard to assumption of risk. 3. In regard to the definition of vice principal. 3. The contributory negligence feature in which the burden of proof is placed on the employer and the award of damages depends upon the comparative negligence of employer and employee.

Employer D.—I believe that the present law of the State of Ohio, with regard to the liability for accidents to employees, is absolutely unfair. It practically puts a premium on carelessness, particularly contributory carelessness.

As the law is supposed to be based upon equity, it is unfair for the reason that it gives one party a decided advantage as against another party, whereas each party concerned in an accident should have an equal chance before the law.

Employer E.—It seems to me that the most equitable plan for both the employer and the employee is one in which the employer pays at the rate of 2 or 3 cents per day for every employee to the State, and the employee pays an equal amount. I understand that in Germany books are issued by the Government, ruled off the size of a postage stamp. The employer buys 5-cent labor stamps from the Government and a book is taken out for every employee. He places one 5-cent stamp in the book each day for the employee, which is deducted from his wages, and the other 5-cent stamp is put in by the firm. When an accident occurs there are no expensive lawsuits, there is no dickering as to who is to blame, there is no ill feeling between employer and employee, and in the end, although we would pay a little more, we would be the gainer.

Let us recommend to the commission a payment of 2 or 3 cents per day per employee. No firm could object to such a small payment, and it would create a fund sufficiently large to take care of any accidents that might happen. Let the State assume the responsibility and pay the employee for his injuries. Let the State set a price, as the insurance companies now do, for each injury, and a weekly indemnity during a period of illness.

Employer F.—The present laws of Ohio are unfair because they impose liability on the employer without regard to the nature of the hazards of the employment. The present laws of Ohio impose no incentive upon employees to perform their duty of exercising reasonable care, but allow an employee to recover even though the employee himself is guilty of negligence. In addition, the law makes all questions for the jury, with the result that, for the same kind of an accident with an equally serious injury, we have all kinds of verdicts, high and low, and an employer has no way of measuring the cost of industrial accidents in his cost account in determining what the goods may cost him.

The Employers' Liability law of Ohio should be amended by imposing liability on employers for negligence in the discharge of his primary duties of organizing his factory and furnishing and keeping in repair his machinery and prescribing reasonable rules and regulations. At the same time the employee himself should not be allowed to recover for his own negligence when the employer has used reasonable care. The Matthews law has unwisely extended the employers' liability without the same time putting some restrictions upon the measure of recovery and thereby imposed great hardships upon the employers, particularly upon the small employers.

Answers to Question 2

Employer C.—Sufficient in quantity. The conditions to be complied with are expensive and impose a burden on Ohio industries and handicaps it in competition to that extent.

Employer F.—In some respects the laws of Ohio are not adequate to cover the prevention of accidents in some kinds of hazardous employments, but the trouble is not with the law but in carrying out the law. The factory inspectors should be men of the highest grade of intelligence, who thoroughly understand the operation of dangerous machinery and who should go to employers in an absolute spirit of fairness and point out specifically to the employers wherein they could provide means of preventing accidents. Our suggestion for the amendment of the factory laws of Ohio is that the factory inspectors should not be appointed because of their political party, but should be selected after open competitive examination, and the examinations should be of such a high standard as to secure men of the highest intelligence and the highest integrity of character to discharge the duties in factory inspection. These factory inspectors also should have adequate compensation, because you cannot get good men to discharge these duties on the miserable salaries now provided for the payment of factory inspectors.

Answer to Question 3

Employer F.—The court and jury system for fixing responsibility for industrial accidents is not satisfactory in its operation. Courts are sometimes too technical, these technicalities resulting in injustice both to the employer and the employee. The jury system is not satisfactory, because juries are largely moved by passion and prejudice in reaching verdicts.

Answers to Question 4

Employer A.—I am in favor of a system under which all accidents to employees shall be compensated for under which the compensation shall be limited in amount and definitely fixed. I believe the question of

negligence should be entirely eliminated, and, further, that every employee should be held responsible for his willful acts. The actual remittances to the workmen would be greater, and the burden could, under wise laws, be more equitably distributed and the tendency toward prolonged litigation reduced to a minimum.

Employer B.—We are in favor of a plan by which fixed damages shall be paid by the State out of a fund, contributed to by the State, employer and employee without regard to negligence, but with assessments graded in accordance with the nature of the risk involved in the business and the character and efficiency of the safeguards installed by the employer.

Employer C.—Yes, if the majority of States or of the States that do most of the manufacturing would pass a uniform law on the subject.

Employer D.—I would be in favor of an entirely new law, which provided compensation to all employees injured to such an extent that they could not earn their usual wages, provided such injury was not caused by gross carelessness or by direct intent.

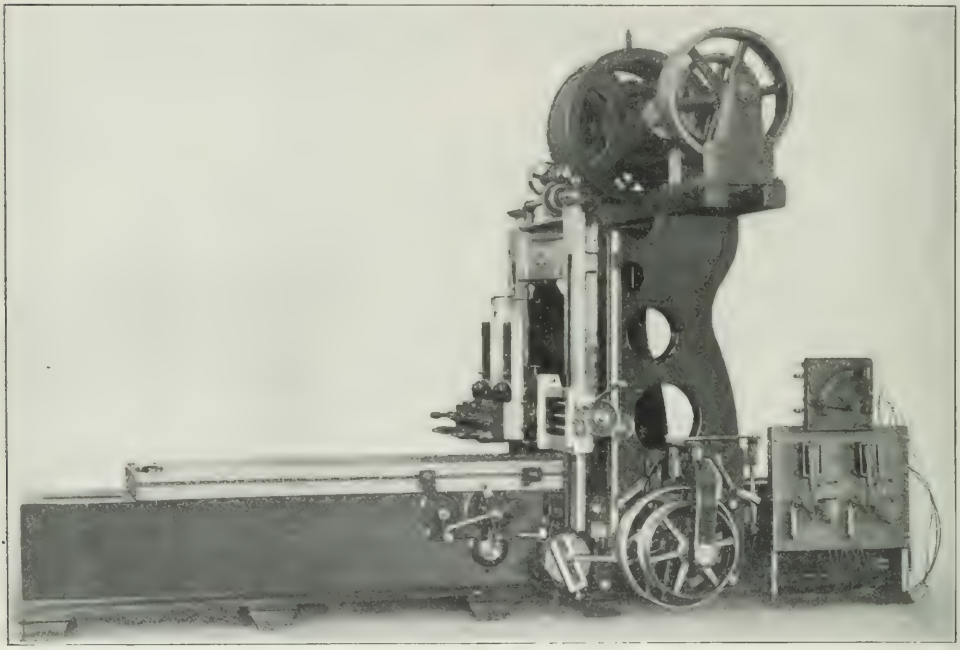
Employer F.—In our opinion the only solution of the problem of industrial accidents in hazardous employments is a fair workmen's compensation act in which recovery should be denied to an employee where he has recklessly brought on the injury on his own shoulders. The compensation for industrial accidents should be paid to the employees, except where the accident has been brought about as above indicated, and the compensation should be measured in part as to whether the accident was the result of negligence on the part of the employer, or whether it came about notwithstanding reasonable care on the part of the employer. These amounts should be so limited as not to throw upon the employer a large increase in his cost account, because to do so would put the Ohio employer at a disadvantage with the employers in other States where similar laws did not exist.

As to Question 5, the opinion was unanimous that employer, employee and the State should contribute. As to Question 6, all expressed a favorable opinion.

The names of the manufacturing establishments whose answers are above given are omitted for obvious reasons. These answers are extremely interesting, not only to Ohio manufacturers, but to others in various sections of the country.

Adjustable Speed Electric Drive for a Cincinnati Planer

A new adjustable speed electric drive has been fitted by the Cincinnati Planer Company, Cincinnati, Ohio, to its 36-in. forge planer. As will be noticed from the engravings this tool is of the same general type as the 56-in. model, which was illustrated in *The Iron Age* March 17, 1910, and others of its builder The special features of this motor drive are that the speed of either the cutting or return strokes can be varied by the operator at will to suit conditions and



A New Type of Adjustable Speed Electric Drive Applied to a 36-In. Forge Planer Built by the Cincinnati Planer Company, Cincinnati, Ohio.

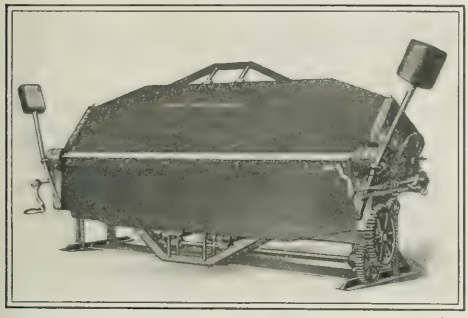
the motor can be coupled direct to the countershaft, thus eliminating all gearing.

The motor used is mounted on top of the planer, as in an ordinary motor drive, and has a speed variation of 2 to 1, regulated by the controlling apparatus, which is mounted on the switchboard at the rear of the housings, the starting box being mounted at the top. In the lower portion of the board are two controllers mounted side by side. One of these is for the cutting stroke and enables any speed between 25 and 50 ft. to be obtained without in any way altering that of the return. The other is for the return speed, which can be varied between 50 and 100 ft. without affecting the speed of the cutting stroke. Thus it is possible to operate at a cutting speed of 40 ft. and a return of 60 ft., or a cutting speed of 20 ft. with a return of 90 ft.

A limit switch in front of the housings operates these controlling levers, so that once they have been set for any particular speed an automatic return to that speed at each stroke is secured. The wiring shown in the illustration is only temporary. As regularly installed, no more wiring is required than with a standard motor drive, except that running to the limit switch.

The Dreis & Krump Motor Driven Brake

A motor driven brake of steel plate construction for bending heavy material has been recently designed by the Dreis & Krump Mfg. Company, 2911 South Halsted street, Chicago, Ill. The brake is intended for handling plates up to ¾ in. thick and is 16 ft. 2 in. long. Machines of this type are adapted for cornice work, making skylights, automobile parts, steel range work, tank and boiler work and mine cars. In doing this last class of work which requires a number of parts having exactly the same radius, a former may be attached to



A Motor Driven Brake for Bending Heavy Plates and Sheets Made by the Dreis & Krump Mfg. Company, Chicago, Ill.

the upper jaw to produce a number of pieces of uniform size and shape.

In operation the upper or clamping jaw is moved by worm gears having eccentric acting hubs in the lower end of the steel connecting links on the end of the machine. These links are rotated by worms operated either by a crank at the front of the machine or through gearing in the rear by power. The apron or bending leaf is operated by two steel cut gear racks working on pinions driven through a series of gears and friction clutches by an electric motor which in the engraving is hidden behind the lower jaw.

The sheet or plate to be bent is clamped between the upper and lower jaws by turning the crank in the front of the brake or by throwing in the clutch which operates the worm gear. This friction clutch brings the gear into action, and the apron is raised and the material bent over the edge of the upper jaw. For making bends of exactly the same angle, an adjustable collar secured to the rack is furnished. When this collar is used the driving clutch is automatically disengaged when the proper angle has been reached and the reverse clutch brought into action which lowers the bending leaf rapidly. A specially convenient feature of the brake is that the entire space between the upper and lower jaws from end to end is open without obstruction so that any width of sheet can be inserted.

The machine is made of heavy steel plate where strength is required, and the housing and connecting parts are of cast steel. The brakes are made in a number of sizes and are designed for operation by electric motor, compressed air or steam power or by hand if no other source of power is available.

The Western Steel & Iron Company.—A new incorporation, known as the Western Steel & Iron Company, will shortly begin work at Pittsburg, Kan., on the foundations for a rolling mill, which it is proposed to remove from Louisville, Ky. Walter Baird, one of the leading promoters of the enterprise, states to a local paper that it is expected to have the mill in operation by May 1, 1911. The company will be incorporated under the laws of Kansas and capitalized at $500,000. The Commercial Club of Pittsburg has contracted to furnish 40 acres of land as a site for the new plant. The main building is to be of steel and concrete, 110 x 300 ft., with a wing, 60 x 200 ft. Other buildings will include a power house, scrap sheds, &c. The plant comprises a 12-in. roughing mill, and 8-in. finishing mill, two hot sheet mills and one cold sheet mill. When operated at Louisville by the Louisville Bolt & Iron Company, the plant made a specialty of nuts and bolts, but the new owners expect to manufacture sheet iron, bar iron, rods, reinforcing concrete bars, and mine rails rerolled from old steel rails. The nearest rolling mill to Pittsburg, Kan., is at Kansas City, Mo.

The Waltham Filing Machine

A convenient machine for die work, especially in the making of small sub press dies for watch, clock and similar work, has been placed on the market by the Waltham Machine Works, Newton and Cutter streets, Waltham, Mass. Fig. 1 is a view of the machine itself arranged for driving from a countershaft with a three-step cone pulley, while Fig. 2 shows it driven by a special chuck in a bench lathe headstock.

The table has two supports and two clamping screws which make it very rigid, and can be tilted to file the clearance angle. While in this tilted position it can be swiveled in the horizontal plane for a complete revolution. In this machine the files can be held by either one of two methods. In the first, the ends of the file are clamped in a vise at the lower end which has a vertical V groove and by a split chuck with four wide slots at the top, thus enabling either flat or round shank files to be securely gripped. In the other scheme, cross holes are drilled in the ends of the files and looped over pins in the frame. This arrangement is desirable for very thin files or diamond charged strips, and by turning the nut at the top of the frame considerable tension can be given. If desired, the upper spindle can be removed from the frame with the file attached which

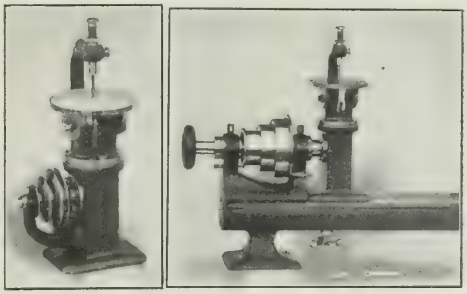


Fig. 1.—The Machine. Fig. 2.—The Machine Attached to a Lathe Head.

A New Filing Machine Made by the Waltham Machine Works, Waltham, Mass.

makes it an easy matter to remove the file from the die by simply releasing the lower end. Files ranging in length from 2 to 3½ in. can be held in the machine, and an assorted set is furnished with it. The stroke of the frame is adjustable, the maximum length being 1½ in.

The table is 5 in. in diameter, and its hight from the bench is 9¾ in. The complete weight of the machine is 21 lb.

The Nippon Yusen Kaisha, the leading Japanese steamship company, has ordered six new vessels for its Pacific service from Seattle to Nagasaki. They will be of 6000 tons, able to maintain 12 knots speed and will be constructed in Japan.

CURRENT METAL PRICES.

The following quotations are to small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¼ in. round and square	1.90¢
1½ to 4 in. x ½ to 1 in.	2.10¢
1½ to 4 in. x 1/16 to 3/8	2.10¢
Rods—¾ and 11-16 round and square	2.10¢
Angles:	
3 in. x ¼ in. and larger	2.00¢
3 in. x 5/16 in. and thicker	2.00¢
1½ to 2½ in. x ¼ in.	2.00¢
1½ to 2½ in. x 5/16 in. and thicker	2.10¢
1 to 1¼ in. x 3/16 in.	2.00¢
1 to 1¼ in. x ⅛ in.	2.00¢
5/8 x 5/8 in.	2.00¢
3/4 x 3/4 in.	2.00¢
5/8 x 5/8 in.	3.50¢
1/2 x 1/2 in.	3.50¢
Tees:	
1 in.	2.60¢
1¼ in.	2.10¢
1½ to 2 x ¼ in.	2.10¢
1½ to 2½ x 5/16 in.	2.35¢
3 in. and larger	2.10¢
Beams	2.10¢
Channels, 3 in. and larger	2.40¢
Band—1 to 6 x 5/16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	5.50¢

Merchant Steel from Store—

per lb.

Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C. R. Soft Steel	R. G. Cleaned
No. 16	2.50¢	2.80¢
Nos. 18 to 20	2.70¢	2.90¢
Nos. 22 and 24	2.75¢	3.00¢
No. 26	2.80¢	3.10¢
No. 28	2.90¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, per lb. 12 @13½¢

Patent Planished, W. 16 wers W. & A. 13½; B. 9½ net

Galvanized.

Nos. 12 and 14	2.95¢
Nos. 22 to 24	3.15¢
No. 26	3.45¢
No. 28	3.85¢

No. 24 and lighter 26 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	5.75¢
No. 26	6.25¢
No. 28	7.25¢

Corrugated Roofing—

2½ in. Corrugation.

	Painted	Galvd
No. 24 per 100 sq. ft.	$3.75	4.80
No. 26 per 100 sq. ft.	3.25	4.40
No. 28 per 100 sq. ft.	2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A" Charcoal:	
IC, 14 x 20	$4.35
IX, 14 x 20	5.60
A. Charcoal:	
IC, 14 x 20	$4.10
IX, 14 x 20	5.35

American Coke Plates—Bessemer—

IC, 14 x 20	$4.10
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb coating	$8.50
IX, 20 x 28 with an 8 lb coating	10.50

Seamless Brass Tubes—

List November 13, 1908 Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 Base price 18¢

Copper Tubes—

List November 13, 1908 Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 19½¢ per lb.

High Brass Rods—

List August 1, 1908 14½¢ per lb.

Roll and Sheet Brass—

List August 1, 1908 14½¢ per lb.

Brass Wire—

List August 1, 1908 14½¢ per lb.

Copper Wire—

Base Price Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity lots) 18 ¢

Sheet Copper Cold Rolled, 16 oz. advance over Hot Rolled

Sheet Copper Polished 20 in. wide and under, ¢ per square foot

Sheet Copper Polished over 20 in. wide, 2¢ per square foot

Burnished Copper, 1¢ per square foot more than Polished

METALS—

Tin—

Straits Pig	38½@39 ¢

Copper—

Lake Ingot	14¾@15 ¢
Electrolytic	14½@14¾¢
Casting	14¼@14½¢

Spelter—

Western	6¼@6½¢

Zinc.

No. 9, base, casks	5 ¢ Open 5½¢

Lead.

American Pig	5 @5¼¢
Bar	6¾@6¾¢

Solder.

½ & ½, guaranteed	22½@23 ¢
No. 1	20½@21 ¢
Refined	18½@18¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	@10¢
Hallett's	@10¢
Other Brands	@9½¢

Bismuth—

Per lb. $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting	24¢
Rods & Wire	Base Price 31¢
Sheets	Base Price 33¢

Old Metals.

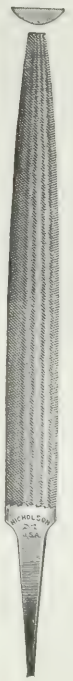
Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	10.50@11.00
Copper, Heavy and Wire	10.50@10.75
Copper, Light and Bottoms	9.50@9.75
Brass, Heavy	7.25@7.50
Brass, Light	5.75@6.00
Heavy Machine Composition	9.00@9.25
Clean Brass Turnings	7.00@7.25
Composition Turnings	8.25@8.50
Lead, Heavy	3.50@
Lead, Tea	3.25@
Zinc Scrap	3.75@

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NICHOLSON
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TRADE MARK



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Providence, R. I.

THE IRON AGE

Established 1855 — New York, November 3, 1910 — Vol. 86: No. 18

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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A Beginning of Rail Orders

Several Other Roads About to Place Contracts

Bar Specifications No Longer Withheld—Sharp Curtailment in Tin Plate

Rail buying for 1911 has begun, the various rail manufacturers having opened their books in the past week. The Erie has practically closed for about 33,000 tons, and the Pennsylvania and New York Central requirements are now under consideration, as are those of the Norfolk & Western. Several Western roads are also making up their estimates. The important question is whether these usual and expected purchases will be on a scale which, together with orders for equipment and supplies, will prove a real stimulus to the steel industry, prepared as it is to cope with double the business now coming in.

Announcement is made that rail prices will be quoted hereafter by the pound instead of the gross ton—an innovation that has been long considered. The familiar $28 quotation for a 2240-lb. ton of Bessemer rails is replaced by 1.25c. per pound, which is the identical rate of the past nine years. Open hearth rails, heretofore $30 a gross ton, are now 1.34c. per pound. Extras for lots less than 500 tons and 20 tons, respectively, correspond to the $2 and $4 per ton heretofore charged, making the price for Bessemer rails 1.34c. in less than 500-ton lots and 1.43c. in less than 20-ton lots.

Car orders, which had dwindled to driblets, are more encouraging. The Lackawanna has bought 1000 cars and 1000 will be built for the New York Central at the shops of the Merchants' Dispatch. The Hawley lines have revived their inquiry, and it is now for 4250 cars. The Pennsylvania Railroad is also expected to come into the market soon.

Prices of finished materials show that co-operation among producers is effective in the main. There is shading by smaller mills on bars and wire products, and in plain structural material the price asked by leading manufacturers has been cut $1 a ton, but these cases are the exception.

The shutting down of a large number of tin plate mills is the chief development of the week. Cannery shipments are over for the most part, and some curtailment is therefore seasonable. This year it is more drastic than usual, as no stocks will be accumulated on a 36c. tin market. By another week nearly one-third of the capacity of the leading producer of tin plates will be idle and independent companies are expected to make some reduction also. Such action may have a salutary effect on the cornerers of tin, who have had things pretty much their own way thus far.

Agricultural works, after withholding specifications for steel bars for some weeks, apparently looking for a decline, have been ordering freely on their contracts in the past 10 days. The recent sales of

1.35c. bars in the Chicago district threatened to affect contract business, but the larger sellers have maintained the 1.40c. basis, while the smaller producers, who were shading prices, are believed to be well sold up.

Prospects are better in the structural trade. The American Bridge Company will build the Florida East Coast bridges, about 7000 tons. For the postoffice at the Pennsylvania Terminal in New York the contract will be let next month. For the superstructure estimates run from 8000 to 10,000 tons. The 40-story Woolworth Building, Park Place and Broadway, New York, will require 5000 tons, but bids have not yet been taken.

October has the distinction of bringing out a larger business in foundry iron than any month of the year. The month has also been marked by a progressive decline in prices. In the past week the buying has been well distributed, both as to sections and classes of foundry product. The two leading radiator interests have taken 50,000 to 60,000 tons on this movement, but deliveries go only through the first quarter. Cincinnati reports good sales for the first half, and there has been an increasing sale of $11 Southern iron for the first quarter of 1911.

Steel making pig iron is weaker. A sale of 5000 tons of basic was made at Buffalo for shipment by water to Chicago. At Cincinnati an inquiry is up for 7500 tons of basic.

Pig iron stocks at furnaces have been growing and merchant producers are probably carrying upward of 1,600,000 tons. Another belated curtailment is under way, and in Alabama, Tennessee, Virginia and Eastern Pennsylvania six or seven furnaces have gone out or will blow out in the next week. The Steel Corporation is banking four of its Youngstown, Ohio, furnaces Saturdays and Sundays.

The export trade in iron and steel has fallen off lately; in the past two weeks the shrinkage in inquiry has been pronounced.

Spot tin at New York has worked slightly below the London equivalent, being the first response to the sharp cutting down of tin plate production.

Steel Rails by the Pound

Steel rails, which, since the beginning of Bessemer rail manufacture in the United States in 1865, have sold at so many dollars a gross ton, are now to be sold by the pound. The change has been under discussion for a year, and the more it was considered the more it commended itself to the manufacturers. But no opportune time was found for putting it into effect until the books of the mills were opened for rail orders for 1911.

The chief reason for establishing rail prices on a pound basis is no doubt to bring them into direct comparison with the prices of other finished products. Heretofore billets and rails, both sold by the gross ton, have been classed together. With most rail producers, not many years back, a deficiency of rail orders meant just so much more steel to be marketed as billets, and it was thus common to compare the prices of the two products. Whenever the rail tariff was up for consideration, or when some Western railroad which hauled little freight to or from steel works sought to break the rail price, we would hear how the cost of rolling rails was but little more than that of billets. It would be pointed out in reply that such a statement was far from the fact and the case of the rail would be presented in its real light — the severity of the tests, the rigidness of inspection and the cost of rejections. Yet the rail price has always stirred up a certain amount of protest (if we except the prices reached in the steel rail war of 1897 and 1898) and the much quoted letter of a steel master as to the cost of producing rails in the Pittsburgh district has been cited as though it contained the last word on the subject. Over against that letter, it may be said in passing, are the exhibits presented to the Ways and Means Committee nearly two years ago showing that for the five years from 1902 to 1906, inclusive, the lowest average cost of making rails in the United States was $20.74, while one producer showed an average of $26.61.

The force of the popular feeling concerning rail manufacture was seen in the reduction of the rail tariff last year from $7.84 to $3.92 a ton. But the demands of the railroads for rail quality and for more expensive methods of manufacture have been more and more insistent. As the result of the agitation of 1907 and 1908 specifications have been adopted, as is well known, making the cost of steel rails greater than in years. It is to be considered that rail steel must not only have high resistance to breaking strains, as is required of structural steel, but it must meet the almost equally important requirement of resistance to abrasion. Moreover, limits have been put upon the speed of working rail steel in the mill, and the stringency of tests has been increased, adding to the probability of rejections.

Besides these considerations on the cost side is the fact that the railroads, after using the rail in main track have still the value represented by its use on spurs or sidings, and after that its market value as a relayer for mine or other industrial use; or, when its full capacity for service is utilized by the railroad, there is still left the value of the rail as scrap, which at times has been known to equal or even to exceed the price of new rails.

All these considerations and others have been urged from time to time in justification of the price of steel rails, and there has been in addition the fact that while other products have cut loose in boom times and soared to high levels rails have been kept uniform. At the same time there has been no way of keeping constantly before the buyer of rails the position of this product in relation to other finished forms. The $28 price for a ton of 2240 lb. figures out exactly 1.25 cents a pound, and that is the price now being quoted for Bessemer rails for 1911 delivery. This price compares to-day with 1.40 cents for bars, plates and structural material; in 1906 and 1907 it would have contrasted with 1.70 cents for plates and structural material. Where premiums have been paid the price for plates and shapes has at times been near the 2-cent basis. Since the rail specifications of recent years have more and more made steel rails eligible to classification as a highly finished product there is appropriateness in the new departure. In the export trade it may be expected that quotations will continue to follow the traditions since there is no move as yet by foreign manufacturers to follow the lead taken by the United States.

Industrial Switching Railroads

Railroad officials who consider and act upon general questions of policy have had under discussion for some time the status of the industrial railroad which performs switching service for large shipping industries. By a long established custom an allowance of $2 to $4 per car is paid to these industrial roads for the switching service which they render, this allowance being paid out of the through rate by the railroad which receives cars from or delivers them to the interchange track of the industrial road. Several cases have been decided by the Interstate Commerce Commission in which it was held that the switching road had no just claim for such allowances. In view of these decisions officials of leading railroad systems are considering the advisability of cutting off all such allowances, except where the industrial railroad can make a case before the commission and force the payment of these switching rates. The proposed action would add an appreciable percentage to the receipts of the railroads from industrial traffic, and would be equivalent to a corresponding advance in rates without inviting the embarrassing discussion that arises when tariff rates are advanced.

Practically all of the large plants which produce iron and steel, with thousands of other individual manufacturing industries, are served by industrial railroads of this character. The question is, therefore, one of general interest among manufacturers, especially since an increase in transportation charges will add somewhat to the cost of production and to market values. The question is one in which the manufacturer is placed at a disadvantage in public discussion, and even before judicial bodies or commissions, on account of the prejudice that has been aroused by many years of agitation of the question of rebates. The Interstate Commerce Commission has in several cases taken the position that it will not interfere when the railroads voluntarily pay nominal rates per car to these switching roads, but it will not enforce payment when the trunk line railroads refuse recognition to the switching roads.

The trend of the decisions by the commission is that the switching road must possess within itself the qualifications of a "common carrier," in order to claim any share of the tariff rate. It must perform service for several industries, or must have stations where freight is received from the public, or in some manner establish legally its position as a common carrier. If it serves only one industry, by which it is owned or controlled, it is a "mere plant facility" which the shipper should maintain at his own expense. There are many cases, especially in the steel industry, where industrial roads owned by shipping corporations are so extensive in their operations that they are recognized by other railroads as common carriers, and would be so recognized by the courts, but in, perhaps, a majority of cases these minor railroads would fall within the commission's definition of a "mere plant facility."

This question is one of many transportation problems in which the theories of legislation do not harmonize with commercial usage or commercial necessity. The interstate commerce law is built up around the theory that a tariff rate is a charge for carrying freight between two points. Fifty years ago a railroad station was a "point." The ordinary country station still maintains this character of a point, with a freight house and, perhaps, a short team track or switch attached to it. As villages grew into towns and towns into cities, the volume of traffic became too great to be handled at one "point," although this fact is not yet recognized in law. A manufacturer could not receive and ship all his materials and goods by wagon through the station freight house, if his business were of any magnitude. In a large city it would create impossible congestion for all the wagon shippers to receive and ship their freight at one point or freight house. The necessities of the railroad have made it customary to have several freight houses and team tracks in large cities, and it has been a serious problem to increase these facilities as rapidly as the growth of traffic requires.

In the evolution of the railroad the manufacturer has been encouraged to take his business away from the crowded "point" or original station. Industrial tracks have been laid for the use of each plant that is large enough to require this service; the manufacturer loads and unloads his own freight in the cars, and the railroad sends switching engines and crews at stated times to place or "spot" incoming cars at the exact place required for unloading and to take away the loaded cars. The original village "point" has expanded into a great city with hundreds or even thousands of these independent "points" at which freight is received and delivered with no additional charge to the shipper. Except in a few Eastern cities the railroads interchange switching service so that an industry or "point" on the terminals of one road has its cars switched to and from other railroad systems entering the same city, without any charge to the shipper except the through tariff rates. The railroad which performs terminal switching service of this character, without any compensation from the shipper, receives a switching allowance from the road which receives the tariff revenue.

The industrial railroad represents a third step in the evolution of the legal "point." The trunk lines have found that it costs them several dollars per car, at an average, to perform the switching service which is required by large industries. The shipper, on the other hand, has found that he cannot rely upon the service performed by switching crews which come to his plant once or twice a day. He cannot load or unload cars as promptly as necessary, and there is too much delay in correcting mistakes made by an outside crew. The railroad is unable to give him as good service as it gives to the small shipper who only handles a few cars per day.

To overcome this trouble the industrial switching road came into existence. It is regularly incorporated as a railroad, has its own tracks—usually many miles in extent—and its own switching engines and crews, and gives good service because it is under the immediate control of the shipper, usually through ownership of its stock. The cases are rare where these roads earn any profit on their investment, but they facilitate the business of both the industry and the trunk line railroad, and the allowance to the switching road out of the through rate is usually less than what it would cost the trunk line to perform the service itself. The interstate commerce law recognizes the le-

gality of an allowance by the railroad for any service performed by the shipper, and merely gives the commission the power to regulate such allowances, as a check on the payment of rebates through this channel. The railroads have established by their own expert witnesses voluminous records to show the cost of performing switching service, and there can be no moral question of the justice of a reasonable allowance for this service when the shipper performs it, either directly or through the medium of an incorporated industrial railroad. In a recent case decided by the commission the railroads had undertaken to collect a switching charge, in excess of the through rate, for making deliveries of cars on industrial sidings, but it was held that this was unreasonable, and that the tariff "point" embraced legally any industrial points or private sidings within a reasonable distance of the point specified in the rate.

Railroads are profitable only where they control a large movement of industrial freight, moving in carloads. The branch lines or "feeders" that are extended into the country seldom pay expenses, if credited only with their mileage proportion of the rates on the traffic they handle. Instances have been brought into the records in rate litigation where branch roads in agricultural districts do not earn $1000 per mile, which is less than the average expenditure of railroads for maintaining the track. The profits of the railroads come from the concentration of traffic in trainloads, on trunk lines. The large systems can maintain an extensive mileage of branches, because the loss on the traffic of the branch is covered by the profit in moving the same traffic on the trunk lines. Independent rural railroads, which have no industrial traffic, seldom pay dividends, although they receive average rates per mile for the traffic they move.

Large industries of a character requiring the service of independent switching roads receive and deliver traffic in train loads. They are usually located near trunk lines, so that the traffic they produce passes directly into trunk line movements without any considerable expense. An industry of this character produces as much traffic in a year as 100 or 1,000 miles of branch lines or feeders, which are maintained at a nominal loss by the large systems, in order to control the profitable traffic which is gathered or distributed by the rural lines. The large industry is therefore entitled to unusual consideration. While it should not, on moral grounds, be permitted to ship at lower rates than its small competitor which produces only a car or a few cars of traffic a day, it would seem as though an injustice would be done if the large shipper is compelled to bear a higher cost for the same service than the small shipper.

A Premium System for Traveling Salesmen

An important house manufacturing power equipment has adopted a premium system for its traveling salesmen and believes that the plan is operating with distinct mutual benefits. Each man's income beyond a certain point is regulated by the amount of his sales, which is a condition by no means uncommon, except that in this case the method is different. A standard is established for each man, consisting of the volume of gross sales that the territory should produce under ordinary conditions, previous experience being taken as the basis. A given cost is determined, comprising salary and the expenses. The profit sharing is fixed by the ratio of the two items of gross sales and the cost of covering the territory. If the latter item should total $3000 and the basis of sales be $30,000, the one being 10 per cent. of the other, then the salesman divides with the house 10 per cent. of any amount of sales in excess of $30,000. Should the total reach $40,000, he receives one-half of 10 per cent. of $10,000, or $500. The stimulus of the usual percentage basis is present, while at the same time the employer is a partner in the gain.

American Capital for Chinese Development

The announcement that American bankers are to finance a loan of $50,000,000 to China is highly significant. Comment upon it will naturally bring out the seeming anomaly of $50,000,000 of American money going into China, while an American railroad goes abroad to find buyers for $10,000,000 worth of notes it has just put out. It may be expected, too, that emphasis will be laid on the considerable amount of the new loan that will find its way to the United States in expenditures for railroad equipment and for the industrial operations the Chinese Government is planning to encourage. In the same connection attention will also be called to the fact that of the $30,000,000 railroad loan to China which European and American bankers arranged some time ago a portion will doubtless be spent in this country.

There is a larger significance, however, in this Chinese loan, taking the broad view of the uplift in China of which the projected expenditures are but one indication. The growing wants of the Chinese are of great import to the iron trade of the world since they mean a new standard of living among China's hundreds of millions. That means, as it means everywhere, an enlarged consumption of iron and steel. The millions of dollars that are soon to be spent for railroads and industrial development are only a beginning. The awakening in China in the past few years, of which some of the features have been almost startling, represents the beginning of a period of appreciation in all values throughout the Chinese Empire.

It will be many years before China ceases to be the cheapest labor market in the world, or one of the cheapest; but the point is that it is journeying toward higher costs of living. Moreover, an important factor in the new scale of national and individual expense is iron. So much attention is given to the fluctuations that come from year to year in the condition of the iron trade at home that the tendency is to ignore movements in the countries of low iron consumption. China will come far short of the pace at which wants have increased in the United States — making it almost literally true here that many luxuries of the last generation are the necessities of today; but China must be given no small place in any estimates that would measure the growth of the world's demand for iron and steel in the next decade. Chinese production of iron and steel will grow at the same time, it may be assumed, since both ore and coal are available in quantity, but the demand may be expected to develop much more rapidly than the domestic supply.

The Machine Tool Builders

President Fred A. Geier and Secretary Charles Hildreth Re-elected—Closing Session of the Convention Had Features of Exceptional Value

The proceedings of the opening session of the annual convention of the National Machine Tool Builders' Association at the Hotel Astor, New York, on Tuesday, October 25, were given in *The Iron Age* of last week. The proceedings of Wednesday, the final day, comprised the reading of papers and the general discussion following them and the business meeting which elected officers and named Atlantic City for the convention place next spring.

Fred A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio, was elected president; C. H. Alvord, Hendey Machine Company, Torrington, Conn., first vice-president; S. H. Reck, Rockford Drilling Machine Company, Rockford, Ill., second vice-president; A. E. Newton, Prentiss Brothers Company, Worcester, Mass., treasurer, and Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., secretary.

The following concerns were admitted to membership, in addition to those mentioned in last week's issue, bringing the growth for the year to 45: Cincinnati Pulley Machinery Company, Covington, Ky.; Milwaukee Machine Tool Company, Milwaukee, Wis.; Wilmarth & Morman Company, Grand Rapids, Mich.; Acme Machinery Company, Cleveland, Ohio; Putnam Machine Company, Fitchburg, Mass.; Bardons & Oliver, Cleveland, Ohio; Willard Machine & Tool Company, Cincinnati, Ohio; Wood Turret Machine Company, Brazil, Ind.; Cleveland Automatic Machine Company, Cleveland, Ohio; Sloan & Chace, Newark, N. J.; Newton Machine Tool Works, Philadelphia, Pa.

The programme of papers was carried out as announced. Frederick L. Eberhardt, Gould & Eberhardt, Newark, N. J., and C. H. Norton, Norton Grinding Company, Worcester, Mass., made interesting addresses in executive session on "Who Should Pay the Expenses of a Representative from the Factory When Sent Out at Request of the Dealer to Help Close a Deal?" Henry Hess, Hess-Bright Company, Philadelphia, Pa., had a very instructive paper on "The Use of Ball or Roller Bearings in Machine Tool Construction," illustrations being distributed among the members that the subject might be most clearly understood. Thomas H. Moore, advertising manager for John Wanamaker, New York, spoke on "Advertising —Large Space in a Few Papers *vs.* Small Space in a Number of Papers." James N. Heald, Heald Machine Company, Worcester, Mass., had as his topic, "Concrete *vs.* Wood Flooring," which gave rise to a very interesting discussion as to methods. The important topic, "The Design and Construction of Machine Tools from the User's Standpoint," was discussed by C. K. Lassiter, mechanical superintendent of the American Locomotive Works, and John Riddell, General Electric Company, Schenectady, N. Y.

On Wednesday evening the members and their friends were the guests of the *American Machinist* at a theatre party.

On Thursday the members of the association and many others of prominence in the machinery trade were guests of *Machinery* on an excursion to Sea Cliff, L. I. This was the eighth annual event of the kind arranged by Alex. Luchars. The trip was made on the steamer Majestic, and an excellent luncheon was served at the hotel at Sea Cliff. A programme of sports was carried out, including a potato race, a relay race and football and push ball games. The outing was admirably conducted, affording more than 700 machinery men a chance to renew old acquaintanceship and make new friends.

The New Prices for Steel Rails

As commented on elsewhere, the steel rail manufacturers are now quoting for their product prices per pound instead of per gross ton, but there is no change in the rate. Bessemer rails are now quoted at 1.25 cents per pound, which is exactly the equivalent of $28 per ton of 2240 lb. For open hearth rails, heretofore $30 per gross ton, the market price is now 1.34 cents per pound. The old extras are retained. For lots less than 500 tons and more than 20 tons, Bessemer rails are quoted at 1.34 cents (formerly $30 per gross ton) and open hearth rails at 1.43 cents (formerly $32 per gross ton). For lots less than 20 tons, Bessemer rails are quoted at 1.43 cents (formerly $32 per gross ton) and open hearth rails at 1.52 cents (formerly $34 per ton). Prices per pound will also apply in the case of light rails, or rails weighing less than 50 lb. per yard, these corresponding in the same way as indicated above, to the prevailing prices per gross ton for the respective weights.

The John W. Danforth Company, Buffalo, N. Y., has been awarded contract by the Navy Department for furnishing and installing pumping stations—including pumps, motors and other apparatus, with pipe lines—for pumping oil from large storage tanks to the Government wharves at the naval stations at Bradford, R. I.; Norfolk, Va.; Charleston, S. C., and Key West, Fla. The Navy Department, having adopted the burning of oil on torpedo boats and other vessels, the facilities provided by this contract will enable the boats to fill their tanks with oil from outlets on the wharves. The contract price is over $85,000, and the work is to be entirely completed in four months. The steam and power pumps and the electrical apparatus for this work are to be furnished by the International Steam Pump Company and the General Electric Company, respectively, through their Buffalo offices.

The Hagstrom Bros. Mfg. Company, Lindsborg, Kan., is distributing glass paper weights of attractive appearance. Attached to the underside of the glass are illustrations of the Hagstrom spark plug and the Hagstrom blow-out, of special interest to the automobile trade.

The Sharon Steel Hoop Company, Sharon, Pa., has closed its branch office heretofore located in the Union Bank Building, Pittsburgh. The purchasing department, formerly located in the Pittsburgh office, has been transferred to the general offices of the company.

The population of Minneapolis, Minn., is 301,408, an increase of 48.7 per cent. The population of Chester, Pa., is 38,537, an increase of 13.4 per cent. The population of the new city of Gary, Ind., is 16,802.

The Liberty Mfg. Company, Susquehanna street, Pittsburgh, manufacturer of steam specialties, has purchased the patents and business of the Pittsburgh Feedwater Heater Company.

The Empire Steel & Iron Company, Catasauqua, Pa., has blown out one of its Crane furnaces and now, out of eight stacks, has but two in blast — one Crane and one Oxford.

The blast furnace of the Central Iron & Coal Company, at Holt, Ala., was blown in October 26 and is now reported producing at its normal rate.

The Ohio Crucible Steel Company, Cleveland, Ohio, is installing one 2-gross-ton special Bessemer converter, which it expects to have ready for operation in November.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 2, 1910.	Oct. 26, 1910.	Oct. 5, 1910.	Nov. 3, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$15.75*	$15.75	$16.00	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	*16.00*	16.00	16.25	19.00
Basic, delivered, eastern Pa.	*14.75*	15.00	15.00	19.00
Basic, Valley furnace	*13.00*	13.00	13.50	17.25
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	14.15	14.15	14.15	17.15
Lake Superior charcoal, Chicago	*18.00*	18.00	18.25	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*23.50*	23.50	24.00	27.00
Forging billets, Pittsburgh	*28.50*	29.00	29.00	30.00
Open hearth billets, Philadelphia	26.00	26.00	26.00	30.60
Wire rods, Pittsburgh	28.50	28.50	28.50	32.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	*13.50*	13.75	14.00	18.00
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	*13.50*	14.00	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.50*	13.75	14.00	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	1.40	1.40	1.40	1.62
Common iron bars, Chicago	1.35	1.35	1.35	1.55
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.60
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.66
Tank plates, Pittsburgh	1.40	1.40	1.40	1.50
Beams, tidewater, New York	1.56	1.56	1.56	1.66
Beams, Pittsburgh	1.40	1.40	1.40	1.50
Angles, tidewater, New York	1.56	1.56	1.56	1.66
Angles, Pittsburgh	1.40	1.40	1.40	1.50
Skelp, grooved steel, Pittsburgh	*1.25*	1.30	1.40	1.45
Skelp, sheared steel, Pittsburgh	*1.35*	1.40	1.50	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.60*	1.65	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.87½	12.87½	12.75	13.25
Electrolytic copper, New York	12.75	12.80	12.50	12.87½
Spelter, New York	5.95	5.60	5.60	6.30
Spelter, St. Louis	5.80	5.45	5.45	6.10
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	4.27½	4.27½	4.27½	4.25
Tin, New York	36.80	36.15	36.50	30.40
Antimony, Hallett, New York	7.75	7.75	7.87½	8.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3 84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; Nos. 29, 2.25c.; No. 30, 2.25c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½ in. corrugations. All above prices are f.o.b., Pittsburgh, terms 30 days net or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1¼ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
⅛ in.	64	58	60	54
¼ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer, open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16 in. take an advance of 15c., and ½-in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 2, 1910.—(*By Telegraph.*)

Pig Iron.—On Friday, October 28, bids went in on the inquiry of the Westinghouse Air Brake Company for 1000 tons or more of malleable Bessemer and gray forge iron for delivery in first quarter and first half of next year, but the business has not yet been closed. The Union Steel Casting Company of this city has bought 1500 tons of standard Bessemer iron, deliveries 250 tons a month over first half, at $15, Valley furnace. The inquiry for pig iron is light, and the market continues weak. We quote standard Bessemer iron for forward delivery at $15; malleable Bessemer, $13.75; No. 2 foundry, $14; basic, $13, and gray forge, $13.25, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Steel.—The market is very quiet and prices are weak. Not enough business is being offered in billets or bars to fairly test prices, but several consumers of sheet and tin plate bars have inquiries out for their requirements for first quarter. We quote Bessemer and open hearth billets at $23.50 to $24; Bessemer and open hearth sheet and tin plate bars, $24.50 to $25, and forging billets $28.50 to $29, all f.o.b. cars, Pittsburgh, Youngstown, or Wheeling district.

(*By Mail.*)

After the election on Tuesday next is now named by the sanguine element as the time when the long deferred improvement in the iron trade may be expected. No definite reasons are given for this belief and there is nothing tangible in the situation that would seem to indicate early betterment. The railroads are not buying a pound of iron or steel they can possibly avoid, and consumers generally continue to place orders only for such material as they absolutely need. It is a fact, however, that several of the leading railroads, including the Pennsylvania, have made up their estimates for track material needed for the first half of next year and some orders for rails, though probably not very large ones, will likely be placed in the near future. The rail makers have adopted a new method of quoting on rails, all quotations now being on a pound basis, but this does not affect the price of standard sections, which still figure out $28 per gross ton. The inquiry for pig iron continues light and the market is weak. Some furnaces are willing to sell through first quarter of next year at present prices. The steel market continues weak, Bessemer billets being freely offered at $23.50 and open hearth sheet and tin bars at $24.50. The sheet mills are entering a good deal of new tonnage, most of it at the prices recently adopted, which are based on 2.20c. for No. 28 black, but in some cases prices are shaded about $1 a ton. The amount of new business in iron and steel entered in October by the leading makers compares favorably with September, but at the same time was a disappointment, not being as large as expected. Low prices continue to rule on coke and scrap.

Ferromanganese.—A leading consumer in the Youngstown district is reported to have bought 2500 tons of foreign 80 per cent., for all of 1911 delivery, at a price slightly under $39, Baltimore. There is some inquiry out for first half shipment. We quote 80 per cent. foreign at $38.50 to $39, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—This material continues somewhat scarce for spot shipment, for which higher prices are offered than for forward delivery. We quote 50 per cent. ferrosilicon for delivery over the next four or five months at $54.50 to $55, Pittsburgh, while for prompt delivery a premium of $1 a ton or more is asked. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—The low prices ruling on both iron and steel skelp have brought out some new business, and we note sales of 4000 to 5000 tons of grooved steel skelp at 1.25c., delivered at buyer's mill in the Pittsburgh district, and 500 tons of sheared iron skelp at 1.70c. for same delivery. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.35c. to 1.40c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumer's mill in the Pittsburgh district.

Rods.—The inquiry for both Bessemer and open hearth rods is light and confined to small lots for early delivery. We quote Bessemer, open hearth and chain rods at $28.50, Pittsburgh, but Bessemer rods are not so firmly held as open hearth.

Muck Bar.—Consumers are now pretty well covered for the remainder of this year and into first quarter. We quote best grades of muck bar, made from all pig iron, at $30 to $30.50, Pittsburgh. Eastern muck bar continues to be offered in this market at $29 to $29.50, but we do not hear of much being sold.

Steel Rails.—The rail makers have adopted the method of quoting prices per pound instead of per ton on both standard and light sections. In the case of standard sections this does not make any change in price, as they are quoted at 1¼c. per pound, which figures $28 per gross ton at mill, the same price that has been in effect for some years. Last week the Carnegie Steel Company received new orders and specifications against contracts for about 2500 tons of light rails.

Structural Material.—A fair amount of new inquiry is coming out, but no large contracts are being placed in this district. The McClintic-Marshall Construction Company has taken material for the Cortlandt street ferryhouse of the Pennsylvania Railroad at Jersey City, 1700 tons, and also the steel for the new Press Building in this city, about 400 tons. Prices are being maintained on the basis of 1.40c. for beams and channels up to 15 in., f.o.b., Pittsburgh.

Plates.—A few scattering car orders have been placed, but these have been greatly magnified in the daily press. The Pennsylvania Railroad will build 500 freight cars in its own shops at Altoona, and the Norfolk & Western 300 in its shops at Roanoke, Va. Reports are current that the Hawley interests are in the market for 4200 cars of various types, but this inquiry came out nearly six months ago. Reports are also circulating that the Pennsylvania Railroad will buy a large number of cars, but the steel car builders here have not received the inquiry. New business in plates continues light and none of the mills is able to operate to more than 50 or 60 per cent. of capacity. The local market on ¼-in. and heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

Sheets.—A good deal of new tonnage has been placed in the past two or three weeks, and most of the leading makers are now operating their plants to larger capacity than for some time. Reports received from four or five of the leading sheet mills in the Pittsburgh and Youngstown districts show that they are running about full, and the same is true of two or three plants in the Wheeling district. In some cases prices are shaded about $1 a ton. The full schedule of prices on black and galvanized and roofing sheets is printed on a previous page.

Tin Plate.—The tin plate trade has slowed down a good deal recently and leading makers are commencing to curtail output materially. The eight hot mills in the Laughlin plant at Wheeling have closed, and it is probable that operations will be further curtailed during the next week or two by both the leading interest and independents. This is always the dull season in the tin plate trade, and as contracts have been pretty well cleaned up the slowing down in new demand is a natural result. Prices remain firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Little new business is being placed in either

THE IRON AND METAL MARKETS

iron or steel bars, but specifications against contracts are coming in at a fairly satisfactory rate. The demand for iron bars has been dull for some months, the railroads not placing new business and in many cases holding up specifications against contracts. The local market on steel bars is 1.40c., but for some points of delivery, notably in the Chicago district, this is being shaded as a basing price. We quote soft steel bars at 1.40c. in large lots and common iron bars at about 1.45c., Pittsburgh. Prices on the latter are weak.

Hoops and Bands.—New orders are only fair and mostly for small lots, while specifications are coming in quite freely. Prices are firm and we quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

Cotton Ties.—We quote cotton ties for November delivery at 77½c. per bundle.

Spikes.—New business continues light, the railroads buying only small lots for needed repair work. We quote standard sizes of railroad spikes at 1.50c to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—There is a fair amount of new business and specifications against contracts are not at a very satisfactory rate. Prices continue to be shaded.

Shafting.—New orders continue light and specifications against contracts are not coming in at a satisfactory rate. Prices are fairly well sustained. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—The demand for wire nails and wire is holding up quite well, but consumers still pursue the policy of largely placing orders only to cover actual needs. Specifications against contracts are reported as quite active, and the leading wire interests advise that their plants are being operated to nearly full capacity. Barb wire and fence wire are dull, as the season is about over, and conditions will be quiet until spring trade opens up next year. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—A good deal of new inquiry is out for small gas and oil lines, but no large contracts are in the market and probably will not be until early next year. The Ohio Fuel Supply Company has placed contracts for four miles of 6 in. and one mile of 4 in. for delivery in the West Virginia district and two miles of 6 in. for delivery in Ohio. It is stated that discounts on both iron and steel pipe are being maintained.

Boiler Tubes.—The market on boiler tubes is in very unsatisfactory shape, the demand being dull and prices are more or less demoralized.

Iron and Steel Scrap.—Inquiries from consumers are light, and no improvement in demand or in prices is expected until there has been some betterment in the pig iron market. There is not a great deal of scrap pressing on the market to find customers, and while prices are very low they are fairly strong. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.75 to 14.00
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	10.00 to 10.25
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	12.00 to 12.25
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.25 to 14.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.50 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00
Heavy steel axle turnings	9.75 to 10.00

Coke.—No large new inquiries for blast furnace or foundry coke have come in the market in the past week, aside from one from a Cleveland furnace interest, which bought 1500 tons for November delivery at $1.55, at oven. The output of coke in the Upper and Lower Connellsville regions last week was 351,085 tons, about the same as the previous week. It may be noted that this is fully 100,000 tons less than in the early part of this year, but there is still too much coke being made. The Sunshine Coal & Coke Company, Uniontown, Pa., operating coal mines and coke works in Fayette and Westmoreland counties, reports that it has closed with several blast furnace operators for their entire supply of coke for 1911 and 1912, prices being somewhat higher than are being quoted at this time, owing to the long deliveries ahead. These contracts aggregate about 20,000 tons a month.

Chicago

FISHER BUILDING, November 2, 1910.—(*By Telegraph.*)

Developments in the market tend to confirm the information given in this correspondence two weeks ago that the most serious political difficulties of the railroads have been settled. The railroads are buying more freely and there are indications that their purchases will be on a more extensive scale in the very near future. Two roads have recently bought 1500 tons of bar iron instead of the small orders that have been given heretofore. One road has ordered 400 tons of plates from store for car repair work, and the equipment companies are showing more confidence in the future. Plans are under consideration to double a car building plant in the Chicago district. Data have been compiled by the railroads for rail orders for next year, amounting to 500,000 tons, although definite inquiries have not yet been submitted to the mills. High officials of the railroads are quoted in private advices as stating that their purchases in the coming year will surpass all former records of railroad activity in the iron and steel market. It is understood that all contracts placed will contain a cancellation clause. The policy of restricting purchases which has been followed the past four months does not seem to have had any considerable effect and it is understood that during the next three months the opposite plan will be followed of heavy buying, subject to cancellation. In the immediate future this will enable the roads to replenish their stocks of materials and bring their equipment into better shape. Outside of railroad purchasing the market shows satisfactory progress. Buying from store, which dropped off during the fall, shows a marked increase. The sheet market is strong and the wire mills in this district are running full. Specifications for bars and merchant steel are satisfactory and there is a little more structural business. Among other items, the steel order for the Heisen Building in Chicago, which was placed last summer, has been increased to about 8000 tons, the steel being fabricated on a separate contract for this building. The scrap market is restless and shows more activity, but large stocks which have accumulated the past fall act as a check on any advancing tendency in prices.

Pig Iron.—A very satisfactory buying movement is the progress in this territory. There are inquiries pending of a definite character for fully 50,000 tons of Northern iron, of which about 10,000 tons are for November and December shipment and the remainder for first quarter or first half. One large buyer is in the market for about 24,000 tons of various grades of Northern iron and 10 or 12 gray iron foundries in Chicago and surrounding territory are inquiring for 1000 to 2000 tons each. The inquiries pending include about 5000 tons of charcoal iron. The inquiries now in the market are of a more definite character than heretofore and a fair amount of business has been closed. The inquiry for Southern iron has also broadened considerably and many orders have been booked for small lots of 100 to 500 tons as well as several orders of 1000 to 2000 tons each of Alabama iron for first quarter. Most of the plow manufacturers are in the market for quantities that will partially cover their requirements for the first half and there are good inquiries from other manufacturers and from jobbing foundries. The business done in the past 10 days in small lots has been so extensive that it makes a good showing for the month of October on the books of many of Chicago offices. Buyers are generally paying $11.50 for Alabama iron for the first quarter and there is less pressure to sell for prompt shipment. Only a few furnaces, principally in Tennessee territory, are accepting prompt orders at $11. The market shows considerable vitality in view of the large accumulation of stocks. Advices in this market indicate that the furnace stocks in Alabama amount to something over 250,000 tons and Tennessee furnaces have about 50,000 tons; southern Ohio stocks are estimated at 175,000; Toledo and Cleveland districts, 100,000; the Valleys, 250,000, including basic and Bessemer; Chicago and Milwaukee territory, 100,000; Lake Superior charcoal, over 100,000; eastern Pennsylvania, 90,000; Virginia, 200,000. The accumulation of furnace stocks on all the markets is holding prices at a low level, but stocks are relatively small compared with the annual consumption of merchant iron. The following

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quotations are for November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The market is quoted at $28, Chicago, for forging billets, although in some cases this price has been shaded.

Rails and Track Supplies.—There are two definite inquiries in the market for round lots of rails for roads in Southeastern territory, but the business is not reported closed. Estimates have been prepared by railroad engineers covering requirements for next year, which amount to over 500,000 tons, but this business has not yet taken the form of definite inquiry. The trade in track supplies is now between seasons, as buying for this year is about over and contracts have not been placed for 1911 shipment. It is understood that a very large tonnage of rails purchased by some Western roads on which deliveries have been made has not been laid in tracks this year. These railroads purchased heavy rails for their main lines, intending to take up the lighter sections in use and utilize them for branches and extensions. On account of political agitation and trouble over the general advance in rates construction work of this character was stopped last summer and cannot be resumed now until spring. For this reason such roads may defer their yearly rail contracts for several months. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12-lb., $28, Chicago.

Structural Material.—The mills are getting more orders for the plain material than a week or two ago and there is a better feeling in the trade. The price of 1.35c., Pittsburgh, is still reported on light material, but the greater part of the business is being placed on the basis of 1.40c. There was also an improvement last week in the number of building contracts let in Western territory. In Chicago an addition to the Presbyterian Hospital, 330 tons, was booked by Vierling, McDowell & Co. In Omaha a power plant, 480 tons, was let to the Paxton-Vierling Iron Works. At Denver the Schuberts theatre, 500 tons, was let to the Loweth Brothers of that city. At Dallas, Texas, the Wilson Building, 800 tons, was let to Schreiber & Sons, Cincinnati. At San Francisco, the Cortez Hotel, 1000 tons, Bethlehem shapes went to Millikins Brothers. In Chicago bids are being taken on a 1600-ton loft building at Fifth avenue and Polk street, Bethlehem shapes specified, which will be erected by the Marshall Field Estate. The Oregon Trunk Line is in the market for 2000 tons of bridges for that company's new road in Oregon. The Anaheim Sugar Company, Anaheim, Cal., has let a contract for 145 tons, for factory additions, to the Des Moines Bridge & Iron Works. The Chicago, Milwaukee & St. Paul has ordered from the American Bridge Company, 125 tons of rods for a Howe truss (timber) bridge. The Monon has ordered 140 tons of bridge work from the Wisconsin Bridge Company. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—Although plate business is one of the quietest branches of the market the Illinois Steel Company continues to receive enough specifications to keep its mill in regular operation. Eastern mills are reported making concessions in prices on plates up to 80 in. wide, but the leading companies continue to hold at 1.40c., Pittsburgh. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The sheet market continues to show steady improvement and the volume of new business is more satisfactory than in any other branch of the trade excepting possibly wire products. The open recognition of the prices now quoted and the adoption of the new differentials on galvanized sheets seem to have had a steadying effect on the market. Jobbers and manufacturing consumers of sheets have been disposed for a long time to purchase only for prompt shipment on account of the trend of the market, but there is either a marked increase in consumption recently or more confidence among buyers. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Specifications on agricultural contracts are very satisfactory and in some directions there is improvement in the amount of new business. Reports continue of the price of 1.35c., Pittsburgh, on soft steel bars, but only on desirable orders and from mills which do not hold annual contracts on which prices are guaranteed against a decline. There is a little improvement in the current demand for bar iron and there has been a fairly steady demand from contractors for concrete bars. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—The wire mills in the Chicago district, which supply the greater part of the Western trade, are reported running practically full. The weather has been very favorable for fall trade in fence and this is keeping up the demand for barb wire, fence wire and field fence. The manufacturing demand is on a normal basis. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—The mills report that specifications and new orders for merchant steel were better during October than in September. Shipments were a little less during October, a natural movement, owing to the fact that the heavy summer shipments go into agricultural implements for the fall trade. Orders from store for all kinds of merchant steel have shown a remarkable increase in the past 10 days. The last week in the month is usually a light one in store orders, but there was unusual activity in this trade last week. The railroads are conspicuous in purchases from stock, as their purchasing departments have been held under such restrictions the past summer that they no longer have time to obtain mill shipments. On a recent order for 400 tons of plates for car repair work it was necessary to purchase from store so as to obtain immediate shipment.

Cast Iron Pipe.—Detroit, Mich., advertised recently for 6300 tons of water pipe, but all bids were rejected and it is not known here whether the business will be readvertised or placed with a Detroit foundry. No other large specifications are reported in the market. The leading pipe interest booked several small lettings last week amounting to about 1500 tons. The season for laying pipe is about over in the North, and interest from now on will center in contracts for winter shipment. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—There are indications of restlessness in the scrap market after a long period of stagnation. The prices being paid by consumers are no higher, but dealers find it easier to dispose of their material and there is a strong undercurrent in the market growing out of the prospect of an early buying movement on the part of the railroads in the market for finished material. A manufacturer at Racine has purchased 1000 tons of cast scrap and there have been several other transactions running into round lots. The leading rolling mill interest has been buying wrought scrap recently and a new steel interest has made purchases of low phosphorus steel scrap. Dealers are finding it a little more difficult to dispose of rerolling rails, as the mills have picked up large stocks this fall and are not active buyers. Any advancing tendency in the market will be held in check for some time by the fact that stocks have been accumulating. Many of the dealers have taken in large stocks of material at their yards in the past two or three months and most of the buyers in this market are also carrying good stocks. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

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The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., November 1, 1910.

The first move toward curtailment of pig iron production in this territory developed during the week, the basic makers taking the initiative. One Lehigh Valley stack went out and one Schuylkill Valley furnace will be blown out this week, while several others are expected to follow in the near future. The market shows little change, transactions being closely confined to the foundry grades. While there is the same expectant feeling that a better market is in sight, buying lacks snap. There has been a trifle better inquiry for some classes of finished products, plates particularly showing up more strongly, although immediate orders are light. The report current that a large buyer in this territory had succeeded in breaking the price for heavy plates is denied by the supposed purchaser, who claims that the order has not been placed. Inquiries for steel rails from some of the large Eastern roads for next year's requirements are expected almost any day. No movement is reported in steel billets, prices of which could be shaded for tonnage. Both iron and steel bars have been dull. A waiting market with lower quotations is noted for old material.

Iron Ore.—Some interest is shown in the outcome of the deliberation on lake ore prices for next year now under way. There has been no inquiry for ores. Importations at this port for the week ending October 29 aggregated 12,950 tons, valued at $35,131. The largest single cargo of iron ore ever received at this port came in Saturday, the steamship Sir Ernest Cassel arriving from Narvik, Sweden, with 9800 tons of Swedish ore. The classification of importations at this port in September is as follows: Spanish and Mediterranean, 40,237 tons; Cuban, 32,200 tons; Newfoundland, 17,825 tons; Swedish, 6454 tons. September importations of Cuban ore at the port of Baltimore aggregated 83,600 tons.

Pig Iron.—There is a very fair volume of inquiry for foundry grades for both prompt and early 1911 delivery, but, outside of the requirements of the cast iron pipe makers, the tonnages being figured on run rather small. No particular betterment in actual sales is reported; in fact, sales during the week probably aggregate less than during the previous one. A Delaware River cast iron pipe foundry, which inquired last week for 5000 tons of analysis iron for early next year, has placed orders for a portion at $14.70, delivered, for Northern iron. Other pipe foundries in this district are in the market for moderate lots, but so far have only bought some small lots of off grade iron at about $14.25, delivered. A Virginia pipe maker placed an order with a local furnace for about 2000 tons of low grade Virginia iron for early 1911 delivery and is understood to be figuring on a further purchase. About an even volume of small lot buying for prompt delivery is reported in the higher grades of foundry iron. A stronger disposition to get at least a portion of the first quarter's requirements placed is noted and sales either for prompt or first quarter are made in carloads to a few hundred tons at $15.75 to $16, delivered, for standard brands of No. 2 X foundry. There has been a better movement in Virginia foundry iron, but in very few instances will sellers contract for delivery beyond the next three months. The general quotation for No. 2 X foundry, and in the majority of instances also for No. 2 plain, is $13.25, furnace, although spot lots can in instances be done at $13. With the most favorable freight rate into this district, the minimum quotation on the former basis is $16.05, which is about the best that can be done, except for odd spot lots. A little more inquiry for rolling mill forge is reported, quantities ranging up to a few hundred tons, on which quotations range from $14.50 to $14.75, delivered. No sales of importance are reported. There is still a lack of interest in the basic market. Sellers' ideas of prices for first quarter and half delivery range from $15 to $15.50, delivered, although for prompt iron $14.75 to $15 could readily be done, but outside of the small inquiry recently reported no interest is shown by melters. Little demand for standard low phosphorus iron is reported, although some inquiry for misfit iron is noted. Standard brands are firm at $22.50, delivered here. The accumulation of stocks and the lack of demand for basic iron have resulted in some producers making curtailments in production. One stack of the Empire Steel & Iron Company at Catasauqua, was blown out last week. One Heckscher, at Swedeland, will go out this week, and one Longdale, in Virginia, was blown out last week; indications point to the blowing out of one or more stacks in the Lehigh Valley district in the near future. Princess Furnace, in Virginia, will be blown out for repairs toward the close of the month, to be idle probably six weeks. These various curtailments will, it is believed, help the situation in this territory to some extent, although the amount of iron on furnace banks has not been heavy enough, as a rule, to influence the market. The following range of prices represents the market for standard brands delivered in buyers' yards in this vicinity, either for shipment during the remainder of the year, and in some instances the first quarter of 1911:

Eastern Pennsylvania, No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	16.00 to 16.25
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 14.75
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—A further scattered small lot inquiry is noted, with one concern in the market for about 500 tons for first half delivery. Prices appear a shade easier, $38.75 to $39, Baltimore, about representing the market.

Billets.—The demand is still confined to small prompt lots for early delivery. There have been no inquiries of sufficient size to test the market, but there is little doubt that the present quotation, $26, delivered, for ordinary open hearth rolling billets, would be shaded 50c. a ton for desirable orders. Forging billets are firm at $28, Eastern mill, with the usual extras for high carbons and special sizes.

Plates.—There is more inquiry and in some instances mills have had a little better run of small orders. Makers are bidding on some 3000 tons for two merchant ships, while quotations for plates for several torpedo boat destroyers are also being figured on. Reports that an Eastern consumer had placed orders for 2000 tons of tank plates for a gas holder at a sharp concession from recent prices is denied by the supposed purchasers, who state that they are in no haste to place the business. Producers in this district are apparently maintaining pretty firmly the quotation of 1.55c., delivered in this territory.

Structural Material.—No new local propositions of any importance have come out, although fabricators are bidding on some fair-sized work in other districts, and one order, for a power house in Washington, D. C., requiring 900 tons, has been placed. The Union League addition is expected to be closed the current week. The bulk of the recent business has been small and of a miscellaneous character, aggregating a somewhat smaller volume. Prices for plain shapes appear to be firm at 1.55c. minimum, delivered in this territory.

Sheets.—A very fair run of orders, mostly small and for prompt delivery, is reported. In the aggregate these reach a good total, and mills in this district continue fully engaged and report a marked urgency by customers for prompt deliveries. Quotations are well maintained, Eastern makers holding firmly the following range of prices for prompt deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand continues dull. Current orders are small. Prices are fairly well held for the class of business offered, but the market has not been seriously tested. For ordinary specifications refined iron bars are quoted at 1.40c. to 1.45c., delivered in this vicinity. Steel bars have been a shade quieter, with the price firmly held at 1.55c., delivered.

Coke.—Interest is being shown in furnace coke for next year's delivery, but buyers and sellers are slightly apart on ideas as to prices. Producers are holding at $1.65 to $1.85, at oven, for forward coke, while consumers' ideas of prices are around $1.55 to $1.65. Not much business has been done, but a better volume is anticipated in the near future. There has been a scattered demand for foundry coke, with sales mostly confined to small lots, with prices for established brands ranging from $2.20 to $2.40, at oven. The following range of prices, per net ton, about represents the market for delivery in this vicinity:

Connellsville furnace coke	$3.85 to $4.10
Foundry coke	4.40 to 4.75
Mountain furnace coke	3.45 to 3.70
Foundry coke	4.00 to 4.35

Old Material.—A waiting market characterizes the local situation. Most consumers are well supplied for the near future and make purchases at bargain prices only. One of

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the leading steel mills has purchased 2000 tons of strictly No. 1 heavy melting steel at $13.75, delivered, but is now out of the market. Other mills offer down to $13 for this grade, simply as fixing a price, as material is not wanted. Under the circumstances it is difficult to name a market quotation for steel scrap, although $13.75 is easily the top of the market. Rolling mill grades are inactive and tenders of material, even at the lower quotations named for some grades, fail to arouse the interest of buyers. While to a large extent nominal, the following quotations about represent sellers' ideas of the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate of 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.50 to $13.75
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.25
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.50 to 12.00
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Matthew Addy & Co., pig iron, ore, coal and coke merchants, with offices at 740-741-742 Real Estate Trust Building, Philadelphia, Pa., will remove this week to rooms 409-411 in the same building. S. C. Ludwig, for many years associated with the Alan Wood Iron & Steel Company, Philadelphia, has resigned and is now with the sales department of Matthew Addy & Co.

Cleveland

CLEVELAND, OHIO, November 1, 1910.

Iron Ore.—Shipments continue to fall off and will be very light this month. All the barges of the Pittsburgh Steamship Company will be in port by the end of the week and the steamers of that company are expected to load their last cargoes by November 19. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The local market shows more activity than for some time in the volume of inquiries from this territory. While not many sales were reported, and some of the inquiries previously noted are still pending, the general feeling shows an improvement. A Kentucky steel company is in the market for 6500 tons of basic, 1000 tons for delivery in each November and December and 1500 tons per month during the first quarter. There is also a local inquiry for 1000 to 2000 tons of basic for the first half. A local foundry is in the market for 2000 tons of No. 2 foundry for the first half. A Canton foundry has an inquiry out for 500 tons of each Northern and Southern No. 2 for the first half. An Erie, Pa., manufacturer wants 1000 tons of No. 2 foundry for the same delivery, and some smaller inquiries have come from the same locality. A radiator company is asking for prices on 1000 tons of Southern iron for November and December delivery, and a Mansfield stove manufacturer wants 500 tons of No. 2 Southern for the first half. A northern Ohio foundry has an inquiry out for 500 tons of No. 2 Northern for the first half. There is a northern Ohio inquiry for 1500 tons of gray forge for December, January and February delivery. A Canton plant is in the market for 500 tons of charcoal iron for the remainder of the year and an unspecified tonnage for its first half requirements. No change is apparent in the price situation. Sales are being made at $14, Cleveland and Valley furnace, for first half delivery. For local delivery, after the first of the year, $14.25 to $14.50, delivered, are the ruling quotations. Southern iron appears firm, at $11.50 for the first quarter, but many consumers are still holding out for $11. For prompt shipment and for the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.50 to 15.00
Northern foundry, No. 2	14.00 to 14.50
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—Some Wise County, Virginia, foundry coke is being sold in this market in competition with the Connellsville brands. Sales are being made at about $2, at oven, which is equivalent to about $2.50, Connellsville. The Virginia freight rate to Cleveland is $2.10, as compared with $1.65 from the Connellsville region. The market continues quiet in both foundry and furnace grades. We quote standard Connellsville furnace coke at $1.55 to $1.65 per net ton, at oven, for spot shipment and $1.70 on contract. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 for spot shipment and $2.25 to $2.50 for the remainder of the year and the first half.

Finished Iron and Steel.—Several of the mill agencies report an improvement in the volume of orders and the general situation in this territory is regarded as better. Some manufacturing plants are getting a larger volume of business and are specifying somewhat more freely on contracts. The hesitancy that has prevailed among buyers for several weeks over the placing of orders because of the belief that price reductions might be secured by waiting appears to have about disappeared and orders are being more freely placed for material that is actually needed. The demand for steel bars is holding up well and prices are firmly maintained. Little new bar business is coming out, as consumers are nearly all under contract. Good specifications are coming from the implement trade. The demand for plates, which has been quiet for some time, shows quite an improvement. Some of the boiler and tank shops have been getting some good orders and have placed contracts for the plates required, which have been accompanied with liberal specifications. Plate prices are being firmly maintained except by a few mills making the narrow sizes. There has been some inquiry for plate contracts for the first quarter, and some of the mills will probably soon begin to take on tonnage for that delivery at current prices. The demand for small lots of structural material is fairly active, but no new work requiring round tonnages is coming out. Prices are being firmly maintained at 1.40c., Pittsburgh. The demand for sheets continues quite active. Prices on galvanized sheets are firm, but there are reports that in some cases black sheets are being shaded $1 a ton. The demand for iron bars is a little more active, some good specifications having come from railroads for repair work. We quote iron bars at 1.30c., at mill, but this price is being shaded slightly.

Old Material.—A better feeling has developed among some of the dealers during the week and they are holding for higher prices than are prevailing. Others declare that there is no foundation for a firmer tone in the market. The demand continues light, mills buying only in small lots. Heavy melting steel and busheling scrap show more activity than other grades. The Erie and Wheeling & Lake Erie railroads received bids November 1 on lists containing indefinite tonnages. An obvious error appeared in this report September 22 and later issues, prices in the first section of the list being stated as per net ton. This should have read per gross ton. Prices are steady and unchanged. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., October 31, 1910.

Pig Iron.—While the inquiry the past week has been very large—much larger, in fact, than for some weeks—yet the volume of business actually booked by Southern producers was far from satisfactory. Such buying as was recorded was at the expense of the price schedule that has been nominally quoted now for some weeks. The bulk of the tonnage placed was on a basis of $11, Birmingham, and the deliveries are practically all limited to the next 90 days. Pipe makers continue to take small tonnages of certain grades when they can be had at a concession. It is generally conceded that $11 is the absolute bottom for Birmingham iron, and it is thought that if such a figure were made general for delivery over the first half of 1911 heavy buying would immediately result. The large volume of inquiry recently tends to confirm this belief, but it is doubtful if many producers in the South can well afford to sell for any extended delivery at such a figure. Meanwhile the bulk of the business that is being placed in the pig iron line goes to the furnaces North or to the stacks in Tennessee that are willing to give away part of their freight differential as compared with Birmingham. It is estimated that October will show about an even break as to production and shipments, so that stocks on hand November 1 will likely vary

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little from the record for October 1. This in itself is an item of considerable encouragement to producers. There are numerous predictions of car shortage during the coming winter months; already there is a great scarcity of coal cars for moving Alabama coal to new fields where a demand has sprung up by reason of the summer strikes in other coal fields.

Cast Iron Pipe.—No bookings of consequence are reported by the Alabama pipe makers for the week just closed. Shipments continue at about the same rate as for some months. Quotations remain at about the following schedule for water pipe, per net ton, f.o.b. cars at foundries this immediate district: 4 to 6 in., $22; 8 to 12 in., $21; over 12-in., $20, gas pipe taking the usual differential of $1 per ton higher.

Old Material.—Listlessness still pervades the scrap market, with quotations nominally as follows:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

Cincinnati

CINCINNATI, OHIO, November 2, 1910.—(*By Telegraph.*)

Pig Iron.—Increasing sales and inquiries improve the situation with local agencies. A Cincinnati foundry has contracted for 700 tons of Northern and 800 tons of Southern No. 2 foundry. A southern Ohio firm bought 1500 tons of Northern foundry and an Indianapolis melter signed for a good sized tonnage of both Northern and Southern foundry, all deliveries for the first half of next year. A number of other orders, ranging from 50 to 300 tons, have been booked for this same delivery. Taking everything into consideration, the outlook continues to grow encouraging, but prices remain at the previously reported low level. Southern foundry can be purchased at $11, Birmingham basis, for this year and delivery extended into the first quarter of next at the same figure, although the regular quoted price is $11.50 for shipment extending through the first half. Northern iron does not seem to be able to get above $14, Ironton, for this year and contracts with some interests could probably be made at this same figure for shipment until April next, although $14.50 is the quoted price for first half contracts. A noticeable feature of the present market is that in actual sales made the difference in price between the regular standard foundry and lower grades does not appear to have been maintained. A local inquiry for 7500 tons of steel-making iron for delivery extending through the first quarter is expected to be closed soon and another for 1200 tons of Northern foundry from a nearby concern will also doubtless be closed before next week. The weekly letter of Matthew Addy & Co. says: "One of the interesting sales of the week was to a large foundry that tried in vain to buy at present prices for delivery over the second quarter of next year. Finally, finding that no furnace would make such a contract, it bought iron to be placed in storage in November and December, to be paid for promptly, but the furnace to carry free of storage charges for nine months. In this way the foundry makes sure next year of cheap iron, for the interest charges which will accrue before the iron is melted will be cheap insurance against an advance in the market." For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, X per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

Coke.—For November-December shipment a small amount of Connellsville furnace coke has been bought, and the usual number of small foundry coke orders have been received the past week. Furnace coke is quoted in all three fields at $1.65 to $1.85 per net ton, at oven, but spot shipment of some of the lower grades would shade the first named figure. The average contract price of $2.25 for foundry coke is the same in the Wise County, Pocahontas and Connellsville districts. For immediate shipment $2 can be done on some grades.

Coal.—A serious car shortage is in sight, and one large interest has been forced to cut down the output of its mines over 40 per cent., as it has no cars in which to ship its product. A large number of the cars furnished are also claimed to be in very bad condition and delays en route for repairs are frequent. Pocahontas lump and egg coal is quoted at $2.25; standard splint lump at $1.85 to $2; run-of-mines at $1 to $1.25, and slack around 90c. at mines. The demand is good for all grades, except slack, but prompt deliveries are hard to make on account of the car shortage, which is certain to be worse when cold weather begins.

Finished Iron and Steel.—There is no change in the quiet conditions that have prevailed for the past few weeks. New contracts are scarce and mill agencies do not look for any immediate improvement. Agricultural implement material has furnished a better tonnage than any other class of orders. The warehouse price on structural material is about 1.90c. and that of steel bars, 1.80c.

Old Material.—Local dealers continue to report only small sales to fill immediate requirements of foundries. Only light tonnages are being bought by dealers. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Buffalo

BUFFALO, N. Y., November 1, 1910.

Pig Iron.—Inquiry is keeping up well, both for current quarter and 1911 deliveries. Consumers manifest a fairly good buying interest, although sales for the past week have not been as heavy as the preceding week. The orders coming in have, as a rule, been for smaller quantities. The larger portion of new business was for foundry grades, but some malleable was included and one 5000-ton order for basic from a Chicago steel company, for delivery before the close of navigation at current quarter price. Prices for most grades are showing a slightly stronger tendency, furnaces in this district not exhibiting any eagerness to secure 1911 business at going prices and not attempting to meet the extremely low delivered prices quoted to New England consumers by some Southern iron interests. Uniformly heavy shipments are now going out from furnaces week after week and in increasing volume. Furnacemen consider the outlook encouraging and are generally inclined to the opinion that the end of the slack period has been reached except as regards railroad business. We quote as follows for current quarter and first half of 1911:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.25 to 14.75
No. 2 plain	14.00 to 14.25
No. 3 foundry	13.75 to 14.00
Gray forge	13.75 to 14.00
Malleable	14.25 to 14.75
Basic	14.25 to 14.75
Charcoal	18.00 to 18.50

Finished Iron and Steel.—Orders continue to come along in fair volume and the feeling prevalent is that the outlook is favorable for a large increase in business as soon as election is over and the cause for a waiting attitude preserved in some quarters on that account is removed. There is continued active demand for tin plate and for wire products. The local agency of the leading interest has added considerably to its force of salesmen in connection with the solicitation of business for shipment from its warehouses and it is understood that these salesmen are meeting with considerable success in obtaining orders for prompt shipment. The Jones & Laughlin Steel Company has been awarded contract for the sheet piling to be used in connection with the government work at Oswego. The Canadian export trade continues active and contracts are being placed by Canadian jobbers and consumers for requirements for bar products covering the first half of next year. Little new work has developed in structural lines during the week. A number of structural steel bridges for Erie Barge Canal contracts are being figured and for two local buildings requiring small tonnages. The H. C. Harrower Company was low bidder for the steel work on the revised plans for the Haberstro Building, Buffalo, 275 tons.

Old Material.—The market is exhibiting some signs of improvement and a considerably better feeling is evident. The demand is picking up in a number of lines, particularly in car wheels. Consumers are a little more inclined to buy for future needs and dealers are booking more business than for some time. Prices have not been affected by the awak-

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ening demand, except car wheels, which have advanced slightly. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.25 to 6.50
No. 1 busheling scrap	11.25 to 12.00

San Francisco

SAN FRANCISCO, October 26, 1910.

Underlying conditions on the Pacific Coast are probably as healthy as in any other section of the country, if not more so, yet the slight improvement which has occurred in the iron and steel industry in other quarters is not reflected here. Aside from one or two lines the market continues to drag, and with the stock-taking period approaching there is little hope of an accelerated movement before the middle of the first quarter of 1911. The customary fall revival of the distributive trade has failed to develop, and the heavy stocks held in local warehouses are diminishing but slowly, giving jobbers no reason to enter the market. Merchants and mill representatives alike complain of poor collections. There is some movement in structural material, but the building situation on the whole is poor, and the persistent dullness in some lines is attributed to this fact. Manufacturers, moreover, are unwilling to take on large supplies in view of the unsettled labor conditions. Local importations of foreign steel are moderate at present, but arrivals at other points on the Pacific are large. Steel from Antwerp was the largest item in the importations at Los Angeles during September.

Bars.—Concrete construction work appears to be fairly active, as this material is being used for a number of local buildings, for harbor work and for many bridges, &c., in the interior. The movement of bars for reinforcing purposes, however, is considerably below expectations, and the majority of purchases are very small. Foreign bars, twisted in local shops, are coming into general use for this purpose. The larger manufacturing interests are confining their purchases of soft steel bars to the smallest possible limits and appear willing to continue this practice for some time. The small jobbing trade is nearly normal in most quarters, but is quiet locally, and the aggregate movement is highly unsatisfactory. Bars from store, San Francisco, are quoted at 2.25c. for iron and 2.45c. for steel.

Structural Material.—A good many extremely small jobs are coming out, but few of the medium class on which local fabricators have relied for most of their business. The contract for the Native Sons' Hall, which was withheld for several months, has been awarded to the Pacific Rolling Mill Company, and Dyer Bros., San Francisco, have the Eagles' Hall contract. The Central Iron Works has a small job on the San Francisco Turn Verein building. A contract for about 125 tons for the Central Methodist Church has been let to the Western Iron Works. Two fair jobs have been let at Portland, Ore.—1800 tons for the Lipman, Wolfe & Co. building and about 1000 tons for the Wilcox building—both being taken by the Northwest Steel Company. The largest job in sight is the Oakland city hall, on which figures will be taken shortly. The Davis Estate building, San Francisco, 800 tons, will probably be let next week, and figures are being taken on 850 tons for the Cortez Hotel at Sutter and Kearny streets. A local contractor has taken about 100 tons for the Honolulu Y. M. C. A. Plans have been completed for the Sacramento County courthouse and the contract will probably be let in December. Figures are being taken on the Hogue building at Seattle, Wash., 2000 tons, to be let October 31, and prospective requirements at that place include the Bon Marche department store, 2000 tons, and the L. C. Smith building. It is reported that bids will be taken shortly on a large federal building at Bellingham, Wash. Plans are being drawn for a large office building at Montgomery and Pine streets, San Francisco. Contracts are expected shortly for a drawbridge near Sacramento, Cal., and it is announced that the Southern Pacific will build a steel bridge over the San Joaquin River near Antioch, Cal. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

Rails.—The tonnage booked since the middle of October has been light, but several substantial orders are expected to come out during November, the principal inquiry being street railway interests.

Plates.—Marine plates, as a rule, are an item of very little importance in the Pacific Coast trade, but some demand is likely to arise from a number of repair jobs on hand. A contract will also be let shortly for a steel steamer for the Puget Sound Navigation Company, which is expected to go to a San Francisco firm, and the Port of Portland Commission, Portland, Ore., will build a large steel towboat. Tank plates remain rather quiet. Manufacturers have plenty of work on hand and in prospect, but have sufficient stock for present requirements, and are not yet inclined to make much provision for the future. The Standard Oil Company is preparing to install 15 new stills at Richmond, Cal.

Merchant Pipe.—The local distributive trade has shown scarcely any improvement for the last two months, and the outside demand is considerably below expectations. In the movement from manufacturer to jobber conditions are the reverse of those which existed a year ago, when large speculative orders were being placed for future delivery. Buying by merchants is at present limited to an occasional carload, with no prospect of any general movement until after the turn of the year. The oil industry is getting into better condition, but a number of shallow wells are coming in and little new development is being started. Up to July the pipe tonnage was somewhat in excess of the same period of 1909, but since then it has been steadily decreasing, and so far October has been about the dullest month of the year.

Cast Iron Pipe.—While no very large orders have been booked conditions are more favorable than for some time, and the aggregate tonnage, composed of small scattered orders, compares favorably with former records. The city of Santa Cruz, Cal., has placed its order with the United States Pipe Company. The city of San Diego, Cal., has voted $340,000 bonds for extensions to the water system and will probably begin work about the first of the year. The town of Madera, Cal., is preparing plans for a complete municipal water system.

Pig Iron.—Demand is almost entirely lacking, and the market is somewhat demoralized. Several cargoes of English and Scotch iron have recently been landed at Seattle, Wash., but arrivals here are not heavy and are partially taken up by former contracts. There is considerable accumulation in the hands of importers, however, and melters are taking no interest in the market. It is hardly possible to sell anything to arrive and spot offerings can be moved only at a sacrifice. A considerable tonnage of English and Continental iron is held at about $23, but this price can be obtained only in exceptional cases, and recent sales have been made at $22 or less. A somewhat higher price can be had for favored brands of Scotch iron, but the movement of such material is extremely small.

Old Material.—Cast iron scrap continues to move in a small way, the majority of melters taking little interest. There is some activity in steel melting scrap, owing partly to the opening of a new plant, and sales amounting to 4000 tons have been made by one firm. Bates & Chesebrough, who shipped a large tonnage to the Atlantic Coast earlier in the year, are not in the market at present. The prices obtained from local interests are considerably higher than those quoted on the material shipped East. There is no movement of railroad wrought scrap locally, but good rolling mill scrap is quoted at $13 to $13.50 per net ton. Rerolling rails are quiet, but prices are steadily maintained. Quotations based on recent transactions are as follows: Cast iron scrap, per net ton, $18; steel melting scrap, per gross ton, $12.50; rerolling rails, $15 per net ton. The last of the structural scrap left from the fire of 1906, held by the Bank of California, has been sold to the San Francisco Iron & Metal Company.

St. Louis

ST. LOUIS, October 31, 1910.

The seasonable weather now prevailing is giving some stimulus to general business. Houses catering to railroads find some improvement in the inquiry and count on an increase in the near future. Pig iron and coke are dull, the movement being mainly of a jobbing character, but there is rather more inquiry for pig iron, principally for first quarter of 1911.

Coke.—The demand for coke is of a jobbing character, covering small lots, mainly for prompt shipment. A leading merchant seller reports the sale of 25 cars of Collinsville foundry to various parties. We continue to quote for Collinsville 72-hour foundry, $2.15 for prompt and $2.35 for contract shipment, per net ton, at oven. Complaint is growing concerning car shortage in both the Pennsylvania and Virginia fields.

Pig Iron.—The past week proved to be an exceptionally dull one in pig iron in this market. The consensus of opinion seems to be that no marked improvement can reasonably be expected until after the November election. Buyers claim that large interests in the country generally will hold off

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and that that will prevent any advance in the market, consequently they are disposed to await the result. In one instance, however, a merchant house expresses the opinion that it is a favorable time to buy and that it is doing so in the expectation of an active demand at better prices after election. We hear of the purchase by a local foundry of 2250 tons Southern No. 2 foundry for shipment over the first half of 1911; also by another consumer of 900 tons, part Southern No. 2 and part No. 4 foundry, for the same shipment. We quote Southern No. 2 foundry for shipment over the remainder of the year, $11; for shipment over the first quarter, $11.25; over the first half, $11.50 f. o. b. Birmingham.

Finished Iron and Steel.—The leading interest reports the demand for standard rails slow, with some inquiry from mining interests for light rails. For structural material there has been an active demand, but mainly for highway bridge work. Steel bars are dull as regards jobbers, but there is some inquiry from agricultural implement manufacturers and wagon makers. For track material the demand is moderate.

Old Material.—Little business is passing, being mostly between dealers and at low figures. No improvement is looked for until the middle of November. The only railroad list on the market for the past week was 400 tons offered by the Chicago & Eastern Illinois, which was closed out at inside prices. A feature of the past few weeks is the small offerings of the railroads. The list is nominally unchanged with respect to prices, but there are hardly sufficient transactions to make a market. We quote dealers' prices as follows, per gross ton, f. o. b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	23.50 to 24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	11.50 to 12.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

The German Iron Market

BERLIN, October 20, 1910.

The chief interest of the market this week has been in the meeting of the Steel Works Union, which was held today at Düsseldorf for the purpose of taking action regarding prices of semimanufactured steel for the first quarter of 1911. Many of the members wanted to adopt higher prices, but it was voted to-day to leave them unchanged. It appears that the reason for not raising prices was the belief that the open hearth steel producers, who are not members, would be the chief gainers from such action. At present these independent producers are bidding sharply and successfully against the union for steel orders in the home market. By keeping just under the union's prices they are able to hold a steady run of buyers, and their business would only be increased under higher union prices. This applies to the home market only, however, as the union allows consumers a drawback on exported finished products, which serves as a special stimulus to the export trade in products made from its material. Another fact in this connection is the prospect that the open hearth makers are soon to be reinforced by the Niederrheinische Hütte, the furnace company of Prince Donnersmarck variously mentioned already in this correspondence. This concern is erecting a large rolling mill for producing the heavier forms of semirolled steel, and it will begin production within a few weeks.

Another matter which came up at to-day's meeting of the union was an application of the Bar Iron Convention to raise the allotments in bars 10 per cent. This convention met yesterday with the intention of advancing prices, but adjourned over pending action by the union. The latter, however, rejected the application, and the convention later declared business in bars for the first quarter of 1911 open at unchanged prices. It had been proposed to lift prices by 2 marks per ton. The firm tenor of prices, however, is indicated by the fact that the Heavy Plate Convention two days ago voted to raise ordinary plates 2 marks. A proposal to raise boiler plates also was postponed. Corrugated tubing was also advanced 2 marks.

The union to-day gave out its usual monthly survey of the market, covering half-rolled material, rails and structural shapes. Home consumers of steel material, says the report, have almost fully covered their requirements for the current quarter, the amounts taken being mostly greater than for previous quarters, and the foreign market is buying in better volume. The foreign demand for steel rails also keeps up. Grooved rails are quieter, and this is also true of the home market for mine rails, but the foreign market for the latter remains quite active. The home demand for structural shapes has improved, and still better business is looked for now that the shipbuilders have returned to work.

The latest news from the ore market indicates that the situation remains firm. Further advances for both home and foreign ores have been made. In the Siegerland district, where a restriction of production by 15 per cent. is nominally maintained, the mines are now producing to their full capacity for the first time in several years. The stock of ores at the mines is being steadily depleted. Idle furnaces in that region are being blown in. Foreign ores are arriving in very large amounts this month—524,000 tons during the first ten days of the month, as compared with only 86,000 tons last year.

Now that the new Pig Iron Syndicate of Essen has begun to take orders for 1911 a somewhat more active trade in crude iron has set in, but the change is by no means marked, since most consumers had already contracted for their requirements for the first half of that year.

Export business in bars has increased in volume this month, the export drawback of 6 marks per ton having gone into effect on the 1st. The mills are nearly all fully stocked with orders to the end of the year. The plate market is in satisfactory shape, although a quieter tone prevails. Medium thicknesses are in good demand. Ship plates are quieter. Machinery shops are receiving pretty fair orders, but prices remain unsatisfactory. The position of the hardware trade continues to improve slowly.

Imports of iron and steel last month amounted to 51,281 tons, against 36,920 tons last year; exports were 404,472 tons, against 342,626 tons. For nine months imports were 409,954 tons, against 333,949 tons, and exports, 3,575,844 tons, against 2,879,487 tons. The surplus of exports over imports was 3,165,890 tons, against 2,545,538 tons.

New York

NEW YORK, November 2, 1910.

Pig Iron.—The buying of foundry iron in this market in October was probably larger than in any other month of the year. It may also be said that there was a progressive decline in prices throughout the month. Furnaces that have held aloof from the market for some time in the expectation of a turn for the better have been at last willing to sell rather freely for first quarter's delivery, and competition has been sharp in a number of instances. In other cases there has been quiet buying without much competition, but the prices named have been so low as to make buying easy. Some large Eastern interests have been in the market, including foundries in New York and New Jersey and in Greater New York. New England machinery foundries have not been as active in the past week as in several weeks preceding. Nearly all classes of foundries have been represented in the late buying. Apart from the purchases of the two large radiator interests, one of which has probably closed at various points for as much as 30,000 tons in October and the other for somewhat less (in buying beginning in September and scattered over the past six weeks), most of the recent business for delivery in 1911 has been in 500 to 1000 ton lots. Stocks, particularly of basic iron, have been increasing in the East and a blowing out movement has begun. One furnace in the Lehigh Valley blew out last week and another will probably follow. A Schuylkill Valley furnace will blow out this week. One Virginia furnace has gone out and another will probably blow out this month. Our quotations are but little changed, but the minimum is more generally the basis of transactions than in the past two weeks. For tidewater deliveries we quote Northern No. 2 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—October was as good as or better than September in all lines. The American Bridge Company took 21,000 tons, as against 19,000 tons in September which, while not a very great increase in tonnage, is a fair per cent. and about represents the ratio of improvement in general. One bar iron mill reports that orders have been received in better volume the past week than for

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the two months previous. Good specifications are being received on steel bar contracts. The plate trade is not very active. Local consuming shops have little to do. Considerable interest is being taken in the new battleship to be built by the Government. It will require 10,000 to 12,000 tons of plates, shapes and bars, and bids go in December 1. Some of the railroads are showing more disposition to contract for their requirements in certain lines. Business is still dull in structural lines, but several quite fair orders have been closed recently. The Hay Foundry & Iron Works has taken 2000 tons for the Jacob Sinn warehouse in New York City; Levering & Garrigues, 550 tons for a stockhouse for the H. G. Hupfel Brewery in Brooklyn and 350 tons for a storage warehouse at Brement and Noll streets, in Brooklyn; the McClintic-Marshall Construction Company, 400 tons for the Press Building in Pittsburgh and 1750 tons for the Cortlandt street ferry work for the Pennsylvania Railroad in New York; the American Bridge Company, 2000 tons for the Philadelphia & Reading grade crossing elimination work at Port Richmond, 200 tons of truss rods for the Chicago, Milwaukee & St. Paul, and will also get the Florida East Coast Railroad work, 7000 tons; the Virginia Bridge & Iron Company, 450 tons for a viaduct at Petersburg, Va.; the Phoenix Bridge Company, 900 tons for a power station for the Capitol Traction Company, Washington, D. C. The time for receiving bids for the post-office at the Pennsylvania Station in New York has been extended one month. It is thought now that the tonnage to be required, which had been estimated at 14,000 to 18,000, will not be over half that amount. Bids have not yet been asked on the 5000 tons for the Woolworth Building, New York. Bids have been offered on several small bridges for the New York, New Haven & Hartford, aggregating about 350 tons. Awards have not yet been announced on the general contracts for the New York subway work. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c.

Cast Iron Pipe.—Several public lettings are being made this week. The Department of Water Works, Providence, R. I., will open bids on about 800 tons to-day; the Department of Public Works, Pawtucket, R. I., on about 1300 tons on Thursday; the Department of Public Works, Yonkers, N. Y., on about 500 tons next Monday. Manufacturers of this vicinity are making bids on a much larger quantity of pipe to private water and gas companies than usual at this time of the year, for delivery next spring. Some of the most clever buyers are now endeavoring to cover their next season's requirements. The market for immediate delivery of small sizes is somewhat disturbed by the persistent efforts of one or two founders to dispose of the stocks accumulated during the late summer and early fall months. Carload lots of 6-in. continue to be quoted at $22.50 to $23.50 per net ton, tidewater.

Ferroalloys.—There have been some good sales of ferromanganese in this market and some large transactions have been made at $39, seaboard, for delivery over the first half. It is estimated that fully 10,000 tons of ferromanganese have been sold throughout the country in the last three weeks. The demand for ferrosilicon is good, but buyers seem to be taking it only as they need it and in small quantities. Sellers here are quoting $56.50, Pittsburgh.

Old Material.—The somewhat hopeful feeling which prevailed among local dealers for the past week or two has faded since buyers have failed to make anticipated purchases. The steel companies of the East are apparently oversupplied with stocks of heavy melting steel scrap, the rolling mills are almost completely out of the market and the foundries are doing very little buying. Another lot of miscellaneous scrap from Panama, 1013 tons, was sold last week at $9.36 per gross ton, f.o.b. Hoboken. It went to a buyer in central Pennsylvania. The next highest bid was $9.35 from a buyer near Philadelphia. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.50 to 11.75
Heavy melting steel scrap	11.50 to 11.75
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
Wrought iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	13.00 to 13.50
No. 1 yard wrought, short	12.00 to 12.50
Light iron	5.50 to 6.00
Cast borings	7.00 to 7.50
Wrought turnings	7.00 to 7.50
Wrought pipe	10.50 to 11.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	10.00 to 10.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

One furnace of the Dunbar Furnace Company, Dunbar, Pa., blew in October 24.

Metal Market

NEW YORK, November 2, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
		Electro-		New	St.	New	St.
Oct.	Lake.	lytic.	Tin.	York.	Louis.	York.	Louis.
27	12.87½	12.80	36.40	4.40	4.27½	5.60	5.45
28	12.87½	12.75	36.30	4.40	4.27½	5.75	5.60
29	12.87½	12.75	....	4.40	4.27½	...	...
31	12.87½	12.75	36.50	4.40	4.27½	...	...
Nov.							
1	12.87½	12.75	36.55	4.40	4.27½	5.95	5.80
2	12.87½	12.75	36.80	4.40	4.27½	5.95	5.80

The stocks of pig tin for spot delivery are more plentiful and the holdings are better scattered. Pig tin in New York is now below the cost of import, which indicates that the London corner continues strong. Copper is holding very firmly, but the buying movement has ceased. Spelter has advanced sharply and is costing close to 6c. a lb., New York. Lead is dull but firm.

Copper.—The copper market has settled down in anticipation of the forthcoming report of the Copper Producers' Association, covering October statistics. A very good report is expected as a result of the late heavy buying, and in consequence sellers show no disposition to shade prices in order to obtain business; some of them predict higher prices within the next fortnight. The report of the New York Metal Exchange shows that exports in October were especially large and the total for the first ten months of the year show a decrease of only 10,062 tons as compared with the same period of last year. Copper is now selling at about 12.75c. for electrolytic and 12.87½c. for lake. These figures make electrolytic five points lower than our quotation of last week, but the recession is due to the fact that one large interest has persistently sold at that price, while others were selling at 12.80c., and as there has not been much buying the general trade has reduced quotations five points, more with a view to pleasing customers than because of any indication of weakness in that market. L. Vogelstein & Co., report the following figures of German consumption of foreign copper for the months January-September, 1910: Imports, 129,440 tons; exports, 6,938 tons; consumption, 122,502 tons, as compared with consumption during the same period in 1909 of 114,960 tons. Of the above quantity 111,131 tons were imported from the United States. In London to-day spot copper sold for £57 15s., and futures £58 15s. The sales amounted to 1200 tons of spot and 2300 tons of futures. The market was firm.

Pig Tin.—Consumers have been taking fair quantities of pig tin and that has accounted for a slight advance in the market during the week. The arrival of the steamer Minnewaska with a large cargo relieved the tension here and tended to break up the corner in spot stocks to some extent. The steamer Minneapolis is now in with 780 tons and when the stocks are scattered among the trade it is thought that consumers will get a better chance to buy at a normal price. As a matter of fact, tin is now selling in New York at less than the cost of import, which goes to show that this market is not responding so quickly to London fluctuations. Judicious buying on the part of consumers here covering their future wants should relieve them from paying any excessive price for spot tin during the next two weeks. There was nothing unexpected in the Metal Exchange report of the pig tin statistics for October, which came out this morning. Deliveries into consumption were good, amounting to 3350 tons, and the total for the first 10 months of the year shows an increase of 3650 tons, as compared with the same period of last year. The total visible supply October 1 was 541 tons below that of October 1, 1909. The figures show no great change in the statistical situation during the month. Pig tin was sold in New York to-day for 36.80c. In London to-day spot tin was sold for £168 7s. 6d. and futures for £168 12s. 6d. The sales amounted to 220 tons of spot and 620 tons of futures. It can be seen from the above that future tin is very close to the price of spot and it is very likely that futures are being taken up by the people operating the London corner.

Tin Plates.—There is little to say about the tin plate market. An average demand exists and the price for 100-lb. coke plates continues at $3.84.

Lead.—Lead is firm but dull, and that is to be expected, as this is usually considered the quiet season in the lead market. Prices are being held firmly and the leading interest is selling at 4.40c., New York, while outside sellers are asking anywhere up to 4.45c. The St. Louis market, which was weak some time ago, has strengthened noticeably and is being held very firmly at 4.27½c.

Spelter.—Spelter is hovering close to 6c. and the frequently expressed opinion on the part of large producers that consumers would have to pay that figure seems to have ap-

parently come true. Spelter could be had in New York this morning at 5.95c., but to-morrow the figure may be 6c. There is very little buying, and this advance has simply been brought about by a steady increase in quotations by sellers. As a matter of fact there has been so little buying that it is hard to tell from day to day just what the price is. It is apparent that those who have spelter in hand are keeping in close touch with each other and it is also very apparent that they are in control of the situation.

Antimony.—Antimony is quiet and weak. Cookson's is costing 8.15c.; Hallett's, 7.75c.; Chinese brands are from 7.40c. to 7.50c. Hungarian grades can be had at all sorts of prices from 7.12½c. up.

Old Metals.—The market is quiet, but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, St. Louis, October 31.—Lead is dull and slow at 4.30c.; spelter is active and strong at 5.60c. to 5.70c., both East St. Louis. Zinc ore is firm and higher at $44 to $45 per ton, Joplin base. Tin is quoted at 36.50c. per lb.; antimony (Cookson's), 8.50c.; lake copper, 13.35c.; electrolytic, 13.25c., all at St. Louis. The demand for finished metals shows some improvement over the previous week, but is still below the corresponding week last month.

Metals, Chicago, November 1.—A fair amount of business is being done in copper, with no change in prices. Some orders have been placed for January shipment, but the business done is principally for November and December. Tin continues very erratic and printed quotations have been an unreliable index of the market for a long time, owing to the frequent changes in price. Spelter is advancing in a very persistent manner and evidently reflects improvement in the demand for galvanized sheets and wire products. We quote Chicago prices as follows: Casting copper, 12⅞c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c., higher; pig tin, carloads, 37c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb., higher; spelter 5.80c. to 5.85c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

Iron and Industrial Stocks

NEW YORK, November 2, 1910.

The stock market has been considerably quieter in the past week, probably due to a feeling of caution as election day approaches. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	9⅜- 10	Pressed St., pref...	96 - 96¾
Allis-Chalm. pref..	32½- 34	Railway Spr., com.	35¼- 36
Beth. Steel, com...	30½- 33⅛	Republic, com.....	33⅛- 35¼
Beth. Steel, pref...	58½- 61⅝	Republic, pref.....	96½- 98¼
Can, com.....	9½- 10⅝	Sloss, com.....	50½- 53¼
Can, pref.....	73 - 76½	Pipe, com.....	17
Car & Fdry, com..	53⅜- 54⅞	Pipe, pref.....	56 - 60
Car & Fdry, pref..	113⅜- 114	U. S. Steel, com..	76⅞- 80¼
Steel Foundries...	46 - 49⅞	U. S. Steel, pref...	119 -120
Colorado Fuel.....	33¾- 35	Westinghouse Elec.	72 - 74
General Electric...	154 -157¼	Am. Ship, com.....	79½- 80
Gr. N. ore cert....	57⅝- 59⅞	Am. Ship, pref....	110 -111
Int. Harv., com...	108¼-111½	Chi. Pneu. Tool...	40 - 41
Int. Harv., pref...	123 -123½	Cambria Steel.....	43½- 44¾
Int. Pump, pref...	82½- 83	Lake Sup. Corp....	25 - 27
Locomotive, com...	39¼- 41	Warwick	10¾- 11
Locomotive, pref...	106¼	Crucible St., com..	12¾- 13
Pressed St., com..	34 - 34¾	Crucible St., pref..	78 - 79½

Dividends.—The J. G. Brill Company has declared the quarterly dividend of 1¾ per cent. on the preferred stock, payable November 1.

The International Harvester Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred, payable December 1.

The Imperial Automobile Company, Jackson, Mich., has declared a 30 per cent. dividend and stock increase from $150,000 to $450,00.

The Pennsylvania Steel Company has declared the regular semiannual dividend of 3½ per cent. on the preferred stock, payable November 1.

The Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable November 23.

Allis-Chalmers Company's Report

A Heavy Increase in Profits

The annual report of the Allis-Chalmers Company, covering the operations of the fiscal year ending June 30, 1910, makes the following comparative exhibit of earnings:

	1910.	1909.
Profit on operation	$2,576,818	$1,809,009
Maintenance, depreciation, interest, &c.	2,081,086	1,673,578
Net profit for year	495,732	135,431
Previous profit and loss surplus	521,429	385,997
Surplus	$1,017,161	$521,429

The general balance sheet, as of June 30, compares as follows:

Assets.	1910.	1909.
Discounts and commissions	$2,683,189	$2,683,189
Real estate, &c.	38,335,395	37,548,053
Bills and accounts receivable	4,841,089	4,721,052
Merchandise, material, &c.	8,503,634	5,580,447
Cash	1,178,131	2,299,017
Development patent account	1,318,091	1,318,092
Investment	361,006	260,000
Totals	$57,220,538	$54,409,850
Liabilities.		
Preferred stock	$16,050,000	$16,150,000
Common stock	19,820,000	19,820,000
Accounts payable	2,125,153	1,205,501
Mortgage bonds	11,148,000	11,148,000
Notes payable	3,655,000	2,400,000
Accrued bond interest	278,700	278,375
Depreciation reserve	1,955,822	1,714,845
Bullock Electric Company stock	1,170,700	1,170,700
Surplus	1,017,161	521,429
Totals	$57,220,538	$54,409,850

From President W. H. Whiteside's accompanying remarks, the following extracts are taken:

"In an industry like that of the Allis-Chalmers Company, which is largely the manufacture of heavy machinery requiring time to build, the results of each year must depend to a great degree upon the previous year's demand. The business booked began to improve during the latter half of the fiscal year ending June 30, 1909, and this improvement has continued during the past year, the sales invoiced and orders booked being, respectively, 29½ and 40 per cent. in excess of the previous period. Of the sales invoiced this year about 55 per cent. was for new lines of business which the company has recently developed, and of these new lines about 75 per cent. was electrical.

"While there has been an improvement in the company's earnings during the fiscal year the various works have been operated at less than 60 per cent. of their present capacity, due to the unsettled condition of the country. There has been a very small demand for heavy machinery, which restricted the company's operations largely to the higher lines, and this necessitated considerable development of new types of small machinery, for which there has been a fair demand.

"Inquiries and negotiations in hand justify the hope that business will soon regain steadiness to the end that uniform bookings may obtain to the full capacity of our present plants.

"There has been no change in the status of the company's first mortgage bonds. That item remains $11,148,000. The treasury bonds have been increased by the addition of $563,000 par value. These bonds are authenticated by the trustee in accordance with the mortgage indenture and available for sale to reimburse the treasury for cash outlays made during the year for property and plant."

The Griffin Mfg. Company, Erie, Pa., manufacturer of builders' hardware, operates a cold rolling and pressed steel plant. Improvements being completed at the works embrace two extensions of 40 x 90 ft., and one, 45 x 120 ft., two stories. The company is installing considerable additional equipment.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Commercial Reports Not Actionable as Libel.—One is not liable for libel in giving his honest opinion as to the integrity and standing of a tradesman in response to an inquiry concerning him.—Colorado Supreme Court, Melcher *vs.* Beeler, 110 Pacific Reporter 181.

Rights of Seller Respecting Payment of Price.—Sale is presumed to be made for cash in the absence of a provision for credit. In such cases the seller is entitled to reclaim the property if payment is not made on delivery; and, unless he has waived cash payment, he can reclaim the property in the hands of an innocent third person. A delivery of goods voluntarily and without payment being insisted on waives cash payment.—Oregon Supreme Court, Johnson *vs.* Iankovetz, 110 Pacific Reporter 398.

Remedy of Buyer for Breach of Warranty.—On breach of warranty of the soundness or fitness of an article sold, which the buyer has had no opportunity to inspect before delivery, he may make his election either to rescind the contract or to affirm it by accepting and keeping the property, and, when sued for the price, set up the false warranty by way of an offset.—Arkansas Supreme Court, B. A. Stevens Company *vs.* Whalen, 129 Southwestern Reporter 1081.

Necessity for Reducing Sale Contract to Writing.—Where all or a large part of articles agreed to be sold are not in existence and are to be manufactured, the contract need not be reduced to writing.—South Carolina Supreme Court, Wallace *vs.* Dowling, 68 Southeastern Reporter 571.

Seller's Remedy for Buyer's Breach of Contract.—Where a buyer of goods breaks the contract to purchase, before delivery and before title passes to him, suit for damages for the breach and not for the price is the seller's proper remedy.—Alabama Supreme Court, St. Louis Hay & Grain Company *vs.* American Cast Iron Pipe Company, 52 Southern Reporter 904.

Effect of Contracts of Sale.—As a general rule title to articles sold vests in the buyer on delivery of them to a railroad company for transportation to him. A contract for a sale f.o.b. cars at Detroit to one living in another State is governed by the laws of Michigan and not of the State where the buyer lives. Unless credit is expressly stipulated, a sale is presumed to have been made for cash. Where a derrick car was ordered, "Price $1160, f.o.b. cars, Detroit," no credit was agreed upon and the invoice was marked "Terms cash" and "Title to the property in this invoice reserved to seller until full payment made," payment of the price was a condition precedent to the passing of title to the buyer unless waived.—United States District Court, Western District of Pennsylvania, *In re* Pittsburgh Industrial Iron Works, 179 Federal Reporter 151.

Right to Recover Value of Old Engine Traded on New One.—Where, as part payment for an engine, the buyer agrees to return an old engine, demand for the latter must be made before the obligation to return it can be converted into an obligation to pay its value.—New York Supreme Court, Appellate Division, Second Department, Otto Gas Engine Works *vs.* Moore, 123 New York Supplement 934.

Duty of Seller of Articles in Shipping Them.—Delivery of articles by the seller to a railroad company for transportation to the buyer is not binding on the buyer, as a delivery to him, unless the seller places the articles in such condition for shipment that the buyer can recover from the railroad company for any damage in transit.—Alabama Supreme Court, Butterworth & Lowe *vs.* Cathcart, 52 Southern Reporter 806.

Rights Under Contracts of Sale.—On a breach of warranty of a thing sold the buyer may keep the article and sue the seller for the difference between its value as warranted and its actual value, or, by acting within a reasonable time, he can return the article and recover payments made. A seller impliedly warrants that the subject of sale is fit for the purpose for which it is intended. By accepting benefits of a contract made by his agent, the seller precludes himself from repudiating representations made by the agent to effect the sale. Positive representations by a seller respecting the quality and condition of the article, intended to be, and, relied on by the buyer, amount to warranties.—Springfield, Mo., Court of Appeals, Lanmeier *vs.* Dolph, 130 Southwestern Reporter 360.

Rights Under Contracts of Sale.—Where a contract of sale is silent as to time of delivery, it must be tendered within a reasonable time. The buyer has an unqualified right to cancel the contract before it is executed, thus escaping liability for the agreed price, but by doing so he incurs liability for breach of the contract, which is measured by the difference between the market price of the articles and the contract price.—Massachusetts Supreme Judicial Court, Barrie *vs.* Quimby, 92 Northeastern Reporter 451.

When Title Passes Under Cash Sale.—Where a seller delivers articles, relying on an agreement for payment of the price on delivery, title does not pass from him until payment.—Ohio Supreme Court, Baltimore & Ohio Southwestern Railway Company *vs.* Good, 92 Northwestern Reporter 435.

Fire Insurance Defeated by Failing to Keep Inventory.—There can be no recovery on a fire insurance policy where insured has failed to keep an inventory of the insured property, as required by the policy, unless he shows that loss of the inventory was without fault on his part, though there be abundant proof that the loss exceeds the amount of insurance.—Texas Court of Civil Appeals, National Fire Insurance Company *vs.* J. W. Caraway & Co., 130 Southwestern Reporter 458.

Acceptance of Articles Sold.—Where one who agreed to buy several pieces of old machinery went to inspect them, the fact that he broke one of them up preparatory to removing it as junk, showed an acceptance of part of the machinery, within the statute which permits certain contracts of sale to be oral, if the buyer receives part of the goods. The buyer's act also constituted a waiver of his right to examine the other pieces of machinery, though he intended to reject them if they were not satisfactory.—Vermont Supreme Court, Patterson & Holden *vs.* Sargeant, Osgood & Roundy Company, 77 Atlantic Reporter 338.

Right of Corporation to Dispute Validity of Mortgage.—A corporation which has received and used the entire consideration paid to it on the faith of a mortgage cannot attack the execution of a mortgage for want of proof of a formal authorizing resolution of the directors.—New Jersey Chancery Court, Earl *vs.* National Metallurgic Company, 76 Atlantic Reporter 555.

Ground for Dissolution of Partnership.—That a special partner has become a special partner in a competing business entitles his associates to a dissolution of the partnership.—New York Supreme Court, Skolney *vs.* Richter, 123 New York Supplement 788.

Powers of Corporations.—A corporation has implied power to borrow money and make negotiable paper for use within the scope of its own business, but it has no power to become an accommodation party to a bill or note.—Arkansas Supreme Court, Simmons National Bank *vs.* Dilley Foundry Company, 130 Southwestern Reporter 162.

Rights in Corporate Names and Trademarks and Trade Names.—A corporation has an exclusive right to the use of its own name, and it will be protected by injunction against the use of such name by another corporation. A corporation may, by user, acquire a right to a trade name other than its corporate name in connection with goods manufactured and sold by it, and as descriptive of them. Generally geographical names are not the subject of exclusive appropriation as trademarks or trade names. But such names, in connection with other words, may sometimes acquire a secondary signification, indicative not only of the place of manufacture, but of the character of the product, so that the name or title thus employed, including the geographical word, may be the subject of protection against unfair competition in trade.—Georgia Supreme Court, Rome Machine & Foundry Company *vs.* Davis Foundry & Machine Works, 68 Southeastern Reporter 800.

Damages Recoverable for Infringement of Patent.—In an action to recover profits derived from infringement of a mere feature of a machine, recovery must be restricted to the part of the profits of the entire machine which arose from such feature.—United States Circuit Court of Appeals, Eighth Circuit, Brown *vs.* Lanyon Zinc Company, 179 Federal Reporter 309.

New Publication

Annual of the French Iron Masters' Association. Edition 1910-1911.—(Annuaire du Comité des Forges de France.) Pages, 1079, 5⅜ x 8⅝ in. Published by the association, 7 Rue de Madrid, Paris. Price, 10 francs.

This bulky volume is, first of all, a directory of the iron and steel works of France, giving the names of officers of the various companies, with details of plants and products. Information is also given concerning the various district organizations in the iron and steel trades, with details of their methods of operation. Another section is devoted to statistical matter dealing with the production and shipments of iron ore, pig iron and various forms of finished iron and steel for France and other countries. Other portions of the book deal with the various ministerial bureaus of trade and industry in France, together with legislation and decisions affecting industrial operations, accidents and relations of employer and employee.

Personal

J. C. Smith, formerly with the Otis Elevator Company, Chicago, has been made general manager of the Haggie-Woodruff Pressed Steel Company, Joliet, Ill.

Walter Meiggs Bush, for the past five years purchasing agent for Levering & Garrigues, New York, has been elected treasurer of the Baltimore Bridge Company, Baltimore, Md. He has also been appointed assistant manager of the company, with headquarters at the general offices and works, Bush street and Baltimore & Ohio Railroad.

H. B. Applewhaite, who has been connected with T. C. Bashor and the T. C. Bashor Company, Baltimore, Md., for over 30 years, and for a long time served as assistant manager, has resigned and retired from the engineering business.

E. M. Allen, vice-president and general manager of the American Refractories Company, Chicago, has returned from a six weeks' visit to the company's magnesite works in Austria.

J. K. Griffith, who for nearly 22 years has been superintendent of the steel plant at Latrobe, Pa., built by the Latrobe Steel Company and since 1905 owned by the Railway Steel Spring Company, has resigned, effective October 31, continuing a relationship in an advisory capacity. His other interests, notably the International Text Book Company, Pittston, Pa., have grown so extensive as to require his personal attention and he will remove to Pittston. He will also probably become active in promoting a cast steel car wheel for which he holds patents.

Peter Donaldson, of James Watson & Co., Glasgow, Scotland, president and managing director of the Dayton Coal & Iron Company, Ltd., Dayton, Tenn., is making his annual visit to the United States.

W. H. Wonfor, advertising and export manager of the Wm. Powell Company, Cincinnati, Ohio, returned last week from a three months' business trip through Mexico.

John H. Sullivan has been appointed Western sales representative of the American Spiral Spring & Mfg. Company, Pittsburgh, with office in the Commercial National Bank Building, Chicago.

The Goldschmidt Thermit Company, 90 West street, New York, announces that Dr. F. H. Hirschland has been elected vice-president.

Cecil Grenfell, M.P., London, England, has been spending the past week in Alabama looking over the properties of the Southern Iron & Steel Company, in which European investors are interested.

Benjamin B. Friedenwald of Friedenwald Brothers, Baltimore, Md., will sail next week for an extended trip abroad in connection with the firm's foreign business.

Seward Babbitt, Buffalo, N. Y., for a number of years sales manager of the gas engine department of the Power & Mining Machinery & International Steam Pump Company, has resigned his position and returns to the William Tod Company, Youngstown, Ohio, with which company he was formerly associated.

Philip Corbin, president of the American Hardware Corporation, New Britain, Conn., who has been ill for some time, is now in a critical condition.

F. F. Fitzpatrick, hitherto vice-president, has been elected president of the Railway Steel Spring Company. Scott Hayes, chief of the sales department, has been elected vice-president.

A successor to O. A. Blackburn, vice-president of the Sharon Steel Hoop Company, Sharon, Pa., who recently resigned, will not be chosen until the annual meeting of the company, which is to be held in February. It is understood that S. P. Ker will continue as president.

Obituary

JAMES J. SMITH, president of the Smith Structural Steel Company, Kansas City, Mo., died October 27, aged 76 years. He settled in Kansas City 45 years ago and engaged in the iron business, becoming connected with the Keystone Iron Works in Kansas City and the Riverside Iron Works at Riverview, Kans., afterward becoming president of the structural steel company with which he was identified in recent years. He leaves a widow and one daughter.

WILLIAM MCAVITY, for 45 years associated with the firm of T. McAvity & Sons, St. John, N. B., in charge of the manufacturing branch of the business, died October 28. His father, Thomas McAvity, was founder of the firm. He served his apprenticeship as a machinist in one of the largest machine shops in Boston, Mass.

JOHN HARLIN, founder of the McNab & Harlin Company of New York and Paterson, N. J., and for many years its president, died October 28. He was a pioneer in the steam valve business and the inventor of several appliances. He was born in Ireland, and came to this country with his parents 70 years ago.

LYNDE BELKNAP, treasurer of the Otis Elevator Company, died suddenly in the company's New York office October 28, presumably from acute indigestion. He was 50 years old, and had been in the company's service for 25 years.

JAMES B. MACLAREN, president of the Ottawa Steel Casting Company, Ottawa, Ont., died October 23, in New York.

The United Metal Trades Association of the Pacific Coast states in a recent bulletin that a strike of the iron shipbuilders in the plant of the Moran Company, Seattle, only continued three days when the workmen returned under the same conditions prevailing at the time of the strike. There was no grievance as to wages or hours, but the men went out because they were intimidated and threatened with assault by union leaders. The statement is further made that the largest machine shop in Portland that signed up with the Machinists' Union when the general machinists' strike was called has declared for a 9-hour day and abrogated its agreement with the union. This leaves only three quite small union machine shops in Portland. Evidently the machinists' strike is petering out.

At the organization meeting of the Board of Directors of the Crucible Steel Company of America, held in Pittsburgh on Wednesday, the following were elected for the ensuing year: Executive Committee—Herbert Dupuy, C. C. Ramsey, James H. Park, George E. Shaw, H. S. A. Stewart, John A. Sutton and H. D. W. English. Herbert Dupuy, chairman Executive Committee; C. C. Ramsey, president; John A. Sutton, first vice-president; O. H. Wharton, third vice-president; G. W. Sargent, fourth vice-president; Chas. W. Rowlands, secretary; Geo. A. Turville, treasurer. The office of second vice-president, formerly held by John A. Sutton, will not be filled for the present.

The P. J. Brown Construction Company has removed from 1210 New England Building to more spacious quarters at 1340 Rockefeller Building, Cleveland. The company's special field is blast furnace, coke oven, rolling mill or open hearth brick work construction.

The Southern Shovel Mfg. Company, Gadsden, Ala., has shut down its plant and is making extensions and improvements with a view to making the entire output self-sharpening shovels and spades.

The Machinery Markets

The railroads are taking more interest in the machinery markets, especially in the East, where some good sized orders have been placed by the Delaware, Lackawanna & Western Railroad against a $75,000 list which had been held up since last May. In other parts of the country the railroads are buying against small requisitions. In Chicago inquiries are increasing, and there, as well as in other sections, gas engine makers have been doing a very good business. In Milwaukee a good business has been done in heavy machinery, especially in the line of cranes, rock and ore machinery and Corliss engines. Machinery of every kind is in fairly good demand in Detroit, where new factory installations form the main factor in the buying. The same condition exists in Cleveland. Business is on a fairly satisfactory basis in Pittsburgh, where the trade is well distributed. Machine tool builders have taken on a little more work in Baltimore, but a decrease in activity is reported in that line in Philadelphia. In other sections of the country business is fairly regular, with nothing of marked importance to note, except on the Pacific Coast, where the buying for mining operations has been very heavy, which is partly due to replacements on account of forest fires. As the result of activity in this field a gradual and steady gain is felt in other lines.

New York

NEW YORK, November 2, 1910.

There are a number of new manufacturing enterprises in prospect in this vicinity that may in the future develop business for the machinery trade, but as yet they have not resulted in inquiries. Business has not been good during the last week, and new inquiries just now are decidedly scarce. The only activity of any kind is shown by the railroads. One large New York machinery house is reported to have booked two extensive orders from railroads in the last fortnight, one consisting of an entire list from a Western railroad. The Delaware, Lackawanna & Western Railroad has been placing orders of late against an extensive list of machine tools issued last May, which had been held up since that time. This list covered 30 or more machine tools, many of them in the larger sizes, and it is estimated that it calls for expenditures amounting to at least $75,000. Fortunately for the trade in general, the purchases of the Delaware, Lackawanna & Western Railroad against this list have been fairly well scattered and a number of houses have obtained a good slice of the business in the last few days. The Pennsylvania Railroad shows signs of closing orders against a few tools it has inquired for, and it is said on good authority that the New York Central Lines will buy against some inquiries recently made. Beyond this railroad activity there is nothing of importance in the market. The demand for second-hand machinery is decidedly better than the call for new equipment.

The teamsters' strike in Manhattan and Jersey City was extended early this week to Brooklyn, and as a result manufacturers and dealers in machinery are having a great deal of trouble in getting and making deliveries. In some cases, shipments of machinery which are badly needed are being held up at the railroad terminals.

Plans are well under way for the new service building which is to be erected in Long Island City by the Lozier Motor Company, Fifty-sixth street and Broadway, New York. The structure will be 150 x 200 ft., and it will be fully equipped to handle all sorts of repair work and if necessary it can be utilized for manufacturing cars. The building will be completed as soon as possible and the equipment will be negotiated for at an early date.

John C. Short & Son, 51 Liberty street, New York, are financial agents for the Crocker Wood Pulp & Paper Company, Wilmington, N. C., which was recently organized with a capital stock of $5,000,000, to acquire large tracts of timber in North Carolina to be utilized for making pulp in a mill to be erected near Wilmington. The company also owns 15,000 acres adjacent to its proposed mills and building operations will shortly be begun. The plans for the pulp and paper mill have not yet been completed.

The American Brake Shoe & Foundry Company, whose main offices are at Mahwah, N. J., has appropriated about $4500 to be spent for furnaces and $1000 for machinery equipment for a plant at Chattanooga, Tenn., which is to be used for the manufacture of crucible steel inserts for brake shoes. The building, which will be of brick and frame, will be 80 x 150 ft. and will cost $5600.

The Kane Sliding Blind Company, Kane, Pa., whose plant was recently destroyed by fire, is rebuilding and is now in the market for swing saws, rip saws, planers, mortisers, tenoning machines, saw tables, molders, shapers, sanders and the like. According to inquiries in this market the company expects to close out its orders about December 1.

The firm of Kaltenback & Stephens, Brooklyn, N. Y., is having erected at 244-256 Sherman avenue, Newark, N. J., a large plant for the manufacture of silk ribbons. The plant will be two stories and 52 x 200 ft. Plans are also being prepared for a large power house which will be part of the plant. The general contract for the construction of the main building has been awarded to Ritter & Smith, Allentown, Pa.

The Mutual Chemical Company, 92 William street, New York, will shortly purchase equipment for a new factory to be erected in the West Bergen section of Jersey City. The building will be 204 x 290 ft., two stories, and it is estimated that it will cost about $60,000.

Francis W. Brady, consulting engineer, 95 Liberty street, New York, is in the market for a number of small rotary air compressors and small rotary or centrifugal pumps, both to be driven at high speeds for direct connection to electric motors.

The plant of the Electrolytic Products Company at Elmwood and Hertel avenues, Buffalo, N. Y., to be used for the manufacture of automobile radiators by the electrolytic process, is nearing completion and will soon be ready for installation of equipment. Frank A. Abbott, secretary, 707 D. S. Morgan Building.

The Safferson & Weisberg Company, Lyons, N. Y., is planning to install a power and lighting plant at its new factory, now nearing completion, on Geneva street.

The Crosby Company, manufacturer of stamped sheet metal work, Buffalo, N. Y., has completed plans for a one-story brick foundry addition, 75 x 120 ft., to its plant at Pratt and William streets.

The mills of the Lake Champlain Pulp & Paper Company at Plattsburg, N. Y., recently destroyed by fire, are to be rebuilt of steel and concrete.

The New York Central Railroad Company has let the general contract for an engine house which it will build at Binghamton, N. Y., to A. E. Badgely of that city.

The Lumen Bearing Company, Buffalo, N. Y., is arranging to place a number of additional furnaces in its foundry plant at Syracuse and Lathrop streets and the New York Central Railroad Belt Line.

The Strootman Shoe Company, Buffalo, N. Y., John Strootman, president, 65 Carroll street, will build a three-story brick and steel factory, 60 x 160 ft., at Monroe and Genesee streets, to cost $50,000. A large amount of improved shoe making machinery will be installed.

The Kelker Blower & Forge Company, Buffalo, N. Y., now located at Elk and Katherine streets, has secured a site on the Pennsylvania Railroad, at Milton and Harrison streets, and is having plans prepared for a new plant.

Contracts are soon to be let jointly by the city of Niagara Falls and the New York Central Railroad Company for construction of a steel viaduct over the New York Central Railroad at Tenth street, at the north end of the city of Niagara Falls. A. C. Douglass, Mayor, and Frederick Chormann, secretary Grade Crossing Commission, have the matter in charge.

Francis G. Ward, Commissioner of Public Works, Buffalo, N. Y., is receiving bids for the Bureau of Water for three steam turbine electric generators for the new water works pumping station foot of Porter avenue.

The city of Geneva, N. Y., has by referendum vote of its citizens decided to make improvements to its water works system to cost $122,000, as follows: New pump and intake pipe, $35,000; reservoir, $30,000, and 20-in. water main, $57,000.

The Onondaga Bed Mfg. Company, Syracuse, N. Y., will

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erect a four-story factory on East Water street, brick and steel construction.

Catalogues Wanted

The Edmunds & Jones Mfg. Company, Detroit, Mich., which makes a specialty of automobile lamps, desires catalogues from manufacturers of sheet metal machinery, plating, electro-galvanizing and enameling processes and electric lamp accessory devices. A note in the Detroit Machinery Market announces that the company intends to build a new plant.

Philadelphia

PHILADELPHIA, PA., November 1, 1910.

The local demand continues quite irregular and in a number of instances sales during the week show a decline. There is little doubt expressed that aggregate sales for October decreased as compared with September. Manufacturers of machinery and tools report a gradual decline in activity in connection with plant operations. Quite a number are operating at not over 50 per cent. of capacity and a portion of the product is for stock tools. Merchants report little fresh inquiry coming out, such as develops being principally for single tools for urgent delivery. No further railroad inquiry has been reported, neither have any open lists of requirements of a general nature developed.

The movement in second-hand equipment, either tools or machinery, continues very light, as also does that for second-hand power equipment. Very little improvement in the export demand is reported. The foundry trade remains dull; new inquiry for machinery castings is light and that for general gray iron castings is only fair. A spotty betterment in steel castings is reported, with the demand still far below normal.

The Lancaster Foundry Company, Lancaster, Pa., will begin operations at its new plant during the current week. The foundry has a capacity of 25 tons a day on light bench work. Its foundry equipment includes two 66-in. Byram Colliau cupolas.

Ballinger & Perrott, engineers, have plans in preparation for a four-story fireproof garage to be erected at 2314 to 2328 Market street. Plans will call for a structure 105 x 120 ft. The name of the owner is withheld.

The Latimer Supply & Machinery Company, Latimer Mines, Pa., is having plans prepared by the Schofield Engineering Company of this city for a three-story and basement warehouse which it proposes to erect at Hazelton, Pa.

The Penn Steel Casting & Machine Company, Chester, Pa., has just completed one of the largest orders for vanadium steel castings made in this country, involving the use of vanadium valued at $25,000.

The Depot Quartermaster, U. S. Army, Philadelphia, will open proposals November 7 for furnishing and delivering either at Philadelphia or St. Louis, Mo., 5000 trunk lockers, with a right to increase the quantity 50 per cent. Samples and specifications may be seen at the Depot Quartermaster's office, Twenty-sixth street and Gray's Ferry road.

The Hess Steel Casting Company has acquired property in Bridgeton, N. J., and will engage in the manufacture of crucible steel castings. Arrangements are being made for a plant of an immediate productive capacity of 1800 tons of small castings a year. It is hoped to get the new plant in operation shortly after the first of the year.

A charter has been granted the International Automobile & Engine Company under the laws of Delaware, with a capital stock of $10,000,000, to manufacture motorcycles, motorboats and airships. The incorporators are William D. Yarnall, Yeadon, Pa.; E. H. James, Sharon Hill, Pa., and S. C. Seymour, Camden, N. J.

The American Light, Heat & Power Company was incorporated last week under the laws of Delaware to generate, accumulate and furnish light and heat. The authorized capital stock is $15,000,000. The Corporation Trust Company, American Equitable Building, Wilmington, is the Delaware representative of the concern and New York parties are said to be interested.

A transfer of a parcel of ground, 50 x 62 ft., on Cumberland street, below Richmond street, to one of the voting trustees of the William Cramp & Sons Ship & Engine Building Company is announced. It is understood that this has been acquired with a view of enlarging the foundry department.

Plans are being made for a three-story fireproof boiler and engine house and bottle washing department, to be built of reinforced concrete, at Sixteenth and Tasker streets, for the Dolfinger Dairies.

The American Culm Furnace Company, Sixteenth and Arch streets, has an option on a tract of land at Elizabethtown, Pa., and is considering the erection of a plant for the manufacture of its furnaces at that place.

The S. P. Stevenson Company, Chester, Pa., manufacturer of cold storage doors, has had plans completed and has under consideration the erection of a fireproof addition to its machine shop. While it is not yet determined when operations will be started we are advised that as soon as the work of erection is begun the company will be in the market for the necessary machine tool equipment.

The Newton Machine Tool Works, Inc., has sufficient business on its books to keep it actively engaged for three or four months. New business develops slowly, although it is believed that a betterment is in sight. It is completing a shipment to a large Western railroad, consisting of both vertical and horizontal milling machines, slotting machines and cold saws. The bulk of the recent deliveries, however, have been heavy horizontal milling machines and cold saw cutting off machines.

Chicago

CHICAGO, ILL., November 1, 1910.

There has been a very gratifying improvement in the past week in the number of general inquiries received by Chicago dealers. While no rush of business has developed and the volume of orders is below the average the fact that there are more customers inquiring for tools is taken as an indication that the machinery-using industries are gaining more confidence. The gasoline engine manufacturers have been doing very well this summer, especially those who make the smaller sizes of engines for the agricultural trade. The demand has been growing at a remarkable rate in recent years for small stationary agricultural engines, and the manufacturers of these engines are steady buyers of tools. Gasoline traction engines are also coming into general use in place of the steam engines sold by the threshing machine manufacturers. While traction engines have never been popular for work in the field, like plowing, on account of the trouble of supplying coal and water to a steam engine, the manufacturers of gasoline engines for this work seem to be making considerable progress. The International Harvester Company is equipping a large plant in Chicago for the manufacture of gasoline tractors, and other large companies are going into the business on an extensive scale. The gasoline engine requires more finishing with machine tools than any other machine used on the farm.

Chicago dealers who handle special lines of tools for the general trade have done better the past year than those who specialize on heavier machines and tools. The automobile business has dropped out of the reckoning as a market and the railroads have been very light buyers. The loss of these two important lines of trade has proved discouraging to many houses which have taken an active part in the railroad and automobile field.

Some of the railroads are pursuing a policy which has created a good deal of feeling among machinery dealers. The lists of the Chicago, Burlington & Quincy and the Chicago & Northwestern were open to all the dealers and manufacturers and the business was apparently placed without favoritism and in a manner that was satisfactory to the trade. Other large railroad systems, however, have confined their inquiries to one or two houses only and have refused the general trade an opportunity to bid.

The Shotwell Mfg. Company, Chicago, has plans prepared for a four-story manufacturing building, 66 x 189 ft., to be erected at Adams and Morgan streets.

The W. H. Howell Company, Geneva, Ill., advises that its entire plant, with the exception of its foundry, was destroyed by fire on October 23, and that it has not been decided whether the plant will be rebuilt at Geneva or the entire business moved to another location. The company manufactures sad irons.

The Joliet Mfg. Company, Joliet, Ill., has purchased two pieces of land adjoining its present property, which gives it a frontage of 750 ft. on the Rock Island tracks. No building plans have been perfected at present, but in the spring the company will probably take up the matter of extensions and other improvements. The land will be used in the meantime for the storage of material.

The Stover Engine Works, Freeport, Ill., has recently completed the erection of an addition, part of which will be used as an office and the remainder for the manufacture of gasoline engines.

The Brigham Brass Mfg. Company, Chicago, has been incorporated with $50,000 capital stock for the manufacture and sale of brass and brass products. The incorporators are

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Silas H. Brigham and Milard S. Fegan, both of Waukegan, Ill.

The Boehn Mfg. Company, Chicago, has been incorporated with $10,000 capital stock to manufacture excavating and hoisting machinery by J. C. Boehn, N. L. House and Louis J. Dionne, 7505 East Seventy-third place.

The Forsyth Brothers Company, Chicago, railroad supplies, is negotiating for the purchase of a tract of land upon which it will erect a manufacturing plant of about 15 one, two and three story buildings. Grossmann & Proskauer, 84 Dearborn street, are the engineers in charge, and are now taking figures for the erection and equipment of one of the buildings which is to be erected this fall. The company is now located at 213 Institute place.

Frank A. Hecht, Chicago, has purchased the vacant property fronting 328 ft. on Throop street and between Congress and Harrison streets, on which he will immediately begin the erection of a manufacturing building 112 x 328 ft., to be occupied by the Kaestner & Hecht Company, elevator repairs and supplies.

The Kling Brothers Boiler Works, Chicago, is receiving bids through Grossmann & Proskauer, structural engineers, 84 Dearborn street, for the erection and equipment of a machine shop and foundry 160 x 250 ft. and a forge and power house 60 x 80 ft., one and two stories.

The Modern Parlor Furniture Company, 664 West Division street, Chicago, is receiving figures through Grossmann & Proskauer, 84 Dearborn street, for the erection and equipment of a factory and warehouse four stories, 105 x 125 ft.

The Howell Mfg. Company's plant, Geneva, Ill., was destroyed by fire October 24. The loss is $200,000.

The elevator owned by the E. R. Ulrich Company, Buffalo, Ill., was destroyed by fire October 17. The loss is estimated at $20,000, partially covered by insurance.

The city of Joliet, Ill., is planning to have separate water works systems for the east and west side on a high and low pressure system, in place of the present plant.

The Wright Carriage Body Company, Moline, Ill., certifies to an increase of capital stock from $100,000 to $150,000.

The Patent Novelty Company, Fulton, Ill., certifies to an increase of capital stock from $100,000 to $150,000.

The Ottumwa-Moline Engine & Pump Company, Moline, Ill., has been incorporated; capital stock, $100,000; incorporators, J. M. Johnston, R. A. Clifton and Jay U. Barnard.

New England

BOSTON, MASS., November 1, 1910.

The convention of the National Machine Tool Builders' Association at New York last week afforded an excellent opportunity to get a grasp on the business situation and every one compared experiences and opinions as to the future. As a rule, the members and others who were attracted to New York by the meetings expressed the belief that an improvement is to be anticipated. The indications are that the railroads will do more buying of machinery and other shop equipment. Recent inquiries would seem to prove that such is the case. Boston dealers received more favorable reports from the machine tool builders of the Middle West. Few signs of discouragement were in evidence, though complaint of collections were heard. On the whole, the great gathering served to stimulate manufacturing for stock, a movement which is already strongly under way.

The Boston Fire Department has prepared plans for its new repair shops, which will replace those recently burned. The building will occupy the site of the old structure on Albany street and will be four stories instead of three, and there will be a large boiler room. An elevator will be installed to carry the heaviest fire apparatus. The estimated cost is about $96,000. A few machine tools were salvaged after the fire, but practically all of the equipment will have to be replaced. The old machinery was practically obsolete. The department has asked for bids on a few tools which are imperatively needed. No appropriation for equipment has been made.

The Boston & Maine Railroad has an expert engineer at work on plans for the proposed $2,500,000 repair shops. While no definite decision as to location has been announced it can be stated officially that the shops will not be located at Readville, on the New York, New Haven & Hartford system, as reported. The probability is that they will be at West Somerville, where the initial unit of repair shops is already erected. At all events, the plant will be on the Boston & Maine system and not on that of its controlling company, the Consolidated.

The McCrum-Howell Company, Norwich, Conn., will absorb five competitors in boiler, radiator and vacuum cleaning apparatus, as follows: Model Heating Company, Philadelphia and New York, boilers and radiators; Cameron, Schroth, Cameron Company, Chicago, jobber of radiators and boilers; American Air Cleaning Company, Milwaukee, Wis.; Vacuum Cleaner Company, New York, and Sanitary Devices Company, San Francisco. The statement is made in connection with the consolidation that the McCrum-Howell Company, with its present business, will control 80 per cent. of the stationary vacuum cleaning industry of the United States, including basic patents. The company will increase its capital stock from $3,000,000 to $7,000,000, the new securities to be divided between common and preferred, making a total of $3,500,000 of each. About one-half of the new money will be employed in effecting the consolidation.

The Interstate Commerce Commission has compromised, temporarily, on the matter of demurrage rules for New England, by establishing a 48-hour limit for all freights, excepting coal, forest products, grain and grain products, for which the limit will be 72-hours. A demurrage bureau will be established at Boston to investigate the subject further during the six months following December 1, after which permanent rules will be laid down.

The Simplex Tool & Supply Company, Boston, Mass., has added to its products a line of high speed steel taps and high speed steel punches, manufactured of a special tungsten steel which hardens at a low temperature, combining the durability of high speed steel with the toughness of the ordinary tool steels. The company has just taken over several manufacturing properties, including the U. S. Gas Furnace Company, Providence, R. I. It is putting on the market a line of furnaces, made interchangable for gas or fuel oil, the only difference being in the burner. H. B. Eaton is president of the company; F. A. Stoddard, treasurer, and William H. Stoddard, general manager. The present office is in the Safe Deposit & Trust Company Building, 201 Devonshire street.

The new plant of the Stanley Machine Company, Beverly, Mass., manufacturer of combustion engines, will consist of a two-story brick factory, 49 x 120 ft., with a one-story wing, 18 x 38 ft.

The Rhode Island Company will double the capacity of its Manchester street power station, Providence, R. I., at an estimated cost of $300,000. A steam turbine will be installed with minimum capacity of 13,500 hp. and a maximum of 20,000 hp. New coal hauling equipment will be installed, increasing capacity from 30 to 100 tons per hour.

Additional improvements announced by the New York, New Haven & Hartford Railroad are nine new steel bridges in New Haven and its surburbs, replacing wooden structures.

The Geo. H. Bushnell Press Company, Thomsonville, Conn., manufacturer of presses and automobile parts, is developing a department for the manufacture of a new type of automobile, having three wheels, for use for pleasure or commercial purposes, or both. It is the design of Maxim Karminski, a French engineer, and Charles Peters.

The Central Oil & Gas Stove Company, Gardner, Mass., will erect two buildings, one 60 x 200 ft., the other 40 x 60 ft. The foundations will be put in this fall and the work of construction will proceed in the spring.

The Union Mfg. Company, New Britain, Conn., has bought the business of the Cincinnati Chuck Company, Cincinnati, Ohio, and is moving the machinery and tools to New Britain. The Cincinnati Company, which was organized in 1907, will wind up its corporate existence.

Cleveland

CLEVELAND, OHIO, November 1, 1910.

Reports regarding the outlook in the machinery trade are quite encouraging. Many manufacturers in metal working lines are getting a better volume of orders for their products than for some time and a further improvement is looked for immediately after election. Makers of general machinery are making little complaint regarding conditions. Their plants are generally busy and orders are being received in fairly good volume. The demand for machine tools is still somewhat quiet, but an improvement is looked for early this month. Dealers are getting a fair volume of scattering orders, but they are largely for single tools. It is believed that if general conditions continue to improve, as expected, manufacturing plants that have been holding back will soon come into the market for machine tool equipment. Railroad buying in this market is still quite limited, but indications point to a better demand from this source shortly. Late reports from the automobile manufacturers are quite encouraging. Some of the plants are gradually making additions to their working forces and a good volume of sales is expected during the coming year. Makers of refrigerating machinery report a good demand for their products. The

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demand for blowers is quite active. Boiler and tank makers report an improvement in orders.

In the foundry trade the demand for castings has fallen off somewhat, but plants are generally quite busy. A better volume of orders is expected after election. The demand for foundry equipment is not active.

The Cyclone Drill Company, Orrville, Ohio, reports a very good demand for well drilling and prospecting machinery. The company's business during September exceeded that of any previous month of the year and its October orders were equally large if not in excess of those in September.

The Great Lakes Engineering Works, Detroit, is preparing a list of the machine tool equipment for its new shipbuilding plant at Ashtabula, Ohio, which will be bought shortly. Considerable machinery will be required, which will be mostly motor driven. The company is also preparing its specifications for equipment for lighting and the distribution of power. The heavier machinery, including cranes, large generators, air compressors, stokers, and pumping machinery for the dry dock, have already been bought. The erection of the structural steel for the buildings is just being started by the Lackawanna Bridge Company, which has this contract. It is expected that the plant will be ready for operation in the spring. The principal buildings will be a power house, 90 x 100 ft.; blacksmith shop, 60 x 90 ft., one story; storage building, 60 x 90 ft., two stories; joiner shop, 50 x 250 ft., two stories; machine shop, 160 x 300 ft., one story.

The Cleveland Foundry Company has let contracts for two buildings which will be the start of a large plant that the company intends to build on a new site recently purchased on Ivanhoe road. One building will be 60 x 170 ft., two stories, and the other 20 x 80 ft. Both will be of brick and steel construction. The Forest City Steel & Iron Company has the contract for the steel work.

Extensive dock improvements, involving an expenditure of $300,000, are planned by the Erie Railroad along the Cuyahoga River in Cleveland. Reinforced concrete docks will be built, on which will be installed a coal handling plant.

The Suspension Roller Bearing Company, Sandusky, Ohio, will erect a building, 60 x 350 ft., one story, of brick construction, plans for which are being prepared by the Osborn Engineering Company, Cleveland. The company will buy brass foundry equipment, stamping machines and other machinery and power equipment, probably consisting of three 25-hp. gas engines. E. A. Boyer is secretary and treasurer of the company.

The American Shipbuilding Company has broken ground for further additions to its plant at Lorain, Ohio. These will include a machine shop, foundry and pattern shop. The foundations will be put in at once, but the erection of the buildings may be delayed until early spring.

The American Tire & Rubber Company, Akron, Ohio, capital stock $200,000, has purchased the Aetna mill property in that city and will at once begin the erection of a plant for the manufacture of automobiles and other vehicle tires and a general line of mechanical rubber goods. The company has elected officers as follows: President, Adam Duncan; vice-president, Gilbert C. Waltz; secretary and treasurer, F. L. Kryder; superintendent, W. J. Yeager.

The Ford Plate Glass Company, Rossford, Ohio, has purchased a 20-acre site adjoining its present plant, and it is announced that plans are being prepared for extensive additions that will nearly triple the company's present capacity. These additions will be erected early next spring.

Indianapolis

INDIANAPOLIS, IND., November 1, 1910.

The Furnas Office & Bank Fixture Company, Indianapolis, whose plant was recently destroyed by fire, has taken out a building permit for a brick structure at Cornell avenue and Eleventh street, to cost $25,000.

The Sterling Wired Box Company, Indianapolis, has been incorporated with $10,000 capital stock, to manufacture boxes. The directors are Jefferson Caylor, H. A. Patterson and Joseph Patterson.

The Star Novelty Company has been incorporated at Indianapolis with $10,000 capital stock, to manufacture novelty goods. The directors are W. W. Williams, G. W. Williams and Charles Sheperkoter.

The Bamboo Lath Company, Indianapolis, has been incorporated with $50,000 capital stock, to manufacture lath. Cane stalks are split and woven in strips 3 in. wide, 10 to 16 ft. long. The directors are Conrad Bender, Herman H. Mayer and Louis Beidel. Mr. Bender is the inventor of the machinery used. The factory will be at 375 West Fourteenth street.

Ralph Beaton, receiver for the White River Light & Power Company, has been instructed by the court to sell on November 19 the dam in course of construction across White River, near Noblesville, Ind. The minimum price has been set at $190,000.

The City Council of Shoals, Ind., is investigating plans for a municipal electric light and water works system.

The Thomas Aerial & Flying Machine Company, Evansville, Ind., has been incorporated with $50,000 capital stock, to manufacture flying machines. The directors are Herbert B. Thomas, Charles F. Diefendorf, August Peltz, W. E. Kimbrough and Peter Parry.

William J. Nicholson and Jacob S. Spiker of Vincennes, Ind., have secured a 35-year franchise for a water works plant at Bicknell, Ind.

The Central Engineering & Construction Company has been incorporated at Indianapolis, Ind., by E. L. Powers, M. W. Addy and E. M. Powers.

The Central Closet Mfg. Company has been incorporated at Kokomo, Ind., with $75,000 capital stock, to manufacture sanitary appliances. The directors are George A. Harper, J. W. Johnson and A. A. Charles.

The Hill-Tripp Pump Company, Anderson, Ind., has increased its capital stock from $30,000 to $100,000.

The increase of capital stock of the Hartman Mfg. Company, Vincennes, Ind., from $25,000 to $50,000 is for the purpose of enlarging the plant, which manufactures cultivators, harrows and other farming implements. The directors are Edward Watson, Eugene Hack, William Willmore, W. H. Vollmer and Louis A Meyer. W. H. Willmore is superintendent and general manager.

The Backstay Machine & Leather Company, Union City, Ind., recently incorporated with $120,000 capital stock, advises that it will manufacture a backstay machine and leather trimmings for buggies and automobiles.

Cincinnati

CINCINNATI, OHIO, November 1, 1910.

With the exception of an increase in the number of inquiries being received there is little change in the machine tool situation. No large orders were placed last week, but the regular day to day business was fair. The automobile industry did not furnish as much encouragement as was anticipated, but after the political situation clears up both the automobile manufacturers and railroads are expected to do much heavier buying.

A few of the foundries are experiencing another temporary dull period; others are running along as usual. Second-hand machinery dealers have made some nice sales lately, but business is not up to the regular standard with them yet.

Dr. George Kerschensteiner, superintendent of the public schools of Munich, Bavaria, made an address at the Hughes High School to the Cincinnati educational authorities on the afternoon of October 31. His subject was along the lines of broadening the scope of the continuation schools. The local school has thus far been devoted only to apprentices and foremen in machine shops, but the enthusiasm generated by Dr. Kerschensteiner's address indicates that other lines will be added to those now taught. In the evening a banquet was tendered the visitor at the Business Men's Club, where another address was made, principally to local manufacturers.

That the continuation school idea is spreading is evidenced by the invitation accepted by Prof. J. H. Renshaw, head of the Cincinnati Continuation School, who addressed the Schoolmasters' Club of Kentucky at Louisville October 28, and a school patterned after the local one will probably be established in Louisville very shortly.

The Associated Foundries of Cincinnati held an informal meeting at the Orpheum Restaurant on the evening of October 25. The plan of getting up a separate organization, whose function would be more of a social than business nature, was proposed and acted on favorably. The idea is to get the different foundry interests better acquainted in a personal way. The officers who were present at the meeting included the following: President, Henry Ritter of the Lunkenheimer Company; vice-president, Wm. Gilbert of the Buckeye Foundry; treasurer, S. M. Blackburn of the J. B. Morris Foundry Company, and secretary, J. M. Manley, secretary Cincinnati Metal Trades Association. After the dinner a theater party was enjoyed by the members and their friends.

W. F. Robertson, president of the W. F. Robertson Steel & Iron Company and of the Manufacturers' Club, had in charge a party of club members and their guests who left Cincinnati October 31 to inspect the large steel plant of the United States Steel Corporation at Gary, Ind. Among the machine tool people who went along were C. H. M. Atkins, H. T. Atkins, E. H. Hargrave, A. R. Betts, E. H. Bardes and R. K. LeBlond.

The Cincinnati Traction Company has commenced work

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on a large addition to its power plant in East End, recently mentioned. Two boilers of 500 and 1000 hp. respectively will be installed.

The Hudepohl Brewing Company, Cincinnati, has had plans prepared for an addition to its bottling works, 100 x 150 ft., two stories. Some special machinery will be installed in this addition.

It is reported that the Railway Materials Company, Chicago, will erect a large foundry addition to its plant at Toledo, Ohio.

The American Tool Works Company, Cincinnati, employing about 500 men, is busy in every department, and in some it has been necessary to put on a night shift. This indicates that general business conditions are healthy, as the company builds a diversified line of tools and draws its patronage from no particular industry.

The large flour mill of W. L. Snyder & Son, Springfield, Ohio, was destroyed by fire October 25. It is understood that it will be rebuilt at an early date.

The Louisville & Nashville Railroad Company is having plans prepared for building a large roundhouse and extensive yards at DeCoursey, Ky., a few miles from Covington.

The Tennessee Lumber & Coal Company, Cincinnati, is in the market for an 8 to 15 hp. steam engine to drive a small generator.

The Ripley Foundry & Machine Company, Ripley, Ohio, whose incorporation was recently noted in *The Iron Age*, has a capital stock of $30,000 instead of $10,000, as was stated.

The Bunting Brass & Bronze Company, making brass, bronze and aluminum castings, Alliance, Ohio, has begun work on a new plant at Toledo, Ohio, which will consist of a two-story main building, 54 x 200 ft., and four smaller structures. All the buildings will be of steel and brick construction.

The Ideal Electric & Mfg. Company, Mansfield, Ohio, announces that the Machinery & Supply Company, 61 Fremont street, San Francisco, Cal., has been appointed its Western agent. The Machinery & Supply Company now carries a line of Ideal apparatus covering the principal sizes. This line includes alternating and direct current generators, induction motors, both of the slip ring and squirrel cage types; special d. c. and a. c. elevator motors and also a complete line of direct current motors.

St. Louis

ST. LOUIS, MO., October 31, 1910.

Business the past week has been dull according to the experience of most of the leading houses, but there is no gainsaying that a more confident feeling prevails among the machine tool men. Much is considered to depend on the outcome of the vote on the Missouri prohibition amendment, as investors are holding off projected improvements of various kinds until it is known whether real estate values are to be upset and many industries affected detrimentally, as would result if the prohibition advocates won.

Considerable disappointment is evident among the machine tool houses here at the manner of placing the Missouri Pacific order. It is felt this business could have been divided somewhat advantageously to the railroad and that, aside from this, the houses operating in the railroad's field should be shown some special consideration. Many well informed men contend the railroads could reduce their shop payrolls materially if they picked out the machines individually and were less disposed to lump the orders. The former course seems to be gradually winning favor among the stronger systems.

The Wissler Instrument Company, making a specialty of surveying instruments and kindred work, finds business moving in a fairly satisfactory way and is operating some 25 machines.

The Universal Welding Equipment Company, St. Louis, has been incorporated; capital stock, $6000; incorporators, Francis Leiber, Ralph Parker and Gustav Cramer. The company will engage in the manufacture of machinery, &c.

The Brooks-Latta Automobile Mfg. Company, St. Louis, has been incorporated; capital stock, fully paid, $150,000; incorporators, Charles E. Brooks, Charles Latta and Allan T. Latta. The company will engage in the manufacture of engines, automobiles, &c.

The woodworking shop of the Burlington Railroad at Hannibal, Mo., was destroyed by fire October 23. The planing mill and lumber yard were also burned.

The city of Granby, Mo., will install a water works system. Bonds will be issued to the amount of $18,000 to cover the cost of construction.

The Calhoun Clay Products Company, St. Louis, has been incorporated; capital stock, fully paid, $160,000. The incorporators are Charles P. Tiley of Belleville, Ill.; R. F. Hickman of St. Louis County, Mo.; A. T. Grosbeck and others. The company will engage in the manufacture of clay products.

The Mexico Power Company, Mexico, Mo., has increased its capital stock from $30,000 to $300,000.

The Moon Motor Car Company, St. Louis, has increased its capital stock from $175,000 to $300,000.

The Carthage Sash & Door Company, Carthage, Mo., has been incorporated with a capital stock of $20,000. The incorporators are James S. Ross, James W. Ross and Frank C. Ross.

The Sheffield Sash Weight & Mfg. Company, Kansas City, has been incorporated with a capital stock of $7500. The incorporators are Solomon Stoddard, Geo. T. Cook and Geo. P. Pierce.

The Arcadia Valley Mfg. Company, St. Louis, has been incorporated; capital stock, one-half paid, $25,000; incorporators, Frank Houlton of Glendale, Mo.; Julia E. Pfaff of Valley Park, Mo.; R. J. Burhen of Ironton, Mo., and others. The company will engage in a general planing mill business.

The Starrett Screen Company, Shelbina, Mo., has been incorporated with a capital stock of $30,000. The incorporators are R. L. Starrett, John T. Doyle and Ruby Starrett.

The National Stone Brick Company of Kansas City, Mo., has been incorporated with a capital stock of $75,000. The incorporators are John D. King, James B. Turner and Dickson C. Collier.

The Camden Coal & Clay Company, which will mine and sell both coal and clay and also manufacture and sell clay products, has been incorporated in Arkansas with a capital stock of $240,000. The incorporators are Dr. A. S. Garnett, D. Frank Clark and Philo N. French. The place of business will be at Lester, Onchita County, and the offices in Hot Springs.

The Luther Cotton Gin Company, Luther, Okla., is being formed. A site has been selected on the spur of the St. Louis & San Francisco Railroad.

The Scott Foster cotton gin, Roosevelt, Okla., was destroyed by fire October 22.

Baltimore

BALTIMORE, MD., November 1, 1910.

Generally speaking, trade conditions during October were hardly as favorable as in the previous month. While a pretty fair volume of business has been transacted in some lines, and in a few even an increase in orders booked is reported, the demand drags. Southern business in the iron and steel lines is reported less active; there is business pending, but constant revisions of programme keep bidders changing estimates to meet new requirements. Subcontracts on several of the new buildings under construction in this city are still held up. Contracts for engines and power piping in the Hochschild building have not been let, while a considerable amount of subcontract work on the Emerson buildings is still unclosed. The greater part of the business in sight for structural steel work is of the smaller class, although fabricators have a very fair share of work in hand. Machine tool builders have taken on a little more work, largely of a special character; machine tool merchants, however, report conditions quiet, with average business slightly below that for September. With winter approaching the demand for contractors' supplies and equipment is gradually declining, that for quarry work remaining the most active. The demand for machine shop and mill supplies shows little activity. Inquiries in nearly all lines have been less pronounced, and the trade generally hardly expects any marked improvement during the remaining months of the year. Industrial plants are fairly busy, largely on old orders, and in most cases are operating under full capacity.

The situation in the foundry trade is more settled; in a few instances the advance in wages recently demanded by molders was granted, in other cases plants are being operated with non-union men. A further difficulty in connection with union labor has developed, pipe fitters and helpers having made demands on employers for an advance of 50 cents a day for fitters, and 75 cents a day for helpers. If this advance is not granted they threaten to strike.

The Engineering & Contracting Company has been awarded the contract to build a garage at Third and Toone streets, for the George Guenther Brewing Company.

Fire destroyed the two-story saw and planning mill of H. L. Thomas & Son, 2601 Boston street, October 27. The

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loss is covered by insurance. The plant is to be rebuilt and equipped as soon as possible.

The Detrick & Harvey Machine Company reports the volume of business taken in October as exceeding that during the previous month, but still continues under normal. Inquiries are reported as a shade more active.

The Baltimore & Ohio Railroad has under consideration the erection of a repair shop, 50 x 300 ft., to be used for repair work in connection with steel cars. A. W. Thompson is chief engineer.

Bids on revised plans are being taken for the proposed new power house for the Southern Power Company, Greenville, S. C.

J. L. Parsons, general contractor, Washington, D. C., has awarded the contract for the structural steel work, about 1000 tons, for the new power house for the Capital Traction Company to the Phoenix Bridge Company, Phoenixville, Pa.

The Baltimore Bridge Company reports business quieter during the month. The contracts on hand are sufficient, however, to keep the plant fully engaged for some months. A fair volume of new work is pending, on which the estimating department is busy. The company has just completed the erection of a bridge over the Matina River in South America.

The Kirwan-Robirds Supply Company, contractors' supplies and equipment, notes a falling off in the demand from the railroads and general contractors. The quarry trade has, however, been quite good and October business compares favorably with that transacted during the previous month.

Friedenwald Brothers continue fairly active on general and special tools, a large proportion of which is for the export trade.

The Crook-Horner Supply Company has been delayed in the removal from 17-19 East Pratt street to its new warehouse and offices at 7-9-11 Balderston street, but now announce that the new quarters will be occupied about the middle of November.

Bartlett, Hayward & Co. report plans for the proposed addition to their machine shops at Scott and McHenry streets as entirely tentative and it is not known when work will be started.

Plans are being considered for the erection of a manufacturing building, on a beehive plan, for rental purposes to small manufacturers. The Consolidated Gas, Electric Light & Power Company is interested in the project, as are also the various trade bodies of the city. The rental plan includes the furnishing of power at reasonable cost, which would be supplied by the Pennsylvania Water & Power Company, which now distributes current in Baltimore from its McCall's Ferry plant on the Susquehanna River.

The Crown Cork & Seal Company has let the general contracts for the erection of the additions to its plant at Highlandtown. The contracts for elevators and heating and ventilation have not yet been placed. Considerable equipment of a varied character, including some tools, will be required for the new addition.

Announcement has been made by the Gas & Electric Company, Baltimore, of a purchase of a tract of land at Arlington, and plans for the erection of a distribution and repair plant at the new site; a large two-story building will be erected. The new location will facilitate the delivery of gas appliances and the making of repairs thereto, in many outlying districts of the city.

The McClintic Marshall Construction Company, Pittsburgh, Pa., has the contract for the steel work on the new shed for the Union Station, Pennsylvania Railroad. The roofing and skylight work has been awarded to the Brann & Stuard Company, Philadelphia.

Plans have been completed for the erection of a large plant to replace the old factory of Becker Bros. & Son, Lexington and Frederick streets, recently destroyed by fire. The new plant is to be three stories of mill construction, and will be equipped with modern machinery for the manufacture of packing boxes, including electric elevators and conveyors. An electric light plant is also to be installed.

The Chesapeake Iron Works reports the demand somewhat easier. A number of small contracts have been taken, including a steel frame shed for the Consolidated Gas, Electric Light & Power Company, a monorail system for the Baugh Chemical Company, and miscellaneous work for the Monumental Brewing Company. Trade in the South is reported quiet, although better than during September.

The Crook-Kries Company will furnish two Ball engines, one 80 and one 120 hp., direct connected to electric generators, for the Mercy Hospital, also two 150 hp. Ball engines to the J. J. Young Company, for general power purposes. This company has been appointed selling agent in the Baltimore district for the Richmond power vacuum cleaner, manufactured by the McCrum-Howell Company, New York.

The Monumental Sugar Refining Company, incorporated under the laws of Delaware, with a capital stock of $3,000,000, has been formed for the purpose of erecting and operating a sugar refinery in the vicinity of this city. It is proposed to erect large buildings of brick, iron and concrete construction, equipped with modern machinery, as soon as financial matters have been concluded. Electricity will be used for power purposes. The new plant will probably be located in the Canton district.

Announcement is made that the plans for the new 12-story warehouse, covering practically a block of ground at Baltimore and Liberty streets, for the Baltimore Bargain House, which are being prepared by Joseph E. Sperry, architect, will be ready by the end of next week. The building will probably be erected in sections and when entirely completed will cover 20,000 sq. ft. of ground.

The Baltimore Retort & Fire Brick Company is busy on general orders and is working on the development of a special system of utilizing waste heat from puddling furnaces, as well as boiler settings of special efficiency.

The T. C. Bashor Company has been awarded the contract for the heating, ventilating and power piping in connection with the new 18-story addition to the Munsey Building. It also has the contract for the heating and ventilation system of the Southern Electric Building and quite a few fair sized propositions are being figured on. The demand for boilers has been a trifle less active, but the plant continues quite busy with work in hand, which includes among other orders one for a quantity of 8-in. steel sewer pipe for New Jersey parties and two large tanks for the Miller Fertilizer Company of this city.

Deitrich Brothers have been awarded the contract for the steel work in connection with the new buildings for the Crown Cork & Seal Company and also have orders for considerable steel work in connection with general improvements under way by the Baltimore Copper Smelting & Refining Company. They are busy in all departments. They have begun the work of clearing ground for a new structural shop and storehouse, 120 x 250 ft., to be erected in connection with their present plant, and will require several electric cranes, punch and shears, cold saw cutting off machines and other equipment.

Detroit

DETROIT, MICH., November 1, 1910.

The volume of construction contracts recently let all through this State and in adjacent districts has been large. Both the metal and woodworking industries show prominently in the list. Almost every day sees quite a batch of incorporation papers filed with the Secretary of State at Lansing, and there is a noteworthy absence of the usual promotion schemes as contrasted with legitimate companies for establishing manufacturing plants. Machinery of nearly every description is now in fairly good demand. One of the best selling lines, both for new and second-hand equipment, is in tools for sash and door factories, flooring plants and other shops specializing in woodwork for buildings. Good used or rebuilt machinery is becoming more scarce and almost as much can be obtained for it as for new.

Terrell's Equipment Company, at Grand Rapids, Mich., is planning the erection of a new factory building, 80 x 385 ft., for use in the production of steel shelving, lockers and other similar equipment for stores, vaults, factory stockrooms, &c.

Bids will be taken until November 8 by the Board of Public Works, Grand Rapids, Mich., on two dynamos for an arc light system. The machines are to be motor driven on power supplied from the new steam turbine unit recently contracted for.

A one-story brick addition, 40 x 100 ft., is to be made to the plant of the Nichols & Cox Lumber Company, Grand Rapids, Mich.

Chain grate stokers are to be purchased early next week for the new municipal power and pumping station at Grand Rapids, Mich.

It is reported from Grand Rapids, Mich., that the Silverman Brass, Iron & Metal Company of that place is erecting a new two-story factory and warehouse building, 50 x 100 ft.

The Warren Motor Car Company, Detroit, has increased its capital stock from $100,000 to $300,000.

The plans of the Abbott Motor Car Company for a plant in Detroit have not yet been fully matured. Its present location is in Warren, Ohio.

E. M. Arnos and others are organizing a stock company at Olivet, Mich., to remodel the mill there into an electric power plant for furnishing light to the community.

Construction contracts were recently let for a two-story addition, 30 x 150 ft., and a new three-story shop building,

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100 x 100 ft., to be erected for the Detroit Forging Company, Detroit.

The Escanaba Lumber Company, Escanaba, Mich., is planning to erect a large mill, for which power and timber-cutting machinery will be required.

Construction contracts have just been let on a new factory building, the main part of which will be 45 x 130 ft., for the E. O. Bulman Mfg. Company, Grand Rapids, Mich.

It is reported from Alabaster, Iosco County, Mich., that the mills, warehouses and docks of the United States Gypsum Company recently burned there will be rebuilt.

The new addition to be made to the plant of Goodwillie Brothers, Manistique, Mich., will be 50 x 200 ft., equipped with power and woodworking machinery of the most modern design.

The Haney School Furniture Company, Grand Rapids, Mich., is preparing to erect a new two-story building.

The plans of the new shops to be built by the Copper Range Railroad at Houghton, Mich., call for buildings 36 x 106 ft. and 24 x 148 ft. All of the machinery is to be driven by electric motors.

The Auto Equipment Company, Detroit, has increased its capital stock to $75,000.

It is planned to make extensive improvements, including the purchase of new machinery, in the municipal power plant at Marquette, Mich.

The Canadian trade of the Penberthy Injector Company, Detroit, has developed to such an extent that it will be necessary to considerably extend the manufacturing facilities afforded by its branch works at Windsor, Ont. Arrangements for an addition are now being made.

A new car house with repair equipment will be built in Lansing, Mich., by the Michigan United Railways. It is to be 130 x 180 ft.

It is reported from Saginaw, Mich., that arrangements have been concluded for the erection of the new plant which the Seeley Auto Engine Company has been planning to locate there.

A plant for the manufacture of fruit packers' supplies will be established at Lansing, Mich., by the Michigan Bent Rim & Basket Mfg. Company, recently organized there by John Leentcaar of that place and Miles Monk of Lowell, Mich.

Articles of incorporation for $30,000 have been filed by the Muskegon Steel Casting Company, Muskegon, Mich.

The Great Lakes Engineering Works, Detroit, is planning the erection of a large plant at Ecorse, Mich., next spring, for the building of marine engines. The company now makes marine engines and refrigerating machinery at its Detroit plant, but its capacity is too small for the growing requirements, and after the new Ecorse plant is built the Detroit plant will be used exclusively for making refrigerating machinery. The company reports a heavy demand for refrigerating machinery and its marine engine department is also well filled with work.

The Capitol Brass Works, Detroit, is completing an addition to its plant that will provide 30,000 sq. ft. additional floor space and about double its capacity. Another story has been added and an extension built to the main building. In addition to its present products this company will shortly begin the manufacture of a new line of water gauges and compression gauge cocks.

The American Blower Company, Detroit, is running its plant overtime to keep up with orders. The company reports a good volume of orders for blowers for various purposes and a heavy demand for engines for small lighting plants.

The Ireland & Mathews Mfg. Company, Detroit, makes very satisfactory reports regarding business conditions and the outlook for the future. The company's plant is well filled with work in all departments.

The Edmunds & Jones Company, manufacturer of automobile lamps, Detroit, Mich., is erecting a plant 65 x 200 ft., which will be fully equipped for sheet metal working machinery. The company is also building a power plant which will include a 250-kva. Crocker-Wheeler generator, direct connected to an Erie Ball high speed engine. A low pressure turbine will drive auxiliary equipment. The boiler room will contain two 125-hp. return tubular boilers fired by Jones stokers.

Pittsburgh

PITTSBURGH, PA., November 1, 1910.

There has seldom, if ever, been a time when the manufacturing plants in this district were kept busy with so few of the surface indications of activity in the booking of contracts. This makes the situation difficult to gauge properly, but it also affords evidence of an essential stability, which argues well for the future of the market. An uncommonly large percentage of the orders recently placed here have been practically on a noncompetitive basis. Inquiries largely outstrip actual bookings, but conditions are not as uneven as they were; that is to say, it is not a case of good business with some dealers and very poor with others; most of them are obtaining about their normal share. In the line of shop equipment, machinery for forging and hot pressing, shearing, bending, punching, riveting, &c., sell about as well as anything, while there is a fair demand for hydraulic presses, accumulators, force pumps and auxiliary apparatus.

The Pittsburgh Machine Tool Company, now located on Darragh street, N. S., Pittsburgh, has purchased a site of ground, 95 x 250 ft., on the Pennsylvania Railroad, a short distance east of Pittsburgh, on which it will erect a new and modern plant, comprising several steel buildings, for the manufacture of lathes, planers and other iron working tools. Plans are now being drawn.

The plans of the Baltimore & Ohio Railway Company for additional shops at Keyser, W. Va., to provide facilities needed in the repairing of steel freight and passenger cars are to be carried into effect shortly. The first of the new buildings decided upon will be 50 x 300 ft. All of the machinery is to be electrically operated.

The Bessemer Limestone Company, whose product is used as flux for blast furnaces of this district, finds the facilities of its plant at Bessemer, Pa., inadequate to the requirements of the industry, and plans for enlargement are now under consideration.

A large warehouse, with equipment for the rapid handling of material, will be built at some point in the Southwest, probably Houston, Texas, by the National Fire Proofing Company, Pittsburgh.

J. Richard Kommer and C. E. Miller of this city are consulting engineers for the proposed water works improvements at East Liverpool, Ohio, which include a large steel standpipe, to be constructed back of the present high pressure reservoir. The pumping station is also to be removed to a better location and increased in capacity, with the probable replacement of some of the equipment by modern high duty machinery.

Tenders will be invited in the near future of material and equipment for the generating plant, holder, &c., to be erected by the Bluefield Gas & Fuel Company, Bluefield, W. Va. Plans are now in course of preparation.

The National Bolt & Nut Company, Pittsburgh, is preparing for a considerable increase in production by improvements in the arrangement of its plant, which include the installation of some new machinery.

Figures will be submitted in the near future by manufacturers of this district on the equipment of a municipal pumping plant at Benton, Pa., the construction of which was recently decided upon.

Chester & Fleming, engineers, whose offices are in the Union Bank Building, Pittsburgh, have in preparation plans for the mechanical filtration plant to be constructed at South Fork, Pa., for the South Fork Water Company. They have recently completed an addition to the pumping plant of the Charleroi Water Company, Charleroi, Pa.

At Martinsburg, W. Va., a large stone crushing plant, equipped with crushing rolls instead of the customary jaw or gyratory breakers, will be built by the National Limestone Company, of which C. P. Grimsley is manager.

The Wheeling Hinge Company, Wheeling, W. Va., is erecting three additional stories to its factory building, which is 75 x 125 ft. This will enable the company to increase its output materially.

Milwaukee

MILWAUKEE, WIS., October 31, 1910.

The past week has brought a good deal of business to local plants, particularly in the line of orders for heavy machinery. Among these are contracts for large pumping engines and hydraulic turbines, steam turbines, Corliss engines, sawmilll machinery, rock and ore crushing outfits, cranes, conveying apparatus and electrical equipment both for large and small capacities. The market for shop tools is also becoming rather more active than it was early in the month; gasoline engines are selling well, and for factory supplies of various kinds there is an increased demand. In the quarters where the principal activity prevails, however, the conditions above noted seem to be taken as a temporary spurt of buying, and it is not felt that the situation has as yet settled down to any firm or regular basis of supply and demand.

The La Crosse Plow Company, La Crosse, Wis., is planning the erection of a new factory, 125 x 450 ft., but construction work will probably not be started before next spring.

The Lyons Boiler Works, De Pere, Wis., is erecting an

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addition to its power plant, 32 x 70 ft., to provide for increased boiler capacity.

Plans are being made for an addition to the forge shop of the Joseph Obenberger & Son Company, Milwaukee.

The Rotary Pump Company, organized by C. R. Gether and others, was recently incorporated here.

The power plant of the Darlington Electric Light & Power Company, Darlington, Wis., was recently burned. It will probably be rebuilt and remodeled for increased capacity.

The Beloit Lighting & Heating Company has been organized at Beloit, Wiss., by Charles H. Jones and others, to manufacture apparatus for the production of gas from gasoline. Plans for a factory are reported to be under way.

If the project for the municipal power and lighting plant is carried at the November election in La Crosse, Wis., a battery of boilers. Corliss engine and an electric generator will be among the requirements in equipping the station. For the city water works an additional pump of 6,000,000 gal. daily capacity may also be provided.

Machinery for an electric light plant will probably be purchased in the near future by the village of Sun Prairie, Wis., which has already let the contract for a building.

Four new factory buildings, three of which will be 80 x 200 ft., and one 50 x 150 ft., are to be erected in the spring by the Egan Mfg. Company, La Crosse, Wis., for use in the manufacture of agricultural implements.

The Johnson Mfg. Company, Marshfield, Wis., which contemplated the erection of a new plant at Wausau, Wis., has decided to remain in its present location and build an addition to the factory there.

The McCrum-Howell Company's branch at Racine, Wis., will build a four-story addition to its plant for use in the manufacture of motors and other parts for vacuum cleaner outfits.

A new plant, including mixing mill, bag house and drying room, is to be built in Milwaukee by the United States Gypsum Company.

The Gardner Machine Company, Beloit, Wis., which is erecting a thoroughly modern plant, electrically operated, on a new seven-acre site secured at South Beloit, expects to occupy it before the end of November. L. W. Thompson, the secretary-treasurer, states that it is looking forward to a large increase in output. As the new works are just across the line in Illinois, although the company's postoffice address will remain as above, a charter has been secured from that State, the incorporation being for $100,000.

The Southern Wisconsin Power Company, Madison, Wis., whose plans for a new hydroelectric power station have previously been reported, will practically duplicate at Prairie du Sac, Wis., the equipment of its Kilbourn plant, which contains four General Electric alternating current generators of 6000 kw., driven from hydraulic turbines built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio.

Work has been started on an addition to the foundry of the Rundle Mfg. Company, Milwaukee.

It is stated by George Challoner of the Wilkin-Challoner Company, Oshkosh, Wis., that Rush C. Brown has become associated with that company as vice-president. Mr. Brown, who was formerly designer for the E. B. Hayes Machinery Company, is a practical woodworker of long experience and will be given entire charge of the manufacturing end of the business.

The Luther Grinder Mfg. Company, Milwaukee, has increased its capital stock to $100,000.

The Independent Electric Mfg. Company, Milwaukee, has doubled its capital stock.

The T. L. Smith Company, Milwaukee, is now represented at Louisville, Ky., by the Urwick Machinery & Supply Company, which has a large established trade in contractors' equipment.

In connection with its new plant at Beloit, Wis., the Berlin Machine Works will erect a three-story office building 55 x 120 ft.

It is reported from Campbellsport, Wis., that the Campbellsport Electric Light & Power Company will build a new power station equipped with a gas producer plant, gas engines and two new electric generators. The equipment at present in service comprises a Fort Wayne alternator driven from a water turbine furnished by James Leffel & Co., Springfield, Ohio.

C. J. Anderson is installing machinery for a foundry and machine shop at Marinette, Wis., having decided not to continue at his former location in Menominee, Mich.

The authorities at Green Bay, Wis., have under consideration a plan for taking over local water works, which are owned by a private corporation, and increasing their capacity.

It is reported from Wilton, Wis., that Carl C. Vogel has been granted the franchise to install an electric plant there. With others he has formed the Wilton Light & Power Company, which will be incorporated for $5,000.

The Hardwood Products Company, Neenah, Wis., has broken ground for the erection of a new factory building, 90 x 190 ft., three stories; a boiler house, two dry kilns and a two-story warehouse. Details of equipment to be installed have not been decided upon, but the company expects to use two 250-hp. boilers, and is now considering the advisability of using electric motive power for operating its machinery.

The Racine Iron & Wire Works, Racine, Wis., advises that it expects to be located in its new factory about November 15. A portion of the machinery has already been ordered, but additional equipment will be ordered from time to time as requirements demand.

The Wisconsin Engine Company, Corliss, Wis., reports among its recent shipments the following: J. M. Kohler Sons Company, Sheboygan, Wis., one 24 and 46 x 42 in. horizontal cross compound direct connected Corliss; Illinois Steel Company, Milwaukee, Wis., one 32 and 56 x 48 in. tandem compound heavy cutting rolling mill; Girard Iron Company, Girard, Ohio, one 28 x 60 in. simple heavy duty rolling mill and one 30 x 60 in. simple heavy duty Corliss; Jones, Coates & Bailey, Chicago, Ill., one 20 x 42 in. simple heavy duty Corliss.

Toronto

TORONTO, October 29, 1910.

Reports as to the condition of trade in the machinery business continue to be favorable. As the time draws nearer for the closing of navigation on the upper lakes work on orders yet to be delivered by Ontario manufacturers to Western customers receives chief attention. Also, with the beginning of winter at hand, machinery, engines, &c., for the Porcupine, Elk Lake, Gowganda and other northern Ontario mining districts beyond the reach of the railroad are being pushed to completion in order that they may be sent forward as soon as the snow roads are formed. It is next to impossible to get a heavy mining plant to its destination in these camps at any other season, so bad is the state of the roads. There is a good, steady demand for workshop machinery of all kinds.

Tenders will be received up to November 8 by the Mayor of Toronto for the supplying of the cast iron lanterns and pillars required for the city's hydroelectric lighting system.

Swanson's, Ltd., manufacturer of stumping machines in Bobcaygeon, Ont., has decided to move to Lindsay, Ont., and extend its business to a capacity of 500 machines a year.

A planing mill is being added to the box factory of the Carew Lumber Company, Lindsay, Ont. It will soon be ready for the machinery.

New machinery to the value of about $10,000 is to be put in the works of the American Road Machine Company at Goderich, Ont., which company is one of the concerns in the latest merger centering in Hamilton, Ont.

The Garlock Packing Company has purchased the factory in Hamilton, Ont., formerly occupied by the Ontario Tack Company. It is said that the only vacant factory in Hamilton at present is that of the Jackson Typewriter Company, and several offers for its purchase have been declined.

A demand for garbage incinerators is developing in Canadian cities. Toronto has decided to establish some new modern incinerators. A sanitary engineer has been retained to report as to the locations and capacities of the required plants. The City Council of Ottawa is still considering the question of which particular manufactory to place its incinerator order with. The superintendent of garbage collection at Hamilton, Ont., says that the time has come when an incinerator must be provided for the service in that city.

The ratepayers of Harriston, Ont., have voted in favor of the town giving a free factory site and taxation privileges to the Canada New Shoe Company.

The power house of the Renfrew Electric Light Company at Smith's Falls, Ont., was burned last week and the machinery was badly damaged.

Letters patent incorporating the Windsor Superior Mfg. Company have been granted by the Ontario government. The business authorized is manufacturing and dealing in wares of every description composed of metal. The capital stock is $100,000, and Windsor, Ont., is the headquarters of the company.

The National Carburetor Company has been incorporated under Ontario laws to deal in and manufacture carburetors, water, air and gas mixtures, automobiles, motorboats, &c. The capital stock is $25,000, and the principal place of business is to be at Ottawa, Ont.

A provisional agreement has been signed by the Industrial

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Committee of Woodstock, Ont., and John B. Parter, president of the Maximilian Machine & Tool Company of Buffalo, in which it is agreed that the Maximilian Pneumatic Tool Company will be organized under the laws of Ontario to establish works and carry on a manufacturing business in Woodstock, the town to give certain privileges, and Woodstock people to take $15,000 stock in the new company. The total capital stock is to be $100,000. Two hundred hands are to be employed after the first year. The company will manufacture a pneumatic riveting machine for bridge work, boiler work and steel architectural work. Woodstock will be the headquarters for foreign shipments. A by-law will have to be passed and confirmed by the ratepayers to give effect to the agreement.

A steel and concrete bridge, 2700 ft. in length, is to be constructed over the Ottawa River at Mattawa, Ontario, at a cost of $3,000,000. Stewart & Hewitson of Port Arthur, Ontario, have been awarded the contract.

The Canada Metal Company has purchased a manufacturing site on Frazer avenue, Toronto, and will at once erect a two-story brick factory to cost about $40,000. The company will also build a plant at Winnipeg, Man. W. G. Harris, Toronto, is president.

The South

CHATTANOOGA, TENN., October 31, 1910.

Sales of machinery continue rather light for this season of the year, but there is a firm undertone to the market and conditions as a whole are relatively favorable. The railroad buying mentioned some weeks ago, which has been of a decidedly miscellaneous character, gives promise of developing further along the line of equipment for repair shops, as improvements long contemplated are now nearly due. Purely industrial lines, including the coal and ore carrying and the logging roads, are not affected by this situation, as they have been spending a good deal of money on their maintenance departments right along; but from these sources a steady run of buying may be looked for which will materially help to swell the total volume of business transacted. There is also to be noted all along the line a more favorable sentiment in relation to the future among manufacturers and jobbers as well as dealers scattered through a wide stretch of territory, as the result of the greater interest shown at various factories, mills and other industrial plants in pending propositions.

In connection with the enlargement of its shops in northern Alabama the Louisville & Nashville Railroad Company will build an electric power plant of considerable capacity. The plans, however, have not yet been fully worked out.

Negotiations are reported to be under way at Newport, Ky., for a direct current generator of 300 kw., engine driven, to be installed by the Newport Rolling Mill Company.

An elevated steel tank of 75,000 gal. capacity and the complete equipment for a water works system are to be purchased at some time during the coming winter by the municipality at Boaz, Ala.

One or more pumping units will be needed for installation in the near future at Wrightsville, Ga., where the water works station recently burned.

The Belton Marble & Granite Company has been organized by J. L. Browning and others to operate a quarry in the vicinity of Belton, S. C.

The machinery in the new factory building which the Champion Wire & Iron Works is erecting at Louisville, Ky., will be electrically operated, and this system of motor drive is to be extended as further manufacturing facilities are provided.

A new plant is to be erected by the Holland Blow Stave Company, Decatur, Ala., to replace the one destroyed by fire.

The public service plant at Live Oak, Fla., which was subsidiary to the Live Oak Mfg. Company, has been acquired by A. L. Humphreys and will be enlarged in capacity.

It is reported from Memphis, Tenn., that F. B. Fischer, New Madrid, Mo., contemplates the construction of a large plant there for the manufacture of carriage and wagon stock and has secured an option on a site for the purpose.

The purchase of the complete equipment for an electric power plant of 75 kw., engine driven, is under consideration by the city officials at Richland, Ga.

Preparations are reported to be under way at Hartsells, Ala., for a new foundry and shop to be erected for the Hartsells Machine Company.

The American Mfg. Company, Chattanooga, Tenn., is arranging for increased production facilities in place of the machinery destroyed by fire some weeks ago.

An engineering firm has been engaged by the city of Kirkwood, Ga., to prepare plans for a pumping plant and water works system.

Motor driven crushers and other equipment will be required in the near future by the Belmont Trap Rock Company, which is developing a quarry near Herndon, Va.

The Corinth Chair Company, Corinth, Miss., is planning the erection of a new factory, the location of which will, however, probably be nearer the coast.

The Greenville-Knoxville Railroad, Greenville, N. C., has under consideration plans for terminal facilities at that place which include the construction of woodworking machine and boiler shops for the car and locomotive repair plant. No definite action in the matter has, however, as yet been taken.

R. Lee Reaves, I. H. Dungan and T. E. Bobbits, Humboldt, Tenn., are contemplating the construction of a hydroelectric plant. Mr. Reaves is the engineer in charge.

Southern Texas

AUSTIN, TEXAS, October 29, 1910.

An increase in the demand for electrical machinery is reported from all parts of the Southwest and Mexico. In South Texas an unusually large number of electric light and power plants have been installed during the last several months and others are constantly being planned. Hydroelectric projects are receiving much attention on the part of investors in this territory. The rapid increase in population, not only in the towns and cities but in the rural districts as well, is creating a demand for cheap power. An era of interurban electric railway construction is also about to be entered upon in Texas. Several projects of this kind are being actively promoted.

J. P. Ward and William Gebhardt have adopted plans for their proposed canning factory at San Antonio. They will invest about $15,000 in machinery.

The Livingston Light Company, Livingston, Texas, will make improvements to its plant. It has increased its capital stock from $2000 to $15,000.

The Sherman Cotton Mills, capital stock $100,000, will install machinery for the manufacture of cotton goods in a building that it recently acquired at Sherman, Texas.

William Willig recently started construction work on a new iron foundry at San Angelo, Texas. He will invest about $30,000 in the enterprise.

The proposition for the town to issue $45,000 bonds to purchase the water works system and electric light plant at Georgetown, Texas, was carried at a recent election. The town will enlarge and otherwise improve the plants, it is announced.

In a recent election held at Ballinger, Texas, it was voted to issue $16,000 bonds for enlarging and improving the water works system.

The town of Rogers, Texas, has voted $14,000 bonds for the installation of a system of water works.

Captain A. B. Wolvin, Duluth, Minn., president of the Texas City Transportation Company, announces that the stockholders of that company have authorized the additional expenditure of $1,500,000 for improvements of its property at Texas City, near Galveston. Additional machinery will be installed upon the docks for the quick handling of freight, including electric cranes. Another steel and concrete warehouse, 100 x 750 ft., will be erected. The company will also install an electric light plant, a water works system and other public utilities for the town.

The Seco Pressed Brick Company, which was recently organized with a capital stock of $40,000, will erect a manufacturing plant at D'Hanis, Texas.

Roger B. Chase is preparing to install about 100 hp. hydraulic works near Canelas, State of Durango, Mexico.

The Gila Valley Electric, Gas & Water Company, Safford, Ariz., recently began the construction of the new reservoir in Fry's canyon for its new water works system. The reservoir will have a capacity of 60,000,000 gal. A pipe line will be laid from the reservoir in the mountains to Safford.

The construction of electric transmission lines through the Mimbres River valley by the Deming Electric Company, Deming, N. M., is causing the installation of many irrigation pumping plants by farmers who derive the power for operating the pumps from these lines. The motors of these plants are from 5 to 40 hp.

The Border Gas Company, Laredo, Texas, in addition to laying a natural gas pipe line from the gas field at Reiser to Laredo, is running a line down the Rio Grande valley for ten miles for the purpose of supplying the irrigation pumping plants with gas for fuel.

The rapid development of sugar cane growing in south Texas is causing a considerable demand for machinery for new sugar mills that are being erected and proposed in

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that region. In the lower Rio Grande valley where the sugar cane acreage was more than doubled this year the erection of several new mills is proposed.

The water works plant of the International Water Company at El Paso was formally taken over by that city October 27. Improvements will be made to the property.

The electric power station of the Galveston-Houston Interurban Railway Company is being erected on the bank of Clear Creek, between Houston and Galveston. The plant will be equipped with steam turbines and two 3000-kw. machines. The boilers will be three in number, each of 500-hp.

W. T. Eldridge and associates will rehabilitate the large paper mill at Sugarland, Texas, and install new machinery for the manufacture of paper from white birch pulp. The mill was originally planned to utilize sugar cane bagasse in the manufacture of paper.

The Livingston Mfg. Company will enlarge and otherwise improve its electric light plant at Livingston, Texas.

Preliminary steps have been taken by the City Council of Paris, Texas, toward the installation of an electric light and power plant and water works system. It is planned that the water works pumping plant shall have a daily capacity of 1,000,000 gal.

A sewerage purification plant and sewer system will be constructed at Plano, Texas. F. H. Lancashire of Dallas has prepared the plans for the proposed improvements.

Considerable activity in installing irrigation pumping plants on shallow wells in the upper Pecos River valley of Texas is reported. One of these wells on the farm of the State agricultural experimental station near Pecos was recently equipped with a No. 4 centrifugal pump and a 10-hp. gasoline engine. It is planned to irrigate 80 acres of land from this well. The experiment has proved so successful that many other pumps are to be installed in that section.

Engineer L. C. Hill of the United States Reclamation Service has made a report to the board of governors of the Water Users' Association of the Salt River valley of Arizona, that the preliminary work toward the erection of a great hydroelectric plant near Tempe, Ariz., is making satisfactory progress. The farmers have agreed to advance $900,000 within the next two years toward carrying out the plans for installing this plant.

Eduardo Soto and Miguel Taboada of Pachuca, Mexico, have applied to the federal government for a concession to install a large hydroelectric plant on the Laguna de Zupitlan, State of Hidalgo. Transmission lines will be constructed from the plant to the mining districts and industrial centers of that region.

The Yoquivo Development Company will install a hydroelectric plant at its mines near Yoquivo, State of Chihuahua, Mexico.

The city of San Augustine, Texas, will soon install a water works system.

The Silver Hill Mill & Elevator Company, Marfa, Presidio County, Texas, has been incorporated with a capital stock of $250,000. The incorporators are R. K. Young, T. C. Crosson, H. B. Young and W. H. Colquitt.

The town of Maxwell, Texas, will soon establish a water works system.

The Enterprise Iron Works, Horrell Brothers, proprietors, 515 East Front street, Fort Worth, Texas, was damaged by fire October 19.

The gin and buildings belonging to the Colorado Oil Company, Dunn, Texas, were destroyed by fire October 19. Loss estimated at $10,000.

The Southwest

KANSAS CITY, MO., October 31, 1910.

More than the usual proportion of business consists of repair work, indicating that mill or factory owners are more concerned at present with keeping the machinery that they have in good operating condition than with replacing or extending their equipment.

Steam specialties of all kinds are wanted in considerable quantities, and the dealers in standard apparatus of this character have recently made numerous shipments to interior points. Railroad agents who have been interviewed at various stations, where traffic ordinarily shows a fair average, state that there has been a decided increase within the past month in both the billing and receipt of detail apparatus, shop and factory supplies, &c., which is significant of growing activity among industries generally in this section.

It is proposed at Axtell, Kan., to build a municipal pumping plant.

An electric power plant is to be installed at Chase, Kan., by the Chase Hardware & Implement Company.

Machinery is to be provided at once for the municipal power plant at Carman, Okla.

Plans for a hydroelectric plant of 600 kw. or larger will be put in execution before long by the Alamagordo Water Power Company, Alamagordo, N. M.

The Commercial Mining Company, Senator, Ariz., is vigorously prosecuting development work which will result at some time during the coming winter in the purchase of additional machinery.

The plant of the Clarksville Light Company, Clarksville, Tex., which is now equipped with two General Electric generators of 150 kw., driven by Lane & Bodley engines, will be rebuilt and enlarged in capacity.

A bond issue for the construction of water works has been approved at Onaga, Kan., and the work will be proceeded with as soon as possible. Burns & McDonnell, Kansas City, are in charge of the plans.

The City Council of Stafford, Kan., is preparing to establish a municipal lighting system at a cost of $25,000.

The King City Electric Light & Power Company, King City, Mo., is considering the erection of a concrete building, 20 x 40 ft., and the installation of a 60-hp., 2300-volt alternating current generator.

The Woodcock Mfg. Company, Vinita, Okla., expects to purchase a lathe, wood cut-off saw, rip saw and a boring machine. The company recently moved its plant to Vinita from Litchfield, Ill.

Farther Central West

OMAHA, NEB., October 31, 1910.

Public utilities, whether operated by municipalities or private corporations, including electric lighting and traction companies, still provide the most considerable purchasing power of any interest or group of interests in this territory. Plans are now on foot to bring quite a number of machinery building plants to the States of this section from other parts of the country, some of the more active commercial bodies having undertaken to secure for them special advantages in the way of free sites, bonuses, &c., and to gather information regarding the best sources of raw material, labor, &c.

The Bullock Public Service Company, Omaha, Neb., will probably install an electric generating plant at Magnolia, Iowa. The matter of a franchise there is now under discussion with the authorities.

A large garage, with repair shop and electric power plant, will be built in Silver Creek, Neb., by E. L. Ives and others, who are organizing a company for the purpose. All of the machinery required will be motor-driven.

The purchase of machinery for a municipal electric station may be taken up in the near future at Wymore, Neb., where the project is under consideration.

A motor-driven air compressor and other machinery will be installed shortly by the Highland Consolidated Mining Company in Highland Park, near Georgetown, Colo.

A noteworthy sale of apparatus for export is one of equipment for experimental work, including a Case crusher, which will be shipped to the Royal School of Mines, Greenwich, England, by the Denver Fire Clay Company, Denver, Colo.

The Frigid Mining Company, Boulder, Colo., is arranging for the installation of an air compressor and drills. Additional machinery for mining and handling tungsten ore is to be purchased as the property is opened up further.

Preliminary plans are reported to have been made for the large hydroelectric plant to be erected in the vicinity of Glenwood Springs, Colo., by the Central Colorado Power Company, whose headquarters are at 1210 Seventeenth street, Denver, Colo.

The municipal authorities at Norfolk, Neb., have engaged engineers to prepare plans and specifications complete for a power and lighting plant as well as to recommend improvements in the water system.

The Intermountain Bridge & Construction Company, Tecumseh, Neb., has taken the contract for a complete system of municipal water works, inclusive of the pumping machinery, to be installed at Milford, Neb. The purchase of equipment is now being considered by the authorities.

The Waterloo Malleable Iron Works, Waterloo, Iowa, has broken ground for the erection of a 100-ft. extension to its gray iron building, a 100-ft. extension to its malleable iron building and an 80-ft. extension to its machine shop. Considerable new machinery is being purchased for the machine shop, which is used for the manufacture of power and transmission.

P. M. Banks, city clerk, Webster City, Iowa, advises that the city is considering the installation of a new power station, but a definite location has not been decided upon.

The R. A. Sleeper Mfg. Company, Sheldon, Iowa, recently organized, has established a factory in that city for the manufacture of underground gas systems, stock tanks and oil tanks. In addition to the manufacture of these products the company will do all kinds of sheet metal work and will handle a complete line of gas fixtures and mantles.

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At a recent meeting of the stockholders of the Corn Belt Packing Company the directors were authorized to erect a plant for the third time to replace the structures destroyed by fire. The capital stock was increased to $250,000.

North Pacific Coast

SEATTLE, WASH., October 28, 1910.

Some rather heavy purchases are now being made of equipment for mining and ore reduction plants located in the interior of Washington, Oregon and Idaho, partly in consequence of new or extended development and partly to replace machinery destroyed by the recent forest fires. In placing most of this business prompt delivery is an object and contracts for nearly all such material will be filled on the coast, directly by manufacturers located here or from stocks carried in the warehouses or sales agencies at Portland, Tocoma, Seattle and Spokane. The last named has become a distributing center of increasing importance for this class of trade as well as for the sawmill and woodworking industries.

An ore crushing plant will be installed next spring by the Matanuska Gold Mines, Ltd., on its property near the head of Cook Inlet, Alaska. The company has offices in Seward, Alaska and Seattle, Wash.

The water works system at Union, Ore., will be improved and it has also been decided to build a municipal power and lighting plant.

E. K. Erwin, secretary of the Southern Oregon Water & Power Company is reported to be in charge of plans for a hydroelectric plant of 7500 kw., to be built on Deep Creek not far from Lakeview, Ore.

The Clark Brothers Company of Belmont, N. Y., which maintains offices here in the White Building, with E. S. Mitchell as manager, has arranged to carry in stock at Seattle an extensive line of the sawmill machinery of its manufacture, including steel castings and other parts. The branch will be equipped to repair not only the company's own apparatus but also any standard machines of a similar nature.

Spoor & Buckhard are rebuilding the mill at Sisters, Ore., that was destroyed by fire. Thoroughly modern equipment will be provided.

Work preliminary to the construction of the first of the new plants to be built by the Inland Empire Paper Company whose headquarters are now at Spokane, Wash., will begin early in the coming month. W. A. Brazeau, formerly of Grand Rapids, Wis., is directing the enterprise.

Work will be started in the near future at Earlington, Wash., on the plant which the Pacific Wheel & Axle Company is to build. The offices of the company are now in the Empire Building, Seattle. J. D. Jones, Walla Walla, Wash., is the moving spirit in the enterprise.

The Holland Cook Mfg. Company, Tem Hill, Wash., has secured the plant of the C. E. Little Company at Ohop and will operate both factories under one management with an increased equipment of machinery. Wood columns, flooring, &c., are manufactured.

The Birch Creek Mining Company, Ltd., Idaho Falls, Idaho, is contemplating the installation of hoisting machinery and air compressors, but has not determined whether steam or electric power will be used.

North Texas

DALLAS, October 29, 1910.

Announcement is made of the purchase by J. R. Nutt of Cleveland, Ohio, and associates of the plant and franchises of the Fort Worth Light & Power Company and of the electrical property of the Fort Worth Gas Company. The purchases of the franchises and physical properties of these two companies has been ratified by the city officials and announcement is made that the new owners expected to spend between $1,000,000 and $1,500,000, in improving, enlarging and overhauling the plants. Among some of the improvements contemplated are the erection of a large three-story power house and the equipping of this new power house with machinery sufficient to furnish nearly all the needs of the city from an electrical standpoint. Most of the large sum to be expended in improvements will go into machinery.

The property owners of Fort Worth are now discussing the advisability of voting a bond issue of $1,000,000, for the improvement of the water works system of that city. The city has outgrown the pumping capacity, while there is also a great shortage on mains. A large part of the issue which it is proposed to vote will be used in the purchasing of new pumping machinery.

Considerable progress has been made on the new building which is to house the addition to the Cotton Belt railway shops at Tyler, Texas. The shops, including the part now being constructed and the old shops, will cover nearly 6 acres of land, and about 800 men will be given employment. In connection with the machine shops an up-to-date electric plant is to be installed. Two dynamos with a combined capacity of 700 hp. are to be installed. The power room in which they will be placed has space for another large one, which will be installed as needed.

The Texarkana Seating Company, with S. H. Richardson as manager, is the name of a new enterprise which expects to be ready to begin operations at Texarkana, Ark., about January 1. The incorporators of the company intend to invest $200,000 in erecting and equipping their plant. Ground has already been broken for the building and the company will soon be on the market for suitable machinery.

At a recent election held at Georgetown, Texas, the proposition of voting bonds for $45,000 for the purchase of the private water and light plant at that place carried. The privately owned electric and water plant is to be purchased by the city at a cost of $3500 and the balance of the bond issue is to be used in purchasing new pumping machinery to increase the capacity of the plant.

The Northwest

ST. PAUL, MINN., October 31, 1910.

All through southern Minnesota and the Dakotas there are visible increasing preparations for the production or distribution of agricultural machinery and apparatus or implements of other kinds for farm use, including gasoline engines. Practically without exception local factories are arranging for an increased output to be marketed by dealers in the spring; and outside concerns have been letting contracts for the erection of new warehouses or estimating shops in the principal centers at which orders are taken. The demand for equipment used by manufacturers of such material is keeping up with the general expansion in the various lines affected.

A large new warehouse, with some tools for repairing and assembling agricultural machinery, will be erected at Dickinson, N. D., by the J. I. Case Threshing Machine Company.

The central power station at Belle Fourche, S. D., owned by the Belle Fourche Light, Heat & Power Company, recently burned and will need to be replaced.

The Minneapolis Northern Suburban Railway Company, recently incorporated for $250,000 by John J. McCarthy, Paul J. Marion and others of Minneapolis, will start work in the spring on an electric traction line to Little Falls, Minn.

Quite a number of electric motors will be purchased during the winter and spring by different interests in the vicinity of Coleraine, Minn., as arrangements have been made by the Oliver Iron Mining Company to supply current to other companies there from its new power plant.

The installation of an electric light system has been decided upon at Gilbert, Minn., and funds for the purpose are now being provided.

An addition, 45 x 80 ft., is being made to the cutting plant of the Twin City Granite Works, St. Paul, Minn.

A steel tower and tank are needed at Worthington, Minn., for city service.

A sash and door factory is to be built at Aberdeen, S. D., by the Western Mfg. & Building Company.

A bond issue for the construction of water works was recently authorized at Leola, S. D.

Contracts have been awarded for a new warehouse, 77 x 122 ft., for the American Steel & Wire Company at Fargo, N. D., for which some mechanical and electrical equipment will probably be required.

It is reported from Lucile, Ida., that the United Placer Company may construct a hydro-electric plant of about 3600 kw. in that vicinity.

The Economy Specialty Company, Grand Forks, N. D., has been incorporated with $20,000 capital stock to manufacture the Economy heat conserver and fuel saver for stove and furnace pipes. The company's factory is located at 114 North Sixth street and is equipped with a complete line of pipe making machinery. The officers of the company are: H. G. Snell, president; C. G. Alguire, vice-president; H. J. Johnson, secretary and treasurer.

The Oxford Linen & Mattress Company, Winona, Minn., is having plans prepared by L. L. Summers & Co., 164 Dearborn street, Chicago, for a manufacturing plant comprising six or seven buildings of one, two, three and four stories. Plans are now in progress and the engineers will be ready for figures about November 25.

Preventable Blast Furnace Accidents

Methods of Guarding Against Explosions of "Normal" Gas and Blowing-In Gas—Slips and Breakouts

BY R. H. SWEETSER.*

Of the serious accidents peculiar to blast furnaces there are several that are preventable, and when they do occur they can be blamed almost wholly on improper blast furnace practice. It is the purpose of this article to discuss these avoidable accidents in detail, and if possible to point out the means of preventing the horrible disasters that have too long been considered a necessary evil of the blast furnace business. There are also accidents due to the faulty design and construction of the blast furnaces and their equipment; and often the furnace practice has to be compromised because of construction errors.

Besides the accidents peculiar to blast furnaces there are those liable to happen wherever boilers, machinery and railroad tracks are used. It is probable that many of the blast furnace fatalities of recent years have been due to the rapid progress in furnace construction and output. The designers and construction engineers in many cases have gone beyond the limits of actual experience, and have built big, unruly brutes of furnaces that have required more than ordinary skill of the furnace men who operated them. Thus the very magnitude of the blast furnace process has become a source of danger. But there has also been a disposition to consider that the furnace business is necessarily dangerous, and that certain accidents are unavoidable and must be expected. Improvements in blast furnace practice can change this impression of danger to a feeling of safety and thus help to remove the stigma that has given rise to such expressions as "the making of steel and the killing of men."

Furnace Gas Accidents

Some of the most disastrous accidents around blast furnaces are those due to gas explosions, and many lives have been lost and much property destroyed by their terrific force. These explosions take place in various parts of the plant — at the top of the furnace, in the dust catchers, in the gas mains, in the hot blast stoves; and it is regrettable that even in the past few years there have been explosions of gas in the cold blast mains and blowing engines. Besides these strictly gas explosions there are those "slips" that are so fearful in results and so uncertain at times as to cause. In addition to the explosive force of the gases from the top and from the hearth of the furnace there is also their deadliness when breathed by the men.

Normal Gas

The waste gas of a normal furnace is not a dangerously explosive mixture and is not even a very rich fuel gas, and its control is a comparatively easy matter. Yet when the furnace is stopped for a few minutes and the blast put on again, there *could* be an explosion of this normal gas providing that the gas accumulates where it is mixed with air and is then ignited. Such explosions can take place under the boilers, in the gas mains, and in partly cold hot blast stoves. Usually such explosions are not of much force, but are simply "puffs" that loosen the joints of the gas burners, or blow off the mud or clay used to seal the explosion and cleaning doors of the underground gas flues (for there are some underground gas mains still in use).

There is no excuse for an explosion of normal waste gas, and a careful stove tender or boiler fireman will prevent it by using ordinary care in lighting the gas in the stoves or under the boilers. If the walls of the combustion chambers are already hot the gas will ignite quietly as soon as the gas valve is opened. Otherwise, the gas should be lighted with a little burning wood or coal.

One source of explosions of normal gas is the practice of raising the bleeders whenever the blast is off the furnace to change a tuyere, or for any other such reason. The raising of the bleeder causes an upward draft through the downcomer and dustcatcher, and thus air is drawn into the gas mains and dustcatcher. When the blast goes on again there is danger of having the mixture of air and gas ignite and explode in the dustcatcher and gas main. There is no need to raise the bleeder during a short stop. If the gas from inside the furnace interferes with the men changing a tuyere or boshplate, the trouble can best be remedied by "drafting back" through the bustle pipe and hot blast main to a stove with its chimney valve open. This simple method prevents the gas from coming out on the men at work on the tuyere or plate. At some furnaces the bell is opened to draw the gas away from the tuyeres, but this is not good practice and often heats up the top rigging. A careless stove tender could cause a gas explosion in a "cold" stove by allowing too much gas to enter the stove before it ignites. In such a case there would be enough gas to do damage to the stoves and the inlet valve, as well as to burn the man who did the careless trick.

The analysis of a "normal" gas will vary greatly with the kind of iron being made, the physical condition of the stock filled into the furnace and with the extent of the economic working of the blast furnace practice in question. The amount by volume of CO_2 will be about 12.5 per cent.; of CO, from 20 to 26 per cent., and the ratio $CO \div CO_2$ should be less than 2.

Blowing-In Gas

The most dangerous gas from the blast furnace is that made during the first few hours of blowing in. During the first few minutes after lighting a furnace the waste gas is nothing but smoke from the burning wood. But this very quickly changes to a highly explosive gas containing much carbonic oxide, and considerable hydrogen and marsh gas, but with only a small percentage of carbonic dioxide. The waste gas is now dangerous if not properly handled, and a gas explosion is liable to wreck the dustcatcher, gas mains and the whole top of the furnace. This gas is also very deadly if breathed. In no case should the blast be interrupted after it is once turned on to a newly lighted furnace, until after the first cast of iron is out.

To prevent explosions of the blowing-in gas, all fire must be kept away from the gas burners at stoves and boilers until pressure of the gas forces it through every crack and crevice in the whole gas main system. When all air in the flue connections has been expelled and nothing but gas is inside, then the burner farthest from the furnace can be opened and the gas lighted. As the flow of gas increases, more burners under boilers and stoves can be lighted; but it is better to have too few burners on than to have one burner too many,

* Superintendent Columbus Iron & Steel Company, Columbus, Ohio.

because if air is drawn into the gas main or downcomer the gas will "kick back," and the explosion that follows may wreck the plant with fatal results.

In 1897 the writer made an investigation of the "Analysis of Blast Furnace Gas While Blowing In," and the results were published in the *Transactions* of the American Institute of Mining Engineers (p. 608, vol. XXXVIII). It was found that "during the second and third hours the waste gas is made up mostly of carbonic oxide, with considerable hydrogen and marsh gas. There is but little carbonic dioxide, and the ratio $CO \div CO_2$ is at its hight. A sample taken within the first half hour had 6.66 per cent. of hydrogen, but there was no hydrogen in the sample taken during the third hour. About three hours after the blast went on the gas contained 2.8 per cent. CO_2, 28.8 per cent. CO, 4.2 per cent. CH_4, and the ratio $CO \div CO_2$ was 10.28.

The "Dougherty method" of preventing gas explosions has been used while blowing in, and explosions were completely avoided. This method has been described in *The Iron Age*.

Gas Explosions in the Cold Blast Pipe

It is to be regretted that even in recent years there have been some furnace gas explosions inside the cold blast mains and in the air cylinders of the blowing engines. It is only through bad practice and gross neglect that such an explosion takes place, even if the stove tender is careless and does not close up the stoves. Such an explosion is impossible except when all blowing engines are completely stopped, and at the same time the hot blast and the cold blast valves are open, so that the gas from the hearth of the furnace can work back through the tuyeres into the hot blast main and air "tubs." Usually such conditions exist after the furnace is stopped to change a leaking tuyere or bosh plate. If much water has leaked into the furnace water gas will be generated in the hearth, gather in the hot blast connections, and work back through the stove to the cold blast connections. When the engines are started again there is a mixture of air and water gas in all the connections between the furnace and the engine room, and it is said that the explosion that follows is the most terrific of all that happen around a furnace. The writer is glad that his experience does not include this class of explosion, but he saw a plant shortly after one had taken place. The wreck of the engines, stoves and blast mains was so complete that the furnace was out of blast for several weeks.

The only safe and sure way to prevent such a disaster is to make it a hard and fast rule that the blowing engines must never be completely stopped unless the blowpipes are all down. This means using a little extra steam when the blast is off, but it keeps the engine warmed up and it absolutely prevents gas explosions in the blast mains and engines.

Dangers from Slips

The danger from "slips" in the furnace are as numerous as are the reasons that have been advanced for them. A slip is a symptom of a deranged condition. Frequently the excessive slipping of a furnace has been stopped without removing the cause of the slipping, and in such cases the dodging of the cause has been at the price of increased cost. Although it has been generally conceded that Mesaba ores are more conducive to slips than any other ores, yet it is a fact that the use of 100 per cent. of Mesaba ores is not in itself sufficient cause for slips. Certain ores have had the reputation of being dangerous, but often it has been proved that when these ores are thoroughly mixed and properly used they are no more dangerous than the old range ores.

A very frequent cause of slipping is a small water leak in the cooling plates or tuyeres, especially when the leak is too small to give easily detected signs. Other causes of slips are improper fluxing of the burden, ring scaffolds, scabs, a "dirty" furnace, poor coke, insufficient blast volume, interruptions in filling the furnace, large amounts of ice and snow going in with the stock, improper filling methods and other irregularities in the operation of the furnace or in its internal condition. As a rule the furnace will give some warning signs of a heavy slip, and the proper precautions should be taken to prevent exposure of the men to the falling stock thrown out at the top, or to the molten material and hot gases sometimes thrown out from the hearth. Complete absence of slips is not obtained even in the best behaved furnaces, and it is therefore necessary to provide some means of escape and shelter for the men whose duty it is to visit the top of the furnace when the blast is on.

In case it becomes necessary to check the blast on a furnace that is hanging, there should be an audible signal given, so that men around the furnace, as well as the men in the engine room, will know that the furnace is likely to make a heavy slip. The practice of slowing down the engines without giving the regular signals should not be tolerated, and if it is indulged in these are apt to be fatal results, especially at hand filled furnaces.

Breakouts

The accidents caused by the molten iron breaking through the hearth jackets are, perhaps, better prevented by proper construction than by the proper furnace practice. Yet it is absolutely necessary that even a properly constructed hearth should have careful attention in order to prevent breakouts of iron and cinder. Regularity in the times for casting and flushing should be firmly insisted upon, and the intervals between casts must be governed by construction, rate of driving and common sense. It is dangerous to hold back a cast of iron much beyond the regular time for casting.

Blowing Out

During the blowing out of a furnace there are some dangers from the enormous amount of gas, the volume of which gradually increases from the time that the filling of stock is stopped, and, of course, the temperature of this gas rapidly increases toward the danger line. But with the proper precautions the gas can be safely handled and its explosive qualities can be almost wholly overcome by the use of two or three 1-in. streams of water forced into the top of the furnace through the test rod holes. The water has the double effect of cooling down the gas, thus preventing heating of the top of the furnace and the downcomer, and it also makes such a large percentage volume of steam in the gas that explosions can be practically prevented.

When the last cast is out of the furnace and the blast is thrown off, the blowpipes should be taken down at once, and until the last blowpipe is down the blowing engines should be kept running slowly, and then they can be stopped. Unless the stock has been burned out to below the tuyeres (and only furnacemen of long experience should attempt to do this), each tuyere should be plugged up with clay as soon as the blast is off, in order to prevent the possible blowing out of any gas flames from the hearth, and also to stop further burning of coke as much as possible. The streams of water going into the top of the furnace will quickly cool down the remaining fire inside the furnace.

The Harbison-Walker Refractories Company, Pittsburgh, will make some large improvements and additions to its plant at Wyland, Ala., which will probably more than double the capacity of that plant in the manufacture of fire brick.

Safety Measures in Steel Works

Recent Results Secured by the United States Steel Corporation

In connection with the reading of the paper of William B. Dickson, first vice-president of the United States Steel Corporation, at the recent meeting of the American Iron and Steel Institute, as published elsewhere in this issue, literature was distributed among the foreign visitors showing the measures taken by the United States Steel Corporation to reduce accidents to a minimum. One pamphlet, which is known as Bulletin No. 1 of the United States Steel Corporation Committee of Safety gives an interesting account of the work of this committee. It gives some hitherto unpublished statements as to the large number of recommendations passed upon and the extensive ramifications of the committee's work in the plants of the subsidiary companies. After referring to the creation of the Committee of Safety and the gathering of data as to conditions at different plants and the measures taken to safeguard employees, the account says:

The committee put into operation immediately a system of inspection, selecting men familiar with the machinery and operations of the different subsidiary companies and sending them to inspect the mills and plants. These inspectors are also men of experience in matters connected with accidents, competent to detect sources of danger and able to devise means of avoidance. They report directly to the Safety Committee. Their reports are exhaustive, taking up each building in the plant and covering it in detail. They call attention even to the smallest sources of danger—worn floors, material piled carelessly and windows that should be cleaned to give better light. Their comments cover even loose planks that workmen have left where they might fall. Railings, ladders, footwalks and set screws are given the most careful scrutiny. The reports and recommendations are gone over with care by the Safety Committee and then are sent to the proper representatives of the company operating the plant in question. The committee requests the company to submit within 30 days a return showing what action has been taken to carry out the recommendations of the inspector; or, if objections are made to any recommendations, on what grounds. At the next meeting of the Safety Committee these returns are taken up and discussed in detail. Where objections have been made to any recommendations and the reason for such objections do not seem sufficient to the committee the representative of the company concerned is requested to appear and explain the matter. Whenever it seems necessary the committee, or one or more members delegated for that purpose, make a personal inspection of the plant with regard to any points in dispute.

NINETY-TWO PER CENT. OF SUGGESTIONS ACCEPTED.

In two years the committee has had 78 of the largest plants thoroughly inspected. It has received and considered no less than 5200 recommendations made by the inspectors. More than 92 per cent. of these recommendations were accepted and complied with by the companies interested. Less than 8 per cent. required any additional discussion.

In fulfillment of its further purpose as a clearing house for information of value in the prevention of accidents the committee, during this time, has received from the different subsidiary companies more than 75 suggestions of plans of new devices and appliances for safeguarding machinery, warning employees and otherwise preventing accidents. These suggestions often come in the form of letters stating the experience of the several subsidiary companies in connection with different kinds of accidents due to causes which might exist in other plants. These letters report various kinds of guards for machinery which have been found effective and are accompanied by blue prints, photographs, estimates of cost and all information necessary to all the companies where similar conditions exist, with recommendations from the committee regarding the different suggestions. By subsequent inspections the committee is enabled to tell how fully these different devices have been adopted.

STANDARDIZING SAFETY DEVICES.

The Safety Committee is now endeavoring to standardize those safety devices which are in use upon machinery common to a large number of the different plants. Heretofore each subsidiary company has worked out its own method of guarding flywheels, gears, electric switchboards and similar sources of danger which exist in all large mills. An endeavor is being made to determine, from among the different methods in use to meet certain common sources of danger, which are the most effective and should be adopted by all mills and plants of the United States Steel Corporation and its subsidiary companies. It is hoped thus to insure the use of only the most improved and effective safeguards and, by familiarizing the superintendents and foremen with these safeguards, to bring about their ready adoption everywhere.

In the October Bulletin, from which the above is taken, the committee gives illustrations of the method of guarding the gears, flywheel, belt and pulley of a vertical punch; of guarding a belt and pulley of a drill press; of combining a blower and safety eye shield for an emery wheel; of guarding with a plate the pockets in a planer bed, and of guarding against a foot being caught between the floor and an elevator cage.

The Committee of Safety of the United States Steel Corporation and subsidiary companies consists of the following: Charles MacVeagh, chairman, general solicitor, United States Steel Corporation; C. L. Close, National Tube Company; F. B. Dodge, Tennessee Coal, Iron & Railroad Company; S. W. Tener, American Steel & Wire Company; E. H. Windom, Oliver Iron Mining Company; R. J. Young, Illinois Steel Company.

Needless Waste of Men

Fifty per cent. of the accidents in American industry are preventable, is the claim of the American Museum of Safety. In proof of this it has just opened a permanent exposition of safety devices in the Engineering Societies' Building, New York, to show how the dangerous parts of machines and processes may be protected, so as to save the lives and limbs of the workmen. It thus becomes a clearing house for every worthy device and every worthy thought concerning safety. It is its purpose to place this new museum idea on the highest plane, namely the realization of the greatest ideal regarding conservation — the conservation of human life.

The exposition consists of machines in actual operation, models and photographs of safety devices for circular saws and planers; presses and grinding machines; safety exit doors and fire escapes; respirators and helmets for supplying pure air; elevators, safety lamps, and containers for gasoline and other volatile liquids. Textiles, the building trades, transportation, quarrying, the chemical industries and woodworking contain their appropriate safeguards.

"I'm in trouble," said a pale and worried employer who called at the museum. "I've just lost one of my best workmen, through an accident on our circular saw. The wood kicked, throwing him forward on the saw, which cut him so badly that he lived only a few minutes. What can you show me in the way of a safety device?" Such problems as this arise every day in industrial life and clearly prove the necessity and value of a clearing house of practical information, where employers and workmen alike may go for advice and practical help.

The United States Sherardizing Company, New Castle, Pa., controlling the sherardizing patents for this country, issues a periodical named the *Sherardizing Magazine*, the latest issue of which contains the report made on sherardizing by Prof. Charles F. Burgess of the University of Wisconsin. He gives an exhaustive series of tests made of metal subjected to the sherardizing process.

The Williams Tool Company, Erie, Pa., is operating to full capacity. It manufactures pipe cutting and threading machinery in five standard sizes for pipe from ⅛ to 12 in.; also the Riblet transverse current heater for utilizing heat from gas engine exhaust, made in sizes for water heaters ranging from 50 to 1000 hp.

High Speed Tool Steel

Methods of Manufacture and Heat Treatment

BY WM. VANC. BRANDT.

The making of high speed or self-hardening tool steel differs in many respects from the making of ordinary steel. An important difference is that in making ordinary open hearth steel, for example, the charge is placed in the open hearth furnace in direct contact with the gases and flame, whereas in making tool steel the charge has no contact with the gases. In making tool steel the charge, consisting of carefully selected scrap, mostly old tools, with the addition of enough low carbon scrap to keep the carbon down within the specified limits, is placed in a small crucible. In the making of one well-known brand a black powder containing about 98 per cent. tungsten is then added, so much of this powder being added to each pound of scrap. The chrome is then added in a ferroalloy state and the crucible tightly closed and placed in a pit or furnace. The furnaces may be made to hold as many pots as desired; a four-pot furnace is not uncommon. Hard coal is then packed around these crucibles and hot air blown through the coal, producing gas. The gas passes up and around the crucibles, until the charge is thoroughly melted. If vanadium is to be added it is put in at this point and the metal allowed to boil for about 10 min. longer.

While the metal is boiling down the molds are put in shape to receive the charge. As they will naturally be colder than the molten metal they must be thoroughly heated in order that the metal may not become chilled, which would result in a bad ingot. As a further precaution the molds are covered on the inside with lampblack, an ordinary lamp being used for this purpose. Lampblack or soot acts also as a nonconductor and keeps the metal from coming in direct contact with the inner surface of the mold. The molds used are made in section and may easily be knocked apart, leaving the clear ingot. They vary in capacity, a common size being 3¼-in. section, with hight of 10 in.

When all is ready the molds are set in place, the crucibles lifted out of the furnace and the metal poured in the mold. As soon as the ingot is sufficiently cooled the mold is knocked apart and the ingot covered with coke dust and allowed to cool gradually. This takes from three to four hours. After the ingots are cooled they are placed in an annealing furnace and annealed at about 900 degrees C., this being followed by cooling in the air. They are then forged down into bars and the bars again annealed at a higher temperature, about 1100 degrees C. After another cooling in air the steel is ready to be forged into various tools.

Great pains must be taken in forging the tool, for it is here that a great many errors creep in which result in defective steel. The tool should be forged at a good white heat and care must be taken not to upset the bar. After the forging the piece should be heated to a very high heat. It has been found that the best results are obtained when the temperature is within a few degrees of the melting point, or until the nose of the tool is almost ready to run. Various methods of cooling are employed, as, for example, the use of an air blast or quenching in oil.

After this treatment the tool is ready to be ground and great care is necessary here as in the other processes. The tool should not be ground too fast. If a dry emery is used it should be run slowly and the tool should not be forced too hard against it. It is better to use a wet emery or the ordinary grindstone. By forcing the tool too hard and grinding it too fast small hair lines appear in the structure, which later result in fracture. After grinding the tool is ready for use.

A few years ago, as is well known, most of the tool steel used in this country was made abroad, but of late years many of our own concerns have put this steel on the market, and as just as good results have been obtained from the domestic product, it has gradually come into use throughout the country. This steel is very expensive to manufacture and retails on the market at from 40 to 80 cents per pound. Nearly all high speed tool steels have practically the same constituents. The carbon is kept low, generally running from 0.55 to 0.65 per cent. The tungsten runs about 0.18 per cent., with chrome about 3.50 per cent. and vanadium about 0.20 per cent., when used, with phosphorus below 0.02, sulphur below 0.02 and manganese about 0.30. There is very little difference between the different brands of high speed steel.

Engineers to Visit Aliquippa

The Engineers Society of Western Pennsylvania has arranged an excursion to the new works of the Jones & Laughlin Steel Company at Aliquippa, Pa., on Saturday, November 5. A train will leave Pittsburgh on the Pittsburgh & Lake Erie Railroad at 1:30 P. M. and will leave Aliquippa about 5:30 P. M. The points of interest which will be visited are as follows:

The pump house has an ultimate capacity of 96,000,000 gal. per day; the installation includes four 12,000,000 gal. centrifugal pumps driven by 650-hp. vertical motors, operating on 6600 volt current. The billet and sheet bar mill comprises four 21-in. and six 18-in. mills. The blooming mill is a 40-in. train and is driven direct by a 20,000-hp. Mackintosh, Hemphill & Co. twin tandem compound condensing engine. This mill is in process of building and will not be completed for some months.

The open hearth department equipment includes four 250-ton Talbot tilting furnaces and one 400-ton mixer. There are four blast furnaces of 500 tons daily capacity each, all of which are completed and three are in operation. The blowing engine installation includes 10 vertical cross compound condensing engines. The power house installation includes four 1000 k. w. engine-driven generators, and there are also to be erected two 3000-kw. turbo-generators; in the power house are installed 52 400-hp. gas-fired vertical boilers.

The coal hoist on the Ohio River has a capacity for hoisting 800 to 900 tons of coal per hour. In the tin plate department, the equipment finished and in operation includes 12 28-in. hot mills, direct driven from one engine, six mills on each side; also five cold mills with rope drive and 24 tin pots. The wire and wire nail mill is equipped with electric drive throughout and contains 125 nail machines. The rod mill was built by the Morgan Construction Company, and includes 10 stands of the continuous type.

The parts of the new plant that are in operation are the tin plate mill and the rod mill, both of which have been running very successfully for some time. It will be several months until the open hearth plant is ready for operation, and in the meantime all the pig iron made by the three blast furnaces is sent to the South Side mills of the company in Pittsburgh.

The National Bolt & Nut Company, Pittsburgh, has awarded contracts for buildings, machinery, &c., for the manufacture of cold punched nuts. The equipment will consist of a 150-hp. Miller improved gas engine, Pawtucket nut presses, National nut tappers, machine shop tools, &c. This plant now has a capacity of 75,000 kegs of National hot pressed nuts annually, and the new improvement will make it the largest nut works in Pittsburgh.

Gases in Ordinary Steels

Amounts at Various Stages of the Process of Manufacture

In a recent number of *Metallurgie* is an article by Professor Goerens of Aachen on "The Gases in Ordinary Kinds of Steel." It presents much original work that is valuable. The historical part of the subject is first reviewed, then comes a short study of the various methods of extracting the gases. The method adopted by the author was to place the material in a vacuum and extract the gases at a high temperature. An ingenious and simple apparatus was worked out. The sample is obtained in the form of small chips from a planing or shaping machine, thereby offering the maximum surface and affording ready evolution of the gas. It is contained in a platinum crucible, that fills the under part of a vessel of fused transparent quartz, closed by a ground glass stopper and sealed with sealing wax. This is prevented from melting by a small water cooling arrangement. A small furnace furnished the heat. The apparatus and method of working are fully described in the original paper.

Most of the work was done on basic Bessemer material; but open hearth, electric furnace and crucible steels were also examined. The results are given in the tables below. The heat used varied from 850 to 1000 degrees C., the time of extraction from 12 to 60 minutes, and the weight of the sample from 7.67 to 32.66 g.:

Table 1.—Basic Bessemer.

No.	Charge.	Analysis. C.	S.	P.	Mn.	Si.	Volume of Gas cc.	Gas per 1 vol. metal.	Analysis. CO_2.	CO.	H.	N.
1	1	0.050	0.057	0.074	0.23	0.019	4.74	0.88	20.1	42.1	24.2	13.6
2	1	0.067	0.038	0.079	0.40	0.021	9.52	3.38	7.75	76.3	6.0	9.95
3	1	0.067	0.038	0.079	0.40	0.021	4.94	3.01	4.9	74.9	6.5	13.7
4	2	0.056	0.066	0.103	0.28	0.014	4.51	1.95	13.8	45.1	31.8	9.3
5	2	0.083	0.050	0.103	0.49	0.050	11.56	4.10	14.7	65.1	12.2	8.0
6	3	0.039	0.062	0.070	0.25	0.008	2.51	1.44	9.7	51.8	25.5	13.0
7	3	0.072	0.049	0.072	0.39	0.007	4.03	3.30	8.8	69.9	11.0	10.3
8	3	0.072	0.049	0.072	0.39	0.007	2.04	1.20	0.3	75.9	11.1	12.7
9	4	0.075	0.051	0.085	0.37	0.015	3.34	1.50	6.5	76.6	11.3	5.6
10	4	0.302	0.037	0.112	0.89	0.021	6.85	3.90	1.5	77.2	4.5	16.8
11	5	0.043	0.074	0.086	0.28	0.013	1.55	0.59	9.5	64.1	15.9	10.5
12	5	0.190	0.065	0.106	0.43	0.017	10.98	4.40	4.3	79.7	3.5	12.5
13	6	0.056	0.066	0.103	0.28	0.014	2.61	2.10	24.8	46.5	17.4	11.3
14	6	0.083	0.050	....	0.49	0.050	2.64	2.70	5.8	73.4	7.8	13.0
15	7	0.036	0.064	0.068	0.29	0.010	1.40	1.20	9.9	68.2	20.1	1.8
16	7	0.056	0.053	0.077	0.47	0.016	2.67	2.10	1.1	...	22.2	...
17	7	0.056	0.053	0.077	0.47	0.016	4.79	3.60	10.4	68.5	9.2	11.9
18	7	0.056	0.053	0.077	0.47	0.016	3.68	2.50	9.6	65.1	12.0	13.3

Table 2.—Basic Open Hearth.

22	1	0.093	0.054	0.025	0.30	0.003	3.66	1.7	2.2	85.6	7.4	4.8
23	1	0.138	0.037	0.031	0.93	0.35	4.49	1.9	3.4	82.8	8.1	5.7
24	1	0.138	0.037	0.040	0.93	0.35	1.92	1.6	3.8	74.9	13.9	7.4
25	1	0.142	0.039	0.045	0.93	0.236	1.09	0.85	1.7	68.4	15.4	14.5
26	2	0.108	0.039	0.018	0.39	0.003	3.30	1.7	5.0	78.5	7.4	9.1
27	2	0.114	0.033	0.023	0.60	0.003	3.17	1.8	2.6	83.2	4.7	9.5
28	2	0.112	0.031	0.024	0.58	0.001	6.98	3.3	4.2	81.7	10.2	3.9
29	3	0.140	0.052	0.045	0.49	0.006	3.15	1.7	5.4	79.4	6.3	8.9
30	3	0.175	0.041	0.045	0.77	0.007	3.44	1.7	4.5	79.8	5.6	10.1
31	3	0.137	0.042	0.049	0.65	0.011	3.96	2.3	3.5	78.6	6.7	11.0

Table 3.—Miscellaneous.

	C.	S.	P.	Mn.	Si.	W.						
19	0.058	0.043	0.085	0.12	0.017	...	2.43	1.3	7.5	80.1	7.1	5.3
20	0.076	0.031	0.069	0.12	0.023	...	6.49	1.3	6.4	84.8	4.7	4.1
21	0.150	0.042	0.098	0.22	0.169	...	3.30	1.9	4.7	78.3	11.7	5.3
32	0.40	0.006	0.038	0.43	0.153	0.24	4.87	3.0	0.8	81.6	6.1	11.5
33	0.40	0.006	0.038	0.43	0.153	0.24	2.25	1.9	1.3	69.2	18.6	10.9
34	0.42	0.005	0.031	0.34	0.155	0.57	1.78	1.5	0.7	71.6	7.2	20.5
35	...	....	....	...	....	...	14.30	6.1	3.7	72.7	8.3	15.3
36	3.65	0.005	0.090	0.085	0.014	...	17.05	8.2	11.5	70.5	11.1	6.9

The samples reported on in Table 1 were as follows: Nos. 1, 4, 6, 9, 11, 13 and 15 were taken from the blown metal before the ferromanganese addition. Nos. 2, 5, 7, 14 and 16 were taken after the addition of the alloy. No. 10 was from the same heat as No. 9, and was taken after the addition of both ferro and spiegel, the heat being of rail steel. No. 12 was from the same heat as No. 11, after the addition of ferro and anthracite. No. 3 was taken from the top of an ingot, from the first heat, four minutes after casting. No. 8 was a similar sample to No. 3, but from the third heat, and was taken eight minutes after casting. Nos. 17 and 18 were from the upper and lower part, respectively, of a test ingot from the seventh heat.

The open hearth samples gave the results shown in Table 2. Nos. 22 and 23 were taken shortly before, and shortly after the addition of ferromanganese. No. 24 was taken while casting the first ingot of the same heat, and No. 25 while casting the last one. Nos. 26 and 29 were taken shortly before the addition of the various alloys; Nos. 27 and 30 shortly after, and Nos. 28 and 31 while casting the last ingots.

Nos. 19, 20 and 21 of Table 3 were taken from electric furnace material; No. 19 from the charge after the removal of the first slag; No. 20 after the removal of the second slag, and No. 21 from the finished steel. No. 32 was from a bad crucible steel; Nos. 33 and 34 from good crucible steel. Lastly, No. 35 was a rail steel sample, and No. 36 a Swedish pig iron. It may be seen that in the oxidized condition the amount of gas contained depends on the process, and is the smallest in the basic Bessemer. After the deoxidation with ferromanganese or other alloys, an increase in the amount of gas usually takes place. G. B. W.

British Railroad Mileage.—The length of the running track of the railroads of Great Britain at the end of 1909, as given by the *Railway Age-Gazette*, was 39,622 miles, and the total length of sidings was 14,350 miles. At the end of 1908 the length of running track was 39,316 miles. At the end of 1909 the length of line in Great Britain (in equivalent of single track) operated solely by electricity was 204½ miles, and 229¾ miles was being operated partly by electricity. The corresponding lengths of line at the end of 1908 were 204½ and 200½ miles, respectively. The total quantity of electrical energy used in 1909 was 253,294,628 Board of Trade units.

Ontario Iron Mines in 1909

Five Properties, 263,777 Tons—Possibilities of Concentration

The nineteenth annual report of the Bureau of Mines for the Province of Ontario, Canada, deals with the mineral production in that province in 1909. The output of iron ore is put at 263,777 gross tons, valued at $645,622. The pig iron production was 407,013 gross tons, valued at $6,301,528. The value of all metallic minerals produced in 1909 was $22,928,496. The iron ore was from five mines: Helen in the Michipicoten district, the Dominion Bessemer Ore Company's property near Loon Lake, east of Port Arthur, the Moose Mountain, the Atikokan and the Bessemer (formerly Mineral Range) in Mayo Township, Hastings County. The output of the first two, which was hematite, was 197,193 tons. The last three produced a total of 66,584 tons of magnetite.

The pig iron output was from seven blast furnaces —two each of the Algoma Steel Company at Sault Ste. Marie and the Hamilton Steel & Iron Company at Hamilton, and one each of the Canada Iron Corporation at Midland, the Standard Chemical Works at Deseronto (formerly Deseronto Iron Company) and the Atikokan Iron Company at Port Arthur. The seven blast furnaces named used 220,307 tons of Ontario ore 543,544 tons of foreign ore and 14,486 tons of scale and mill cinder. In the production of 407,013 tons of pig iron, 436,707 tons of coke was used and 973,413 bushels of charcoal. The operations at the various iron mines in Ontario as detailed in the report may be summarized as follows:

A Year's Operation

The Atikokan iron mine resumed work in August, 1909, and produced 150 tons a day during the time of operation. The work consisted of stoping on the wide ore body about 50 ft. from the mouth of the tunnel. A raise was put through west of the tunnel and the ore mined by a system of underhand stoping to the raise. The stope is carried about 40 ft. in width. To the east of the tunnel the ore body has been reached by an open cut. The ore is trammed out of the tunnel and dumped into a large gyratory crusher, then elevated to a bin above the railroad track and loaded direct into cars.

The Dominion Bessemer Ore Company, Ltd., opened up an iron ore deposit in 1909 about 22 miles east of Port Arthur, at the head of Thunder Bay. Two cargoes were shipped before the close of navigation. An ore loading dock has been built and a tramway from the dock to the mine about 1 mile inland. The ore lies in a bedded formation from 2 to 5 ft. thick. Two grades are produced, one running over 55 per cent. iron and the other below. Both are rather high in manganese, with very low sulphur and phosphorus.

The Moose Mountain mine shipped steadily during the latter part of 1909. The ore was taken out by underhand stoping from a vein about 65 ft. high. It was then crushed to an inch product and passed over magnetic cobbers to sort out the waste rock. A large plant has been put in for magnetic concentration. No ore is shipped in the winter months. Shipments are made over the Canadian Northern Railroad 80 miles to the docks at Key Inlet. The bins at the docks are so arranged that they well feed from the center of the bottom to a 42-in. traveling belt. This conveys the ore to a similar belt on the docks which elevates the ore to the dock trestle 60 ft. above the water level. The ore is weighed by an automatic device while on the belt. About 800 tons of ore can be loaded per hour and the pockets have a capacity of 8000 tons. The belts are driven by motors.

The Lake Superior Corporation shipped from the Helen mine about 1000 tons of ore per day in the season of navigation. No. 1 shaft is down to the sixth level, a depth of 450 ft. On the fifth level a body of iron pyrites was encountered and a considerable tonnage has been blocked out. Both iron ore and iron pyrites are now being shipped. Electric power for the surface plant is obtained from the Algoma Power Company at High Falls, on the Michipicoten River. A new 12-drill compressor driven by a 200-hp. motor has been installed, together with an 80-hp. motor to drive the crusher, an 80-hp. motor to drive No. 1 hoist and a 150-hp. motor to drive No. 2 hoist. A new turbine pump driven by a 100-hp. motor with a capacity of 500 gal. per minute against a 400-ft. head has been installed on the fifth level. The company has been developing the Magpie mine, 15 miles northeast of the Helen, and railroad connection has been made with the Magpie. [The first shipment was made last week.—ED.] Other work is being done by the company at Iron Lake, south of White River, and at Goudreau Lake.

Concentrating Ontario Magnetites.

The report contains the result of an investigation by George C. Mackenzie into the concentration of low grade magnetites. The writer says that while Ontario is comparatively poor in deposits of merchantable iron ore, it is rich in deposits of low grade material. Detailed figures are given of the cost of concentrating Ontario magnetites and converting them into briquettes. Mr. Mackenzie says that it has been demonstrated that first-class Bessemer concentrates can be produced from the crude ores tested, the concentrates forming hard porous briquettes more or less peroxidized and free from sulphur when submitted to a process similar to the Gröndal system of briquetting. On the question of cost, the report says:

> Reliable data pertaining to costs of crushing are difficult to obtain, and when obtained are uncertain in application to specific problems. For the reason that different ores are of widely different physical structure, it has been stated that crushing costs may be estimated at the rate of 1 cent per mesh—20 cents per ton for 20-mesh, 60 cents for 60-mesh and $1 per ton for 100-mesh. The writer has had no experience in the application of this schedule, but in so far as he can learn it tallies approximately with the costs of crushing ores of average hardness.
>
> That the process of magnetic separation applied to the concentration of low grade Ontario iron ores is worthy of serious consideration cannot be doubted, and it is not too much to say that the outlook for the establishment of such an industry in Ontario is encouraging. Our blast furnaces are forced to operate with high priced fuel imported from the United States, and, in the majority of instances, are burdened with an ore mixture that yields not more than 55 per cent. of pig iron. Over 70 per cent. of the iron ore smelted in Ontario furnaces is imported from the United States, due to the fact that native mines cannot supply the demand for either foundry or Bessemer ores; indeed, at the time of writing there is but one Ontario mine producing Bessemer iron ore and in limited quantity.
>
> That the production of high grade briquetted or nodulized Bessemer concentrates would find a ready market there can be no doubt, and if a price of $5 to $6 per gross ton for this material could be secured and maintained there should be a comfortable margin of profit above the costs of production and transportation.

Crerar, Adams & Co.'s New Quarters

Crerar, Adams & Co., Chicago, metals and railroad supplies, have removed to their new building, recently completed, at 239 to 259 East Erie street, at the corner of Fairbanks court. They had been established since 1858 at Fifth avenue and South Water street, Chicago, with the exception of one year following the Chicago fire.

The new building is 100 x 130 ft., seven stories and basement. It is of steel construction, absolutely fireproof, with brick exterior and tile floors and partitions, the floors having a concrete surface. Every convenience has been installed to facilitate the transaction of business. There are two large electric elevators, and a pneumatic tube system connects all departments. The general office, on the first floor, is arranged in the style of a bank. It is lighted by the indirect system. The dictagraph, an improvement on the telephone, has been adopted for intercommunication in the office and connecting with the various floors.

The National Enameling & Mfg. Company, Youngstown, Ohio, has been incorporated by William Wilkoff and others with a capital of $25,000. The company has leased the plant of the Youngstown Car Mfg. Company and will make enameled steel conduits. Other specialties will be taken up later.

Hydraulic Pressed Steel Company's New Machine Shop

The question of securing the proper amount of light and ventilation in factory buildings is vital because a well lighted and well ventilated shop means better satisfied workmen and more work per man. Considerable attention was paid to providing adequate light and ventilation in the erection of a new machine shop recently completed by the Hydraulic Pressed Steel Company, Cleveland, Ohio, which was designed by the Forest City Engineering Company of that city. Another important feature in the construction of this building is the small number of columns and the economizing of space in locating them and the shafting. The accompanying engraving gives an interior view of the shop before the installation of the machinery was completed.

This building is 85 x 250 ft., and runs east and west. There are three continuous metal skylights with wire glass extending the whole length of the building, which let in light from the north only, thus excluding the direct sunlight. This is an adaptation of saw-tooth construction to a building running east and west. Ventilation is obtained in the middle and higher bay by monitor windows operated from the ground.



Interior View Showing the Excellent Lighting in the New Machine Shop of the Hydraulic Pressed Steel Company, Cleveland, Ohio

In the center bay a 10-ton crane with 36-ft. span runs the length of the building. At the west end a railroad track passes through the building, enabling the crane to pick up heavy plates and other material from flat cars. There are only 10 columns in the entire building. These are spaced 43 ft. on centers, and the crane runway, as well as the roof trusses, are carried this distance between the columns on deep girders.

The main line shaft is also carried from the bottom chord of these girders, being fastened to sleepers which are hook bolted to angles. This construction is made possible by running the shafts through slots in the columns, thus placing them where they are out of the way of other equipment. A new feature is provided in the construction of the large railroad doors. These are hung on an overhead track similar to ordinary sliding doors, but they are opened and closed in a few seconds by a rack and pinion arrangement.

The Russell-Sklenar Steel Rail Company states that it is planning to establish, possibly at Duluth, Minn., the manufacture of a steel rail patented by Charles A. Russell of St. Paul. The patent covers a form of joint, the end of one rail being provided with a slot or mortise and the end of the other rail with a tenon projecting into the mortise. In this way, it is claimed, labor will be saved in laying rails and angle bars and bolts can be dispensed with.

The Volatile Matter of Coal

The title of the first bulletin issued by the new Federal Bureau of Mines is "The Volatile Matter of Coal." The authors, Horace C. Porter and F. K. Ovitz, conducted their investigations at the Pittsburgh station while it was under the Technologic Branch of the Geological Survey. The results obtained at that plant showed that the work of determining the fuel values of the coals and lignites in the United States would be incomplete if it did not include systematic physical and chemical researches into the processes of combustion. Hence, in their later investigations the authors carried on such researches, concentrating attention on those lines of inquiry which promised results of greatest economic importance. This bulletin is, therefore, a report on an investigafion of the volatile matter in several typical coals—its composition and amount at different temperatures of volatilization. Quoted directly the authors say:

The investigation has already shown that the volatile content of different coals differs greatly in character. The volatile matter of the younger coals found in the West includes a large proportion of carbon dioxide, carbon monoxide and water, and a correspondingly small proportion of hydrocarbons and tarry vapors. The older bituminous coals of the Appalachian region yield volatile matter containing large amounts of tarry vapors and hydrocarbons, difficult to burn completely without considerable excess of air and a high temperature. Coal of the Western type, moreover, gives up its volatile matter more easily at moderate and low temperatures than that of the other type. The volatile matter produced at medium and low temperatures is rich in higher hydrocarbons of the methane type, such as ethane and propane, which contain a larger portion of carbon than is present in methane.

These facts help to explain the difficulty of burning Pittsburgh coal, for example, without smoke, the low efficiency usually obtained in burning high volatile Western coals, the advantage of a preheated auxiliary air supply introduced over a fuel bed, and the advantage of a furnace and boiler setting adapted to the type of fuel used. They bear directly also on the question of steaming "capacity" of coal for locomotives, the designing and operation of gas

producers for high volatile fuels, and the operation of coke ovens and gas retorts.

The results show further that certain bituminous coals of the interior and Rocky Mountain States give promise of good yields of by-products of coking, notably ammonia and high candle power gas, comparing favorably in these respects with the high grade coking coals of the Eastern States.

They show also that inert, noncombustible material is present in the volatile products of different kinds of coal to an extent ranging from 1 to 15 per cent. of the coal.

The Allen Safety Set Screw

A safety set screw made from a solid bar of steel and guaranteed not to mushroom or upset in the hole has been recently placed on the market by the Allen Mfg. Company, Hartford, Conn. These screws are made in a number of different sizes ranging from ⅜ to 1 in. long and with a variety of points such as

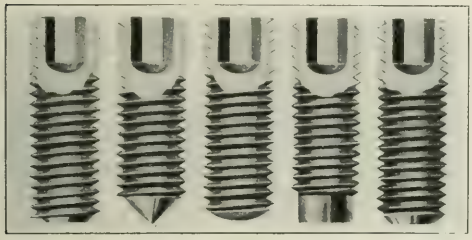


Fig. 1.—A Group of Set Screws Made by the Allen Mfg. Company, Hartford, Conn.

cup, conical, oval, dog and flat which are shown in Fig. 1. A hexagonal hole formed in the other end serves as a hold for the wrench which can be made by bending a piece of hexagonal steel of the proper size at right angles as illustrated in Fig. 2.

The principal advantages of these screws are that all styles of points are available, and it is not necessary to retap holes in order to fit the standard thread. Great strength is another advantage claimed for these screws; it is said to be practically impossible to break

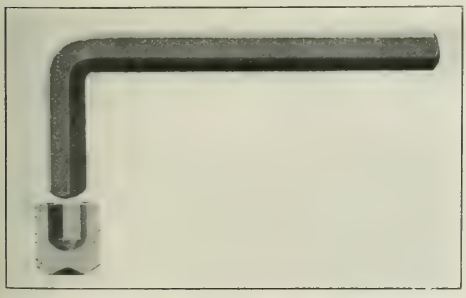


Fig. 2.—Hexagonal Steel Wrench Used with the Allen Safety Set Screw.

or injure the screw. The largest size of screw, which is ¾ in. in diameter by 1 in. long, under test has withstood a pressure estimated at 5 tons without breaking the screw or stretching the thread. The points of these screws are heavily reinforced so as to resist any crushing tendency under heavy strains and the screw mentioned above has ⅜ in. of steel between the bottom of the hexagonal hole and the point.

Factory inspection laws and insurance requirements make it necessary to cover up protruding set screws on shafting and revolving parts of machinery. With the Allen screws no covering is necessary as the screw is entirely contained within the hole in which it fits, and there are no projections to catch on clothing and cause accidents. It is unnecessary with this screw to have a hole in the collar for half of its depth to admit a wrench. All that need be done is to drill a hole through the collar and insert the screw, tightening it with the L-shaped wrench.

The Kentucky and Indiana bridge over the Ohio River at Louisville, Ky., is to be rebuilt for heavier loads and greater traffic capacity. The new structure is designed for Cooper's E-65 loading, and the two long spans over the Kentucky and Indiana channels will be 620 ft. long. The bridge will be a double track structure, with roadways outside of the trusses, and will be supported on new concrete piers. The old bridge was built in 1881-86 and was made up of through truss spans, with a single track and roadways. The live load which the old structure was designed to carry consisted of two 57-ton locomotives, followed by a train load of 2240 lb. per foot, with 1200 lb. per square foot for the roadways.

The Austro-American Magnesite Company, which is owned and operated by the American Refractories Company of Chicago and Joliet, Ill., is pushing rapidly to completion additions to its plant in Austria that will double its present capacity. By January 1, 1911, it is anticipated the output of dead burned magnesite from this plant will range from 60,000 to 75,000 tons annually. Large shipments will immediately be made to the United States to enable the American Refractories Company to maintain stocks at Philadelphia and New Orleans, something it has not heretofore been able to do owing to the heavy demand for its product.

The engineers of the Interior Department are preparing estimates for an appropriation that will be asked from Congress this winter for an interesting highway bridge across the Little Colorado River in Arizona. This bridge will have an arched span of 650 ft., and will have to be erected without false work. It will be similar in design to a bridge across the Zambesi River at Victoria Falls, South Africa. It will span the Little Colorado below Canyon Diablo, the highway for which it is planned running from Flagstaff to Tuba.

The Canton Iron & Steel Works, Baltimore, Md., has been chartered under the laws of Maryland, with a capital of $100,000, and will operate the plant of the former Canton Iron & Steel Company, recently purchased at receivers' sale. John J. Caine is president; H. E. Woodman, vice-president; Wm. Sourbeer, secretary and treasurer, and John C. Brown, general manager. The plant was put in operation October 12 and is now running at practically full capacity, making refined iron bars, muck and scrap bars and socket and staybolt iron.

The Factory Sites Improvement Company, Portland, Ore., has been incorporated with $150,000 capital stock. The company has made purchases of approximately 800 acres of land, having 6750 ft. of frontage on the Columbia River, lying within the 5-mile circle from the business center of Portland and adjoining the extensive holdings of the Swift Packing Company. The land is advantageously situated in relation to the main routes of transportation between the Columbia River and the city.

The Association of Edison Purchasing Agents has elected officers for 1910-1911 as follows: H. C. Lucas, Philadelphia, president; W. H. Francis, Boston, first vice-president; J. W. Brennan, Detroit, second vice-president; A. W. Banks, Jr., Baltimore, treasurer; J. J. Miley, Minneapolis, stock controller; H. F. Frosse, Edison Electric Illuminating Company, Brooklyn, N. Y., secretary.

The Betterment of Labor Conditions in the Steel Industry*

Accident Prevention, Relief and Pension Funds, and the Reduction of Sunday Labor

BY WILLIAM B. DICKSON.†

No man who has had experience in the employment of large numbers of workmen, and, least of all, iron and steel manufacturers, will be inclined to minimize the importance of maintaining such conditions of employment as will serve to keep the workmen contented with their lot. When you take into account the small value of the raw material in the ground required to produce a ton of finished steel—*i. e.*, the ore, coal and limestone, and compare this comparatively insignificant amount with the final total cost of production, you will realize the fact that the great difference is made up of the amounts paid for labor in the various processes from the mine to the consumer. The annual report of the United States Steel Corporation for 1909 shows this in a striking manner in the item of annual salaries and wages amounting to $151,663,394.

While it is true that the importance of the attitude of the wage earner toward his employer has always been recognized, it is only in recent years that the subject has been seriously viewed from any standpoint other than the wage rates, and that there has come a recognition on the part of the employer of what has been called a "social responsibility."

The Human Element Receiving More Attention

Much weight has been given, and properly, to the vast resources of ore, coal and stone which form the basis of our industry, and to the necessity for proper conservation of these materials. We are now beginning to place more emphasis than formerly on the human element, which, purely from the economic standpoint and aside from any altruistic motives, must be kept in condition for efficient work if we are to maintain our position in the world markets. Dr. Eliot of Harvard, says: "Progress is measured by happiness, not by dollars and cents." And no nation can be really progressive unless the great body of its citizen workers are happy and contented.

As an old Carnegie man, you will pardon me if I cite as one of the first notably successful recognitions of the human element as a large factor in successful mill operation, the action of Mr. Carnegie, who made it possible for his mill superintendents and other practical operating men who had risen from the ranks of ordinary workmen to become his partners. He is credited with having made the statement that if he had lost all of his other assets, but had retained his splendid working organization, he could have speedily regained a dominant position in the steel industry. While due allowance must be made for some amiable exaggeration in this declaration, few men who have had any practical experience in the administration of large enterprises will be apt to minimize the importance of the attitude of the workmen to the employer. How best to weld his employees into a compact and efficient working force is a question constantly in the mind of every intelligent employer.

Steel Corporation Methods for the Prevention of Accidents

The most striking instance of the aroused interest in the welfare of the workmen is shown in the effort and money which are being expended to safeguard the lives and health of the workmen. I can best illustrate this by a statement of what is being done by the subsidiary companies of the United States Steel Corporation.

These companies now employ about 50 men, who devote all or a substantial part of their time to questions affecting the safety and health of employees. The officials in charge of this work estimate that a total expenditure of about $400,000 per year is now and will continue to be required for the maintenance of this organization and for providing safeguards and all sorts of safety devices. These range all the way from the protection of a set screw on a shaft to the building of subways under tracks for use of workmen. For a statement in greater detail of methods and appliances for the prevention of accidents, you are referred to an article recently published in the *Survey* by David S. Beyer, chief safety inspector of the American Steel & Wire Company, from which I quote as follows:

> This work is a logical outgrowth of association with the accidents which must inevitably accompany the use of machinery. It is probably safe to say that the casualty or accident department has always preceded the safety department; that dealing with the men who have been injured has brought about a desire to prevent the recurrence of accidents. From the first scattering efforts in this direction have grown more systematic methods, until accident prevention has developed such a variety of detail and such breadth of possibilities that it is fast becoming a technical branch of itself.
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> What was originally a species of self-defense has broadened out into more humanitarian lines, until at present it is being taken up on a scale that would not have been dreamed of in this country a few years ago. Safeguards once considered entirely satisfactory are being replaced by others of improved construction. New forms of protection are constantly being devised. In some of the companies which were brought together in 1901 to form the United States Steel Corporation organized safety departments have existed for the last fifteen years; in all of them more and more attention has been given to safeguarding employees, until at present each of the main subsidiary companies has a corps of trained specialists who devote their time to studying the causes of accidents and to devising means to prevent them. New impetus was given this work by the interest manifested in it, and the policy adopted toward it by the officials of the Steel Corporation.
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> Every year all the men in charge of these matters for the several subsidiary companies have been called together at the general offices in New York for discussion of the problems connected with their work, the first general meeting being held in May, 1906. At these meetings the officers of the corporation have given assurances of support to the subsidiary companies in every practical undertaking for the prevention of accidents. This resulted in the formation in April, 1908, of a Central Committee of Safety. This committee is composed of five members representing subsidiary companies operating the largest plants and mills, with an officer of the United States Steel Corporation acting in an advisory capacity. It was empowered to appoint inspectors to examine the various plants and equipment, and submit reports of safety conditions, with suggestions for improvement. The committee was further requested to record and disseminate data on regulations, rules, devices, &c., tending toward safer working conditions in the plants.
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> The committee has selected as its inspectors men already engaged in safety work in the subsidiary companies; in other words, the matter has resolved itself largely into a system of intercompany inspection, which gives the plants inspected the benefit of new viewpoint and varied experience, and at the same time enables the inspectors themselves to see what is being done elsewhere, and to carry back new ideas and devices to their own plants. The plan has worked well and has been of great assistance to the several com-

* A paper read at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

† First vice-president United States Steel Corporation.

panies, who hitherto have been coping with their own safety problems without definite knowledge of what other members of the great corporation family were doing.

Meetings of the committees are held about once a month, when arrangements for inspection are made and reports considered. Drawings, photographs, rules, specifications, &c., are submitted for consideration, and such as seem desirable are sent out to all companies.

Tennessee Company Welfare Work

Mr. Crawford, president of the Tennessee Coal, Iron & Railroad Company, has devoted much thought to safety and welfare work among his employees. He writes about an interesting development as follows:

One of the most important conveniences for the men is bath-houses, which have been installed at the ore mines. There are at present four in use and two are being constructed. They are centrally located at the different divisions on Red Mountain, are built of brick with concrete floors, separate lockers, and wash-rooms for whites and blacks. They are equipped with shower baths and wash-troughs and hot and cold water. They are heated by exhaust steam and are kept clean by attendants in charge night and day. A charge of 50 cents per month is made for the use of locker and baths. This makes it possible for the men to change their clothes before entering the mine, and on rainy days when they would get wet coming to work they are able to enter the mine and go to work in dry garments.

Previous to the installation of these "drys" many men failed to come to work on rainy days. This has not only been a comfort to them, but their health and efficiency have been greatly improved.

Where the question of patent rights is involved, our companies are properly jealous of any attempt on the part of our competitors to infringe, but in this movement to safeguard the lives and health of our workmen, we will be glad to give every one interested the benefit of our experience, and to aid in every possible way to attack this problem of accidents to workmen at the proper end—*i. e.*, by preventing them. I am authorized by Judge Gary to invite your inspection of our methods and appliances. I have for distribution a limited supply of booklets which have been issued by the various companies, and Mr. MacVeagh, the general counsel of the corporation, and Mr. Bolling, his assistant, who supervise this work, will, I am sure, be glad to answer any questions, either verbally or by correspondence.

In connection with this subject it is interesting to note in the daily papers a statement to the effect that the sum of $50,000,000 will be expended by American railroads in installing safety appliances on railroad equipment under the rules recently adopted by the Inter-State Commerce Commission.

Accident Relief

In spite of every precaution, large numbers of accidents occur, involving temporary or permanent disability or death. To meet this condition and secure some measure of uniformity in all the different departments, there has been devised a voluntary accident relief plan. This plan of relief is a purely voluntary provision made by the companies for the benefit of employees injured and the families of those killed in the service and constitutes no contract and confers no right of action. The entire amount of money required to carry out the plan will be provided by the company, with no contributions whatsoever from the employees. The plan provides different compensation for temporary and permanent disablement, based on the nature of the injury, length of service, and number and age of dependents. The present plan is tentative only, but if it meets with success it is hoped that some similar plan will be permanently adopted.

This question of workmen's compensation is receiving much attention, particularly in those States where large mining and manufacturing industries are located, and the party conventions are bringing it to the front as a political issue by inserting in their platforms planks demanding compulsory compensation laws. New York and Ohio within the past year have passed employers' liability laws, and in the States of Wisconsin, Massachusetts, Minnesota and New Jersey commissions have recently been appointed by the Legislatures to consider the subject of compensation for industrial injuries.

The Law's Delay

Under existing liability laws in the various States, only a small proportion of the workmen injured by accidents of their employment receive anything approaching adequate compensation. The fact that some employers do voluntarily pay their injured workmen even where no legal liability exists, only emphasizes the present chaotic conditions. These conditions are bad enough, even if the questions arising under them were quickly adjusted, but the trouble is intensified and ill-feeling engendered between workmen and employers by what is, in my judgment, the great shame of the American people—namely, "the law's delay." In the majority of cases, the very essence of justice is the promptness with which it is administered, but by delays on technicalities, by retrials and appeals to higher courts, the man of limited means is placed at an immense disadvantage. To our shame we must admit that under such conditions the poor man and the rich man or corporation are not "equal before the law."

I was interested in noticing the language of the oath of office which Mr. Hughes has just taken on his accession to the Supreme Bench. One clause reads: "I will . . . do equal rights to the poor and to the rich." I believe that our independent legislative and judicial systems are the very bulwarks of our free institutions and I have no sympathy whatever with the recent wanton attacks on our courts. I would be the last to question the good faith and honesty of purpose of our judges. Nevertheless, the fact remains that judicial procedure in this country must be simplified before such a statement as is contained in this oath becomes a reality in practice.

President Taft has touched on no question more vital to our prosperity than this one of "the law's delay." We need an American Dickens to show forth in their true colors the workings of our circumlocution offices. The practical certainty of long-drawn-out litigation and the remote prospect of a favorable verdict in many cases, owing to the operation of what many believe to be antiquated "fellow servant," "contributory negligence," and "assumption of risk" clauses in the various statutes have helped to foster another evil —namely, the so-called "ambulance chaser" who preys upon the credulity of the injured person and undertakes the prosecution of his suit for a contingent fee, often amounting to 50 per cent. of the award. Other expenses usually reduce the net amount received to about 30 per cent.

There are great difficulties in the way of framing laws to meet these conditions. The statement has been made that "legislation is the final agency by which the law is brought into harmony with social needs." In other words, legislation, to be effective, must be the crystallization of public opinion. But even if laws are enacted which reflect public opinion and meet the approval of a majority of employers and workmen, they must run the gauntlet of the courts on the question of their constitutionality. In the event of an adverse decision, legislation must, of course, wait until the tide of public opinion has risen sufficiently to carry amendments to the Federal and State constitutions.

Accident Compensation a Charge Against Industry

Personally, I believe that compensation to injured workmen is a legitimate charge against the cost of manufacture and that the victim of an industrial accident or his dependents should receive compensation, not as an act of grace on the part of his employer, but as a right.

The burden of industrial accidents now falls, in

the most haphazard and unscientific manner, on the victim himself and his dependents, the benevolent employer, the sympathetic fellow-workmen, or the public authorities, or on all of these.

I am inclined to believe that the solution will come eventually by the imposition of a tax on all employers based on the number of employees and the hazards naturally inherent in each industry. The proceeds of this tax should be used, first, to perfect and extend the system of factory and mine inspection so as to prevent accidents and remedy unhealthful conditions of employment; and, second, to provide an insurance fund from which payments can be made to the injured or their dependents.

How to bring about conditions which will accomplish this on a basis fair to all interests is, however, a serious problem. My plea to the members of the Institute, most of whom are vitally interested in all of these questions, is to keep an open mind and not to forfeit their influence in shaping legislation by mistaking mere inertia for true conservatism.

"United States Steel and Carnegie Pension Fund"

In addition to the accident relief plan, but entirely separate and apart from it in its administration, the United States Steel Corporation has established a fund of $8,000,000 for pension purposes, which, by agreement with Andrew Carnegie, will be consolidated with the $4,000,000 fund heretofore created by him. The aggregate amount will be known as the "United States Steel and Carnegie Pension Fund;" and the net proceeds will be administered by a board of 12 trustees for the benefit of employees of all subsidiary companies of the United States Steel Corporation. Eight of the trustees have been appointed by the corporation and four by Mr. Carnegie. It is hoped that the details of administration will be perfected so that the plan will become operative January 1, 1911.

The average American workman does not take kindly to any form of paternalism. There is a wide difference, however, between benevolent schemes which impose restrictions on the liberty of the employees and which may be granted or withheld at the whim of the employer, and such general plans as have been outlined, which so fundamentally affect the lives of the ordinary workmen. These are designed to take into account as a proper element in making up costs of manufacture, accidents to and deterioration of the human element, just as in the case of the inanimate machinery or equipment. While the altruistic feature seems to be the most prominent, these plans really have a broader basis in the economic fact that the employer cannot reasonably hope to be permanently successful unless his workmen are also prosperous and therefore contented.

The Seven-Day Week

In conclusion, I would like to emphasize again the importance of a question on which it was my privilege to present a paper to the Institute at the dinner following the annual meeting on May 27—namely, the seven-day week in the iron and steel trades. At that time I said:

> As you are aware, the United States Steel Corporation has recently taken some advanced steps in matters vitally affecting the relations between our various companies and their employees, namely: the reduction of seven day labor to a minimum, the establishment of a system of accident and accidental death relief, and the establishment of a pension system.
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> In considering the first named, *i. e.*, the question of a seven-day week, we were, of course, met at the outset by the difficulty of adjusting a six-day week to the operations which are necessarily continuous, and which are generally so recognized even by the most radical opponents of the seven-day week. This refers particularly to such departments as the blast furnaces. The corporation has not yet been able to devise a practical working system by which the men employed at these continuous operations can be given one day off in seven, and the purpose of this paper is to invite the co-operation of other companies operating blast furnaces, with a view to devising some workable plan. It is my own deliberate judgment, after a period of almost thirty years' continuous connection with the industry, the early part of which was passed in manual labor in the mills, that the present conditions which necessitate the employment of the same individual workman twelve hours a day for seven days a week are a reproach to our great industry and should not in this enlightened age be longer tolerated.

In response to this appeal, a resolution was passed referring the matter to a committee of five to consider the subject and report later. I understand the chairman has appointed this committee, selecting as its members men who have had large practical experience in the handling of blast furnaces and steel works.

The following comments were made by the leading trade journals:

The Iron Age, June 2, 1910.

> With full appreciation of the difficulties involved in the proposal thus put before the steel manufacturers of the country it may safely be said that they are not insuperable. With their record for the solving of problems that have repeatedly blocked the advance of the industry, the engineers and managers who have done so much to put American steel works practice in the forefront will not be willing to confess failure in advance when thus challenged to bring about a much-desired change. Ore unloaders, traveling cranes, charging machines for open hearth furnaces, automatic skip hoists, pig iron casting machines and the whole list of mechanical improvements that have been steadily cutting down the exhausting drudgery of iron and steel works operations, have been the response of engineers to the constant demand for new economies in production.
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> It will scarcely be claimed that the substitution of a six-day week for a seven-day week and the abolition of the 84-hour week in the iron industry are of less consequence than the ends served by any of the mechanical improvements mentioned.

The Iron Trade Review, June 9, 1910.

> The question of Sunday labor is not necessarily a religious one at all. It is a well-known fact that man is not so constituted that he can work year in and year out seven days a week for even less than 12 hours a day and be much better than an animal. There is no time for enjoyment, no time for self-improvement, no time for such intercourse with members of one's family. Work means degradation. Hard as these conditions are, the difficulties of abolishing them have been many, and have been due not merely to the dilatoriness of some manufacturers, but also to positive opposition of workingmen and labor unions, who fought against reducing the hours of labor if accompanied by a corresponding reduction of pay.
>
> A single employer or number of employers could not reduce the working hours without reducing the pay, because the companies having longer hours would be at a distinct advantage. It is not even possible for one part of the country to adopt the short hour system unless a similar policy is followed in other parts of the country. This has been clearly demonstrated in the case of San Francisco, where the adoption of the eight-hour day has proved ruinous to many industries, simply because they could not compete with other parts of the country where the nine and ten hour systems prevail.
>
> If this Sunday work is to be reduced to a minimum, it is extremely desirable that the largest number of employers possible be enlisted in the movement, and, for this reason, such an organization as the American Iron and Steel Institute promises to be could have very great influence in bringing about the proposed reform.
>
> The report of the committee appointed by Chairman Gary to investigate the Sunday work question will be awaited with keen interest. It will be found impossible to abolish Sunday work entirely, especially in the case of the blast furnace, but by increasing the number of employees every man can be given one day off in seven, as is done by seven-day newspapers to their employees.

President Taft has said: "The man who does not hope for better things and does not believe that better things can be brought about, is not the man likely to bring better things about." The encouraging sign of the times is that men who believe in better things and who are in position to give effective help in bringing them about are now taking an active interest in these questions.

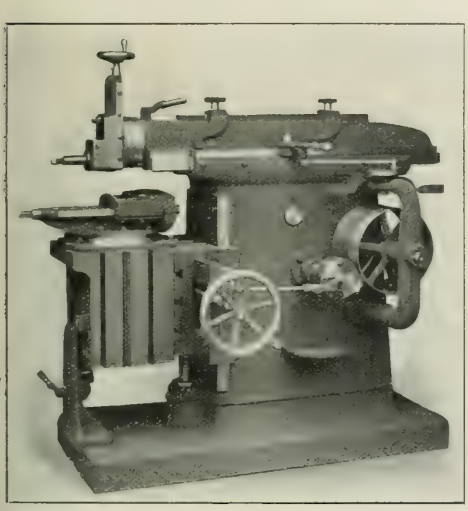
The problems confronting us are not easy ones, but they certainly present less difficulties than those which have been surmounted in other lines. It is not to be expected that men who have been so conspicuously successful in the development of mechanical appli-

ances and processes and in the administration of immense enterprises will fail to solve these social problems when they are confronted with the absolute necessity for their solution.

The Steptoe 26-In. Triple Geared Shaper

A new 26-in. triple geared shaper has recently been brought out by the John Steptoe Shaper Company, 2951 Colerain avenue, Cincinnati, Ohio. This machine is designed to take very heavy cuts with high speed steel tools and is geared in the ratio of about 42 to 1.

Two large diameter rack gears drive the ram, and this construction permits the passing of bars through an opening in the top of the column for keyseating, which is impossible where only one large gear is used. The rack with which these gears mesh is cut from a



A New Triple Geared Shaper Built by the John Steptoe Shaper Company, Cincinnati, Ohio.

solid steel bar and the teeth are staggered to avoid excessive jarring at each end of the stroke and transmit an even pushing strain through both gears. The shifter dogs are placed conveniently on the top of the ram, which allows the dogs to be made larger than usual. The plate for shifting the belt is slotted eccentrically, so that one belt is shifted before the other. This reduces the squealing which is often heard where shifting belts are used on triple geared shapers. An outer support of large proportions is furnished for the driving pulley shaft.

The head may be swiveled to any angle. This adjustment is controlled by the lever at the back of the head, and pushing it from the operator loosens the head for swiveling, while the reverse movement instantly locks it. The table and the apron are both slotted on top and afford very liberal clamping surface. The table support can be quickly adjusted for different hights by the lever at the outer end and has a roller which runs on a plane surface under the table to permit lateral feeding of the table.

The edge of the graduated swivel vise base is beveled at an angle of 30 degrees, so that it can be more easily read. For preventing the upper jaw from rising when the work is being tightened in the vise, the upper jaw has a firm grip around the lower one. Where extreme accuracy is desired and this grip is not sufficient to overcome the tendency of the upper jaw to rise, two additional clamping bolts are provided, which project through the upper jaw, and when fastened will overcome this tendency.

The column, ram and base are heavily ribbed and braced. Cast iron bushings and ring oilers are provided for all the shaft bearings in the column and the shafts are turned with spiral oil grooves to secure the proper distribution of the lubricant over the entire bearing. All the wearing surfaces have flat gibs and in addition the gib adjusting screws in the ram and harp slide are provided with lock nuts. Hand wheels are provided, which will be found to be convenient for adjusting the lead and harp slide screws.

New Bailey Sheet and Pair Furnace Installations

George J. Hagan, Pittsburgh, Pa., sole licensee for the Bailey patents, has received from the Berger Mfg. Company, Canton, Ohio, an order for three additional Bailey combination sheet and pair furnaces, making a total of six furnaces ordered for that company's plant within the last seven months. The first furnace was installed under a guarantee to save 25 per cent. in fuel. The guarantee was exceeded, as the result of a test showed a saving of 40 per cent. over the furnace previously used. The old furnaces had averaged 682 lb. of coal per ton of finished sheets, but with the combination furnace the consumption now averages 404 lb. When the cost of fuel is considered, a greater saving is made than 40 per cent., due to the combination furnace being equipped with a mechanical stoker which enables slack coal to be used as against the dearer run-of-mine coal.

The McKeesport Tin Plate Company, McKeesport, Pa., has placed with Mr. Hagan an order for the furnaces and gas producers that will be required for the second addition to its plant, the first addition installed by him about a year ago having proved so satisfactory as to prompt President E. R. Crawford to write to Mr. Hagan an exceedingly flattering letter. This last order will be completed, and the apparatus ready for operation by December 1. The Allegheny Steel Company, Pittsburgh, has also ordered for its plant at Brackenridge, Pa., Bailey combination sheet and pair furnaces.

The plans and specifications sent out for the new Gary plant of the American Sheet & Tin Plate Company call for combination sheet and pair furnaces of the Bailey type. Several of the plants of that company are already using the Bailey Furnace, notably the Vandergrift Works.

Mr. Hagan is district sales agent for the American Stoker Company, New York, and reports sales of six mechnical stokers, duplicate order, to the Berger Mfg. Company, and six stokers, second order, to the Canton Sheet Steel Company, while an order has also been received from the Allegheny Steel Company. These machines are all eccentric-shaft driven.

International Exhibition at Budapest.—The National Association of Hungarian Ironmongers (Magyar Vaskereskedök Országos Egyesülete) will hold an International Exhibition of Novelties and Patents of the Iron and Engineering Industry in the Industry Palace at Budapest, May and June, 1911. The principal articles to be exhibited are iron and steel manufactures, apparatus for domestic use, technical devices for manufactories, motors and models or designs of new machines. The exhibition is expected to offer manufacturers an opportunity to extend their trade and to secure to inventors the development of patents. It is stated that many patents registered in Hungary lie idle because the inventors are unaware of a way in which to have the invention properly worked. Applications for space will be received until November 30, 1910. The director is Armin Biro, general secretary of the Association of Hungarian Ironmongers, Budapest.

Paying Factory Salesmen's Expenses

Who Should Pay the Expenses of a Representative from the Factory When Sent Out at the Request of a Dealer to Help Close a Deal?*

PAPERS BY FREDERICK L. EBERHARDT, NEWARK, N. J., AND CHARLES H. NORTON, WORCESTER, MASS.

FREDERICK L. EBERHARDT'S PAPER

I realize that this is a question which is likely to be productive of much discussion, and perhaps difference of opinion, principally for the reason that there are so many different conditions that may enter into each separate occasion when assistance from the factory may be required.

The first thought which will undoubtedly occur to those who have not given the subject any consideration is, Why should there be any question as to who should pay such expense? The agent is usually given certain territory, in which he is protected; inquiries which come directly to the factory are sent to him and orders are credited to his account. He is paid a certain percentage for making a sale, and he is presumed to be posted on the machines he is agent for and for the sale of which he is given a commission. The agent has to pay his salesmen's salaries, their carfares and other expenses incidental to effecting a sale. Therefore why should he not also pay the expenses of a factory representative when it is necessary to call on the latter to help close a deal for which he (the agent) is to receive a commission? This, as I said, would probably be a first thought, but after one goes into the subject deeper he finds that there are other sides to the question, and the answer to it will depend largely upon the nature of the machine in question and how frequently assistance is required by the agent.

Why Is It Necessary to Call on the Factory for Assistance?

The answer to this is found in the fact that nearly all of the dealers handle from a dozen to 50 different kinds and makes of machines, tools, &c., and some of them even more than that number. With a limited force of salesmen, it would be practically impossible for the latter to be thoroughly posted on each line of machines they are trying to sell; in fact, I have found that sometimes the factory representatives themselves are in doubt as to the possibilities of machines, and it is occasionally necessary to make tests before the desired information can be obtained, the conditions varying with each case.

In other cases, what might be termed a "wall of reserve" has been built up between the agent and the intending purchaser, due to trouble over some previous sale, perhaps of a machine of some other make, and, while the purchaser might want a certain make of machine, he would prefer to do business directly with the factory representative rather than with the agent. In such cases the agent shows his wisdom in calling on the factory rather than lose the sale. This is where the so-called factory "missionary" comes in—the man who combines practical factory knowledge of the capabilities of the different machines with selling ability.

When Assistance Is Required

It has been my experience that with the simpler machines the agent does not require much assistance. The services of the factory representative are generally required in introducing a new line of machines, with which the agent and his salesmen are not as conversant as with the older line. Again, when selling machines that are of a more or less complicated nature, where, before deciding the customer is in a state of doubt, but eager for practical information or pointers to guide him in arriving at a final decision as to what will best be suited for his requirements—where due, perhaps, to inexperience or lack of information—the agent or his salesmen is unable to speak advisedly. This, then, is when the need or call for the man from the factory originates and is found to be necessary; and it is too often because the salesman has not sufficiently posted himself beforehand, at least to the extent which he should do, in order to be truly a representative.

Qualifications of a Salesman

This naturally leads up to the qualifications to be possessed by a salesman. One finds a great difference as to the ability and qualifications of various agents and their salesmen, which makes the call for assistance from the factory at times absolutely imperative. I feel more attention should be given this point by the manufacturer, requiring that the agent and his salesmen keep better posted and in better training. The one who is best fitted for his work will certainly book more orders and will require less outside assistance than one who does not measure up to the same qualifications. This implies that a salesman, to be efficient and to excel, must first be adapted by nature to the work, and, second, be well trained and posted. He must not alone be a good judge of human nature, but a close observer; he must exercise tact, and possess a certain analytical turn of mind so as to quickly and thoroughly absorb the functional operations and characteristics of the several machines which he is called upon to discuss with the buyer.

A salesman, to be efficient and successful, must be able to convince his customer that his product is the best one on the market and thoroughly suited to the purpose. To convince another of this, he must believe it absolutely himself. To have this confidence, he must have a complete knowledge of his own and competing lines, and one of the best places to obtain this is from the manufacturer. Such a salesman, if of good personality, and having the knack or ability of imparting good, truthful argument and helpful suggestions, will accomplish results and not require much direct assistance from the factory.

Some manufacturers, recognizing the difficulty of securing agents thoroughly versed in the construction and capabilities of their machines—frequently owing to the technical or special nature of the machines themselves—have established their own agencies, manned by specially trained experts from their factories. Some of these manufacturers claim that direct representation is the only way.

What Is Fair for the Manufacturer to Do

But where we are represented by agencies which handle a number of different makes and kinds of machines, as most of us are, I believe it is fair for the manufacturer to expect to be required to do a reasonable amount of assisting by personal representation with prospective customers, and without seriously considering the question of expense. I feel, however, that in such instances both the agent and his salesmen should be on the spot so as to be in a position to thoroughly absorb all of the information imparted at such an interview or presentation of the subject in that particular case; also, that both should have previously

* Read before the National Machine Tool Builders' Association, New York, October 26, 1910.

visited the manufacturer's works, seen the machine in action, and thoroughly informed themselves as to its scope, and become familiar with all or as many of its characteristics as is possible. After a certain amount of this, so to say, "self-instruction," a salesman should be able to present without great difficulty, to another customer having similar requirements, all of the arguments previously presented.

The manufacturer should not be required too frequently to send a representative from the factory to assist in effecting a sale. I would not, however, advise a hard and fast rule, as no two circumstances are entirely alike. There are times when the fact of a personal representation, direct from the factory, adds a certain mutually beneficial tone; also, when the size of the order and the circumstances warrant, I believe it is good business for this to be done, and the expense to be borne by the manufacturer, or, if much of this work were required, the manufacturer and agent might divide the expense. If an agent were compelled to defray the factory representative's entire expenses whenever he felt that the services of the latter were required, it would be simply human nature for him to defer calling on the factory, and he would try to close the order himself, and thus avoid the expense. Such action might, in many cases, be the means of losing sales—not only of that particular order, but also of subsequent orders, that would otherwise have benefited both the agent and the manufacturer.

Sales Price Should Carry the Expense

I do feel, however, that this item of expense, which is an added burden on the manufacturer's profit and which is too often overlooked by the agent and the buyer, could be greatly minimized if the agent would give more attention to the careful selection of his men, see that they are better trained and afford them more opportunities to frequently visit the manufacturers' shops. Too few salesmen are well or sufficiently posted (the fault of either the agent or the manufacturer—sometimes both); too few have the ability to acquire and grasp the practical information which the buyer wishes to know in order to enable him to satisfactorily and confidently make up his mind that the machine in question is going to be the right one for his work, from a practical, economical and modern standpoint. It sometimes happens that a salesman, in offering a machine, will fail to consider whether a customer has other machines of a similar character equipped with tools, fixtures or cutters, which possibly it would be advantageous and sometimes imperative to have interchange with the new machine; or he will recommend a machine of insufficient capacity, &c.

For lack of this information, too often only obtainable on the spot, the salesman unconsciously entails great annoyance and delay to the customer, and involves added expense to the manufacturer. For the correction of the difficulties referred to, I believe it is necessary for the agent and salesmen to "measure up" better to the responsibility of their positions.

I would not, however, overlook the position and responsibility of the manufacturer. He should see that both the agent and his salesmen are amply supplied with all information and assistance to the above end, believing that with a hearty, sincere co-operation less personal assistance from the factory will be required.

A Phase of the Dealer's Side

In going over the merits of the subject with a dealer, he quite naturally unfolded some views of his side of the case, and said: "In reverse cases, would the manufacturer pay the dealer for straightening out troubles on his machines which are not right when sent out? We have had considerable of this work to do, and surely if we had to pay the manufacturer for his services we would insist upon his paying us for ours when the case was reversed."

This phase of the situation, from the dealer's side, may at times be more or less true, depending upon the circumstances; it, however, only emphasizes the old saying that there are always two sides to a story, and each side should be disposed to play fair.

The proper question to ask, it seems to me, is not who shall pay the expenses, but when shall the expenses be paid by the manufacturer, or, rather, when shall the agent call on the manufacturer, at the latter's expense, to assist him. This matter, then, resolves itself largely into a question of the personal equation, and results will vary accordingly. It is up to the manufacturer, the agent and his salesmen, and the amount of interest and energy the latter are willing to put into their chosen work. If the agent or the salesman possesses the right mettle he is bound to succeed, but only by close attention and personal effort. It seems to me that these thoughts surround and govern the whole subject, at least so far as trade in this country is concerned. The more they are considered and practiced, the better will be the results obtained.

CHARLES H. NORTON'S PAPER

This question raises other questions which the Norton Grinding Company feels are related to this one, and quite as important:

1. How can the maker of machine tools be sure that he or his tools shall be understood before they are sold, and afterward?

2. How can the maker be sure that the right tool is recommended for the work to be done?

3. How can he be sure the right equipment is selected and specified?

4. How can he satisfy the customer that the tool is suitable after it is installed?

We have not found it practical to rely upon the agent and his salesman alone for efficient service along these lines. We find the agent and his salesman very helpful to us in introducing our machines and in the care of customers generally, and we would not think of dispensing with their services; but we do not believe any one can correctly present a machine tool to a buyer unless he has either designed it or is familiar with its construction by the actual work of constructing it, or that any one who has not actually produced work with it can correctly estimate on work for a new customer.

One not familiar with a tool is poorly fitted to defend it against the misstatements of competing agents when in conference with a doubting buyer. Selling a machine tool is very different from selling cloth or cigars. It is nothing to say that "they are made by the best people, and we put the best goods into them." Therefore, the one who is discussing the question with the doubting buyer must be absolutely familiar with all sides of the question.

Reaching the Customer Through Agents

It seems necessary to reach the customer through agents. This being true, we believe it is necessary to train a man in our own works who shall act with the agents to secure and maintain a correct understanding between the customer and ourselves. The average foreman and workman cannot be trusted to correctly look into the merits of a proposed tool, and the average buyer buys what his foreman says is best; so it becomes necessary for the maker to be sure his tool is understood by the buyer, in order to secure the order.

To secure such understanding it is necessary that some one who knows shall present the case, and what is more convincing than to be able to say, "I know, because I have come up in the works where these tools are made, and I will come here to your works and make good if you buy." It is also necessary that he should go when the tool is sold and be able to take off his coat and cuffs and actually teach the workman to produce work as guaranteed.

We found that we were constantly in trouble because of the lack of mechanical knowledge on the part of the salesmen, and any effort on their part to familiarize themselves with our tools was bounded by a few hours between trains and without the removal of their cuffs. We felt that we must be represented by trained mechanics, men who had trained in our own work, and who could at all times keep us in touch with all the facts, favorable as well as unfavorable, for it would seem that the average salesman is very quick to fall into the customer's way of thinking and to assist him by assent to the customer's criticism, rather than to defend intelligently the machine he is representing.

A man from the works is better prepared to meet unjust criticism and to satisfy the customer of the correctness of his machine, as well as to satisfy the works of errors they may have made in the machine and that would justly merit criticism.

We have an arrangement with our agents in regard to commissions by which we are able to furnish a man from the works to work with our agents, although this arrangement does not pay all of the expense; a part of it is borne directly by us. We believe, however, that it is the most profitable way to proceed, and so far it has worked out well.

At first the plan was looked upon with disfavor by all but one of the agents. Now all agents like it. Our men work with the agents, but continue in our employ, we paying their salary and all expenses. They, of course, do not take the place of the agent and his salesman, nor do they assume anything belonging to the salesman. They work with the salesman, assuming the authority for all estimates or guarantees, explain mechanical features, render intelligent reports to us of all criticisms from our customers and all defects of our tools as they see them in use.

The Value of Co-operation

Working, as they do, with the agent and salesman to assist in making sales and satisfying customers, they are brought face to face with all sides. Their familiarity with the technical features and personnel of our works enables them to report intelligently to us, and enables us to understand them, and to correctly diagnose all cases and prescribe the remedy, with the result, as we now believe, that we have a better understanding of the user's position and the buyer and user have a better understanding of our tools.

We believe that in cases where such a plan as we follow is not in force, and when, on occasion, the agent shall ask that a man be sent to assist him, it is for the best interest of the maker to send a man at his own expense, until some arrangement can be made. It has always been our habit to send a man on such occasions, paying all of his expenses.

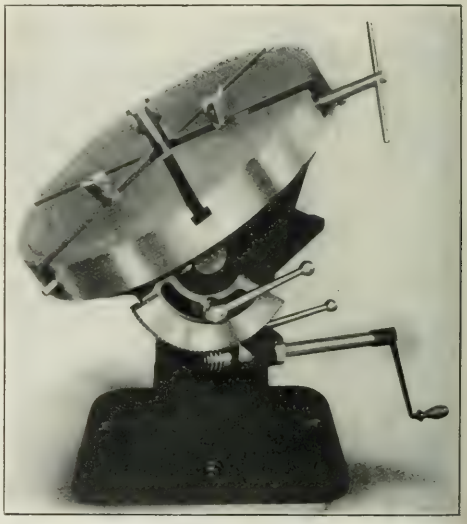
We feel that it is for the best interest of the machine tool maker to be more directly represented, and in saying this we do not depreciate in the least the dealer and salesman. We believe they are necessary to success.

Employees Remembered by a Deceased Manufacturer.—Isaac Smith Remson, president of the I. S. Remson Mfg. Company, Brooklyn, N. Y., who died October 13, has provided in his will that as "a certain amount of success in general business is due to faithful employees and they are entitled to a share of the assets which have naturally been increased by their co-operation," he leaves to the officers and employees of the company certain sums to be reckoned as follows: After one year's service and up to five years, $100 for all or a portion of the first five years' service; after five years' service, the sum of $50 per year up to ten years; after ten years, $100 per year for the entire length of further continued service, no fraction of years to be allowed. The company was formed in 1890 and is thus twenty years old. It builds wagons and manufactures automobile accessories.

The Gang Universal Drill Table

The William E. Gang Company, 1543 Queen City avenue, Cincinnati, Ohio, has recently placed on the market a table for radial drills, with chuck attachment which is universal in every respect. The upper part, which carries all of the operating levers, swivels in a complete circle about the base. In addition to this rotary movement the chuck can also be turned upon its center regardless of the angle to which it is tilted. This latter movement is accomplished by a crank, worm and large diameter worm wheel segment graduated from 0 to 90 degrees, the last insuring the setting of the table accurately at any desired angle.

The chuck, which was originally designed for drilling copper blast furnace tuyeres or work of a similar nature, is of the three-jaw independent type, 26 in. in diameter, and will hold work of round or irregular shape. The jaws are made with a false front for chucking castings which are tapered both internally and externally and adjusts itself to any taper within wide limits. A spring to keep the false jaws tilted back toward the center of the chuck is also furnished, its purpose being to render the placing of tapered bore work in the jaws easy, as it is only necessary to loosen one of the three jaws to remove or replace work in the chuck. These jaws are reversible and can be removed if desired, so that the chuck can be used as an ordinary round table.



A New Universal Table with Chuck Attachment, Made by the William E. Gang Company, Cincinnati, Ohio.

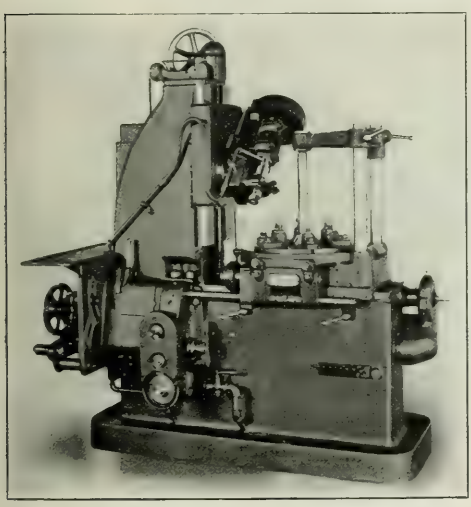
Instead of the 26-in. chuck illustrated, this table can be furnished with a 26-in. plain round top or a plain square top measuring 2 in. less on a side.

The Lake Superior Corporation has made the first shipment of iron ore from its Magpie iron mine in the Michipicoten district to its plant at Sault Ste. Marie, Ont. A railroad has been built to the new mine, from which shipments are expected in time to equal those from the Helen mine, which is 15 miles from the Magpie. These two properties when fully worked are expected to make the Sault works independent of Minnesota ores, which are now used in part.

A New Gould & Eberhardt Gear Hobber

The Latest Automatic Machine for Spur, Worm and Helical Gears

One of the latest and most highly developed hobbing machines manufactured by Gould & Eberhardt, Newark, N. J., for cutting spur, helical and worm gears is illustrated herewith. The object of the manufacturer has been to develop a machine which would operate at the highest possible efficiency when using high speed steel hobs. With this end in view several parts of the machine have been strengthened and enlarged, and the operation rendered simpler by locating the operating levers in more convenient places. Two sizes of hobber are built, one having a capacity of five pitch in cast iron and six pitch in steel blanks 12 in. in diameter with a 6-in. face, and the other handling blanks 24 in. in diameter by 10-in. face width, with a capacity of four pitch in cast iron and five pitch in steel. These machines are suitable for all classes of small and medium sized gears, such as change gears, gears for textile machinery, automobile transmission and timing gears, gas engine valve motion gears, herringbone gears when made in halves, steering gears



A New Type of Hobber for Spur, Helical and Worm Gears Built by Gould & Eberhardt, Newark, N. J.

for automobiles and worm feed gears for lathes and drill presses.

The face plate or revolving work table is made in one piece with the index worm wheel, a form of construction which is claimed to be very rigid and reduce torsional strains to a minimum. The work slide furnishes a rigid support at its outer periphery, and the table is arranged so that it may be revolved in either direction to accommodate right or left hand gears. The work slide on which the table is mounted can be adjusted longitudinally on the base of the machine for different diameters of blanks or depths of teeth and is also employed when cutting worm wheels. For reading the center distance between the cutter and work spindles and also for obtaining the desired center distance in hobbing worm wheels a scale with vernier attachment is provided. On the standard machine this adjustment is made by hand with a crank handle, but if desired an automatic adjustment known as an automatic in-feed, which forms part of the machine shown in the engraving, can be furnished at a slight additional cost. In the machines equipped with this attachment as soon as the gear has been cut to the desired depth the feed is automatically stopped. The work table revolves upon an antifriction washer in the work slide, and at this point there is a channel into which the oil supplied to the cutters and the chips drop. From this channel they are carried to the front of the slide and drop into the base of the machine, thus preventing the chips and the oil from flowing on the floor and keeping the machine clean.

One work arbor is furnished with each machine, but is left blank so that it may be finished to required size. The arbor is mounted in a convenient manner, and is supported rigidly at its outer end, so that it may be used up to the full rated capacity of the hobber. This support is a very important feature, especially with the long and slender mandrels employed in cutting helical gears of extreme angles, and when several blanks are mounted on the arbor at once as it makes it possible to cut a greater number of gears at one setting. The support can be swung to one side, which makes it possible to remove the finished gears and mount new blanks on the work arbor conveniently, while by removing the two uprights carrying the triangular supporting arm, gears having a larger diameter than that for which the machine is regularly rated may be cut.

The indexing worm wheel is of the split type, and is hobbed in place which is said to insure a very accurate wheel. High-grade machinery steel is used for the worm, which is hardened and ground and runs in an oil bath. The teeth of the gear are of coarse pitch. The worm is mounted in rigid bearings so arranged that it can be disengaged from the indexing wheel conveniently, and the latter revolved by hand to ascertain if the mandrel and gear blank run true. This feature is convenient and also important because if accurately running gears are to be secured they must run true while being cut. A perfect fit is always maintained between this worm and worm wheel, and the former has a micrometer adjusting device by which the work can be adjusted circumferentially without disconnecting any mechanism. This is very essential in cutting helical gears or resetting a spur gear which has already been cut and the design of the device is such as to adapt itself readily to a very minute adjustment and still maintain a positive connection between all parts.

In cutting helical gears and especially when cutting the first one of a size, it is frequently desirable to take two cuts to obtain the correct tooth thickness. A patented device is furnished to set the machine at the original or zero position when commencing to cut a gear wheel of this type, and a second cut may be taken by simply returning the machine to this zero position. This device is said to save considerable time and do away with the experimental adjustments which would otherwise have to be made. In the absence of a resetting device it would be necessary either to cross the belt and run the machine backward until the cutter slide had returned to its original position or loosen the gear on the mandrel, or else take off the change gears so that in starting the second cut the cutter would cut uniformly on each side of the tooth. A complete set of indexing gears is furnished for cutting every number of teeth from 10 to 100, and also a large number of teeth up to 400, while the machine is so arranged that by special calculation spiral gears having prime numbers of teeth may be cut without employing special indexing gears.

A vertically adjustable cutting slide, carrying a supplemental slide which may be swiveled and adjusted to any angle, is mounted upon the stanchion at one end of the frame. This supplemental slide is counterbalanced and may be adjusted vertically by hand or power, the hand wheel being mounted at the top of the stanchion near the side where it can be conveniently reached by

the operator. The cutter spindle has powerful gearing and is arranged to swing above the horizontal when cutting either right or left hand gears, and when the cutter spindle is swung to one side or the other means are provided to have the spindle revolve in the proper direction. For taking up the wear taper wedges are provided. To secure symmetrically formed teeth it is important that the tooth and the hob be set central with the work arbor; for this purpose a gauge is provided which is so arranged that it is always in place in the slide. Thus the gauge is in position when the operator requires it, and the hob may be set centrally regardless of whether the work is in the machine or not.

The power feed is down for either right or left hand gears and is of the draw cut type, the feed parts being arranged in the base of the machine and the bed of the machine. Electric motor drive can be readily applied, and an adjustable speed motor with a 3 to 1 ratio and a maximum speed of 1500 rev. per min. is recommended.

The Anderson Gear Rolling Machine

A Radically New Process for Forming Gears

Harold N. Anderson, mechanical engineer of the Speedwell Motor Car Company, Dayton, Ohio, has invented the machine which is illustrated herewith for rolling the teeth in steel spur blanks. Fig. 1 shows the operating side of the machine (since the photograph was taken the pulley at the back has been replaced by a large gear driven by a pinion), Fig. 2

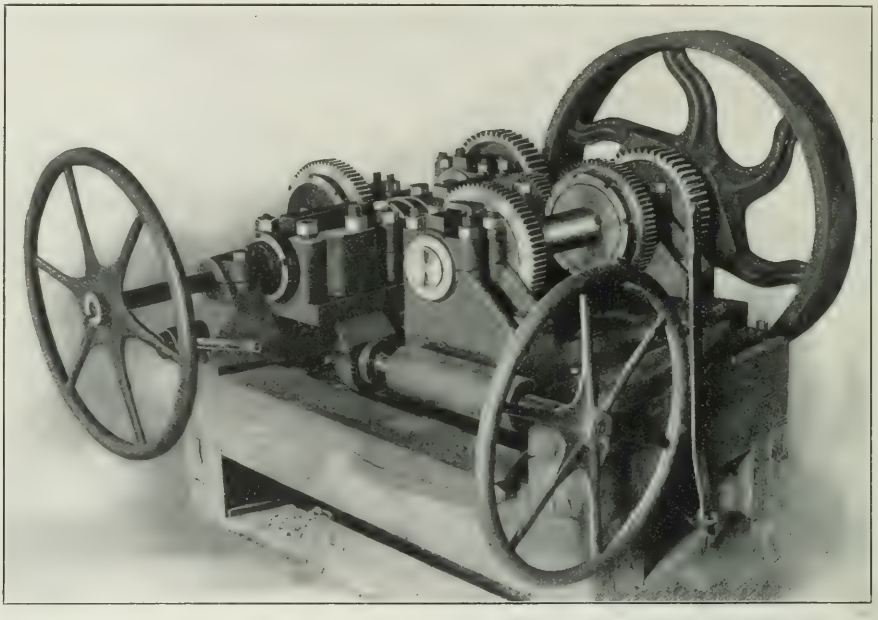


Fig. 1.—Operating Side of a New Gear Rolling Machine Invented by Harold N. Anderson, Dayton, Ohio.

conveniently engaged or disengaged by a handle on the side. The advance of the feed is controlled by the rotation of the work regardless of the number of teeth or diameter being cut, and is a definite amount for each rotation of the spindle carrying the blank. The feed change gears are located at the rear of the machine and are placed according to the indexing chart or in the position obtained by calculation. The speed of the cutter is regulated by a large diameter cone pulley running on a sleeve bearing which takes all the strain due to the pull of the belt that would otherwise come on the pulley shaft. This method of support eliminates the necessity of an outer support on the shaft and is said to insure the proper meshing of the driving gears on this shaft at all times. A great variety of speeds are obtainable at the cutter spindle, and the proper one for the cone pulley may be selected from the index furnished with the machine.

These machines can be arranged to cut steering gears with single, double, triple or quadruple thread milling cutters where the lead is greater than 2 in. at a slight additional cost, the regular machine handling worms under 2-in. lead. An oil pump is furnished which is attached to the side of the machine and driven by gears capable of easy disconnection when it is desired not to use the pump. An oil pan which catches any drippings from the machine is cast around

gives details of the machine and Fig. 3 shows a pair of gears rolled on the machine.

The advantages claimed for this process are cheapness, a much stronger tooth, a generated and developed tooth, elimination of the tendency to warp, ability to use any kind of steel and the impossibility of eccentricity in the gears. The whole periphery of the gear is rolled in one or two heats depending on the size of the blanks, which means that as a general thing the gear is not in the machine for a period longer than 45 seconds. In rolling the teeth, each one is practically forged by an enormous side pressure on each blank which tends to make the metal in the teeth very dense and hard. As compared with a cut gear, the tendency of a rolled gear to warp during case hardening is claimed to be a great deal less, as the structure of the metal at the periphery is changed while hot, and there are no internal strains to be relieved in the case hardening operation. It is claimed that this process can be employed with any alloy steel gear the blank of which can be drop forged and in silicomanganese steels, which are almost impossible to machine, the teeth can be rolled and ground and the hole ground, thus completing all the operations by forging and grinding. The gears are held at the periphery in a chuck, and the center hole is bored as a last operation, the position of the work being adjusted from the pitch

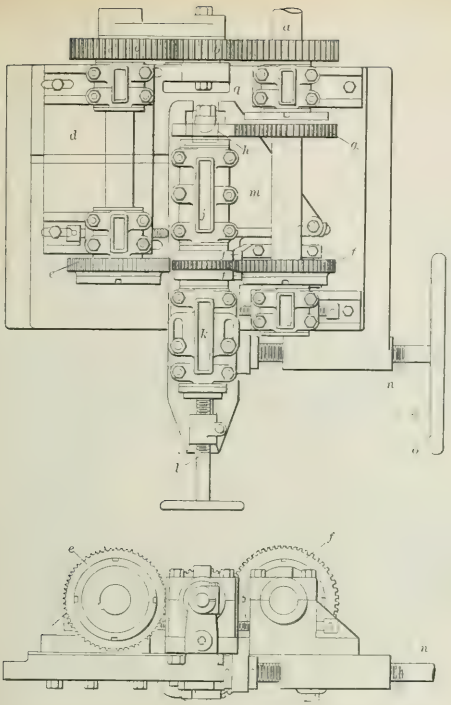


Fig. 2.—Plan View and Elevation of the Machine, Showing Details.

line of the teeth. In this way the hole must be concentric with the pitch diameter, whereas in cutting a gear there is possibility of eccentricity if the arbor springs or is untrue.

As will be noticed from Fig. 2, the machine is very simple. It comprises the driven shaft *a* which drives the shaft *d* through the gears *b* and *c*. The break down or roughing gear *e* is mounted on the end of this shaft, while on the end of the driving shaft is mounted the finishing gear *f*. A timing gear, *g*, is also mounted on this shaft and drives the gear *h*, which is of the same size as the gear to be rolled. The gear blank *i* is held between two chucks *j* and *k*, whose

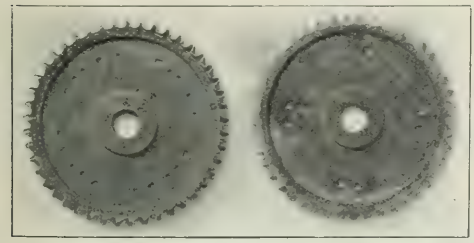


Fig. 3.—A Pair of Spur Gears Rolled on the Machine.

movement is controlled by the screw and hand wheel *l*. The entire carriage *m*, which carries the chucks and the gear blank, pivots on *q*, which is in line with the edge of the gear *h*, and a screw, *n*, controlled by the hand wheel *o* oscillates the carriage.

In operation the blank *i* is inserted, and the carriage thrown over toward the break down gear which does the roughing work. This operation is very interesting, as the blank to be rolled is only a trifle larger than the pitch diameter of the finished gear. This gear serves to break up the metal, and to force it out to a larger diameter. After this has been done the blank is then pressed into contact with the finishing gear *f* until the proper depth of tooth is reached and also the proper diameter of the gear. At the same time the surplus metal thrown out on the end of the tooth is trimmed off by the cutter *p* by the movement of the carriage which brings the edge of the blank in contact with the cutter. The gear is kept in this machine until a permanent set is reached, and is then pushed off the arbor by the stripping device which cannot distort it. After the tooth is rolled it is said to be absolutely free from scale.

Although primarily designed for rolling spur gears, the process can also be applied to bevel gears with an even greater decrease in the cost. In roughing the teeth of a bevel gear by this machine the sides of the teeth have the true tooth curve with an evenly added amount of material to be removed in finishing. This result is different from that secured by the ordinary roughing machine which cuts a perfectly straight side to the tooth. Consequently the generating machine is required to remove more stock in rounding the corners at the top of the tooth than on the pitch line.

If very great accuracy is desired, the gears should have a finishing cut, but it is believed that with a further development of this process that these gears can be used in the cheaper grades of motor cars without any finishing cuts.

George W. Perkins on Profit Sharing.—The New York *Evening World* of October 29 contains an interview with George W. Perkins, member of the banking firm of J. P. Morgan & Co., and also a member of the Finance Committee of the United States Steel Corporation, in which he gives his views on profit sharing as a means of avoiding strikes. He claims that the officers of great corporations should remember that such concerns are more nearly public institutions than private property. Speaking of the success of the profit sharing principle as adopted by the United States Steel Corporation and the International Harvester Company, he said: "The corporations of the future must be those that are semipublic servants, serving the public, with ownership widespread among the public, and with labor so fairly and equitably treated that it will look upon its corporation as its friend and protector rather than as an ever-present enemy, above all believing in it so thoroughly that it will invest its savings in the corporation's securities and become a working partner in the business."

A Baltimore Shippers' Association.—Through the efforts of A. E. Beck, traffic manager of the Merchants and Manufacturers' Association, an organization of the shippers of Baltimore and vicinity has been formed, known as "The Shippers' Conference," which will meet monthly. A committee termed "The Conference Committee" meets weekly for the consideration of traffic matters and to devise plans for the adjustment of differences between shippers and carriers. The organization is now arranging for a conference between representatives of shippers and carriers for the discussion of means for the betterment of transportation facilities. The plan is reported as being regarded with favor by the transportation interests.

A paper on the rotary kiln, by Ellis Soper of Detroit, will be presented at the New York meeting of the American Society of Mechanical Engineers, 29 West Thirty-ninth street, on the evening of November 9. Following this paper, Charles Whiting Baker, editor of *Engineering News*, will give an illustrated lecture on the Panama Canal. The date of this meeting has been changed from the customary one, because the meeting would have come this month on Election Day.

The Fay & Scott 16-In. Lathe

A New Geared Head Lathe with Instantaneous Speed Variation

Instantaneous spindle speed variation is obtained in a new type of single belt drive friction geared head lathe developed by Fay & Scott, Dexter, Maine. The tool is fitted as a plain turning lathe without any lead screw and is designed to be belted directly from the line shaft, but if desired a lead screw and compound rest can be applied. Fig. 1 is a general view of the new tool, Fig. 2 is a view looking down on the headstock with the gear guards removed to show the gearing, and Fig. 3 is a section of the headstock taken at right angles to the view shown in Fig. 2. In this tool the following standard modern features have been incorporated: A hollow hammered steel spindle with ground bearings, bronze boxes, a tailstock of the cutaway type, a wide waist carriage, a flat inside front track and a double plate bevel gear type of apron with reverse and positive lockout of feeds when cutting threads.

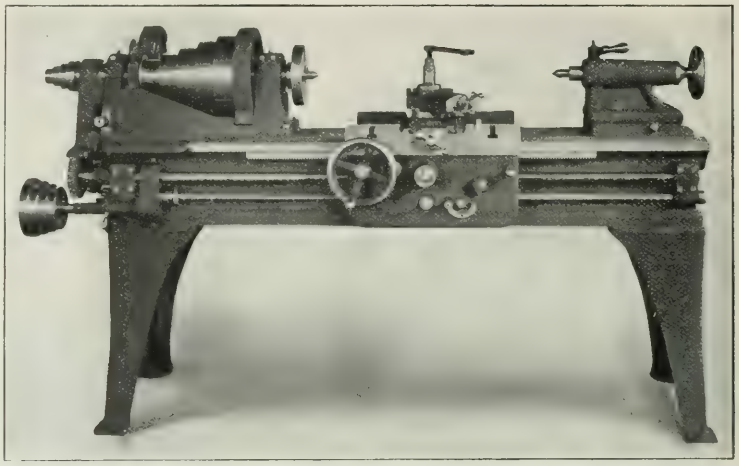


Fig. 1. A New 16 In. Geared Head Lathe Built by Fay & Scott, Dexter, Maine

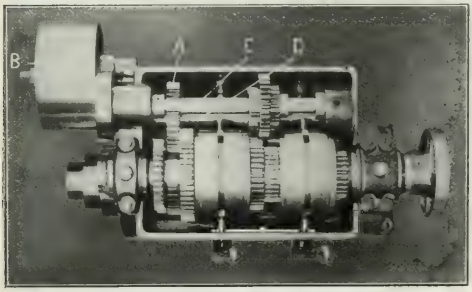


Fig. 2.—View Looking Down on the Headstock, with Gear Guards Removed.

Four mechanical speed changes obtained by friction clutches are provided. These clutches are of the expanding type with cork inserts. The two levers located at the front of the headstock control the changes, which are made while the machine is in motion without any shock to the gears. The sleeve *a*, Fig. 3, carrying the gears *b*, *c* and *d*, is driven at a constant speed and turns on the shaft *e*. The four gears *f*, *g*, *h* and *i* are mounted on four friction bands, *j*. These rotate idly on the spindle *k*, but can be bound thereto by the four frictions *l*. These last four gears are always in mesh with those on the sleeve *a* and drive the spindle at four different speeds. The engaging of two conflicting ratios of gearing simultaneously is impossible. All the working parts are readily accessible and the friction clutches have a single adjustment by a screw driver. The entire mechanism runs in an oil bath, eliminating noise.

Power is transmitted from a single driving pulley, B, on the back of the tool, through the reducing gears on the shafts C and D to the gear A, which meshes with the gear *c*. In this way the spindle is relieved of all belt pull, tending to force it out of line and runs true at all times.

Reverse speeds can be obtained by using a two-friction countershaft, or a greater number of speeds with a variable speed countershaft. The equipment regularly furnished includes all the accessories for a tool of this nature, while the following can be furnished as extras: Taper attachment, oil pan and turrets fitted to the carriage or the Vs.

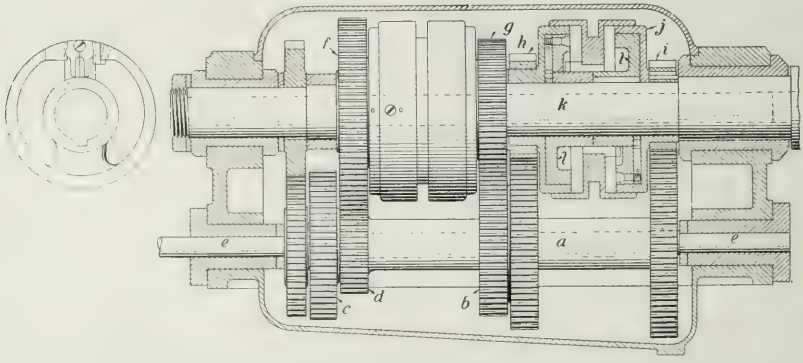


Fig. 3.—Vertical Section Through Headstock, Showing Speed Change Gears.

Some Difficult Special Castings

An order recently completed by the Marshall Foundry Company, Pittsburgh, Pa., for the St. Lawrence River Power Company, Massena Springs, N. Y., comprised a number of special gray iron castings which are interesting. Fig. 1 shows an end and side view of an upper draft tube thimble and Fig. 2 is a cast thimble for a thrust bearing, while Fig. 3 shows one of these thimbles being finished in a boring mill. Fig. 4 is a view of a carload of castings forming an export shipment.

The thimble shown in Fig. 1 is one of five which is to be used in the construction of a new plant by the power company. These castings are said to be the largest ever made for this character of service, and the work of casting them in green sald molds involved some difficulties owing to their peculiar shape. These castings will be mounted on heavy concrete foundations, and as they are required to sustain a heavy load and are under constant pressure they had to be perfectly sound. The thimbles were 17 ft. 10 in. long, at the bottom, 10 ft. wide and 6 ft. high, and weighed 28,000 lb. each. The machining of all the joints and flanges of the castings was done by the Marshall Foundry Company.

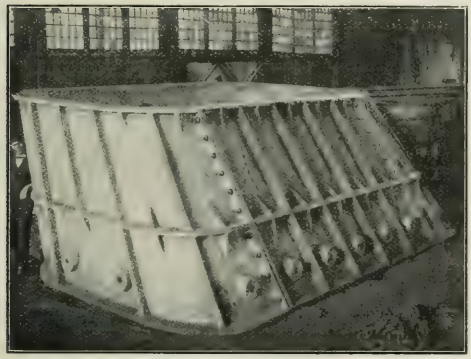


Fig. 1.—A 28,000-Lb. Casting Made by the Marshall Foundry Company, Pittsburgh, Pa.

The thrust bearing thimble, which is also one of the five, is of gray cast iron, and the inside diameter was 13 ft. 4 in., the external diameter 14 ft. 6 in. and the weight 20,000 lb. The mold for this casting was of loam and formed by sweeps instead of patterns, and the pockets between the flanges and the intersecting rims were constructed by using dry sand cores. These castings will also be subjected to heavy pressure, and therefore had to be carefully designed and constructed.

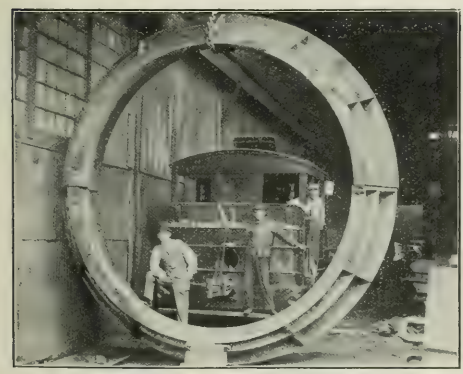


Fig. 2.—One of Five Large Thrust Bearing Thimbles.

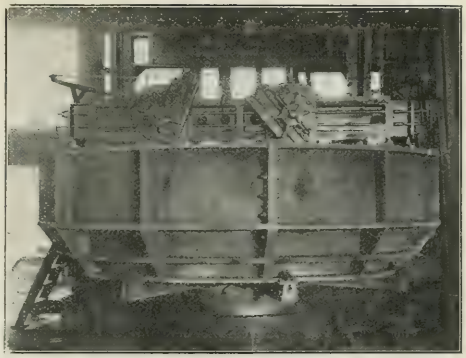


Fig. 3.—Finishing an Assembled Thimble on a Boring Mill in the Marshall Plant.

The company makes a specialty of loam or shell work, and Fig. 4 shows a carload export shipment of cast sections intended for vacuum pans in sugar mills which were made with sweeps. The company has made castings as large as 120 in. in diameter for manufacturing chemicals, while the loam work handled ranges from 18 in. to 15 ft. in diameter. These castings are only a few of the many difficult and interesting ones which have been made in the company's foundry since its organization 40 years ago. The daily capacity of the foundry is 250 tons, and the special lines turned out are ingot molds and miscellaneous gray iron castings.

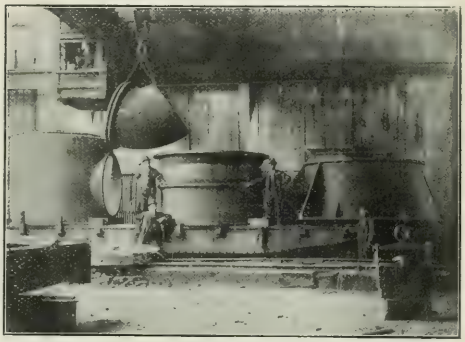


Fig. 4.—Sugar Mill Vacuum Pans Being Loaded for Shipping.

Railroad Equipment Orders.—The Hawley Lines, which several months ago were inquiring for 8000 cars, are now asking revised bids on a large portion of the amount, including 3000 all steel hopper cars, 250 steel underframe furniture cars, 250 automobile and 750 box cars. The Lackawanna has ordered 500 steel underframe box cars and 500 all steel hopper cars. The Norfolk & Western will build 500 hopper cars in its own shops. The Hudson & Manhattan has ordered 30 steel subway cars and the Pennsylvania 40 all steel passenger cars. The *Railway Age-Gazette* notes that the Bingham & Garfield, Salt Lake City, will be in the market for several hundred ore cars. The Seaboard Air Line is expected to buy 10 freight locomotives and 13 passenger cars. The Louisville & Nashville has ordered 100 ballast cars from the Rodger Ballast Car Company. It is reported that the Baltimore & Ohio will buy 105 passenger and baggage cars. Specifications from the Pennsylvania Railroad for freight cars and locomotives are looked for this month.

Ball Bearings in Machine Tool Construction*

The Present Standard Practice of American and German Builders

BY HENRY HESS.†

One of the oldest uses for ball bearings in machine tools is on the vertical spindles of drill presses; such use has been successful only when proper bearings, properly mounted, have been used. The Colburn Machine Tool Company showed at Atlantic City and elsewhere a heavy drill press that drove a 1½-in. drill through 31 in. of cast iron per minute, and a 3½-in. drill through 11¼ in. per minute; that means a pretty heavy thrust. This thrust was taken on Hess-Bright ball bearings of the self-adjusting seat type.

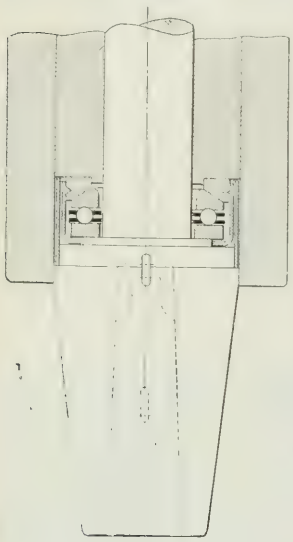


Fig. 1.—Ball Bearing of the Unit Type for a Drill Press Spindle Made by the Hess-Bright Mfg. Company, Philadelphia, Pa.

Fig. 1 shows a bearing of the cage type that may be handled as a complete unit and contains also the convex compensating seat washer. In this arrangement a sleeve, forming an oil well to keep the balls submerged is employed.

It is preferable to take the weight of a radial drill column at the top on a ball bearing placed there rather than on one placed at the lower end. This is because the relatively small bearing at the top costs only a small portion of what a ball bearing big enough to surround the column would come to. To relieve the friction due to the pressure that the sleeve exerts at the base of the column in a radial direction, this pressure is taken on one or more radial ball bearings arranged around the column; these small bearings also cost much less than a single large one and are quite as efficient.

In the swinging arm type of radial drill, bearings are employed at the top and bottom to take the radial thrust, and a compensating seat thrust bearing is placed at the bottom to take the vertical load.

Milling and Planing Machines

The Becker Milling Machine Company, Hyde Park, Mass., in its catalogue on belted vertical milling machines, shows a speed box equipped with Hess-Bright ball bearings, reproduced in Fig. 2. Other prominent

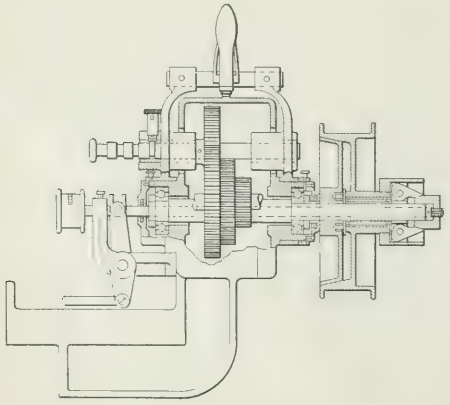


Fig. 2.—Ball Bearing Milling Machine Speed Box Used by the Becker Milling Machine Company, Hyde Park, Mass.

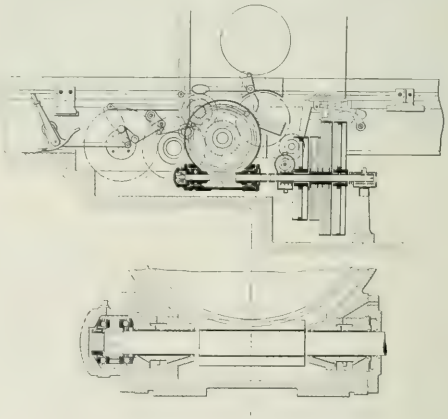


Fig. 3.—Ball Bearings for a Heavy Worm Driven 144-In. Planer.

American specialists in this line take the feed screw thrusts on ball bearings.

Fig. 3 is reproduced from a description in the *Zeitschrift des Vereins Deutscher Ingenieure* of a heavy worm driven 144-in. planer. It will be noticed that the two thrust bearings for taking the worm thrust both on the cut and the reverse strokes are quite conveniently mounted and housed in a cap at the end of the worm gear case. It has been found that the correct employment of suitable ball bearings does away with all likelihood of back lash from worn plain steps and considerably increases the ease of running of the planer and of its power efficiency.

Grinding Machines

In the vertical spindle of a surface grinder* built by the Blanchard Machine Company, Cambridge, Mass., shown in Fig. 4, you will notice that the weight is taken at the top on a thrust bearing, as is the radial load at this point on a radial, while the grinding thrust is taken just immediately above the face grinding wheel on a thrust bearing, all of the Hess-Bright type. The entire countershaft of a German grinding machine built by Unger of Stuttgart is mounted on Hess-Bright ball bearings.

In our own shops we also have remounted a number of our grinding machine countershafts, as well as the wheel spindles on ball bearings. We have found

* From a paper presented before the National Machine Tool Builders' Association, at New York City, October 25 and 26, 1910.

† President of the Hess-Bright Mfg. Company, Philadelphia, Pa.

* *The Iron Age*, October 13, 1910, contained an illustrated description of this tool.

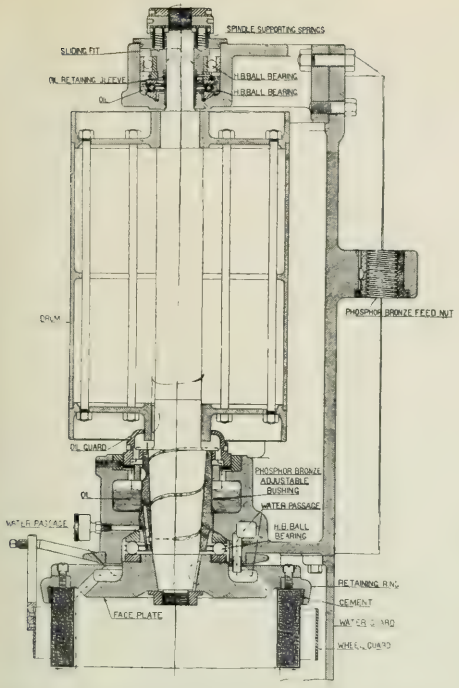


Fig. 4.—Spindle of the Vertical Surface Grinder Built by the Blanchard Machine Company, Cambridge, Mass.

that, while on the original plain bearings the belts were frequently thrown off when suddenly starting the machines, the substitution of ball bearings entirely stopped this. In addition all the various annoyances due to wear and the necessity for frequent lubrication have been done away with.

Mr. Hanson of the Pratt & Whitney Company was kind enough to permit me to refer to his use of ball bearings on one of his very heavy grinding machines, and Fig. 5 shows the entire load of a 10-in. and a 7-in. belt taken on two ball bearings. The Rushmore Dynamo Works has mounted a considerable number of its grinding and buffing heads on our ball bearings.

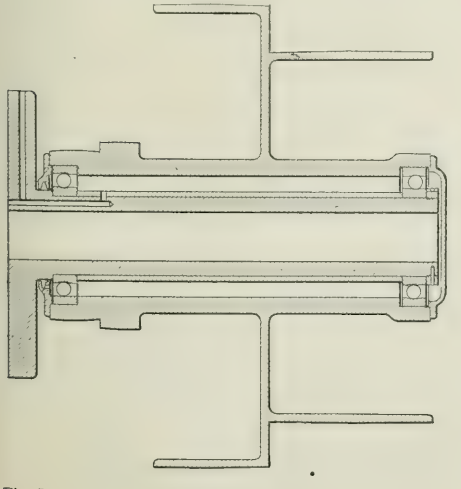


Fig. 5.—Ball Bearing for Pulley of a Heavy Grinder Made by the Pratt & Whitney Company, Hartford, Conn.

Mr. Rushmore has expressed his surprise that builders of this machinery do not regularly so mount their spindles.

Punch Presses

In the examples heretofore considered the ball bearings have been employed under conditions of fair uniformity as to load and at speeds ranging from the moderate ones of cutting tools to the higher speeds of grinding machines. That ball bearings are used with very decided success also under conditions of considerable shock is evidenced from their use in a heavy power press or punch where the flywheel or drive shaft is mounted on a ball bearing. This is a fairly heavy press as is indicated by the large driving gear weight of a ton. Carefully made comparative tests on this press showed that ball bearings decreased the idle stroke power by 54 per cent. The power required for the plain bearing during the working stroke was 16.8 hp., which reduced to 13 hp. with the ball bearing. The total time required for one working and one idle stroke was 13 seconds, of which 1 second was taken up by the working stroke. The power saving for the

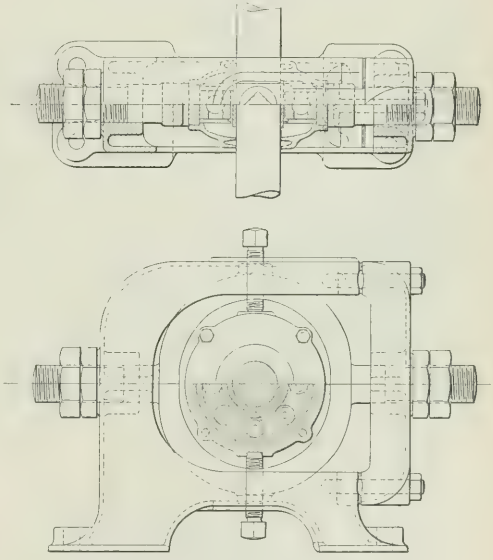


Fig. 6.—Detail of a Post Shafting Hanger Designed by the Hess-Bright Mfg. Company, Philadelphia, Pa.

complete cycle was 40 per cent. This press has been in use for a number of years, and the ball bearings do not yet show the slightest indication of wear.

Rolling Mill Tools

The proposition was put up to us once of improving the performance of certain very heavily stressed cold disk saws. The plain bearings required renewal about once every three weeks, and that also necessitated a returning of the shaft itself and put the machine out of commission for some time. This disk ran at 4100 rev. per min., and required 20 hp. for the drive, and would, when thrown on, almost stall the motor and frequently blow the fuses. A stream of cold water was kept continually running through the water jackets of the babbitted bearings. Since the machine has been changed to ball bearings a 7½-hp. motor substituted for the 20-hp. has ample reserve and readily picks up the saw on the first point of the starting rheostat and without shock. The machine has been running for over a year without evidence of the slightest deterioration in the bearings.

Woodworking Machinery

Among the largest European builders of woodworking machinery are Fleck & Sohne of Berlin. Of 159 types of tools they build, some 80 are now mounted on ball bearings. Tests have shown that the power savings on the idle run amount to 60 per cent., while under cut the actual horsepower saved is greater, owing to the greater load on the bearings. In addition to power savings, Fleck and others cite as fully as important the facts that wear is very much reduced, that all danger of bearings heating is eliminated, and that the consumption of lubricant is greatly reduced.

Among American woodworking machine builders the Defiance Machine Works mounts an 18-in. spoke lathe on these bearings. With the original babbitted bearings 2 hp. was required to run the cutter head idle and 7 hp. while turning an 18-in. spoke; mounted on ball bearings the reduction was from 2 hp. to 0.8 hp. for the idle running and from 7 hp. to 5.8 hp. while under cut.

The Advance Machinery Company considers a dovetailing machine one of the most difficult of woodworking machines to deal with and declares that while trouble was had with the dovetailer to a very considerable extent before the substitution of ball bearings, not a complaint since that change has been received. This concern has adopted them also for its shapers and other machinery.

Shafting

This is an essential portion of every machine tool, possibly not so much as concerns the main line, but certainly as to the countershafts. Fig. 6 shows the ball bearings embodied in a post hanger. Recent papers read before the American Society of Mechanical Engineers covering efficiency tests* may be referred to by those interested. The hanger is no longer the usual foundry job, but is a good example of machine tool design, as all the various supporting surfaces are machined. The usual rib construction has also been departed from in favor of the far superior box sections current in your own practice as machine tool designers and builders. Used as a countershaft, this hanger is equipped with a lug for the attachment of the shifter fork supporting arms, that can be set at any angle.

The first employment of these ball bearings was with the German Niles Tool Works Company of Berlin, where the entire line of countershafts was mounted on them. This was feasible without entailing greater costs than with plain bearings, in that only three sizes were employed for the whole range of tools. To do that the ends of the heavier shafts were necked down; this was permissible without a weakening of the shafts since the ball bearing itself is so short as to bring in no bending moments at all, but stresses the shaft at the resultant shoulders practically only when in shear.

Radial ball bearings can be had from stock in sizes ranging from less than ¼-in. bore to 4½-in. bore, and in light, medium and heavy carrying capacities, up to 14,000 lb. In thrust ball bearings stock sizes run up to 28,600 lb. load at 10 rev. per min. Special ball bearings can be had to suit any demand, even up to 400,000 lb.

Contracts were awarded last week by the McKeesport Tin Plate Company, McKeesport, Pa., for furnaces, a gas producer and boiler setting in connection with the additional hot mill capacity, which will likely be two mills.

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* "Line Shaft Efficiency, Mechanical and Economic," presented at the annual meeting of the Society, December 7 to 10, 1909. An abstract of this paper and the discussion on it was printed on page 1381 of *The Iron Age*, December 16, 1909.
"Improvements in Line Shaft Hangers and Bearings," presented at the spring meeting of the Society, May 31 to June 3, 1910. An abstract of this paper and the discussion on it was printed on page 1379 of *The Iron Age*, June 9, 1910.

Customs Decisions

Flexible Metal Tubing

The Board of United States General Appraisers has handed down a ruling defining the classification to be imposed on flexible metal tubing or hose, under the tariff act of 1909. The importers in the test case are Hensel, Bruckmann & Lorbacher, who objected to the assessment of duty made by the collector of customs at New York.

The tubing or hose is made of copper, and returned for duty under paragraph 151 of the new law as "flexible metal tubing or hose, not specially provided for in this section." This classification carries a duty of 30 per cent., whereas under the contention made by the importers the rate would be only 2½ cents per pound under the provision in paragraph 176 specifying "copper pipes." It is apparent from the remarks of General Appraiser Fischer, who writes the decision for the board, that the issue is a close one. He thinks that the provision of the law under which the merchandise was assessed by the collector is more specific than the paragraph claimed by the importers. He accordingly overrules the claim. In doing so he says:

> It is of course true that between the enumerations of an article, both equally specific, the one qualified by the "not specially provided for" clause must yield to the one in which the enumerations are not so qualified. We find it unnecessary, however, to apply that rule of construction in the case at bar. It is admitted that the goods are flexible copper tubing or hose, and we hold that the provision "flexible metal tubing," paragraph 151, tariff act of 1909, supplies a more definite and specific enumeration of the merchandise than the provision for "copper pipes" under paragraph 176. The protests are overruled, and the decisions of the collector affirmed.

The Cazadero Hydroelectric Plant

The Portland Railway, Light & Power Company, Portland, Ore., has recently placed in service, at its Cazadero plant, a 6300-hp. horizontal Francis turbine. This unit is the fifth furnished by the Platt Iron Works Company, Dayton, Ohio, for this plant and the results of official tests conducted show that all guarantees made by the builder have been exceeded.

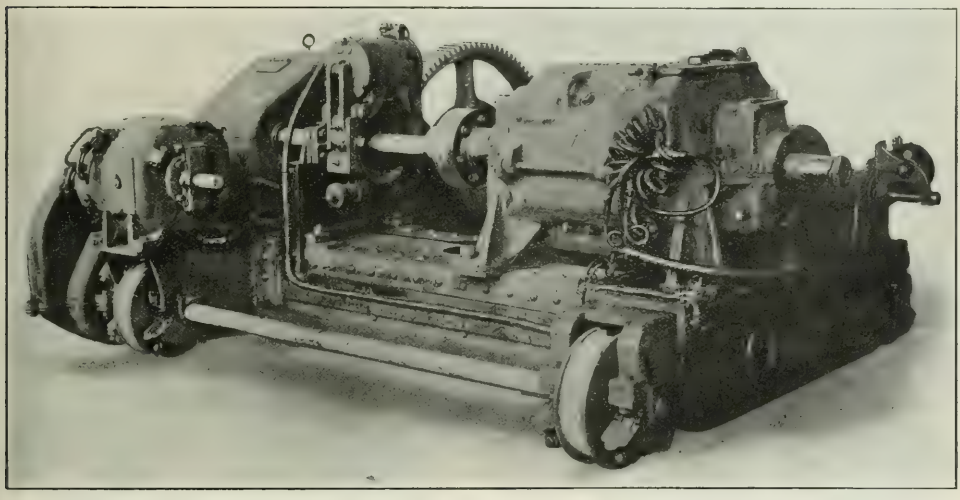
The Cazadero plant is one of the most modern and successful hydroelectric developments to be found in this country and now has a total output of about 28,000 hp. It operates under a head of 125 ft. and furnishes power for the city of Portland. An additional development by the same company has recently been undertaken for which the Platt Iron Works Company is building the entire hydraulic equipment, including three 6000-hp. twin spiral flume turbines as well as the exciter turbines and other accessories.

A Direct Process in Washington.—The Washington Steel & Iron Company, Spokane, Wash., has commenced the construction of a plant at Leavenworth, Wash., 25 miles west of Wenatchee, to work the Rothert process for making high grade tool steel from titaniferous magnetite ore by one operation. Exhaustive tests are stated to have been made of the process in the experimental plant of the company at Hoquiam, which will be removed to Leavenworth. Crude oil will be used for fuel in the company's own specially constructed furnaces. A large mill site has been secured at Leavenworth which is ideal for the handling of the ore and the operation of a plant of large capacity. It will be but 15 miles from the ore beds and immediately on the railroad. It is stated that the company has near Blewett a deposit of 20,000,000 tons of iron ore. Associated with the company are M. A. Corner of Wallace, Idaho, and J. L. Torkelson, O. P. Moore and E. K. K. Allen of Spokane. E. H. Rothert is general manager.

A New Niles Mill Trolley

A recent design of a crane trolley to meet the severest conditions existing in steel plants which was installed at the plant of the Inter-Ocean Steel Company, Chicago Heights, Ill., by the Niles-Bement-Pond Company, 111 Broadway, New York City, is illustrated herewith. The entire machine is built for strength and rigidity, and consists of two heavy box side frames connected together with a built up steel girt, the whole forming a rigid H section. This girt is rigidly braced by a cover plate extending its entire length, and the bearings supporting the drum, drum pinion shafts and truck wheels are cast integral with the side frames.

The trolley drive mechanism is extremely simple and consists of two sets of spur gears which are self-contained in an oil tight case, the shaft revolving in removable bearings. Westinghouse type K motors, especially designed for use where severe intermittent service is required, operate the trolley. These motors



A New Type of Mill Trolley Installed at the Works of the Inter-Ocean Steel Company by the Niles-Bement-Pond Company, New York City.

are of inclosed type and nearly square in cross section.

The hoisting is done by extra pliable plow steel wire rope having a minimum factor of safety of seven compared with its ultimate strength. The hoist is driven by Westinghouse type MT mill motors, which are connected to the motor shaft by a flange compression coupling. This coupling may be instantly removed by relieving the pressure of its internal sleeve, thus avoiding the marring of the armature by driving off a pinion or coupling. The drum and running sheaves are 30 times the diameter of the rope, the latter being bronzed bushed and in duplicate in the girt and the bottom block. The drums are extremely heavy and have machine turned right and left hand grooves for the rope. The gear driving the drum has machine cut teeth, is forced on the end of it by hydraulic pressure and keyed in position. The drum shaft is also forced into the drum and is free from all torsional strains. The drum pinion, which is of forged steel, is forced on its shaft and keyed into position; this shaft also serves as the load brake shaft. It is supported by three bearings, one being integral with the side of the trolley and the other two forming part of the load brake gear case.

The load brake is of the maker's standard double disk type, with hard bronze wearing surfaces and is self-contained. When the crane is carrying its full load it is subjected to a pressure in excess of 200 lb. per square inch of surface. In action the brake is said to be noiseless and automatic and no thrusts are transmitted to its bearings, as it is absolutely self-contained on its shaft. Its action under all conditions of service is uniform, and it will not permit the load to run down unless driven by the hoist motor through a spur gear mounted directly on the brake. This gear, in common with all the others of the trolley, is made from a steel casting with cut teeth of the Brown & Sharpe involute standard and all pinions are steel forgings. The entire brake, motor gear and pinion are inclosed in an oil tight case and can be removed without disturbing any other mechanism. An electric brake of the solenoid type is attached to the motor shaft, sets instantly when the current is shut off and releases when the motor is started.

The truck wheels are forced onto the shaft and keyed in position. These shafts revolve in square half-bronze bushings, which are held from rotating by waste oil boxes underneath and from longitudinal movement by flanges. Through bolts connect the waste boxes to the trolley sides in which there are dovetailed seats that take the thrust, thus relieving the bolts. By elevating the trolley ¼ in. the truck wheels can be readily removed.

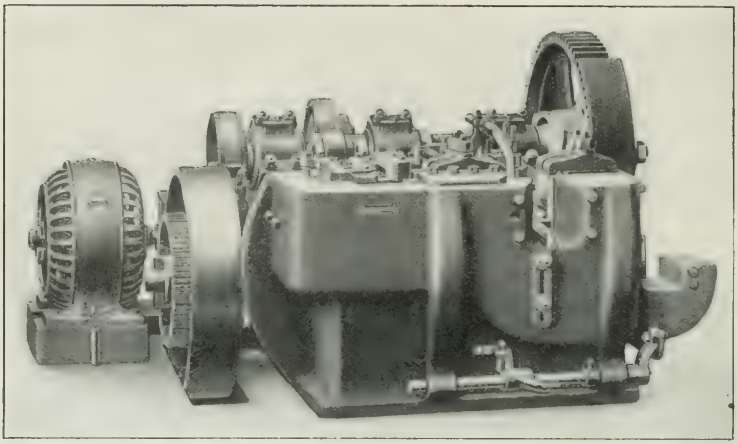
The bearing pressures on all parts of the trolley are very low, except on the truck wheel bearings, but in no case exceed 500 lb. per square inch. The speed of the truck wheel shaft is very slow, but on all the other bearings the pressure is reduced in proportion to the speed.

Negotiations have been practically completed by a group of New York bankers for a loan of $50,000,000 to the Chinese Government for the reform of her currency, the promotion of industrial development and for the building of State railroads. The loan will be in the form of 45-year 5 per cent. bonds. This flotation is entirely distinct from the $30,000,000 Hankow Railway loan, which has been under negotiation for several months.

The Cunard Steamship Company is stated to have approved plans for a steamship which will eclipse the Olympic of the White Star Line. The new vessel will be 1000 ft. in length. She will have 90,000 hp. which will give her a speed of 25 knots an hour.

An Improved National Forging Machine

One of the especially interesting exhibits at the recent exposition of bolt, nut and forging machinery at the plant of the National Machinery Company, Tiffin, Ohio, August 19 to 23, 1910, referred to in *The Iron Age* August 4 and September 1, was an improved line of forging machines. These machines are built in sizes having a capacity of 1½, 2, 2½, 3, 3½ and 4 in.; the one shown in the accompanying engraving is the 2-in. type The special features of this machine are the friction slip flywheel and the direct motor drive.



An Improved Type of Forging Machine Built by the National Machinery Company, Tiffin, Ohio.

While the friction slip flywheel, upon which patents are pending, is extremely simple in detail, it is said to meet a positive requirement in forging machine construction. Its design is such as to protect the machine against the enormous strains imposed upon it by the momentum of the flywheel when the machine stalls because of an excess of stock or cold metal being fed into the dies. The flywheel is held between friction flanges keyed to the shaft, and when excessive material or cold stock is fed into the machine, preventing the heading tool from completing a full stroke, the flywheel slips between these flanges. This slipping action dissipates the momentum of the wheel and is said to eliminate the excessive shock attendant to a rigid flywheel, while at the same time it protects both the machine and the motor.

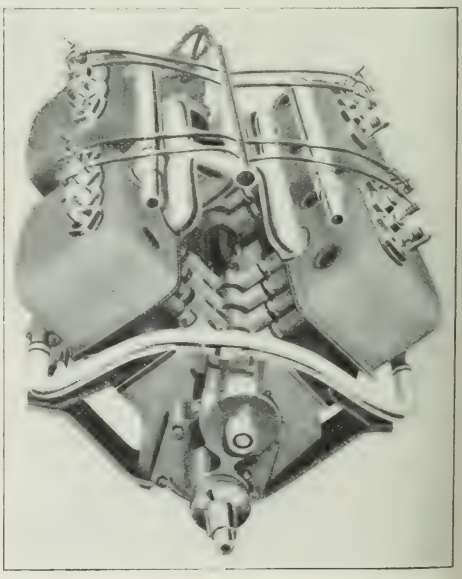
The type of motor drive employed is said to possess the advantages of compactness, long life and protection of the motor and freedom from petty repairs, while under the most severe tests it has proved to be a very practical method of directly connecting a motor and a forging machine. The motor is secured to a bracket bolted to the machine bed, and the pinion on its armature meshes with a gear which is bolted to the friction flywheel. Another interesting feature is the double cam mechanism operating the grip, which allows the opening and closing of the dies to be timed. This gives an unusually large upset or gathering capacity, and makes it possible not only to handle a wider range of work but to turn out more intricate forgings with a small number of operations.

Correction.—An omission occurred in the article on the Inland Steel Company's Works which appeared in the issue of *The Iron Age* for October 20. On page 915 mention was made of the combination sheet and pair furnaces as being of the Swindell type. These furnaces are of both the Bailey and Swindell types.

The Herman Aerial Gasoline Engine

A new type of gasoline engine for aeronautical use has been developed by David L. Herman, 508 Moffat Block, Detroit, Mich. In its design the objects sought were extreme lightness and the elimination as far as possible of all moving parts.

As will be noticed from the engraving, the engine is of the four-cycle type, having eight L-shaped cylinders cast in pairs. This large number of cylinders was decided on because the application of power is more continuous and the vibration less than with a smaller number. The 16 valves of these cylinders are all operated by a single one-piece cam shaft, which also drives the centrifugal pump and gives positive circulation. This construction eliminates 36 moving parts, together with a large number of pins which are likely to work loose and cause trouble. The crank shaft is hollow and of crucible chrome nickel steel, with three cadmium nickel bronze bearings. The cam shaft gear is of special alloy steel, meshing with an intermediate fiber filled gear, which gives a light and at the same time silent gear train.



A New Type of Gasoline Engine for Aeronautical Use Made by David L. Herman, Detroit, Mich.

The hardened and ground valve tappets have fiber inserts, and another special feature is that the gray cast iron valve heads are welded on steel stems, which not only makes it impossible for them to wear loose but also gives a valve head, the material of which has the same coefficient of expansion as the iron of the cylinder, thus reducing chance of breakage of the valves.

A special composition known as Aerial metal, which is said to be 15 per cent. lighter than aluminum and 50 per cent. stronger, is used for the crank case, the water jackets, gear housings, pipes and wherever a light alloy could be used without interfering with the serviceable properties of the motor. The crank case has large hand holes, which make the connecting rod bearings easily accessible. The water jacket is cast separate from the cylinder, which makes it possible to inspect and check up the cylinder castings more thoroughly than was the case heretofore. The water jackets are not shrunk on the cylinder, but are bolted in position with chrome nickel steel bolts, the difference of expansion between the iron and Aerial metal being taken up in the bolt holes.

The lubricating system is of the splash type with a force feed oiler for the crank case, which gives a positive method of lubrication. A high tension ignition system is provided and any desired make of magneto is furnished.

Two sizes of engine are built, the principal dimensions of which are as follows:

Length of stroke, inches	3⅜	4¾
Diameter of cylinder, inches	3¾	4
Speed, revolutions per minute	1,200-1,800	1,200-1,800
Horsepower developed	34 to 45	56 to 70
Crank shaft diameter, inches	1½	1¾
Length of end bearing, inches	4½	4½
Length of center bearings, inches	3½	4½
Length of pin bearings, inches	1 11/16	2
Diameter of piston pin, inches	⅞	⅞
Diameter of valves, inches	1½	2

In a recent test one of the smaller of these engines was mounted in an automobile truck loaded with sand and pig iron and has run over 5000 miles on very rough roads without repairs of any kind.

Employers' Liability in Ohio

The Employers' Liability Commission appointed by Governor Harmon of Ohio has been holding sessions in Cleveland this week to receive the views of employers and employees on the questions the commission is considering, particularly as to changes that should be made in the Norris-Matthews law, passed in April, 1910, by the Ohio Legislature. J. P. Smith, a member of the commission, in a recent article in a Cleveland paper, asks the question, "Shall the employer be compelled to pay for the carelessness and negligence of the employee?" He answers, "I believe that every honest, fair minded citizen will answer in the negative."

Employers at Cincinnati, Dayton and Youngstown, Ohio, who have already given their views to the commission, consider that the new Ohio law should be amended so as to relieve the employer of responsibility for negligence on the part of the employee or failure to report conditions which he knows to be defective and unsafe. This point was made in some of the communications of Cincinnati manufacturers printed in *The Iron Age* of October 27. The sentiment is growing among employees that while workmen should be compensated for accidents resulting from risks peculiar to certain employments there is danger in lessening the feeling of responsibility which employees should feel. This point was emphasized in the paper of Thomas D. West before the American Foundrymen's Association at Detroit in June, 1910, entitled "The Personal Equation in Industrial Accidents." This paper, which has been used in the present hearings in Ohio as expressing the views of many manufacturers, combats the view that the majority of accidents in a trade are incident to it and happen without fault on the part of either employer or employee. Mr. West argues that the general acceptance of such a view is likely to have serious results in taking away from the operative the sense of personal responsibility and making him heedless of the effect of his actions on the safety of others.

The Flather Tilting Shaper Table

A demand for a tilting table as an adjunct in shaper work has led the Mark Flather Planer Company, Nashua, N. H., to evolve a combination tilting and swiveling table which permits angular adjustments of the work to be made on an axis parallel to the face of the column, as well as on another at right angles to it. Fig. 1 is a general view of the table, while Fig. 2 shows the details of the tilting mechanism.

The tilting table rests on the regular table which

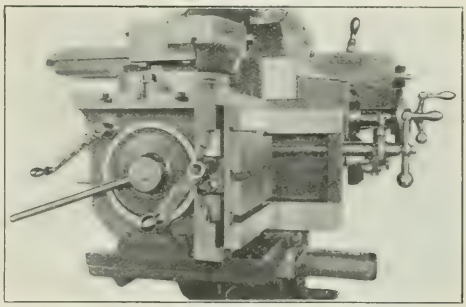


Fig. 1.—The New Tilting Shaper Table Made by the Mark Flather Planer Company, Nashua, N. H.

has lugs forming the bearings at *a* by which the tilting is accomplished. The angularity of the tilt is determined by the position of the two blocks *b*, the rounded corners of which rest against the angular surfaces *c*. One of these blocks is at the front of the table and the other at the rear. Each is threaded to receive one of the adjusting screws *d*, which are independent of one another. In adjusting the table one screw is loosened until the block which it controls is out of engagement with the table. The desired angle

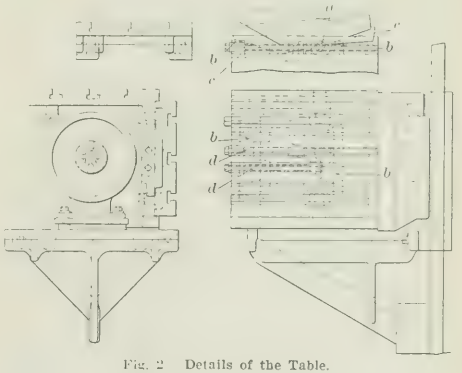


Fig. 2 Details of the Table.

is secured by the other screw after which the first is tightened, so that the table rests solidly against both blocks and is locked securely. Each of these adjusting screws has a thrust block to prevent end play. The limit of angular adjustment is 5 degrees below the horizontal and 8 degrees above it. The swiveling of the table is accomplished in the usual way.

The furnace of the Zenith Furnace Company, at West Duluth, Minn., which went out August 13, was blown in October 19 after repairs.

New Tools and Appliances

A New Type of Slide Rule.—For facilitating the tedious and time consuming details in connection with mathematical work, Kolesch & Co., 138 Fulton street, New York City, have brought out the Calculigraph which like similar calculating devices is based on the well-known properties of logarithms. The instrument consists of two parts, a plate measuring 12 x 9½ in. containing the necessary graduations and a graduated bridge which has a number of parallel slots through which results are read directly from the plate. The large size of the plate and the corresponding coarseness of the graduations, it is said, tend to secure a high degree of accuracy. In operation the slots in the bridge are kept parallel with the lines on the plate and the former moves back and forth like the slide of an ordinary slide rule.

Wet Tool Grinder.—Hoysradt & Case, Kingston, N. Y., are building two sizes of wet tool grinder having 16 and 24 in. wheels in which the effort has been to produce a simple and efficient tool in which an even and steady flow of water can be maintained upon the wheel without using a pump. In this grinder the water is contained in a hollow head while the wheel runs in a separate trough and any desired amount of water can be supplied to the wheel through a hollow bronze connection. By simply shifting a lever beneath the bowl and in front of the machine these grinders can be used for either wet or dry work. Self-oiling, dirtproof bearings are used on the grinder and also on the countershaft and it is claimed that three or four oilings a year will keep them running perfectly.

Gasoline Engine Testing Base.—Joseph Tracy, 116 West Thirty-ninth street, New York City, has placed on the market a testing outfit for gasoline engines consisting of a cast iron bed plate and universal support for carrying the motor which may be connected to a dynamometer or prony brake. The four engine supports are mounted on small base plates provided with means for lateral and longitudinal adjustments and a vertical adjustment is provided by the sliding members of the supports which can be locked in any desired position. This bed plate forms a substantial foundation for any motor-testing operations and with the adjustable supports any style or size of motor can be securely seated and lined up quickly. All the contact surfaces of the bed plate and motor supports are planed thoroughly to eliminate the makeshift methods frequently employed for testing.

A Convenient Die Stock.—The Handy Mfg. Company, Bridgeport, Conn., has placed on the market a compact die stock made in the smallest practicable form. The tool is self-contained and no bushings, wrenches, &c., are required. The design is said to avoid all slippage while cutting and the leader screw has been eliminated. Four sizes are manufactured for cutting both right and left hand threads on pipe ranging from ¼ to 2 in. in diameter.

The Bell Pneumatic or Steam Hammer.—The Buffalo Foundry & Machine Company, Buffalo, N. Y., builders of the Bell steam or air hammer which is made in four sizes, the weights of the falling parts being respectively, 250, 450, 700 and 1500 lb. with cylinders 6, 8, 10 and 12 in. in diameter, has recently redesigned the valve gears of the two larger sizes. The change consists in replacing the oscillating valve formerly used by a balanced piston valve, but this improvement has not resulted in any change in the pattern or general appearance of the hammers.

Large Capacity Arbor Press.—Edwin E. Bartlett, 326 A street, Boston Mass., has designed a new type of arbor press in which the distance over the plate can be increased at will. A ratchet and pawl are employed in connection with the forcing mechanism which makes it possible to always use the lever in the most efficient position as the ratchet is keyed fast to the pinion while the pawl is held in the casting through which the lever passes. The lever is counterbalanced and automatically comes to a vertical position when the pawl is disengaged and the ram is free to be moved by a hand wheel. The lever can slide in its casting so that the leverage employed can be varied as more or less power is required. These presses are mounted on wheels and can be easily moved about the shop.

Adjustable Locomotive Hub Plate.—For eliminating the lateral motion of the frame and boiler of locomotives, the Smith Locomotive Adjustable Hub Plate Company, 207 Commerce Building, Pittsburg, Kan., has patented a device to be placed on the inside of the wheel. This consists of a plate fitting into the bore of the hub and a liner placed on the inside of it, both being held in position by snap rings. Space is left between the plate and the liner which is filled with heavy grease applied through a hole with screw pressure from the outside of the driving wheel. This grease acts as a cushion behind the plate and by increasing the amount the plate is adjusted to any position to take up the lateral motion.

An Electrically Driven Sensitive Drill Press.—The A. J. Deer Company, Hornell, N. Y., is making an electrically driven sensitive drill press which is designed for automobile factories, garages, general repair shops and for use wherever a light portable tool is required. The motor is wound for operation on either direct or alternating 110 to 220 volt circuits and three changes of speed are obtained by the three-step driving cone pulleys. The spindle of the drill is counterbalanced and the table has a vertical adjustment and may be swung around the column. A chuck and lever feed are provided for the spindle.

Vertical Marble Working Lathes.—The F. R. Patch Mfg. Company, Rutland, Vt., has recently designed and built two vertical lathes and a large dimension drum saw having diamond cutting edges. These machines were shipped to the Colorado-Yule Marble Company and will be used in manufacturing the large marble columns for the Post-office at Denver. These columns are about 44 ft. long and the diameters are 5½ ft. at the base and 4½ ft. at the upper end. They are built in sections or drums and have 24 flutes, the lathes being designed to do the fluting by circular diamond saws and carborundum wheels.

The Fox Multiple Spindle Drilling Machine.—A new multiple spindle drill intended for the drilling of gas engine frames, cylinder parts, automobile transmissions, pump flanges and work of a similar character has been recently brought out by the Fox Machine Company, 815 North Front street, Grand Rapids, Mich. The tool is designed for either belt or motor drive and when the former is employed a single large diameter, broad face, constant speed pulley is used. There are six changes of spindle speeds and six changes of head feeds all obtainable through gear boxes and the transmission is of the selective sliding gear type. The capacity of the drill is eight 1½-in. drills. If desired a friction tapping device located on top of the column can be furnished. Expanding ring clutches are used and provision is made for their adjustment as it becomes necessary. The levers are all within easy reach of the operator and the drills may be stopped without shifting the belt. The maximum space which can be drilled is a rectangle 16 x 30 in. or a circle 24 in. in diameter. Two special features of the drill spindles are the exceptionally strong construction of the spindle bearings and supporting arms which greatly reduces the drilling strain and the ability to raise or lower the drills according to their varying lengths when set at very close centers.

Test Indicator for Screw Threads.—Joseph L. Wolfe, 859 Stratford avenue, Bridgeport, Conn., has brought out an indicator especially adapted for testing the threads on taps, dies, screws, &c., 1 in. or longer, accurately and rapidly. The instrument has two ball points which are brought into contact with the thread to be tested and the movement of these points around the thread being tested records its accuracy on the indicator dial, which is graduated to read thousandths of an inch and has a range of 0.024 in. on either side of the zero mark and enables

an inaccuracy of 0.0002 in. to be easily detected. The indicator shows whether the thread is fast or slow in thousandths of an inch and the movement of the pointer is in one direction if the thread is fast and in the opposite if slow, while if the thread is accurately cut the pointer on the indicator will remain at zero.

Knurling Tools.—The Miller Tool Company, New Britain, Conn., is making what is known as the six-in-one knurling tool, the name being derived from the fact that there are six knurls available that may be used either in pairs or singly. These are arranged in pairs of the same pitch so that three grades of cross and a similar number of single knurls are obtainable. When the latter is being used the turret is locked. All the knurls are machine cut and are mounted on hardened tool steel pins. The turret and holder are of hardened machine steel and the tool is designed for use on engine and turret lathes and screw machines for both heavy and light work.

A Disk Wheel Cementing Press.—An improved type of disk wheel cementing press constructed so that the top plate may be swung out of the way while the disk wheel is being glued and then swung back into position when pressure is to be applied, has been placed on the market by Charles H. Besly & Co., Chicago, Ill. The wheels are raised from the face of the press by a central shouldered shaft actuated by a cam movement. If pressure is to be applied the yoke is brought into engagement with a stud set in the pedestal and kept in position by the pressure, no lock being required. In raising the disk wheels the cam is thrown slightly over the center and against the bumper pin which holds the disk rigidly supported by its own weight. In lowering, the disk is raised slightly to permit the cam to come over the center and then lowered till the wheel rests on the pedestal casting. This is a desirable feature as the 26-in. wheel handled by this press weighs 125 lb.

A 21-in. Upright Drill Press.—A 21-in. drill press with back gears, positive geared feed and tapping attachment has been placed on the market by the Superior Machine Tool Company, Kokomo, Ind. The feeding mechanism is inclosed by a gear box mounted on the head which is stationary and the drive is by a vertical shaft driven from the spindle quill by spur gears. Four feed changes ranging from 0.006 to 0.016 in. per revolution of the spindle are available and these are obtained by simply shifting conveniently located handles attached to the gear box. The tapping attachment is of the maker's standard type equipped with friction gears inclosed with gear covers. A special feature of the drill press is the covering of all the gears by guards for protecting the workman. The machine will drill to the center of a 21-in. circle and the maximum distances between the table and the spindle and the base and the spindle are 20 and 37 in., respectively. The table has a traverse of 16 in, and the spindle which is bored to receive a No. 3 Morse taper has a traverse of 8 in.

Locating Machine.—For quickly locating centers on dies, jigs, templates and other work where accurate location is essential, the Beacon Tool Works, Naugatuck, Conn., has developed a machine which is provided with micrometer adjustment. Three sizes are made, the largest taking a block measuring 12 x 14 x 8 in. high and the smallest, one whose dimensions do not exceed 4 in.

A Fuel Oil Brazing Outfit.—The Gilbert & Parker Mfg. Company, Springfield, Mass., has recently placed on the market a fuel oil brazing outfit. Air and fuel oil are used in this burner, the combustion being completed in the burner itself with the result that a smoke free flame like that of gas is directed upon the work. The standard form of outfit is designed for attachment to a table, but if desired a portable form can be supplied.

Railway Motor.—The Allis-Chalmers Company, Milwaukee, Wis., has recently placed on the market a new railway motor known as its type No. 302. This motor is of the same general type as the others which the company builds. The field frame is of cast steel and is split horizontally through the armature and axle bearings. The pole pieces are made of soft steel punchings clamped between malleable iron plates and securely riveted. Special insulation is used on the field coils and for final finishing the entire coil is treated with insulating varnish by the vacuum process. The armature bearings are in solid housings and are made large for strength and long wear. The bushings are of cast metal lined with high-grade babbitt and fit the bore of the housing accurately. The armature core is built up of soft steel laminations carefully annealed and varnished after punching and ventilation is secured by leaving spaces between them at intervals. The nominal rating of the motor is 55 hp. at 500 volts and a two-motor equipment will operate city and suburban cars at a maximum speed of 30 miles per hour, while a four-motor equipment will operate interurban cars at a schedule speed of 24 miles per hour and a maximum of 40 miles.

Four-Slide Milling Machine.—The Garvin Machine Company, Spring and Varick streets, New York City, has recently placed on the market a special type of four-slide milling machine adapted for manufacturing operations such as cutting oil grooves in automobile axles, keyseating, fluting, squaring ends, notching, flatting, &c. The tool combines four separate machines. Each slide is independent so that three slides are working while the fourth is being loaded and the machine is constantly in operation. Two independent cutter spindles equipped with powerful back gears serve the pairs of slides at either end of the machine. Power and hand feed with an automatic trip are furnished and the slides have independent vertical screw adjustments and a quick lifting movement. Twelve changes of feed are available and the mechanism is driven from the countershaft.

Strong Automatic Engine Stop.—The Strong, Carlisle & Hammond Company, Cleveland, Ohio, has a new engine stop with which there is no reduction in area of the steam line, and no sprocket, chains and belts to move the different parts. This stop can be controlled either electrically or mechanically. A specially designed quick-closing valve having 25 per cent. more area than the steam pipe is used, which is closed by a tripping device consisting of a magnet and hammer, the latter knocking the valve rod from its seat, which can also be accomplished by hand. A speed limit device, consisting of a band with a projecting pin, is fastened to the engine shaft. When the revolutions exceed a certain number the pin closes an electric circuit which operates the tripping device and shuts the quick-closing valve. Beside the speed limit device, circuit closers electrically connected to the tripping device are generally installed in different parts of the engine room. By breaking the glass in a circuit closer and pressing a key the engine may be stopped. In connection with the Strong telltale the stop can stop an engine driving machinery by ropes when a strand breaks. Below the ropes a fine copper wire is stretched to the telltale and should a strand break the wire is generally broken and the engine stopped as previously described. If, however, the wire is merely pulled the electric circuit is closed by a back contact.

Pneumatic Riveter.—The Standard Railway Equipment Company, St. Louis, Mo., is equipping its Monarch riveter with an improved self-tightening spring locking device to prevent the barrel and handle from becoming loose in service. This device consists of a spring engaging a slot in the handle casting on one side and the teeth of a locking collar on the barrel at the other. To remove the handle the barrel is gripped in a vise with the handle uppermost and the tooth part of the spring is then disengaged from the collar by a screw driver or small chisel. To keep the spring from engaging the collar teeth while the handle is being unscrewed, a piece of sheet metal is inserted between the spring and collar for the former to slide on. A bar is placed through the grip hole of the handle which is unscrewed the same as an ordinary nut.

A Combination Drilling, Boring, Facing and Tapping Machine.—A two-spindle machine especially adapted for drilling, boring, counterboring and tapping has recently been placed on the market by the Hoefer Mfg. Company, Freeport, Ill. The box-type column is

attached to a stationary base and at the opposite end is the cross rail to which the two spindle heads are gibbed. One of these heads is permanently fastened on the cross rail while the other is adjustable through a screw so that varying center distances can be obtained. Three-step cone pulleys drive the spindle through steel worms and bronze worm gears, the former having ball bearing end-thrusts and running in oil baths. Each spindle is driven and fed independently of the other and the feed is positively geared and can be tripped at any predetermined point automatically. Four independent feed changes are provided which are obtained by a lever swinging against an index plate and the spindles also have a hand feed and quick return lever. When tapping, gears are used to secure the lead required and to prevent stripping of the threads.

Blow-off Valves and Swing Unions.—L. J. Bordo Company, Philadelphia, Pa., has brought out a line of blow-off valves for steam, compressed air or oil. The important features are ease of operation and a plug which cannot lift from its seat and is always perfectly tight. The valve is operated by placing a wrench on the square portion of the plug and giving it a quarter turn. The lifting gland is permanently secured by a lock nut and by releasing the latter and turning the gland to the left, the plug is raised so it can turn easily. When the lock nut is released the lifting cam coupling the gland to the plug can be pulled out and the gland removed for repacking. The valves are made with screwed or flanged ends and straightway or angle. The unions are furnished either for straighway or angle connections, and the essential features are the same in both. In the angle type the bonnet is slipped over a grooved ell, followed by two brass rings with a gasket between them. These in turn are held in place by a split brass ring set in a groove in the ell. An outside threaded ell with a lock nut is next placed in position and is fastened to the first by a screwed bonnet. It is claimed that no matter which way the steam or fluid is flowing, the wearing parts of the joint are well protected.

Aurora Upright Drill Press.—The Aurora Tool Works, Aurora, Ind., is building a 20 and a 21 in. upright drill press of the stationary head type equipped with positive gear feeds, the mechanism of which is inclosed in a case attached to the column. The spindle driving quill transmits power to the feed box through bevel gears and a horizontal shaft and connection is made with the worn shaft on the head by a vertical shaft and bevel gears. The base is heavy and well ribbed and the columns are of large diameter with the metal distributed to secure strength. A back brace to avoid the possibility of springing the column, a feature common to all the drill presses built by this company, is provided. To insure substantial support for the top shaft, spindle, feed shaft and cone pulleys, the yoke is made a part of the column. The table is heavy and well ribbed and rests on a large circular bearing on the arm which is carefully machined to fit the column.

An Improved Upright Drilling Machine.—The Kern Machine Tool Company, Cincinnati, Ohio, has developed a new line of standard upright drills for general manufacturing purposes. The principal improvement in this machine over the company's standard construction is the device used to obtain the eight positive feeds. The feed box is placed on the sliding head utilizing the space back of the quick advance and return lever. This location does not interfere with the full traverse of the sliding head in either direction and allows the box to be of sufficient size to permit the feed gears and shafts to be of ample size and coarse pitch. The feeds range from 0.006 to 0.048 in. per revolution of the spindle and all changes are made without stopping the machine, the principle embodied in the box being the tumbler and sliding gear design. Another feature is the automatic trip for the feed mechanism which is located directly on the feed shaft and is in the form of a saw tooth clutch operated either by hand or by a trip dog on the sleeve rack which can be adjusted to any depth within the range of the spindle. This eliminates the gravity or drop worm box and insures a constant full contact between the worm and the worm wheel at all times. Eight speed changes are provided and all exposed gears are protected by guards.

A 1500-lb. Steam Hammer.—The Massillon Foundry & Machine Company, Massillon, Ohio, has added a 1500-lb. steam hammer to its output, in the construction of which a combination of the two methods of fastening the slides in place is employed. The first of these is to use two bolts which pass through the main frame and into the slides and together with the thin and narrow wedges often used hold and back up the slides and the guides. The other scheme is to eliminate the bolts entirely and place the slides and guides in a cavity provided in the cheek of the main frame with adjusting bolts passing from the outside of the frame cheeks into the back of the slides and the guides. In this hammer two bolts pass through each slide and back through the main frame, thus throwing the strains of the ram on the frame of the hammer rather than on the cheeks. The advantages of this construction are that the cheeks of the main frame behind the slide back up and support the bolts which pass through the main frame while on the other hand the bolts passing through the main frame support and protect the cheeks on the main casting and the result is a construction which is practically unbreakable. The slide wedges are of forged steel and they extend the full width of the base or back of the slides. The cheeks of the main frame furnish a strong brace or bearing for these parts. The construction is further reinforced by projections on the cheeks which extend out beyond the wedges and cover a part of the front of the slides, thus making a pocket or cavity for them.

Trade Publications

Drop Forgings.—The Consolidated Mfg. Company, Toledo, Ohio. Catalogue. Size 6 x 9 in.; pages 24. Devoted to a line of drop forgings for the use of machine tool builders, cutlery, automobile, gun, bicycle, motorcycle and electrical appliance manufacturers, where they take the place of steel and malleable castings as the percentage of loss in machining is eliminated. Except one page of text, the entire catalogue consists of illustrations showing the different styles of forgings which the company has recently turned out.

Lubricants.—The Kent Lubricating Company, 500 Manufacturers' Building, Milwaukee, Wis. Catalogue. Treats of the Kent lubricants for various services. These include Kent grease, which is made in four different grades to meet all requirements in lubrication, also grease for automobiles and wagon axles, a boiler compound for neutralizing the action of scale-forming impurities in boiler feed water and an airbrake lubricant.

Mining Supplies.—Coshocton Iron Company, Monongahela, Pa. Booklet. Calls attention to a line of mine sheaves, rollers, grips and miscellaneous equipment for rope haulage. All the sheaves are cast with a chilled face and are rope lined with four-strand tarred Manila rope. The rollers are cast iron, with and without a chilled face, and also gum wood. Endless rope haulage cast steel tubular grips are shown, which are claimed to give the maximum stiffness with a minimum weight, while a protected screw and simplicity of parts keep down repair bills. These are made in all sizes, for center or side bumper cars. Other equipment shown includes a cast iron bumper for all styles and sizes of cars and cast iron frogs or turnouts for 12 to 60 lb. rails. All the different pieces of equipment are illustrated and for the sheaves brief specifications are given of the various sizes and different dimensions.

Fire Hydrants.—Norwood Engineering Company, Florence, Mass. Loose-leaf catalogue. Relates to the Holyoke and the Walker fire hydrants. The former has been one of the standard types for towns, cities and factories for over 35 years and is of the gate type, with a downward opening valve which permits an unobstructed waterway. All the valve openings in this hydrant are ¼ in. larger than the listed size, and the posts and heads have increased waterways which minimize the friction loss. If desired these hydrants can be furnished with either independent inside or outside gates for each nozzle. The special feature of the Walker hydrant is the rubber faced bronze mounted gate. The illustrations show both hydrants in elevation and section and tables of dimensions are included.

Siphons.—Schutte & Koerting Company, Twelfth and Thompson streets, Philadelphia, Pa. Catalogue 2, section A. Describes the Koerting universal siphon or steam jet for moving water and other liquids. These are made with brass or iron bodies and brass nozzles, and connections are provided on the top

and both ends for the steam and discharge pipes. The illustrations show the different types of siphons and their uses, the latter being supplemented by text.

Woodworking Machinery.—Hall & Brown Woodworking Machine Company, 1913 North Broadway, St. Louis, Mo. Pamphlet and catalogue. The former illustrates and describes briefly a few of the more important new machines designed for use in various woodworking industries. These include matchers, surfacers and matchers, double surfacers, planers, tenoners and a number of different types of saws. All of these tools are illustrated and their salient features brought out in the text supplementing the engravings. The catalogue is devoted to the company's Twentieth Century series and consists of views of the different machines making up the line, the majority of which are the full size of the page, 13 x 21 in., and the description is given on the other side of the leaf.

Brickmaking Machinery.—The Arnold-Creager Company, New London, Ohio. Booklet. Size 8 x 10½ in.; pages 24. Refers to a complete line of brickmaking machinery and supplies. These include brick molds, machines for operation by steam engines or animal power, pug mills, disintegrators, elevators, automatic cutters, barrows and trucks and kiln parts. The different pieces of machinery are illustrated and described and brief specifications are appended.

Deep Well Pumps.—P. K. Wood Pump Company, Los Angeles, Cal. Booklet. Concerned with the Wood's deep well propeller pump, in which the water is raised by the revolution of a screw at high speed. In the operation of this pump the moving element or propeller throws the water against the casing, where it is forced up by interior guide blades, and this process is repeated until the water reaches the discharge outlet of the pump. No increase in speed is required for additional depth in using this pump, as more runners are added and this is said to increase the efficiency of the pump. The illustrations show the various styles of pump built and there are a number of views of installations.

Automobile Tires and Rims.—The Firestone Tire & Rubber Company, Akron, Ohio. Three booklets. These point out the advantages of the Firestone pneumatic tires for automobiles and the Firestone dual pneumatic tires and quick detachable rims for motor trucks. The automobile tires are made in different styles for the standard types of rims, and demountable rims are used for carrying spare tires inflated and ready for use, thus furnishing a convenient means of quick and easy tire changing on the road. The dual pneumatic tires are formed by fitting two pneumatic tires side by side on each of the rear wheels of automobile fire engines, chemical engines, hose wagons, motor ambulances and auto patrol wagons. These tires can be removed for repairs the same as a single tire.

Electric Motors.—The Emerson Electric Mfg. Company, St. Louis, Mo. Five bulletins. No. 3139, replacing No. 3133, and 3140, replacing Nos. 3100A and 3136, call attention to a complete line of single-phase induction motors. Those covered in the former are of the back-geared type with countershafts ranging from ⅛ to ½ hp., and the latter are of the full load start clutch type, ranging from 1-20 to ½ hp. No. 3310, replacing 3308, illustrates an electric blower for use in connection with hot air residence furnaces. No. 3910, replacing 3907, illustrates and describes a line of family sewing machine motors for direct and alternating current circuits, while No. 3911, replacing 3905, treats of factory sewing machine motors with power transmission. In all the bulletins the various styles of motors are illustrated, brief specifications are given and tables of the principal dimensions appended.

Electrical Machinery and Appliances.—General Electric Company, Schenectady, N. Y. Three bulletins. No. 4749 gives general descriptions and specifications of a line of alternating current switchboard panels. These are built in three sections and the pages of the bulletin are divided correspondingly, so that the designer may have before him a picture of the complete panel desired, together with the full description of the equipment. No. 4755 illustrates and describes the equipment used in the electrification of the Cascade Tunnel of the Great Northern Railway Company. The difficulties encountered before the work was done and the manner in which these were overcome later serve to show the ability of electric traction to increase the capacity of sections of railroads where, owing to certain physical conditions, operation by steam locomotives has reached its limit. No. 4767 refers to both alternating and direct current motors for use in steel mills and describes especially the 6000-hp. 6600-volt induction motors recently installed in the Gary plant of the Indiana Steel Company.

Wire Belt Lacing and Babbitt Metal.—J. M. Hayden & Co., 6 Pearl street, Grand Rapids, Mich. Booklet. Refers to the Globe composition wire belt lacing, which is said to make a smooth joint, conform perfectly to the pulley, prevent any loss of contact between the belt and the pulley where the joint is made and will not cut through the belt. The Globe box metal is said not to require as great heat as many to melt it, stays liquid longer and in forming the lining is free from defects.

Fire Protection Apparatus.—Eureka Fire Hose Mfg. Company, 13 Barclay street, New York City. Catalogue No. 2. This is the company's 1910 catalogue describing and illustrating the various brands of fire hose and supplies for railroads, steamships, wharves, factories, hotels and public institutions. The hose includes a wide range of styles from a 4-ply fire hose to the ordinary garden hose. All of these are illustrated and briefly described, and a price-list and the various sizes of each brand made are included. Space is also given to accessories, such as ring couplings, spanners, play pipes, shut-off nozzles, hose racks and reels, hose carts, fire extinguishers, lanterns, axes and crowbars and holders. These also are illustrated, and where more than one size is made a table of capacities is appended.

Gear Shields.—The Ironsides Company, The Wyandotte, Columbus, Ohio. Circular. Concerned with the Ironsides gear shield, a lubricant for electric railroad use. The results of tests made on a number of these shields when in use on city and interurban cars are given, and a drawing shows the condition of the gear after running 317,869 miles with an Ironsides gear shield.

Metal Sheets.—The Stark Rolling Mill Company, Canton, Ohio. Mailing card. Concerned with Alumaloyd sheets for automobile parts and bodies. These sheets have a smooth surface to which paint adheres readily and is retained. One of the particular advantages claimed for these sheets is that paint applied to them will not scale, as the sheets will not rust and rust is the usual cause of paint scaling.

Bar Iron and Iron and Steel Shapes.—John Helmuth & Co., 30 Church street, New York City. American representatives for William Cooke & Co., Ltd., Sheffield, England. Catalogue. Size, 5½ x 8 in.; pages, 40. Contains a list of the various brands of Cooke's refined iron, with photographs showing the fractures and physical tests obtained with them. The various rolled iron and steel shapes are illustrated and lists of the various sizes and extras given. Records of tests made with several sizes of Cooke's Best Yorkshire iron are appended.

Pipe and Lap Welded Casing.—Wheeling Steel & Iron Company, Wheeling, W. Va. Booklet. Covers the various sizes of black and galvanized steam, gas and water pipe which is made in the standard, extra strong and double extra strong weights. The different sizes of lap welded casing fitted with V threads and protected sleeve couplings are listed, and space is also given to line and drive pipe, oil well tubing and couplings for standard wrought pipe, lap welded casing and patent sleeve tubing. Complete tables of weights, dimensions and prices of the different sizes are included.

Washers.—The Positive Lock Washer Company, Avenue A, Newark, N. J. Folder. Concerned with a nut locking device for railroad track joints, crossings, frogs, switches, locomotive and car frames, trucks, draft rigging, truss rods and brake beams, electric motors, bridges and machinery. The washer consists of a piece of flat steel bent to circular form, with projections on the ends so that the body of the washer carries the load of compression and the ends are relieved, thus keeping the strength constant. The barbs being free to move when subjected to vibration force themselves into the nut and the metal backing and prevent the former from turning.

Portable Hoists.—James P. Dunn, 6616 Lawnview avenue, N. E., Cleveland, Ohio. Catalogue. Concerned with Bailey's steel and iron portable hoists, which are designed for use in monument works, cemeteries, stone yards, factories, warehouses, car and gas works, construction, bridge building and all kinds of engineering work. These hoists are made with both single and double purchase and in four sizes, having capacities of 2, 4, 6 and 10 tons, respectively. It is stated that one man can raise the maximum load of each hoist and hold it at any point, while in lowering the weight of the load lowers it at any desired speed.

Wood Split Pulleys.—Saginaw Mfg. Company, Saginaw, Mich. Catalogue. Size 6 x 9 in.; 40 pages. Deals with the Gilbert wood split pulleys, which are said to be lower in first cost than the same type of iron or steel pulleys and will give as long service and permit lighter and less expensive shafting and hangers to be used on account of their lighter weight. The different styles and sizes of pulleys are illustrated and described, and a complete price-list and telegraphic code are appended.

Cold Drawn Steel Tubes.—National Tube Company, Frick Building, Pittsburgh, Pa. Blotters. Call attention to a series of advertisements regarding the manufacture of Shelby seamless cold drawn steel tubing, the first of which appeared in *The Iron Age*, August 19, 1910. The illustrations show primitive forms, methods of manufacture and uses of tubing.

Automobiles.—The Royal Tourist Car Company, Cleveland, Ohio. Catalogue. Concerned with the model M, series 2 car, having a four-cylinder motor and developing speeds from 5 to 65 miles per hour. The cylinders are vertical and in pairs, with valve chambers, water jackets and cylinder heads cast integral. Brief specifications of the car are given, with views of it and the factory where it is made.

Refrigerating and Ice Making Machinery.—The Creamery Package Mfg. Company, 182 Kinzie street, Chicago, Ill. Catalogue. Illustrates and describes a line of refrigerating and ice making machinery built in a number of different sizes. The various machines are illustrated and described with tables of dimensions and a number of views show installations of apparatus made by this company.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1 1/4 in. round or square ..... ₱ lb 1.90¢
1 1/2 to 1 1/2 in. x 1/4 to 1 in. ..... ₱ lb 1.90¢
1 1/2 to 1 1/2 in. x 1/4 to 5/8 in. ..... ₱ lb 2.10¢
Rods 3/8 in. and 11/16 round and square ..... ₱ lb 2.10¢

Angles: Cts ₱ lb
3 in. x 3 in. and larger ..... 2.05¢
3 in. x 2 1/2 in. to 2 in. and 1/4 in. ..... 2.35¢
1 1/2 to 2 in. x 1/4 in. ..... 2.05¢
1 1/2 to 2 in. x 3/16 in. and thicker ..... 2.10¢
1 to 1 1/4 in. x 3/16 in. ..... 2.20¢
1 to 1 1/4 in. x 1/4 in. ..... 2.30¢
1 to 1 1/4 in. x 5/16 in. ..... 2.10¢
5/8 x 5/8 in. ..... 2.50¢
3/4 x 3/4 in. ..... 2.50¢
5/8 x 1/8 in. ..... 3.50¢
1/2 x 3-32 in. ..... 4.35¢

Tees:

1 in. ..... 2.65¢
1 1/4 in. ..... 2.15¢
1 1/2 to 2 x 1/4 in. ..... 2.15¢
1 1/2 to 2 x 3/16 in. ..... 2.35¢
3 in. and larger ..... 2.15¢

Beams ..... 2.10¢
Channels, 3 in. and larger ..... 2.45¢
Bands—1 to 6 x 3/16 to No. 8 ..... 4.30¢
"Burden's Best" Iron, base price ..... 3.15¢
Burden's "H B & S" Iron, base price ..... 3.95¢
Norway Bars ..... 6.00¢

Merchant Steel from Store—

per ₱

Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.50@3.00¢
Best Cast Steel, base price in small lots ..... 7¢

Sheets from Store—

Black

	One Pass, C R Soft Steel	R G Cleaning
No. 16	₱ lb 2.55¢	2.85¢
Nos. 18 to 20	₱ lb 2.65¢	2.90¢
Nos. 22 and 24	₱ lb 2.75¢	3.00¢
Nos. 25	₱ lb 2.85¢	3.10¢
No. 26	₱ lb 2.90¢	3.30¢
No. 28	₱ lb 2.95¢	3.35¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₱ lb 12 @ 14 1/2¢
Patent Planished, W. Dewees Wood & A. Iley, B, 9¢ per lb

Galvanized.

Nos. 12 and 14 ..... ₱ lb 2.95¢
Nos. 22 to 24 ..... ₱ lb 3.15¢
No. 26 ..... ₱ lb 3.50¢
No. 27 ..... ₱ lb 3.80¢
No. 28 ..... ₱ lb 4.00¢

No. 29 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ..... ₱ lb 5.55¢
No. 26 ..... ₱ lb 6.25¢
No. 28 ..... ₱ lb 7.25¢

Corrugated Roofing—

2 1/2 in. Corrugated.	Painted	Galvd
No. 24	₱ 100 sq. ft. $3.85	4.80
No. 26	₱ 100 sq. ft. 3.20	4.10
No. 28	₱ 100 sq. ft. 3.00	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IC, 14 x 20 ..... $6.35
IX, 14 x 20 ..... 7.60
A. Charcoal:
IC, 14 x 20 ..... $5.40
IX, 14 x 20 ..... 6.50

American Coke Plates—Bessemer—
IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40

American Terne Plates—
IC, 20 x 28 with an 8 lb. coat $8.50
IX, 20 x 28 with an 8 lb. coat 10.50

Seamless Brass Tubes—

List November 17, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19 1/2¢ ₱ lb

High Brass Rods—

List August 1, 1908. 14 1/2¢ ₱ lb

Roll and Sheet Brass—

List August 1, 1908. 14 1/2¢ ₱ lb

Brass Wire—

List August 1, 1908. 14 1/2¢ ₱ lb

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity (18) ₱ lb 18 ¢
Sheet Copper Cold Rolled, 16 oz. 1 cent advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 3¢ ₱ square foot
Sheet Copper Polished over 20 in. wide, 2¢ ₱ square foot
Polished Copper, 1¢ ₱ square foot more than Polished

METALS—

Tin—

Straits Pig ..... ₱ lb 38 1/2@39 ¢

Copper—

Lake Ingot ..... ₱ lb 14 3/4@15 ¢
Electrolytic ..... ₱ lb 14 1/2@14 3/4¢
Casting ..... ₱ lb 14 1/4@14 1/2¢

Spelter—

Western ..... ₱ lb 6 1/4@6 1/2¢

Zinc.

No. 9, base, casks ..... ₱ lb 5 1/4¢ | Open ..... ₱ lb 5 3/4¢

Lead.

American Pig ..... ₱ lb 5 @5 1/4¢
Bar ..... ₱ lb 6 3/4@6 1/4¢

Solder.

½ & ½, guaranteed ..... ₱ lb 22 1/2@23 ¢
No. 1 ..... ₱ lb 20 1/2@21 ¢
Refined ..... ₱ lb 18 1/2@18 3/4¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₱ lb ..@10¢
Hallett's ....@10¢
Other Brands ..... @9 1/2¢

Bismuth—

Per ₱ ..... $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 31¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₱ lb 10 5/8@11.00
Copper, Heavy and Wire	₱ lb 10 5/8@10.75
Copper, Light and Bottoms	₱ lb 9.50@9.75
Brass, Heavy	₱ lb 7 2/3@8. 7.50
Brass, Light	₱ lb 5.75@6. 6.00
Heavy Machine Composition	₱ lb 9 5/8@9. 9.75
Clean Brass Turnings	₱ lb 7.00@7. 7.25
Composition Turnings	₱ lb 8.25@8. 8.50
Lead, Heavy	₱ lb .. @ 3.50
Lead, Tea	₱ lb .. @ 3.25
Zinc Scrap	₱ lb .. @ 3.75

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NICHOLSON U.S.A. TRADE MARK

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PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 | New York, November 10, 1910 | Vol. 86: No. 19

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

CHARLES T. ROOT, - - - - - PRESIDENT
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Still an Uncertain Market

Large Rail Contracts Expected This Month

Further Pig Iron Curtailment—Sales of Bessemer Iron at Lower Prices

An election result with so few surprises as are found in Tuesday's returns could not have an important effect upon business. The campaign saw no placing of orders for iron and steel contingent upon the election outcome, in the way that has often been done. Leaders in the trade are now simply waiting for events, with no definite expectation of anything beyond what has already been indicated concerning rail purchases. In making up their orders at this time for 1911 the railroads are only making the usual provision for early rollings to insure spring deliveries. Beside the Erie order, already noted, no rail contracts for 1911 are reported, though the Norfolk & Western is figuring on 30,000 tons, which will probably be divided between two manufacturers, while the Burlington has been added to the list of roads negotiating for their requirements. It is expected that a large total of orders for 1911 will be on the books before December 1.

Curtailment of pig iron production continues, but steel companies have done all of it in the past month. Of merchant furnaces as many blow in as go out. The United States Steel Corporation now has 50 furnaces out, as against 45 on October 1. The independent steel companies blew out six furnaces in October. The Steel Corporation will blow out one Duquesne and one Edgar Thomson furnace this week and will bank one at Bellaire. Its active furnace capacity, now 63 per cent., will then be about 61 per cent.

In October the total output of coke and anthracite pig iron was 2,087,385 gross tons, or at the rate of 67,335 tons a day. This compares with 68,542 tons a day in September, and is the smallest rate since July, 1909. The active capacity at the opening of this month was 65,826 tons a day for 231 furnaces, or 1700 tons less than for 239 furnaces on October 1. Stocks at furnaces increased in October. Pig iron production on November 1 was at the rate of 24,350,000 tons a year, or about 1,400,000 tons less than the average of 1907 and 1909.

Pig iron buying has broadened somewhat in the Central West, but has been less in the East than the average for October. Bessemer iron has broken through $15, at Valley furnace, and one round lot was sold for delivery in the first half of 1911 at $14.60. Inquiry for basic iron is pending in the East, but furnaces and buyers are some distance apart.

In foundry iron prices have not yielded in the past week in the way noticed in the two preceding weeks. Producers having taken a certain amount of first quarter businesss at low prices are not eager for more of the same sort. That is about the extent of the so-called improvement in the situation. Chicago and Buffalo

report considerable activity. One radiator interest has continued its recent buying, placing a considerable order for its Western works. A 5,000-ton sale of malleable Bessemer for delivery over the first half of 1911 was made at $14.50, Buffalo furnace. Alabama furnaces have had but a small share of the 1911 business thus far placed, buyers holding out strenuously for an $11 basis.

In most finished materials the week has shown a falling off both in new orders and specifications. While a hopeful view prevails it is admitted that there must be a marked quickening of the pace to insure even fair operation of the mills this winter.

Orders for wire products closed in October exceeded those for September, and wire is still the leader in activity.

Several inquiries for wrought pipe for both gas and oil lines have come up in the past week, one being from the Tri-County Gas Company for 80 miles of 2 to 10 in. pipe, and another of good size from a Canadian company. Merchant pipe is bought more freely for replenishment of stocks.

The copper producers' report for October, showing some increase in production, and yet large enough deliveries to reduce stocks has been interpreted as favorable on the whole, and predictions are made of a considerably larger reduction of stocks this month. Prices have advanced an eighth, at all events, to 12.87½ cents for electrolytic and 13 cents for lake, with cautious buying by consumers.

Steel Works Labor Conditions

We have already referred (*The Iron Age*, October 13, 1910, page 841) to the investigation of labor conditions in the iron and steel industries now being conducted by the Bureau of Labor of the Department of Commerce and Labor, in pursuance of resolution No. 237 of the United States Senate, calling for full information in regard to wages and hours of labor in iron and steel manufacture. To furnish the information called for in the numerous blanks sent out to iron and steel manufacturers will involve a large expenditure for clerical and other labor, as may be judged from the fact that complete scales of wages are wanted for the years 1900, 1905 and 1910, while an even more burdensome inquiry deals with accidents. Details are called for of every accident in iron and steel works in the United States in the two years ending June 30, 1910. In the same connection particulars are asked for of appliances installed for preventing accidents with results from their adoption. A much more voluminous report can be made in response to this latter inquiry than would have been the case two or three years ago, the activity of iron and steel manufacturers in the interim having been particularly noteworthy in this direction.

An unusual feature of the inquiry now being conducted by the Bureau of Labor is that its representatives are visiting steel plants and directly interrogating employees as to prevailing conditions. Such questioning may result in great injustice to manufacturers if the information secured from employees is not checked up by being brought to the attention of those in charge of operations. Very much will depend, in this connection, on the familiarity of the investigator with the operations about which he asks. Some of those who gathered the materials for the Pittsburgh Survey, for example, might have profited much by discussing the matters of which they treated with those familiar with labor conditions in iron and steel manufacture. A very different light is thrown, for example, upon the 12-hour shift at blast furnaces by a statement of the actual working time of employees, the character of the work done and the amount of waiting time included in the 12 hours. The fact that employees, when given a choice between 10-hour and 12-hour jobs at the same hourly rate choose the latter, is also to be considered. The hard conditions of 12-hour labor are oftentimes products of the imagination of the inexperienced investigator. There are some evidences of this in the publication made by the Bureau of Labor concerning conditions at the works of the Bethlehem Steel Company. The Bureau will be but doing simple justice if, in advance of publication, it discusses the reports of its agents with those who have long been in positions of responsibility in the iron and steel industries.

Concurrently with the Government investigation the American Iron and Steel Institute's committee of five, composed of presidents of important steel companies, is gathering data concerning Sunday labor at iron and steel works, and particularly seven-day labor in the continuous processes. Apropos of this latter inquiry, it may be said that the efforts thus far made to reduce the amount of Sunday labor at steel works have produced one important argument not included in the original statement of the case, and that is that the small repair forces now at work on Sunday accomplish as much as the much larger forces which did Sunday work under the old régime. The economic argument thus strongly reinforces those based on ethical grounds.

A New Record in Iron and Steel Exports

It is highly interesting to note that 1910 is making a new record in international trade in iron and steel, at least so far as finished materials are concerned. The statistics for the first nine months of the year show that Great Britain, Germany and the United States have had a larger export trade in finished and semi-finished iron and steel than in any like period in their history. Leaving out iron ore and old material, the total of iron and steel exports from Great Britain for the three quarters was 3,434,000 gross tons, against 3,074,000 tons to September 30, 1909; 3,109,000 tons in 1908 and 4,002,000 tons in 1907, which was the year of largest exportation. The pig iron movement was responsible for the record made in 1907, however, the total of pig iron, including ferromanganese and spiegeleisen, for the first nine months amounting to no less than 1,554,000 tons, whereas this year the pig iron exports have been 922,000 tons. Finished and semi-finished materials thus amount to 2,512,000 tons this year, against 2,448,000 tons in 1907. Prices have not been as high this year as in 1907, the total value of iron and steel exports for the first nine months of 1910 being £31,935,000, as against £35,623,300 in the first three quarters of 1907.

Germany, which in the past two years has been pressing Great Britain closely in exports of iron and steel, is likely to forge ahead in 1910. The statistics for the first three quarters of the year show exports of 3,461,186 metric tons from Germany, leaving out ore

and old material. This is equivalent to 3,405,000 gross tons, or only about 29,000 tons less than the total for Great Britain. Germany has a strong lead over Great Britain, however, in exports of finished and semi-finished materials, as only 564,761 tons of the above amount is pig iron, while Great Britain's total includes 922,180 tons of pig iron in the first three quarters of this year.

It is already evident that the United States will make a new record in iron and steel exports in 1910. So far as sales for export are concerned it has already been noted that for several months past these have been averaging 25,000 tons more than for the corresponding months of 1909. For the nine months ending September 30 the total, leaving out ore and old material, was 1,063,430 gross tons, or about 225,000 tons more than in the corresponding period of 1909.

There are cross currents in the iron and steel trade of the three leading countries, and it cannot be said now just how the balance stands between Great Britain, Germany and the United States. It can be said, however, that 1910 will show a new record in the consumption of iron and steel products in neutral markets, as it will show a new record for the total production of the United States, Germany and Great Britain.

Light Upon the International Steel Conference

The London *Iron and Coal Trades Review*, after due deliberation upon the objects of the American Iron and Steel Institute, and particularly on the purposes of the recent New York meeting to which representatives of the iron and steel industries in European countries were invited, comments as follows:

> The object is not to foster a definite international price agreement, but rather to encourage friendly rivalry instead of injurious competition. This is Judge Gary's way of putting it. American participation in the international steel trade is not very large at present, and the extent of the participation is probably pretty well governed by unwritten principles already, but through what the Institute accomplishes Judge Gary no doubt expects the participation to be increased. Again, there is the certainty that while the Payne-Aldrich Tariff bill of 1909 materially reduced iron and steel duties, another revision is coming in the not distant future, and it is likely to make much more serious breaches in the tariff wall. It is not to be supposed that British manufacturers could make serious inroads in American domestic trade, in point of tonnage, for what would be a large tonnage to any of the European countries would be a relatively small tonnage to the Americans, but what a low tariff or free trade basis could easily bring about would be reduction in American exports through European manufacturers threatening disturbance to American domestic trade by occasional incursions. British or German manufacturers might not be able to export regularly and steadily to the United States, but by occasional sales they could break the best American market, and the price of their abstention would be the limiting of American exports to a certain figure. The lower the American tariff, the higher price, through limited exports, American manufacturers must pay in order to be let alone. Judge Gary wants to have the terms as liberal as possible, and one means is to advertise, through this new Institute, American willingness to be friendly, and its ability to manufacture cheaply. To-day we are more sure of Judge Gary's friendliness than of his ability to manufacture cheaply.

It is not an uncommon experience that employers of labor, in making friendly advances to their employees, are considered by the latter to have thus given evidence of weakness, if not of fear of what their employees might compel them to grant. We have in the above extract a remarkable illustration of what may be conjured up against the friendly proposals of an advocate of co-operation among manufacturers. Those who participated in the New York meeting now have the key to every chamber and recess of the minds that conceived it. And the final sentence of the comment exposes the fear that was companion to the friendliness!

But lest this London expression be taken too seriously, it may be well to add another extract from the same article, which unmasks the real situation as to this country's "ability to manufacture cheaply":

> The Gary plant, . . . it is well to observe, involves a computed expenditure of some £15,000,000 (outside of coal mines, ore mines and ore carrying facilities) with an output of some 1,200,000 tons of finished products a year, largely rails; in other words, £12 10s. invested in plant per ton of annual output. Including the capitalization in ore, coal and transportation, together with royalties, there is an interest, royalty and depreciation charge of not very far from £2 per ton of finished product.

The builders of the Gary plant probably little dreamed that the work they have prosecuted with such pride would so soon compel international negotiations to insure its operation at a profit. After saddling their product with a $3.12½ charge per ton (at 5 per cent.) on construction alone, they might have contrived in some way to cut loose from the ore, coal and transportation facilities and, by buying raw materials in the market, have saved the remainder of the $10 handicap against every ton of steel they produced. Then, too, our contemporary might have missed the delectation of building its man of straw.

Gratuities to Influence Sales

The recent trials involving corruption in connection with the repair work of one of the railroad systems of the Middle West call attention to the utter uselessness of the legislation passed by a number of States striking at all forms of gratuities in connection with sales of goods. It has long been recognized that presents of money play a part in the transaction of business. A generation ago the practice was more prevalent; better systems of buying now make it more difficult. But the favor of some employees, in positions both high and low, still has to be secured by this dishonorable means.

In certain works and in isolated departments of others the salesman finds it absolutely necessary if he is to secure the business. The owner pays the bill usually, for the price is made to include the gratuity. Men who come in frequent contact with subordinates in plants assert that the custom is just as prevalent as it was five years ago, before laws were made providing a penalty of fine and imprisonment for both the receiver and the giver of the inducement. No necessity for concealment exists, excepting from the owners, for the law became practically a dead letter from the moment of its passage.

The fault lies with the employer. If he were anxious to get at the reasons for the selection of purchases for his plant he could discover the offender with no great amount of trouble. Usually the condition is well known to many salesmen. A reputation is made, knowledge of which spreads quickly. The owner, by ridding himself of this form of parasite, would reduce his costs, for corruption means expensive buying. The great majority of employees are honest men, but occasionally among them is a rascal who sees no wrong in enriching himself whenever and however possible. If a man is dishonest the trait will express itself in other ways should the occasion offer. Those who looked to see the terror of the law bring an end to "grafting" in the works now realize, if they have

given the subject thought, that the remedy must be one of shop discipline, administered after watchful investigation.

Orderliness as a Cost Factor

In many manufacturing plants a source of waste is the lack of orderliness. While synonymous with neatness, the word has a meaning which reaches much further in its application to a shop or factory. It includes the essence of the adage "a place for everything and everything in its place," taking into account not only tools, jigs, fixtures and parts awaiting assembling or further operations, but finished pieces in process of assembling, as well. This is particularly true in manufacturing, where a workman specializes within narrow limits of production.

An example of the practical value of orderliness may be given. In a factory manufacturing electrical appliances a certain apparatus, produced in great numbers was assembled by operatives at the average rate per man of 12 a day. It contained a large number of pieces and required the use of various sizes and forms of screws. A young man was put to work on the job. He proved slow and gave poor satisfaction in the beginning, and was even derided by his fellows. But he possessed a large bump of orderliness and the capacity to study his work, and as a consequence evolved a system of laying out his work on the bench for greater convenience in handling it. Each piece was in the sequence of its assembling. Each kind of screw was isolated in a position of convenience proportional to the frequency of its use. Once he had determined upon his system he adhered to it. The result was a machine-like facility of operation. Hand and brain were coordinated by constant practice to a very high degree of efficiency, vastly increasing production, and at length a capacity of 50 per day was reached. The superintendent realized that such a man should not be wasted at a bench and made him foreman of instruction in this department. He trained the men in the use of his system and they were given to understand that thereafter 50 and not 12 pieces were the day's work, and they did it.

Few works exist where examples cannot be found to prove a similar need of better systems, though in most cases the waste would be less pronounced. A large percentage of shop benches show an inclination toward disorderly methods. Frequently men are seen searching for a part or a tool in a miscellaneous collection of articles lying about helter skelter. In old fashioned shops, where benches and the spaces beneath them and every other corner are full of evidences of disorderliness and slovenliness, the waste is criminal in the eyes of the progressive manufacturer. Yet a similar condition, on a less scale, may be present in his own shops. The introduction of a premium system reveals the presence of this fault. So also does concentrated effort on the part of superintendent and foremen.

In recent weeks manufacturers in various metal working lines have had more opportunity than for some time to select the most suitable men from among those applying to them for employment. The various employment bureaus of the metal trades associations note that fewer men from among those sent out from their offices are given places. Manufacturers have been able under such conditions to strengthen their forces by bringing up the efficiency average.

Correspondence

Preventable Blast Furnace Accidents

To the Editor: Mr. Sweetser's article on preventable blast furnace accidents is timely and to the point. On the whole, he covers the ground well and gives good advice. Regarding gas explosions, he says: "Some of the most disastrous accidents around blast furnaces are those due to gas explosions, and many lives have been lost and much property has been destroyed by their terrific force."

While these disastrous explosions considered by themselves are not numerous, considering the total number of furnaces, the fact that they can and do occur should be sufficient warning to the responsible parties; not only should every precaution be exercised to minimize the possibility of their occurrence, but if a sure preventive method exists it should be applied without delay.

Mr. Sweetser says further: "The waste gas of a normal furnace is not a dangerously explosive mixture, and is not even very rich in fuel gas, and its control is a comparatively easy matter. Yet when the furnace is stopped for a few minutes and the blast put on again there *could* (italics are Mr. Sweetser's) be an explosion of this normal gas, providing that the gas accumulates where it is mixed with air and is then ignited." There is, therefore, a possibility of an explosion after every stop, even with normal gas containing from 70 to 75 per cent. of incombustible constituents, and this possibility becomes a probability when the gas becomes mixed with an appreciable per cent. of hydrogen due to a leaky tuyere or bosh plate.

Mr. Sweetser advocates keeping both bell and bleeders closed while the blast is off. This is good advice, provided your bleeders are perfectly tight, your explosion doors do not leak and your burner valves are all tightly closed at the same time. The fact is that bleeders, if they are used at all, never close tightly, and explosion doors always leak more or less; and if matters could be thoroughly investigated it would be found that the explosion doors are the cause of nine-tenths of the explosions which they are designed to make ineffective. That leaks and crevices exist even in the best constructed and well supervized gas main systems of modern blast furnaces is admitted by Mr. Sweetser when he says: "To prevent explosions of the blowing-in gas, all fire must be kept away from the gas burners at stoves and boilers until the pressure of the gas forces it through every crack and crevice of the whole gas main system." There are not a few practical blast furnace men who insist on opening the bell and bleeders wide whenever the blast is taken off and on opening the dust catcher below, thus sweeping the downcomer clear of gas and permitting the boiler burners to draw the gas from the gas main, trusting to the volume of gas to shove the air out ahead of it when the blast is put on, and it is claimed for this method that it insures a minimum danger from explosions.

There are many ways by which the danger of having gas explosions, both in blowing in and after stops, can be and are minimized. Every practical blast furnace man has a way derived from experience which is more or less satisfactory to himself. Not one in ten of the practical blast furnace men would frankly acknowledge that they cannot be sure of handling blast furnace gas without imminent danger. There are very few who have had the sad experience of a disastrous explosion. It is a safe assertion, however, that there is not one blast furnace man whose experience covers a term of years who has not experienced some more or less

serious gas explosions, to say nothing of the innumerable minor explosions or so-called kicks or puffs. The writer speaks from 15 years of practical experience, during which time he had one serious gas explosion and an untold number of minor ones. Sometimes there would be a period of several months without a puff, and then again an interval where there would be hardly a stop without a kick or two in spite of all precautionary efforts. Generally the cause would be discovered and removed; often not.

Mr. Sweetser's suggestions for preventing gas explosions are laudable, and if properly carried out may be more effective than many others; but, like all precautionary methods, they minimize the probability but do not exclude the possibility of having gas explosions. There is only one way to prevent blast furnace gas explosions, in blowing in as well as in blowing up after stops or shutdowns, and that is to drive out all the air from the dust catcher, downcomer and gas main with a gaseous medium which is neither combustible nor a supporter of combustion, just before putting on the blast. Any neutral gas will answer the purpose, but steam is the most available and easiest to apply and is, therefore, the medium used.

This method was first conceived and successfully applied by J. W. Dougherty something over six years ago. It has been in continuous use at the furnaces of the Pennsylvania Steel Company for the past five years. Its effectiveness having been thus thoroughly established, the writer undertook its introduction at other furnaces. Within the past year ten other furnace plants have adopted Mr. Dougherty's method. The license fee is exceedingly moderate, the cost of installation in no case will exceed $25 and the up-keep is practically nil. E. A. UEHLING.

PASSAIC, N. J., November 4.

The John Fritz Medal Award for 1910

The John Fritz medal, established in 1902 in honor of Mr. Fritz on his eightieth birthday, has been awarded for this year to Alfred Noble, past president of the American Society of Civil Engineers, "for notable achievements as a civil engineer." The presentation will be made Wednesday evening, November 30, at the house of the American Society of Civil Engineers. Dr. Samuel Sheldon will preside and addresses will be made by Isham Randolph and Dr. R. W. Raymond. The awards of the John Fritz medal have been as follows: In 1905 to Lord Kelvin, "for his work in cable telegraphy and other scientific attainments"; in 1906 to George Westinghouse, "for the invention and development of the air brake"; in 1907 to Alexander Graham Bell, "for the invention and introduction of the telephone"; in 1908 to Thomas Alva Edison, "for the invention of the duplex and quadruplex telegraph, the phonograph, the development of a commercially practical incandescent lamp and the development of a complete system of electric lighting, including dynamos, regulating devices, underground system protective devices and meters"; in 1909 to Charles T. Porter, "for his work in advancing the knowledge of steam engineering and in improvements in engine construction."

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its regular monthly meeting at the Manufacturers' Club, Philadelphia, on the evening of November 2, with President Thomas Devlin in the chair. The Railway Material Company, Phoenixville, Pa., represented by Charles H. True, was elected to active membership. After discussion, the association by motion favored the selection of San Francisco, Cal., as the location, in 1915, for the exhibition commemorating the opening of the Panama Canal. An interchange of views regarding trade conditions followed. While reports showed a variance, the anticipation of more activity in the not distant future was general. The meeting concluded with an interesting address by President Devlin, descriptive of his foreign travel during the summer.

The Blindness of Single Spaced Correspondence

Two essentials of business correspondence are that every letter shall be carefully scrutinized by its writer before mailing and that it shall be intelligible to its recipient without demanding of him any unusual effort. Great risk of failure in both these respects comes with closely spaced typewriting. Single spacing brings the lines so nearly together that, unless the eyes are concentrated to an unusual degree, the words above and below merge most confusingly with those that are being read, especially with men whose eyesight is not normal. When a letter contains only a few lines the practice does not matter so much, but many houses, happily in decreasing numbers, employ the concentrated method on all of their correspondence. Even quotations of prices are run into the lines of a paragraph, instead of being paragraphed individually. Nothing is more confusing, and to most people more annoying, than to try to separate numerals that are jammed closely together. Business men are even compelled to have their own operators rewrite such correspondence that it may be easily digested.

The evil is removed by the setting of all typewriters of an office for double spacing. Possibly this means a slightly increased cost for stationery, and letter books may fill more rapidly. In a great majority of cases however, business letters cover only a single sheet with double spacing. Letter books are rapidly giving place to carbon letter copies. But, whatever the economy of single spacing, it is small enough compared with the results which may follow the necessarily rapid reading of letters. It is very important that the meaning be clear, visually as well as in the wording. Otherwise, complications may ensue in succeeding correspondence, until the outcome of the original misunderstanding may be serious. Such cases are by no means unknown, and the blindness of close spacing is an important contributory cause.

October Copper Production and Stocks

The report for October of the Copper Producers' Association shows a reduction in stocks of 9,531,800 pounds from October 1 to November 1. The report is as follows:

Stock of marketable copper of all kinds on hand at all points in the United States October 1	148,793,714
Production of marketable copper in the United States from all domestic and foreign sources during October	126,469,284
Deliveries of marketable copper during October:	
For domestic consumption	67,814,172
For export	68,186,912
Total	136,001,084
Stock of marketable copper of all kinds on hand at all points in the United States November 1	139,261,914

The reduction of stocks thus shown is smaller than had been expected. It compares with a reduction in the previous month of 20,087,531 pounds. It may be said, however, that the September reduction was much greater than expectations. The production of October, a 31-day month, was, of course, larger than that of September, which was only a 30-day month. This partly accounts for the smaller stock reduction in October.

Pig Iron Production

A Decreased Rate in October

A Net Loss of Eight Furnaces and of 1700 Tons a Day in Capacity

Curtailment of pig iron production continues. In October the total output of coke and anthracite iron was 2,087,385 gross tons, or at the rate of 67,335 tons a day. This compares with 68,542 tons a day in September and is the smallest rate since July, 1909. The entire reduction is in steel works furnace operations, the production of merchant furnaces being stationary. Seventeen furnaces were blown out and nine were blown in last month, leaving 231 furnaces in blast November 1, a net loss of eight. The active capacity at the opening of this month was 65,826 tons a day, or 1700 tons less than on October 1.

Estimating charcoal iron, pig iron production November 1 was at the rate of about 24,350,000 tons a year, or about 1,400,000 tons less than the average of 1907 and 1909. The domestic production of ferromanganese and spiegeleisen in October, 8500 tons, was the smallest since December, 1908.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with October, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
October, 1909	57,067	26,789	83,856
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,290	26,948	84,148
February	57,876	27,740	85,616
March	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,657	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963
September	47,007	21,536	68,542
October	45,794	21,541	67,335

October Output by Districts

The table below gives the production of all coke and anthracite furnaces in October and the four months preceding:

Monthly Pig Iron Production. Gross Tons.

	June. (30 days)	July. (31 days)	August. (31 days)	Sept. (30 days)	Oct. (31 days)
New York	163,375	162,961	158,666	148,999	147,894
New Jersey	18,443	18,962	19,177	18,773	13,379
Lehigh Valley	66,944	61,014	63,878	63,919	69,327
Schuylkill Val.	60,349	61,340	64,926	60,689	61,673
Lower Susquehanna and Lebanon Val.	60,315	60,043	54,442	53,750	54,072
Pittsburgh dis.	483,909	502,711	510,352	505,342	507,508
Shenango Val.	130,290	113,280	113,500	108,114	112,026
West. Penn.	132,344	129,786	116,117	115,622	126,098
Md., Va. and Kentucky	82,181	75,051	76,477	68,398	67,926
Wheeling dis.	76,166	73,164	68,341	74,143	76,581
Mahoning Val.	208,988	215,282	211,575	201,986	202,667
Central and North. Ohio.	145,393	139,627	122,960	111,958	117,902
Hocking Valley, Hanging Rock and S.W.Ohio.	41,521	30,163	32,490	27,657	24,029
Mich.,Minn.,Mo., Wis.,Col.,Wash.	68,051	65,863	66,096	63,935	72,825
Chicago dis.	328,953	264,136	258,145	259,672	246,504
Alabama	160,970	143,313	140,015	148,755	160,077
Tenn., Georgia and Texas	37,086	31,806	29,690	24,563	26,897
Totals	2,265,478	2,148,442	2,106,847	2,056,275	2,087,385

There was a net loss of eight in the number of active furnaces between October 1 and November 1. Among furnaces blown out were the New York State Steel Company's stack at Buffalo, Oxford in New Jersey, one Crane and one Palmerton in the Lehigh Valley, one Paxton in the Lower Susquehanna Valley, one Duquesne and one Aliquippa in the Pittsburgh district, one South Sharon in the Shenango Valley, three Cambria in Western Pennsylvania, one Mingo in the Wheeling district, Madeline and one South Chicago in the Chicago district, and Sheffield, Williamson and one Sloss-Sheffield in Alabama.

Among furnaces blown in were Harriet Y at Buffalo, one Dunbar and Perry in Western Pennsylvania, Cherry Valley in the Mahoning Valley, one Federal in the Chicago district, one Mayville in Wisconsin, Zenith in Minnesota, and one Vanderbilt and Central in Alabama.

Capacity in Blast November 1 and October 1

The following table shows the daily capacity of furnaces in blast November 1 and October 1. These figures are based largely on the performance of the furnaces in the past two months:

Coke and Anthracite Furnaces in Blast and Capacity.—Gross Tons.

Location of furnaces.	Total number of stacks.	November 1. Number in blast.	November 1. Capacity per day.	October 1. Number in blast.	October 1. Capacity per day.
New York:					
Buffalo	17	13	4,135	14	4,335
Other New York	7	3	550	3	582
New Jersey	7	2	432	3	625
Spiegel	2	..	....	..	....
Pennsylvania:					
Lehigh Valley	23	12	2,076	13	1,970
Spiegel	3	1	90	2	161
Schuylkill Valley	16	7	2,010	7	2,023
Low. Susquehanna	7	4	802	5	913
Lebanon Valley	10	6	847	6	878
Pittsburgh district	50	38	15,483	40	16,433
Spiegel	3	1	114	1	130
Shenango Valley	20	10	3,226	11	3,487
Western Penn.	27	14	3,295	15	3,704
Maryland	4	3	805	3	795
Wheeling district	14	7	2,420	8	2,510
Ohio:					
Mahoning Valley	23	18	6,837	17	6,333
Central and North.	22	10	3,803	10	3,715
Hocking Val., Hanging Rock and S. W. Ohio	15	7	775	7	758
Illinois and Indiana	31	20	8,050	20	8,410
Spiegel	3	0	0	1	155
Michigan, Wisconsin and Minnesota	10	7	1,340	5	905
Colorado, Missouri and Washington	7	4	1,100	4	1,096
The South:					
Virginia	23	10	1,140	10	1,150
Kentucky	5	2	348	2	350
Alabama	46	23	5,274	23	5,175
Tenn. and Georgia	20	9	874	9	910
Totals	415	231	65,826	239	67,512

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.— 1908.	1909.	1910.	Spiegeleisen and ferromanganese. 1909.	1910.
January	664,415	1,117,823	1,773,201	12,325	19,538
February	745,802	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,553	1,739,212	23,743	25,591
April	727,540	1,093,092	1,669,092	22,478	22,304
May	759,674	1,256,448	1,619,283	20,334	26,529
June	717,689	1,565,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,991	1,442,572	22,313	25,756
September	933,514	1,660,839	1,410,221	28,148	15,151
October	996,481	1,769,094	1,419,624	25,384	8,500
November	981,167	1,689,994	.....	23,376	.....
December	1,090,339	1,768,799	.....	20,791	.....

Graphic Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age* The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	39,619	59,232	84,459
April	73,885	38,289	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	36,444	64,656	75,516
July	72,763	39,287	67,793	69,305
August	72,594	43,851	72,546	67,963
September	72,783	47,300	73,507	68,542
October	75,386	50,554	83,856	67,335
November	60,937	52,595	84,917	.....
December	39,815	56,158	85,022	.....

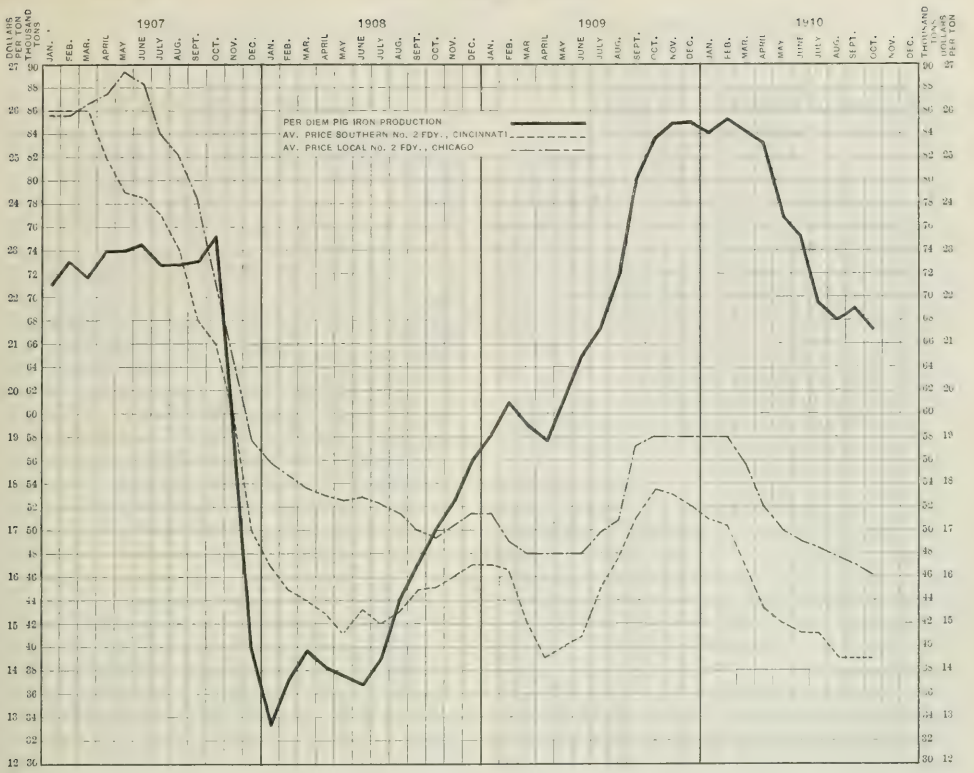


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to November 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron Delivered at Chicago.

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	14.25	16.40
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	14.25	16.06
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—*Gross Tons.*

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,228,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,250,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	2,056,275
October	2,336,972	1,567,198	2,599,541	2,087,385
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

Improvements are being made to the blast furnace of the Sharpsville Furnace Company, Sharpsville, Pa. These include a new hot blast, cold blast gas mains, three new stoves, and a spray type of gas washer, designed by Arthur G. McKee, Cleveland, Ohio. The stoves are already in and work will be started on the steel work shortly.

The Sheffield Coal & Iron Company, Sheffield, Ala., blew out on October 17 the one furnace it has been operating the past year.

The Jones & Laughlin Wire Catalogue

The Jones & Laughlin Steel Company, Pittsburgh, has issued its first catalogue on wire nails and wire products. It is an attractively illustrated booklet of thirty-two pages and contains much detailed information about the various brands of wire nails, wire rods, barb wire, staples, annealed wire, galvanized wire and other wire products now being manufactured in the new Aliquippa department of the company. The Jones & Laughlin products in iron and steel have been the standard of quality for 60 years, and the firm's long record of achievement and of fair treatment of customers in the steel trade is a guarantee for the new products it has just commenced to turn out at the Aliquippa Works. The sales head of the wire department is George A. Mason, personally known throughout the trade because of his long service with another company. Associated with him in the sales department are Thomas C. Ham and George E. Quigley, both men of experience in the wire business.

The Western Steel Corporation, Seattle, works at Irondale, Wash., has placed with Tate, Jones & Co., Inc., Pittsburgh, an order for Kirkwood oil burning appliances for its third open hearth furnace. It has been using two Kirkwood equipments for some time.

The W. F. & John Barnes Company, Rockford, Ill., was awarded a gold medal for its exhibit of machinery at the recent Brussels Exposition, particular mention being made of the completeness of its line of drilling machinery.

Josephine Furnace of Corrigan, McKinney & Co., at Josephine, Pa., will be blown out this week for relining.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 9, 1910.	Nov. 2, 1910.	Oct. 12, 1910.	Nov. 10, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.75	$15.75	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	*14.75*	14.75	15.00	19.00
Basic, Valley furnace	**13.25**	13.00	13.10	17.25
Bessemer, Pittsburgh	*15.50*	15.90	15.90	19.90
Gray forge, Pittsburgh	14.15	14.15	14.15	17.15
Lake Superior charcoal, Chicago	*18.00*	18.00	18.25	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*23.50*	23.50	24.00	27.00
Forging billets, Pittsburgh	*28.50*	28.50	29.00	31.00
Open hearth billets, Philadelphia	26.00	26.00	26.00	30.60
Wire rods, Pittsburgh	*28.00*	28.50	28.50	32.50
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	*13.50*	13.50	13.75	18.00
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	*13.50*	13.50	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.50*	13.50	13.75	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.37*	1.40	1.40	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.55
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	*1.25*	1.25	1.40	1.50
Skelp, sheared steel, Pittsburgh	*1.35*	1.35	1.50	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.60*	1.60	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	12.87½	12.87½	13.25
Electrolytic copper, New York	**12.87½**	12.75	12.75	13.00
Spelter, New York	**5.95**	5.95	5.60	6.30
Spelter, St. Louis	**5.80**	5.80	5.45	6.15
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	4.30	4.27½	4.27½	4.25
Tin, New York	36.25	36.80	....	30.50
Antimony, Hallett, New York	*7.75*	7.75	7.87½	8.25
Nickel, New York	**45.00**	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.25c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

Butt Weld.

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
⅝ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	77	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

THE IRON AND METAL MARKETS

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld } Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.

2, 2½ to 4 in.... Lap Weld }

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter that 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 9, 1910.—(*By Telegraph.*)

Pig Iron.—Considerable new inquiry for pig iron has come up in the past week and some tonnage has been closed. A local consumer is reported to have bought one lot of 2000 tons and another lot of 3000 to 4000 tons of Bessemer at prices ranging from $14.60 to $14.75, Valley furnace. It is also reported that the Westinghouse Air Brake Company has bought 8000 tons of foundry and forge, but this is not confirmed. The General Electric Company is in the market for 6000 tons of iron, but none of this will come from local or Valley furnaces. The market on basic iron is stronger, due to the withdrawal of low prices put out some time ago by two furnace interests. We quote as follows: Standard Bessemer iron, for delivery through first half of next year, $14.60 to $14.75; malleable Bessemer, $13.75; basic, $13.25; No. 2 foundry, $13.75, and gray forge, $13.25, all at Valley furnace, the freight rate to Pittsburgh district being 90c. a ton.

Steel.—There is more inquiry for billets in small lots ranging up to 1000 tons, and there are also several large inquiries reported in the market for sheet and tin bars for first quarter. A sale of 500 tons of Bessemer sheet bars for November and December delivery is reported at $24.50, Pittsburgh. We quote Bessemer and open hearth billets at $23.50 to $24; Bessemer and open hearth sheet and tin plate bars, $24.50 to $25, and forging billets, $28.50 to $29, all f.o.b. Pittsburgh, Youngstown or Wheeling district.

Merchant Pipe.—The Moncton Tramway, Electricity & Gas Company, Ltd., Moncton, New Brunswick, is in the market for the pipe material for transportation of natural gas. The line is to be laid next spring, and the quantity involved is about 1600 tons.

(*By Mail.*)

The feature of interest in the iron trade this week is the break in prices on Bessemer pig iron, brought about by the placing of some fairly large tonnage for first half delivery. For several months the nominal price of Bessemer iron has been $15, at Valley furnace, but this price held only for the reason that not enough new business was being offered to thoroughly test the market. Recently a local interest bought 1500 tons for first half delivery at $15, Valley furnace, but last week a leading local consumer sent out inquiries for the same delivery for quite a large tonnage, and has closed for part of it on the basis of $14.60, at Valley furnace, or $15.50, Pittsburgh. The same interest is negotiating for another larger tonnage, which may be closed before this week is out. A little better inquiry is reported for steel billets in lots ranging from 200 tons up to 1000 tons, but prices continue weak. Conflicting reports are made regarding specifications against contracts received by the steel mills so far this month against the same period in October. Several large mills report their specifications better, while others state they show a large falling off as compared with the first week or 10 days in October. Consumers are buying only such quantities of material as are absolutely needed, while jobbers are merely purchasing enough to maintain stocks. Confidence in the future seems to be lacking. An encouraging feature of the situation is that on most orders placed there are requests for prompt shipment.

Ferromanganese.—The low prices ruling on foreign 80 per cent. for delivery through the first half have brought out some inquiry. Several large lots are under negotiation for delivery in the first six months, and one lot of 2000 tons for delivery over all of next year. A leading consumer is reported to have bought 1500 tons, deliveries 250 tons a month over the first six months at about $38.50, Baltimore. We quote foreign 80 per cent. at $38.50 to $39, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—Consumers are pretty well covered and there is not much new inquiry. There is a scarcity of 50 per cent. for prompt shipment, and it is bringing slightly higher prices than for forward delivery. We quote 50 per cent. for delivery over the first six months of next year at $55 to $55.50, and for prompt delivery at $56 to $56.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—One leading consumer has placed fully 9000 tons of steel and iron skelp in the past three or four weeks. We note a sale of 2000 tons of small sizes of grooved steel skelp at 1.25c., Pittsburgh. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—There is not much inquiry, only small lots being wanted for prompt shipments. Consumers are buying merely as their needs require. We quote Bessemer rods at $28 to $28.50, and open hearth and chain rods at $28.50, f.o.b. Pittsburgh.

Muck Bar.—Consumers being pretty well covered, while two of the local makers have their product pretty well sold up through the first quarter. We continue to quote best grades of muck bar, made from all pig iron, at $30 to $30.50, Pittsburgh, with Eastern muck bar still being offered in this market at about $29, delivered.

Steel Rails.—No domestic orders for standard sections of moment have been placed, but negotiations are now on between the Carnegie Steel Company and a number of leading roads that will probably develop into orders between now and December 1. A good many standard section rails are being rolled at the Edgar Thomson mill for export. New demand and specifications against contracts for light rails last week were better than the week before, the Carnegie Steel Company having taken close to 3000 tons. Under the arrangement recently made for quoting rails on a per pound basis, quotations on light rails are now as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are absolutely minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—No car orders have been placed in the past week and the whole plate trade is very dull. A number of the local plate mills were down last week for lack of orders, but are running again this week, though not to full capacity. No large business is in sight. The local market on ¼-in. and heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

Structural Material.—Inquiry in the past week has been light, and no large contracts have been given out in the local market. Several Western roads are inquiring for a good deal of tonnage for bridge work and some of these contracts are expected to be placed before the month is out. We continue to quote beams and channels up to 15 in. at 1.40c., f.o.b. Pittsburgh.

Sheets.—A fair amount of new tonnage has been placed for delivery in this and next month. Some mills are selling for delivery in first quarter at present prices, while others refuse to do so, believing the sheet market will be higher after the turn of the year. The market on sheets remains on the basis of 2.20c. for No. 28 one pass black sheets and 3.20c. for No. 28 galvanized, but in some cases, on nice specifications, these prices are shaded $1 a ton. The full schedule of prices now in effect on black and galvanized and on roofing sheets is given on a previous page.

Tin Plate.—In the last few days specifications have notably increased, and if this continues some of the capacity recently thrown idle will be started up again. Some heavy contracts for bright plate from the meat packing and condensed milk interests have been placed in the past week or two for delivery in the first quarter, and in some cases the second quarter. Prices on tin plate are firm, and we quote 100-lb. cokes at $3.60, base box, f.o.b. Pittsburgh.

Bars.—The amount of new business in both iron and steel bars is lighter now than at any time this year, being confined to small lots to cover actual needs. Consumers are not disposed to contract, not being assured that present prices on either iron or steel bars will be maintained. The railroads are buying very little. Specifications against con-

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tracts for steel bars are coming in at a fairly satisfactory rate. The local market on steel bars is 1.40c., but for some points of delivery, notably in the Chicago district, this is being shaded as a basing price. We quote soft steel bars at 1.40c. in large lots and common iron bars at about 1.45c., Pittsburgh. Prices on the latter are weak.

Hoops and Bands.—Consumers are placing new orders only in small lots to meet current needs. Specifications have been a little heavier so far this month than in the first week in October. Prices are firm, and we quote hoops at 1.50c. in large lots, and 1.55c. in small lots; bands, 1.40c. in carload and larger lots, and 1.45c. in small lots, the latter carrying extras as given in the steel bar card lated September 1, 1909.

Cotton Ties.—The heavy demand is over, but consumers are specifying quite liberally against contracts. On shipments going out this month 77½c. per bundle is charged.

Spikes.—There is no improvement in the demand for railroad spikes. The railroads for some months have been buying only such quantities of spikes as are absolutely needed for repair work. It is believed, however, that after some rail orders are placed the demand for standard railroad spikes will show a material betterment. The demand for small railroad and boat spikes is quiet. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—Specifications on contracts are coming in at only a fairly satisfactory rate, but new business is only for small lots to cover actual needs. Material betterment n the demand is expected in the near future.

Spelter.—A number of large consumers have been holding off to see if a break would not come in the market, but stocks of some of them are getting very low and they will have to buy, in limited quantities at least, in the near future. We quote best grades of spelter at 5.75c., East St. Louis, equal to 5.87½c., Pittsburgh.

Merchant Steel.—Inquiry is light and has been for some time, while specifications against contracts are only fair. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ by ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—Several leading makers of shafting state that in the past two weeks specifications against contracts have been coming in at a little better rate, but new orders are only for small lots. It is believed that the demand from the automobile builders and implement makers will show material improvement within the next month or two, and early in the new year specifications are expected to be coming in more freely. Regular prices are being fairly well maintained.

Wire Products.—The demand for wire products and wire is only fair, jobbers and consumers placing orders only for such quantities as are needed to maintain stocks. Specifications against contracts are coming in fairly well, but the general condition of the wire trade is not as satisfactory as desired. The demand for cut nails is a little better, and specifications on contracts are reported as coming in a little more freely. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—Several large inquiries for both gas and oil lines have come up in the past week, one of these being from the Tri-County Gas Company for 80 miles of 2 to 10 in., and another from a Canadian company for a large quantity, but details are not ready to be given out. Mills report quite a good demand for merchant pipe, most orders carrying with them urgent requests for prompt shipment, showing that stocks held by distributers all over the country are very low. The stocks of pipe being carried by the mills at the present time are also lower than at any period this year, and the mills will enter the new year with their stocks well depleted and with every prospect of good business. It is stated that discounts on both iron and steel pipe, printed on a previous page, are being pretty firmly held.

Boiler Tubes.—There is absolutely no improvement in either demand or prices of boiler tubes, and the market is in very unsatisfactory condition, as it has been for practically all of this year. It is stated that in a good many cases iron boiler tubes are being sold below the actual cost of making them.

Iron and Steel Scrap.—This trade continues quiet, new inquiries from consumers being light and prices are only fairly strong. There is more activity in the demand for borings and turnings than for any of the other grades. The leading consumer of heavy steel scrap in this district is said to be pretty well filled up and has not been taking in much for some time. Prices on cast scrap and car wheels are lower. We note sales of about 1000 tons of cast iron borings on the basis of about $8 and about 1200 tons of machine shop turnings at a little above $8.50, Pittsburgh. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.00 to 13.25
No. 2 foundry cast	12.50 to 12.75
Bundled sheet scrap, at point of shipment	10.00 to 10.25
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	12.00 to 12.25
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.50 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00
Heavy steel axle turnings	9.75 to 10.00

Coke.—Standard grades of blast furnace coke are being offered as low as $1.50 per net ton, at oven, the lowest price reached for about three years. There is not much new demand for either furnace or foundry coke and prices are weak. The output in the Upper and Lower Connellsville regions last week was 345,000 net tons, a decrease over the previous week of about 5000 tons. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55, and for delivery over the first half of next year at about $1.75 per net ton, at oven. We quote standard makes of 72-hour foundry coke at $2 to $2.10 for prompt shipment and $2.25 up to $2.50 on contracts per net ton, at oven, for first half of next year. W. W. Peabody & Co., Uniontown, Pa., operators and shippers of coal and coke, report the business outlook more encouraging, and look for higher prices on both coal and coke in the near future. The firm has sold during the past 10 days, for November shipment, 18,000 tons of standard Connellsville furnace coke, and about 250 cars of foundry coke.

Chicago

FISHER BUILDING, November 9. 1910.—(*By Telegraph.*)

Notwithstanding the political uncertainty, which causes many buyers to await definite returns, some of the mills reported an increase last week in the volume of new business. The general tendency of the market, however, has been to wait until the financial world has adjusted itself to the results of the election. Conditions in the West continue very favorable. The wire mills in this territory are well employed, and new business in November is keeping up at the satisfactory rate that was reached in October. The hardware trade is good, and the manufacturers of agricultural implements report very satisfactory conditions in their field. The fabricating interests had a better week than for some time, and the market is sustained by the enormous amount of business in prospect. The railroads have been doing a little better in their purchases, but have not begun buying on the scale that is expected. Their operating departments are clamoring for materials, and requisitions are piling up in their purchasing departments, but the higher officials have been unwilling to release orders except for most urgent requirements. The earnings of the railroads, however, show a large movement of commodities this fall. Under the rules of the Interstate Commerce Commission the railroads have been charging to operating expense a fixed percentage for depreciation of equipment, whether the money is actually expended or not, and it is understood that a large fund has thus accumulated the past summer which will be available for the purchase of materials and equipment when the railroads begin their buying movement. The scrap market has been holding steady, but heavy stocks check any efforts of the dealers to obtain better prices.

Pig Iron.—The buying movement in pig iron, which was reported last week, has gathered satisfactory headway and has resulted in the placing of a considerable tonnage. It is understood that the buyers who were then reported in the market have purchased about 25,000 tons of Northern iron, principally foundry grades. The market for Southern iron also shows a tendency to broaden out, and more business has been done, principally in lots of 100 to 500 tons. Ala-

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bama furnace interests, which have been holding off for some time, have begun to take contracts for first quarter and first half. In some cases iron is sold for second quarter to purchasers who will take a satisfactory tonnage for the first quarter, but there is talk of concessions in price on sales for first quarter, although most of the business is done at $11.50, Birmingham, while $11 continues the ruling price for November and December shipment, and there are more brands available at this figure for prompt shipment than a few weeks ago. The demand for prompt shipment is light and buyers are interested chiefly in prices for next year. There are good inquiries for charcoal iron, on which the business is not reported closed, and one Chicago foundry is inquiring this week for 2000 tons of malleable. The malleable foundries are usually anxious to cover their requirements at least six months ahead, but they have purchased very little this fall for delivery during the first half. The foundries making agricultural malleables have been running full, but the larger foundries, which specialize on railroad work, are carrying good stocks of iron and will not come into the market until they get more contracts for their product. On the whole, the feeling in the market has improved very materially in the past two weeks. The following quotations are for November and December shipment, Chicago delivery.

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The market is quiet, as business has been slack for some time in the forging shops, and only occasional orders are taken. The base price on forging billets, subject to concessions on desirable orders, is $28, Chicago.

Rails and Track Supplies.—There are more inquiries from minor railroads for small lots of rails up to 1000 and 2000 tons, but the leading Western railroads have not yet come into the market for 1911 contracts. Orders for light rails and track supplies are dropping off, but the roads continue to order small lots of track material for immediate shipment. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12-lb., $28, Chicago.

Structural Material.—While only one small building contract was let in Chicago last week the total of fabricated business in the West shows considerable improvement over preceding weeks. The bulk of the business was taken by the leading interest. The Oregon Trunk Railway, a new Hill line in Oregon, has let to the American Bridge Company contracts for bridges amounting to 1800 tons. As the Hill interests are very conservative in buying the placing of this business is taken as a favorable sign in the market. The United States Government has awarded to the American Bridge Company, through the Mississippi River Improvement Commission, a contract for river barges which will require 3000 tons of fabricated material. The American Bridge Company has booked 100 tons for a foundry building for the Imperial Iron Works at Duluth, 100 tons for the Peery Hotel at Salt Lake, Utah, and 900 tons for buildings for the American Beet Sugar Company at Huntington Beach, Cal. The Chandler Apartment Building in Chicago, 250 tons, was let to the Moráva Construction Company of this city. It was reported last week on apparently good authority in this market that the mill order for the Heisen Building had been increased to 8000 tons, but it now appears that this report was premature. A majority of the mills report an improvement in orders and specifications for plain material, with the minimum price generally held at 1.40c., Pittsburgh. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—While it is known that Western roads have prepared data for large car orders, the business has not developed far enough to result in orders or inquiries from the mills for steel. There is a fair inquiry for tank plates as well as car shop material for repair work. There are more reports of concessions on plates than on any other material, but the leading mills continue to hold 1.40c. as their minimum. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The sheet business is holding up better than any other line of finished material, and a strong market is looked for when conditions become more settled after the election. The steady advance in spelter has had a tendency to strengthen the market for galvanized sheets, and it is suspected that the sheet interests have been heavy buyers of spelter to cover their future requiremnts. The store demand for sheets is exceptionally good. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The weakness this fall in prices of all finished materials has had a somewhat dampening effect on specifications, as buyers on yearly contracts do not get the benefit of any decline in the market price on material that has been already specified. The market, however, has been holding steady in the case of bars, and large buyers do not seek a decline, as it would unsettle their costs and selling prices on their manufactured product. A slight turn for the better in the market will eliminate the concessions that have been made by smaller mills. There is some improvement in the railroad demand for bar iron. A month ago the purchasing departments were restricted to 100-ton orders, but in the past 10 days they have been able to specify in 200 and 300 ton lots for prompt shipment. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Sales by the leading interest during October reached a larger total than the record for September, which had been considered a very satisfactory month. November is starting in at the same rate as October and steady buying is looked for until severe weather stops outdoor work. Jobbers and dealers are carrying small stocks and the business this fall has been for prompt shipment and immediate consumption. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The market is quiet, as the buying season for this year's delivery is about over and municipalities have not begun advertising their specifications for winter or spring shipment. There is a fair run of small orders for prompt shipment, but no important lettings are reported for the past week. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Merchant Steel.—Very encouraging reports are received from the agricultural implement trade. The manufacturers in this line had their annual convention at St. Louis last week, and it is understood that they expect during the next six months to exceed their former records of production. They are the principal consumers of merchant steel in this territory, and the prosperous conditions which they report are very gratifying to the mills which supply this trade.

Old Material.—While there has been much talk of a better feeling in the trade, the scrap market does not respond with any definite movement in prices. A rolling mill interest has purchased a considerable tonnage of wrought scrap in the past 10 days, and buying of this character usually raises the price 50c. to $1 on any line of material. This particular buyer paid as high as $12.50 per net ton, but obtained all he wanted, and the market has gone off again to about $12. There is a good steady demand for steel scrap, but the supply in the market is ample and has prevented any advance in the price. Rerolling rails are a little weaker, and several lots have been sold recently at $15 per gross ton delivered, although the railroads within the past month have obtained higher prices. Cast scrap is in better demand, but while the price is a little firmer it keeps within a narrow range. Machine shop turnings have also been in demand, and a new steel interest is making inquiries, especially for low phosphorus steel. A strong buying movement on the part of consumers will be necessary to lift the market out of the stagnation that has prevailed the past six months, as stocks are large in the hands of both dealers and consumers, and the railroads also are carrying large stocks which will come out as soon as the market shows any strength. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switch-

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ing charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.25 to 7.75
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., November 8, 1910.

While there has been considerably more inquiry for pig iron, largely for early 1911 delivery, actual transactions during the past week show a falling off, as producers are not very anxious to accept forward business at the present market. In view of the better inquiry, however, the trade feels more encouraged as to near future buying. There has been no further curtailment in production, although the blowing out of one or more furnaces is being considered. The finished material market shows little change, makers generally reporting the week's business as light and in a number of cases smaller in volume than in the preceding week. Refined iron bars are lower. Billets continue easy. Consumers, however, are beginning to feel round for prices for first quarter. Nothing of importance has developed in the steel rail situation, but it is believed that some of the large roads will come to a decision in the matter this week. The old material market has been dull, with prices unchanged. Coke is in better inquiry, but most buyers and sellers are at variation as to prices.

Iron Ore.—There has been no movement in this district, both buyers and sellers awaiting developments. Importations of foreign ore at this port during the week ending November 5 aggregated 15,346 tons, valued at $66,505.

Pig Iron.—From the nature of inquiries which have recently developed, it is evident that consumers of the higher grades of foundry iron are beginning to believe that prices have reached bottom. Efforts to get both moderate and fair sized lots for early next year delivery are more pronounced, and orders would no doubt result if such deliveries could be freely had at the quotations made for this year's delivery. Sellers, however, exhibit hesitancy in accepting orders for extended delivery at ruling quotations, as they believe that, while they will not go lower, there is a possibility that a shade better might ultimately be done. Among inquiries for foundry iron recently received, the following are noted: One for 2000 to 4000 tons of No. 2 X, from the local locomotive builder, for first quarter delivery; 1500 tons of No. 2 plain and a small lot of No. 3 foundry from a railroad in this vicinity for first half; 1000 to 2000 tons for first quarter from a stove manufacturer; 1000 tons of No. 2 plain and 1000 tons of No. 3 foundry for this year's delivery, from a machinery builder, together with numerous smaller lots, running up to 500 tons, from various classes of buyers, for both prompt and early 1911 delivery. An Eastern steel mill has also been feeling round for 20,000 tons of basic iron, for delivery during December and the first quarter of next year, which would be bought at a price, but sellers refuse to meet the purchaser's ideas. As far as actual sales are concerned the volume during the week has probably been less than for some weeks. The cast iron pipe makers, who recently purchased quite heavily, have not been buying extensively, although understood to still be in the market for iron for this year's delivery. Several odd lots have, however, been sold to these consumers, including some off basic at $14.70, delivered. Several odd lots of forge iron have been sold to rolling mills. One sale of 600 tons has been made for this year's delivery at $14, furnace, equal to $14.60, delivered at mill. Small sales of both standard and misfit low phosphorus have been made, the standard grade selling at a price equal to $22.50, delivered here. With the exception of the inquiry noted above, the demand for basic iron is at a standstill as the larger buyers will, in the majority of cases, carry iron bought for this year's shipment over into next year. In view of the decreased productive capacity of this grade, sellers have firmed up in their ideas as to prices for next year's delivery, which now range from $15 to $15.25 for first quarter and $15.50 for first half. The following range of prices represents the market for standard brands, delivered in buyers' yards in this vicinity, shipment during the next 60 days and in some instances the first quarter of next year:

Eastern Pennsylvania, No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	16.00 to 16.25
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 14.75
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—The demand from consumers in this territory is very light. An occasional small lot is sold, but there has been no further inquiry for any material quantity either for prompt or forward delivery. Prices are unchanged at $38.75, Baltimore, for prompt, and $39 for forward deliveries.

Billets.—Current business is confined to small lots for prompt delivery. The larger consumers are showing more interest, however, in supplies for early 1911 shipment, but definite inquiries have not yet developed. For small lots of ordinary rolling billets, $26, delivered in this territory, is still the ruling quotation, although a concession can be had for desirable orders. Makers contend, however, that no reduction would be made for forward deliveries. Forging billets are firm at $28, f.o.b. Eastern mill, the usual extras being added for high carbons and special sizes.

Plates.—Business during the week has been smaller in the aggregate, although the number of orders coming to the mills continues large. Consumers are still buying only for immediate needs, but occasionally a fair size order develops, one for 1000 tons for car work being reported. A number of fair propositions are pending, particularly for ship work, several of which are expected to result in orders in the near future. The inquiry for 2000 tons of plates for gas holder work, reported last week, is still unclosed. It now develops that this is for Pacific Coast delivery, quotations against which are not governed by the usual Pittsburgh basis. For ordinary plates prices show no change, the recent quotation of 1.55c. for carload lots, delivered in this territory, being maintained.

Structural Material.—The general contract for the building of the addition to the Union League, requiring from 900 to 1000 tons of structural shapes, has been awarded to Cramp & Co., who state that the contract for the structural work will not be let for a week. Very little business of any size has been closed recently, although there has been a fair demand for miscellaneous material. Prices appear to be fully maintained, 1.55c., delivered in this territory, being the minimum for plain shapes.

Sheets.—Business has fallen off slightly, but Eastern mills have a fair volume of business on their books and believe the slowing down will be but a temporary one. A moderate inquiry for requirements of consumers over the first half of next year is noted, but sellers are not anxious to take on business of that character. Prices are firm, the following range being named by Eastern makers for early deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Mills are short of orders for refined iron bars, and lower quotations have been made for the ordinary run of business. In some instances 1.30c. mill, equal to about 1.37c. to 1.42c. delivered in this territory, has been named, and it is rumored that a desirable order might bring further concessions. Consumers are placing small orders, covering immediate needs. A fair run of specifications for steel bars from agricultural implement makers is reported, and prices for steel bars are firm at 1.55c., delivered.

Coke.—A moderate amount of business in furnace coke for early 1911 delivery is reported and more is pending, but a number of sellers refuse to meet buyers' ideas as to prices. One sale of 24,000 tons, for first half, at private terms, is reported. Spot furnace coke is available at $1.55 per net ton at oven, but for forward delivery $1.75 is nearer the market. Few transactions of importance are announced in foundry coke, sales being mostly in small lots. In exceptional cases prompt foundry coke can be had as low as $2 per net ton at oven, but the general market ranges from $2.20 to $2.40. The following range of prices, per net ton, is named for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	$3.85 to $4.10
Foundry coke	4.40 to 4.75
Mountain furnace coke	3.45 to 3.70
Foundry coke	4.00 to 4.35

Old Material.—The market is very quiet. Melters are, for the most part, well supplied, and what little business there is has been largely confined to transactions between

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dealers, applying on previous sales to mills. Strictly No. 1 heavy melting steel ranges from $13.50 to $13.75, delivered, although occasionally material that will pass inspection at some mills can be had under that price. A few sales of No. 1 railroad wrought have been made at $16 to $16.25, delivered. A general waiting policy is being followed, however, both by buyers and sellers, and quotations are necessarily nominal to a large extent. The following range about represents sellers' ideas of the market, delivered in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to 1.35c. per gross ton, although buyers would probably not purchase at those figures, unless in need of material:

No. 1 steel scrap and crops	$13.50 to $13.75
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.25
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.50 to 12.00
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cincinnati

CINCINNATI, OHIO, November 9, 1910.—(*By Telegraph.*)

Pig Iron.—The local situation continues to improve. Inquiries are coming in and some fair sized orders are being booked. One agency reports its sales in the first week of November as showing nearly as large a tonnage as the entire month of October. This is an exceptional case, but there is no doubt that consumers are beginning to sit up and take notice. The furnace interests are also getting more independent about taking on business at prevailing figures, and Southern iron especially shows more firmness. Malleable is also engaging attention and several inquiries are being worked on, including one for 2000 tons from the Chicago district. A sale of 1500 tons of malleable to an Indiana concern was made this week, and a number of smaller orders were booked during the past few days, practically all for shipment through the first half of next year from central and northern Ohio. There are an encouraging number of inquiries for foundry iron, ranging from carload lots to 2500 tons, and while no large sales are to be recorded, a considerable tonnage is changing hands, made up principally of small and medium sized orders. Southern foundry No. 2 is quoted for spot shipment at $11, Birmingham, but most interests are now demanding $11.50 for first half delivery, although there are rumors that $11.25 can be done for the first quarter with some furnaces. For either prompt or first half shipment Northern foundry is quoted at $14, Ironton district, but some furnaces absolutely refuse to book business below $14.50 and seem confident they will get this figure or higher within a very short time. The 7500 tons of basic wanted by a local consumer has not yet been contracted for, but the order is expected to be closed soon. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—For shipments to begin January 1 a local agency has made a contract with a Southern furnace to supply it with a year's supply of furnace coke at the rate of 4000 tons per month. Foundry coke is moving fairly well on contracts, but new business is light and is confined practically to carload lots for immediate requirements of the smaller consumers. Some spot shipment furnace coke can still be bought around $1.55 to $1.60 per net ton, at oven, but the contract price for Connellsville, Wise County and Pocahontas fields remains between $1.65 and $1.85. Foundry coke is quotable at an average figure of $2.25 for contracts, but for spot shipments the $2 price for some grades still stands.

Coal.—The car shortage situation is gradually becoming worse, and practically no selling agency is willing to promise delivery of any grade under 30 days from receipt of order, and most of them would be lucky to fill this promise on time. Prices are as follows: Pocahontas lump and egg, $2.25; standard splint lump, $1.85 to $2; run of mines, $1 to $1.25, and slack, 90c. to $1, f.o.b. cars at mines.

Finished Iron and Steel.—Structural material moves very slowly, as there is but little new building going on in this vicinity just now. There are a large number of plans under way, however, and an excellent spring business is anticipated. The retail price for structural material is 1.90c. and on steel bars 1.80c. is quoted, both f.o.b. warehouse.

Old Material.—The improvement reported in other markets is not noticeable here, and local dealers do not look for any brisk business until after the turn of the year. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, November 8, 1910.

Iron Ore.—October lake shipments of ore show a falling off of 1,748,360 tons, as compared with the corresponding month of 1909. The October movement ran 1,396,393 tons behind that of September. The November movement last year was heavy, shipments from November 1 to the close of navigation amounting to 5,418,745 tons. This year the November movement is expected to amount to only about 2,000,000 tons, and practically no ore will be shipped during December. The total lake shipments for the season will be close to 42,000,000 tons, or slightly in excess of the total lake movement of 41,683,873 tons last year. Some of the ore firms will clean up their shipments this week. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—A good volume of inquiry for foundry iron for the remainder of the year, and first half delivery has come from Ohio consumers in the past few days. That the market is becoming more active in other sections is indicated by reports of local furnace interests to the effect that they have received considerable inquiry from Indiana, Michigan, the Pittsburgh district and the East. While the demand is largely for foundry iron, some fair inquiries are pending for basic. Buyers are feeling the market carefully, and some of the business pending a week ago has not yet been closed. Foundry iron inquiries from consumers in this territory are mostly for small lots of 300 or 400 tons or under. An Elyria, Ohio, furnace manufacturer is in the market for 2000 to 3000 tons of foundry iron, 2 to 2.50 per cent. silicon, for first half delivery, and expects to close for this tonnage to-day. Among the larger inquiries is one from a Berea manufacturer for 500 tons of Northern and 200 tons of Southern for first half delivery. The northern Ohio consumer who had an inquiry out last week for 1500 tons of gray forge for December, January and February delivery has bought that tonnage of Northern iron, and is now in the market for 500 tons of Southern gray forge. Foundry iron prices continue weak, although at least one interest is asking a slight advance. Northern foundry iron is being offered at $14, Valley furnace, for No. 2, the price that prevails for delivery through the remainder of the year. For first half, No. 2 is quoted at $14.25 to $14.50, delivered, Cleveland. There is quite an active demand for charcoal iron. For prompt shipment and the remainder of the year, we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.50 to 14.75
Northern foundry, No. 2	14.00 to 14.50
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—Local selling agencies are figuring on an inquiry from an Eastern furnace interest for 20,000 tons of coke per month for first half delivery. The market generally is quiet. There is very little inquiry for foundry grades. We quote standard Connellsville furnace coke at $1.55 to $1.60 per net ton, at oven, for spot shipment. For the first half $1.90 is asked, but this price can probably be shaded to $1.85. Connellsville 72-hour foundry coke is held at $2.10 to $2.20 per net ton, at oven, for spot shipment, and $2.25 to $2.50 for delivery through the first half.

Finished Iron and Steel.—One or two agencies report a little improvement in orders, but the market is generally quiet. Specifications on contracts are coming along fairly

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well, but new business is mostly in less than carload lots. The sentiment appears to have improved somewhat and sellers are looking for more activity after election. Steel bars are firm at 1.40c., Pittsburgh; specifications are good, but not much new business is coming out. The demand for plates continues light, but manufacturers in this territory are figuring on work that will require some round tonnages. The only shading in prices is by mills making the smaller sizes. Some of the mills have opened their books for plate and structural tonnage for the first quarter at the current price of 1.40c., and some business has been booked for that delivery. The demand for structural material is quiet. Considerable work is in prospect, but much of this will not be placed before early spring. The contract for the Fowler Building, Detroit, 800 tons, has been given to the McClintic-Marshall Construction Company, Pittsburgh. The American Shipbuilding Company has secured a contract for a 240-ft. passenger boat for Ashley & Dustin of Detroit. The specifications for the plates and shapes for this boat are not yet out. The foundations for the new City Hall Building in Cleveland will require 500 tons of reinforcing bars, for which an inquiry is out. The demand for sheets is only fair; prices on black and galvanized are being quite generally shaded $1 a ton below the regular quotations by the independent mills. The rivet market is firmer. Current quotations on steel rivets are being adhered to for the remainder of the year. The demand for iron bars continues light. We quote common iron bars at 1.30c. to 1.35c., Cleveland.

Old Material.—While the market is quiet there is a slight improvement, as compared with the past few weeks, and a better feeling prevails among the dealers. There is practically no demand from the foundry trade. Dealers are showing less disposition to make sales by shading prices. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Buffalo

BUFFALO, N. Y., November 8, 1910.

Pig Iron.—A steady volume of small orders has been coming in, and it is understood that a large radiator concern has just placed orders for a portion of its requirements for its Western works, amounting to a considerable tonnage, some of which came to the Buffalo district. An order for 5000 tons of malleable for delivery in this State, was taken at $14.50 for first half—a malleable order of moderate size from a Rhode Island concern was also taken. The total of small orders booked reached a fairly good aggregate, comprised largely of foundry grades. A good deal of iron for general foundry purposes is being figured on for New England points; also inquiries for considerable tonnages of foundry grades from a Western threshing machine company, a large electrical concern and a local car wheel works. Prices are a shade stronger—that is, current schedules are being more closely adhered to, and some furnaces are making a difference in quotations between prompt, first quarter and first half deliveries. Most furnaces, however, continue to quote current schedules to cover first half deliveries. We quote as follows, f.o.b. Buffalo, for current quarter and first half 1911:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.25 to 14.75
No. 2 plain	14.00 to 14.25
No. 3 foundry	13.75 to 14.00
Gray forge	13.75 to 14.00
Malleable	14.25 to 14.75
Basic	14.25 to 14.75
Charcoal	17.75 to 18.25

Finished Iron and Steel.—Quiet conditions have prevailed during the week, but specifications on contracts have been coming in more freely than for some time. Indications point to a considerable revival in new buying shortly. There has already been considerable forward contracting in wire and wire products, the feeling being that prices have reached the bottom, and the trend will now be upward. There is also considerable inquiry for sheets and tin mill products. The first shipments of wire and wire nails from the new wire mills of the Jones & Laughlin Steel Company at Aliquippa for this territory are being received this week. The Canadian export trade keeps up well, and the local agency of the leading interest reports some good bookings for bars, plates and shapes during the week. Business in structural lines continues rather light, although some new fall and winter construction is being figured on. Bellew & Merritt, Macedon, N. Y., who have secured the general contract for a section of the Erie Barge Canal work in that vicinity, are receiving bids for 425 tons of steel. Bids are also being received this week for the Oak street warehouse of the H. D. Taylor Company, Buffalo, on revised plans calling for 150 tons, and bids for steel for the Pilgrim Congregational Church, Buffalo, 100 tons. Plans for the Washington Street Market for the city of Buffalo, which have been delayed, will be out for figuring next week. They call for about 700 tons, construction to be begun next spring.

Old Material.—The market has shown a slight improvement, caused principally by the increased demand from outside districts, the demand from Buffalo mills showing a comparatively limited betterment. Local foundries are making increased purchases in a small way, and dealers are adding a little more freely to their stocks. Prices exhibit a strengthening tendency. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.25 to $12.75
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.50 to 15.00
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	18.00 to 18.50
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	11.75 to 11.25
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.50 to 6.75
No. 1 busheling scrap	11.25 to 12.00

New York

NEW YORK, November 9, 1910.

Pig Iron.—The volume of business has been smaller in the past week than in any week of October, but there is still a fair total of well distributed buying, in which machinery foundries in New England and eastern New York, as well as New Jersey, have been represented. Sellers take a rather more hopeful view of the situation, partly because the further cutting down of pig iron production that is promised will stop accumulations of stock, and partly because better railroad buying has a sentimental effect on all lines. Radiator and cast-iron pipe foundries have satisfied their wants for the present and no notably large lots have been taken in the past week by other interests. In fact some inquiries that seemed promising have been withdrawn. At the same time furnaces are not hurrying to quote on inquiries for the first quarter, and particularly the first half of 1911, most of them having a fair amount of their product for the next three months already placed. Furthermore, there is nothing in present prices to prompt a scramble for business. Valve manufacturers in Connecticut, stove founders in New York State and jobbing foundries in New Jersey have bought moderate lots. Prices for basic iron for 1911 have been under discussion in eastern Pennsylvania without any agreement between sellers and buyers. Furnaces are disposed to ask 50c. to 75c. more than the low figure, $14.50, touched five or six weeks ago. We continue to quote as follows, for tidewater deliveries: Northern No. 2 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—How much of the late dullness in the iron and steel business has actually been due to the approaching elections will shortly be revealed. Certain it is that the last week has been especially quiet in all lines of finished iron and steel, whatever may have been its cause; at the same time there appears to be a very pronounced feeling that an improvement of conditions is imminent and no weakness in prices is evident. There is no change to report in the situation in plates, steel bars or bar iron. Very little new business is being placed, but the bar mills are fairly active on old contracts. For bar iron there appears to be a little more inquiry for contracts for future delivery. The past week has been particularly dull in the structural lines and a very small tonnage was closed. Milliken Brothers took 300 tons for an apartment house at 110th street and Seventh avenue, in this city. The New York Central transfer bridge at Sixty-ninth street, 350 tons, it is also understood, has been placed. New inquiries in the market for bridge material are as follows: For the Baltimore & Ohio, 2000 tons for grade crossing elimination work in Chicago, 200 tons for the Virginian Railway, and 200 tons for the Chicago, Milwaukee & St. Paul. Bids have also been asked for 700 tons for a city bridge in Seattle. The only impor-

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tant proposition still to be heard from in New York City are the post office at the Pennsylvania Station, the Woolworth Building and the Washington Irving High School. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c.

Steel Rails.—Sales of the week include 1500 tons by the Carnegie Steel Company and 1600 tons by a western Pennsylvania mill to the Lexington & Eastern Railway Company. The Norfolk & Western tonnage for 1911, recently under consideration, is reported at 30,000 tons, which will probably be divided between two Pennsylvania mills.

Ferroalloys.—Ferromanganese is selling well, and transactions have been made in this market at $39 for delivery over the first half. Ferrosilicon is in fair demand and sellers here are asking $56.50, Pittsburgh.

Cast Iron Pipe.—The most important public letting in this vicinity now coming up is for 1800 tons of water pipe at Hartford, Conn., on which bids will be opened November 21. Rumors are current that New York City will shortly ask bids on a large quantity of water pipe, but as yet nothing definite is known as to time or quantity. Inquiries are not so numerous as they have been and current business in small orders is diminishing. Inquiries for New England requirements now seem to have practically covered what may be expected from that section. Very low prices have been made on recent lettings. The lowest bid on the Providence letting, 800 tons, opened November 2, was $21.40, delivered, for 16-in. and $22.10 for 6-in., made by a company in eastern Pennsylvania. The bids opened November 3 on about 4000 tons of cast iron water pipe and special castings by the New York Department of Water Supply, Gas and Electricity, divided in three sections, ranged on section 1 from $21.34 to $22.40 on 1530 tons of pipe, $35.65 to $46.50 on 150 tons of specials and $38.65 to $46 on 60 tons of valve boxes; on section 2 from $21.90 to $23.40 on 1960 tons of pipe, $38.80 to $48.50 on 300 tons of specials and $42 to $47 on 170 tons of valve boxes; on section 3 from $22 to $24.15 on 35 tons of pipe, $45.50 to $50 on 110 tons of specials and $38.90 to $50 on 35 tons of valve boxes. Carload lots of 6-in. are quoted at $22 per net ton, tidewater.

Old Material.—The market is exceedingly quiet, even the foundries doing very little buying. Stove plate shows a little better movement than other grades of cast scrap. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.00 to 11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.50 to 13.00
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.50 to 6.00
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	10.00 to 10.50
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	10.00 to 10.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

St. Louis

ST. LOUIS, November 7, 1910.

The car works and steel foundries report a falling off in their business. This is really the only serious discordant note. On the whole the outlook in the iron trade is regarded as encouraging. Many of the leading merchants are inclined to favor a reasonable advance in railroad rates, predicted on the belief that the railroads would be enabled to resume liberal buying of supplies and improve their equipment and roadbed. It would lead also to extensions of their lines and develop new lines.

Coke.—The dullness is somewhat more pronounced. As customary when trade is quiet, the tone of the market is weaker. None of the leading sellers is in receipt of inquiries of consequence and no sales of importance are reported.

Pig Iron.—There is a somewhat larger inquiry than has been the case for some time. Buyers and sellers, however, continue, for the majority of instances, apart in their views, although the former are not as sanguine in regard to lower prices prevailing in the near future as they were some weeks since. A leading house reports sale of 1000 tons Southern No. 2 foundry to an Illinois stove manufacturer, and the same tonnage to another Illinois stove manufacturer, both lots for shipment over the first half. Another office reports sales of Southern No. 2 foundry, aggregating 1000 tons, for various deliveries, principally first half. A third house mentions inquiries for 500 tons Southern No. 2 foundry, shipment over the first half, and 450 tons from various parties for miscellaneous kinds of iron. There is no change in prices.

Old Material.—While there is an improvement in the inquiry for scrap iron and steel and a stronger undertone to the market, there is very little doing as regards actual business. It is, however, the opinion of the leading dealers that consumers' requirements will soon force some buying. The following railroad lists were offered last week: Chicago & Eastern Illinois, 400 tons; Missouri Pacific, 800 tons; Wabash, 300 to 400 tons. With the exception of relaying rails, which are 50c. per ton higher, we note no change in prices, though they are somewhat firmer.

Birmingham

BIRMINGHAM, ALA., November 7, 1910.

Pig Iron.—Considerably more interest is being manifested in deliveries after January 1 than even at the time of last report, but market conditions have not been affected to an appreciable extent, owing to the difference in opinion of the parties concerned in the matter of price. The tonnage booked during the week is probably no more satisfactory than for the week previous and is in all cases for prompt shipment, with an unusually large territory covered. So far no lower price than a basis of $11, Birmingham, for prompt shipments has been heard of and $11.50 for deliveries after the first of next year is being adhered to strictly by all interests in making quotations. A number of offers of $11 for round tonnages to cover the first quarter have been made without success, and it is not believed than an opportunity was offered by the buying interests for trading at a price 25c. per ton higher. Such a price would no doubt be accepted by certain large producers for shipments to cover the entire first half, but the idea of $11 for shipments within that time has apparently become so general that quotations on an $11.25 per ton basis would not result in heavy buying until requirements are more urgent. Stock reports from this district for November 1 do not show a material decrease during October. The actual consumption during the latter part of the month was considerably reduced and still further reductions have been made since November 1. The most significant curtailments in the melt have been made by the manufacturers of cast iron pipe, but normal activity in that industry is reasonably expected immediately after the beginning of the new year. It is noted that no inquiries for low grade iron have been withdrawn and that the output of such grades is being moved very readily, with practically all shipments to pipe foundries.

Cast Iron Pipe.—It is understood that the tonnage on the order books of producers was very materially reduced during October, and that the small orders now being placed are of but little consideration, when compared with the present rate of production. The movement to the North and Northwest has decreased to a very appreciable extent during the past fortnight, and all contracts expected from such territory are being held in abeyance. There have also been one or more postponements of lettings in the South pending more favorable weather conditions for the proposed extensions. A new level for prices of small lots has recently been established, with the aggregate tonnage very limited, but all local concerns are known not to have been competitors for the business. It is not believed that present prices would be acceptable to certain large producers, even for round tonnage contracts, consequently latest transactions are not considered a criterion of market conditions. We revise last quotations published by a reduction of $1 per ton, and quote nominally as follows for water pipe, f.o.b. cars here: 4 to 6 in., $21; 8 to 12 in., $20; over 12 in., average $19, with $1 per ton extra for gas pipe. These prices are no doubt subject to material shading by certain producers.

Old Material.—No reports of an encouraging nature are yet made by local dealers; in fact, the market is practically without any feature of interest. The accumulation in this district has been materially reduced, but the reduction is due to the failure of dealers to replenish stocks rather than to a heavy movement to consumers. Dealers quote prices about as follows per gross ton, f.o.b. cars, here, although all these prices are nominal only:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

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Metal Market

NEW YORK, November 9, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper			Lead.		Spelter.	
Nov.	Lake	Electrolytic	Tin.	New York.	St. Louis.	New York.	St. Louis.
3	12.87½	12.75	36.30	4.40	4.27½	5.95	5.80
4	12.87½	12.75	36.20	4.40	4.30	5.95	5.80
5	12.87½	12.75	.....	4.40	4.30	5.95	5.80
7	13.00	12.87½	36.40	4.40	4.30	5.95	5.80
9	13.00	12.87½	36.25	4.40	4.30	5.95	5.80

Copper has advanced ⅛c. as the result of the better feeling caused by the October report of production and stocks. The price of pig tin has eased off slightly. The recent advance in spelter is being well maintained. Lead is firmer in the West.

Copper.—While the report of the Copper Producers' Association showed an increase in production, when a decrease was expected, the deliveries during the month were heavy enough to offset this disappointment and the trade on the whole has accepted the report favorably. An indication of the improved feeling caused by the report is shown in the fact that the large sellers of copper advanced their quotations ⅛c. on Monday and the few outside lots that were offered at less than that price were soon taken up by anxious consumers. There has been good steady buying all the week, but the demand is not particularly heavy. Electrolytic copper is now held firmly at 12.87½c. and lake is selling at 13c. The exports of copper so far this month have not been very heavy, amounting in all to 5050 tons. The London market has not taken the October statistics as favorably as sellers on this side of the water and there has been a noticeable decline in the price there. The London market was boosted somewhat, however, previous to the report on the supposition that a decrease in production would be shown. Large copper selling interests now announce that they had not expected a decrease in October, but they declare that the report to be issued in December will show a noticeable curtailment. The London market closed to-day with spot copper selling at £57 17s. 6d. and futures at £58 16s. 3d. The sales amounted to 200 tons of spot and 1100 tons of futures. The market closed steady.

Waterbury Average.—The Waterbury average for October was 12.87½c. The average price of lake copper in New York during the month was 12.84¾c., and the average price of electrolytic was 12.71¼c.

Pig Tin.—As there was no selling on either Saturday or Tuesday, the week's trading has been light. Stocks are more plentiful in this country, but as the major part of the available tin is in the hands of a few people the holders show no disposition to take business at lower prices than prevailed a week ago. The market here is now below the cost of import, which is a clear indication that the corner heretofore controlling spot supplies of tin has lost its grip to some extent. The market began to fall off on the afternoon of November 2, and when the market opened November 3 tin was selling ½c. cheaper than the day before. Since that time quotations have strengthened only 10 points, and, as consumers show no anxiety to buy, no great advance is looked for within the next few days. The arrivals of tin so far this month have been 1380 tons, and there are 965 tons afloat. In New York this afternoon pig tin was sold for 36.25c. The London market closed with spot tin selling at £165 15s. and futures at £166 5s. The sales amounted to 170 tons of spot and 300 tons of futures. The market closed firm.

Tin Plates.—There is not a very active demand for tin plates, but the price for 100-lb. coke plates is maintained at $3.84, New York.

Lead.—Lead has strengthened in the West, and the call for the metal here is a little better than it was a week ago. Lead is now costing 4.30c., St. Louis, and the price here continues at 4.40c., according to the quotations made by the leading interest, though outside sellers are asking more. The usual quotation of the independent sellers is 4.45c. rive the most benefit.

Spelter.—The advance made last week is being well maintained, and the interests that control the supplies are not particularly anxious to sell even at the higher quotation. There are reports of further reductions in the smelting output of the metal caused by the closing of plants in the Kansas gas district. Prime Western spelter in this market is costing 5.95c., and in St. Louis it is being held at around 5.80c.

Antimony.—Buyers continue to neglect antimony. Cookson's is quoted at 8.15c.; Hallett's, 7.75c.; Chinese brands, 7.40c. to 7.55c., and the Hungarian grades from 7.12½c. up.

Old Metals.—The market is strong, but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.25 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, November 8.—There is a fairly steady demand for copper and the Chicago market is about ½c. stronger. Spelter continues to advance. Lead is quiet. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13¼c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c., higher; pig tin, carloads, 37c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb., higher; spelter, 5.90c. to 5.95c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, November 7.—Lead is quiet at 4.27½c.; spelter is higher and firm at 5.75c., both East St. Louis. Zinc ore is active and higher at $45 per ton, Joplin base. The strength of the ore market is due to a much improved demand for spelter and to a reported concerted effort all along the line to advance prices. A further advance is predicted. Tin is quoted at 36.65c. per pound; antimony (Cookson's), 8.47½c.; lake copper, 13.35c.; electrolytic, 13.22½c., all at St. Louis. The demand for finished metals for the past week averaged fair, with some improvement in railroad buying.

Iron and Industrial Stocks

NEW YORK, November 9, 1910.

While the volume of business in stocks has not been large, pending the approach of election, some iron and industrial stocks have made decided gains since last report, notably United States Steel common, International Harvester common, Republic common and Can preferred. The range of prices on active iron and industrial stocks from Wednesday of last week to Monday of this week was as follows:

Allis-Chalm., com.	9 - 9¼	Railway Spr., com.	35½ - 36
Allis Chalm., pref.	31¼ - 31¾	Railway Spr., pref.	96
Beth. Steel, com.	31 - 32½	Republic, com.	33⅜ - 36
Beth. Steel, pref.	61⅜ - 61½	Republic, pref.	98 - 99½
Can., com.	50 - 50⅝	Sloss, com.	51⅝ - 53
Can., pref.	75½ - 78⅞	Pipe, com.	16½ - 17½
Car & Fdry, com.	54 - 56	Pipe, pref.	56
Car & Fdry, pref.	114 - 115	U. S. Steel, com.	78½ - 81¾
Steel Foundries	46½ - 47¾	U. S. Steel, pref.	116⅞-118½
Colorado Fuel	34½ - 35¾	Westinghouse Elec.	73½ - 74¾
General Electric	154 - 155¾	Am. Ship, com.	79¾ - 80
Gt. N. ore cert.	59⅝ - 61	Am. Ship, pref.	110½
Int. Harv., com.	110½-115	Chi. Pneu. Tool	40½ - 41
Int. Harv., pref.	123 -123¼	Cambria Steel	43½ - 44
Int. Pump, com.	43 - 45⅝	Lake Sup. Corp.	25½ - 26
Int. Pump, pref.	82 - 83¾	Pa. Steel, pref.	105¾
Locomotive, com.	39¾ - 41	Warwick	11
Locomotive, pref.	106¼	Crucible St., com.	13 - 13¾
Pressed St., com.	34½ - 35½	Crucible St., pref.	78¼ - 79⅝
Pressed St., pref.	97		

The Otis Steel Company's Increased Earnings

The London *Statist* of October 29 refers to a recent rise in the price of ordinary shares of the Otis Steel Company, Ltd., Cleveland, Ohio. In three days the London quotation advanced from 81½ to 92½, as the result of an increase in the dividend from 5 to 6 per cent. The fiscal year ending June 30 was next to the best year in earnings. "Trading profits" are reported at £150,232 on a total capital of £610,123. For depreciation £25,000 was written off, £19,800 was placed to the credit of the service fund and £25,000 was added to the reserve fund. In addition £20,000 was set aside to form the nucleus of a dividend equalization fund. The profit of over £150,000 in the year ending June 30, 1910, compares with £93,519 in 1909, £76,497 in 1908, £158,444 in 1907 and £136,236 in 1906. The capital of the company now consists of £280,123 of 5 per cent. debenture stock and £330,000 consolidated ordinary stock.

Trade Publications

Pumping Machinery.—The Heller-Aller Company, Napoleon, Ohio. Catalogue No. 26. Lists an extensive line of ball bearing wind engines, galvanized steel towers, suburban water pumping outfits, flag and bell towers, pneumatic pressure tank water systems, gasoline engines, hydraulic regulators, pressure house tanks, pump cylinders, hydrants, tank valves and floats, tanks of galvanized steel, pine and cypress, cisterns, tank heaters and feed cookers.

Air Purification System.—Thomas & Smith, 116 North Carpenter street, Chicago, Ill. Brochure. Presents the advantages of the Thomas Acme air purifying and cooling system. The various features of the system are described, and there are engravings showing both installations of the apparatus and buildings where it has been installed.

Drag Line Excavators.—The Bucyrus Company, South Milwaukee, Wis. Catalogue. Concerned with the Heyworth-Newman drag line excavators, which are built in several sizes for handling buckets ranging from 1½ to 5 cu. yd. capacity, and with booms of any length up to 100 ft.

Knife Grinding Machinery.—Samuel C. Rogers & Co., 10 Lock street, Buffalo, N. Y. Circulars. Refer to the various sizes of improved Buffalo automatic knife grinders and saw sharpeners. Three sizes of the former are built, and a maximum size of knife ground is 120 in. long. The saw sharpeners are made in three sizes to handle circular saws as large as 72 in. in diameter, and the line also includes band saw sharpeners for blades 10 in. wide.

Electrical Machinery and Appliances.—Fort Wayne Electric Works, Fort Wayne, Ind. Instruction book and three bulletins. Instruction book No. 3043 deals with installing and operating the type K3 single phase watt-hour meters. Tables of dimensions and wiring diagrams are included. Bulletin No. 1121 describes and illustrates the Northern type B direct current generator, which is built in sizes ranging from 1 to 75 kw. No. 1124 is concerned with portable calibrators for alternating current watt-hour meters. This calibrator is designed to supresede the ordinary method of calibrating meters with standard indicating instruments and a stop watch. No. 1125 refers to the type K3 single phase induction watt-hour meter, and describes the various features of it at length.

Textile Machinery.—The Mason Machine Works, Taunton, Mass. Two illustrated catalogues. The first is concerned with a line of ring spinning machinery for cotton mills, and the second refers to the carding machinery of this company, and like the other describes them completely.

Sheet Metal Stamping.—Otto Konigslow Mfg. Company, Cleveland, Ohio. Loose leaf portfolio. Contains a number of photographs of special sheet metal stampings and automobile parts made by this company and a number of interior views of the plant.

Fuel Economizers.—The Green Fuel Economizer Company, Matteawan, N. Y. Bulletin No. 132, entitled "Power for Cement Mills from Waste Heat." Presents information regarding the amount of fuel used in the various cement making processes, and discusses several means of cutting down the heat wasted up the kiln and boiler stacks or radiated by the hot clinker. These different methods are illustrated and a number of layouts of actual installations in cement mills are shown.

Double Spindle Lathes.—J. J. McCabe, 30 Church street, New York City. Illustrated loose leaf circular. Refers to a double spindle, 26-48-in. swing lathe in operation in various shops. This lathe combines in one tool a triple gear 48-in. lathe for big work, and a handy back geared 26-in. lathe for small work. Two separate sets of head and tail stocks accommodate the different diameters of work.

Quick Change Miller and Gear Hobber.—The Adams Company, Dubuque, Iowa. Two loose leaf circulars. No. 701 illustrates and describes the No. 0 Farwell quick change miller, so-called because the fixtures are clamped to the table without using wrenches and the cutter brought to position very quickly. No. 811 gives general description and specifications for the Farwell No. 3 gear hobber, an illustrated description of which appeared in *The Iron Age* September 8, 1910.

Steam Traps.—George M. Newhall Engineering Company 136 South Fourth street, Philadelphia, Pa. Circular. Pertains to the Vance steam trap, which is declared to have an exceptionally large discharge valve area and to act positively under all circumstances. The construction and operation of the trap are described, and a sectional view shows the various parts.

Electric Construction Supplies.—Illinois Malleable Iron Company, 1801 Diversey Boulevard, Chicago, Ill. Catalogue. Deals with a number of electrical construction supplies for interior and outdoor, overhead and underground work.

The New York State Steel Company blew out its furnace at Buffalo, N. Y., October 14. It will be relined.

The Pittsburgh Metal Products Company

The Pittsburgh Metal Products Company, a corporation with a Delaware charter, has recently opened offices at 1639 Oliver Building, Pittsburgh, Pa. The company has been organized for the purpose of thoroughly exploiting products made from American ingot iron. It has been licensed by the International Metal Products Company, Middletown, Ohio, to take over the manufacture and sale of genuine American ingot iron products, such as plates from No. 9 gauge to 11-16 in. thick, inclusive, up to 84 in. wide by 25 ft. long; also lap welded boiler tubes, welded pipe, tubing, casing, line pipe and certain classifications of sheets. Genuine American ingot iron, 99.94 per cent. pure, is a material which has been commanding the attention of the consumers of iron and steel products for the past two or three years, because of its properties for resisting rust, acids, sulphur, and other corrosive agents.

The Pittsburgh Metal Products Company furnishes literature giving descriptive information pertaining to the superior rust resisting properties of American ingot iron, among which is a blue print showing the results of certain tests, particularly illustrating, in a unique way, the superiority of this material for the resistance of rust, acids, &c. Harry E. Sheldon is president and W. Lester Walker is secretary and treasurer.

Cincinnati Machinery Trade Activity

Secretary Manley, of the Cincinnati Metal Trades Association, has made public his last quarterly report. Taking June 15, 1907, as standard, association plants in this territory are working up to 91 per cent. Below is given a tabulated list of reports issued from that date to September 15, 1910:

	Per cent.		Per cent.
June 15, 1907.....	100	March 15, 1909.....	62
September 15, 1907.....	97	June 15, 1909.....	65
December 15, 1907.....	85	September 15, 1909.....	72
March 15, 1908.....	67	December 15, 1909.....	83
June 15, 1908.....	56	March 15, 1910.....	89
September 15, 1908.....	53	June 15, 1910.....	92
December 15, 1908.....	56	September 15, 1910.....	91

It will be seen that the last report shows a falling off of 1 per cent. over the previous one, but indications are that this will more than be made up before the December report is issued.

Republic General Offices to Go to Youngstown.—It has been definitely decided to remove the general offices of the Republic Iron & Steel Company, now located on the seventeenth and eighteenth floors of the Henry W. Oliver Building, Pittsburgh, to Youngstown, Ohio. The company will begin at an early date the erection of a modern office building in Youngstown near its steel plant. It is to be seven or eight stories high. As soon as the building is finished it will be occupied for the purpose above named. The move will likely be made July 1 next year, and the company will maintain a district sales office in Pittsburgh after the general offices are taken to Youngstown.

The population of Youngstown, Ohio, is 79,066, an increase of 34,181, or 76.2 per cent. The population of El Paso, Texas, is 39,279, an increase of 23,373, or 146.9 per cent.

The annual meeting and banquet of the Cleveland Employers' Association will be held at the Hollenden Hotel, Cleveland, Ohio, on the evening of November 29.

The Malleable Iron Fittings Company, Branford, Conn., is installing an additional modified Bessemer converter.

Iron and Steel Analysis

An Important Error in Sulphur Tests

BY GEORGE AUCHY.*

This error is sulphuretted hydrogen loss—not from diffusion out of solution, but from dissociation—in dissolving the cadmium sulphide before titration in the almost universally used volumetric evolution method. The remedy is in the adoption of the seldom used Wood's modification (but with a special precaution not hitherto proposed) described in Blair's "Chemical Analysis of Iron," which consists in filtering the cadmium sulphide before solution and titration, whereby this loss is avoided, as in that case the cadmium sulphide adheres to the filter paper and does not at once diffuse and dissolve, and in titrating, therefore, the iodine may from the start be kept continuously in excess (the special precaution above referred to), shaking the flask after each addition until the blue begins to change to purple, and thus allowing of no chance for sulphuretted hydrogen dissociation.

Heretofore it has not been suspected that there was loss of sulphuretted hydrogen in dissolving and titrating as usual, and the purpose of Wood's modification is not to prevent such loss, but to "avoid the error that the absorbed hydrocarbon gases may produce"—a plus error, of course, and a very important one also. From the earliest use of the Elliot method for sulphur and its modern modifications the fact that sulphuretted hydrogen in very dilute solution promptly dissociates to a certain extent is a fact that has entirely escaped notice, and what has helped to blind analysts to this error has been the partly compensating error from dissolved hydrocarbons that Wood avoids by filtering—an error equivalent to from 0.01 to 0.03 per cent. sulphur when the solution is cold. That Wood did not discover the sulphuretted hydrogen error also may be ascribed to the fact that he did not titrate promptly and did not take pains to keep the titration abreast of the solution of the cadmium sulphide. As fast as the sulphuretted hydrogen is formed it must find the iodine immediately at hand to decompose it. Otherwise it immediately decomposes of its own accord—to some extent at least—and if the cadmium sulphide in Wood's modification be entirely dissolved before titration the result will inevitably be just as low as by the usual process. It will, in fact, be much lower, because here there will be no dissolved hydrocarbon error to boost it up.

A Known Fact Ascribed to a Wrong Cause

That the usual volumetric evolution method gives results much lower than aqua regia method results has been known to the writer for many years, but has always been ascribed by him to a wrong cause—sulphuretted hydrocarbon loss in dissolving the drillings instead of sulphuretted hydrogen loss in dissolving the cadmium sulphide. Beginning in 1901, he called the attention of the trade to this error in a number of articles descriptive of different experiences on this point, and published in the *Journal* of the American Chemical Society, *The Iron Age*† and the *Chemical Engineer*. Of these various articles, the one that lingers the most dolefully in his memory is one showing that even in wrought irons this sulphuretted hydrocarbon error (as he then considered it) occurs. Not that there was any mistake in the facts he brought up, but his easy and ready assumption that his low results by evolution were due to sulphuretted hydrocarbon loss, now that he is aware of the real cause—sulphuretted hydrogen loss in titrating—seems very foolish. However, nobody believed either his facts or his theories at the time; although the belief in this same loss in the case of pig irons (based on the classical experiments of Professor Phillips in 1895) was universal.

Later on it transpired that abroad they had also been having experiences with the evolution method for steel, and these experiences, like the writer, they ascribed to sulphuretted hydrocarbon loss, the same as in pig irons, and the use of the red-hot porcelain tube recommended by Phillips for pig iron became quite general abroad for steels also. Finally, in the seventh edition of "Blair's Chemical Analysis of Iron," the statement, "the evolution method in steels as in pig irons sometimes gives results a little too low," indicates that at last this country also is—although very guardedly—coming to this belief, a belief that the writer so ignominiously failed to get it to accept years ago.

A Question as to Evolution Methods for Steel

The interesting question now arises: Is there after all any sulphuretted hydrocarbon loss in evolution methods for steel? Loss undoubtedly there is in the volumetric evolution method, as just explained, and not a slight one, but a great one, but as the writer was mistaken in his theory of the cause of the loss, so also possibly may be everybody else, and our German and English brethren's red-hot tube may perhaps be in steel analysis an utter futility. But the writer must hasten to confess that he has not proved that a small part of the difference he found years ago between evolution and aqua regia results was not due to sulphuretted hydrocarbon loss—there may have been a little of that also in connection with the main loss—the sulphuretted hydrogen loss. He has been deterred from going into this point by the experience of Professor Levy, described in the *Journal* of the Iron and Steel Institute for 1908, an experience which shows that even in white pig iron the sulphuretted hydrocarbon loss is apparently rare (he was unable to find any cases of it at all), certainly not inevitable, and one might therefore make very many tests in steels before finding a case.

But a significant point in favor of the opinion that there is such loss in steel is, it must be admitted, the declaration of Blair to that effect. For Blair's evolution method is a gravimetric-volumetric one; the sulphuretted hydrogen error does not appear therefore in it, and any low results obtained by that method could very properly be attributed to sulphuretted hydrocarbon loss, although not necessarily so.

Appended are a few results showing the gain in Wood's modification results over the usual volumetric evolution method results.

No.	Usual method, sulphur, per cent.	Wood's modification, sulphur, per cent.
18,615	0.068	0.090
18,491	0.041	0.051
18,502	0.027	0.036
18,373	0.057	0.074
18,375	0.057	0.066
18,598	0.057	0.076
18,616	0.056	0.064
18,596	0.056	0.074
18,719	0.081	0.094
18,734	0.073	0.086
18,733	0.063	0.084
18,719	0.081	0.092

But the following show that the compensating hydrocarbon error of Wood in the usual process will on occasion bring the usual method result up to the Wood result:

18,499	0.046	0.049
18,500	0.045	0.044
18,402	0.070	0.068

This compensating hydrocarbon error may range from 0.010 to 0.030 per cent. sulphur, according to a few experiments made by the writer, with pains taken to titrate perfectly cold (heat enormously increases the error). The use of a correction is therefore impossible. Equally futile is standardization by a standard steel.

It will, of course, be understood that the "Wood's modification," referred to in the above table, includes the writer's precaution in titrating, without which the original modification is useless.

* Laboratory of Henry Disston & Sons, Inc., Tacony, Philadelphia.

† December 19, 1904.

The Machinery Markets

Dullness prevailed during the week in some machinery selling centers because of the election, while in other localities the election had no effect on the market whatever. In New York and Chicago the trade has been marking time during the last week and nothing of consequence has come into those markets with the exception of scattered railroad orders. In Pittsburgh there is an increased demand for second-hand and rebuilt machinery and conveying equipment is selling better than some other classes of mechanical apparatus. In Cincinnati the Buffalo & Susquehanna Railroad Company has placed some orders and inquiries indicate that good business will shortly ensue from other sources in that market. In Cleveland the Lake Shore Railroad has inquiries out for a number of motors, but beyond that there is a light volume of scattered inquiries largely for machine tools. More cheerful reports come from Cincinnati where a number of new enterprises are supporting the market with purchases, and there is a steady run of miscellaneous inquiries from the railroads. There is a renewed demand from the South for machinery of all kinds and boilers and other power accessories are being asked for in good quantities. New enterprises have resulted in good purchasing in the Southwest, where the outlook for the future is very encouraging. A similar condition exists in the Northwest, and a feature of the trade there is a good call for woodworking machinery. Manufacturing expansion in the farther Central West is bringing in a large volume of inquiries and some good trading is promised in the market in the near future.

New York

NEW YORK, November 9, 1910.

Because of the intervening holiday of yesterday the week has been a short one in the New York market and there are no developments of any consequence to report. Orders are still drifting in from the railroads mentioned in last week's review, but very little business has been done in other directions. A few inquiries have come into the market and some trading has been done in second-hand machine tools. Prospective buyers of machinery equipment are showing a great deal of hesitancy at this time, but it is hoped that with election excitement over they will take hold with renewed confidence. It is generally conceded that many manufacturers who sent out rather ambitious lists of requirements more than a month ago have compromised by closing out for enough equipment to tide them over, and in consequence have reduced their requirements materially. Many of them have gone so far as to purchase second-hand machinery in place of new equipment their inquiries called for. A general survey of the trade brings out the fact that inquiries on the whole are numerous, and it only requires a more general feeling of confidence to bring about a buying movement of some consequence. Machine tool builders are fairly busy and many of them are still behind in their orders, but recent cancellations on the part of dealers and other customers has resulted in cutting down the delivery terms on many makes of machine tools. In other words, some machine tool builders who were as much as four months behind on lathe and shaper orders for weeks ago are now only 30 days behind because of the cancellations that have come in of late. This is not true of all manufacturers, as makers of some classes of hydraulic machinery are ordered up several weeks ahead, and have all the work they can take care of with their plants running on full time. Manufacturers of electric motors are also decidedly busy, and there is a good call for small power units, such as are installed in small jewelry manufacturing plants, apartment houses and office buildings.

Ford, Bacon & Davis, consulting engineers, 115 Broadway, New York, are preparing plans for a power house to be built at Hurricane, W. Va., for the Clinchfield Coal Corporation, Spartanburg, S. C. The plant will provide electric lighting and power facilities for the mines of the company near Dante, Va., and adjacent towns. In addition to the power house four substations will be erected, and a contract has been closed with the Westinghouse Electric & Mfg. Company for all the electrical apparatus, which will include two 1000-kw., 6600-volt turbines and 300-kw., 250-volt motor generator sets. Contracts for boilers and other auxiliaries, together with power accessories, will be let at an early date, and the plant will be ready for operation about April 1. This enterprise is part of the Clinchfield Company's plan for extensive developments of its coal properties along the Carolina, Clinchfield & Ohio Railway. About $200,000 will be spent, and the company recently arranged to spend $50,000 to lay 8 miles of iron pipe for conveying water to its mines from the Clinch River.

The Maximilian Machine & Tool Company, Buffalo, N. Y., will erect a factory building at Woodstock, Ont., for the manufacture of the Maximilian pneumatic tools. The company has a capital stock of $100,000 and has secured 2 acres of land upon which the factory will be erected. Equipment required for the plant will consist of turret lathe machines, handy lathes with turrets, plain lathes, lathes to finish cylinders and pistons, milling machines, universal grinders, internal grinders, tool grinders, drill presses, bench drills, presses, furnaces for handling valves, small tools, drills, reamers, gauges, files, power saws, air compressors, anvils, blacksmith supplies, &c.

The Alonzo H. Magee Company, with New York offices at 106-108 Beekman street, has completed arrangements for manufacturing its product in a plant recently acquired at Carlstadt, N. J. The company recently purchased several buildings there on a plot of land 200 x 500 ft., where it will continue to manufacture air valves, gauges, gaskets, hot water thermometers and other specialties.

James Stewart & Co., 30 Church street, New York, have been awarded the entire contract for the construction of a 3000-barrel cement plant to be built at Hudson, N. Y., for the Knickerbocker Portland Cement Company. James Stewart & Co. will buy all the machinery and other equipment in addition to supervising the erection of the factory building.

The Reddin Iron Works, Syracuse, N. Y., has let contract for construction of a one-story foundry addition to its plant on Marcellus street.

The Garlock Packing Company has acquired the factory premises formerly occupied by the Ontario Tack Company on Queen street, North Hamilton, Ont., and is enlarging and equipping the plant for its own use.

The Rennselaer Valve Company has been incorporated at Troy, N. Y., with a capital stock of $500,000, to manufacture valves, hydrants, brass castings and foundry products. The incorporators are Messrs. Rowe and Irving, Troy, N. Y., and Thos. Breslin, Waterford, N. Y.

The State of New York will erect a steel lift bridge over the Erie Canal at Franklin street, Syracuse, at an estimated cost of $43,000. Bids are being received by Frank C. Stephens, Superintendent of Public Works, Capitol Building, Albany.

Chicago

CHICAGO, ILL., November 7, 1910.

The approach of a national election usually causes a cessation of activity in the machine tool trade, especially when the issues involved have any direct bearing on business conditions. For several months the machine tool trade in the West has been depressed by uncertainty in the minds of many manufacturers, and the volume of orders has been considerably short of the average sales in this territory in good times. There has been some complaint also of slow collections and conditions on the whole have been far from satisfactory from the standpoint of the dealers. It is generally understood, however, that a turning point has been reached in business conditions, and that a better market for machinery may be expected from now on.

Inquiries from the general trade have been improving the past week or two, and there are signs of returning confidence among manufacturers in the West. While the railroads use only a small percentage of the product of the machine tool industry, the policy of the railroads is a very important factor in the condition of the market. The reports that the railroads have obtained a settlement on political questions which are of paramount importance to them have therefore proved very encouraging among machinery men. As soon as the rail-

THE MACHINERY MARKETS

roads begin placing liberal orders for rails and equipment, business men generally will be satisfied that there has been a turn in business conditions, and that they can go forward safely in making extensions and improvements which require new investments in tools.

In the business actually done recently there has been a good demand for special lines of tools, as well as for hack saws, grinders and smaller tools and machines. There is some scattered buying by railroads, but no large tranactions in the railroad field are reported in this market.

Joseph T. Ryerson & Son, Chicago, recently made a sale of several tools to a Mexican railroad. Included in the order were a flue welding machine and a beveling shear.

The city of Chicago, Ill., is having plans prepared for a thorough overhauling of its water works system.

The Sangamo Electric Company, Springfield, Ill., has under course of construction a two-story brick addition, 40 x 160 ft., in which will be installed its offices, shipping rooms and testing and assembling departments. Not much new machinery will be purchased, but the company will be in the market from time to time for machine tools.

Philadelphia

PHILADELPHIA, PA., November 7, 1910.

Machine tool and machinery dealers almost unanimously report the volume of business transacted in October as unsatisfactory. With extremely few have sales equaled those of the previous month, and several report the smallest business for a long period. Nor do they see any material encouragement for the immediate future. While general trade conditions are apparently on the way toward betterment, it will take some little time, it is believed, for the more extensive buyers of tools to reach the full capacity mark. The railroads in this territory have for the past few weeks been almost entirely out of the market. No fresh inquiries have developed; in fact, quite a few of their recent inquiries are still unclosed. The situation from the manufacturers' standpoint is unchanged; their field is wider than that of the merchants, but even then business is reported irregular and few plants are being operated at capacity and these have, as a rule, but a few months' work ahead.

During the week some purchases have been made, but largely of the single tool character. In nearly all classes of tools deliveries can be made promptly, stocks in merchants' warehouses being large and varied, and in the majority of instances immediate shipment is available.

The demand for second-hand machinery and machine tools continues irregular; there has been no demand along any particular line. A moderate inquiry for boilers and engines comes out, and it appears as if some of the pending business will develop into orders at an early date. No betterment in the export demand for machinery or tools is reported; some few orders have been taken for special equipment, but there has been no inquiry reported for tools of the standard types.

The foundry trade continues irregular; there is probably a little more inquiry for steel castings, prices for which are not very strong. Inquiry for machinery castings is dull, reflecting the condition of the trade. Jobbing foundries are moderately active, and in some cases a very fair demand for builders' cast iron work is reported.

The Preston Company, Drexel Building, is erecting a plant at Bridgeton, N. J., for the preparation of silica sands for foundry use. The plans are for a plant of 600 tons capacity per 10-hour day. While a good share of the machinery and equipment has been provided for, the company is still in the market for a 900-hp. engine and a boiler of 1200 hp.

The Industrial Supply & Equipment Company, engineers' specialties and contractors' equipment, 407 Sansom street, has been appointed sales agent in the territory east of Pittsburgh for the Brown coupling, for high pressure service, manufactured by the Brown Automatic Hose Coupling Company, Cleveland, Ohio.

The Commissioners of the District of Columbia, Washington, D. C., will receive sealed proposals until November 12 for the furnishing and erecting of a complete electric lighting plant for the temporary buildings of the workhouse located at Occoguan, Va. Specifications may be obtained at the office of the Chief, Clerk, Engineering Department, 427 District Building, Washington, D. C.

R. B. Seidel, Inc., crucible manufacturer, has begun the building of a large kiln for burning black lead crucibles. Other improvements to the plant are also under way. The new kiln will increase the burning capacity fully 80 per cent. The demand for crucibles and special plumbago and clay shapes is reported as very good.

The Charles McCaul Company has the contract for the addition to be made to the boiler house at the Tacony power plant of the Frankford, Tacony & Holmesburg Traction Company, at Tacony. Plans call for a one-story brick and steel structure.

The West Chester & Wilmington Electric Railway Company, which was formed about a year ago to build a trolley line between West Chester, Pa., and Wilmington, Del., will, it is stated, be ready to ask for bids for the construction of the road in the near future.

The Philadelphia Roll & Machine Company reports a fair volume of business, with the plant running 80 per cent. of its capacity. Orders are being received both for sand and chill cast rolls, although the quantities are smaller than when general business is more active. The demand for charcoal iron air furnace castings continues good, and considerable heavy machinery work has been taken. The addition to the plant, previously referred to, is completed, and preparations are being made to install the machinery, which has already been purchased.

The Frick Grate Bar Company, which also conducts a general engineering business at 421 Chestnut street, has been appointed sales representative in the Philadelphia district, including eastern Pennsylvania, New Jersey, Maryland and Delaware, for the line of turbo-blowers, manufactured by the Turbo-Blower Company, New York.

The Franklin Brass Foundry Company, Reading, Pa., will make application for a Pennsylvania charter November 29, to engage in the manufacture of brass, iron or other castings of various kinds. The incorporators named are Frank A. Gring, F. W. Kaucher, Oscar Rickenbach and Henry M. Koch.

The Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., has been awarded the contract for pumping engines for use in the Water Department of Harrisburg, Pa. The installation consists of two complete units, independent of each other, each having a capacity of 1,000,000 gal. per day. One unit is to be driven by a direct connected gasoline engine, the other by electric motor. Each unit is interchangeable, except as to form of drive. The pumps are of the vertical triplex type, having plungers 8¼ in. in diameter and 12-in. stroke. The contract includes the pumps, piping and installation of the equipment. The pump business of this company has been increasing so rapidly that it has been found necessary to double the capacity of some departments connected with the pump manufacture, particularly chilled iron plungers, for the grinding of which a machine having a capacity 20 x 96 in. has recently been ordered.

Robert Erato, West Palmyra, N. J., is in the market for conveying machinery to carry clay from a nearby clay bank to the mill, a distance of about a quarter of a mile. He is also preparing to engage in the manufacture of asbestos products, such as coverings, insulation, &c., for which a plant is now being installed.

The Philadelphia Machine Screw Company notes a very fair demand for various classes of special screws. This concern has recently installed several automatic screw machines, to better enable it to take care of orders for special screws, small parts for automobiles and electrical purposes and special machine screw work.

Cincinnati

CINCINNATI, OHIO, November 7, 1910.

The Buffalo & Susquehanna Railroad Company is reported to have bought a small lot of tools, some of which business benefited Cincinnati machine tool builders. Nearby railroads are very slow in making up their minds to come into the market and only small orders for emergency tools are being placed. With the elections out of the way and with indications for a fair settlement of the rate question, the railroads are not expected to be such disappointing customers as they have been during the past year.

A canvass of local manufacturing industries develops rather peculiar conditions. Some machine tool builders were very busy all through October, while others were compelled to temporarily lay off a few men or else go into building stock tools. In other lines of manufacture, for instance the stove business, local factories generally report October as being the busiest month they have had for years. The sawmill machinery business continues dull, but there is a good demand for small combination woodworking machines.

Taking everything into consideration, the situation is one to make everybody indulge in a general optimistic feeling, and if next spring does not open up with a record breaking business it will be a great surprise to business men in this section of the country.

Work on the new plant of the Cincinnati-Bickford Tool Company at Oakley is being pushed all possible, but the company has been disappointed in not getting into its new quarters on the date anticipated.

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The frame work of the six-story building for the Ohio Mechanics' Institute, on Walnut street, has been completed and the inside work commenced on. The heating contract, which is one of the largest let in this section of the country lately, was awarded the Attlesey-Dyer Company of Cincinnati.

The Herancourt Brewing Company, Cincinnati, will erect a three-story brick and concrete storehouse and cold storage plant at 1406 Harrison avenue.

The Cincinnati Time Recorder Company, Cincinnati, has increased its capital stock from $50,000 to $75,000. No immediate additions to its plant are contemplated.

The Monarch Machine Company, Sidney, Ohio, builder of lathes, is so busy at the present time that it has found it necessary to materially add to its working force.

The stock of the Royal Rubber Company, Akron, Ohio, has been increased from $50,000 to $200,000.

The Klein-Marshall Furnace Company has been incorporated at Canton, Ohio, with $40,000 capital stock. The incorporators are G. D. Viers, John E. Hisey, Ray E. Viers, O. T. Clewell and H. W. Penrock.

Plans have been completed for an addition to the Isaac Joseph Iron Company's plant on Hunt street, Cincinnati, recently mentioned, but actual work of construction will not begin until next spring.

The new brick building for the Hisey-Wolf Machine Tool Company, on Colerain avenue, Cincinnati, has been completed, and the company expects to move into its new quarters some time this month.

It is reported that J. F. Wright of Canton, Ohio, is the principal promoter of a new company that will erect a factory for the manufacture of a patented pipe wrench.

Plans are being prepared for an addition to the plant of the Gendron Wheel Company, at Toledo, Ohio.

Cleveland

CLEVELAND, OHIO, November 8, 1910.

The local demand for machine tools continues quiet. Dealers report a light volume of scattering inquiries, which are largely for single tools. A large part of the orders are for small tools for new manufacturing enterprises that are starting up in a small way. Little business is coming from large manufacturing plants. In most cases these are holding off expected purchases until they have more work on hand. Local plants making machine tools continue to run near full capacity, but several are pretty well up on orders and some of the tools they are making at present are for stock. A local manufacturer of heavy forging machinery reports an improvement in the situation, having received some good sized orders during the past few days. The demand for this class of machinery has been light for some time, owing to the limited buying by the railroads.

The demand for heavy handling machinery is not active, but plants are well filled with work. New orders are mostly for small equipment. Some good inquiries are pending from the East for coal handling plants. The demand for electrical equipment is rather quiet, being confined largely to medium sized and small motors for industrial plants. Very little business is coming from the electric railways.

Reports from various parts of Ohio indicate considerable activity in the erection of new manufacturing plants and additions, but most of these are outside of metal working lines and will not stimulate the machinery market further, perhaps, than to create an additional demand for power equipment.

The Metals Welding Company has completed a new plant at 4400 Perkins avenue, Cleveland. This company was recently organized to manufacture the Harris type of oxy-acetylene plants, to do job welding of all kinds, and sheet welding and brazing. E. C. Reader is manager of the company. Howard H. Snyder, formerly connected with the Braze Weld Company of Cleveland, is superintendent.

The Superior Drop Forge & Mfg. Company, Cleveland, will shortly begin the erection of a new forge shop, 50 x 100 ft., and will purchase the necessary forge shop equipment. On the completion of this building the company plans the erection of another forge shop of the same size. Plans for the construction are being prepared by the Forest City Engineering Company. The company is located at West Seventy-third street and the Big Four track, where it is now building a machine shop.

The Lake Shore Railroad has an inquiry out for a number of motors for its new shops at Elkhart, Ind. The list of machine tool requirements for those shops is not yet out. This railroad is also planning some extensions to its Collinwood, Ohio, shops, including a new machine and car shop.

The Reliance Mfg. Company, Massillon, Ohio, has been formed by Frank C. McLain and others to manufacture lock washers and metallic matting. The company has leased a building on East Tremont street for a plant and will at once begin operations.

The N. J. Rich Knitting Company, Cleveland, has commenced the erection of a large concrete factory building, 100 x 360 ft. and four stories. It has not yet been decided whether a power plant will be installed or whether power will be supplied by a commercial company.

The Stevens Iron Works & Fireproofing Company, Cleveland, is building a new one-story brick plant on Perkins avenue.

The Ohio Brass Company, Barberton, Ohio, which recently purchased the plant of the Hi-Potential Company in that city, is building a large two-story addition to its plant.

Sealed proposals will be received by the Director of Public Safety, Cleveland, November 18, for a steam and electric generating unit, to be installed at the city colony farm at Warrensville.

The Lawrence Clay Products Company, Canton, Ohio, with a capital stock of $200,000, will begin the erection of a large plant in North Lawrence soon after the first of the year for the manufacture of building brick. John P. Jones is president of the company and William D. Street is secretary.

The James Foundry Company, Clyde, Ohio, will build a new plant, and will buy some foundry equipment.

The Erie Railroad will install a new coal tipple on docks that it is about to build in Cleveland.

New England

BOSTON, MASS., November 8, 1910.

Inquiries are more numerous than they have been, and signs generally indicate that orders should improve from now on. The passing of the election is considered as eliminating a deterrent to business. Few large orders are being placed, nor are there lists of any consequence in sight. Builders of heavy machinery, such as rolls, punches and shears, are having little inquiry for their product, but this trade also is more hopeful than it has been for some time. More active interest on the part of the railroads is having its influence on the general feeling of the trade.

The plant of the H. D. Smith Company, Plantsville, Conn., manufacturer of vehicle and special drop forgings and drop forged fine tools, lost a large portion of its works by fire October 31. The die sinking department, machine room, finishing department and assembling department were destroyed, together with a large amount of stock in process. The forging shops and wareroom were saved, however, and the company is arranging for temporary finishing quarters, and plans to be operating again in about two weeks. Customers are anticipating their wants for future shipment and the company will undoubtedly be able to take care of their orders in the near future.

The H. B. Smith Company, Westfield, Mass., manufacturer of heating boilers, radiators and other steam specialties, is planning large additions to its works for the spring, but at the present time the matter has not gone far enough to permit of the publication of details. The improvements will include both foundry and machine shop additions.

Additions to general manufacturing plants include the following: American Hatters & Furriers Corporation, Danbury, Conn., to rebuild plant recently destroyed by fire with a loss of more than $100,000; Hampden Glazed Paper Company, Springfield, Mass., new factory; E. E. Dickenson Company, Essex, Mass., addition to factory 50 x 150 ft., two stories.

W. & B. Douglas, Middletown, Conn., have brought out a new type of contractors' diaphragm pumping outfit, designed for removing large quantities of gritty water at low cost, and easily portable. The engine has been tried out by public service corporations, for drainage and sewage work, and as a bilge pump on vessels. The unit contains gasolene engine and tank. The capacity is 3000 gal. per hour, and the weight 650 lb., crated.

A. H. Wells & Co., Inc., Waterbury, Conn., manufacturer of seamless tubing, brass, copper, bronze and nickel silver, will build a brick addition to its works, 64 x 107 ft., one story. It will be used for the manufacture of seamless tubing.

The Screw Machine Products Corporation, Providence, R. I., will build a two-story and basement addition to its factory to contain about 20,000 sq. ft. It will be of mill construction and will cost $25,000. The company manufactures screws, nuts, rivets, and other headed and threaded work and turned pieces.

J. V. Critchley has become the sole owner of the Critchley Machine Screw Company, Worcester, Mass., having purchased the interest of the silent partner of the firm. The business was established four years ago in a small room,

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Mr. Critchley having no assistance in the factory. To-day 80 people are employed, and the equipment comprises 150 screw machines. No machine screws properly are manufactured, the product being confined to special turned work. The company is very busy and is about to resume an overtime schedule of hours. An order just received from an automobile concern calls for 5,000,000 pieces of a special high carbon steel, requiring 235,000 lb. of stock. The company has taken additional space in the building at 100 Beacon street.

A syndicate of Hartford men, comprising Clarence E. Whitney, Whitney Mfg. Company; Robert H. Schutz, Sigourney Tool Company and Smyth Mfg. Company; Edward J. Manning, Royal Typewriter Company, and Herman F. Cuntz, Columbia Motor Company, has acquired 160 acres in the southwestern part of the city, south of the Hartford Rubber Works Company, and will develop the land for industrial purposes. The land is peculiarly adapted to its purpose, because of its natural contour and its proximity to the main line of the New York, New Haven & Hartford Railroad. Not only will new industries be located on this land, but model homes for workmen will be constructed.

The O. C. White Power Company, 15 Hermon street, Worcester, Mass., is in the market for a 125-hp. Corliss engine.

Detroit

DETROIT, MICH., November 7, 1910.

New manufacturing companies, with the established concerns of small or medium size who are adding to their shop facilities, were responsible during October for the best character of buying, and their requirements seem to be expanding rather than diminishing. From the railroads that traverse Michigan, northern Indiana and Ohio there have come to the manufacturers of this State, as well as some of the principal dealers, quite a steady run of miscellaneous inquiries, with the promise of a more substantial volume of buying in the near future.

In the line of foundry work there has recently been a marked revival of business, coincident with the renewed activity in motor-vehicle building and related industries. Operators of such plants will be good buyers of equipment and supplies during the winter.

The plans of the Matthew Lamont Company, Bay City, Mich., for a new factory building include a three-story structure, 96 x 154 ft., of reinforced concrete construction. Power and woodworking machinery, as well as an electric lighting outfit, steam heating plant, &c., will be among the company's requirements.

Plans are reported to be nearly completed for a forge shop to be built as a part of the Detroit Steel Products Company's plant in this city.

A bond issue to provide for the electric lighting plant was recently authorized at an election held in Davison, Mich.

The Cumback Motor Company has been organized in Detroit by A. A. Bailey, W. S. Bailey and R. A. Cumback.

Plans for a water works system at Wayne, Mich., including pumping machinery of a thoroughly modern type are now being prepared.

The Detroit Edison Company, Detroit, whose main power station is equipped with units of 30,000 kw. built by the General Electric Company, Schenectady, N. Y., is planning large additions to its system, the exact extent and character of which have not yet been made public.

A two-story frame addition is being made to the factory of the American Carving & Mfg. Company, Grand Rapids, Mich.

Some additional equipment is to be installed by the Bos-Bolhuis Lumber Company, Holland, Mich., which had been extending its plant.

Cameron F. Roberts, 347 Woodward avenue, Detroit, is secretary of the newly organized Day Automobile Company, and will be in charge of plans for the manufacturing plant which it is proposed to establish here.

A two-story factory, 50 x 90 ft., is to be built in Detroit by Martin Church, who is also reported to be interested in the Page Wire Fence Company, Walkerville, Ont.

The W. J. White Company, Detroit, is letting contracts for the building and equipment of a new two-story factory.

The U. S. Rusk Company, Grand Rapids, Mich., is reported to have completed plans for a two-story factory addition, 45 x 80 ft.

Construction contracts have been let for a new three-story factory building, 70 x 100 ft., to be erected for the Detroit Carriage Company, Detroit.

A machine shop is to be built in Detroit by Arthur Colton on a site 150 x 450 ft. recently acquired. The firm's headquarters are now in the Detroit Gas Company's Building.

A two-story factory building is to be erected in Toledo, Ohio, by the Allen Mfg. Company of that place.

The Coldwater Ladder Company, Coldwater, Mich., is erecting a new factory building.

The Pontiac Motor Cycle Company, organized under the laws of Michigan with an authorized capital of $600,000, is building a plant on a 20-acre tract in Pontiac, Mich. The company will manufacture motor cycles and its buildings now under way include three structures, one 45 x 208 ft., another 55 x 100 ft. and a third 55 x 128 ft. The plant will be equipped with electric power system in motor drive groups, and the company is in the market for polishing and plating devices, oil burning furnaces suitable for steel treatment, oil brazing stands, portable enameling ovens and a line of machine tool equipment suitable for motor cycle manufacture. Allied with the motor cycle company is the Pontiac Drop Forge Company, which is erecting one building 65 x 100 ft. and another 30 x 130 ft. The forge company expects to purchase a line of steam drop and helve hammers from 100 to 250 lb., power shear, drilling and stamping presses, oil burning furnaces for forging, blowers, oil tanks and a complete line of die shop equipment. Robert M. Brownson is president and general manager of both companies.

The Reliable Wire Company has been organized at Muskegon, Mich., with a capital stock of $100,000, to manufacture enameling wire. The company has in course of construction a plant which will be equipped and put in operation as soon as possible.

The B. & B. Buggy Company, Marshall, Mich., has plans prepared for the erection of a new factory building 80 x 300 ft., with a wing at each end 50 x 75 ft., to be erected during the coming spring.

The Newaygo Engineering Company, Newaygo, Mich., will erect in the spring a new factory of fireproof construction for the manufacture of the Newaygo separator, adapted to handling either wet or dry screenings, and other machinery. In addition to manufacturing the company will do an engineering business, specializing in the pulverizing departments of Portland cement, fertilizer and other similar plants. The equipment used by the Newaygo Portland Cement Company has been taken over, but additional equipment will be purchased upon completion of the plant.

Pittsburgh

PITTSBURGH, PA., November 7, 1910.

Purchases of shop, factory and mill equipment are being delayed or only partially made. In not a few instances, within the past month, second-hand or rebuilt machinery has been substituted for new on lists that had been pending for some time. One of the bright features of the situation is the well-sustained demand from nearly all parts of the United States, and many foreign countries, for apparatus to be used in recovering, loading, conveying, and treating heavy material, such as ores, rock, coal, &c. Economy of operation has become a factor of such importance in the various lines of industry affected, with narrowing margins of profit, that replacements of this class of machinery are being made wherever the net results will warrant them. The introduction of electric drive, which is tending to become practically universal for all purposes such as those above mentioned, has led directly to much of the change that is at present going on, and it frequently results in the complete remodeling of handling or treating plants along the most modern lines.

The repair and maintenance facilities of the Pittsburgh & Lake Erie Railroad Company are to be considerably extended, and some purchases of shop equipment will be made within the next few months.

A new carhouse addition, with equipment for repair work, will be built at Butler, Pa., by the Butler Passenger Railway. The plans, however, are not yet complete.

The Malcolm Brake Shoe Company has been organized at Charleston, W. Va., to establish a plant for the manufacture of the railroad specialty mentioned in the title. C. A. Malcolm, Minden, W. Va., is the leading incorporator.

The plant of the Pittsburgh Steel Company, at Monessen, Pa., was inspected by about 250 traffic representatives of the New York Central lines who recently met in Pittsburgh to get a more complete idea of the industrial importance of this district as a freight producer.

The Railway & Industrial Engineering Company, Pittsburgh, is featuring in its sales this fall a tool used in slotting commutators for direct current generators and motors.

The Hockensmith Wheel & Mine Car Company, Penn Station, Pa., has met with much success this season in the sale of the angle bar trucks for mine cars which it handles. A feature of these is the Eureka wheel made in the company's plant.

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Milwaukee

MILWAUKEE, WIS., November 7, 1910.

The industrial situation here shows further improvement, and some of the men laid off by the larger machinery building plants a few weeks ago are being taken back. Large orders are more plentiful than they were, while a greater aggregate of small orders, routine buying, requisitions for spare parts, repairs, &c., is generally observable. It is the feeling among manufacturers and sales agencies that, if the present favorable tendencies hold throughout November, there will be steady improvement following. This judgment has been based principally upon the new projects or improvements known to be pending, which now fill office files as prospects.

In the northern part of Wisconsin, together with Upper Michigan, there has been very little known of the dullness felt here, and there is now a great deal of activity in all of the mining and timber districts. One of the most pronounced features of this is the growth of local industries supplying material, machinery or other equipment, fabricated metal, boiler and plate work, castings, &c., for which dependence was formerly had mainly upon the more populous centers of Wisconsin or neighboring States. At the same time the volume of trade with Milwaukee, Racine, and other of the more southerly cities has increased considerably.

Representative manufacturers of machine tools and other shop equipment located in Wisconsin seem to be very much in favor of the action taken at the recent annual meeting of the National Machine Tool Builders' Association with respect to noncancellation of contracts. So far as local plants are concerned, however, there does not appear to have been any serious difficulty from the situation which it is sought to remedy.

Plans for a new factory building to be erected next March or April will probably be completed in the near future by the Racine Art Furniture Company, Racine, Wis. The project is not yet, however, in definite shape.

The Petrel Motor Car Company, Milwaukee, will remove in the spring to a new plant situated at the southern limits of the city.

The plant to be built in Appleton, Wis., by the General Mfg. & Machine Company will be used for the production of a new patented range.

A. C. Lingelbach, president of the American Hydraulic Air Compressor Company, 1317-1319 Majestic Building, Milwaukee, states that the company's plans include the erection of a large central plant for furnishing power to manufacturing industries in the form of compressed air. Further details will be made public later on.

Construction contracts are about to be let on a large new pulp mill to be erected at Tomahawk, Wis., by the Tomahawk Pulp & Paper Company. All of the machinery is to be driven by means of electric motors, but it will probably not be necessary for the company to erect a new power plant.

The Bain Wagon Company, Kenosha, Wis., is about to build an addition to its boiler house.

Some machinery, including electric motors, is to be purchased by the Wisconsin Auto Top Company, Milwaukee, for its new factory addition.

Another story, 40 x 116 ft., is to be added to the brass foundry of the National Brake & Electric Company, Milwaukee.

The Wisconsin Bridge & Iron Company, Milwaukee, which maintains offices in the Sheldon Building at Houghton, Mich., is getting a large percentage of the orders for new mining buildings, steel tipples, &c., to be erected on the iron and copper ranges.

New quarters have been secured by the Beaver Mfg. Company, Milwaukee, in a factory building on First avenue, near Oklahoma avenue, which is being remodeled for the purpose. The company will continue in its present location for some months.

As an illustration of the market which builders of heavy machinery here are now finding in the Far North, it is stated that the Alaska Perserverance Gold Mining Company, Juneau, Alaska, has in service at its crushing plant five large gyratory breakers and 50 gravity stamps furnished by Milwaukee companies. An installation of this size would be notable anywhere, but it is surpassed by others in the same vicinity which were originally supplied from the shops of concerns whose headquarters are in this city.

A sprinkler system is to be installed in the new plant of the Waltham Piano Company, Milwaukee.

Some additional buildings are to be erected within the next few months for the Horlick's Malted Milk Company, Racine, Wis.

Otto H. Falk and E. J. Kearney are representatives of the metal working industries on a committee recently appointed by the Merchants and Manufacturers' Association, Milwaukee, to arrange for an industrial exposition in this city in 1911.

M. G. Jeffries, Janesville, is reported to be active in an effort to induce the Brunswick-Balke-Collender Company, Chicago, to erect a branch factory in that city.

The Racine Boat Company, Racine, Wis., is about to let construction contracts on a new shop building, 60 x 100 ft., and a boiler house addition, 40 x 60 ft.

The Independent Electric Mfg. Company, Inc., Milwaukee, will arrange during the winter for enlarging its manufacturing facilities, and is to be in the market for some new machine tools and other equipment. It makes a specialty of starting boxes and controlling devices for a considerable variety of service.

Additional electrical machinery will probably be required in the near future for the plant of the Chicago Brass Company, Kenosha, Wis., which is contemplating some improvements. Definite plans to this end have not yet been determined upon.

The Gisholt Machine Company, Madison, Wis., is letting construction contracts for an extension of its main machine shop, 100 x 200 ft.

Toronto

TORONTO, November 4, 1910.

There is no apparent slackening of the activities that maintain the demand for machinery. Considerable though that demand continues to be, it would undoubtedly be much greater if labor were as plentiful as contractors, manufacturers, lumbermen and other employers desire. In the wonderfully fine weather of this open fall railway building, for one thing, would be carried on upon a larger scale if hands could be got. And, of course, in all such occupations machinery and outfit are directly applied and the implements thus used are the products of machinery in manufacturing works. If there were workers for all the work to be done outdoors and indoors there certainly would be a much enlarged demand for machinery, and the increase in plant capacity would be greater. The conditions of the trade are very favorable.

The Backaway Pulp Timber Company has been incorporated under Dominion authority, with a capital stock of $250,000, its head office to be at Toronto, Ont.

The Wayagamack Pulp & Paper Company has been incorporated under Dominion authority, with a capital stock of $5,000,000, its head office to be at Montreal, Que.

The Town Council of Englehart, Ont., has decided to issue debentures for $30,000, the money to be used in the construction of a hydroelectric power plant at the High Falls.

The Canadian Underwriters' Association has had the fire appliances and water works of the town of Picton, Ont., inspected, and has found that the whole of the system should be overhauled, that modern equipment should be put in and that the pumping capacity should be increased by 1,600,000 gal.

The City Council of Victoria, B. C., has authorized the expenditure of $50,000 for the purchase of additional fire fighting apparatus. This is a consequence of the $1,000,000 fire that visited the business quarter about 10 days ago.

The Moose Mountain Mining Company, of which D. D. Mann, Toronto, is one of the active directors, has decided to add to its works at Sellwood, Ont., a Grondahl process plant.

Patterson Bros., a shoe manufacturing firm at Duluth, Minn., have a proposal before the City Council of Portage la Prairie, Man., to establish a $75,000 factory in the latter city. They would employ 150 hands the first year and 250 hands after that.

A cold storage plant is to be erected in Edmonton and the government of the Province of Alberta is expected to grant it a subsidy.

The Stewart Sheaf Loading Company will erect a factory in Elmwood, Man., for the manufacture of sheaf loaders.

Preparations are being made for the reconstruction and re-equipment of the Renfrew Electric Company's plant, which was recently destroyed by fire, in Renfrew, Ont.

The Mead-Morrison Company of Chicago is installing the machinery for the large addition the Canadian Pacific Railway Company is making to its coal sheds at Fort William, Ont. Two screening and pick-up rigs will be put in. The cost of the improvements is to be $100,000.

The Murray Drilling Company, Victoria, B. C., is purchasing new machinery for the oil boring operations it is carrying on at Muir Creek.

Machinery for the new plant the Independent Rubber Company is erecting at Merritton, Ont., will be put in late next month. The Canadian Car & Foundry Company at Am-

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herst, N. S., has lately received some important contracts for baggage cars and snowplows.

Kuhne & Anderton of Beaver Falls, Pa., propose to establish a branch plant at Port Hope, Ont., for the manufacture of steel door mats.

An addition is being made to the plant of the Colonial Wood Products Company at Thorold, Ont., and a considerable quantity of new machinery will be installed.

A contract has been let for the new buildings the Toronto Electric Light Company is to erect in Toronto at a cost of $100,000.

The Galt Motor Company, Galt, Ont., is making an addition to its building, the new space being required for the manufacture of two-cycle engines. The engines will be of capacities varying from 5 to 60 hp.

The Sutherland Fence Company, Sarnia, Ont., has found it necessary to provide itself with larger premises and has started to build a factory 100 x 150 ft., in which woven wire will be made.

The John Palmer Company, Fredericton, N. B., is increasing its capital stock from $75,000 to $125,000 and will add to the capacity of its plant.

The Brompton Pulp & Paper Company, East Angus, Que., is spending $200,000 on new buildings and equipment.

A by-law will be submitted to the ratepayers of Steelton, Ont., to authorize the expenditure of $30,000 for the construction of a lighting plant.

The Amherst Malleable Company, Amherst, N. S., is extending its premises by an addition in which it is expected to employ 150 men.

A four-story building is being added to the works of the Amherst Boot & Shoe Company, Amherst, N. S.

The ratepayers of Welland, Ont., have ratified a by-law providing for the expenditure of $52,000 on water works.

Proposals for the erection and installation of an electric light and flour plant and flour mill are invited by the Mayor and Council of Maple Creek, Saskatchewan.

H. E. Blasingham, Loganport, Ind., has inquired of the Town Council of Berlin, Ont., what inducements the municipality offers for the establishment of a factory his company desires to locate in Canada for the making of automobiles to sell at $750 to $900. W. Arrowsmith, Morrisburg, N. J., is also in communication with Berlin in reference to a project to put up a Canadian branch factory in which to make foot arch supports.

A steam heating boiler made by the Gurney Foundry Company, Toronto, Ont., for the opera house at Brockville, Ont., is said to be the largest ever made in Canada.

The works of the Ontario Wheel Company, Gananoque, Ont., were destroyed by fire on November 3. The loss, estimated at $125,000 or upward, is covered by insurance.

The Brandon Electric Light Company's central station heating plant is ready for the winter's business, and the demand is so great that the company finds it necessary to extend its system by adding mains. Brandon, Man., is the first Canadian city to have a central heating plant.

The town of Biggar, Saskatchewan, is issuing $15,000 debentures for the carrying out of a scheme of water works improvement and fire protection equipment.

Telfer Bros., Collingwood, Ont., propose to add $21,000 worth of new machinery to their woolen manufacturing plant.

F. J. Wellwood, Elmwood, Man., is preparing plans for the addition of a shoddy mill to his plant.

It is officially announced that the amount to be expended by the Canadian Pacific Railway Company on improvements in connection with the Place Viger new passenger and freight terminals and freight shed is $3,000,000.

The steamship Beaverton brought a cargo of machinery to Port Arthur, Ont., a few days ago for the Western Dry Dock & Shipbuilding Company's plant there.

In the spring the National Electric & Heating Company will move from Galt, Ont., to Toronto, where a large building is being constructed for it.

The city of Saskatoon, Saskatchewan, is selling £88,600 bonds in London, England, the money to be applied to public works.

Price Bros. & Co., Quebec, Que., are offering £1,000,000 first mortgage bonds in London, the proceeds to be used in the building and equipment of large pulp and paper mills.

J. H. Plummer, president of the Dominion Steel Corporation, Sydney, N. S., says that the construction of a sixth blast furnace is being arranged for by his company, and that preparations are being made to change from the production of wire rods to the production of other forms of steel should that alternative be made necessary by the Government's tariff policy.

It is stated that the Robert Stewart Company, Guelph, Ont., will enlarge its plant and that machinery to be driven by electric power will be installed in a new building to be erected.

A by-law to raise $4,000,000 for a visible water supply system in Winnipeg was referred to the Fire, Water and Light Committee of the City Council.

The Saskatchewan Flour Mills Company is erecting a large oatmeal mill at Moose Jaw, Saskatchewan.

Parties from Detroit are negotiating with the Publicity Commissioner at Ottawa, Ont., for the establishment of an automobile plant in the latter city.

The outlay on the branch knitting mill the Penman Company of Paris, Ont., is enlarging in Brantford, Ont., is to be from $75,000 to $100,000.

Subscriptions are being asked for the taking up of the $15,000 stock the Canada Grain Shocker Company desires to sell to local investors in Chatham, Ont., where its works are being put up.

G. Carter, Son & Co., St. Mary's, Ont., are to become the Carter Milling Company. A cereal mill will be installed and $150,000 of preference stock will be issued to pay for its construction and equipment.

The Manitoba Bridge & Iron Works Company, Winnipeg, Man., announces that it is open to purchase a belt driven compound air compressor, equipped with inter-cooler and automatic cut-off, capacity to be 700 cu. ft. of free air per minute compressed to 100 lb.

The King George Mine Company, Cobalt, Ont., intends to install a compressor at the mine.

F. C. Gamble, engineer of the Public Works Department at Victoria, B. C., is calling for tenders, first, for the superstructure and, second, for the erection of a two-span steel bridge over the Thompson River on the line of the Canadian Pacific Railway 218 miles east of Vancouver, B. C. The contracts will be open to tender until November 28.

The Alabastine Company of Paris, Ont., is putting up a building 55 x 108 ft. at its mine near the village of Caledonia, Ont., and will put in a new plant for crushing the gypsum and manufacturing it into merchantable forms.

The Canadian Locomotive Company, Kingston, Ont., has received an order from the Canadian Pacific Railway Company for 10 10-wheeler engines.

The Dominion Sewer Pipe Company, Swansea, Toronto, Ont., is erecting a brickmaking plant at Waterdown, Ont.

A site of 4 acres has just been purchased in Toronto on which a large factory employing several hundred men is to be built. Particulars are yet withheld.

Montreal, London and Winnipeg City Councils are all considering the purchase of motor engines for fire protection service.

P. Butchart of Tod Inlet, B. C., is reported to be about to establish a plant at St. Boniface, Man., for the manufacture of Portland cement. To run the factory 2000 hp. will be required.

The Diebel Company's chair factory at Hanover, Ont., was totally destroyed by fire October 3. The loss is covered by insurance.

The South

NASHVILLE, TENN., November 7, 1910.

Salesmen are meeting with more success in closing negotiations that have long been awaiting approval. It is freely predicted that during the coming fortnight there will be more contracts signed than in either of the two preceding fall months and that a period of ordering for a reasonable distance ahead is about to take the place of the hand-to-mouth buying that has thus far prevailed. Steam boilers, heaters, pumps and auxiliary apparatus, together with power and electrical machinery of every description have been the mainstay of a large portion of the market this fall, with every indication that the demand from similar sources will take a great deal more equipment of this character within the next few months. To a very considerable extent the requirements of users are being met by boilermakers, engine builders and manufacturers of pumps, electrical machinery, &c., located in the South. In fact, the percentage of such trade supplied by the plants of this section appears to be much larger than in any previous season.

The Solomon-Norcross Company, Atlanta, Ga., has prepared plans for an addition to the electric light plant at Shelbyville, Tenn., owned by J. F. Boyd of that place. New hydroelectric units aggregating 400 to 500 kw. will be provided as soon as the details have been fully worked out.

The Lenoir Car Works, Lenoir, Tenn., is making additions to its equipment, including the installation of two traveling cranes built by the Northern Engineering Works, Detroit, Mich.

J. B. McCrary, Atlanta, Ga., has undertaken the construction of a complete system of water works at Asheboro, N. C., which will include a pumping unit of 750,000 gal. daily capacity and a steel tower and tank.

The purchase of an additional centrifugal pump for the

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water works system at Richmond, Va., has been recommended by a committee, which recently investigated the requirements of the service.

Heavy purchases of refrigerating machinery will be made in the near future by the Atlantic Ice & Coal Corporation, Atlanta, Ga., which has decided upon extensive betterments at its various plants.

For the new power plant to serve its extended shops at Boyles, Ala., the Louisville & Nashville Railroad has ordered six water tube boilers, aggregating 1800-hp. capacity, at normal load, from the Henry Vogt Machine Company, Louisville, Ky.

The Pan-American Mining Company, Gulfport, Miss., which is developing a group of mines in Mexico, will provide equipment in the near future for a concentrating plant to serve the various properties. It is expected that electric power will be utilized throughout.

The sawmill at Stevenson, Ala., which burned some weeks ago, will be rebuilt by J. F. Mitchell.

In consequence of important extensions and improvements to be entered upon shortly, additional power units will be required for the electric generating station of the Augusta-Aiken Railway & Electric Company, Augusta, Ga.

The Casey & Hedges Company, Chattanooga, Tenn., will be awarded the contract for repairs to the water works system at Key West, Fla.

Plans are now being made for the new municipal power plant at Jacksonville, Fla. The machinery installed in the present station will be sufficient in the beginning, as it includes steam turbine units of the most modern design, but ample provision will be made at the new plant for future extensions.

Construction contracts covering the extension of the plant of the American Brake Shoe & Foundry Company, at Chattanooga, Tenn., were recently awarded. The details of equipment are now being decided upon.

A timber cutting plant and planing mill is to be installed at Red Bay, Ala., by Grissom & Barton.

The Seaboard Pipe Foundry Company, Savannah, Ga., is planning for the erection of a large plant which will include a main shop, 104 x 185 ft.; machine shop and tapping room, 56 x 100 ft.; storeroom, 50 x 100 ft., and cleaning room, 35 x 100 ft. The buildings will be of steel and concrete construction.

The Red Star Lumber Company has been organized, with an authorized capital stock of $150,000, to establish sawmills at Mayna, La. The company has large holdings of land in Louisiana and has one mill in operation at Mayna for the manufacture of cypress shingles. A modern band mill will shortly be installed, together with other improvements. O. S. Jones is president of the company.

The Southwest

KANSAS CITY, MO., November 7, 1910.

The effect of new construction among plants engaged in or affiliated with the metal working industries is beginning to be felt in the machinery market, where more inquiries for tools have been observable lately than for some time. Orders, however, seldom cover more than a few machines at a time. The bulk of the buying, outside of what is done for the account of new factories, appears to originate chiefly with shops at interior points, where funds realized from the sale of the grain crops are finding their way into investments for local industries.

All public utilities at Clayton, New Mexico, are now under the control of the city, and the construction of a new electric power and pumping plant will probably be entered upon within the next few months.

The city of Altoona, Kan., has engaged an engineering firm in Kansas City to prepare plans for a system of modern water works.

A mechanical filtration plant is to be purchased by the city of South Fork, Ark. Plans have been ordered drawn.

A heavy crushing plant is under erection by the Union Basin Mining Company at Union Basin, not far from Kingman, Ariz., to serve the new concentrating mill recently completed. Other improvements are to be made later.

From Marked Tree, Ark., it is reported that T. J. Turner will build a timber cutting plant and handle factory.

The enlargement of the power and pumping plant operated by the city is under consideration at Tucson, Ariz.

The Miami Copper Company, Miami, Ariz., is rushing work on additions to its plant, including a new concentrator and a large electrically operated pumping station, which will be located three miles distant. Extensive purchases of equipment for the account of this property will need to be made at intervals for some time to come.

The Arizona Power Company, Prescott, Ariz., is considering the erection of a new transmission line from Jerome to Fossil Creek, a distance of 163 miles, and the installation of a 300-hp. compressor.

The Bisbee Light & Power Company, Bisbee, Ariz., will remodel its gas plant.

The city of Columbia, Mo., has engaged M. E. Fawkes as engineer in charge of improvements to the electric light and water works, for which bonds in the sum of $125,000 were recently voted. The improvements to the electric light plant include the erection of a building and boiler plant, rearrangement of street lighting system, installation of 750-hp. electric generating plant, comprising new 500-kw. high pressure steam turbine generating unit and a 250-kw. generating unit.

The Fox-Harris Machine & Supply Company, Pine Bluff, Ark., is erecting a one-story building, 120 x 154 ft., which will be ready and equipped by January 1.

The Northwest

MINNEAPOLIS, MINN., November 7, 1910.

The almost continuous good weather of the past month exerted a favorable influence upon buying, as it led to many purchases which would ordinarily have been deferred until spring. Contractors in particular are proceeding with work that they contemplated abandoning, and quite a number of plans for new buildings which were only contemplated came to a sudden head, so that the present fall is witnessing great activity in this line. How much longer it will continue is, of course, dependent upon conditions. In several respects, however, the effect will be felt upon purchases for new plants or additions, the necessity for which has been created by this season's work. For example, between now and the renewal of construction work in March or April there cannot fail to be a heavier demand for woodworking machinery than in any former year, as the season that is just closing witnessed decided difficulty in obtaining deliveries of material for interior finishing, sashes, doors, pilasters, columns, &c Plans are therefore now under way for numerous shops, fully equipped to turn out builders' supplies of this nature, which will be located in the smaller cities all through the Northwest, as well as in the centers from which such material is ordinarily secured.

Robinson, Cary & Sands, St. Paul, were recently awarded the contract by the city for a feed water heater, condenser and other apparatus to be installed in the Centreville pumping station.

The Minneapolis Steel & Machinery Company is erecting a large steel tower and tank at Cass Lake, Minn., for the Cass Lake Water & Power Company.

Further hydroelectric power development will result in the vicinity of Chisholm, Minn., from the formation of the Mesaba Range Power Company, which has acquired the plant heretofore operated there by the Range Power Company.

The American Brake Shoe & Foundry Company will erect on its property in Minneapolis a new storehouse 40 x 80 ft.

The Roanoke Mining Company, on Elk Creek, near Wallace, Idaho, is providing a large quantity of new machinery for its property, including an air compressor, hoist and pumping units. Other equipment will be required after the completion of the development work now to be undertaken.

New machinery will be needed shortly for the American-Kootenai property at Libby, Mont., which will be worked by the Montana Consolidated Mining Company, recently organized for that purpose.

The installation of a pumping plant to serve the community is under consideration at Tower, Minn.

Extensive improvements will probably be made next spring in the water works system at Slayton, Minn.

The authorities at Chinook, Mont., have under consideration the granting of an electric power and lighting franchise to S. W. Swenson.

The North West Paper Company, Brainard, Minn., is having plans drawn for a new manufacturing plant, which will be driven in every department by means of electric motors.

It is reported from Duluth, Minn., that additions to be made to the Gogebic Steam Boiler Company's works there will include a two-story shop, 40 x 88 ft., increasing the company's floor space about 35 per cent. The construction contract has already been let.

The Nisqually Iron Works, Tacoma, Wash., has acquired a plant recently occupied as a repair shop by the Chicago, Milwaukee & Puget Sound Railway and will do a general repair business. The plant is equipped to repair locomotives, engines, logging machinery and other heavy equipment. The company expects to install additional machinery, including a 48-in. throat punch and shear and a set of 8 or 10 in. rolls.

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San Francisco

SAN FRANCISCO, CAL., November 2, 1910.

Machine tools remain inactive, local inquiries being of smaller consequence than last month. Merchants note a barely perceptible increase in sales for the valley towns, consisting entirely of small orders for single tools. Such articles are purchased only from stock and for prompt delivery, in view of immediate needs. Some of the local shops are now fairly busy, manufacturers of pumping machinery and gas engines having about an average volume of business on hand, with few orders of unusual importance.

There is a fair inquiry for general contractors' equipment, though few large orders are expected until the first of the year. The principal railroads are curtailing new construction work, the most important development on which contracts are still coming out being the Northwestern Pacific line between Willitts and Eureka, Cal. Work will be continued through the winter, however, on several large irrigation projects, for which some machinery contracts have recently been placed. Heavy crushing machinery is quiet and there is apparently a large surplus of crushed rock around San Francisco and in northern California, owing to the decreased demand for railroad ballast. Small crushers and some types of road machinery, however, still find a ready market. There is a fair demand for brick and cement working machinery through the State as a whole, though little important business is coming out.

Export trade is fairly active. Large shipments have recently been made to the Hawaiian Islands, including a 35-ton turbine for a dredge at Pearl Harbor and a lot of equipment for the Hilo Railroad. A large amount of mining machinery has also been sold in Los Angeles for shipment to South America and local manufacturers in this line report a number of new orders.

The demand for mining equipment in California, Nevada and Arizona has been limited for the last two months, partly owing to the shortage of water power, but inquiry in this department is now becoming general. Air compressors and drills are in especially strong demand at present and a number of mines are figuring on hoisting equipment, ore mills, &c. There is considerable activity in electric power equipment, both steam and hydraulic, and there is a good outlook for installation during the coming year.

The Joshua Hendy Iron Works, San Francisco, has taken a contract for three more pumps for the Sacramento Valley Irrigation Company, with a capacity of 2,000,000 gal. per hour, at a price of about $30,000.

N. E. Otterson, special representative of the Chicago Pneumatic Tool Company, with offices at 71 First street, San Francisco, has just returned from a trip to the East.

The Machinery & Supply Company, recently incorporated, has established offices at 61 Fremont street, San Francisco, and has secured a warehouse near Second and Bryant streets, where a large stock will be carried. Sales offices will also be opened at Los Angeles and Seattle, Wash. The stock will include a line of heavy duty induction motors of the Ideal Electric & Mfg. Company, Mansfield, Ohio; power and filter presses of Wm. R. Perrin & Co., Chicago; Dick and Church boilers of the Phœnix Iron Works, Meadville, Pa. It will also act as agent for the Pittsburg Transformer Company, the W. S. Rockwell Company and others. The personnel includes R. B. Elder, former local manager for the Allis-Chalmers Company; H. C. Wybro, former president of the Wybro-Hendy Company, and A. E. Mason, formerly in charge of the forge and furnace department of the Allis-Chalmers Company at Milwaukee.

Geo. E. Pancoast, chief engineer of the Hearst news service, has closed contracts for a large amount of machinery, including a number of General Electric motors, for the Hearst Building in San Francisco.

It is reported that E. W. Hartman, Sacramento, Cal., who is building a concrete barge, is planning to install a large plant at Oakland for the manufacture of concrete piles and barges.

The Zierath Combination Drill Company has been incorporated at Los Angeles, with a capital stock of $500,000, by J. N. Cole, A. G. Pfannkuchen, H. C. Dillon, J. Scott and E. Galley.

The cupola of the Pasadena Foundry Company, Pasadena, Cal., was wrecked by an explosion on the night of October 26. It is believed that the damage was caused by dynamite. This company was recently incorporated, with a capital stock of $50,000, by F. A. Hopping, C. V. and J. M. Wishart, E. O. Elgin and W. J. Colcleuth.

The Joseph Goodrich Power & Tool Company has been incorporated at Los Angeles, with a capital stock of $200,000, by J. Goodrich, C. H. Barry, H. M. Frye, A. L. Jameson and J. W. Doyle.

The Chico Iron Works, Chico, Cal., has taken a contract for a large dredge of the Oroville type for Mrs. A. E. Drexaer of San Francisco, for use in the Sacramento Valley.

The Mountain Quarries Company, which controls lime quarries near Auburn, Cal., announces that a 3-mile aerial tramway will be built between that town and the quarries.

Work is proceeding on the new sugar factory at Anaheim, Cal., contracts having already been let for the erection of the principal buildings.

The Pacific Tank Company has secured a large tract at Los Angeles, where a woodworking plant will be installed.

Plans are under discussion for the installation of a lot of waterworks machinery at the municipal plant of Porterville, Cal.

The town of Bakersfield, Cal., is in the market for a gas engine, hoist and a 36-in. rock screen.

Howard Berry of Melbourne, Australia, is looking over the California market for fruit packing machinery.

The new dredge for the Natomas Consolidated of California will be built by the Yuba Construction Company, Marysville, Cal., which has for some time made a specialty of this class of work.

A large air compressor and a lot of pumping machinery have been ordered for the Cassidy Consolidated mine, near Grass Valley, Cal.

A 2-ton skip and a 100-hp. electric motor will be installed at the West End mine, Tonopah, Nev., replacing steam hoisting equipment.

The Western Pipe & Steel Company, which recently commenced operations in its new plant at Richmond, Cal., will shortly erect a new building for the manufacture of boilers.

Two locomotives which were used in leveling the sand hills in the present downtown district of San Francisco have been donated to the museum at Golden Gate Park. They were the property of David Hewes and were brought to California in 1858.

The Alamotis Water Works Company, Long Beach, Cal., is planning extensive additions to its present system of water works.

The Southern California Chemical Company, Los Angeles, Cal., is considering the erection of a new plant at a cost of about $100,000.

Farther Central West

OMAHA, NEB., November 7, 1910.

The demand for machinery of all kinds continues fair and it would not take much of a buying movement to bring about considerable activity, but at present there is no life to the situation. From information gathered by one of the leading commercial organizations of this section, for the guidance of its own industrial committee, it appears that an immense volume of new building and plant improvements is only waiting for proper encouragement to be put into effect. All of the existing plants appear to be doing very well and this has, of course, a strong influence in imparting confidence to those who waver about making investments in local industries.

The Musgrave Fence & Auto Company, Des Moines, Iowa, will erect a seven-story warehouse and office building to replace the structure that recently burned.

The chief engineer of the Monticello Electric Company, Monticello, Iowa, is preparing plans for the new power plant to be built in the spring.

A metal working plant, including foundry and machine shop, will be built at Moravia, Iowa, by J. A. and J. Q. Hiatt. For the present temporary facilities are being provided.

As soon as a proper site has been selected by the authorities at Webster City, Iowa, steps will be taken for the erection and equipmnet of a municipal power and lighting plant.

It is reported from Des Moines, Iowa, that, through the efforts of interests identified with the Commercial Club there, several new industries have been induced to locate in that city. These include a silo manufacturing plant to be established by F. D. Hawkins & Co., Unadilla, N. Y., and a factory to be built by the Adel Mfg. Company, Adel, Iowa.

A 200-kw. generator furnished by the General Electric Company, Schenectady, N. Y., which will be driven by a hydraulic turbine, is being added to the plant of the Glenwood Light & Power Company, Glenwood Springs, Colo.

The Eagle Iron Works, Des Moines, Iowa, is meeting with excellent success this season in the sale of its large ventilating fans of the Miller central disk type, which show high efficiency at moderate speeds. Its design includes ring oiling bearings and force feed lubrication.

It is reported from Creston, Iowa, that the local pumping plant and water distribution system, controlled by private interests, will be extensively remodeled and enlarged.

Plans for the construction of a modern pumping plant at Fremont, Neb., have been submitted to the City Council.

As soon as a franchise has been granted for the purpose

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R. O. Prather, Griswold, Iowa, will install an electric power plant at Elliott, Iowa.

The construction of a pumping plant and complete system of water works has been authorized at Adair, Iowa.

The equipment of the Herald Mining Company, Boulder, Colo., is now being operated by means of electric power, and the system of motor drive will be enlarged as the works of the company is extended.

The plans of the Omaha Structural Steel Works, Omaha, Neb., for a new fabricating plant include a shop building 120 x 250 ft., to be erected at Forty-eighth and Leavenworth streets. The details of construction and equipment have not yet been fully worked out.

The Interstate Investment & Development Company, Charles City, Iowa, which owns 480 acres of land containing large quantities of marble, lithograph stone, Portland cement and brick materials, is negotiating for plants to be installed during the spring of 1911. Plans are now being considered by the company for the erection of six plants which will be equipped with modern equipment, the purchase of which is now being considered. The company proposes to erect a brick plant with a daily capacity of 17,000 to 20,000 bricks, Portland cement plant with a daily capacity of 5000 barrels and a marble plant.

The Colby Motor Company, Mason City, Iowa, which has been occupying temporary factory quarters for some time, is now erecting its own building, 150 x 450 ft.

Southern Texas

AUSTIN, TEXAS, November 4, 1910.

Several of the independent railroad projects that have been in process of incubation for the last several months seem to have almost reached the point of realization in Texas. A few construction contracts have recently been let, and similar action is promised as to other lines in the near future. The established railroad systems are apparently planning no extensions of improvements for the early part of the coming year; considerable work is being done, but it is the carrying out of plans that were adopted some time ago.

Preliminary steps have been taken for the construction of a cotton compress in Corpus Christi, Texas, to cost about $30,000. Roy Miller, secretary of the Commercial Club, is promoting the project.

The Trinity Valley Traction Company will soon finish locating the route for its proposed interurban electric railroad that is to be constructed from Dallas to Palestine, Texas, abut 100 miles. Considerable machinery will be required for the power plant. J. V. Watkins of Dallas is interested in the project.

The Taylor Water Company will install a larger pump at the San Gabriel River pumping station, and make other improvements and considerable extensions of its water works system at Taylor, Texas.

Theodore Stegner of Kansas City, Mo., will apply to the City Council of Brownsville, Texas, for a franchise for the construction of an electric light and power plant and a street railway system. He states that he will also erect an ice and cold storage plant and a canning and preserving factory.

D. McNeill Turner, Corpus Christi, is preparing to make application to the City Council for a franchise for a gas plant and distributing system.

The Cactus Milling Company will install a mill at Corpus Christi for the manufacture of stock feed. An investment of about $25,000 will be made in the plant.

The Southwestern Portland Cement Company will double the capacity of its plant at El Paso if it is successful in securing the contract for furnishing cement for the Government dam at Elephant Butte, which is a part of the large land reclamation project. The present capacity of the plant is 1500 barrels of cement per day. This will be increased to at least 2500 and probably to 3000 barrels, it is stated.

A new town will be established and other improvements made on a ranch of 44,000 acres in McMullen County, Texas, by the Two Rivers Ranch Company, Wichita, Kan. The land will be divided into farms and colonized. The plans involve the installations of considerable irrigation machinery.

Irrigation machinery and considerable structural material will be required in carrying out the plans for the development of 35,000 acres of land near Christine, Texas, by its owner, Dr. C. F. Simmons of San Antonio. He will establish three towns on the property.

The establishment of a plant at Dallas for the manufacture of stationery of various kinds is contemplated by the Kalamazoo Stationery Company, Kalamazoo, Mich.

The City Council of Yoakum, Texas, has under consideration the construction of a complete and modern system of sewers. It is also planned to acquire the plant and distributing system of the local water company, and if this is not done to have the town establish its own water works system.

C. S. Fowler & Bro., San Antonio, who are developing a ranch of 65,000 acres on the Frio River, 18 miles from Gardendale, with the view of colonizing the property with farmers, will install a large pumping plant and system of irrigation.

The North Texas Gas Company will extend its natural gas pipe line from Fort Worth to Ennis, a distance of about 50 miles, and the preliminary arrangements looking to the fulfillment of the project are under consideration.

An electric light plant will be installed and a water works system constructed at Bellaire, Texas.

Machinery will be installed for the new water works plant for the town of Cuero, Texas. Capt. F. R. Perkins of Dallas is in charge of the construction work.

The machine shops of W. G. Forsyth at McKinney, Texas, which were recently destroyed by fire, will be rebuilt.

Part of the machinery in the main building of the Merchants' & Planters' Oil Company's mill at Houston was destroyed by fire recently. It will be replaced with new machinery.

R. T. Pruitt will build a large cold storage plant in San Antonio, to cost about $25,000, to replace the plant recently destroyed by fire.

The City Council of Bryan will construct a complete system of sewers, and when that improvement is finished the municipal water works system will be extended and otherwise improved.

Alberto Heredia will establish a factory at Chihuahua, Mexico, for the manufacture of heavy pasteboard from waste paper.

The Grabill Industrial College, an American conducted institution at Montemorelos, Mexico, will erect a factory for the manufacture of boxes. It is already manufacturing school and household furniture and this factory will be enlarged. Its new shop building will soon be equipped with machinery. J. R. Lowe is mechanical engineer of the institution.

Jose Farjas will install a large pumping plant as a part of the irrigation system which he will construct to water about 25,000 acres of land in the valley of the San Lorenzo River, near Culiacan, State of Sinaloa, Mexico.

The Mexican Iron & Steel Company, an American concern which acquired the iron mines and foundry at Tula, State of Jalisco, Mexico, some time ago, has adopted plans for the erection of modern iron and steel works, a tool and implement factory and a plant for the manufacture of by-products from charcoal.

North Pacific Coast

PORTLAND, ORE., November 4, 1910.

Summaries of market conditions recently made by leading machinery men are practically repetitions of the reports for the past few weeks, with the difference that greater emphasis can now be laid upon almost every detail of improvement in trade.

Norman R. Smith, general manager of the newly organized Hydro Patent Power Company, Portland, Ore., whose plans were recently mentioned, states that the company is now prepared to demonstrate the possibility of watering lands adjacent to running streams at a very low rate per acre. It is the expectation that a number of branch factories for the production of machinery used in their process will be established at various centers in addition to the main plant in Portland.

The Baker City Sampling Works, Baker City, Ore., will be enlarged, remodeled and equipped with the most modern machinery, having passed under the control of the Oregon-Idaho Investment Company of that place.

The Pacific Electric Engineering Company, Portland, Ore., whose headquarters are at 213 Second street, has been making a specialty this year of designing and installing electric power and lighting plants for sawmills, planing mills and other service of a similar character.

A steady buyer in future of factory supplies will be the Nicholai Door & Mfg. Company, Portland, Ore., which is completing a new plant.

The Phœnix Iron Works, Portland, Ore., whose foundry, machine and boiler shops are on Hawthorne avenue and East Third street, has had a heavy line of repair work this season in addition to the large and varied line of machinery, structural iron and steel, water gates, hydrants, hydraulic giants and other material which it handles. In the line of equipment for logging and sawmill work business has been particularly good.

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The construction of a timber cutting plant northeast of its Cazadero hydroelectric power station is under consideration by the Portland Railway, Light & Power Company in order to provide material for contemplated extensions in that direction.

In the Alaskan trade there have recently been prominent the so-called Pony dredges built by the Hammond Mfg. Company, Portland, Ore., which perform practically the same service as the larger plants and can be operated at much lower cost. These dredges are also being used to excellent advantage in the smaller shallow streams of Mexico and South America where gold bearing bottom is found.

A vote will be taken in December at Vancouver, Wash., on the matter of issuing bonds for the proposed water works system.

Work on a sash and door factory will probably be started late this fall by the Cedar Creek Lumber Company, Spokane, Wash.

M. A. Phelps & Co. are preparing to erect a large new timber cutting plant, electrically operated, at Cusick, Wash.

Bonds for the installation of a water works system have been voted at Toledo, Ore.

The construction of a modern system of water works is under consideration at Waverly, Wash., where a bond issue to provide funds for the purpose will probably be voted upon in the near future.

The Spokane Corrugated Culvert & Tank Company, Spokane, Wash., has been incorporated with $20,000 capital stock. The company will erect a plant for the manufacture of sheet metal products. The incorporators are John S. Beall and C. A. Foster of Portland, and H. G. Harrison of Spokane.

Government Purchases

WASHINGTON, D. C., November 7, 1910.

The Paymaster-General, Navy Department, Washington, will open bids November 15, under schedule 2992, for two Hartness flat turret lathes.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids December 3 for two 300-hp. boilers, piping, economizer, flue, boiler feed pumps, motor generator set, wiring, &c., for the United States naval station, New Orleans, La.

The Paymaster-General, Navy Department, Washington, will open bids November 15, under schedule 3030, class 21, for two steam double cylinder deck winches.

The United States Engineer, Engineer's Office, *Chronicle* Building, San Francisco, Cal., will open bids November 28 for furnishing and installing electrical machinery on draw bridges across Tidal Canal, Oakland Harbor, Cal.

Bids were opened by the Bureau of Supplies and Accounts, Navy Department, Washington, October 25, as follows:

Class 21.—One motor driven geared head lathe—Bidder 52, Fairbanks Company, Washington, $786 and $802; 70, Hendey Machine Company, Torrington, Conn., $990; 85, J. P. Kemp, Baltimore, Md., $864.50; 92, Manning, Maxwell & Moore, $990.

Class 51.—One high speed friction saw—Bidder 124, Henry Pels & Co., New York, $1137; 129, J. T. Ryerson & Son, Chicago, Ill., $1538.

The Isthmian Canal Commission, Washington, D. C., opened bids October 27, under canal circular 608, as follows:

Class 3.—One washer cutting machine—Bidder 11, Fox Brothers & Co., New York, $3217; 14, Hilles & Jones Company, Wilmington, Del., $1250; 25, Manning, Maxwell & Moore, New York, $1130, $510, $1900 and $536; 28, Nicetown Plate Washer Company, Philadelphia, Pa., $1800.

F. E. Arnold, Constructing Quartermaster, New London, Conn., opened bids for constructing pumping station, &c., at Fort Terry, N. Y., October 25, as follows:

M. L. Baird & Co., Philadelphia, Pa., $9850.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids November 1, as follows:

Schedule 2948, class 1.—One belt driven crank shaft grinding lathe—Bidder 81, Henshaw, Bulkley & Co., San Francisco, Cal., $2900; 208, Tindal, Morris Company, Eddystone, Pa., $2470 and $2910.

Class 61—For furnishing and installing one crane and seven trolleys at Naval Station, North Chicago, Ill.—Bidder 122, Manning, Maxwell & Moore, New York, $1909.50; 146, New Jersey Foundry & Machine Company, New York, $1805; 223, Whiting Foundry Equipment Company, Harvey, Ill., $1505.

Class 82.—One motor driven geared lathe—Bidder 69, Fairbanks Company, Washington, $106.10; 78, Garvin Machine Company, New York, $985; 85, Hendey Machine Company, Torrington, Conn., $1185; 97, J. P. Kemp, Baltimore, Md., $1020; 122, Manning, Maxwell & Moore, New York, $1185; 139, Miami Valley Machine Tool Company, Dayton, Ohio, $392 without motor; 144, Niles-Bement-Pond Company, New York, $1640 and $977.

Employers' Liability in Ohio

Representatives of a large number of leading manufacturing companies in metal working lines in Cleveland appeared before the Employers' Liability Commission during its session in that city October 31 to November 3 to present their views regarding changes that should be made in the Norris-Mathews law that was passed by the last session of the Ohio legislature. A paper on the volunteer accident relief plan of the American Steel & Wire Company was read by S. W. Tener, manager of that department of the company, and other papers were submitted on the subject of employers' liability. While different opinions were expressed regarding various phases of the topic under discussion the general sentiment, as shown during the hearing and in the answers submitted to questions propounded, appeared to be about as follows:

The present employers' liability law of Ohio is grossly unfair. If a general compensation act is to be adopted all the statutes in the State fixing employers' liability should be repealed and any such liability then remaining would be solely upon negligence under the common law.

Measures for the prevention of accidents are of prime importance. Realizing that the prevention of all accidents is impossible there should be a well organized department for the inspection of factories, workshops, mines, &c. This department should be placed under the control of engineers and experts of acknowledged ability, who will employ similar grades of efficiency for the actual inspection service, the whole department to be under civil service regulations and entirely removed from party politics.

There should be a general compensation system with a reasonably regulated schedule of payments for employees injured in accidents. This will be for the best interests of all concerned. Such a plan would have a tendency to diminish poverty and relieve suffering and make for the better citizenship of those who might otherwise be forced upon the community for support. Such a law should be sufficiently general to take in all accidents of trade, except those due to the clear and malicious carelessness of the injured himself. Awards for death benefits should be payable in installments over a period of years instead of in a lump sum, which might soon be dissipated and the beneficial purposes of the law defeated.

In reply to the question as to how the expense of a compensation system should be borne the majority favored having the State pay the cost of administration. A few also wanted the State to bear a portion of the compensation. The general opinion, however, was that the expense, outside of the cost of administration, should be divided between the employer and employee. A few thought the employer should pay it all, and among others considerable difference of opinion was expressed as to what portion should be borne by the employer and what portion by the employee. The opinion prevailed that the State, either through a new or an existing department, should provide general supervision to see that a compensation plan is properly administered, whether it is undertaken by insurance companies, mutual associations or individual employers.

Cleveland and Cuyahoga County have been selected by the Employers' Liability Commission as a field in which to conduct an extensive investigation regarding the number, causes and settlement of industrial accidents. E. E. Watson, who recently conducted a similar investigation in Illinois, will be in charge of the work and will be aided by a corps of assistants. This investigation has started and will continue for six weeks.

Top Furnace of the Wheeling Steel & Iron Company, Wheeling, W. Va., was out of blast three weeks in October for repairs.

Ore Dock Construction Halted

Allouez Bay Extension Waits—Curtailment at Iron Mines

MARQUETTE, MICH., November 5, 1910.—As to the outlook in Lake Superior iron mining for the year to come, little can be said at this time. Conditions do not appear as promising as at this date in 1909; nevertheless it is the opinion that some improvement will appear in the coming months. Rather more ore in stockpiles is being carried over than was the case last fall, and while some underground mines are closing along with the open pit properties, which usually suspend at this time, it is believed that fully as much development work will be conducted as during last winter. Probably a dozen new mines are being opened on the old ranges, and even more than that number on the Mesaba. Steam shovel work in the latter region is continuing at its customary heavy rate, and as far as at present known there will be no more than the curtailment in this work of stripping usual in the winter season.

While because of its ore haulage contract with the United States Steel Corporation, the Great Northern railroad will show an increase in its Mesaba range shipments next season, the gain, it is expected, can readily be handled with present facilities. For that reason construction work on the new dock of steel and concrete at Allouez Bay, Superior, will not be pushed. The steel is being stored, in fact, and operations shortly will be suspended for the winter. For a similar reason, extensive contemplated improvements in the ore yards at Allouez will not be taken up until next summer. These include a change in the grade to the docks and the erection of a storage house, a round house and other structures.

The Soo Line is making good progress with the construction of its ore dock at Superior. The pier will be in readiness well before the opening of the next shipping season. The most of the required 8000 piles have been driven and work on the superstructure is about to start. The Soo Line will serve the new Cuyuna range. The company was in the ore hauling business to some extent years ago, having a small dock at Gladstone, Mich., to which ore was hauled from the Menominee range. Its Wisconsin Central division serves a number of Gogebic range mines, its docks being at Ashland.

Output Reduced on Old Ranges

Corrigan, McKinney & Co., of Cleveland, have a very considerable amount of ore in stock at their Great Western mine in the Crystal Falls district, and the mine has been closed down. The workings are permitted to fill with water, which is taken to indicate that the suspension will be of considerable duration. Only recently Corrigan, McKinney & Co. stopped work at their Colby and Ironton mines on the Gogebic range. Their Kimball, Fairbanks and Crystal Falls properties in the Crystal Falls district also are inactive, and the big Stevenson open pit on the Mesaba range has filled its contracts for the season. Not all the company's mines are idle, however, and some new ore deposits are being opened. While the Great Western is out of commission, an addition to the engine house will be built and all machinery put in first-class condition.

Operations at Oglebay, Norton & Co.'s Bristol mine at Crystal Falls, have been materially curtailed, whereas nearly 400,000 tons of ore was produced in 1909, only about 300,000 tons will cover the output this year. From all its properties on the Menominee range the company is sending out this season somewhat more than 500,000 tons. Next to the Bristol, the largest shipper is the Berkshire at Stambaugh, with 100,000 tons. The new Buckeye at Commonwealth has a record of 90,000 tons, and the Chatham at Stambaugh of 60,000 tons. The Buckeye will carry over in stock some 25,000 tons of ore. The deposit at this property appears to be a large one, but it is of low grade. Oglebay, Norton & Co.'s Empire mine on the Marquette range is about to suspend operations, but this is to be expected, it being in part an open pit operated on the milling system.

The Buffalo & Susquehanna company's Hiawatha mine at Iron River, Menominee range, has wound up its season's shipments at 130,000 tons. The Spring Valley Iron Company's new Zimmerman property in the nearby Palatka field likewise has completed its year's quota. A force of 50 men will be employed in development work at this mine throughout the winter, and much new ground will be opened. A great deal of exploration is in progress in both the Iron River-Stambaugh and Crystal Falls districts. The drilling extends over more than twenty-five miles of country.

New Concrete Shafts

The Cleveland Cliffs Iron Company is making excellent progress with the construction of the new shaft at the Negaunee mine, Marquette range. The concrete lining has been put in to a point nearly 500 ft. below the surface. Instead of being sunk, this shaft was raised to surface, the operations starting from a drift driven from the older workings of the mine. The opening is now being enlarged, this work starting from surface, and as the rock is being cut out the walls are being concreted to a thickness of 14 in.

The concrete shaft which the New York Foundation Company has been sinking at the Morton mine on the Mesaba range is now practically completed and shortly will be turned over to Tod, Stambaugh & Co., Cleveland. The shaft, one of the largest of its kind, is 180 ft. in depth and 28 ft. in diameter. More than a year was required to get it through the treacherous overburden of sand, water and boulders and firmly to anchor it in the rock ledge. The cost is said to have approximated $250,000. The Morton contains a very large deposit of ore, and the mine is destined to rank among the most important of the Mesaba range underground producers.

An important deal involving Cuyuna range, Minnesota, property has resulted in the Rogers-Brown interests securing control of the Weyerhaeuser eighty in Section 11, 46-29. The tract is believed to contain a large ore body, and it has been sought by various interests. Adjoining it on the west is the Interstate mine, where a concrete shaft is being sunk, while on the east side is the Keating forty, with its high grade ore. To the northeast is the Neimeyer forty, where the Armour concrete shaft has been completed, the Chisholm & Williams ore body, and the property of the International Harvester Company. To the west also are the Feigh holdings, leased to the Hill Lumber Company of Saginaw, and to the northwest the ore bodies in the Gross and Hopkins and Jeune lands — all seemingly on the same iron formation.

Lake Superior Ore Shipments in October

The shipments of Lake Superior iron ore in gross tons from Upper Lake docks in October, 1910, and up to November 1, are given below, with corresponding figures for 1909:

	October, 1910.	October, 1909.	To Nov. 1, 1910.	To Nov. 1, 1909.
Escanaba	639,444	928,175	4,507,517	4,930,971
Marquette	309,283	528,195	2,998,503	2,507,712
Ashland	380,839	714,271	3,817,669	3,136,275
Superior	1,317,902	1,008,956	7,802,254	5,747,454
Duluth	1,223,710	2,002,861	13,089,262	11,850,038
Two Harbors	1,006,263	1,448,343	7,763,103	8,092,884
Totals	4,877,441	6,625,801	39,978,308	36,265,334

The percentage of the total going over Superior docks has increased this year, being 19.52 to November 1, against 15.85 to the same date last year. Two Harbors shows a falling off from 22.32 to 19.42. Duluth's percentage is practically the same—32.74 this year, against 32.68.

The British Steel Industry

Its Outlook in the Light of Developments in Other Countries

William Clark of the Steel Company of Scotland made the presidential address at the annual meeting of the West of Scotland Iron and Steel Institute, held at Glasgow October 21. Reviewing the progress of iron and steel manufacture in Great Britain, he compared its expansion with that in the United States and Germany. He considered that one reason for the lower cost of production in Germany and Belgium than in Great Britain was that in the former countries longer hours are worked. The protection enjoyed by Germany and other countries, enabling them to take export orders at lower than domestic prices, he considered another cause of their relatively faster advancement in iron and steel. Some of the British works, he admitted, being pioneers in their line, are now somewhat antiquated; but he considered it a matter of gratification to know that extensions and remodelings are now going on on a large scale, particularly in the Midlands, and that a number of works have been put in condition to compete with the low price of Continental steel. The portion of the address discussing the future and the factors that will more and more enter into international trade in iron and steel is as follows:

The Outlook

The outlook for the steel industry, not alone of Scotland, but of Great Britain, is one that requires serious consideration. Manufacturers here are gradually, but surely, losing markets in different parts of the world which have formerly taken large quantities of steel from our shores. Japan is now manufacturing largely for her own requirements, and trade with that country will gradually disappear. Further, while it may be many years before Japan is in a position to compete for the outside requirements of the world, that day will surely come. The requirements of China have, to a large extent, been supplied by this country; but this is likely to cease in the course of time. The Hanyang Iron & Steel Works were started about the year 1890 to provide rails for the Pei Han Railway. Like all new ventures it had many vicissitudes, but it is now, and has been for some years, a factor to be reckoned with in the steel producing world. They have a rich and abundant supply of ore in the Tayeh district, 75 miles from the works, situated on the Yangtse River. The ore assays about 65 per cent. iron, and is said to be of excellent quality. The coal and coke come from the Pinghsiang Mines in Kiangsi Province, 250 miles from the works. This company has been supplying the Japanese Government Steel Works with ore from the Tayeh mines, and has also been shipping Bessemer hematite pig into San Francisco at a cheaper rate than the works in the Eastern States of America could supply it.

The Labor Factor

I mentioned as one of the reasons why Great Britain had fallen behind in her production of steel, as compared with some of our Continental competitors, the higher wages paid in this country for some classes of labor. The wages, however, paid in China for all classes of labor are so much lower than what is known even in the most poorly paid districts of the Continent, that in considering these we readily perceive what serious competitors they may become, especially in our oversea trade. According to an article which appeared in *Chambers' Journal* for July, "the works are now turning out fully 500 tons of pig iron and 250 tons of rails per day, and it is expected this output will be more than doubled when the plant in course of erection has been completed." The article goes on to say: "Labor both at the river side and at the works is cheap. The coolies engaged in loading and unloading the ore work for 3 pence per shift, while at the works wages vary from 5 pence per day for unskilled to 5 shillings per day for skilled furnacemen and mill hands; the average may be taken at about 1 shilling 3 pence per day." These facts call for serious consideration. The wages paid on the Continent of Europe are more likely to appreciate than depreciate, and China and Japan cannot hope for many years to emulate our army of highly trained engineers, chemists and workmen; but it is the duty of all these to see to it that no effort is spared on their part to maintain and extend our position in the steel producing world. There is much yet to learn. The call of the engineer is ever for something better. Britain has hitherto been in the forefront where the best and most reliable material was to be had, and if she continues to lead in the matter of quality we need not fear but that there will ever be a market open for the best.

The Direct Process and Various Economies

There are many schemes at present engaging the attention of manufacturers for the cheapening of the cost of production. It has long been the desire of the scientist to produce steel and iron direct from the ore. In 1873, at the Steel Company of Scotland's Works, furnaces were erected by Sir William Siemens, and good puddle ball was produced direct from Tharsis purple ore, but the cost was much in excess of the indirect method of manufacture, so the furnaces were dismantled. There have recently been several methods put forward to accomplish this desirable end; should any of them prove successful, it would probably revolutionize the steel and iron making industry. Recently I saw some iron said to have been made by a direct process and at a price that would mean a revolution in the manufacture of iron and steel. Unfortunately, the process is not yet perfected and cannot, therefore, be further discussed at present.

The recovery of the by-products from producer gas has not made the progress it should have made if the claims of its promoters are correct. This should not be in the region of doubt, but be clearly open to demonstration, seeing it has now been in operation at several places for some years. There is no doubt as to the efficiency and reliability of the gas engine, which is exclusively at work in many large plants in the country, and this being so there is the greater need for a forward movement being made with the recovery of the by-products from producer gas.

The exhaust steam turbine has achieved the success the pioneers predicted for it, and is now introduced into many large works where exhaust steam is available. Another advance has been made in the introduction of the mixed pressure turbine which is suitable for either high pressure steam or exhaust steam.

The adoption of electrically driven mills is making steady progress, and some of the very large works in England have adopted this method with satisfactory results, and further plants are in course of erection. The power is obtained from the surplus gas from the blast furnaces, which is used in gas engines generating the electric energy necessary to drive the mills. The engines are, in like manner, supplying the necessary power to free the air used in the blast furnaces from moisture, with good results so far as the blast furnace is concerned.

Improvements at Michigan Charcoal Furnaces

The Lake Superior Iron & Chemical Company is spending $350,000 in construction work at Newberry, Luce county, Mich. A retort plant, an acetate of lime works and a sawmill are being erected, as are various buildings to be devoted to auxiliary uses. The retort plant will occupy a building 72 x 300 ft., besides cooling houses, and will necessitate the construction of five miles of railroad tracks in the yards. The sawmill will have a capacity of 60,000 ft. a day.

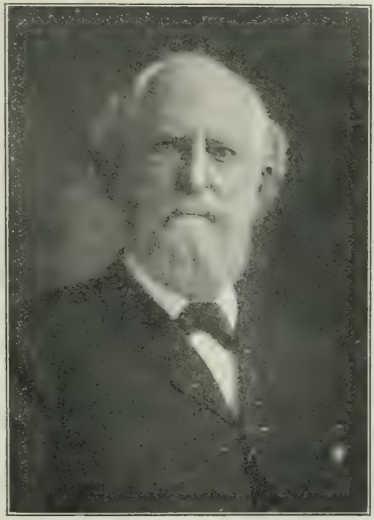
The Lake Superior Iron & Chemical Company is also making extensive improvements at its plant at Manistique, Schoolcraft County, Mich. These include a steel and brick boiler house, 47 x 140 ft., a machine shop of the same dimensions, a sand house, 28 x 60 ft., and an addition to the engine house. The smokestack, one of the largest in Upper Michigan, will be 158 ft. high, 13½ ft. in diameter at the base and 9 ft. at the top, and will be of reinforced concrete.

Pittsburgh Steel Company Blast Furnaces.—Reports in the daily press to the effect that the Pittsburgh Steel Company, Pittsburgh, operating an open hearth steel plant and wire rod and wire mills at Monessen, Pa., had decided to build four new blast furnaces are premature. It is true that the company has under consideration the building of two or more blast furnaces in order to supply its own pig iron, which is now bought in the open market, but a definite decision has not yet been reached, although it probably will be shortly. The company is having a heavy demand for its wire products and for its Pittsburgh Perfect steel fencing. To meet this heavy demand, which involves at all times an ample supply of pig iron, blast furnaces are needed.

Death of Philip Corbin

Philip Corbin, New Britain, Conn., president of the American Hardware Corporation and founder of the great business of P. & F. Corbin, died November 3, aged 86 years. He was born in Willington, Conn., October 26, 1824. The son of a farmer, he attended district school and helped his father, and occasionally worked for other farmers in the neighborhood. His education ended when he had completed a term and a half at the West Hartford Academy. After he was 15 he spent but little time at home, but worked for other farmers. At that time there was no farm machinery and men worked in crews or gangs, the best man setting the pace for the others. His strength and the cheerful spirit with which he worked made him especially valuable as a pace maker, and his services commanded a premium over ordinary wages.

Mr. Corbin abandoned farm life in 1844, when he went to New Britain, entering the factory of Matteson, Russell & Co., now the Russell & Erwin Mfg. Company. It was then customary for the manufacturers to have their goods made upon yearly contracts by men who engaged their own labor, and Philip Corbin worked for such a contractor, receiving $14 per month in wages. To add to his earnings, he did such other work as he could obtain, outside the regular hours of labor, among other things sweeping out the factory once a week for 50 cents. A few months later he went to the North & Stanley factory, also in New Britain, working for a lock contractor, and, quickly mastering the trade, was himself a contractor before he was 21, with 19 men in his employ. Until he attained his majority, Mr. Corbin gave his father all his earnings aside from the amount required for his support, and in the last year of his minority the sum thus paid was fully $1000.



PHILIP CORBIN.

In 1848 Mr. Corbin formed a co-partnership with his brother Frank, and a brass founder, Edward Doen, under the name of Doen, Corbin & Co., to manufacture hardware, each contributing $300. Securing land and a building, a horse and tread mill were installed to supply the power to the two lathes, grindstone and emery wheel which composed the equipment. In May, 1849, work was begun, and the first shipment of goods — brass ox balls — was made July 4. Mr. Corbin usually began work at daylight and often as early as three o'clock in the morning, and performed in each day work which would have cost from $6 to $7 to hire done at the prevailing rate of wages of $1.50 per day. He also kept the books and conducted the correspondence. His tireless energy and great vitality enabled him to perform herculean tasks without impairment of health, and it is worthy of note that despite the hardships and overwork of the early years of his career he survived every one of the men with whom he did business at that time. In the same year he married. Henry W. Whiting, Mrs. Corbin's father, bought Mr. Doen's interest a few months later, and two years afterward Mr. Whiting disposed of his share to the two brothers, and the firm became P. & F. Corbin, a name which has become famous the world over.

In 1851 American manufacture was in its infancy, and nearly all the hardware was imported. Mr. Corbin avoided domestic competition by confining his product to articles made abroad, and as they were better made than the imported goods he found a ready market. It was at this time that he formed his policy of making goods of a superior quality and a complete assortment in any line he adopted. He was thus able to meet all demands in any field he entered. In 1854 it was found desirable to incorporate in order to secure increased capital. Philip Corbin was made secretary, and continued in the management; in 1859 he was elected treasurer, and at the death of F. H. North, one of the new stockholders at the incorporation, was chosen to succeed him as president of the corporation. In 1858 Andrew Corbin joined his brother and in 1860 took charge of the New York office, returning to New Britain in 1872 to become general manager of the factory and first vice-president.

In 1882 the Corbin Cabinet Lock Company was organized to take over that department of the business. The American Hardware Corporation was formed in 1902, consolidating the business of P. F. Corbin with the Russell & Erwin Mfg. Company, Philip Corbin being made its president. The Corbin Screw Corporation was organized in 1903, and the same year the Corbin Motor Vehicle Corporation was founded. Mr. Corbin was active in other industrial and financial enterprises and was president of the New Britain Machine Company, the Porter & Dyson Company, the Savings Bank of New Britain (to save which he risked his entire private fortune), and other corporations.

He was prominent in the Congregational Church; had been president of the New Britain Club and the Maple Hill Golf Club; served in various town offices when the services of good men were required and was a member of the State Legislature in 1884 and of the State Senate in 1888.

Of a family of ten, three survive him — a brother, Elbert A. Corbin, and two sisters. His son, Charles F. Corbin, his son and daughter and a grandson, are the only direct descendants. Mr. Corbin's wife died in 1909.

Mr. Corbin's business career is unique in that it covered a period of 66 years of active life, of which 61 years were spent in the management and development of a single enterprise engaged in the manufacture of hardware. The capital invested has grown from $900 to $10,000,000 and the number of persons employed from 3 only to 10,000. To the nation at large Mr. Corbin is known as a great industrial leader. To his townspeople and others who came to know him personally there is added a warm appreciation of his individuality, which was in many ways unusual, even in New England, where the stern struggle for existence aided in the development of the character of the people of Mr. Corbin's time. He was dignified, with the dignity that came from a self-respect that exacted more from himself than it required from others. Approachable, the door to his office was open to every employee of his companies. He avoided ostentation and resisted any attempts to force him into undue prominence.

With an opportunity to amass a great private fortune, he chose to draw from his companies a modest salary and to turn back into the business the increment it created. The extent of his benevolence will never

be known, for though he gave liberally he sought avenues for his benefactions which kept them unknown except to those directly concerned. He never forgot a friend and rarely made an enemy, and to those whom he trusted he gave his entire confidence in a manner which bound them to him.

Personal

A. C. Hanna, formerly secretary of the Dominion Wire Company, Montreal, has gone to Winnipeg as sales manager there of the Steel Company of Canada.

S. M. Hershey, formerly with the Norton Company, Worcester, Mass., has taken charge of the manufacturing department of the Carpenter-Kerlin Gear & Machine Company, 75 White street, New York.

Frank O. Wetmore has been elected one of the directors of the Allis-Chalmers Company to succeed William W. Allis, retired. All the other directors were re-elected.

John Lambert and Harry Bronner have been elected members of the Executive Committee of the Republic Iron & Steel Company, succeeding L. C. Hanna and E. W. Oglebay, who have resigned. Mr. Bronner is a member of the New York banking and brokerage firm of Hallgarten & Co. The Executive Committee now consists of John A. Topping, chairman; John W. Gates, Grant B. Schley, Harry Bronner and John Lambert.

Thomas M. Kennedy of the purchasing department of the Lane Bros. Company, railroad and general contracting, Altavista, Va., has been transferred to Jackson, Ky., to take charge of a storage warehouse for the same concern, and will have charge of the purchasing of all supplies for the contract which the company has recently secured there. Mr. Kennedy's successor at Altavista will be J. P. Thompson, recently with the Virginia Soapstone Company of Albemarle County, Va.

Gulf Coast Commercial Matters

MOBILE, ALA., November 3, 1910.—One of the largest and most representative gatherings of business men of Florida and southern Alabama assembled in years attended a recent session at Pensacola, of the board of army engineers for rivers and harbors who are looking into the project of a canal from Pensacola to Mobile Bay, which it is estimated will cost about $1,000,000. The board was headed by Col. William T. Rossell. Addresses were delivered and statistics presented showing the benefits to be derived, it being estimated that the annual saving on coal, cotton and iron exported from Birmingham and contiguous districts would exceed a quarter million dollars in freight rates and also furnish transportation facilities to Baldwin County, Ala., which now has a very limited means of getting products to market.

Birmingham's coal business this year will be by far the greatest in the history of the district, the Western miners' strike and the low stage of the Ohio River, which prevents Pittsburgh coal from reaching New Orleans, having caused enormous demands to be made on the Birmingham district this year.

At the concluding session at Beaumont, Texas, of the Intercostal Inland Waterways League it was decided to especially strive for the construction of an intercostal canal not less than 9 ft. in depth and with a bottom width of 100 ft. or more, to extend from New Orleans on the Mississippi River to Brownsville, Texas, on the Rio Grande, and in furtherance of the project the secretary of the organization, who was made a salaried officer, was instructed to devote his time principally to its accomplishment. At this meeting New Orleans was indorsed as the logical point for holding the Panama exposition in 1915.

The Merchants' and Manufacturers' Progressive Union of New Orleans announces that the Guatemala Northern Railroad has finally acceded to the bureau's position that rates be given on merchandise in carload lots. Up to the present it was immaterial whether shipments were in carload lots or less, the rates being the same, but now that the rate concession has been granted every business concern in New Orleans trading with the tropics will have an opportunity to exploit its Guatemalan trade. A.

Obituary

LYMAN CORNELIUS SMITH, Syracuse, N. Y., died November 5, aged 50 years. He was born at Torrington, Conn., and was engaged in the livestock commission business until 1875. In 1877 he took up the manufacture of breech loading firearms, and in 1890 organized the Smith Premier Typewriter Company, of which he was president until it was sold to the Union Typewriter Company. He was a vice-president and member of this company until 1903, when he resigned, and, with his brothers, organized the L. C. Smith & Brothers Typewriter Company and was elected its president. He was also president of the Hudson Portland Cement Company, United States Transportation Company, L. C. Smith Transit Company, Rochester, Syracuse & Eastern Railroad Company and the National Bank of Syracuse; a director of the Halcomb Steel Company, vice-president and treasurer of the Toledo (Ohio) Shipbuilding Company and vice-president of the Board of Trustees of Syracuse University. In 1900 he gave to that university the Lyman Cornelius Smith College of Applied Science.

LOUIS C. TAYLOR, purchasing agent of the John A. Roebling's Sons Company, Trenton, N. J., died October 27.

W. BURNET EASTON, president and treasurer of the International Boiler Works Company, Stroudsburg, Pa., died suddenly November 5. He had been president of the company since its incorporation 12 years ago.

The gray iron foundry department at the Pottstown, Pa., plant of Stanley G. Flagg & Co., Philadelphia, Pa., was badly damaged by fire November 4. The building, which was a frame structure, was entirely destroyed, as was some of the machinery. The blowers and cupola, however, were not seriously damaged. Molding will be resumed in one of their other foundry buildings in a few days, so that little delay in the execution of orders is anticipated. The loss was approximately $10,000.

The commission on employers' liability and workmen's compensation for accidents, appointed by the Governor of Massachusetts, had a public hearing at Boston last week. A number of manufacturers were present, and they will be given a further opportunity later this month to indicate their views on the legislation proposed. Meanwhile the commission is to visit a number of other cities in carrying on its investigations. It is instructed to report a bill by January 4, 1911.

The Petroleum Iron Works Company, Sharon, Pa., has secured an order from the Republic Iron & Steel Company for two 11½ x 250 ft. stacks for the works at Youngstown, Ohio; also 750 tons of tankage from the British West Indies. Its shops are running full on work for various concerns in the United States and Mexico.

Production of Wire Nails and Cut Nails in 1909

The American Iron and Steel Association has just published detailed statistics of the production of iron and steel cut and wire nails in the United States in 1909.

Cut Nails

The statistics for iron and steel cut nails and cut spikes embrace only standard sizes of nails and spikes cut from plates. They do not include railroad and other forged spikes, wire nails of any size, machine-made horseshoe nails, cut tacks, or hob, clout, basket, shoe or other small sizes of nails. Cut spikes are always included with cut nails. The production in 1909 amounted to 1,207,597 kegs of 100 pounds each, against 956,182 kegs in 1908, an increase of 251,415 kegs, or over 26 per cent. The following table gives the production of cut nails and cut spikes by States in 1908 and 1909 in kegs of 100 lb., iron nails being separated from steel nails for 1909:

	1909.			1908.
	Iron.	Steel.	Total.	Total.
Pennsylvania	265,568	401,224	666,792	525,169
West Virginia, Massachusetts and Ohio	.....	364,947	364,947	285,554
Kentucky, Illinois and California.....	42,120	133,738	175,858	145,459
Totals.....	307,688	899,909	1,207,597	956,182

In 1909 over 74.5 per cent. of the total production was cut from steel plate and a little less than 25.5 per cent. from iron plate, while in 1908 over 67.5 per cent. was cut from steel plate and a little less than 32.5 per cent. from iron plate. The maximum production of iron and steel cut nails and cut spikes was reached in 1886, when 8,160,973 kegs were made. Thirteen works in six States made cut nails in 1909, as compared with 14 works in seven States in 1908. Eight works were idle in 1909. The following table gives the production in kegs by States of cut nails from 1906 to 1909:

	1906.	1907.	1908.	1909.
Pennsylvania	657,836	664,998	525,169	666,792
West Virginia and Indiana	208,935	175,549	285,554	364,947
Massachusetts and Ohio	114,400	102,333		
Kentucky, Illinois and California.....	208,068	166,258	145,459	175,858
Totals.....	1,189,239	1,109,138	956,182	1,207,597

In 1909 our exports of cut nails and cut spikes amounted to 22,256,458 lb., or 222,565 kegs of 100 lb., against 15,731,898 lb., or 157,319 kegs, in 1908. Our imports of cut nails and cut spikes are only nominal.

The production of iron and steel plate for the manufacture of cut nails and cut spikes in 1909 amounted to 63,746 tons, against 45,747 tons in 1908, an increase of 17,999 tons, or over 39.3 per cent. Of the total in 1909 about 47,822 tons was steel and 15,924 tons iron, against 30,265 tons of steel and 15,482 tons of iron in 1908, an increase in steel nail and spike plate of 17,557 tons and in iron nail and spike plate of 442 tons.

Wire Nails

The production of steel wire nails in 1909 amounted to 13,725,053 kegs, of 100 lb., as compared with 10,662,972 kegs in 1908, an increase of 3,062,081 kegs, or over 28.7 per cent. The maximum production was reached in 1909. The year of the next largest production was 1904, when 11,926,661 kegs were made. The following table gives the production by States in 1908 and 1909 in kegs of 100 lb.:

	1908.	1909.
Massachusetts, Rhode Island and Connecticut	134,170	195,298
New York, New Jersey and Pennsylvania.	4,214,681	6,113,353
Kentucky, Georgia and Ohio.....	2,787,140	3,470,001
Indiana and Illinois.....	2,812,105	3,258,106
Wisconsin and Colorado.....	714,876	688,295
Totals.....	10,662,972	13,725,053

The wire nails produced in 1909 were made by 44 works in 13 States, as compared with 41 works in 13 States in 1908. In 1909 there were five idle wire nail plants, against 14 in 1908. A number of plants were abandoned in 1909.

Our exports of wire nails in 1909 amounted to 68,668,654 lb., or 686,687 kegs, against 59,381,946 lb., or 593,819 kegs, in 1908. We import very few iron or steel wire nails.

September Exports and Imports of Iron and Steel

The September report of the Bureau of Statistics of the Department of Commerce and Labor shows a decrease in both exports and imports of iron and steel. The total value of the September exports of iron and steel and manufactures thereof, not including iron ore, was $16,776,178, against $17,628,538 in August. The value of similar imports in September was $2,680,369, against $3,473,636 in August.

The exports of commodities for which quantities are given totaled 106,781 gross tons in September, against 130,877 tons in August, 128,055 tons in July, 120,596 tons in June, 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for September and for the nine months ending with September are as follows compared with the corresponding periods of the previous year:

Exports of Iron and Steel.

	September.		Nine months ending September,	
	1910.	1909.	1910.	1909
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	12,997	2,862	83,862	40,837
Scrap	1,915	1,437	16,867	23,487
Bar iron.....	1,621	784	14,928	9,721
Wire rods.....	1,044	1,230	16,897	10,671
Steel bars.....	1,039	6,651	78,934	51,372
Billets, blooms, &c...	4,480	10,475	14,162	94,594
Steel rails.....	20,538	23,478	263,782	189,784
Iron sheets and plates.	7,878	6,117	77,008	50,950
Steel sheets and plates.	16,615	10,973	127,648	73,871
Tin and terne plates..	808	610	8,394	6,825
Structural iron and steel	10,333	7,473	114,552	68,433
Wire	6,801	3,743	67,750	60,046
Barb wire.....	5,953	4,233	64,635	49,148
Cut nails.....	661	772	5,370	6,898
All other, including tacks	1,138	538	7,408	5,837
Pipe fittings.....	12,960	13,830	118,100	112,955
Totals.....	106,781	95,206	1,080,297	855,429

The imports of commodities for which quantities are given totaled 30,960 tons in September, against 36,878 tons in August, 42,326 tons in July, 31,010 tons in June, 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of the imports of such commodities for September and for the nine months ending with September are as follows compared with the corresponding periods of the previous year:

Imports of Iron and Steel.

	September.		Nine months ending September,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	16,668	12,601	176,615	99,823
Scrap	3,186	9,886	65,457	14,263
Bar iron.....	2,508	1,717	31,211	11,662
Billets, bars and steel forms, n.e.s.....	3,919	1,434	36,026	11,853
Sheets and plates....	704	432	5,465	2,657
Tin and terne plates.	2,719	4,346	53,801	44,388
Wire rods.....	1,256	941	15,779	9,547
Totals.....	30,960	31,357	384,354	194,193

The imports of iron ore in September were 208,892 gross tons, against 282,949 tons in August, 248,810 tons in July, 193,415 tons in June, 240,833 tons in May, 206,135 tons in April this year and 164,613 tons in the month of September, 1909. The total importations of iron ore for the nine months ending with September were 1,999,917 gross tons, against 1,119,331 tons in the

corresponding period of last year and 482,908 tons in the corresponding period of 1908. Of the September imports of iron ore 118,650 tons came from Cuba, 32,499 tons from Spain, 11,913 tons from Sweden, 11,692 tons from Canada and 34,138 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the nine months ending with September was $146,924,302, against $113,920,860 in the corresponding period of last year. Similar imports were respectively $30,439,703 and $20,879,982.

Aluminum Welding and Brazing

André Beltzer, chemist-engineer, furnishes the following interesting description of a new aluminum welding and brazing process:

The development of the aluminum industry has been handicapped, up to the present, by the fact that no satisfactory and cheap method was known to weld or to braze this most useful metal. With the flux and special brazing sticks which the General Welding Company, 355-357 Fourteenth street, Hoboken, N. J., offers now to manufacturers, it is possible to weld and braze aluminum sheets easier and cheaper than to weld steel sheets of the same thicknesses.

The Welding Process

The process of welding aluminum consists simply in heating the two edges of the sheets up to their melting point with the blowpipe, and then melting in the joint an aluminum wire previously dipped in the flux. The welding is accomplished very rapidly, in one-third to one-fourth of the time required for iron welding. Absolutely no skill is required as in steel welding, and the success of the work does not depend upon the skill or care of the welder. The reason is that in welding steel the welder will carelessly add molten metal on metal that is not yet melted, and although the joint will appear to be good, there will be no weld. On the contrary, with aluminum the drop from the wire will stick to the metal only when the metal below is molten, and the weld is then assured.

For welding aluminum it is necessary to use some kind of oxy-gas flame such as oxy-acetylene, oxy-benzine, or oxy-illuminating gas. But the work is more easily and more quickly accomplished with the oxy-illuminating gas flame, which has a more moderate and widespread heat.

In many cases, welding aluminum sheets will not be satisfactory, because the heat required for melting aluminum will warp the sheets and distort the parts to be welded. Also, it is practically impossible to weld very thin sheets, say No. 20 gauge and thinner. It is then necessary to join the aluminum sheets at the lowest possible temperature. This problem is solved by using the special brazing sticks offered by the General Welding Company, which melt at 350 degrees, the melting point of aluminum being 657 degrees. This process must not be confused with the numerous aluminum processes now on the market. It is entirely different.

The Brazing Process

The operation of brazing consists simply in heating the two edges with the flame until the flux melts by the heat of the piece itself; then the stick is melted in between the two edges. The operation is even more simple than the soldering of two pieces of galvanized sheets. The brazed joint is as strong or even stronger than the metal itself. This process is recommended for the manufacturer of aluminum cooking utensils and containers of all kinds and shapes.

It is often difficult to reach the melting point of an aluminum casting or alloy without warping the piece and also without developing new cracks in the casting. In using the brazing sticks, (melting point at 450 degrees), specially recommended for brazing aluminum alloys, it is a simple matter to repair broken castings or those having blow-holes or shrinkage cracks. The shape of the casting will not be changed, and no new cracks will develop in the casting during or after the brazing operation. It must be noted here also that the brazed joint is as strong if not stronger than the actual metal itself. The method of brazing castings is the same as for brazing aluminum sheets.

For brazing castings the oxy-illuminating gas flame is recommended, but if the parts are small any source of heat (gas and air flame, gasoline-air, &c) is sufficient.

The Remelting of Aluminum Scrap Without Loss

The General Welding Company also offers to aluminum foundries a very interesting deoxydation product to remelt aluminum scrap without loss. The metal thus obtained is pure and homogeneous and has exactly the same properties as the original metal. The scrap, whether of aluminum sheets or castings, is melted in a crucible; then half of a pound to one pound of the compound is added to each 100 lbs. of scrap. Before pouring, the contents of the crucible are thoroughly agitated and the slag is removed. To show the remarkable properties of this compound, aluminum can be recovered even from aluminum foils.

The Charles G. Stevens Company's New Warehouse

The Charles G. Stevens Company, Chicago, has a new warehouse under construction at North Jefferson street and the Chicago & Northwestern tracks. The building is 80 x 150 ft., two stories and basement. It will be used as a "tonnage warehouse" for storing and shipping iron and steel and other materials which are handled by the company in quantities, supplementary to the business now carried on by the company in its new building at Jefferson and Monroe streets.

The company's general office is located in the Monroe street building, and two floors are used for the storage of the general stock. An ingenious racking system has been adopted, which enables a large variety in sizes and grades of material to be carried on a small floor space. Bars, tubing, pipe, strips, cold rolled stock, sheets and an almost infinite variety of other material are carried in small quantities, in a "pigeon hole system" of racking, which has been adopted in place of vertical racks. This plan enables the company to give very prompt service in filling orders for unusual sizes or grades of iron or steel. An electric furnace is being installed in the basement for the tempering or heat treatment of tool steels. In this furnace a barium chloride bath is heated electrically to the exact temperature that may be required for the tools to be treated.

The Poole Engineering & Machine Company, Woodberry, Baltimore, Md., has elected the following officers as a result of the recent death of the president, George Poole: President and treasurer, Robert Poole Simpson; vice-president and general manager, Thomas H. Mirkil, Jr. John A. Finney is continued as secretary. As these officers have been connected with the company in responsible capacities for many years its policy will in no way be changed.

The Terry Core Drill Company and the McKiernan Drill Company have consolidated under the name of the McKiernan-Terry Drill Company. The new company will continue to manufacture the various products of both companies, consisting of a full line of rock drills, hammer drills, core drills, coal cutters, sheet pile drivers, compressors, etc. The office of the company is at 115 Broadway, New York.

An Effective Hot Blast Patch

An emergency patch on a bad break around a hot blast valve has proved so successful at the Columbus Iron & Steel Company's blast furnaces, Columbus, Ohio, that a brief description with illustrations is here given. The original flanges on the hot blast connections above and below the bronze valve seat were poorly designed and made of cast iron. After several years of service the flanges on two of the hot blast stoves cracked and began to spread. In spite of carefully placing new bronze valve seats and the liberal use of red lead the blast continued to leak and the broken pieces of the flanges gradually moved more and more out of level. As the flanges were riveted to the casing it would have required a stop of two or three days to make the necessary repairs, as all the firebrick lining of the connections would have to be torn out and then replaced after the riveting was finished.

The construction of the hot blast valve connections is shown in Fig. 1. The upper and lower flanges are about 4 in. apart, and the space between is taken up by the bronze hot blast valve seat, which is so much in the shadow in the photograph that only a part of the lower flange can be seen.

On February 1, 1910, the blast was off the furnace for about five and a half hours for general repairs. New bronze valve seats were placed in the two stoves, the joints being made with red lead as usual. Then the bronze seats were thickly coated with what is commonly known among blast furnace men as "English cement" and the annular space between the top and bottom flanges of the valve seat was nearly filled with "circle" firebrick (made for a 60-in. diameter), bedded in the "English cement." When all the brick were in

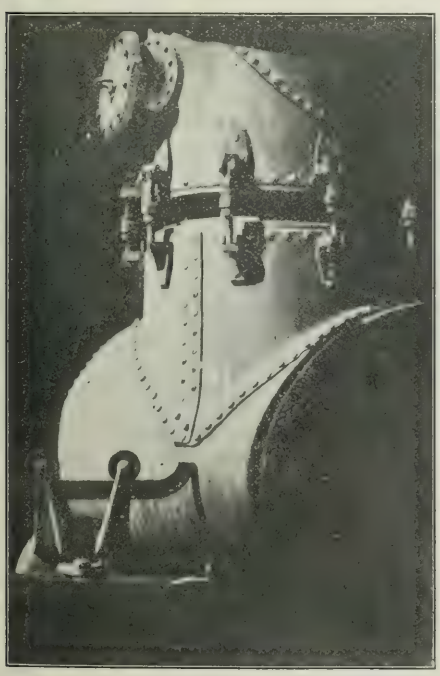


Fig. 1.—The Hot Blast Valve Seat Before Repairs.

place cement was plastered on the outside until there was a solid ring of cement and brick around the valve seat. Fitting tightly outside the cement and brick an iron band ¼ in. thick and 7 in. wide was fastened in place with small bolts. The band was in two sections, and a slot for the water pipes was cut in the proper place. The turnbuckle bolts were then placed in the lugs and drawn tight.

During the eight months that these two patches have been in service it has been necessary to replace one of the iron bands with a band more carefully fitted, the original band having been made out of old material, and also to smear on some fresh cement. Otherwise there has been no trouble in stopping the blast leaks, and the putting on of the new flanges has been postponed until the furnace goes out of blast. The completed patches are shown in Fig. 2. To the right of the two water pipes can be seen one pair of the

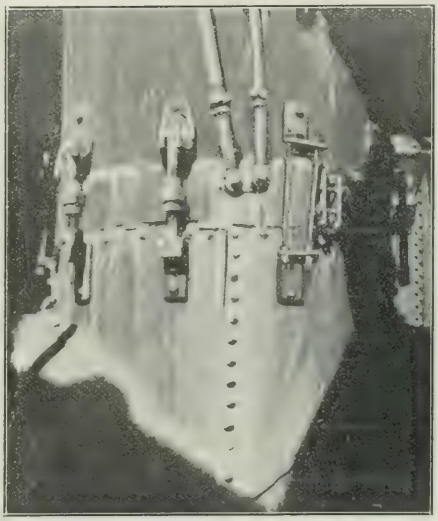


Fig. 2.—The Hot Blast Valve Seat Repaired with Band and Cement.

angle iron flanges with bolts for fastening together the two sections of the band.

Recently the blast leaks around another valve seat were completely stopped by a circle of firebrick set in the "English cement" without having any iron band on the outside. In this case the cement had several hours to harden before the blast pressure was on it. This "English cement" goes under the trade name of "Purimachos cement." Its properties are especially valuable around blast furnaces because of its resistance to heat and pressure.

Shop Changes Due to the Steel Car.—The *Railway Age-Gazette* refers to the shop side of the steel car era as follows: "The introduction of the steel car in both passenger and freight service is rapidly transforming the equipment of most railroads and gradually changing the character of the car shops and making its impress upon the car department generally. The shops are becoming iron working shops with punches, shears and riveters, and the repair men are no longer carpenters and cabinet makers, but sheet metal workers and blacksmiths. The design of the steel car is more of an engineering problem, and most of the work can be handled better by the machinist or other iron worker than by the old-time car builder or woodworker. It is a remarkable fact, however, that the cabinet maker in the shops of the large passenger car builders has so adapted himself to the fitting of steel sheets, moldings and trimmings that his work is more rapid and accurate than the regular sheet metal workers."

The Hendey Quick Threading Attachment

A Lathe Attachment for Quickly Returning the Carriage

A new attachment for lathes, which, as its name indicates, is designed for rapid thread cutting, has been brought out by the Hendey Machine Company, Torrington, Conn. Its special feature is the saving in time over ordinary methods, which is accomplished by returning the carriage at high speed after each cut until the thread is finished. This is accomplished by the coarse pitch multiple thread quick return sleeve which, together with the chasing sleeve, rotates constantly when the attachment is in use. The length of travel in either direction is governed by automatic trip dogs, and thus no perceptible time is lost when making engagement from one sleeve to the other, which is in great contrast to ordinary lathe work where it is necessary to reverse all the moving parts from the countershaft down. Figs. 1 and 2 show the attachment applied to a lathe when both in and out of use, while Figs. 3 and 4 are front and end views giving details of its construction.

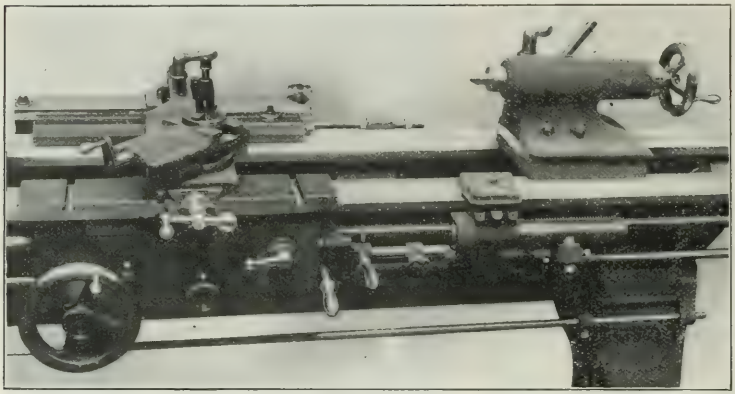


Fig. 1.—The Quick Threading Attachment Made by the Hendey Machine Company, Torrington, Conn.

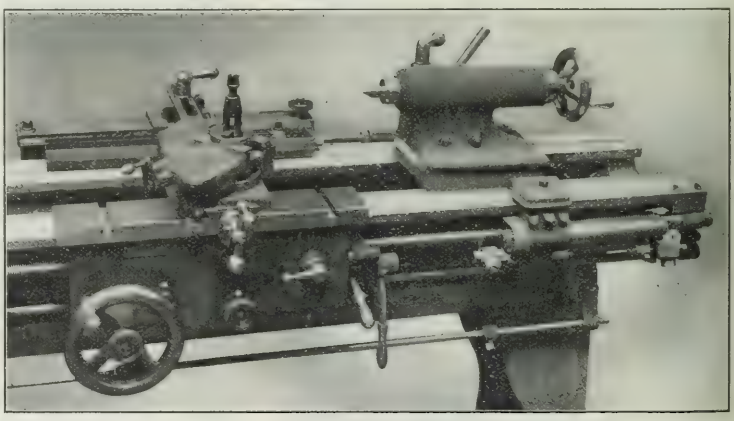


Fig. 2.—View Showing Attachment at End of Lathe When Not in Use.

The attachment has comparatively few parts; seven in all; hence is not complicated. It is clamped against the front V of the lathe and has a sleeve which slips over and is driven by the lead screw. The construction is clearly shown in Fig. 1 where the attachment is mounted on a lathe with the actuating or rocker shaft connected with the bracket on the lathe apron and the guard removed to show the chasing and the reversing sleeves. When not in use the attachment is easily disconnected by removing the knurled head pin connecting the actuating shaft with the lathe apron. The entire attachment, with the exception of the apron bracket and the working lever, can then be moved to the end of the lathe bed as shown in Fig. 2, where it is out of the way.

As shown in Figs. 3 and 4, the two sleeves *a* and *b*, are geared together and rotate at the same speed as the lead screw which passes through the sleeve *a* and drives the attachment. The nuts *c* and *d* engage with these sleeves and are held in the rocker *e* which is connected with the apron by the push shaft *f* through the handle *g* in the bracket *h*. When the slip nut in the apron is thrown out of engagement, the rotation of the lead screw causes the carriage to move in one direction when nut *c* and sleeve *b* are in engagement and very rapidly in the opposite direction when nut *d* and sleeve *a* are engaged. The limits of this travel are determined by dogs which strike stop pins on the bracket *i* and throw the rocker *e* and the handle *g* to the neutral position where neither nut is in engagement.

In using the attachment when cutting a right hand thread, after the gear box has been set for the desired pitch, the regular reverse handle shown at *j* is thrown into the extreme lower position, Fig. 4, and left there. The attachment is clamped tightly to the bed by the screw *k* at a point which will permit the desired amount of travel. The handle *g* is then thrown to the neutral position as shown in Fig. 4. Four dogs are sent with the attachment, two, marked R_1 for use when cutting right hand threads, and two, marked L, for cutting left hand threads. The first two dogs are slipped on the shaft *f* which is connected to the handle *g* by the taper pin *l* as shown in Fig. 3. The correct position of these dogs *m* and *n* is found by running the carriage by hand to the desired place of stopping and sliding the corresponding dog until it hits the stop pins where it is fastened.

With the carriage at the right or tailstock end and the lathe running, the handle *g* is raised to the cutting position, Fig. 4, and pressure is kept on it until the nut *c* slips into its thread on the sleeve *b*. The carriage will then travel until the dog *m* throws the rocker out of engagement and the handle *g* to the neutral position. After backing the tool out of the cut, the handle *g* is thrown down to the reverse position, and the carriage

travels back rapidly until the dog *n* throws the nut *d* out of engagement with the sleeve *a* and the carriage stops. This process is repeated as often as necessary to complete the thread. When cutting left hand threads the dogs marked L are substituted for the others, and the reverse handle *j* is thrown into the position indicated by the full lines, Fig. 4, and left there. The operation is otherwise the same as for cutting a right hand thread except that the quick return is toward the headstock instead of away from it.

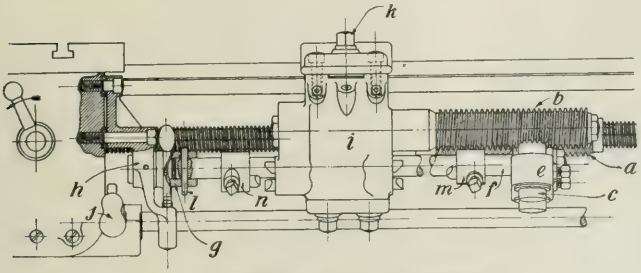


Fig. 3.—Front View of Attachment.

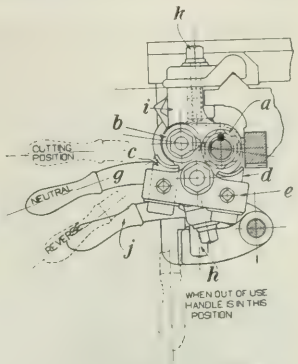


Fig. 4.—End View.

Two Views of the Attachment, Showing Details.

The attachment can be furnished for the maker's 14, 16 or 18 in. lathes of the regular or geared head patterns; it is recommended, however, that the minimum length of bed to which it is applied should be 6 ft. for the 14 and 16 in. sizes and 7 ft. for the 18-in. lathes. It is furnished for cutting either English or metric pitches and is used to the best advantage on that class of work where the thread averages from 1 to 3 in. in length, although it may also be used up to its limit, which is 6 in.

The Surrell Boiler Furnace

A new type of boiler furnace for which a number of important advantages are claimed is being manufactured by the Surrell Double Draft Boiler Company, 85 Liberty street, New York City. This furnace is designed to be connected to an ordinary type of boiler and furnishes the heat necessary for the production of steam, thus eliminating the grate in the old boiler. Among the advantages claimed are greatly increased capacity with a decrease in the amount of coal consumed and freedom from smoke and clinkers in the ash. The furnace is self-stoking and will burn all grades of coal. Fig. 1 is a plan view of the furnace, while Fig. 2 is a sectional elevation through a combustion chamber.

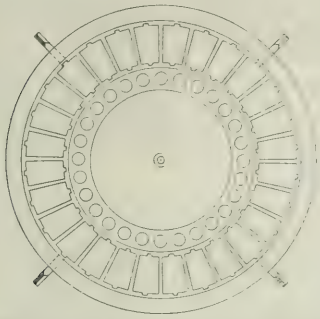


Fig. 1.—Plan View of a New Type of Boiler Furnace Made by The Surrell Double Draft Boiler Company, New York City.

In a recent test made on one of these furnaces in an apartment house in New York City, a fire was started with pea coal at 7 a.m. and a pressure of 5 lb. maintained with all the doors closed until 10 p.m. At that time more coal was put on the fire, and the next morning the steam pressure was 2 lb. Throughout this time the fire was not shaken down. In addition to this furnace for attachment to horizontal tubular boilers,

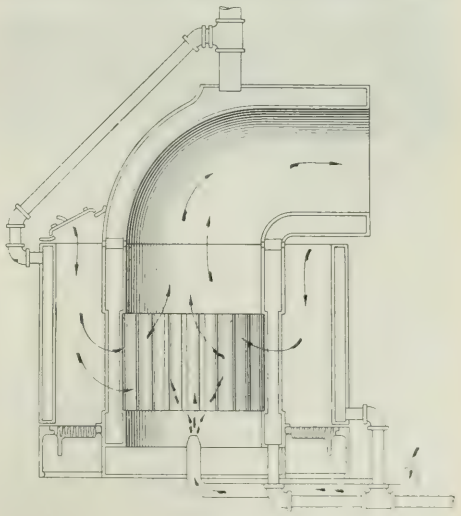


Fig. 2.—Sectional Elevation Through Combustion Chamber.

the company is also building a complete boiler in which its furnace is embodied. These boilers are designed for supplying both high and low pressure steam and also hot water for heating.

Railroad Equipment Orders. — The Pittsburgh, Shawmut & Northern is expected soon to be in the market for 2300 coal cars and 500 box cars. The Jamison Coal & Coke Company has ordered 400 hopper cars from the Standard Steel Car Company, which will also build 15 cars for the Lehigh Valley. An order has been given to the Pressed Steel Car Company for 50 tank cars for the Canadian Pacific. Inquiries in the market include 100 steel ore cars for the Lake Superior & Ishpeming, 100 box and 100 flat cars for the Atlanta & West Point, and 13 coaches for the Seaboard Air Line. The Swift Refrigerator Transportation Company is considering 250 cars, and the Armour Car Lines will build 200 refrigerator cars. The Detroit, Toledo & Ironton has ordered 12 locomotives from the American Locomotive Company, and the Seaboard Air Lines will buy 10 freight locomotives.

The Wilmarth & Morman Lathe Center Grinder

Rapidity and Convenience of Operation Are Its Chief Characteristics

The accuracy of lathe work depends upon the grinding of the centers, and while machinists generally appreciate the importance of keeping the lathe centers ground true, they are nevertheless prone to neglect to regrind them because of the time required with some of the appliances which are used for this work. A grinder for truing lathe centers, which is simple in construction and easily attached to a machine, is now being

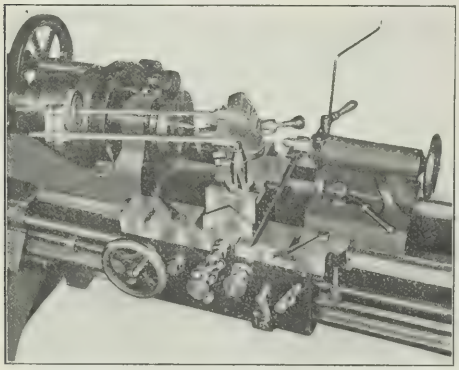


Fig. 1. The New Lathe Center Grinder Made by the Wilmarth & Morman Company, Grand Rapids, Mich.

made by the Wilmarth & Morman Company, Grand Rapids, Mich. Fig. 1 is a view of the grinder in working position in a lathe, Fig. 2 shows the manner of mounting the grinder in the lathe, and Figs. 3 and 4 are sections through the operating gears and the grinder spindle, respectively.

The grinder consists of a base which is attached to the tool post by a shank or holder and a casing mounted on the base, which is free to swivel so that the driving shaft can be swung in a horizontal plane. The drive is obtained by a rubber friction disk *a*, Fig. 2, held in contact with the lathe cone pulley. The driving shaft *c* is rigidly held by an auxiliary or supporting shaft *d*, and the two are united by a casting providing

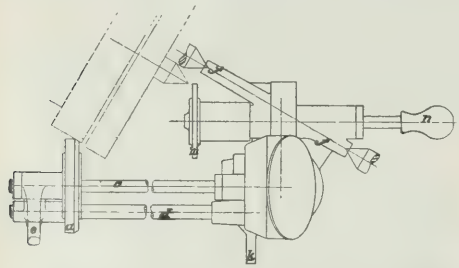


Fig. 2. Manner of Mounting the Grinder on a Lathe.

a bearing for the friction driving disk which is kept in contact with the cone pulley of the lathe by the handle *e*. Power from the driving shaft is transmitted through the bevel gear *f*, Fig. 3, and the pinion *g* to a pair of spiral gears, *h*, which in turn drive the grinding spindle *i*, Fig. 4. This bevel gear and pinion drive enables the operator to swivel the upper gear housing to any angle without affecting the drive.

When the grinder is to be set up in the lathe the center locating lugs *j*, Fig. 4, on the main base casting, which are fitted with hardened tool steel ends, are placed between the head and tailstock centers of the lathe. These locating lugs are set at an angle of 30 degrees with the center line of the grinding wheel spindle, thus locating the latter at the correct angle

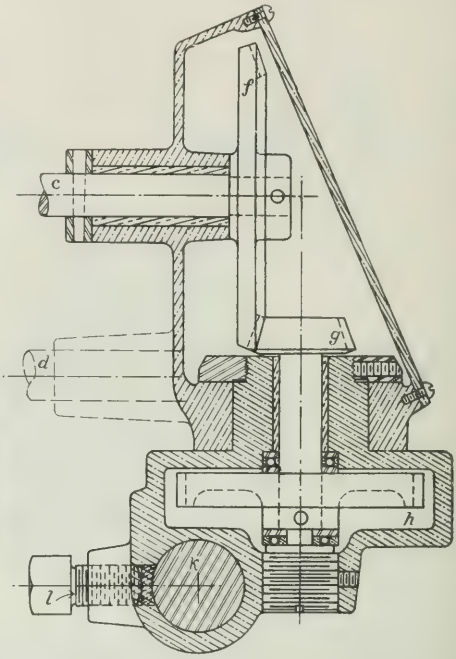


Fig. 3.—Section Through the Gearing of the Drive.

for grinding. While the grinder is accurately located in this way, the tool post holder *k*, Fig. 3, is clamped tight in the tool post, thus locking the angular setting. To prevent the possibility of an imperfect setting due to the tool post holder springing through inaccuracy of the tool post, the screw or the wedges, two holder clamp screws, *l*, are loosened while the holder is clamped solid, thus permitting the whole device to swivel into the plane which has been determined by the lathe centers. After the shank is clamped these screws are tightened, thus fixing the grinder in the correct position.

In operation the grinding wheel *m*, Fig. 2, is brought into contact with the center being ground by the handle *n*, which controls its motion. The tailstock is then withdrawn and all further movement of the

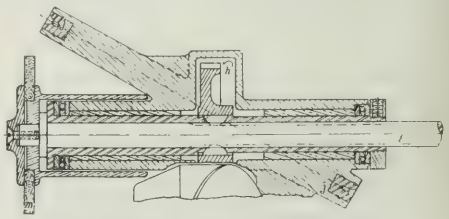


Fig. 4. Section Through the Grinder Spindle.

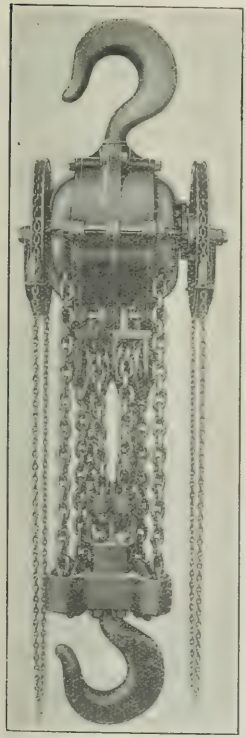
grinder is done by manipulating the lathe carriage and the cross slide.

Friction has been eliminated as far as possible in this grinder by using well lubricated bronze bearings and ball thrust bearings wherever the latter are needed. In the main casting and wherever possible elsewhere

aluminum has been used, thus making the outfit light and easy to handle between the toolroom and the lathe. A telescopic sleeve at the rear of the wheel protects the bearing from grit and dust. The tool post holder is of ample size and is made of cast steel to give the necessary rigidity. Next to the accuracy with which the center is ground, the convenience and the time required to set the grinder are of importance. In tests made at the maker's factory the grinder has been taken from the floor, all the necessary settings and adjustments of the lathe carriage, tool post, centers, &c., made, the grinder locked in its fixed position, a center ground and the grinder removed from the lathe in 1 min. 5 sec. Only a little grinding was necessary in this particular instance, but all the adjustments for mounting the grinder in the lathe, locating the settings for a 60-degree angle, starting and stopping the machine and removing it from the lathe, it is claimed, can easily be completed in less than a minute. This, of course, is a better measure of the efficiency of the grinder than any figures covering the time of a complete operation, as the actual time of grinding a center depends upon its condition.

A 40-Ton Cyclone Hoist

A new Cyclone chain hoist of 40 tons capacity has been brought out by the Chisholm & Moore Mfg. Company, Cleveland, Ohio. The general construction of this hoist is similar to that of smaller sizes of hoists made by this company, but the larger hoist permits the making of the parts of such size as to give great strength and wearing capacity. The general appearance of the hoist is shown in Fig. 1 and the interior of the head in Fig. 2.



A 40-Ton Cyclone Hoist Made by the Chisholm & Moore Mfg. Company, Cleveland, Ohio.

The head of the hoist is divided into three sections by two partitions, the two outer sections each containing a load chain wheel and the central section a pinion and three spur gears. This pinion is mounted on the hand wheel shaft. The two load chain wheels are each mounted on a hollow steel shaft and the hand wheel shaft passes through them, carrying the pinion in the central division, which drives the three spur gears, which are mounted on shafts 1¾ in. in diameter. These shafts are turned down to eccentric ends 1¼ in. in diameter, that carry in each of the outer sections or divisions a spur wheel having 48 teeth. These gears mesh with the internal gear on the load chain wheel having 50 teeth, so that each revolution of the eccentric gives a gyratory movement to the spur wheel and moves the load chain wheel forward two teeth.

The hand wheel shaft turns in graphite bronze bushings and the eccentrics in hardened steel roller bushings. The eccentric shafts are hardened, hardened and ground steel bushings are pressed into the malleable iron frame and the steel rollers are contained in cages.

The hoist has a multiple disk brake which effectively locks the load and at the same time permits free lowering by a reverse movement of the hand wheel.

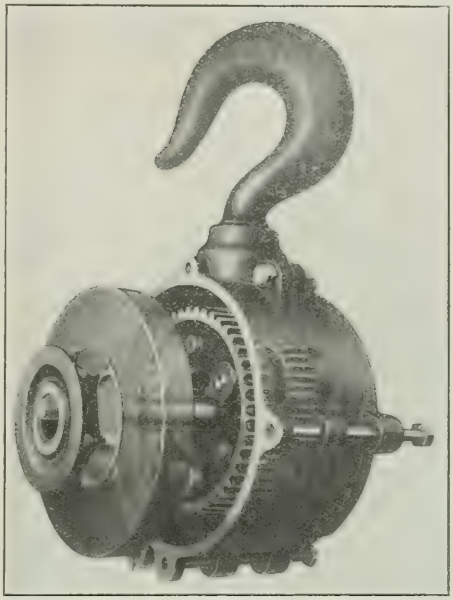


Fig. 2.—Phantom View of the Hoist Head.

It has two independent load chains moving together, and the idler sheaves are so placed as to permit the doubling up of the chain and carrying the load on eight strands of ¾ in. chain. The idler sheaves are all bushed with graphite bronze self-lubricating bushings. None of the bearings require oiling.

The hoist, as shown in the illustrations, is compact in form. The minimum distance between the upper and the lower hooks is 84 in. and the weight is 2030 lb. The forged hooks alone weigh about 140 lb. each. The hoist is claimed to have a high frictional efficiency: a pull of 80 lb. on each of the hand wheels raises a load of 40 tons.

These hoists are made in three smaller sizes having capacities of 16, 20 and 30 tons. All are similar in construction, except that the 16-ton size handles its load on four strands of ⅝-in. chain, the 20-ton size on four strands of ¾-in. chain and the 30-ton size on six strands of ¾-in. chain. The 16-ton size has one hand chain wheel, but the larger sizes have two chain wheels.

Announcement is made that the business of William Forgie, Washington, Pa., has passed into the hands of the Duff Mfg. Company, Pittsburgh, which has bought the entire Forgie plant, including all rights and privileges of making the oil well jacks originated by William Forgie. This line will be added to the present list of Duff products. Most of the machinery in the Washington plant has been transported to the Duff factory on the North Side of Pittsburgh. William Forgie was one of the pioneers in the jack business, but was exclusively a maker of jacks for oil well operators. His business developed and it was no small concern that the Duff company acquired when it prevailed upon the veteran manufacturer to dispose of his plant.

Machine Tools from the User's Standpoint

John Riddell's Discussion of Machine Tool Design, with Instructive Criticisms*

In the Schenectady Works of the General Electric Company we have a very large variety of parts which have to be machined, but the parts running into the greatest numbers are principally made by our screw machine and punch press operations, which, in many cases, run into the millions.

Lathes

The writer has been considering seriously for a number of years the advisability of having, instead of standard engine lathes, simple turning machines, to produce such pieces as small shafts, which are required in more or less large quantities, but since there is a certain variation as to dimensions in this class of work we could not have our machines so very special that they could not be used for a general run of similar work.

It has been the practice for a long time when, if several lathes were required for any particular department, standard engine lathes would be purchased, which machines would be fully equipped with screw cutting, cross feed, rod feed, compound rest, large and small face plates, and, very frequently, with an extra block for large outside turning. Many such machines have been purchased with the view of being transferable from one department to another as emergency would arise, and it was thought advisable on this account to have the machines as universal as possible. Experience has taught us, however, that an engine lathe once placed in one of our shafting departments would, in many cases, wear itself out before having to do any face plate or chucking work, and, very seldom, screw cutting. You can therefore see that the cross feed, as well as screw cutting, would be superfluous. Lathes for this work should be equipped with a powerful rod feed, and with a suitable friction device which would slip if the turning tool should meet with any obstruction, so as to prevent serious accident to the machine.

Such machines should be so designed that the screw cutting attachment and cross feed could be readily applied, if in the future they should be required, which, in our case, would be in very rare instances.

Many attempts have been made to solve the problem of small shaft turning, with more or less success, but many of the machines designed for this purpose have been more or less complicated, which precludes the possibility of putting inexperienced men on to run them.

A lathe to be used exclusively for shaft turning, say, from about 2 to 4 in. in diameter, would not require the range of speeds as for a standard engine lathe. A standard engine lathe of about 18 or 20 in. swing should be geared from about 3 or 4 rev. per min. up to about 600. The lathe I have in mind should have a range of speed of from about 20 rev. per min. to about 250 for turning, and two or three higher speeds for filing and polishing. These speeds should possibly be between 450 and 600 rev. per min. It is desirable in our case at least to have such machines fitted for electric motors. The motors should have a speed variation of about 2 to 1, which, with two or three gear changes, should give all the speeds necessary for a simple turning machine.

Automatic Screw Machines

The automatic screw machine, in a general way, is made so that six, seven or eight operations can be performed on most any of them. Whereas a very large quantity of work going through them requires but two or three operations at the most, such as milling, threading and cutting-off. Many of the screw machines are so complicated that they will perform the operations whether the tools are actually working or not.

It would seem that machines could be very much simplified by making some do three or four operations only, and not encumber them with too many useless parts, or at least parts which will have to be running whether they are actually performing any useful work or not.

The same is true of some larger automatic turret machinery. Some of these machines are designed for boring and facing, but nevertheless the turret will have five or six positions, all of which operations must be gone through with whether there are but one or two simple operations to be performed at the loss of much valuable time.

Machines, such as shapers and slotters, appear to be as simple in construction and design as they should be made, and they have all the necessary feeds and speed variation.

I am glad to see that some of our wide-awake machine tool builders are making variable speed planing machines. This would seem quite necessary at present on account of the great variety of material which they are called upon to machine.

In the old days a planing machine that would operate at 20 ft. per minte was thought all that could be desired, but it must be borne in mind that they had very few kinds of material to operate on then; whereas now we have a range of material from chrome and nickel and vanadium steels to the various steel castings, and from cast iron to aluminum and other metals which can be operated at a high speed. It is, therefore, necessary in a great many cases to have planing machines which can operate at a satisfactory speed on any kind of material. This can be accomplished by variable speed motors, or through gear change boxes.

Milling Machines

In regard to milling machines generally we have a pretty large range to select from at present. If we want the simple hand milling machines there are several good ones made, as well as the Lincoln type miller — various plain milling machines, universal millers, and the various types of vertical millers.

Drill presses have been very well taken care of also. We have our sensitive drills, which can be purchased with any number of spindles, with one or two changes of speed. We also have a full line of upright machines, which can be purchased with or without tapping attachment. The tapping attachment has become a necessity in a great many cases, and is a very useful addition. I have heard several complaints about the breaking of taps by their use, but with simple tap holders, which can be adjusted to slip before breaking, this latter fault should be overcome.

A great deal might be done toward adapting multiple spindle heads to single spindle presses. It is very doubtful if, as at present constructed, it is good judgment to put in too many expensive multiple spindle drills, for the reason that it takes so long to adjust them for a small number of pieces.

Radial drills generally should be so stiffened up as to permit of only the smallest amount of spring to the arm. I believe more drills are ruined by the springing of arms, both under the actual pressure and when a

* Read before the National Machine Tool Builders' Association, New York, October 26, 1910.

drill is breaking through than would be if it were not for the springing referred to, as under the pressure of drilling the arm goes up, and when the pressure is relieved from the point the drills are forced through and in many cases catch on the lips and break.

Grinding machinery generally is probably as near perfection as can be expected. The wearing parts are well protected from grit, and feeds well taken care of, and there seems to be very little to be desired from the user's standpoint. There is one very important point, however, about all grinders, and that is the protection from injury to the operator by the breaking of wheels and dust. There should be exhaust hoods of ample capacity provided with each dry grinder, as well as some safety device to prevent the wheel from flying in case it should break. This applies to all kinds of grinders.

Horizontal boring mills as made at present are well up to the times, but in a great many cases, due to the requirements of gasoline engine cylinders and other work of a similar character, special machines should be provided for the purpose. This work is very particular, and in many cases slow and difficult; due frequently to one end being closed; cylinders being cast *en bloc,* and the irregularity of rough castings and the exacting requirements of our engineers.

Vertical boring mills are built for various purposes, from car wheel borers up to machines taking 25 ft. or more. I do not believe it pays to unnecessarily complicate such machines. Rigidity and accuracy are the essential points in all machine tools, and these features should not give way to unnecessary complication of parts. All gears and counterweights should be thoroughly protected against injury to the operators.

Electric Drive—Safety Appliances

From experience extending over some 28 years in the electric motor business, I am a thorough believer in the electric motor drive. Criticism has been made that on universal machines which might be called upon to do from a fraction of a horsepower of actual work, to six or seven hp., that the invesement is unnecessarily high as compared to group driving such machines. To a certain extent this is true but if more care was exercised in designing and selecting as above outlined this criticism would disappear. We must consider the flexibility of the electric motor drive, bearing in mind that a machine so equipped can be taken from any part of a large manufacturing plant and placed in another part, and can be running in a very short time in any remote location where there is no other sourse of power. It will only absorb the amount of power actually required to do any particular job, and on the other hand we must consider the line shafting with its numerous hangers, pulleys, countershafts and belts, which must be kept oiled and repaired. Go into any large screw machine department and see the number of belts in actual use to get a clear idea of the situation.

We have had considerable trouble at the Schenectady Works of the General Electric Company lately in trying to conform to the new State laws, which are very stringent as to the protective devices on machine tools in general and woodworking machines in particular. It is an exceedingly difficult matter to so protect buzz planers and circular saws as to guard against carelessness and the apparent indifference of the workmen, and if some one would devise proper ways and means for protecting such machines he would have the thanks and blessing of the whole manufacturing fraternity.

Accidents are frequently due to carelessness on the part of the operators, because, first, they will not take time to shut down their machines when making adjustments, for the reason that a spindle running 3000 or 4000 rev. per min. would require an appreciable length of time to come to rest and also to start again. This would suggest some suitable brake which would quickly and effectively stop such machinery without complicating it.

If an operator has a great many pieces of a similar kind to either saw, plane or shape, he may possibly take pains to apply such guards, which are usually provided; but if, as frequently happens, a man wants to plane one single piece or saw a strip from a board, he will not take time to adjust the safety appliance, and he is very apt to be caught. This would point out the necessity of having some suitable guards which would always be available no matter what the conditions were, and it would seem that people producing this particular line of machinery would conjure up something practicable and effective. As it is, the market is flooded with unsatisfactory devices, which in many cases are mere traps and generally do more harm than good; but the law says we must use something.

Punch presses in general are very well designed, but they, like woodworking machinery, are comparatively dangerous to the fingers of careless or dreamy operators. We have in the Schenectady Works of the General Electric Company several hundred of such machines, and have applied a great many safety appliances and devices to protect the workmen against thoughtlessness, but it appears that no matter what we have been able to apply they are either taken off and thrown to one side or neglected in some manner so that sooner or later an operator is apt to get a finger pinched. This would suggest automatic feed mechanisms and something to take the piece from the dies after the operation is completed. There have been enumerable devices of this kind exploited, but nothing as yet seems to cover the ground fully.

Another defect in this class of machinery is the fact that in many instances when clutches and other parts come loose, due to wear, they are very apt to repeat the stroke. This frequently happens when a man's hand is between the dies. Such accidents should be impossible until the operator deliberately steps on the treadle.

Noise in Machine Shops

It has been pointed out that there is a great deal of gear noise in the machine shops of the present day. I am sorry to admit that this is true, but it is not wholly due to the fact that there are more gears used in the construction of machine tools, but is more especially due to the higher speeds at which machines are run to-day, as compared to 10 or 20 years ago; as I mentioned before in reference to planing machines. Before the advent of high speed steels 20 ft. was considered to be a fair cutting speed for an ordinary steel shaft or a piece of cast iron to be either turned or planed; whereas to-day, we are actually turning shafts at from 75 ft. to 125 ft. per min. So it will readily be seen that machines to-day are producing from three to six times more work than they did a few years ago; hence it should follow that there would be more noise due to machine tools producing this extra amount of work. These gear noises are very unfortunate, but we hope by improved gear cutting machinery and the use of various other materials which have recently been introduced, that this trouble will gradually disappear.

Muslin Gears and Pinions

We have at the Schenectady Works introduced gears and pinions made of a high grade of muslin which have been applied to a great variety of uses. We have used one of them on a boiler maker's punch and shear which previously gave considerable trouble, not only on account of noise, but in the actual breaking of the gears; due to excessive back lash and fly wheel action on the machine. We had such wonderful success with that particular pinion, which has been running now some two years, that we gradually extended the use until now we are using them on two 10-ft. planing machines, which are operated by electric mo-

tors and compressed air clutches, as intermediate pinions for the reverse motion. Heretofore we have tried various substitutes, including bronze, which would go to pieces in two or three weeks; steel would last longer, but made an intolerable noise; rawhide would seem to shrink and burn out quickly, and we very seldom could find anything that would stand the work longer than three or four weeks at the most.

It is, perhaps, too early to say much about the particular pinions in question, but they have at present been running four months, and they have not yet begun to show any signs of distress, and it looks as though their life would be as long as the gears with which they mesh.

I might ask your indulgence while I describe what has recently been done with a pair of these pinions. As I said before, we have been using them some two years and are gradually extending their use, and have now fitted up a large department at the Lynn Works of the General Electric Company where we can produce them in fairly large quantities, but before putting them out in very large quantities we desired to have a life test to destruction, and with this in view we rigged up two railroad motors opposed to each other. One of these has a cloth pinion on the armature shaft running into a steel gear on countershaft. On the other end of this countershaft is another cloth pinion engaging with another large steel gear. The other side of this steel gear engaging a cast gun iron pinion of the same dimensions as the cloth. This then connects with its shaft and gear to a rawhide pinion on the opposite motor. This particular motor is resisted by rheostats to load the motor which has the muslin pinion. In starting this test it was found that there were no results from a certain load. This load was gradually increased, and when after stopping the motors to examine the pinions, through some oversight, an excessive overload was applied when they were again started. The shock was so severe that it broke about one-half of the teeth from the gun iron pinion, leaving the two muslin pinions in as good condition as before. Another gun iron pinion was put on, which also broke. A third was then put on and the load reduced, and the life test has now been running some two or three weeks, and will be continued until some of the gears actually wear out and not break.

I point this out to show the actual strength of pinions made of this material. So we have reason to believe that with time the noises in machine shops will gradually disappear as they came, without, however, a corresponding reduction in output.

I will not attempt to mention in detail the vast number of standard, to say nothing of special machines, which are at present in use. To sum up briefly, the essential requirements are simplicity, rigidity and accuracy, with ample protection for the workmen.

There is one other thing that must be borne in mind in the production of machine tools, and that is the gradual disappearance of the old time all-round mechanic. It has frequently been pointed out when some special machine tool was brought out to reduce costs of certain operations, that such a machine could be operated by a farmer boy, or one without any practical knowledge of machine tools. This has very seldom proved to be the case as such a one cannot make the necessary adjustments on such machines. Therefore, simplicity is a prime factor in machine tool designing.

The McCrum-Howell Company, New York and Chicago, has secured control of the Model Heating Company of Philadelphia and New York and will retain the entire sales organization of that company. In addition to the Model boilers and radiators heretofore handled by the Model Heating Company the McCrum-Howell Company offers a complete line of vacuum cleaning apparatus, both portable and stationary.

New Lang Tool Holders

The G. R. Lang Company, Meadville, Pa., has placed on the market the two new tool holders which are illustrated herewith. These holders have been developed in response to a demand for one that will not only cover the range of work now done with the ordinary tool holder, but which will also displace the solid tool on a large class of work which is now beyond the range of economical operation with the usual holders. A triangular cutter of twice the area and twice the depth of the usual square cutter is used. The size of the point and the method of clamping give sufficient

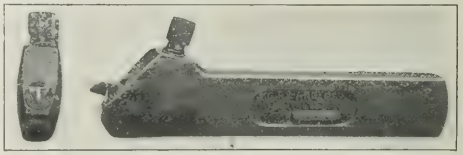


Fig. 1.—End and Side Views of the New Lathe and Shaper Tool Holder Made by the G. R. Lang Company, Meadville, Pa.

area for heat radiation and rigidity, and the cutter is supported at the point directly opposite the direction of the thrust, thus preventing the point from springing down or backing away from the cut. These cutters are rolled to the proper dimensions in bar length and can be purchased as readily as square sections.

The general lathe and shaper tool for the lighter classes of work is shown in Fig. 1. These tools are made in three different sizes, and the sizes of the cutters range from ¼ to ½ in. triangular steel. Any shape

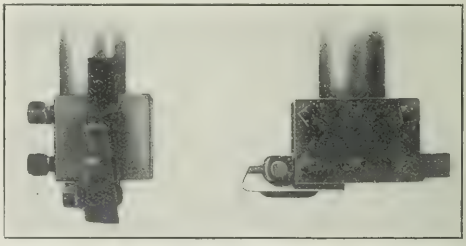


Fig. 2.—Two Views of a Lang Tool Holder for Vertical Boring Mills.

of cutter point can be ground with this triangular steel the same as with the square stock, and the saving in weight of steel used, it is claimed, will pay for the holders themselves. The cutter is mounted in a V-shaped seat, which not only gives a larger bearing but makes a perfect fit on both sides, thus giving substantially a solid tool. This cutter seat is milled lengthwise in a steel bushing which is pressed into a round hole and is interchangeable. Tempered tool steel is used for the entire holder including the set screw and the bushing.

The other tool holder, illustrated in Fig. 2, is designed for use in vertical boring mills. This cutter is extra large, and its special field is the taking of heavy roughing cuts. Owing to the shape of the cutter it is only necessary to grind it on the end to resharpen it as the top and side angles are correct. This holder is made in five sizes for tool post openings ¾ in. long by 1 in. wide up to openings which are 1¼ in. long by 1⅞ in. in width.

The new furnace of the Wickwire Steel Company, Buffalo, N. Y., which blew in October 1 and was active throughout the month, is known as Harriet Y. The original furnace of this company will be known as Harriet X.

The Rockford 15-In. Lathe

Equipped with a Special Gear Changing Arrangement

A lathe which is especially designed to meet the requirements of tool room work and manufacturing has been placed on the market by the Rockford Tool Company, Harrison avenue and Eleventh street, Rockford, Ill., and is illustrated herewith. Fig. 1 is a general view of the tool and Fig. 2 shows details of the change gear mechanism. The construction is heavy with numerous reinforcing ribs so as to handle heavy cuts.

The headstock is heavily built and well braced so as to resist any stress or strain which may be put upon it. As illustrated the tool is equipped with a five-step cone pulley, the largest having a diameter of 10¼ in. and a face width of 2⅜ in. The ratio of the back gears is 10 to 1. The lathe can also be furnished with a three-step cone pulley with double back gears where considerable power is required. The faceplate is heavy and reinforced by a number of ribs to prevent springing when the work is clamped. The spindle is of crucible steel and has a hole 1⅜ in. in diameter through its entire length. Phosphor bronze bearings are used; the front one is 2⅝ in. in diameter and 4 in. long and the rear one 1 5-16 in. in diameter and 3 in. long.

The bed is heavy and reinforced by ribbing. The webs in the sides are placed as nearly as possible under the shears to prevent chatter and spring when heavy cuts are being taken, and the shears themselves are large and have ample bearing surface. The carriage also has a large bearing surface and is gibbed both front and back. The feed reversing mechanism is contained in the apron, which is also ribbed, and the design is such that the split nut and the feed cannot be thrown in at the same time. The tailstock is also of rigid construction, and the spindle is 1 15-16 in. in diameter and has a travel of 6 in. The centers of both the head and tailstocks are bushed for a No. 3 Morse taper.

The cross slide and the compound rest feed screws are both graduated and taper gibs are used to compensate for wear. The compound rest can swing through an angle of 90 degrees. All numbers of threads from 3 to 20 per in., including an 11½ pipe thread, can be cut and every even number from 20 to 40.

In substituting one set of change gears for another no wrenches are required, and the substitution is easily and quickly made. The stud and the lead screw have a ball catch, which is shown at *f* in Fig. 2. The hole *a* in the idler gear bracket *b* can accommodate all the change gears, and the stud has two large washers *c* which clamp on the bracket. The stud has a knurl *d* and a permanent wrench *e* for locking the idler gear at any point within the range of the bracket.

The following table gives the principal specifications and dimensions of the lathe:

Swing over bed, inches	15¾
Swing over carriage, inches	10¼
Maximum distance between centers, 6-ft. bed, inches	36
Diameter of front spindle bearing, inches	2⅝
Length front spindle bearing, inches	4
Diameter rear spindle bearing, inches	1 15/16
Length rear spindle bearing, inches	3
Diameter of hole through spindle, inches	1⅜
Diameter of tailstock spindle, inches	1 15/16
Diameter of largest step on cone pulley, inches	10¼
Width of belt, inches	2¼
Ratio of back gear	10 to 1
Diameter of countershaft pulley, inches	10
Face of countershaft pulley, inches	3
Speed of countershaft, revolutions per minute	150
Weight, pounds	1,550

In addition to the 6-ft. bed, this lathe is also made with beds 8 and 10 ft. long. The equipment regularly furnished with the lathe includes a large and a small face plate, follow and back rests and the necessary wrenches. A taper attachment can also be furnished if desired.

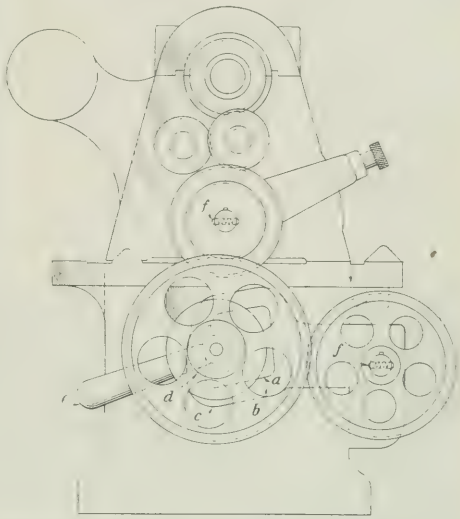


Fig. 2.—A Detail of the Head End of the New Rockford Lathe.

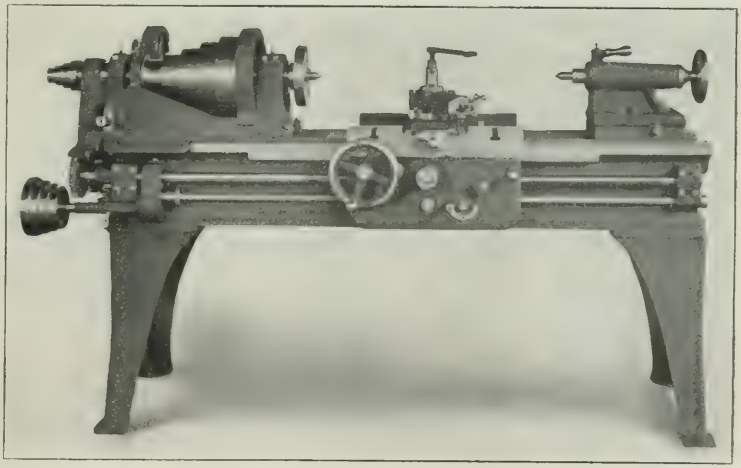


Fig. 1.—The New 15-In. Lathe Built by the Rockford Tool Company, Rockford, Ill.

The Texas-Mexico Commission Company, El Paso, Texas, announces that the business heretofore conducted under the name of that company will hereafter be transacted under the name of the W. A. Cannon Company, but without change in ownership or management. The company represents manufacturers in the sale of machinery and general supplies for mines, mills, smelters and railroads. W. A. Cannon is manager.

The Weinberg Revolving Cylinder Gas Engine

A Light Weight Two-Cycle Motor Designed Especially for Aeronautical Use

In a gasoline engine it is a problem to obtain the greatest power with the least weight and fuel consumption. At the same time the motor should have long life and be reasonably free from repairs and breakdowns and have all parts readily accessible. The simplest design embodying the least possible number of parts is the best. The engine illustrated herewith represents a new type invented by Frederick Weinberg, 118 Alfred street, Detroit, Mich., especially for aeronautical use. Fig. 1 shows an aeroplane equipped with one of these engines while Fig. 2 gives details of its construction.

The engine has two cylinders, which are really one divided into two perfectly balanced units, and the different working phases of the cycle occur in both units at exactly the same time but in opposite directions. This relieves the center of the engine from bending strain under normal conditions. It is claimed that all ignition trouble has been eliminated, as both sparks must occur simultaneously.

The engine shaft is stationary, while the cylinders revolve, and advantage is taken of centrifugal force in distributing the gas and exhausting it. The pistons describe a true circle around the wrist pin and during a half revolution form a vacuum in the crank case which draws the gas and oil mixture through the hollow crank shaft into the case, where it is compressed during the next revolution. A valve between the carburetor and the engine prevents the gas from being driven back. It then enters a cylinder through a by-pass and drives out the burnt gas through the exhaust port. A short time before the head of the piston clears the by-pass the exhaust valve is opened mechanically and the burnt gas is driven out by centrifugal force. While most of the gas is driven out in this way before the piston head reaches the opening and as the exhaust is still open at this instant, the new charge helps to assist in expelling the remainder of the burnt gas.



Fig. 1.—The Weinberg Two-Cycle Revolving Cylinder Gas Engine Mounted on an Aeroplane.

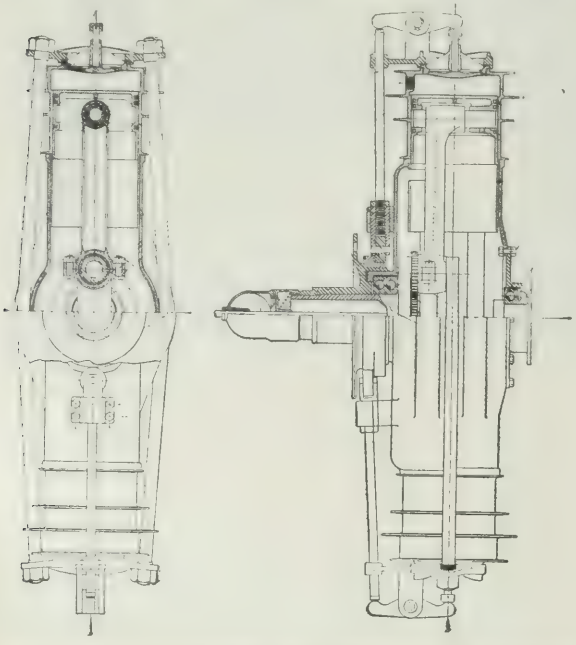


Fig. 2.—Front and Side Elevations, Partly in Section, of the Weinberg Revolving Cylinder Gas Engine.

The crank case is aluminum and is cast in one piece. The cylinders are cast iron machined all over and the pistons are the same material and contain three rings, two above and one below the wrist pin. The crank shaft is double throw and made hollow to reduce weight and also admit the charge of gas. The exhaust valve is located in the head of the cylinder and is designed to empty it in a minimum time. These valves are of the poppet type and are positively opened at the proper time by levers actuated by eccentrics on the shaft and are held closed at all other times by centrifugal force without the aid of springs.

The magneto is driven positively at the same speed as the crank shaft, which is claimed to insure easy starting of the engine without the aid of a battery. The current is generated and distributed to a sector and from there to both spark plugs at the same time, an arrangement which, it is claimed, insures the firing of both cylinder units at the same instant and avoiding any possibility of one missing fire.

The cylinders are effectively cooled by their revolving rapidly in the air and being at the same time exposed to the cooling draft of the propeller. Heat is thus easily radi-

ated from the cooling flanges and all possibility of overheating is said to be avoided.

The engine is held together by two tension bars terminating at each end in a valve cage retainer in which the valve is seated. These rods bind the whole together tightly. From the design of the engine the action of centrifugal force keeps the valve tightly seated, and the whole cylinder is in compression instead of tension. The tension bars are of sufficient size to withstand the pressure at high speed, and there is no danger of the parts becoming loose or thrown off.

Ball bearings are used throughout and the engine is lubricated by the spray system, in which oil is drawn into the crank case in the form of a fine spray, thus positively oiling all internal working parts.

The over-all dimensions of the engine are 5 x 5 ft. and the weight is 110 lb. The speed attained under load is 1200 rev. per min.

A Hawthorn Flaming Arc Light Installation in a Gun Shop

One of the problems in connection with large iron and steel mills, foundries and machine shops is efficient artificial lighting. Prior to the perfection of the flaming arc lamp the most efficient illuminant was the carbon arc, which is still used to some extent. Where the ceilings are high as in foundries, steel mills and machine shops, lamps of great penetrating power must be used, since at the present time traveling cranes are used in almost every mill of any size, and it is necessary in most cases to hang the lamps above these cranes. The large machine shops and foundries are generally built with two or three bays, a popular arrangement, being one central bay where the heavy work is handled and one or more side bays usually having galleries where the lighter and detail work is carried on. Frequently the side bays are also equipped with traveling cranes, and in that case the lamps are hung around the sides of the bay. The upper gallery and the main bay are, however, generally illuminated by hanging flaming arc lamps above the cranes. The special advantages of these flaming arc lamps are great brilliancy and penetrating power, low operating expense and the agreeable effect of the light.



The Harrison Gun Shop of the Crucible Steel Company of America Lighted with Hawthorn Flaming Arc Lamps Made by the Western Electric Company.

For some time the Crucible Steel Company of America experienced difficulty in satisfactorily lighting its gun and projectile shop at Harrison, N. J., which is operated day and night, thus requiring good artificial illumination. The shop was formerly lighted by carbon arcs, but these proved unsatisfactory. Individual incandescent lamps hung near the various lathes, planers, and other machines were next tried, and it was thought that this would solve the lighting problem. It failed to do so, however, as the men on the night shift were continually having trouble with their eyes, and finally flaming arcs were tried.

After a thorough test seven Hawthorn flaming arcs, made by Western Electric Company, Chicago and New York, were installed in the main gun shop and three in the adjoining shop. These lamps were run two in series on a 110-volt circuit and, although the voltage is very unsteady due to the fact that two or three 40 or 50 hp. induction motors are often started or reversed simultaneously, the lamps are said to operate very satisfactorily.

One of the interesting features resulting from the installation of these lamps is the increase in the amount of work turned out by the night shift, which was a little over 10 per cent. The amount of light together with its quality is said to be responsible for this increase. The golden yellow rays given out by a flaming arc lamp approximate natural sunlight and are easy on the eyes.

Although the lighting of foundries has heretofore been difficult because of structural conditions, overhead cranes and the presence of smoke and dust, it is said that one or two flaming arcs hung above cranes will satisfactorily light a foundry measuring 50 x 100 ft. at a very slight expenditure for power, since one lamp gives 3000 cp. at 550 watts. With this large amount of light per lamp so few units are required that the installation and maintenance cost is very small.

The Zenith Furnace Company, Duluth, Minn., will begin the erection of a new blast furnace early next spring, plans for which are now being prepared by Arthur G. McKee, engineer, Cleveland, Ohio. The size of the stack has not been definitely determined, but it will probably be 78 ft. high by 17 ft. 6 in. bosh, or somewhat larger than the company's present stack. A new cast house, bins and trestle will also be built. The company has not decided whether it will dismantle its present furnace on the completion of the new one or whether it will operate both.

The Colorado Fuel & Iron Company, Pueblo, Colo., blew in its B furnace October 3 and blew out its A furnace October 27, leaving three furnaces in blast November 1.

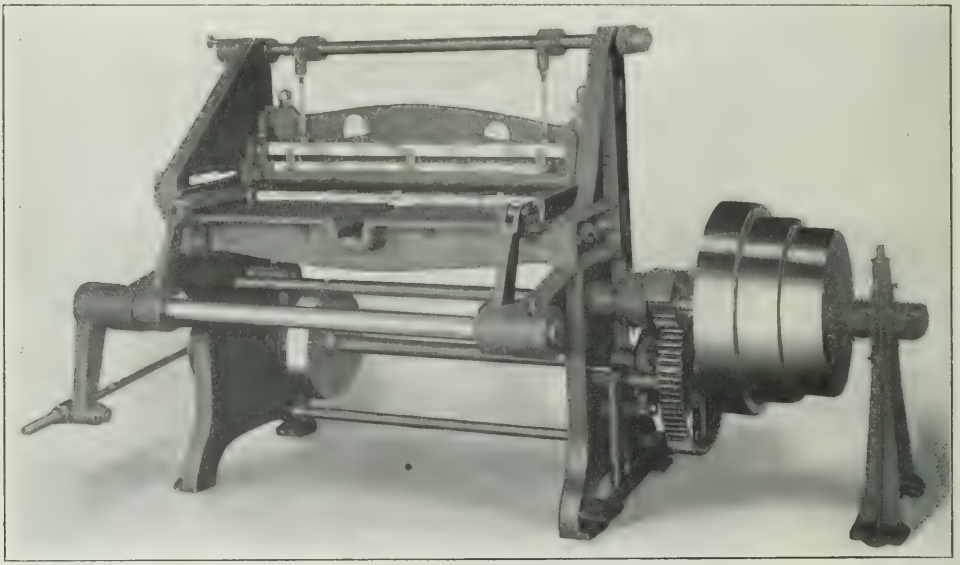
The Niagara Automatic Feed Squaring Shear

The Niagara Machine & Tool Works, Buffalo, N. Y., has equipped its line of power squaring shears with an automatic feed capable of taking hold of a sheet of stock and placing it in the proper position for cutting into strips of any desired width up to 12 in. In use the sheets being cut are supported by a bench or a platform of wood which is built in front of the machine.

The gripping mechanism is carried on a slide actuated by rock levers from a crank disk on the main shaft. The stroke of the slide can be readily adjusted on the crank disk to the width of the strips to be cut and the gripping jaws will always feed up to within ⅞ in. of the knives regardless of the width of the strip. The upper gripping jaw clamps the material by toggles which have an adjustment to care for various thicknesses of stock. A holddown attachment actuated by a cam and lever from the main shaft is placed between the gripping jaws and the knives. This holddown bears on the stock before the jaws commence to recede from the starting position to take hold of the sheet further back and consequently the material is always held firmly. Should it be desired to raise the holddown quickly when it becomes necessary to stop the machine and release a sheet after it has been partly cut this can also be done.

Three different rates of speed are available and a three-step cone pulley with step diameters of 22, 19 and 17 in. respectively is provided. The machine is back geared with a ratio of 4 to 1 and the speed of the slide is 46, 60 and 80 strokes per min., the slowest speed being used for the widest strip. The motion of the machine is controlled by the Niagara shear clutch, which is so arranged that it can be tripped either by foot treadle or by a hand lever. While the material is being fed forward the motion can be stopped at any time by releasing the pressure on the treadle or moving the hand lever.

In the engraving the feed is shown applied to the No. 236 power squaring shear, which is adapted for cutting iron of No. 14 and lighter gauges, but it can be applied to other sizes and types of the maker's shears where the cutting length does not exceed 52 in. While the feeding device can be used on practically all grades of stock it is better adapted to the fairly heavy material rather than to the lighter gauges.



A Sheet Metal Squaring Shear with Automatic Feed Built by the Niagara Machine & Tool Works, Buffalo, N. Y.

Kane & Roach Wire Straighteners

Two new machines especially designed for use in wire mills and rivet and bolt works for straightening material from the coil as it passes into the heading machine have been developed by Kane & Roach, Syracuse, N. Y. Fig. 1 shows a 12-roll wire straightener and Fig. 2 the No. 1 automatic wire straightener and shears with automatic dumping table. In the construction of both of these machines several new features, it is claimed, have been embodied which differentiate them from others on the market.

The 12-roll wire straightener has as distinguishing features the cam motion and lever for opening the rolls to get the stock between them and the ability to handle wire ⅝ in. in diameter. It will be noticed from Fig. 1 that all the rolls are mounted on adjustable plates. The three lower ones are mounted on a plate which is adjusted by the screw shown underneath so as to keep them in line with the other rolls. The three upper rolls are arranged so that each is adjusted in a vertical direction independently of the others in the plate, and the whole plate is adjusted by moving a lever at the right side, which is connected with two cams and the side connections. Giving this lever a half turn slides the upper plate and the three rolls up ½ in., thus allowing plenty of freedom to slide the stock in regardless of its crooked condition. The horizontal rolls are adjusted in exactly the same way. This machine is heavier than usual for a wire straightener, the hardened steel rolls are of large diameter and the journals upon which they run also are of hardened steel. In operation the material is fed from the coil and passes through these rolls, which straighten it before it enters the heading machine, one operation straightening it both up and down and sideways.

The No. 1 automatic wire straightener and shears with automatic dumping table shown in Fig. 2 is a special machine for this class of work. Both the upper and lower rolls are driven by gears and are arranged with several passes for different sizes of material, and

can be used for rounds, squares, hexagons and flat bars. The straightener illustrated is arranged for handling round stock from ¼ to ½ in. in diameter and has two sets of passes for straightening material as it comes from the coil, or, if desired, two coils or two bars may be run through simultaneously.

The automatic dumping table can be made in any desired length and is arranged with stop gauges so that the material is cut off to any length and the table dumps the stock automatically into a cart or other receptacle. The speed of operation is from 100 to 150 ft. per min., which can be doubled by straightening two

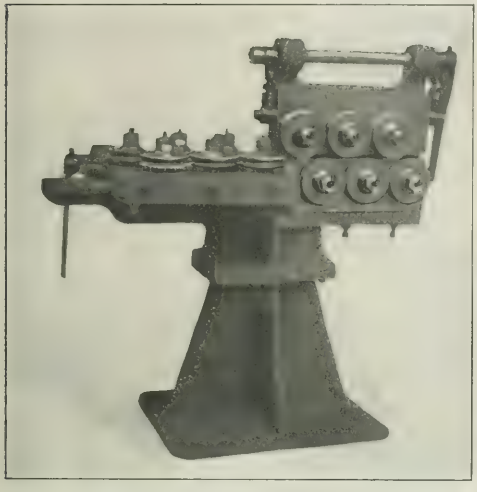


Fig. 1.—A 12-Roll Wire Straightener Built by Kane & Roach, Syracuse, N. Y.

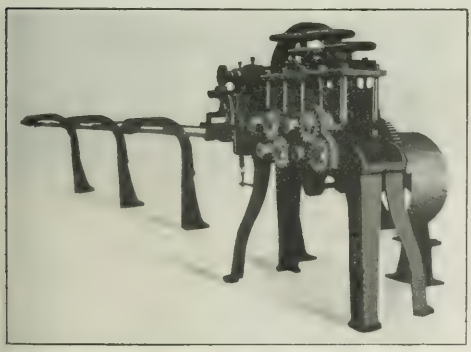


Fig. 2.—The No. 1 Automatic Wire Straightener and Shears.

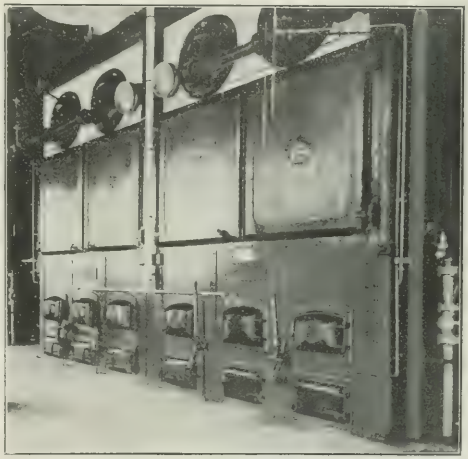
bars at a time. Three-quarter inch stock can also be straightened and cut off automatically in this machine, but in this case only one bar is handled at a time.

The C. C. & E. P. Townsend Company, New Brighton, Pa., has completed its new additions, the boilers and engines are in place and special machinery of its own manufacture for making nails, rivets and wire specialties is now being installed. The new plant will be ready for full operation about January 1. The buildings are of steel, brick and mill type construction. The increased production over the older plant will approximate 50 per cent., with the advantage that the new plant has been designed for continuous operation, the raw material being worked through the different processes from one end of it to the other. Charles L. Stewart, formerly with the Pressed Steel Car Company, Pittsburgh, is now Eastern sales representative of the company, his district taking in the cities east of Pittsburgh and through the New England States.

Test of the Miraflores Boiler Plant

Two installations aggregating 5000 hp. are at present in service on the Panama Canal at the Gatun and Miraflores locks, and the steam is used in connection with the generation of electricity to operate the cableways for placing the concrete. Some idea of the magnitude of this work can be gained from the fact that the lower locks are 41½ ft. deep and the two upper locks are each 30 ft. deep, while all are in pairs 110 ft. wide and 1000 ft. long. To construct one set of locks requires 2,000,000 barrels of cement, 2,000,000 cu. yd. of crushed stone and half that quantity of sand.

The government specification for these boilers required an evaporative efficiency of 65 per cent. when evaporating 17,000 lb. of water from a feed water temperature of 210 degrees F. to a gauge pressure of 205 lb. absolute and 150 degrees superheat. Each boiler was also required to have not less than 4000 sq. ft. of heating surface. When operating under the



Two of the Boilers Installed at Miraflores, Panama, by the E. Keeler Company, Williamsport, Pa.

conditions given above with 1 oz. of induced draft and a grade of Pocahontas coal having a fuel value of 14,000 B.t.u. per pound, a thermal efficiency of not less than 65 per cent. was to be obtained. The ratio of superheating surface to the heating surface was to be approximately 1 to 5 and the ratio of grate area to heating surface to be 1 to 65 approximately.

The E. Keeler Company, Williamsport, Pa., secured the contract for this installation and 12 Keeler water tube boilers were installed, six in each plant in batteries of two each. One of the batteries of the Miraflores plant is shown in the accompanying engraving. These boilers were erected in special steel casings entirely inclosing the front, sides and rear and lined with 2 in. of magnesia block and 9 in. of fire brick. After the canal is in operation these steam plants, which are probably the largest ever built for construction purposes, will be maintained as an auxiliary for the permanent operation of the locks.

On March 3, 1910, the acceptance test was made on one of the boilers at the Miraflores plant, at which the efficiency obtained on the basis of the contract requirements was 82.36 per cent. At this test the horsepower developed by the boiler was 569.97, or almost 43 per cent. in excess of its rating. The equivalent evaporation from and at 210 degrees F. per pound of combustible was 13.33 lb.

Rolling Mill Machinery

Improvements Made in Its Construction During the Past Decade

In a recent issue of *Stahl und Eisen,* Director H. Ortmann of Völklingen dealt specially with the improvements which the last ten years have witnessed in the equipment of rolling mills. For convenience he has divided the subject into four parts — rolling machinery proper, the transmission system, the motor and all the appliances serving to convey the ingot, billet or

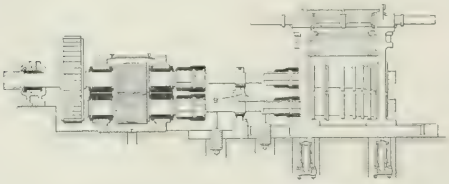


Fig. 1. A New Type of Roll Stand.

bar to be rolled, at its various stages until it becomes a merchantable article.

Rolling mill housings have not undergone many changes recently. The position of the rolls has in general remained the same but the bearings have been enlarged and widened where it has been practicable, to reduce the pressure per unit of area. The roll stands have been more securely fastened, and the dimensions at the base increased. In the case of reversing rolling mechanisms the stands have been reinforced by strong cross frames above the rolls as in Fig. 1 so that they can not move laterally nor rock, but form closed frames. For the balancing above the upper rolls various forms of construction have recently been used. The hydraulic cylinders have been placed near the top and connected by tie rods with the part built into the upper roll. The starting and balancing of the upper rolls is controlled by an electric motor.

Rolling Machinery Proper

In a form of construction designed by the Duisburger Maschinenbau Aktiengesellschaft, formerly Bechem & Keetman, intended for carrying out the principles outlined above, the threads of the upper and lower adjusting screws fit closely so that when the

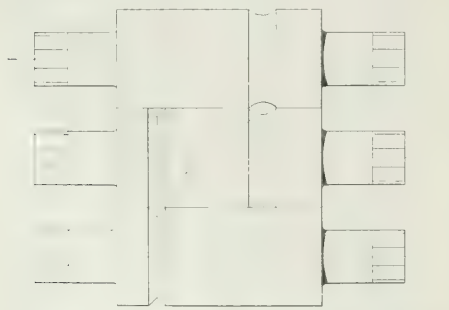


Fig. 2. Schöpf's Arrangement Diagrammed, Showing the Course of the Work.

material passes between the rolls snapping of the screws and the resulting concussions are avoided.

Another notable improvement has been the use of guides for diverting the smaller sections rolled from one pass to the next. Formerly two forms of construction were chiefly used for small sections. These were the rolling mechanisms most common in Europe where a majority of the bars are inserted by workmen and in which only medium and small bars are automatically inserted by the guides, so that a large portion of the work has to be performed by skilled hands, and the continuous rolling mechanism originating from America which is not new and is practically automatic.

By the introduction of special guides which turn the bar either 90 or 45 degrees, the elements of a simplified and automatic rolling mechanism have been provided. This result has been attained by the form of construction patented by Herr Schöpf, Düsseldorf, diagrammed in Fig. 2. In front of the stand of rolls is a curved guide not shown but mounted on a vertical column. The bar coming from the upper oval opening enters the outlet guide and is turned through an arc of 90 degrees on the semi-circular track in the direction of the lower square opening. In another form of the process, square bars are given a 45-degree turn.

A wire rod rolling mechanism provided with guides as in Fig. 2 and constructed by Gebruder Klein, Dahlbruch, for a Rhenish cable factory, consumes on an average 162.5 kw. per hour, for the production of a ton of wire 5 mm. (0.19 in.) thick, from 130 mm. (5.11 in.) blocks. This figure is surprisingly low, but it might, however, be partially explained by the increased speed

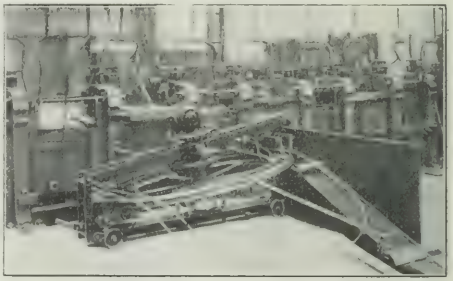


Fig. 3. View of Tober's Guiding Arrangement for Rods.

of the rolling process attained with Herr Schöpf's guides and partly by the direct driving of separate portions of the rolling mechanism, thus eliminating all rope and belt transmissions.

A similar arrangement for guiding oval bars and specially adapted for soft materials like copper has lately been perfected and introduced by Herr Tober, Oberschöneweide. This system is also applicable to iron, particularly to quite small oval and flat bars as well as hoop iron. In this arrangement a rotary motion is applied to the guiding groove by a small overhead electric motor, the speed being as great or greater than that of the bar leaving the mechanism. This style of machinery is made by the firm of Fried. Krupp, A. G., Grusonwerk, Magdeburg, and is intended to deal with several bars at the same time. Details of this arrangement are given in Figs. 3, 4 and 5.

Power Transmission

In this part of rolling mill machinery there had been notable defects both in design and construction calling for a thorough reform. Figs. 1, 6 and 7 represent power transmissions for rolls designed from modern points of view, which Herr Ortmann suggests, comparing in detail with older machinery. In discussing various points of difference in rolling mill

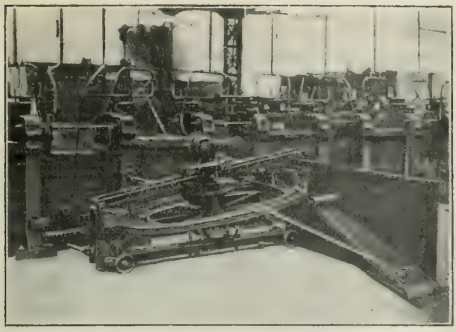
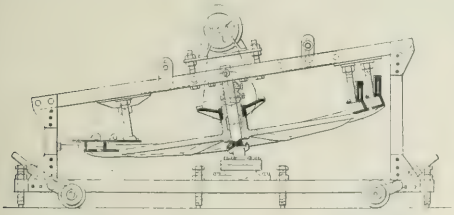


Fig. 4.—Another View of the Tober System.

equipment he calls attention to the fact that in the older rolling mills the solid spindles used in connection with the couplings were apt, if they broke, to cause damage to the engine shaft, the frame and the fly wheel. With the couplings shown in these engravings these defects are avoided; the solid spindles being eliminated and replaced by hollow spindles or similar appliances.

In rolling mills making tool and high grade steels where rapid changes in the position of the rolls are required and where friction couplings are used a new electromagnetic friction coupling designed under the Watzke patent by Salau & Birkholz, Essen-Ruhr, has been adopted and is illustrated in Fig. 8. In this coupling all the levers generally required for pressing the cone disks against each other are eliminated. The two cones, one of which is firmly fixed to one axle and the second movably attached to the other, are drawn toward each other by a stationary electromagnet. By cutting off the electric current the coupling is easily released, a spring forcing the two friction disks apart. In contrast with other electromagnetic friction couplings the advantage claimed for this model is that no grinding rings or brushes are employed. A similar electromagnetic coupling, but with rotating magnets and employing grinding rings and brushes, is made by the Berlin-Anhaltische Maschinenfabrik.



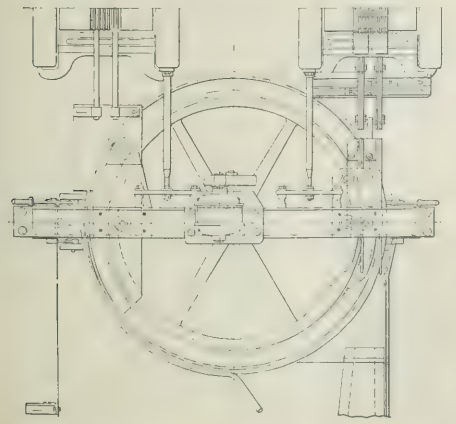


Fig. 5.—Elevation and Plan View of the Tober Guiding System.

The Motor

The adoption of electric motors in rolling mills has produced many changes stimulating the builders of steam engines to develop the working capacity of the latter and resulting in the introduction of notable improvements during the last ten years. By the aid of electric power it has been possible to increase the power of rolling trains already operated by steam or gas. Either the electric motor has been connected by belting or some other means with one of the shafts of the rolling mill and run simultaneously with the engine or it has been coupled to the engine shaft. The motor chosen is of sufficient power to replace the engine should the latter become unserviceable. A 2000-hp. gas engine directly coupled with a 2000-hp. electric motor runs parallel with the latter.

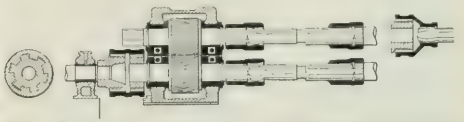


Fig. 6.—A New Type of Roll Stand, Showing Power Transmission.

The gas engine has been also extensively adopted in rolling mills, but only for trains running in one direction. The prejudice which was long entertained against this class of engine seems to have been the result of selecting too small a size; a like experience applying to electric motors. As gas engines must not be overloaded they should be chosen of higher power than the maximum expected. According to Herr Ortmann's experience where gas engines have been large enough originally and were constructed on the basis of experience they have given satisfaction and have seldom got out of order.

Prominent among the improvements made during the last ten years, are those in the regulating arrangements of reversing steam engines in which Ehrhardt & Sehmer, Schleifmühle, near Saarbrücken, as well as Sach & Kiesselbach, have been prominent.

Conveying and Finishing Apparatus

In taking up this final portion of the subject, Herr Ortmann first deals with the question of roll drives, remarking that a long time elapsed before transmission appliances, pure and simple, were radically improved. The position and dimensions of the journals and shafts were so faulty and old fashioned that considerable wear and fractures of the different parts were to be anticipated. The rolls driven by gears and their driving shafts have now been so designed and placed that the wear in any direction has become quite limited. In some cases ring-oiled bearings have been employed, arranged of late for the use of Kalypsol or similar lu-

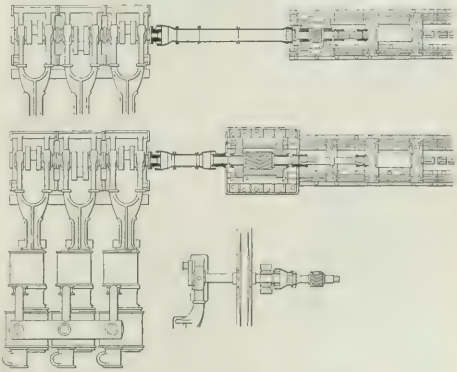


Fig. 7.—A Modern Design of Power Transmission for Rolling Mills.

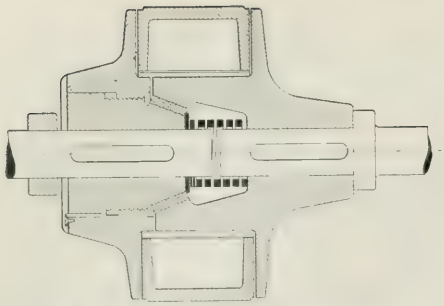


Fig. 8.—The Watzke Patent Friction Coupling.

bricant, and the results obtained have been satisfactory. In place of a gear drive for the separate rolls a crank drive which has been extensively adopted of late years has been designed and built by the Duisburger Maschinenbau Aktiengesellschaft.

The lifting tables used in connection with rolling trains in front of the frame were formerly operated by steam or hydraulic power, but lately electric motors have been used for the purpose. To avoid starting and stopping the motor, a friction coupling has been introduced which acts when the elevator is to be put in motion or stopped. Modern forms of construction are alike in this respect.

Block shears were formerly operated by hydraulic power, but during the last ten years they have been gradually improved, being now made to cut up instead of down, which results in greater steadiness. The newest electrically driven model is shown in Fig. 9 and is constructed by the Duisburg firm already mentioned. Rotating shears have been made by the Gewerkschaft Deutscher Kaiser with the disk revolving at the same speed as the roll.

Other methods are referred to, including the transportation of material by rails with eccentric movement. Among many other new features of rolling mill equipment during the last 10 years are the improved appliances for straightening rails, beams and other articles. Presses were formerly used, and much depended upon the skill of the workman. The automatic machines originally employed in America did not gain a footing in Germany, but German manufacturers now make machines through which a single pass suffices to straighten a large percentage of rails, while the remainder can readily be finished in a press near by. A speed of a meter (39.37 in.) per second has been attained with this five-roll machine.

As Herr Ortmann states in his concluding remarks, so many improvements have been made during the last 10 years in the direction covered by the fourth section of his article as to call for separate and exhaustive treatment. While his remarks are here necessarily condensed, Herr Ortmann's discussion of the general question contains a large amount of detailed information on all the points dealt with.

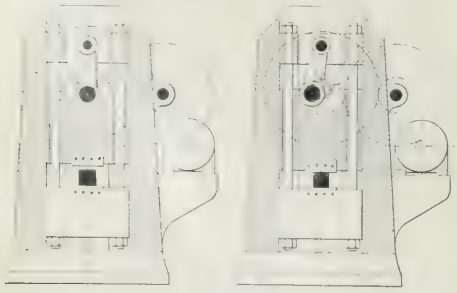


Fig. 9.—Block Shears with Movable Upper Blade for Cutting from Below.

Kilbourne & Jacobs Special Steel Tunnel Car

An order for 500 steel cars of the type shown in the accompanying engraving has recently been completed by the Kilbourne & Jacobs Mfg. Company, Columbus, Ohio. These cars are intended for handling freight in the tunnel of the Illinois Tunnel Company, which is laid out through the entire business district of Chicago, and are made up into trains drawn by electric locomotives. An illustrated description of this tunnel system appeared in *The Iron Age*, August 4, 1904.

Two of the special features in the design of these cars were occasioned by the fact that the radius of some of the curves is as small as 15 ft., which is also complicated because there is not a sufficient clearance to permit superelevation of the track and the diverse character of the material handled. In addition to handling general merchandise and manufactured products these cars also carry the coal supply to and remove the ashes from the large office buildings in the downtown districts and also carry the mail between the Post-office and the various railroad stations.



An All Steel Car for Freight Tunnel Work Built by the Kilbourne & Jacobs Mfg. Company, Columbus, Ohio.

These varied uses require a car of very adaptable design. The one shown is of steel throughout. The side and the end shield are removable, being riveted to stakes which fit into pockets. The cars are built to carry a load of 15,000 lb. and weigh 3610 lb. Their over-all dimensions are 12 ft. 5⅞ in. long, 5 ft. 1 5-16 in. high and 3 ft. 9½ in. wide. The cars are equipped with automatic couplers and spring draft gear, and the trucks, which are spaced 6 ft. 3 in. on centers, have Andrews cast steel side frames and the bolsters are also of cast steel. The wheel base of the trucks is 27 in. and the gauge of the track is 24 in. The diameter of the truck wheels is 14 in.

Production of Charcoal Bloomaries in 1909.—The American Iron and Steel Association finds that the production of iron blooms, billets, and bars in charcoal bloomaries from pig iron or from pig iron and scrap, amounted in 1909 to 56,365 gross tons, against 55,973 tons in 1908, 84,623 tons in 1907, and 94,999 tons in 1906. It will be seen that there has been a decline in the manufacture of hammered charcoal blooms in recent years. Of the 1909 total, 9,593 tons was manufactured for sale, and 46,772 tons for the consumption of makers. Pennsylvania is the principal producer, its total being 44,146 tons last year, against 46,144 tons in 1908 and 71,099 tons in 1907. The other producing states, Massachusetts, Maryland, Kentucky, and Ohio, had a total of 12,219 tons last year, 9,829 tons in 1908, and 13,524 tons in 1907.

A Dodge Short Center Rope Drive

At the strawboard and wrapping paper mill of the Lawrence Paper Company, Lawrence, Kan., three beaters are belt driven from a line shaft in the basement. This shaft is arranged to be driven either by an electric motor or by a steam engine. For a number of years the engine alone was used, but it is now kept in reserve for the days when low water reduces the supply of current from the hydroelectric plant.

The particular interest centers around the engine

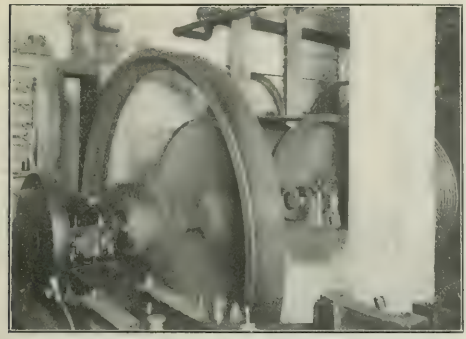


Fig. 1.—Short Center Rope Drive at the Mill of the Lawrence Paper Company Installed by the Dodge Mfg. Company. Mishawaka, Ind.

and its connections, as it is here that the short center rope drive illustrated herewith was installed by the Dodge Mfg. Company, Mishawaka, Ind. Figs. 1 and 2 give views of the drive from opposite ends, while Fig. 3 shows the details. The engine runs at 85 rev. per min. and the line shaft at 142 rev. per min. At first this difference in speed and the lack of room for a long rope drive led to the installation of a pair of spur gears having 98 and 59 teeth respectively with a pitch of 2½ in. and a face width of 11½ in. Considerable trouble was experienced with these gears as well as noise, since the load is subject to large and sudden fluctuations inseparable from the work of pulping straw, jute and other fibrous materials. In installations of this kind to avoid shock both a flywheel and an elastic drive are essential. The engine had the first, but the gears could not supply the latter, and consequently the fluctuations in load frequently broke gear teeth.

In addition to the breaking of the teeth there was also a continuous loss of power in friction and this led to the installation of a 250-hp. Dodge American system rope drive to replace these gears. As there was only 62½ in. between the centers this was the only practicable solution of the problem, combining the adaptability to a small working space with the elasticity for enduring and absorbing shocks. The sheaves were made as large as could be used in the small space, the rim flanges having only running clearance. The rope makes 19 wraps around the sheaves and the tension equipment is so arranged that the carriage runs on a horizontal track from the rear wall at right angles to the drive. The substitution of rope drive for the gears necessitated the reversal of the direction of rotation of the engine, which was easily

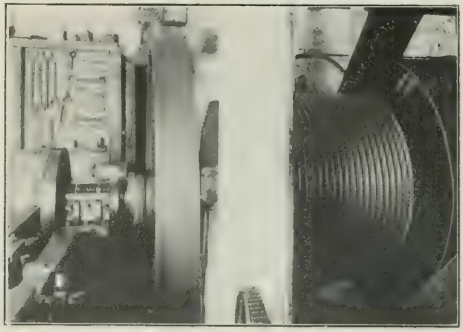


Fig. 2.—The Driven End of the Drive.

made, but previous conditions were not changed in any other way.

When the motor does the driving, as was the case at the time the photographs which are reproduced were taken, the engine is disconnected at the crank pin and the eccentric and the line shaft drives the flywheel through the rope drive. In this way the balancing effect of the momentum in the rotating wheel is retained.

Ferro-Lithic Plates for Concrete Construction

The Rock Island Railway Company, which is building a large freight station in Kansas City, Mo., is using in the reinforced concrete construction Ferro-Lithic plates manufactured by the Berger Mfg. Company, Canton, Ohio. Ferro-Lithic plates consist of dovetailed, cross-ribbed steel sheets which act both as forms and reinforcement. The concrete is applied on the upper side while a good plastering surface remains on the lower side. Important saving in time is secured by this construction, as no wooden forms are needed. It also saves the waste in lumber inseparable from wooden forms. It is to be used for the ceiling of the second floor of the new station, which will be occupied by the office force. As a result of the introduction of this form of concrete construction, which was adopted by

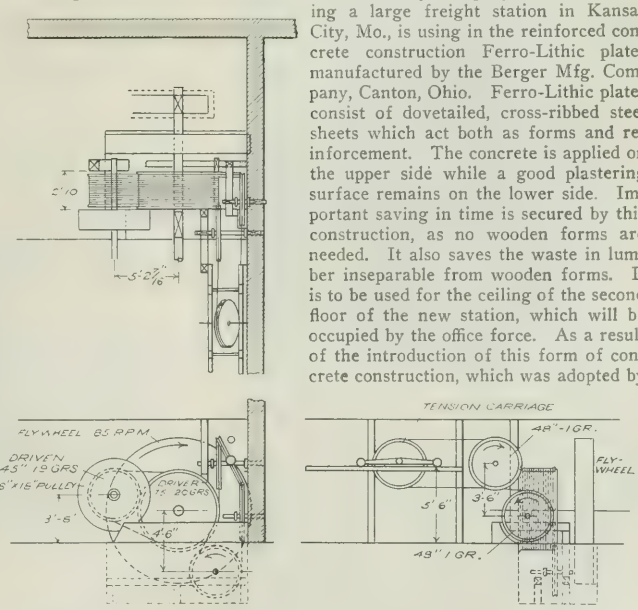


Fig. 3.—Plan and Elevations of the Drive.

H. T. Hawk, architect for the Rock Island Lines, it is expected that hereafter similar buildings for this railroad system will include specifications for Ferro-Lithic plates. The contractors for the erection of the building are George B. Swift & Co., Chicago.

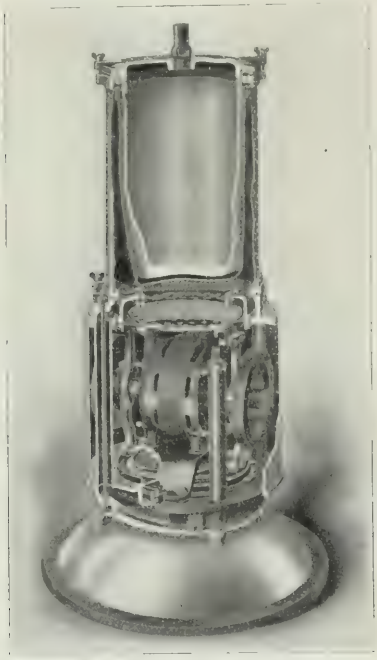
The Cambria Steel Company, Johnstown, Pa., had four of its furnaces in blast November 1, three having been blown out last month—on October 22, 23 and 28, respectively.

The Keller Duplex Vacuum Cleaner

A New Design with the Pumps Superposed

Announcement was made under New Tools and Appliances in *The Iron Age*, September 15, 1910, that the Keller Mfg. Company, Twenty-first street and Allegheny avenue, Philadelphia, Pa., had placed on the market a new type of duplex diaphragm vacuum cleaner. The special advantages of the machine are that it is entirely self-contained, the working parts are arranged in a vertical line and balanced so that the machine is steady and smooth running, the suction is constant, and the central portion of the diaphragm is not rigidly connected to any of the moving parts.

As will be seen from the engraving, which shows the interior construction of the cleaner, it consists of three parts: the base, the middle or operating portion and the upper or dust collecting chamber. The base is a



Broken View Showing the Interior of the Santo Vacuum Cleaner Made by the Keller Mfg. Company, Philadelphia, Pa.

round conical casting 23 in. in diameter and is shown broken away so that the general details and construction can be clearly seen. This type of base affords sufficient spread and weight to give the machine a firm bearing and at the same time avoid the necessity of a special foundation so that the machine can be set down on any level floor.

The operating part consists of two pump chambers, one above the other, the upper one being supported by four tubular columns, which also serve as a passageway for the air from the vacuum chamber to the lower pump. A substantial bracket or bridge supports a ¼-hp. motor, designed especially for this machine, between the two chambers. The ⅝-in. motor shaft extends beyond its bearings at each end and carries double eccentrics which are machined from a single piece and keyed to the shaft. Steel ball bearing races and aluminum eccentric rods surround the eccentrics. These rods are four in number, two connecting with the upper pump and two with the lower. The eccentrics are 180 degrees apart on the shaft, and each revolution of the shaft gives two impulses to the pump or 2400 per min. The bearings are of liberal dimensions and are bushed with bronze. Each has a grease cup of sufficient capacity to operate the machine for several months without attention. The specially constructed ball bearing eccentrics have the balls uniformly distributed, and these are kept at equal distances by felt plugs which are impregnated with a heavy oil. In this way proper lubrication of the eccentrics for a long time is insured and additional lubricant is supplied to the bearing by simply putting a few drops of oil in each raceway.

Each of the pumps is of the maker's standard type and consists of a saucer-shaped chamber closed by a diaphragm. The two connecting links actuating the pump are attached to a ring which in turn is secured to the center of the diaphragm. The entire portion of the diaphragm inclosed within this ring is perforated with a number of ½-in. holes, and this perforated portion is covered by a galvanized steel plate having the same number and size of holes as the diaphragm, but located so that the holes in the plate and the diaphragm are not in line with each other. A galvanized wire netting is placed above the plate to limit the play of the diaphragm within the ring. When the moving portion ascends, the air is free to pass through the holes in the steel plate and across and up through the holes in the diaphragm, but on the return stroke the latter presses against the steel plate and closes the holes. The number and the size of these holes is so proportioned that free and unrestricted passage of the air is afforded without loss due to back pressure. In this construction it is claimed that when the connecting rods and the ring which are positive in their action start to move in either direction, the inertia of the slack diaphragm in the center of the ring causes a drag which automatically opens or closes the valves at the proper moment. The positive action of the pump is said to begin on the instant of the reversal of motion, and consequently the volumetric efficiency of this form of pump is very high, and the customary slippage loss encountered in ordinary piston or rotary pumps is reduced to a negligible quantity. The arrangement of the eccentrics and cylinder is said to be such that the two pumps are automatically balanced by the atmospheric pressure and the wear on the motor bearings reduced to a minimum. The pump mechanism is claimed to have a friction loss of less than 5 per cent. of the available motor power.

The dust chamber consists of a cylindrical steel shell mounted above the operating or pump portion and is readily removable by loosening the three thumb nuts which hold it in place. A lid locked in place by thumb nuts and sealed with a rubber gasket closes the top of the chamber. For separating the dust from the air two bags, one inside the other, are used. The inner one is of cotton drill and the outer one of heavy felt. It is claimed that the separation in this interior bag is practically perfect, and the outer felt one is used merely as a precaution to avoid any possibility of dust being drawn into the pump if the operator should carelessly replace the lid without returning the dust bag. The interior bag may be taken out for removing the dust by simply loosening the two thumb nuts on the lid and removing it.

In operation the dust-laden air enters the upper chamber through a 1½-in. pipe in the center of the lid. As soon as the air is relieved of its burden, part of it passes directly to the upper pump while the balance goes down through the supporting pipe columns to the lower one. After passing through the pumps the strained air is blown out around the motor and escapes through an opening in the casing. The inlet pipe is connected to the piping of the house or building by a 5-ft. length of 1½-in. rubber hose, which gives a connection preventing the transmission of any noise and

jar and also allows the lid of the machine to be removed without disturbing any connections.

The cleaner stands 40 in. over all and weighs 180 lb. Its capacity is 45 cu. ft. of free per min., and the vacuum produced is 8 or 9 in. mercury gauge.

A Pridmore Rock-Over Molding Machine

A new rock-over molding machine designed to carry a 22 x 18 in. flask has been placed on the market by Henry E. Pridmore, Chicago, Ill. This machine has a 12-in. draw which is 4 in. longer than the one previously furnished and permits the machine to handle unusually deep patterns and very materially increases

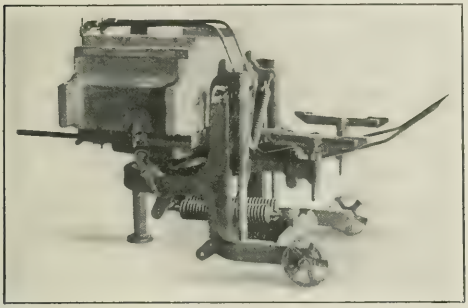


Fig. 1.—A Flask Rammed and Clamped Ready to Roll Over in the New Rock-Over Drop Molding Machine Built by Henry E. Pridmore, Chicago, Ill.

its scope and adaptability. Fig. 1 shows the flask rammed and clamped ready to roll over, Fig. 2 is a view showing the clamper released and the mold dropped away from the pattern, while in Fig. 3 the pattern is rolled back into position, and the mold is ready to be lifted away.

In Fig. 1 the bottom board is clamped in place by adjustable clamping rods. The rocking-over process

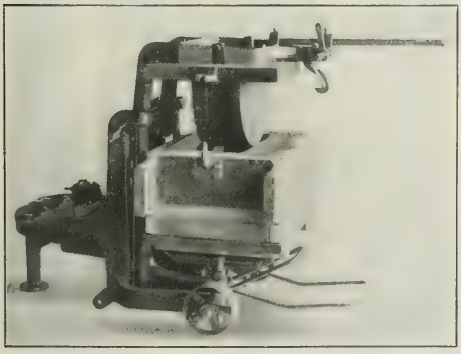


Fig. 2.—The Clamper Released and the Mold Dropped Away from the Pattern.

is assisted by the double extra heavy balance springs, and in Fig. 2 where the flask has been dropped away from the pattern the advantage of the deep drop is plainly shown. When the flask is dropped away from the pattern the latter comes out of the sand without tearing, thus leaving a clean true mold.

This machine is particularly adapted for molding pump cylinders, &c., and has also been used for molding two-barreled automobile engine cylinders complete in one casting with valve chambers on both sides. These cylinders are molded in a straight flask, and in their preparation three machines are used, one each on the

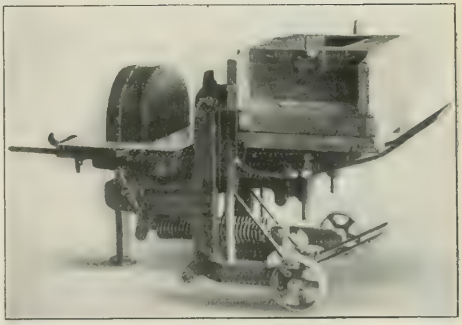


Fig. 3.—The Pattern Returned and the Mold Ready to Be Lifted from the Machine.

cope, the cheek and the drag. A record of 15 cylinders per man per day has been attained with a 16 x 14 in. machine fitted with only a 5-in. drop. Ten of the new machines have been installed in one shop for making large cores for air compressors, engines, &c., but no figures of the production are as yet available. The 12-in. drop machine can handle much heavier work and is considered a better machine than any previously built of this type, for the reason that it has a much larger draw. The new machine weighs 900 lb., but is readily portable, as it is well balanced and equipped with trucks.

The Minnesota Steel Company's Plant

Steady progress is being made in the construction of the new plant of the Minnesota Steel Company, at Duluth, Minn. The two blast furnaces, on which foundation work has been under way recently, will be 22 x 95 ft. and will be equipped with eight hot blast stoves. They will have a capacity of about 325,000 gross tons of basic pig iron a year. The steel plant will have seven 75-ton basic open hearth furnaces, with an annual capacity of 300,000 gross tons of ingots, and one 600-ton metal mixer. There will be two continuous regenerative bar heating furnaces and four four-hole soaking pits. The rolling mills will consist of one 40-in. reversing blooming mill, one 28-in. combined rail and structural mill, with six stands of two-high and two stands of three-high rolls, and one combined merchant mill, with nine stands of 16-in. roughing and three stands of 12-in., two stands of 10-in. and two stands of 8-in. finishing rolls. The products will be rails, bars and structural shapes, the total annual capacity being about 225,000 gross tons.

At the recent annual meeting of the National Rolling Mill Company, Mansfield, Ohio, H. L. Reed retired from the presidency, owing to the condition of his health, but remains on the Board of Directors. The following officers were elected: President, L. A. Ott; first vice-president, August Kochheiser; second vice-president, C. T. Moriarty; treasurer, P. J. Wigton; secretary, E. C. A. Reed. The officers and A. W. Monroe and Mr. Reed comprise the Board of Directors. The company is reported to be in a flourishing condition and its output has been contracted for until next March. The new corrugating plant is under roof and other extensions are planned.

The Whitney-Kemmerer Company, through its Cincinnati, Ohio, office, has closed contract with a prominent Southern furnace for approximately 4000 tons per month of its Wise County coke, for one year dating from January 1. This deal was made on the sliding scale basis.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square ..... ₱ lb 1.90¢
1½ to 4 in. x ⅝ to 1 in. ..... ₱ lb 2.10¢
1½ to 4 in. x ¼ to 5-16 ..... ₱ lb 2.10¢
Rods—⅜ and 11-16 round and square ..... ₱ lb 2.10¢

Angles:	Cts ₱ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 5-16 in. and over	2.35¢
1½ to 2 in. x ⅛ in.	2.60¢
1½ to 2½ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in. and thicker	2.20¢
1 to 1¼ x ⅛ in.	2.30¢
5/8 x ⅛ in.	2.40¢
½ x ⅛ in.	2.50¢
5/8 x ¼ in.	3.35¢
½ x 3-32 in.	4.35¢

Tees:

1 in. ..... 2.65¢
1¼ in. ..... 2.45¢
1½ to 2 in. x ¼ in. ..... 2.15¢
1½ to 2½ x 3-16 in. ..... 2.35¢
3 in. and larger ..... 2.15¢
Beams ..... 2.10¢
Channels, 3 in. and larger ..... 2.40¢
Bands—1 to 6 x 3-16 to No. 8 ..... 2.50¢
"Burden's Best" Iron, base price ..... 1.75¢
Burden's "H. B. & S." Iron, base price ..... 2.35¢
Norway Bars ..... 3.50¢

Merchant Steel from Store—

per ₱ lb

Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.50¢
Best Cast Steel, base price in small lots ..... 4¢

Sheets from Store—

Black

	One Pass, C.R.	R. G. Cleaned
	Soft Steel.	
No. 16	₱ lb 2.50¢	2.80¢
Nos. 18 to 20	₱ lb 2.70¢	2.90¢
Nos. 22 and 24	₱ lb 2.75¢	3.05¢
No. 26	₱ lb 2.90¢	3.15¢
No. 28	₱ lb 2.90¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₱ lb 12 @13½
Patent Planished, W. Dewees Wood ..... ₱ lb A, 10¢; B, 9½¢ net

Galvanized.

Nos. 12 and 14	₱ lb 2.95¢
Nos. 22 to 24	₱ lb 3.30¢
No. 26	₱ lb 3.50¢
No. 28	3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₱ lb ..5.15¢
No. 26	₱ lb ..5.25¢
No. 28	₱ lb ..5.35¢

Corrugated Roofing—

2½ in. corrugated:	Painted	Galvd
No. 24	₱ 100 sq. ft. 3.85	4.80
No. 26	₱ 100 sq. ft. 3.95	4.90
No. 28	₱ 100 sq. ft. 4.90	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 ..... $6.35
IX, 14 x 20 ..... 7.60
A. Charcoal:
IC, 14 x 20 ..... $5.10
IX, 14 x 20 ..... 6.50

American Coke Plates—Bessemer—
IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating $8.50
IX, 20 x 28 with an 8 lb. coating 10.50

Seamless Brass Tubes—

List November 13, 1908 ..... Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 ..... Base price 18¢

Copper Tubes—

List November 13, 1908 ..... Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 ..... 19½¢ ₱ lb

High Brass Rods—

List August 1, 1908 ..... 14½¢ ₱ lb

Roll and Sheet Brass—

List August 1, 1908 ..... 14½¢ ₱ lb

Brass Wire—

List August 1, 1908 ..... 14½¢ ₱ lb

Copper Wire—

Base Price, carload lots, mill ..... 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. ..... 18 ¢
Sheet Copper Cold Rolled, 14 oz. ..... advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 14 oz. ..... ₱ lb
Sheet Copper Polished over 20 in. wide, 14 oz. ..... square foot
Planished Copper, 14 oz. square foot, more than Polished

METALS—

Tin—

Straits Pig ..... ₱ lb 39 @39½¢

Copper—

Lake Ingot ..... ₱ lb 14¾@15 ¢
Electrolytic ..... ₱ lb 14½@14¾¢
Castings ..... ₱ lb 14¼@14½¢

Spelter—

Western ..... ₱ lb 6¼@6½¢

Zinc.

No. 9, base, casks ..... ₱ lb 5¼¢ | Open ..... ₱ lb 5¾¢

Lead.

American Pig ..... ₱ lb 5 @5¼¢
Bar ..... ₱ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed ..... ₱ lb 22½ @23 ¢
No. 1 ..... ₱ lb 20¢ @..¢
Refined ..... ₱ lb 18¼ @18½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₱ lb .. @10¢
Hallett ..... @10¢
Other Brands ..... @9½¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₱ lb 11.00@11.25
Copper, Heavy and Wire	₱ lb 10.75@11.00
Copper, Light and Bottoms	₱ lb 9.75@10.00
Brass, Heavy	₱ lb 7.25@ 7.50
Brass, Light	₱ lb 5.75@ 6.00
Heavy Machine Composition	₱ lb 9.75@10.00
Clean Brass Turnings	₱ lb 7.25@ 7.50
Composition Turnings	₱ lb 8.25@ 8.50
Lead, Heavy	₱ lb .. @ 5.75
Lead, Tea	₱ lb .. @ 5.50
Zinc Scrap	₱ lb .. @ 4.00

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Established 1855 — New York, November 17, 1910 — Vol. 86: No. 20

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Further Rail Orders

No Uniform Policy in Railroad Buying

Pig Iron Markets Firmer, While Finished Materials Are Generally Quiet

The conflicting reports concerning the policy of the railroads in the purchase of rails and equipment are evidently due to the fact that each road will be governed by its own condition and needs. What has come out in the past week indicates that while some roads will buy little, others are now considering purchases of considerable amount. In some cases orders are being placed, or will be placed, without waiting for the decisions on rate advances; other requisitions will be determined by the outcome of the present hearings.

The Louisville & Nashville Railroad has just placed 29,000 tons with the Tennessee Company. The Carnegie Steel Company, in addition to 15,000 tons of the 30,000 tons bought by the Norfolk & Western, will roll 5700 tons for A. De Mayo & Co., and the leading interest has sold 8000 tons to the Kansas City, Mexico & Orient. The Pennsylvania Railroad and the New York Central are making progress on their rail estimates, and the Lehigh Valley, Lackawanna, New Haven and Boston & Maine are expected to place orders soon, while several Western lines are negotiating. The Boston & Maine's requirements may be as high as 50,000 tons, representing an unusual programme of renewals.

Considerable steel car business is likely to be given out before the end of the year, 10,000 to 12,000 cars being included in late estimates. An early order is expected from the Pittsburgh & Shawmut for 2800 cars and a number of locomotives.

Finished material markets have been generally quiet, and buying on a large scale, apart from rail orders, is not looked for in the remainder of the year.

The condition heretofore noted in the merchant pipe market—a growing demand from jobbers whose stocks have been depleted—is more marked, and pipe mills are increasing their output.

The tin plate situation has improved, two or three important consumers having placed their orders for the first half of 1911, though shipments in some cases will not begin before spring.

Sheet mills are fairly well sold into 1911, and prices are maintained as a rule, though shading has been reported in territory tributary to certain mills.

In structural steel the chief railroad inquiry is from the Boston Elevated, which will require 5000 tons for

its Cambridge extension. The Virginia Railway is expected to contract for 2000 tons for bridges. While the 1.40c., Pittsburgh, basis is still shaded, 1.35c. is reported less common on plain material.

Plate mills are running at about 50 per cent. of capacity, and the prospect for betterment is not immediate, unless car orders improve. About 10,000 tons will be needed for the two new battleships.

The market for billets and sheet bars has not been seriously tested, so that the effect here of the firmer tendency in steel making pig iron has not yet been measured.

All pig iron markets report a slight improvement, and in some sections prices show firmness, quite in contrast with the willingness of furnaces a fortnight ago to accept low offers. In the Buffalo district sales of 35,000 to 40,000 tons, chiefly foundry grades, have raised asking prices 25c. to 50c. Southern irons continue to lag behind Northern grades in activity, as $11.50, Birmingham, for No. 2, for which most Alabama sellers are holding where 1911 deliveries are involved, is above the Northern parity in a good many districts.

In the Pittsburgh district considerable inquiry has developed for steel making iron, and both basic and Bessemer are firmer. One buyer has asked for 30,000 tons of Bessemer for the first half of 1911, and a steel foundry has asked for 10,000 tons of basic, while other inquiries amount to 10,000 tons. Bessemer iron is held more firmly at $15, at Valley furnace, and $13.50 is more generally the minimum quotation for basic, while some producers of the latter are keeping aloof from the market at this level.

Railroad Earnings

Inasmuch as there has been an average increase in railroad mileage in the past 10 years of 2.1 per cent. each year, comparisons of total earnings in different years are misleading, for the new mileage is necessarily capitalized and represents fresh investment. Even the statement of earnings per mile does not eliminate all possible error, since by reason of double tracking, increase in the number of cars and locomotives per mile of line, and increase in their capacity per unit, the capital investment per mile of line is, over long periods of time, increasing, and a portion at least of this increase is capitalized. The statement per mile of line, however, is the most indicative of actual conditions of any that can be compiled. The following table shows the total operating revenues and net operating revenue, from rail operations, per mile of road reporting, as given by the reports of the Interstate Commerce Commission since the establishment of the uniform system of accounting on July 1, 1907:

All Roads Reporting. Per Mile of Line, Rail Operations Only.

	1907-8.		1908-9.		1909-10.	
	Gross.	Net.	Gross.	Net.	Gross.	Net.
July	$1,012	$335	$845	$291	$934	$333
August	1,065	373	896	326	1,002	383
September	1,033	343	946	354	1,040	403
October	1,103	368	1,003	383	1,100	439
November	968	291	916	323	1,047	399
December	852	227	887	296	936	288
January	759	180	789	218	888	242
February	703	163	752	212	854	240
March	801	241	888	301	1,007	331
April	763	221	846	268	948	281
May	760	220	865	282	986	301
June	800	260	902	319	996	323
Average	$884	$268	$878	$298	$978	$330

The returns for July last, just published by the Interstate Commerce Commission, are in full as follows:

Rail operations:	Total.	Per mile.
Gross	$230,615,776	$969
Net	73,157,547	307
Ratio, per cent	68.28	...
Outside operations:		
Net revenue	$320,042	$1
Operating income	64,746,769	272
Mileage operated	238,168.64	...

The net revenue from outside operations is always light, the items almost balancing. The "operating income" is obtained by taking the net revenue from rail operations, adding the net revenue from outside operations, and deducting one-twelfth the annual taxes. The operating income thus varies from month to month in practically the same manner as the net revenue from rail operations, and these, as given in full for three years in the preceding table, can be studied as indicating net results to the railroads.

The fiscal year 1907-8 opened when traffic was at high tide, the total operating revenue of $1103 per mile of line in October, 1907, being probably the highest in the history of American railroading, although this cannot be stated with certainty, as there are not comparable statistics for previous years. The decrease thereafter was sharp and conclusive, for only four months later, in February, the lowest revenue, $703, for any month in the period was shown.

Before scrutinizing the figures of gross and net revenue in detail, however, it is well to observe their relations with each other. The net is the gross, less operating expenses, and the ratio of operating expenses to gross is called the operating ratio. As it increases the net operating revenue decreases.

The lowest operating ratio in the fiscal year 1907-8 was 64.99 per cent. In the next fiscal year a much lower minimum was reached, 61.80 per cent., in October. Operating ratios have been as follows:

1907-8.....69.67	1909-10.....66.24
1908-9.....66.08	July, 1910.....68.28

It will be observed that there has been no wide variation, such as might be surmised from the amount of discussion which has recently been indulged in. The gross and net revenues from rail operations have hung pretty closely together month by month.

Examining the gross revenues in more detail, it will be observed that the average for the fiscal year just ended, $978, well exceeds the average for the preceding fiscal year, and still more the average for the fiscal year 1907-8, which contained four very good months, an average month, and seven poor ones. A thousand dollars a month may well be considered a very good average, for the best month shown was only 10 per cent. in excess of this. The past fiscal year has come very close to showing this average, and so recent a month as March exceeded it, while July just past showed $969. On the whole, then, it must be inferred that railroad gross earnings this year have been running pretty heavy, while there has been a steady and very great increase from the lean months closely following the panic of October, 1907.

The month of heaviest gross operating revenue was October, 1907. In that month the net operating revenue from rail operations was, as seen in the table, $368. That sum, however, was exceeded once in the following fiscal year, and it has been exceeded no less than four times in the fiscal year just ended.

Even the cursory examination of the figures which

has just been given indicates pretty clearly that railroad earnings, whether gross or net, have become quite good in the past year, and the trend since last spring, while slightly downward, is by no means alarmingly so. The most unfavorable feature of the trend at the time of the latest statistics is that — for July last — the gross revenue was quite large, $969, while the net, $307, was relatively small. In a measure this probably represents advanced wages, but there has been so much said, whether rightly or wrongly, about the disposition of railroads to pad their expenses in the past six months that it would be unreasonable to take it for granted that all the figures for the past three years are absolutely comparable.

The stake of the steel industry in railroads has unquestionably changed greatly in the past few years. Going back to the eighties, the prime interest of the iron trade was in railroad building. In 1887 there was an increase of no less than 12,876 miles in the length of railroad in the United States, the average annual increase for the three years 1886-7-8 being 9265 miles. In 1891-2-3 there was another maximum, the average for these three years being 9387 miles. At no subsequent time has the increase in a single year been equal even to two-thirds of either of these averages. The average annual increase in the past ten years has been 4470 miles. In the eighties railroad consumption of iron and steel was chiefly in the building of railroad, and that in the strict sense, for there was so much less business that equipment amounted to much less per mile of line than it does now.

After the industrial depression of 1893-8 the railroad industry began a fresh course of expenditure. In this case the expenditure was not nearly so much for new road as it was for the improvement of existing railroad. Heavy locomotives were bought in large numbers. Light cars were replaced with heavy cars and soon these heavy cars became almost exclusively all-steel and steel underframed cars. Light rails were taken out of track and heavy sections substituted. Existing bridges were replaced by heavier structures. In the spirit which actuated the railroad industry, and in the source of the funds by which the expenditures were paid for, there was little, if any, difference between the movement in the eighties and the recent movement. At the earlier time it was necessary to build track to get to the business, which was increasing, but of late it has not been so necessary to do this as to find equipment to handle the business standing beside the track, for in the country as a whole there is one mile of railroad for every 13 square miles of surface.

These two great movements are past, and it may be that nothing resembling them will occur for years to come, but meanwhile there has come what amounts to practically a new source of demand for railroad material, that arising from its wearing out. At first iron and steel products were required for building; now they are required for upkeep. Comparisons over a long period of years will show that with remarkable steadiness, and subject to really only minor fluctuations, the total ton-mileage of the railroads of the country doubles every 10 years. Thus while in 1887 the production of rails was 2,100,000 tons, more than two-thirds as much as last year's production, the work the rails in track had to perform, irrespective, obviously, of how many miles of them there were, was less than one-fourth of what it is to-day. As with rails, so with locomotives and cars.

A feature of this change in the character of railroad demand which calls for particular attention at this time, in view of the discussion of rates, borrowing power, &c., is that the expenditures for this upkeep are a part of operating expenses, and must be met before net income is ascertained. This the Interstate Commerce Commission requires, the new accounting system setting up depreciation funds for the purpose.

The Economy of Specifying Deliveries

Manufacturers who specify the date of deliveries on all purchases find that a very material saving ensues, amounting at times to the equivalent of an increased working capital. When production exceeds orders the seller is apt to hurry shipments, billing goods as soon as possible, in order that he may receive the money at the earliest moment. Also, he is prone to ship first that which is most convenient for him to produce at the time, regardless of its place in the routine of manufacture of his customer. To take a concrete case: A machinery builder who had placed a general order for the castings of a large lot of heavy machines, received first the counterweights, the very last part required by the assembling room. The bill came with the goods. The outcome was the establishment of the rule of specification of date of shipment. If a lot of castings is needed September 1, that date is specified and a bill dated earlier will be paid only upon the agreed basis. In one instance delivered goods, involving the tidy sum of $5000, specified for October delivery, were billed in August. Were the bill accepted the account would have been settled in September. Under the contract it was paid 60 days later, giving the buyer the use of the money for that considerable length of time. In the long run a working capital has a larger buying power. The rule may even obviate at times the necessity of accommodation from the banks. Its adoption would be worthless, however, excepting when coupled with a complete shop system of keeping track of production, because in order to specify deliveries the date must be foretold with some degree of accuracy.

A Record of Replacement Parts

A record of the replacement of parts is valuable to the machinery builder, both for maintaining a supply of repair parts for customers and as a guide to future design. The weaknesses of a machine are thus tabulated. The experience of the Bullard Machine Tool Company, Bridgeport, Conn., culminated in this system several years ago. Successive replacement orders for a certain pinion were received. They led to the examination of the order files, revealing a hitherto unrealized weakness, for breakages of the part had been more numerous than was necessary. The pinion was replaced by one of a high quality steel, and the orders dwindled. From this as a beginning a careful record of all replacements was maintained by the designing department and has proved of inestimable importance. As models are improved from time to time, such data furnish proof of satisfactory strength or of the need of improvement.

Replacements will always be necessary, no matter how perfect the design of a machine. The fault may

be with the workmen of the customer; and again most machines have their weak points, no matter how great the skill and care of the designer; ultimately, wear is responsible for replacements. The manufacturer is wise if he is always ready to make immediate shipment. It should be an invariable rule to ship on the date of receipt of the order, and relieve the customer of the handicap of an idle machine, since on it may depend the procession of shop operations. Carelessness in such details may be costly when the user is again in the market for machinery.

Parts should always be in stock. To manufacture them without an accurate system is expensive. The record of replacement orders furnishes a basis of calculation for extra parts in sending lots of machines through the works.

Examining Ratings in Buying

The custom is growing of examining credits in buying as well as in selling. The theory is that to establish business relations of any sort with a house which is not founded upon a substantial basis is unwise. The newcomer in a field of industry may be poor in cash but rich in ability and energy and product. An older concern may be rich in tradition and reputation but weak in existing management. Actual rating does not always indicate the desirability or undesirability of beginning relations, either in buying or in selling. As the good sales department watches customers' credits so should the good buyer. The quality of product is often affected by the same conditions which produce financial stress. For staple products many buyers like to tie up with one good house, which learns to understand their wants, and thus avoid much of the trouble and cost of experimenting. In purchasing equipment the certainty that the maker will remain in business is insurance against difficulty in obtaining repair parts.

Correspondence

Single Spaced Correspondence

To the Editor: We are pleased to see your protest against single spaced correspondence, though we are not pleased with the effect of double spacing nor the necessity of too careful calculation in selection of size of sheet for each communication, bulky accumulation of copy, &c. What we would like to see is a space and a half. Can you influence typewriter manufacturers to arrange for this spacing on part if not all of their machines? THE W. J. CLARK COMPANY.

SALEM, OHIO, November 11, 1910.

A member of the Copper Producers' Association says that the charge made last week that the monthly figures of the association are manipulated is false and adds: "The production for October, which was very much larger than was generally expected, is accounted for in part, at least, by a very large contribution to the output by a single refinery. There are refiners here in the East which in the course of business always have between 60,000,000 and 70,000,000 pounds of copper 'in process.' It so happened that the refinery in question carried over from previous months a considerable quantity, which it was able in October to put through the refining process, and it was this abnormal situation which resulted in the extraordinary output as presented in the October statement."

The Steel Corporation Acquires Heroult Patents

The United States Steel Corporation recently exercised options it has had for many months, and which were about to expire, and has acquired the rights for the United States in the Heroult process for electric steel making and refining. As is well known, two 15-ton Heroult furnaces, the largest in use, have been operated for more than a year, one at the South Chicago works of the Illinois Steel Company and the other at the South works, Worcester, Mass., of the American Steel & Wire Company. At South Chicago several thousand tons of rails and a considerable tonnage of axles have been made of electric steel, the Heroult furnace being operated as an adjunct of the Bessemer converter. At Worcester the Heroult furnace has been employed to refine open hearth steel which has entered into wire rope and other high grade wire products. The practice at Worcester has reached a forward stage of development, exceptionally high quality steel being made from ordinary materials. Operations involving the products to which electric steel has been applied at South Chicago are still regarded as in part experimental.

Hickman, Williams & Co.'s Pig Iron Handbook

Hickman, Williams & Co., whose main office is in Louisville, Ky., with branch offices in eight leading cities, have issued the third edition of their pig iron handbook. It is a volume of 159 pages of pocket size, bound in flexible leather. It contains articles on "Effects of Variation in Constituents of Cast Iron," by W. G. Scott; "Metallurgy of the Cupola," by H. E. Field; "Constitution of Pig Iron," by Robert Forsythe; a chapter on constituents of pig iron by H. L. Williams; tables giving approximate analyses for various kinds of castings; tables showing the composition of alloys used in castings; numerous statistical tables are presented on the production and consumption of pig iron; average monthly prices of various kinds of pig iron for a series of years; Lake Superior ore prices and shipments; coke statistics; tariff duties on pig iron and related materials, &c. Numerous analyses are given of special brands of pig iron and coke for which the firm is selling agent. A number of pages are ruled with blanks for the insertion of data on analyses of pig iron and coke.

The Ilgner System in Rolling Mills.—In *The Iron Age* of March 3, 1910, reference was made to the patent litigation then pending in London affecting the Ilgner patent for the electrical driving of reversing rolling mills. The decision of the case, which was brought by the German company controlling the Ilgner patents, against the Electric Construction Company, Ltd. of England, was against the Ilgner patents on the ground of lack of subject matter. An appeal was taken and on October 20 the Court of Appeals at London affirmed the adverse decision. The court held that the only innovation in the Ilgner system for reversible rolling mills was the employment of a heavier flywheel than had been employed in the well-known Ward-Leonard control.

The exhibit of foundry facings, supplies and equipment, the latter including tumbling barrels, molding machines, core ovens and an overhead track system, brass melting furnaces and separators at the Chicago plant of the S. Obermayer Company October 26, was visited by over 400 persons. The educational feature appealed to the instructors of the various technical schools in Chicago who attended with about 100 of their senior students.

The American Steel Foundries

The eighth annual report of the American Steel Foundries, covering the year ending July 31, 1910, shows the following profit and loss account:

Earnings from operation of plants and net income of subsidiary companies (after deducting manufacturing, selling, administrative and head and district office expenses, and before deducting depreciation)		$1,839,984.48
Other income:		
Interest, discount and exchange	$27,556.29	
Income from investments and loans	7,698.67	
Sinking fund profit	2,053.81	
Miscellaneous	18,778.83	
		56,087.60
Total income		$1,896,072.08
Deduct:		
Interest on borrowed money	$33,332.54	
Interest on debentures	137,472.00	
Interest on bonds:		
Outstanding	$176,783.75	
In sinking fund	55,516.25	
	232,300.00	
Bond sinking fund installment and profits	107,053.81	
Depreciation of buildings, plant and equipment (all properties)	355,693.05	
		865,851.40
Balance—net income		$1,030,220.68

The balance sheet as of July 31, 1910, is as follows:

Assets.

Real estate, buildings, plant, machinery, tools, equipment, patents and goodwill:		
As per balance sheet of July 31, 1909	$19,961,095.36	
Additions during the year	598,854.87	
	$20,559,950.23	
Real estate not used for business purposes	298,630.15	
		$20,858,580.38
Sinking fund assets (exclusive of bonds purchased and held by trustees):		
Cash and accrued interest		64,628.26
Securities:		
Notes secured by first mortgage	$40,000.00	
Miscellaneous securities	139,264.08	
	$179,264.08	
Inventories	$2,206,120.75	
Accounts and bills receivable (less reserves)	3,642,878.33	
Cash	645,463.67	
		6,673,726.83
Insurance premiums, &c., prepaid		36,285.33
Total		$27,633,220.80

Liabilities.

Capital stock (authorized and issued), 171,840 shares of $100 each		$17,184,000.00
Bonds and debentures:		
First mortgage 6 per cent 10-30 year sinking fund gold bonds	$3,500,000.00	
Less redeemed and held by trustees of sinking fund	976,000.00	
	$2,523,500.00	
First mortgage 5 per cent. gold bonds of American Steel Casting Company (due November 1, 1912)	446,000.00	
Four per cent. debentures	3,436,800.00	
		6,406,300.00
Accounts payable	$1,154,407.56	
Payroll accrued	236,442.91	
Accrued interest on bonds and debentures	144,311.00	
Dividend No. 2 (payable August 15, 1910)	214,800.00	
		1,749,961.47
Depreciation and renewal reserves		1,120,105.18
Bond sinking fund (accrued since August 1, 1907)		493,941.94
Profit and loss account:		
As per balance sheet of July 31, 1909	$78,291.53	
Net income for the year ending July 31, 1910, as per annexed statement	1,030,220.68	
	$1,108,512.21	
Deduct dividends No. 1 and No. 2 for the quarter-years ending April 30 and July 31, 1910	429,600.00	
		678,912.21
Total		$27,633,220.80

President Kelley's Comments

The statement of President Wm. V. Kelley says in part:

The gross sales for the year were $17,173,740.98 and the gross earnings from operations of plants and other income after deducting manufacturing, selling, administration, head and district office expenses and management commissions, were $1,896,072.08. The net income of $1,030,220.68 applicable to surplus shown in the balance sheet, is the remainder after deducting all interest and other charges, including $1,199,983 for repairs and maintenance and $355,693.05 for depreciation of fixed properties and also after appropriating $162,570.06 for the sinking fund for the company's first mortgage bonds. The sinking fund appropriation, while properly charged against income, is in reality a setting aside of profits for liquidating the bonded debt, and the retirement of bonds from the fund benefits stockholders by increasing the value of the company's property.

From the bond sinking fund $138,500 par value of first mortgage bonds were bought and retired during the year and the balance of the accretions to the fund, together with the annual installment paid to the trustee October 1, will purchase at least $178,500 more, making the total retired or provided for to date $1,155,000, out of the original issue of $3,500,000.

Charges aggregating $598,854.87 were made to the capital account during the year, for real estate, new construction, additions, machinery and equipment, care being taken that only such charges were made as materially increased the value of the company's property and were not properly chargeable elsewhere. In addition, the further sum of $300,582.10 was spent for replacements and for minor additions and improvements and charged to the depreciation reserve.

An opportunity occurred to secure additional land adjoining the Alliance plant, and as the trend of business indicates the necessity of much greater productive capacity in that locality and as the opportunity was not likely to be repeated, advantage was taken of it and the land acquired at a reasonable price. It is not intended at present to improve the property, but use it as a convenience in the operations of the present plant. At Indiana Harbor a new plant for the production of light weight castings has been completed and put into successful operation with the result of lowering costs and increasing the output of the entire plant. A tract of land adjoining the company's property at the same plant came into the market at a very attractive price, and as its use is very desirable to facilitate the plant's operations it was purchased.

Since the close of the fiscal year shipments and earnings have been satisfactory, but orders on hand have shown a steady decrease from month to month for several months, and there is as yet no definite betterment in sight, although there is a decided change in sentiment, and the opinion seems to be that better business conditions will prevail within a short time.

Since the five-year contract with the president and the three vice-presidents of the company, under which they share in the profits in excess of a fixed sum, expired July 31, 1910, the annual report gives a review of the five-years' record. Prior to August 1, 1905, the company's largest 12-months' shipments did not exceed 120,000 tons. For the 12 months ending September 30, 1910, shipments were over 205,000 tons, the largest month's shipments being somewhat less than 20,000 tons, so that present capacity may be taken at not less than 220,000 tons, or an increase of about 70 per cent. The financial operations of the five years are also reviewed. The capital expenditures in the five years were $1,710,135 and the depreciation reserves $1,432,307. The capital charges cover a new plant at Pittsburgh, new plant and equipment at Indiana Harbor, additional land at Alliance, Indiana Harbor and Hammond, and new buildings, additions and equipment at various plants. The gross sales for the five years were $68,036,955 and the net earnings $4,497,131. The net earnings, together with the profits paid into the sinking fund—$727,899—make a total for the five years of $5,225,030.

The largest shipment of tin plate ever received in Texas arrived at Port Arthur, Texas, recently, consigned to the Texas Company. It will be used for casing oil at the refinery of the company at Port Arthur. The tin plate came from Swansea, England, and the duty on the shipment amounted to $25,000.

The Cincinnati Iron & Steel Company denies the press dispatches saying that it has leased the mill of the Hazleton Sheet Steel Company at Hazleton, Pa.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 16, 1910.	Nov. 9, 1910.	Oct. 19, 1910.	Nov. 17, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.75	$15.75	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	*14.75*	14.75	15.00	18.50
Basic, Valley furnace	13.25	13.25	13.00	17.25
Bessemer, Pittsburgh	15.90	15.50	15.90	19.90
Gray forge, Pittsburgh	14.15	14.15	14.15	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.50	23.50	23.50	27.00
Forging billets, Pittsburgh	*28.50*	28.50	29.00	31.00
Open hearth billets, Philadelphia	*25.50*	26.00	26.00	30.60
Wire rods, Pittsburgh	*28.00*	28.00	28.50	33.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	*13.50*	13.50	13.75	18.00
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	*13.50*	13.50	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.50*	13.50	13.75	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.37*	1.37	1.40	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.55
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	*1.25*	1.25	1.30	1.55
Skelp, sheared steel, Pittsburgh	*1.35*	1.35	1.40	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.60*	1.60	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	13.00	12.87½	13.25
Electrolytic copper, New York	**12.87½**	12.87½	12.80	13.00
Spelter, New York	**5.95**	5.95	5.60	6.30
Spelter, St. Louis	**5.80**	5.80	5.45	6.15
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	**4.30**	4.30	4.27½	4.25
Tin, New York	*36.50*	36.25	37.62½	30.75
Antimony, Hallett, New York	7.75	7.75	7.75	8.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.25c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1¼ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

THE IRON AND METAL MARKETS

Plugged and Reamed.

1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1½ to 2¼ in.	61	43
2½ in.	65	48
2¾ to 3 in.	69	55
3½ to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 16, 1910.—(*By Telegraph.*)

Pig Iron.—Inquiries are reported in the market for 45,000 to 50,000 tons of Bessemer and basic iron, mostly for delivery in the first half of next year. One consumer is reported to be inquiring for upward of 30,000 tons of standard Bessemer iron for first half. The American Steel Foundries is in the market for 10,000 tons of basic for its Alliance, Ohio, plant; another Western consumer for several thousand tons of basic, and there are other inquiries. For standard Bessemer iron for first half, the lowest price being quoted is $15, Valley furnace, and 1500 tons is reported to have been sold at this price for first half delivery, the iron to be used in making ingot molds. A sale is also reported of 500 tons of standard Bessemer for December and January at $15, at Valley furnace. A Valley furnace interest has sold 3000 tons of basic for first half at about $13.25, at furnace, and a sale of 500 tons of basic has been made at $13.75, Valley furnace, the sulphur and phosphorus running slightly lower than in ordinary basic. We quote for delivery in the first quarter and first half of next year as follows: Standard Bessemer iron, $15; malleable Bessemer, $13.75; basic, $13.25 to $13.50; gray forge, $13.25, and No. 2 foundry, $13.75 to $14, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—There is a fair amount of new inquiries for billets, sheet and tin bars, but mostly for shipment in this and next month. Several large makers of sheets and tin plate who buy bars under sliding scale contracts are reported negotiating for their supply for first quarter of next year. On account of the firmer feeling in Bessemer and basic pig iron the opinion prevails that prices on steel are now probably as low as they will go. We quote Bessemer and open hearth billets at $23.50 to $24; Bessemer and open hearth sheet and tin plate bars, $24.50 to $25, and forging billets, $28.50 to $29, all f.o.b. Pittsburgh, Youngstown or Wheeling district.

(*By Mail.*)

The report of sales of standard Bessemer iron at $14.60 to $14.75, at Valley furnace, for delivery in first half of next year, printed last week, has caused comment in the trade, and attempts have been made to discredit the correctness of these sales and the prices. One statement widely published was that the only sale located was one of 1600 tons of off-Bessemer iron, running up to 0.12 per cent. phosphorus and as high as 0.08 per cent. sulphur. This iron was reported to have been sold at $14.60, Valley furnace. A Valley furnace in the early part of this month did sell to a consumer in this city 600 tons of off-Bessemer iron for forward delivery at $14, Valley furnace. The iron was of standard Bessemer grade, except that sulphur was allowed up to 0.08 per cent.; many furnaces would sell this as malleable Bessemer. However, our report last week of sales of 6000 tons or more of standard Bessemer iron for delivery in first half of 1911 as low as $14.60, Valley furnace, was absolutely correct in every way. The iron was standard Bessemer, phosphorus not to exceed 0.10 per cent. and sulphur not to exceed 0.05 per cent. Further, more than a month ago sales of standard Bessemer iron were made below $15, Valley furnace; in fact, $14.75, at furnace, was shaded. Considerable new inquiry for pig iron has developed in the past week, and prices on standard Bessemer iron are firmer and higher than last week. One consumer is reported to be inquiring for 30,000 tons of standard Bessemer iron for first half, a steel casting interest is in the market for 10,000 tons of basic for delivery at Alliance, Ohio, and in all there are inquiries out for more than 50,000 tons of Bessemer and basic, all for delivery in first quarter and first half of next year. A local furnace interest sold last week 1500 tons of standard Bessemer iron to an Eastern consumer at $15, Valley furnace, deliveries being 250 tons a month for first half of next year. A sale of 500 tons of basic iron running lower in sulphur and phosphorus than regular basic analysis has been made at $13.75, at Valley furnace, but this price is above the actual market on basic. A sale was also made of 3000 tons of basic for first half by a Valley furnace for forward delivery, at about $13.25, at furnace. The market on Bessemer and basic iron is firmer, and on several large inquiries now pending $15, at Valley furnace, for Bessemer and $13.25 to $13.50 for basic are the lowest quotations that have been made. Several Valley furnaces are quoting $15.50 for second quarter on Bessemer iron, and as high as $16, at furnace, for Bessemer for second half of next year delivery. There is not much new inquiry for steel billets, sheet or tin bars, but the impression prevails that prices are probably as low as they will go, in view of the firmer feeling in Bessemer and basic iron. New inquiry for finished iron and steel continues light, consumers steadily pursuing the policy of placing orders only to cover actual needs, and there is no desire to contract ahead. It is not believed there will be much material change in the iron market for the balance of this year, as we are close to the holiday season, when there is usually a slow-down in operations to take inventory and close up the year's business. There is some inquiry out for furnace and foundry coke for first half, with some low prices being made. Scrap is only fairly active, with prices inclined to weakness.

Ferromanganese.—The lowest prices of the year are being quoted on 80 per cent. foreign ferro, for delivery in first half. One recent sale of about 1200 tons, deliveries 200 tons a month for first half, is reported to have been made at very close to $38, Baltimore. We quote the market on foreign 80 per cent. ferro for first half delivery at $38.50, Baltimore, but on a firm offer and for large tonnage, this price might be shaded. The rate from Baltimore on ferromanganese is $1.95 a ton for delivery in Pittsburgh district.

Ferrosilicon.—There is not much new inquiry, and 50 per cent. ferrosilicon for prompt shipment continues somewhat scarce, and is bringing slightly higher prices than material for forward delivery. We quote 50 per cent. for delivery over the first six months of next year at $55 to $55.50, and for prompt delivery at $56 to $56.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—No new sales of either iron or steel skelp have been made in this market since the last report, and prices are only fairly strong. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—The quiet condition existing in the wire nail and wire trades is reflected in rods, new demand for which is quiet, and for small lots only. We continue to quote Bessemer rods at $28 to $28.50, and open hearth and chain rods at $28.50, Pittsburgh.

Muck Bar.—No new sales of muck bar have been made in this market in the past week or two, and the recent reduction of 25c. a ton in puddling may have the effect of bringing slightly lower prices for bar. Local makes of best grades of muck bar, made from all pig iron, are held at about $30, delivered, buyer's mill, Pittsburgh, while Eastern muck bar is being offered here at $29 or less, delivered.

Steel Rails.—New buying of rails by the railroads has started in a small way, but the actual tonnage that will be placed by the railroads will not be as large as expected. The Erie Railroad has bought 33,000 tons, divided between several mills, and the Pennsylvania Railroad and several other systems are expected to come in the market any day with contracts. It is known that several leading roads have made up their schedules of rails needed for next year, and the Norfolk & Western is expected to place its contract this week. It will probably amount to from 30,000 to 35,000 tons. New demand and specifications against contracts on light rails continue good. The Carnegie Steel Company booked a nice tonnage in the past week. Under the arrangement recently made for quoting rails on a per pound basis, quotations on light rails are now as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are absolutely minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

THE IRON AND METAL MARKETS

Plates.—Inquiries for the plates for the two battleships, one to be built by the Government at Brooklyn, and the other by one of the ship yards, have not yet reached the mills, but are expected to do so about December 1. These two boats will each take about 10,000 tons of plates and shapes, and part of this tonnage will likely come to local mills. No car orders of moment have been placed in the past week, but the Pittsburgh, Shawmut & Northern is in the market for about 3000 steel cars, some locomotives and other equipment, which will likely be placed at an early date. The whole plate market continues very quiet, and all the plate mills are badly in need of orders. They are running only part time, probably to not over 50 per cent. of capacity. The local market on ¼-in. and heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

Structural Material.—While some large jobs are in the market, they are very slow in coming out. The McClintic-Marshall Construction Company has taken about 2000 tons of bridge work, and the American Bridge Company two contracts involving about 1800 tons. It is probable a good deal of large work, originally scheduled for this year, will now go over into next year on account of the lateness of the season. We continue to quote beams and channels up to 15-in. at 1.40c., f.o.b. Pittsburgh.

Sheets.—New inquiry for sheets continues fairly active, but the mills have sold a good deal of tonnage for delivery over balance of this year, and into first quarter of next year. Prices on the whole are fairly strong, but in certain sections and to meet competition of two or three mills, prices are slightly shaded. The market on sheets is on the basis of 2.20c. for No. 28 one pass black sheets and 3.20c. for No. 28 galvanized, but in some cases, on nice specifications, these prices are shaded $1 a ton. The full schedule of prices in effect on black and galvanized and on roofing sheets is given on a previous page.

Tin Plate.—New demand for tin plate in the past two weeks has been more active, and two or three of the largest can companies have recently covered their requirements for bright plate for first half of next year. Deliveries on these contracts will start next spring, and, while output of tin plate has been very materially curtailed recently, it is not unlikely a part of the idle capacity may be started in the near future. The market on tin plate is reported firm, and we continue to quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Specifications on steel bars are not coming in as freely as desired, some concerns holding back from specifying in the belief that later on the market may be a little lower. So far, however, the leading steel bar mills have steadily maintained their price of 1.40c. on steel bars, except for delivery in certain districts, notably in Chicago, where this price is shaded as a basing price. Prices on iron bars are weaker, and the recent settlement of the puddling scale for November and December was on a 1.35c. basis for iron bars. We quote soft steel bars at 1.40c. in large lots and common iron bars at 1.40c. to 1.45c., Pittsburgh.

Hoops and Bands.—A leading consumer of hoops is reported in the market for its entire requirements for first half, and this tonnage will likely go to a local mill, which has been favored with this business for some years past. New demand for hoops and bands is mostly in small lots to cover current needs, but specifications against contracts are coming in at a fairly satisfactory rate. We quote hoops at 1.50c. in large lots, and 1.55c. in small lots; bands, 1.40c. in carload and larger lots, and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—Most contracts entered by the mills early in the year for cotton ties have been cleaned up, but a few belated specifications are still being received. We quote cotton ties at 77½c. per bundle, f.o.b. Pittsburgh, for November shipment.

Spikes.—New demand for railroad spikes continues quiet, and is mostly for small lots for repair work. Now that the railroads are showing some inclination to place orders for steel rails, it is believed new demand for railroad spikes will improve in the near future. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—There is a moderate new demand mostly in small lots to cover current needs, but specifications against contracts are only fair. Regular prices, which are 1.90c. for structural rivets and 2c. for boiler rivets, are still being shaded.

Spelter.—In spite of the quiet new demand, the high prices ruling for spelter for some weeks are maintained. We quote best grades of spelter at 5.80c. to 5.85c., East St. Louis, equal to 5.92½c. and 5.97½c., Pittsburgh.

Merchant Steel.—New demand continues light and is only for small lots to cover actual needs. One leading mill reports that so far this month its specifications against contracts have been slightly better than in the same period last month. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—There is decided improvement in specifications against contracts for shafting, two local makers reporting that shipments against orders so far this month have been somewhat in excess of the same period in October. It is stated that regular discounts are being fairly well maintained, and are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—New demand for wire nails and wire products is only fair, being confined mostly to small lots to cover actual needs. Neither jobbers or consumers are showing much desire to contract ahead, but specifications against orders placed some time ago are coming in quite freely. The American Steel & Wire Company is reported to be operating to about 80 per cent. of capacity, while the leading independent mill reports that it is able to run practically full. Announcement is made that the Pittsburg Steel Company, the largest independent maker of wire rods, wire nails and Pittsburgh fencing, will build possibly three blast furnaces at Monessen, Pa., where its mills are located. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—Two or three fairly large inquiries for line pipe for gas and oil lines are in the market, and may possibly be given out within the next week or 10 days. It is also stated that the long-talked of project of the Everett-Busch Syndicate of St. Louis to pipe gas from the Louisiana fields into St. Louis has again been revived and may be put through before long. New demand for merchant pipe is coming in quite freely, and the mills are entering more actual orders for pipe for prompt shipment than usual at this season of the year. We are advised that discounts on both iron and steel pipe, printed on a previous page, are being maintained.

Boiler Tubes.—There is no improvement to note in the boiler tube trade, either in demand or prices, both of which have been very unsatisfactory to the mills during practically all of this year. Discounts on both iron and steel boiler tubes continue to be materially shaded.

Iron and Steel Scrap.—Not much new business is being placed by consumers of scrap and the whole market continues quiet. There is a fairly active demand for heavy steel scrap for open hearth purposes, and also for borings and turnings, but in the other grades of scrap very little is doing. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.00 to 13.25
No. 2 foundry cast	12.50 to 12.75
Bundled sheet scrap, at point of shipment	9.00 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.25 to 17.50
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.75 to 14.00
Sheet bar crop ends	15.50 to 15.75
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.75 to 9.00
Old iron rails	16.50 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00
Heavy steel axle turnings	10.25 to 10.50

We note sales of about 2000 tons of cast iron borings on the basis of $8.25, f.o.b. Pittsburgh; also about 1000 tons of turnings at $8.75, Pittsburgh, and about 1000 tons of heavy steel scrap at $14.25 to $14.50, delivered.

Coke.—The coke trade continues in very unsatisfactory condition, and it has been plainly evident for some time that too much coke is being made and that output will have to be materially restricted before any improvement in either in demand or prices can be reasonably expected. Standard makes of furnace coke for prompt shipment, that is, loaded

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on cars, which must be moved, has been offered in the past week as low as $1.50 in net tons at oven. Output of coke in the Upper and Lower Connellsville regions last week was 340,556 tons, a decrease of nearly 5000 tons over the previous week. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55, and for delivery over the first half of next year at about $1.75 per net ton, at oven. We quote standard makes of 72-hour foundry coke at $2 to $2.10 for prompt shipment and $2.25 up to $2.50 on contracts per net ton, at oven, for first half of next year.

The United Steel Company of Canton, Ohio, has opened an office in room 518, Park Building, Pittsburgh, Pa., in charge of E. B. Blandy. Mr. Blandy for some years was sales manager of the Tennessee Coal, Iron & Railroad Company in New York City.

Chicago

FISHER BUILDING, November 6, 1910.—(*By Telegraph.*)

The Chicago market shows decided improvement the past week. Specifications for bars, plates and structural shapes have been better than at any time in three or four months. The 1.35c. price on these finished materials has practically disappeared, and the mills which have been holding for 1.40c. are getting business of a class which they were losing a few weeks ago. Car shops are beginning to specify for round lots of plates and shapes, one lot of 1200 tons and another of 1400 tons having been booked within a few days. While these orders are small for car material they reflect an improvement in the demand from car builders, and it is understood that orders for a large number of cars are in prospect which have not reached the stage of mill specifications for the material. A Western shop will furnish the under frames for 1000 steel cars ordered by the New York Central. The order for over 4000 cars for the Hawley lines was practically awarded a few days ago, but a hitch occurred regarding the specifications and the final disposition of the order is not yet reported in this market. Manufacturers of special lines of railroad equipment are figuring on good contracts. Rail sales booked by Chicago mills last week amounted to 22,000 tons. The railroad malleable foundries evidently have more business in prospect as they are inquiring for pig iron and buying more scrap. One manufacturer of railroad equipment recently bought a round lot of steel from store in Chicago in order to obtain immediate delivery. A serious car shortage is reported in the South, and in Chicago territory the situation is tightening. Leading trunk lines are refusing large shipments because they cannot furnish cars, and complaints of shortage are becoming more general. The weather has been very favorable for moving freight, and the railroads have been handling more traffic than a year ago. An early winter or a little dry snow will have serious results in this territory, as it would restrict general business and cause as disastrous a car shortage as four years ago. This, however, would force heavy buying of cars and motive power.

Pig Iron.—The buying movement in pig iron in this territory continues to broaden out and the Northern furnace interests have booked a number of sales of round lots for first quarter and first half. There have also been good sales of charcoal iron to car shops and railroads. Several malleable foundries are in the market for round lots for first quarter or first half, one Milwaukee foundry wanting 5000 tons of malleable Bessemer and others inquiring for smaller lots. Inquiries from malleable foundries are significant, as the larger foundries are carrying iron which they bought last winter. There is a good general demand from foundries for Northern iron and furnace stocks are beginning to decrease. The inquiry for Southern iron does not reach so large a tonnage, but is improving. One local foundry has inquired for 3000 tons of Southern and there are several inquiries for 1000 tons each. There is a good buying movement in moderate sized lots of 100 to 1000 tons. For prompt shipment both Tennessee and Alabama brands are going at $11 to the end of the year, and some furnaces which were willing to take business for first quarter at this price are now asking $11.50. The low prices of Northern foundry iron and scrap have a tendency to restrict the purchase of Alabama iron in this territory, as a large number of foundries can use a mixture of Northern and scrap at a cost of less than $15 per gross ton, delivered. The foundries which require high phosphorus and high silicon iron have been buying principally Tennessee brands. The market for Southern grades will, therefore, be restricted until the buying movement in Northern iron has raised the price level. The car shortage in the South is reported so severe that furnaces are using gondola cars. Local furnaces are unable to keep up with their shipping orders for lack of cars. The following quotations are for November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The market continues at $28, Chicago, for forging billets, and is somewhat firmer than a month ago.

Rails and Track Supplies.—The Illinois Steel Company booked an order for 15,000 tons of open hearth rails last week and another for 2500 tons of open hearth, with scattering lots of Bessemer and open hearth which made a total of about 22,000 tons. The principal Western railroads are preparing estimates of their requirements, but have not yet submitted definite inquiries to the mills. Important developments in the rail trade are expected within the next month. The track supply departments are running light at present on new business as the buying season in this line is about over for this year and specifications for 1911 business have not come in. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12-lb., $28, Chicago.

Structural Material.—The structural mills are doing better than the fabricating interests in getting new business, as they are beginning to receive specifications from car builders. Specifications and new buying of plain material have shown so much improvement that the 1.35c. price has practically disappeared from the market. Several large buildings in Chicago are held up awaiting a new building ordinance on which action is expected this week. The proposed new code permits an increase from 16,000 to 18,000 lb. in the stresses on steel members, and makes slight modifications in other respects in the legal requirements of a steel structure, especially in high buildings. This will reduce the amount of steel used and the cost, and is in line with the legal requirements that have proved safe in other cities. For some time the architects who handle steel buildings have been making their specifications conform to the proposed new code, and all work of this class is, therefore, held up until it is adopted by the City Council. Bids will soon be asked on a new theatre on Clark street, which will require about 4500 tons. The American Bridge Company has taken two small orders for bridge work, one from the Chicago, Milwaukee & St. Paul for 240 tons and one from the Oklahoma Central for 140 tons. A power house at Omaha for the Omaha Electric Light & Power Company, 460 tons, was let to Paxton, Vierling & Co. of that city. A stamp mill for the Nevada Hills Mining Company, Nevada, 300 tons, was booked by the American Bridge Company. The Supreme Court of Arkansas has given a favorable decision on questions in dispute regarding a bridge across the Arkansas River at Fort Smith which requires 4600 tons. The contract for this bridge was let to the American Bridge Company last summer, and work will go forward at once. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The plate business is picking up and good specifications are coming in from car building shops as well as from the car repair shops of the railroads. One order taken last week from a car shop was for 1200 tons and another for 1400 tons. While no large car orders or inquiries are reported from Western railroads, small lots of cars are being ordered from time to time. The New York Central has placed contracts for 1000 steel underframe freight cars, and a Davenport, Iowa, plant will furnish the special shapes for the underframes, using Bethlehem shapes. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Sheet business is holding up in a very satisfactory manner and there is a good run of orders from both manufacturing and jobbing customers for open hearth sheets. Buying of small lots from store has also been active. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.40c.

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to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Specifications for soft steel bars have been heavier the past three or four days than at any time in the preceding three or four months, as the weakness in prices which checked specifications for a month preceding the election has disappeared. The principal buyers of bars on yearly contracts did not want to see the price go off, and enough new business has appeared in the last week to satisfy the mills that had been disposed to make concessions. The bar iron mills are doing better. The railroads are not reported as placing any large contracts, but they are specifying more frequently for 100 and 200 ton lots. Manufacturers of specialties in the equipment trade are figuring with the railroads on good contracts, and this helps the market. The hard steel bar mills are getting more business this week than for some time past. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Manufacturing consumers of wire are becoming interested in placing contracts for their requirements for the first half of 1911 and some of them are anxious to close. The mill interests, however, do not expect to make prices covering the first half until December 1 on this class of trade. The jobbing demand for wire products has kept up at a very good rate, but is expected to fall off now that freezing weather is in sight. This is especially true of barb wire and field fence. In the case of nails it is estimated that about half the product of the mills is used for packing boxes and this trade is not much affected by the seasons. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Old Material.—There is a little more strength in the scrap market, but not enough to create any notable movement in prices. The open hearth steel interests are taking all the melting steel that is offered them, paying on a basis of $12.75 for strictly graded heavy melting steel. There is not much demand for the higher grades of steel scrap. The steel foundries are not getting the orders from automobile manufacturers that they had a year ago, and their melt has been considerably reduced. The larger steel foundry interests which handle railroad work have accumulated large stocks of scrap during the past summer, and will not be in the market until they have booked a considerable amount of new business for their product. The malleable foundries are apparently getting some of this railroad business, as there is a better demand for railroad malleable scrap and prices are a little stronger. The demand from gray iron foundries is holding the market for cast scrap about even. The rolling mills are carrying large stocks, and apparently are getting all the material they need at present prices. The demand for hard steel bars rolled from old rails has been light for some time, and this has made the market easy for rerolling rails. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.25 to 7.75
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Merchant Steel.—Specifications for mill shipments have shown a steady improvement since September 1, and the volume of business is normal. There is a good demand from store for tool steel and special lines of material. A railroad equipment company has purchased a round lot of material from store in order to obtain immediate delivery, and the general inquiry for store lots of all grades of steel is active.

Cast Iron Pipe.—The leading pipe interest has taken a letting of 500 tons of 16-in. water pipe at Chanute, Kan., for winter shipment. Inquiries are beginning to come in from Western cities for winter shipment. In fact, the season is opening earlier than in former years, and if municipalities could obtain the money at satisfactory rates there would be a very heavy buying movement for water pipe. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., November 15, 1910.

Generally speaking, consumers are still disposed to make haste slowly, and, although there has been some feeling around for supplies for delivery during the early part of next year, no further definite inquiry of any importance is reported. Several of the large blocks of foundry iron before the trade recently have been closed, but no further heavy tonnages have come out. Further curtailment of pig iron production is in sight, and it is quite likely that several Eastern and several Virginia furnaces will go out before the end of the month. A little more interest has developed in the steel making grades of pig iron and some sales of basic iron have been made. Heavy steel plates remain quiet, but a better movement in structural material is to be noted. The billet situation shows but little change. A better demand for sheets, however, is reported. The railroads still hold off, and no important orders for rails or cars have been placed in this district. Iron bars continue weak, while the old material market is at a standstill.

Iron Ore.—Importations at this port during the month of October aggregated 87,380 tons, at an invoiced value of $299,218. During the week ending November 12 arrivals totaled 48,298 tons, at an invoiced value of $168,393. There is no fresh movement in the ore market in this district.

Pig Iron.—Several of the larger blocks of foundry iron, referred to recently, have been closed during the week. The Baldwin Locomotive Works has purchased 2000 tons of high silicon and 1000 tons of low silicon, special analysis iron, for first quarter delivery, which was taken at prices a trifle under the current market for standard grades. A nearby cast iron pipe foundry purchased 1000 tons of low grade iron, and it is reported that another pipe maker closed for a block of several thousand tons. A thousand tons, half No. 2 X and half No. 2 plain, was taken for early delivery by a machinery builder, but the inquiry for 1000 to 2000 tons from a stove founder has been withdrawn. No further inquiry for large quantities for early 1911 delivery has come out, although there has been a fair amount of small inquiry. With the exception of the sales above referred to transactions in foundry grades have been less pronounced, the bulk of the business being in small lots at prices ranging from $15.75 to $16, delivered, for No. 2 X foundry. Producers are still disinclined to fill up order books for early 1911 shipment at ruling prices, the disposition to blow out furnaces is still strongly in evidence, and the number now active in this territory will no doubt be still further reduced before the end of the month. The situation in Virginia iron has developed some weakness. A number of sellers still adhere to $13.25, furnace, for No. 2 X, and refuse to sell for extended forward delivery, the same grade, however, can be had from other producers at $13, furnace, either for prompt or first quarter delivery, although it is stated that the tonnage that will be sold at this figure is limited. It is reported that even the lower quotation has been shaded, but that the iron offered is hardly to be considered up to the usual standard grade. A better volume of business has been done in forge iron, and several fair inquiries, one for 1000 tons, are being figured on. Sales have been made to rolling mills at $14, furnace, making a range of delivered prices from $14.25 to $14.60, according to the delivery point. More interest is shown in the steel making grades; a belated announcement is made of a sale of 10,000 to 12,000 tons of basic iron to an Eastern structural steel maker, for November, December and January delivery, at $14.75, delivered, which was closed several weeks ago. Another buyer is still in the market for a round lot of basic for first quarter, while a sale of several thousand tons of basic at $14.75, delivered, and a like amount of Bessemer iron has been made to another consumer, delivery during the next three months. A better inquiry for low phosphorus iron is also reported, one buyer is in the market for 3000 tons, while other consumers are feeling around for early 1911 supplies. Small sales of this grade have been made at $22.50, delivered in this vicinity. The following range of prices represents the market for standard brands, delivered

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in buyers' yards in this vicinity, shipment ranging from prompt to first quarter of next year:

Eastern Pennsylvania, No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	15.80 to 16.25
Virginia, No. 2 plain	15.80 to 16.25
Gray forge	14.25 to 14.75
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—Sales have been small, and, while there has been a little more inquiry, the market drags. For deliveries running over the first half of next year, $38.75, Baltimore, is named, while some sellers name $39, Baltimore, for delivery over the entire year.

Billets.—Orders during the week, while not numerous, have in a number of cases been of larger size. While there has been little in the way of definite inquiries for forward requirements, consumers are showing some interest in the market, but sellers are not disposed to sell for forward delivery at present quotations. Basic open hearth rolling billets for delivery in this territory during the remainder of the year can be had at $25.50 to $26, according to tonnage, but no quotation is available as yet for first quarter shipment. Forging billets are firm at $28, Eastern mill, the usual extras being added for high carbons and special sizes.

Plates.—The demand continues irregular and mills report the aggregate tonnage of orders during the past week as being smaller. While there are a few fair sized propositions under negotiation, they close slowly. Consumers would, in instances, contract for forward requirements, but, as a rule, mills refuse orders on which the delivery is extended. Meanwhile prices for heavy plates in carload lots are well maintained at 1.55c., delivered in this vicinity.

Structural Material.—More activity in the way of building work is to be noted, several contracts have recently been placed, including one for 1500 tons for a hotel addition in Washington, D. C. The contract for the Union League addition, about 900 tons, is still unplaced, but expected to be closed this week. Fabricators are figuring on an eight-story building, requiring about 900 tons, to be erected in this city, and a building for which 1100 tons will be required, in Savannah, Ga. Several other smaller propositions in this vicinity are also pending. There has been a fair demand for business of a miscellaneous character, and prices of plain shapes, delivered in this district, have been comparatively firm at 1.55c. to 1.60c., according to specifications.

Sheets.—Business has again taken an upward turn, and orders are more numerous as well as somewhat larger in size. There is also a better inquiry for forward delivery, but Eastern mills will not consider business for 1911 shipment at present prices. Mills are more actively engaged and prices are firm, the following range being named by Eastern makers for prompt shipment: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Business in refined iron bars has been offered a trifle more freely, but the quantities involved have been small, carload lots being the maximum. Makers are after orders sharply, and while 1.37c. to 1.42c., delivered in this territory, about represents the market for refined iron bars, concessions could no doubt be had for desirable business. The demand for steel bars continues fairly even, with prices at 1.55c., delivered.

Coke.—The market has been quieter. Negotiations for furnace coke for next year's delivery are under way, but develop slowly, owing to uncertainty of blast furnace operations. Foundry coke has been sold in moderate lots. Prices are practically unchanged, spot furnace coke may be had at $1.55 per net ton at ovens, while $1.75 to $1.85, ovens, is quoted for extended delivery. Spot foundry coke is quoted at $2 to $2.10, ovens, but for forward delivery prices range from $2.20 to $2.40, ovens. The following range of prices per net ton about represents the market for delivery in buyers' yards in this vicinity:

Connellsville furnace coke	$3.85 to $4.10
Foundry coke	4.40 to 4.75
Mountain furnace coke	3.45 to 3.70
Foundry coke	4.00 to 4.35

Old Material.—The demand continues very light and sales have been largely confined to transactions between brokers for material to apply on old contracts. Consumers show little interest in the market and purchases are confined to odd bargain lots. No. 1 heavy melting steel is quiet, at $13.50 to $13.75, delivered, and, while lower prices are talked about, it is to be noted that bids of $13.50 to $13.60 on recent railroad lists failed to result in bidders getting any tonnage. Rolling mill grades are dull and the market, on the whole, listless. The following range about represents sellers' ideas of the market, delivered in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to 1.35c. per gross ton, although buyers would probably not purchase at those figures, unless in need of material:

No. 1 steel scrap and crops	$13.50 to $13.75
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.25*
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.50 to 12.00
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

The Philadelphia office of the Bethlehem Steel Company, W. B. Kennedy, sales agent, and the office of the Juragua Iron Company, now located in the Pennsylvania Building, will remove on December 1 to Suite 1609 in the Morris Building, Chestnut street, above Broad street.

Cleveland

CLEVELAND, OHIO, November 15, 1910.

Iron Ore.—The ore shipping season is rapidly drawing to a close. Boats of the Pittsburgh Steamship Company that are bound down with cargoes will go into winter quarters as soon as they are unloaded, and no boats of that fleet will sail after this week. Bad weather has interfered with the ore movement during the past few days, and some boats that were to get another cargo have been ordered into winter quarters. Some of the ore firms will wind up their shipments this week and others will keep a few boats running during the remainder of the month. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market continues fairly active. A number of sales of foundry grades were made during the week and a fair volume of new inquiries came out for the first quarter and first half delivery. Local and Valley prices remain stationary, but one local interest, that is largely protected from this competition because of freight rates, and which recently advanced its asking price 25c. a ton, reports that it has made some sales at a slight advance. The Elyria, Ohio, furnace manufacturer, who had an inquiry out last week for 2000 to 3000 tons of No. 2 foundry for the first half, has bought the bulk of its requirements from a Cleveland furnace. A central Ohio culvert manufacturer has bought 1000 tons of No. 2 foundry for the same delivery. One local interest reports sales during the week aggregating about 7000 tons, mostly in small lots, of foundry iron. A central Ohio manufacturer has an inquiry out for 1000 tons of No. 2 Northern and 500 tons of Southern for the first half, and a number of smaller inquiries are pending. Other buyers are feeling the market without having definite inquiries out. Sales are being made on the basis of $14, Cleveland or Valley furnace, for No. 2, for the first half, and $14.25, delivered Cleveland, for the same delivery. Some interests still decline to meet the market and have practically no tonnage on their books for delivery after the first of the year. There is a fair demand for Ohio silvery iron in small lots. Prices range from $18 for the first quarter to $18.25 to $18.50 for the first half. We note the sale of 1000 tons of charcoal iron for the first half. Southern iron appears firm, at $11.50, Birmingham. Several producers have declined to accept offers of $11.25. For prompt shipment and the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.50 to $15.65
Northern foundry, No. 1	14.50 to 14.75
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	14.00 to 14.15
Southern foundry, No. 2	13.35
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—The market is very quiet and prices are weak. There appears to be a surplus of foundry grades for prompt shipment at present. There is some inquiry for furnace coke for the first half, but consumers are showing a disposition to want to make contracts on a sliding scale basis. The demand for foundry grades is mostly in car lots. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton, at oven, for spot shipment, and $1.80 to $1.90 for the first half. Connellsville 72-hour foundry coke is held at $2 to $2.20 for spot shipment, and $2.25 to $2.50 on contracts through the first half.

Finished Iron and Steel.—The demand in finished lines continues moderate, although there are indications of an improvement. Some inquiries for round tonnages in bar

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products have come out during the week. Mill agencies are getting a good volume of orders, but they are mostly for small lots. The demand for steel bars on contracts is fairly active, and orders for concrete reinforcing bars are still quite plentiful. Plates continue quiet, but orders for small lots of structural material are holding up well. Prices on steel bars and structural material are firm at 1.40c., Pittsburgh. Plates are being shaded to 1.35c., only by mills making the narrower sizes. The demand for sheets is less active with the approach of the winter season that will interfere with outside work. Sheet prices are being quite generally shaded $1 a ton. In structural lines a good amount of new work is developing in this city, much of which is expected to come out early next year, making the structural outlook very promising. Among new work is an addition to the Pingree shoe factory in Detroit, requiring 800 tons, for which bids are now being received. The contract for 800 tons for the Fowler Building in Detroit has finally been awarded to the American Bridge Company. At the recent election the voters of Cuyahoga County authorized the County Commissioners to issue bonds for building a new high level bridge in Cleveland. Work will be started as soon as possible, probably during the coming summer, and will require a large tonnage of steel. The Standard Oil Company has awarded a contract to the American Shipbuilding Company for a steamer and a barge to be operated in the oil trade on the Great Lakes. It is expected that the Jones & Laughlin Steel Company will order a new ore boat to replace the W. C. Moreland, a 600-ft. boat that was recently lost on Lake Superior after being in commission but a few weeks. The demand for shafting has improved considerably as a result of increased activity in the automobile trade. The demand for bar iron is a little more active, owing to the receipt of orders from the Northwest to be shipped by water before the close of navigation. Prices are unchanged at from 1.30c. to 1.35c., Cleveland.

Old Material.—While the market continues to drag along the feeling among dealers is decidedly better. They believe that the bottom has been reached and that somewhat better prices will prevail before long. With this expectation they are refusing to sell out of stock at current prices. Consumers apparently do not share in the belief that prices will advance soon, and are buying only for their immediate requirements in small lots. The demand for borings and turnings is somewhat more active. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	13.75 to 14.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, November 16, 1910.—(*By Telegraph.*)

Pig Iron.—Actual buying during the past few days has not been so heavy as was anticipated. However, inquiries are coming in and prospective business is very encouraging. From the St. Louis territory local agencies are working on an inquiry for 2000 tons of foundry iron and 5000 tons of basic. An Illinois consumer is asking for 1500 tons of Southern foundry, and a nearby Ohio firm wants 900 tons of either Northern or Southern foundry all for first half shipment. The usual number of requests for small tonnages of foundry and some malleable are being figured on. A 600-ton lot of Southern foundry No. 2 was sold this week at $11 for prompt delivery, and a local foundry is also understood to have covered for its requirements at this same figure, with shipments running through December. But generally speaking, there is a firmer feeling on prices for Southern foundry, and while there are reports that all the furnaces have not fallen into line, it is a fact that most of them are holding out strong for $11.50 covering first half delivery. A number of $11 offers are reported, but local agencies state they are unable to place the business at this figure. Except for immediate shipment Northern foundry No. 2 is available at $14, Ironton, and contracts extending through the first half can be made at this figure, although some furnaces are holding out for $14.50. Malleable is firm at $14.25 to $14.50, and there is a fair inquiry for it, with some small business being done. The local order for a round lot of basic is being held up, and the Central Ohio firm that asked for 1000 tons of basic has also withdrawn its inquiry. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Two Southern contracts for furnace coke were closed last week, but local agencies were not favored with any of the business, and details, as to the tonnage and price, are not available. It is stated that furnace coke is moving very slowly, especially in the Connelsville field, and some operations are understood to be very anxious for business. Only small quantities of foundry coke are being sold, and no large contracts are in sight just now. Furnace coke ranges from $1.50 to $1.60 per net ton, at oven, for spot shipment, and around $1.65 to $1.85 for contracts. Foundry coke can be purchased at $2 for immediate shipment, but $2.25 per net ton, at oven, represents the average contract figure at which business would be accepted. The prices govern in all three fields.

Finished Iron and Steel.—A little more activity is noted in the structural material line. Reinforcing concrete bars have been reasonably good sellers during the past few days. Other lines continue dull. Structural material is quoted at 1.90c., but iron bars are obtainable at 1.75c. per pound, warehouse.

Old Material.—Consumers appear loath to make any time contracts and continue purchasing only such amounts of scrap as will keep them operating. All the yards have large stocks on hand. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., November 14, 1910.

Pig Iron.—The result of the recent election has had no appreciable effect on the Birmingham pig iron market. There have probably been more inquiries, but few, if any, of these have resulted in orders. Buyers still seem to be insisting that they should have their first quarter and first half iron on basis of $11, Birmingham. That price is still good for shipment during November and December, and it looks now like a question of endurance between the buyer and seller as to the price for the first half of 1911. The most careful check that is available on pig iron stocks in Alabama shows an increase of about 11,000 tons in October—practically all on the yards of two concerns. There has been no material change in the rate of production, and November finds the situation seemingly very similar to that of the past month. The producers of this district are simply moving along at a good rate of production, seemingly content to let the matter of price work itself out. Some good orders have been booked for charcoal pig iron, the price on which seems to be a little firmer. Some apprehension is felt in this district as to a great car shortage during the coming winter.

Cast Iron Pipe.—Selling agents do not report a larger volume of business transacted in the past week than for the week previous and prices are understood to have developed even more variations. It has been announced that the requirement of several large gas companies for extensions would come up for consideration within the next 30 days, but it is not probable that any such tonnage will be placed for shipment prior to January 1. A lot of 1500 tons of water pipe for Denison, Texas, will be placed in the coming week. With this exception actual business in sight is very unattractive. We continue to quote nominally as follows, per net ton, f.o.b. cars here, notwithstanding the fact that a criterion of values is not offered in any transactions recorded: 4 to 6 in., $21; 8 to 12 in., $20; over 12 in.,

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average, $19, with $1 per ton extra for gas pipe. These prices are subject to material shading for municipal contracts.

Old Material.—Probably more interest is being manifested in this market than at the time of last report. One or more bargain lots on dealers' yards recently changed hands without establishing a basis for prices. The tonnage being offered dealers is very light and it is not believed that the aggregate of all grades on founders' yards in this district is very considerable. We quote nominal asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

San Francisco

SAN FRANCISCO, November 9, 1910.

Business was retarded more than usual pending the election, and now it is over buyers are expected to take a little more interest, though no general movement is anticipated. The distributive movement on the whole is extremely quiet, but stocks in some lines are beginning to break up, and jobbers are entering the market in a small way. Prices on some lines of finished material from stock have been slightly reduced.

A change in terms of sale has been announced by local merchants, taking effect November 1. A discount of 2½ per cent. was formerly allowed for payment on the 10th of the month following date of sale, but hereafter terms will be 30 days net cash on bars and all heavy hardware. An effort was made to apply these terms to merchant pipe, but this will probably not succeed, owing to conditions obtaining in the plumbing supply trade.

Bars.—Several of the local merchants are carrying large stocks of foreign material. Reinforcing bars are moving in a moderate way in small lots, and foreign material for this purpose is offered in large quantities at low prices. The Western Steel Corporation, Irondale, Wash., has had a representative in this market, and has taken a number of small orders for bars at somewhat below importers' quotations, which are 1.76c. to 1.78c., San Francisco. It is announced that this company's mill will soon be in shape to supply all coast requirements of bars in all sizes. It will also in a few months be in position to roll structural shapes and plates. A further reduction in prices has been made by local merchants, bars from store, San Francisco, being quoted at 2.20c. for iron and 2.40c. for steel.

Structural Material.—Last month for the first time San Francisco took third rank among the Coast cities in building operations, being surpassed by both Los Angeles and Seattle. The valuation of permits granted here was $1,425,116, compared with $1,693,173 for September, this year, and $1,969,008 for October, 1909. It is conceded that the winter will be very dull. Few jobs of any magnitude have been awarded anywhere on the Coast. Locally, the Masonic Temple and the Knights of Columbus building should be heard from in a few days, and the Cortez Hotel is still withheld. The Nevada Building, one of the largest in prospect, and the temporary City Hall, will be of reinforced concrete. Bids on the Lowell High School will be received December 7, and figures are being taken on the Grattan School, with a number of other schools in sight. Plans are being drawn for the Terminal Hotel, to cost about $200,000. A new steel frame high school is planned for Portland, Ore., and an injunction against the erection of the proposed steel bridge by that city has been refused. The Pacific Gas & Electric Company will erect a small steel building at Colusa, Cal. Plans will be ready in about 10 days for an addition to the Court House at Portland, Ore., requiring about 1000 tons. Contracts are expected before long on steel caissons for the Government drydocks at Bremerton, Wash., and Honolulu, T. H. Local interests have not yet reduced their quotations on plain material from store, but very little business can be done at the nominal basis of 2.60c. for beams and channels, 3 to 15 in.

Rails.—A Western mill is said to have taken an additional contract for 21,000 tons of standard sections for the Salt Lake road, and an order has been placed for 70-lb. rails and supplies for a new line between Fresno and Clovis, Cal. It is reported that the long delayed Fresno-Hanford interurban line has obtained the necessary financial backing and will proceed at once with construction. A number of smaller inquiries are coming into the market, mainly from roads near the Coast, and the total movement is considered highly satisfactory for this time of year. Light rails are very quiet.

Merchant Pipe.—The demand in the oil fields has been of little consequence for several months, and ordinary sizes of merchant pipe are still dull. Some houses at interior points, particularly Sacramento, which has the same terminal rates from the East as San Francisco, are getting a fair volume of business, but local buying is closely limited. The stocks of many jobbers, however, have become broken, and mill interests are selling a slightly larger tonnage than last month. No general movement is likely for some months, as several local firms are still carrying heavy stocks. The Santa Fe Oil Company is planning to lay a pipe line from its wells at Olinda to San Bernardino, Cal., a distance of 40 miles.

Cast Iron Pipe.—A number of new inquiries are coming up, though most of them are of only moderate size. Los Angeles is in the market for a small lot of high pressure pipe, bids to be opened November 21, and the Los Angeles Gas & Electric Company will take bids this week for about 1200 tons. The Portland Gas & Coke Company, Portland, Ore., is in the market for several thousand tons. The Pomona Consolidated Water Company recently purchased 200 tons of 8-in. pipe. The Bay Cities Water Company of Oakland will probably purchase some small lots of 6 and 8 in. pipe. There is a tendency to easiness in prices.

Pig Iron.—The volume of work has increased at some of the local foundries, but the situation in general is unchanged, and the only movement of pig iron consists of occasional small lots for immediate delivery. Aside from some special analysis irons nothing can be sold above $23, and as a rule about $22 is the best that can be obtained.

Old Material.—A lot of 1000 tons of steel scrap, largely old boilers, was sold recently at the Mare Island Navy Yard. Otherwise there have been no important transactions in this line, local yards being pretty well cleaned up. Owing to the large requirements of the Western Steel Corporation, and the prospective opening of the Columbia Steel Company's new plant and that of the Pacific Coast Steel Company, it is believed that the coast demand will clean up all the melting scrap that can be obtained, and dealers are accordingly holding all supplies very firmly. Cast scrap is in slightly better demand, but by no means active, and supplies are light. Prices show little change, being quoted as follows: Cast iron scrap, net ton, $18; steel melting scrap, gross ton, $12.50; wrought scrap, net ton, $13.50; rerolling rails, net ton, $15. The San Francisco Iron & Metal Company now maintains an office at Seattle, Wash., and will shortly open a yard there.

St. Louis

ST. LOUIS, November 14, 1910.

The record breaking corn crop, by furnishing more business to railroads, is leading to an increase in the purchase of new and the repair of old equipment. In pig iron inquiry is more general, now that elections are over. Reports of prices being reduced further by Southern makers have been found to apply to furnaces having a lower freight rate than that from Birmingham, and to cases where the grade is not up to standard. Transactions of this nature have proved quite a disturbing factor.

Coke.—With the exception of one office, sellers report the past week a quiet one in coke, with business mainly for quick delivery; but specifications on contract coke are coming in quite freely. A leading house reports a sale of 6000 tons of foundry coke to a local company for next year's shipment. The local railroads have been buying smithing coke. There is some irregularity in prices. The quotations below are for round lots of standard Connellsville 72-hour foundry: Spot delivery, $2 to $2.25; for shipment to July, 1911, $2.25 to $2.50; 48-hour, $1.75 to $2, per net ton, f.o.b. oven. Carload lots are 25c. to 35c. per ton higher.

Pig Iron.—A marked improvement in the inquiry for pig iron is reported by the leading sellers. The following inquiries are mentioned: 500 tons Southern No. 2 foundry, shipment over the first half of 1911; 400 tons 80 per cent. ferromanganese; 100 tons Southern silvery, shipment prior to January 1; 1000 to 2000 tons malleable iron, shipment over first half; 800 to 1000 tons Southern No. 1 foundry for same shipment; 1200 tons Southern No. 2, same shipment; 300 tons Southern No. 2; 100 tons Northern foundry; 2500 tons (750 tons analysis basis, 500 tons No. 2 and 1250 tons No. 3) Southern foundry, for shipment over the first half of 1911; 250 tons No. 2 Northern foundry; 500 tons with silicon 2.25 to 2.75 per cent.; 300 to 500 tons Southern No. 1 foundry for immediate shipment. The following sales were made: 450 tons Lake Superior charcoal iron, shipment over the first quarter 1911; 100 tons Southern silvery, shipment prior to January 1; two lots of 600 tons each Southern analysis iron, shipment over first half 1911 (St. Louis

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territory. Prices are somewhat firmer, and some furnaces are reported to have withdrawn from the market. There is, however, a disposition to furnish lots to suit buyers' ideas at the round lot figures. We quote Southern No. 2 foundry for any delivery up to July 1, 1911, at $11, though most Alabama furnaces are holding at $11.50 and some ask $12, with a variation of these figures for first quarter delivery, Birmingham basis.

Finished Iron and Steel.—The leading interest reports a marked improvement in the tone of the market, with more general inquiry for all kinds of steel products. The call for light rails is good, coming from coal interests mainly, with some call from lumber companies. There is more inquiry for structural material, and quite a good general demand for bars from both jobbers and manufacturers. In track material there is more activity, and a fair demand for steel hoops.

Old Material.—Leading dealers find indications of buying on a more liberal scale by consumers, but the present demand is quite moderate. The only railroad lot on the market the past week was 200 tons, offered by the Cotton Belt Railroad. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$11.50 to $12.00
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 bushelling	11.00 to 11.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad tank and sheet scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.50 to 8.00

The St. Louis Blast Furnace Company is proceeding with the relining of its furnace and expects to complete the brickwork in about two weeks. It has accumulated ore during the period of repairs and expects to blow in under favorable circumstances, as there are orders on its books for about four months' run.

The German Iron Market Less Active

BERLIN, November 4, 1910.

The iron market situation is surrounded by considerable uncertainty, and is apparently less satisfactory than a fortnight ago. The leading newspaper of Essen has issued this week its usual monthly review pitched in a rather pessimistic tone, and it has made a rather bad impression on the stock market. It warns the stock market operators that they have pushed up share prices considerably higher than is warranted by the actual state of the iron trade. It further says that specifications on goods already ordered are coming in less satisfactorily—even less so, in fact, than new business, which has not come up to expectations this autumn. The orders on hand with many important concerns, says this report further, are less than last year; and it mentions the case of the great Phœnix Company, whose orders at the beginning of October were 65,000 tons less than on that date in 1909.

Prices Show Irregularity

It is represented that dealers and consumers have little confidence in the stability of the market, and are, therefore, very cautious about doing new business. They doubt whether present prices can be maintained, particularly where they are fixed by mere price agreements rather than by syndicates like the Steel Works Union. The price situation is, in fact, involved in uncertainty. At the last trading in iron products on the Düesseldorf Exchange two weeks ago, the only changes were in boiler plates and light plates. The former were quoted at 130 to 134 marks, against 132 on the previous trading day; the latter, at 137.50 to 142.50 marks, against 125 to 140 marks. No changes in pig iron were noted. A controversy regarding the price of bars has been going on in the press for several days. The latest advance adopted by the convention was to about 114 marks, but it was asserted several days ago that one important concern in Hanover was selling at 100 marks, and that otherwise sharp price cutting was going on. In answer to this, however, it has been stated that the Hanover concern was selling at the low price, by a special arrangement with the convention, only for rail shipments in the direction of Berlin, as a compensation for the high freight charges on the long haul.

The Export Situation Not Satisfactory

In the export trade the price situation appears to be again less satisfactory. Belgian mills have continued to lower their offers at Antwerp. Last week it was asserted that they had reduced both iron and soft steel bars, on board ship, to 95 to 98 shillings, but according to German market reviews foreign buyers have no difficulty in placing orders at Antwerp for 94 to 95 shillings. These prices shut out German mills. Belgian works are also bidding very sharply for foreign business in heavy plates, cutting prices to 106 shillings, free on board—also a price that the Germans will not meet. German mills have taken some foreign orders in thinner plates without having to make any considerable price concessions. The export business in beams is very quiet, and goods are being offered at prices lower than those of the trade combination. The general export market is represented as depressed by the American situation, especially by the sales of American semimanufactured steel in England for 1911 delivery, which give the impression that American producers are not looking for an early improvement in their position. This week's review of the American market situation by *The Iron Age* made an unsatisfactory impression on yesterday's stock market here, since it failed to confirm the slight improvement claimed by other authorities.

The East Indian market appears to be fully supplied for the rest of the year; orders coming in from that quarter are only for 1911 delivery and at prices lower than the quoted lists; but it is stated that considerable business was done upon that basis. The Japanese market, which had shown a considerably improved demand some weeks ago, seems now to have fully supplied its demand. Trade with that country has been further cut down by a freight war among the shipping companies, which leaves rates for 1911 delivery in complete uncertainty.

The Home Market Quiet

The home market is very quiet in all its departments, and the outlook is evidently less satisfactory than at any time during the autumn. In the western part of the empire a number of local organizations of dealers are about to be dissolved owing to disagreements over prices. The fight between the Steel Works Union and the independent open hearth works continues. Last week it was stated in the press that the union had demanded of the organization of the manufacturers of fine sheets that they obligate themselves to buy all their material of the union, as otherwise the existing drawback on exported goods would be canceled. From the ore trade it is reported that business continues satisfactory; the market is still firm, and the furnaces are paying the higher prices recently adopted, without making any particular objections.

Buffalo

BUFFALO, N. Y., November 15, 1910.

Pig Iron.—The market has a firmer tendency and the majority of the furnaces have advanced prices sharply on all grades of pig iron. The advance approximates 50c. per ton, and in addition to this some furnaces have made a differential for the higher silicons, a course which has been ignored during the past few months. Orders for between 35,000 and 40,000 tons have been taken by Buffalo furnaces during the week for foundry grades and malleable with some basic. Some of this tonnage went at a slight advance over the low prices which have obtained recently. The United States Radiator Corporation placed a portion of its requirements contracted for last week with Buffalo furnaces, the remainder going to Ohio and Valley furnaces. A large manufacturer of railroad castings in western New York has an inquiry in the market for 5000 to 10,000 tons of basic. The Tonawanda Iron & Steel Company will blow out its "A" Furnace for relining the latter part of this week, and the New York State Steel Company's furnace, which is now out for relining, will be blown in again about the middle of December. We quote as follows, f.o.b. Buffalo, for deliveries covering remainder of year and first quarter of 1911:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No. 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.50
Malleable	14.75 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—Although a fair volume of orders for bar and plate material and other finished products is coming in, the market appears to be dragging a little and

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a number of inquiries for good sized tonnages that were pending prior to election are still held up by the prospective buyers, evidently because the purchasers wish to ascertain in just what way general business conditions will be affected by the result before deciding to buy. Prices remain firm. Steel bars, $1.40, Pittsburgh base, and $1.50, Pittsburgh, for hoops in carload lots or over; $1.55 to $1.60 for smaller and miscellaneous lots. It is understood that the Merchants Despatch Company's shops at Despatch, N. Y., have been awarded contract for 1000 fast freight line cars by the New York Central Railroad Company, mostly refrigerator cars, for which a considerable tonnage of plates and bars will be required. A local corrugated bar company has received contract for 275 tons of concrete reinforcing bars for lock and bridge abutment work on the Erie Canal between Fairport and Kings Bend. The Canadian export trade continues in exceptionally good volume. One inquiry from a large Canadian consumer calls for 100,000 boxes (about 5000 tons) of tin plate for delivery during 1911. Fabricated structural material is running rather lighter, but several small contracts are being figured this week. Metz Bros., who have been awarded contract for the German Deaconess Hospital, are receiving bids for the steel work, about 100 tons. The Lackawanna Bridge Company has received contract for the bridge work for Erie Barge Canal, section No. 63, between Fairport and Kings Bend, aggregating quite a large tonnage.

Old Material.—Transactions for the current week have not been quite as heavy as for the week prior to election, the demand being lighter in most lines. Prices are practically the same as last week, with the exception of No. 1 wrought and cast scrap which are slightly firmer, due to increased demand from outside districts. We quote, as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.25 to $12.75
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	10.75 to 11.25
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.50 to 6.75
No. 1 busheling scrap	11.25 to 12.00

New York

NEW YORK, November 16, 1910.

Pig Iron.—A further moderate business has been done in foundry pig iron in the past week, New Jersey, eastern Pennsylvania and New England buyers being represented in the transactions. The low prices recently made by Buffalo furnaces appear to have been withdrawn, and the principal change noticeable throughout the market is that furnaces are not now accepting bids with the readiness that was apparent two weeks ago. The minimum for No. 2 X at Buffalo is now generally $14, whereas this price has been cut 25c. or more in some transactions in the early part of the month. Some of the sales made in New Jersey by eastern Pennsylvania furnaces indicate that low level was reached in those districts in the past 10 days, and views of producers are now somewhat firmer. The sales reported for the week include a heavy tonnage from Buffalo on contracts with radiator works, one interest having closed about 20,000 tons in the latter part of last week. In eastern Pennsylvania a sale of basic iron made two weeks ago at $14.75 is just reported. On deliveries in the first half of 1911 makers are asking $15 and in some cases higher. We quote as follows, for tidewater deliveries: Northern No. 2 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Ferroalloys.—The market for ferromanganese is very firm here and offerings are being made at $39, seaboard, for delivery over the first half. There are some good inquiries out. The supplies of ferrosilicon for spot delivery are limited and sellers show very little disposition to take much business at the present figures. The market here is firm at $56.50, delivered at Pittsburgh.

Finished Iron and Steel.—Elections over, their influence, if anything at all, is removed for the time being at least, and their result can have little effect for some months to come. Aside from such considerations, the feeling is quite general that little improvement is to be expected before the first of the year, and there is an even more decided opinion that conditions cannot change for the worse. The railroads appear to be the important factor and probably if they were doing their usual buying, business would be normal for this season of the year, for the attitude and actions of the railroads have a very far-reaching effect on other industries. Some feel that when the buying movement sets in it will be very heavy, others that the railroads have adopted a more methodical buying policy and that it will mean ultimate good, for their orders have usually been either very plentiful or very scarce. When the former the mills increased their capacity, only to be in a bad way when the orders diminished. With a steadier demand it will be much easier to regulate producing capacity to correspond. The plate trade is very quiet, but awaits with interest the issue of specifications, which is expected within a week or 10 days, for the plates to be required for battleship No. 34 to be built in the Brooklyn Navy Yard. About 6000 to 7000 tons of standard plates will be required and about 1000 tons of special treatment steel plates. The ship will have a displacement of 25,000 tons. The steel bar trade is receiving good specifications, but taking little new business. The bar iron interests report a little improvement and better inquiry. Structural business continues about the same. The American Bridge Company has received from the Erie Railroad an order for eight small bridge spans, part for its Cincinnati division and part for other divisions, aggregating 400 tons, and from the Bessemer & Lake Erie, 350 tons of bridge material. It now appears that the Baltimore & Ohio work near Chicago will require but 800 to 900 tons, that for the Virginia Railway, 2000 tons, and since a revision of the design, the highway bridge for Seattle is expected to take 1200 tons. Awards have been made of several small bridges for the New York, New Haven & Hartford, aggregating 350 tons, of the transfer bridge for the New York Central at Sixty-ninth street, 350 tons, and of a paper mill, 300 tons, for the Piermont Paper Company at Piermont, N. Y. The Jones & Laughlin Steel Company has taken about 1200 tons for the Raleigh Hotel, to be erected at Washington. The Boston Elevated Railway is in the market for a tonnage which may reach 5000, for its Cambridge extension, but it may take considerably less or none at all, according to whether or not it is satisfied with the prices. Bids closed November 12 for 14 small bridges for the Lehigh Valley. No decision has been reached on the 1500 tons for the Realty Trust Company building at Atlanta, nor the 1200 tons for the Savannah Bank & Trust Company building at Savannah, Ga. The general contract for the latter has been taken by a Philadelphia contractor. The Riter-Conley Mfg. Company has 800 tons for a warehouse for the Oil Well Supply Company at Pittsburgh. The American Bridge Company has received an additional order from the American Rolling Mills Company for 700 tons, and it now looks as though this company would get the Fowler Estate building, Detroit, 750 tons. Bids closed November 14 on the general contract for the Bigelow Building, Boston, which will require 1000 tons. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c.

Steel Rails.—The Carnegie Steel Company will roll 15,000 tons of the 30,000 tons recently placed by the Norfolk & Western, and has closed 5700 tons for A De Mayo & Co. The Steel Corporation has booked 29,000 tons for the Louisville & Nashville, to be rolled at Ensley, Ala., and 8000 tons for the Kansas City, Mexico & Orient. The Interborough, New York, has given an order for 500 tons of contract rails.

Cast Iron Pipe.—Last week was even quieter than its predecessor in this line. The only important municipal contract was placed at a very low figure by the city of Yonkers, with John Fox & Co., for about 1200 tons of 6 and 8 in. pipe, at $20.70 per ton, delivered. A contract was also awarded by the Brooklyn Union Gas Company for 1380 tons of 4, 6, 8 and 12 in. pipe and special castings, but it was a private contract and the price is not given. Carload lots of 6 in. are quoted at $22 per net ton, tidewater.

Old Material.—No improvement in the scrap market is to be noted, and transactions have been insufficient to change any quotations. Melting steel scrap and wrought iron appear to have been in greatest demand. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.00 to 11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.50 to 13.00
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.50 to 6.00
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	10.00 to 10.50
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	10.00 to 10.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

THE IRON AND METAL MARKETS

Metal Market

NEW YORK, November 16, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Nov.	Lake.	Electro lytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
10	13.00	12.87½	35.05	4.40	4.30	5.95	5.80
11	13.00	12.87½	35.80	4.40	4.30	5.95	5.80
12	13.00	12.87½		4.40	4.30	5.95	5.80
14	13.00	12.87½	35.80	4.40	4.30	5.95	5.80
15	13.00	12.87½	36.40	4.40	4.30	5.95	5.80
16	13.00	12.87½	36.80	4.40	4.30	5.95	5.80

Pig tin is advancing in this market because of the close concentration of stocks. Copper, which sagged somewhat early in the week, is firmer on account of a rise in the London market. Spelter is moving very slowly, but prices are well maintained. Lead is stronger here as the result of advances in the Western market.

Copper.—The copper market has been listless all week and there has been very little trading. There was talk on Monday of offers to shade prices on electrolytic copper for immediate delivery. This was caused largely by reports of trading at lower prices in the London market. Yesterday, however, the price of copper advanced sharply in London, and this morning's cable showed stronger quotations, consequently the market here in electrolytic copper improved in tone and the metal is generally held at 12.87½c. Lake copper was much firmer than electrolytic all week, and the price of 13c., established November 7, was well maintained. The exports of copper so far this month have been slightly better than they were during the same period last month, amounting in all to 11,403 tons. The London market closed to-day with spot copper selling at £57 16s. 3d. and futures at £58 15s. The sales amounted to 350 tons of spot and 890 tons of futures. The market closed very dull.

Pig Tin.—Pig tin advanced 60 points yesterday as the result of a report from London that the price for futures there advanced to the same price as that asked for spot tin. This morning's cable confirmed this report by quoting both spot and future tin at £156 15s. This means that futures are being taken up by the London corner, and as stocks are closely concentrated here it is expected that the New York market will follow the London fluctuations very closely for a week at least. There has been so little trading that the market has had no snap despite the advanced prices, and even now the metal is bringing only 5 points above the cost of import. On Monday it was 55 points below the import cost. It is generally conceded that existing prices are artificial and both sellers and consumers state that considering the available supplies the metal is bringing much more than it should. The arrivals of tin in this country so far this month have been 2100 tons and there are 670 tons afloat. In New York this afternoon pig tin was sold for 36.80c. The London market closed with spot tin selling at £167 7s. 6d. and futures at the same price. The sales amounted to 170 tons of spot and 400 tons of futures. The market closed strong.

Tin Plates.—As is usually expected at this time of the year, the demand for tin plate is not active. Sellers are looking forward to a good call for stocks from the manufacturers of tinware household utensils, &c., as soon as the holiday season is over. As a rule the department store buyers, who are the principal customers of tinware manufacturers in this line, place a large part of their orders for goods directly after the first of the year. The price for 100-lb. coke plates remains at $3.84.

Lead.—Although there is a light demand for lead, the market is stronger than it was a week ago and the metal is being held here by outside sellers at 4.45c. The leading interest continues to quote 4.40c., which puts the general market at that price, although holders of selected brands are getting the higher figure. In the West lead is very firm at 4.30c.

Spelter.—The spelter market is attracting attention because of the unusual conditions. Regardless of the fact that there has been a very light demand and consumers are filling their wants by buying on a hand to mouth basis, the recent rise is being held to firmly by those who have the metal to sell. There is no way of finding out just what the actual production of spelter is at present, and buyers have to take the producers' word for it that the production has decreased, both because of a restriction and through the forced closing of plants in the Kansas gas district. Some sellers of spelter go so far as to predict the price will soon be advanced 6c. a pound, East St. Louis, which would make it 6.15c. here. At present the nominal prices are 5.95c., New York, and 5.80c., East St. Louis.

Antimony.—It is thought that the antimony market has reached the low level and buyers have been more active of late than in several weeks past. Prices have not advanced, but the market is firmer and there is less indication of shading. Cookson's is quoted at 8.15c. and Hallett's at 7.75c. Chinese brands are from 7.40c. to 7.55c., and Hungarian grades from 7.12½c up. There are reports of inquiries for large quantities of both Cookson's and Hallett's.

Old Metals.—The market is strong, but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, November 15.—There is a good demand for casting copper, and the best brands are a little stronger than 13c., Chicago. Lead is quiet. Tin continues to fluctuate, the latest quotation for carloads being ½c. lower than last week. Spelter maintains the advance that was noted last week. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13½c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 36½c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb., higher; spelter, 5.90c. to 5.95c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots: sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 24½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, November 14.—Lead is steady at 4.27½c.; spelter is in active demand and higher at 5.90c., both East St. Louis. Zinc ore is strong at $45 per ton, Joplin base. Tin is quoted at 36.12½c. per pound; antimony (Cookson's), 8.50c.; lake copper, 13.35c.; electrolytic, 13.22½c.; all at St. Louis. For finished metals the demand the past week was moderate from the trade, but the leading manufacturer sold five carloads of metal in a single day to railroads.

Iron and Industrial Stocks

NEW YORK, November 16, 1910.

The prices of active stocks on the New York Stock Exchange declined in some cases sharply on November 9, the day following the election, and in very few instances have the opening prices of that day been reached in the past week. United States Steel common opened at 81½ on November 9 and declined to 78¼. On the day following the low point for the week was reached at 76. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	9⅞	Pressed St., pref.	96 - 96¼
Allis-Chalm., pref.	30½ - 31	Railway Spr., com.	33½ - 35⅞
Beth. Steel, com.	30⅝ - 33¼	Republic, com.	33½ - 36
Beth. Steel, pref.	59 - 61½	Republic, pref.	96 - 98½
Can, com.	9½ - 10½	Sloss, com.	48¾ - 52½
Can, pref.	74½ - 76¾	Pipe, com.	15⅞
Car & Fdry, com.	51½ - 55¼	Pipe, pref.	55 - 57½
Car & Fdry, pref.	114½	U. S. Steel, com.	76 - 81½
Steel Foundries	45¾ - 48½	U. S. Steel, pref.	116⅝ - 118⅞
Colorado Fuel	32½ - 35½	Westinghouse Elec.	69½ - 74⅛
General Electric	151½-154	Va. I., C. & C.	50 - 55
Gr. N. ore cert.	57¼ - 60⅞	Am. Ship, com.	*77 - 80
Int. Harv., com.	111 -115	Am. Ship, pref.	110¾
Int. Harv., pref.	*120¼-123½	Chi. Pneu. Tool	39½ - 40
Int. Pump, com.	42¼ - 44¼	Cambria Steel	42½ - 43½
Int. Pump, pref.	83⅝ - 83¾	Lake Sup. Corp.	24⅜ - 25¾
Locomotive, com.	38 - 40⅛	Va. Steel, pref.	104½-105
Locomotive, pref.	106 -106¾	Warwick	10½ - 10¾
Nat. En. & St., com.	16 - 16½	Crucible St., com.	12¼ - 13½
Pressed St., com.	33 - 35	Crucible St., pref.	77½ - 79½

* Ex dividend.

Dividends.—The General Electric Company has declared the regular quarterly dividend of 2 per cent., payable January 14.

A dividend of 50 cents has been declared on Great Northern Iron Ore Properties, payable December 1. In August 50 cents was declared, and in February 50 cents; in August, 1909, $1.

A meeting of stockholders of the Union Switch & Signal Company, Pittsburgh, will be held December 14, for the purpose of voting on a proposed increase in the capital stock of the company from $2,500,000 to $5,000,000.

The Harbison-Walker Refractories Company, Pittsburgh, Pa., has declared a quarterly dividend of ½ of 1 per cent. on the common stock, payable December 1.

The plant of the Canton Sheet Steel Company is practically completed and will be ready for operation by December 1. Six of the eight mills will be started first.

Pennsylvania Industries and New Taxation Laws

HARRISBURG, PA., November 15, 1910.—Manufacturing interests in Pennsylvania, especially those engaged in iron and steel, are awaiting with considerable interest the recommendations of the State Legislative Commission named to draft new taxation laws for submission to the Legislature when it meets on January 3, 1911. This commission has been in session for months, and it is understood that it will suggest some radical changes in the taxation laws.

The chief change and one most affecting the iron and steel trades relates to taxation of capital actually engaged in manufacturing. Under present laws such capital in the form of capital stock is not subject to taxation, although loans and bonded debt are taxed at the rate of 4 mills. It is said to be the intention to place a tax of 2 mills on the dollar of capital employed in manufacturing. For several sessions efforts have been made in this direction, the members from the agricultural counties having always made it a part of their platform and endeavored to have bills providing for a 5-mill tax placed on the statute books. It is certain that there will be opposition to such a tax from members from the industrial counties, as it would affect millions of dollars now engaged in the metal and allied industries.

It is also said that labor interests will endeavor to have a new employers' liability bill passed at the coming session. A bill was passed a few years ago, but was attacked in the courts.

The State authorities will back an effort to have the chief of the Bureau of Industrial Statistics vested with the powers of labor bureaus in other States. Bills looking to this end have been drafted. In the session of 1909 an effort was made to create a new bureau, with arbitration powers, and to open employment agencies, but as it contemplated a new department it was not received favorably.

Canadian Bounties on Iron and Steel

The following companies participated in the bounties paid by the Dominion Government on iron and steel in the fiscal year ended March 31, 1910:

Algoma Steel Company	$318,814
Dominion Iron & Steel Company	1,029,502
Nova Scotia Steel & Coal Company	97,345
Hamilton Iron & Steel Company	238,408
Lake Superior Iron & Steel Corporation	54,628
Ontario Iron & Steel Company	4,463
Canada Iron Corporation	41,146
Atikokan Iron Company	15,099
Standard Chemical Company	10,120
Total bounties paid	$1,808,533

Charles C. Murray of Pittsburgh, trustee in bankruptcy of the Shenango Iron & Steel Company, announces that the plant at Wheatland, Mercer county, Pa., including all machinery, stocks, &c., will be offered at public sale on December 21. The plant contains a puddle mill, a 10-in. mill, 18-in. mill, bar mill, coal conveyor housing and engine, fagot room, machine shop, blacksmith shop, ore house, time office, brick shed, pattern shop, tool house, power house, rolling mills, cranes, scales and all other machinery necessary for the manufacture of bar iron.

The new buildings for the department of practical mechanics at Purdue University, Lafayette, Ind., were formally dedicated November 12. President Stone in his address referred to the beginning of the engineering schools 30 years ago in a modest work-shop in the basement of one of the university buildings. The new plant represents the fourth of its kind installed at Purdue, each of the preceding ones having been outgrown. The new building and equipment cost $170,000, not including the equipment previously belonging to the department. Melville W. Mix, president of the Dodge Mfg. Company, Mishawaka, Ind., and president of the Manufacturers Bureau of Indiana, discussed the value of the new buildings and plant from the viewpoint of the manufacturer who gets his technically trained men from the universities. Twelve universities and colleges, 15 high schools, and many manufacturing companies and railroads sent representatives to the exercises.

W. Edgar Reed, consulting electrical engineer, 1312 Machesney Building, Pittsburgh, engineer for the new municipal plant, Millvale, Pa., reports that it has been placed in operation. The buildings are modern and contain two 100-hp. Titusville Iron Works boilers, two 90-hp. Ideal engines direct connected to Westinghouse alternators, rectifiers, arc lamps, &c. Mr. Reed is also engineer for the new municipal light and power plant at Martins Ferry, Ohio, which contains two 300-hp. Erie City boilers and Buckeye engines, direct connected to a 450-kw. and a 250-kw. generator. He has also made an inspection of the new municipal water and light plant at Cambridge Springs, Pa., where a 100-hp. Skinner engine, direct connected to a 60-kw. Westinghouse generator, Westinghouse rectifier and the metallic flame system of arc lighting is used. Mr. Reed also undertakes the laying out of large units in the manufacture of iron and steel.

The No. 1 blast furnace of the Jones & Laughlin Steel Company at Aliquippa, Pa., has gone out of blast and the No. 1 stack of the Dunbar Furnace Company at Dunbar, Pa., has been started up, after being idle for about two months for repairs. The No. 4 blast furnace of Republic Iron & Steel Company at Hazelton, near Youngstown, Ohio, is nearly completed and will be ready for blast about January 1. It is a duplicate of the No. 3 furnace, having a skip hoist and all modern appliances. The stack will have a daily capacity of about 500 tons.

The Jones & Laughlin Steel Company of Pittsburgh, in order to supply adequate transportation facilities for its employees at its new plant at Aliquippa, Pa., will build a street car line of its own. A company to be known as the Woodlawn-Southern Railway Company has been organized and has applied for a charter, and an electric street car line will be built from the works at Aliquippa to the different localities near Aliquippa, in which the men make their homes.

The bi-monthly examination of sales sheets of the Republic Iron & Steel Company, and other bar iron makers, held in Pittsburgh November 12, shows the puddling wage scale for November and December will be based on a 1.35-cent card, which nets the puddlers $5.87½ a ton, a decrease of 25 cents as compared with the rate for September and October. The wage scale in the finishing department is decreased 2 per cent. This scale affects puddlers belonging to the Amalgamated Association and the Sons of Vulcan.

The Coin Machine & Mfg. Company of Portland, Ore., has purchased 30 acres of land at Trafford City, Pa., on which a new plant will be erected. The company, which is capitalized at $2,000,000, has a plant at Portland, Ore., and one at Kansas City, Mo. The selection of Trafford City for the Eastern works was decided upon on account of its being close to the supply of raw material and the shipping facilities offered. Work on the new plant will be started in a short time.

The Stonega Coke & Coal Company, Inc., has removed its general offices from Stonega, Va., to Big Stone Gap, Va.

The Machinery Markets

Trade in most machinery selling centers is a shade better than it was a week or two ago. The railroads continue to support the market by placing orders for single tools and it is apparent from the inquiries that are out that many railroad repair shops are in need of equipment. An active demand for woodworking machinery continues in the Pittsburgh market, the orders coming largely from the South. Sales are slow in Cincinnati, but machine tool builders there see a good business ahead as they continue to make up machines for stock. Inquiries have increased in Chicago and there is a small list out from a Western railroad, calling chiefly for machine tools. Trade is strengthening in the South and in the Southwest. In the latter market interurban railroads are the principal buyers, and it is announced there that the Atchison, Topeka & Santa Fé Railroad will shortly purchase tools for a repair plant. In other markets business continues about the same, but there are encouraging reports based on increased inquiries.

New York

NEW YORK, November 15, 1910.

The railroads are doing some scattered buying in the New York market, and there are inquiries out for good sized lists of equipment for early delivery to two Newburgh, N. Y., manufacturers whose plants were visited by fire recently. Beyond this there is little in the way of actual business before the trade, but some enterprises that have for one reason or another been held in abeyance of late give promise of materializing in orders soon. The railroad buying has been done largely by the Delaware, Lackawanna & Western Railroad, and a few orders have been placed by the Grand Trunk Railroad and the New York Central Lines. These were largely in the way of single machines taken for replacement. The shipbuilding companies of the Atlantic coast and on the Great Lakes have been doing a little purchasing for equipment needed to take care of the winter repair work, which has been coming into the Great Lake shops especially in good volume. The demand for machines in this market for export is helping to support the trade materially, and some good orders have been placed for mining equipment for delivery in Mexico. There is a continued strong demand for second-hand machinery. In a number of instances recently large manufacturers who have let their equipment run down or were for some reason in a hurry for machines have bought second-hand material from stock in order to obtain immediate deliveries.

The Coldwell Lawn Mower Company, Newburgh, N. Y., is inquiring for considerable equipment to replace machinery destroyed by fire November 11, when the principal shop building of the plant was burned to the ground. The structure, which was 200 x 300 ft., contained considerable new manufacturing equipment and the loss, which is covered in insurance, is estimated at $165,000. The storehouse, containing a stock of 50,000 lawn mowers, was saved from the flames, and the company has a new addition to the plant, which was begun some time ago, nearly ready for occupancy, consequently the machinery equipment will be purchased immediately and the plant will be put in operation as soon as possible.

The Lackawanna Mfg. Company, manufacturer of gasoline motors, whose plant adjoined that of the Coldwell Lawn Mower Company at Newburgh, was also a sufferer from fire. The larger part of its manufacturing plant was destroyed, but fortunately a new plant across the street, which was just recently completed, was saved and the company's business will be transacted from there. The Lackawanna Mfg. Company, which is closely connected with the Coldwell Lawn Mower Company, is also buying machinery which is to be installed as soon as deliveries can be made.

The General Electric Company, Schenectady, N. Y., is progressing with its plans for a large plant it has under way at Erie, Pa., and it is asserted that it will not be long before a good sized list of machinery equipment is in the market covering requirements for the plant. It will be remembered that the company purchased 700 acres of ground at Erie several years ago, and it planned at that time to use about 400 acres for the erection of residences for employees and the rest of the land was to be devoted to manufacturing purposes. The company's plans were abandoned for the time being because of the business panic, but recently some manufacturing buildings have been put up there and the property has been utilized, but by no means to the extent originally intended. It is said that the company's business has been growing so rapidly of late that it has been considering the carrying out of its original plans in connection with the Erie property, and accordingly some trade may ensue from that source.

The Wasson Piston Ring Company, Bayonne, N. J., has been organized, with an authorized capital stock of $35,000, and the company is now formulating plans for the erection of a manufacturing plant. At present the company's product is being made at the works of the Crane & Whitman Company of Bayonne. The company manufactures piston rings for internal combustion engines, and according to its charter it is also privileged to make motors and piston packing. The incorporators of the company are Robert B. Wasson, 9 Sylvester street, Cranford, N. J.; Foster Crampton, 60 Wall street, New York; Hubert T. E. Beardsley, 45 Cedar street, New York, and Louis Burnstein, 180 Pulaski street, Brooklyn, N. Y.

There are indications that the Simms Magneto Company will shortly place orders for equipment to be installed in its plant now in course of construction at Watsessing, N. J. The plant, which is well under way, will consist of a two-story building, 150 x 300 ft. It is adjacent to the tracks of the Delaware, Lackawanna & Western Railroad. Mr. Simms of the Simms Magneto Company is expected home from Europe shortly and, according to people in the trade who are acquainted with the company's affairs, a list is now being made up by William Shuler, the purchasing agent, which will be acted upon as soon as the head of the company returns.

The Victor Motor Truck Company, Buffalo, N. Y., has been reorganized and reincorporated, with a capital stock of $250,000, and will build and equip an extensive plant. The present factory is at 1457 Niagara street, in the Ross Manufacturing Building.

The Dussault Foundry Company, Lockport, N. Y., is rebuilding the portion of its plant damaged by fire recently, erecting an addition 55 x 65 ft. and a new cupola room 20 x 45 ft. It will put in a No. 3 Whiting cupola, a cinder mill, new core ovens and additional molding machines, and will also install a 10-ton traveling crane with 30-ft. span runway.

The Larkin Company, soap manufacturers, 663 Seneca street, Buffalo, John D. Larkin, president, is receiving bids for a 2000-hp. electric power plant, steam heating plant and elevator equipment for an eight-story building which it is to erect. The electric power plant, for which Niagara Falls power will be used, will require alternating current motors, 5 to 50 hp.; transformers, switchboards, ammeters, &c.

The Aluminum Castings Company, Buffalo, N. Y., has let contract for a one-story brick and steel heating plant which it will build in connection with its new foundries at Elmwood and Hertel avenues and the Erie Railroad.

The New York Central Railroad Company is enlarging its machine shop on Broadway, opposite Goethe street, in its East Buffalo yards.

The Standard Oil Company is building a one-story car repair shop at its Atlas Works, Elk and Babcock streets and the Buffalo Creek Railroad, Buffalo, N. Y.

The Rochester Fibre Box Company, Rochester, N. Y., John A. Levis, president, 129 Andrew street, is having plans prepared for a new factory which it will erect early next spring at an approximate cost of $50,000.

The Allegheny Valley Brick Company is placing orders for equipment required for the plant it is building at Olean, N. Y., including two 165-hp. gas engines and necessary brick-making machinery.

The Century Steel & Iron Company, 1445 Niagara street, Buffalo, N. Y., W. J. Wark, president and manager, is building an addition for the manufacture of Bessemer steel castings to its present foundry plant.

The Standard Welding & Mfg. Company, Buffalo, N. Y., recently incorporated with capital stock of $10,000, has leased manufacturing premises at 951 Main street, where it will engage in the manufacture of sheet metal specialties and general custom welding, with especial reference to the automobile trade, using the Linde Air Products Company's oxyacetylene process. Thos. H. Muffitt is president of the company, formerly vice-president of the National Welding & Mfg. Company, manufacturer of the Model acetylene gas generators, and Jno. L. Heider is secretary and treasurer.

THE MACHINERY MARKETS

It is the intention of the company a little later on to manufacture a line of acetylene gas generators.

The Onondaga Bed Mfg. Company, Syracuse, N. Y., is in the market for a punch press to be installed in an addition now in course of construction.

Business Changes

The Pawling & Harnischfeger Company, Milwaukee, Wis., has opened a branch office in the Washington Building, Portland, Ore., which will be in charge of R. K. Morse, who for some years past has been a member of the company's engineering staff at the home office.

Safety Device Catalogues Wanted

Kent McNaughton, Association Rooms, Stevens Building, Detroit, Mich., requests catalogues from manufacturers of safety devices. He would like to receive as much literature on this subject as possible and therefore requests manufacturers whose catalogues show safety devices in connection with their own machines or apparatus to send him copies of such publications.

Chicago

CHICAGO, ILL., November 15, 1910.

The settlement of political uncertainties has not brought any rush of business to Chicago machinery houses. There is a slight improvement in the number of inquiries and a little more business is being closed, especially in smaller tools and machines, and dealers are encouraged to believe that this improvement will continue. The more conservative among Chicago machinery men, however, do not expect a broad market until after the first of the year. One Western railroad is in the market for a small list of tools, and a good indication is that the mechanical men of several railroads are looking around on the street, getting data for future purchases.

Authorities in the banking world estimate that general business in the West is a little above normal, except in railroad purchases. The machine tool trade is, therefore, a striking exception to general conditions. The fact that business in other lines is good will undoubtedly have its ultimate effect on buyers of the best class of tools. The plow manufacturers at Moline, Ill., have begun working a 12-hour day for the winter, and, while they are not buyers of many high class tools, the fact that their business is so good is encouraging. A serious check on the operations of manufacturers in other lines who would be good buyers of tools is that interest rates are high, and it is hard work to borrow even at high rates. There has been an unusual demand on the banks the past year for money to carry crops. It takes twice as much money now to finance a car of hogs as it required a few years ago, and the same thing is true of cotton. The market prices of wheat and corn have been above normal. It is a part of the legitimate business of the banks to carry all of these commodities from the time they leave the hands of the producer until they go into consumption. High prices increase the amount of money required for this business, and the inflation in commodity values has been responsible for high interest rates and the unusual demand for funds. This condition goes around the circle to the railroads. The bankers expect a slow liquidation during the coming year in commodity prices which will tend to release funds and make conditions easier for manufacturers, railroads and other users of borrowed capital.

The Chicago, Rock Island & Pacific Railroad is in the market for a small list of tools.

The Moline Plow Company, Moline, Ill., at a special meeting of its stockholders authorized an increase in its capital stock from $7,000,000 to $9,000,000, the increase being necessary for future expansion and extra working capital.

The People's Power Company, Moline, Ill., has closed a contract to furnish power to six allied manufacturing concerns of Moline and East Moline. These companies are Deere & Co., Deere & Mansur Company, Moline Wagon Company, Velie Motor Company, Union Malleable Company and the Marseilles Company. The power plant of the Deere shops will be retained to supply steam for heating.

Forsyth Brothers Company, Chicago, after negotiating for some time for the purchase of a site on which to locate its new plant, advises that it has purchased 23 acres of land at Harvey, Ill., on the Illinois Central and Grand Trunk railroads, with switching facilities on the Baltimore & Ohio Terminal. The company has already begun the erection of a building, 100 x 400 ft., which it is expected will be ready for occupancy by the first of the year. Other buildings for which plans have been prepared will be erected in the spring. The company is at present located at 213 Institute place, and manufactures railroad supplies, but will abandon this plant as soon as the new one is completed. A considerable amount of new equipment will be purchased.

The new building of the Otis Elevator Company, at Quincy, Ill., which will join the present unit on the west, is under construction. It will be 100 x 375 ft.

The Sterling Hearse & Carriage Company, Sterling, Ill., has been incorporated with a capital stock of $10,000. The incorporators are A. A. Wolfersperger, C. E. Bensinger and H. C. Newell. The company will engage in the manufacture of vehicles.

The Clark Delivery Car Company, Chicago, certifies to an increase in its capital stock from $5000 to $150,000.

The Greenberg Automatic Fitting Machine Company, Chicago, has been incorporated with a capital stock of $100,000. The incorporators are Wm. F. Smith, Chas. W. Kohn and Samuel E. Greenberg.

The Decatur Fountain Company, Decatur, Ill., certifies to an increase in its capital stock from $50,000 to $100,000.

Arthur J. O'Leary & Son Company, Chicago, advises that the first building of its new plant, 100 x 300 ft., is nearly completed and foundations for installing the machinery are now being placed. It is expected that the new plant will be in operation by the first of the year.

The S. G. Taylor Chain Company, Chicago, Ill., has purchased a site at Hammond, Ind., upon which it will erect a plant for which plans are now being prepared. The company also operates a plant at Maxwell, Ind., which will be moved to Hammond upon completion of the new factory. The Chicago plant will eventually be moved to Hammond.

Philadelphia

PHILADELPHIA, PA., November 15, 1910.

Very little change in the week to week volume of business is reported by either merchants or manufacturers, and from present indications a continued dull market is anticipated. The larger buyers show no disposition to make further purchases, as the demand for their own products has shown no marked improvement. The railroads continue light buyers, purchases being confined to single tools, as a rule, for replacement purposes. No information is available as to requirements of the railroads for next year, and it is now believed that nothing in this direction will develop until after the turn of the year. Local merchants report sales confined largely to single tools. A few propositions, which have been before the trade for some months, covering a number of tools, are now believed to be in shape for early closing. Machine tool builders report the demand as irregular, and, as a rule, no change in operative capacity is reported, there being enough scattered business to keep plants working at about the same rate, varying in most cases from 50 to 75 per cent. No betterment is reported in the demand for tools for export. Second-hand machinery merchants report but a light demand.

The foundry situation is unchanged. Jobbing foundries are fairly busy, but there has been little fresh demand for machinery castings. While there is a fair inquiry for steel castings, foundry plants are not very actively engaged.

The Eynon-Evans Mfg. Company is considering the installation of new furnaces in its brass foundry, which would increase the capacity about 30 per cent. This company reports a fair volume of general business coming in, with some departments quite active.

The Winton Motor Car Company, Baltimore, Md., is having plans prepared for the erection of a large garage on Maryland and Mount Royal avenues, in that city, bids for the construction of which will be asked at an early date.

The Greater Reading Hotel Company, Reading, Pa., has awarded a contract for a brick and steel fireproof nine-story hotel, from plans by J. H. Windrim of this city, to the Westlake Construction Company, St. Louis, Mo., which will take bids for the various branches of work to be done.

Estimates are being invited by the Packard Motor Car Company for a large garage on Broad street, from Pearl to Wood streets. It will be of brick, steel and reinforced concrete, eight stories, with frontage of 71 ft. and depth of 164 ft. 3 in.

The Industrial Supply & Equipment Company, 407 Sansom street, this city, has been appointed sales agent in the Philadelphia territory for the Jerguson Mfg. Company, Boston, Mass., manufacturer of Wilt-Bonco self-adjusting reflex water gauge and Wilt-Bonco engineering specialties.

Negotiations are pending for the sale of the plant of the Allentown Foundry Company, Allentown, Pa., for use in manufacturing machinery for braiding electrical wires.

The Lorraine Motor Company is taking estimates for a large garage building at Thirty-seventh and Ludlow streets.

The Board of Awards, Baltimore, Md., will receive bids

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until November 30 for a new office and laboratory building and a transformer house at the Back River sewage disposal works, as shown on plans at the office of the Sewage Commission, 904 American Building, Baltimore, Md.

The Metropolitan Electric Company, Reading, Pa., will, as soon as the service from its new plant in that city is in full operation, discontinue service from its water power plant at Klapperthal, near Reading, and may ultimately rebuild the latter plant.

A contract has been awarded to F. L. Hoover & Sons for the construction of a new boiler house, 35 x 40 ft., a three-story addition, 30 x 40 ft., and a 30 x 60 ft. addition to the mill of the Megargee Paper Mills at Modena, Pa. The boiler to be installed in the new boiler house has already been contracted for.

The Markle coal interests are behind the incorporation of a number of power companies to operate in the vicinity of Hazleton, Pa., charters having been secured a few days ago for four companies to furnish electricity for light, heat and power in Hazleton and three adjoining townships. The incorporators are A. Markle, C. B. Houck and W. H. Lawall of Hazleton. The Pardee interests established a number of power companies in the same region several years ago.

The Sciple-Gouchenour Company has been chartered to manufacture boilers and machinery in Philadelphia. The capital stock is $18,000, and the incorporators include H. M. Sciple, W. E. Gochenour and C. B. Sands, all of Philadelphia.

Cincinnati

CINCINNATI, OHIO, November 15, 1910.

Machine tool traveling salesmen generally report excellent business in sight, but complain of the scarcity of actual orders. There is also spirited competition, and it is stated that a few firms have been cutting prices, but this is not confirmed. Some tool builders are accumulating stocks, but have not yet the number of tools normally carried on hand. Should the expected awakening in business occur, the builder able to make prompt shipment will have a decided advantage.

Second-hand machinery is moving a little better and a steady improvement is looked for. Except for the smaller sizes of motors and dynamos, electrical machinery is slow, but indications are that the spring season will be a good one.

Machinery supply dealers are booking only a fair business, but report improvement over the corresponding period of last year.

The John J. Bruce Company's foundry on Colerain avenue, Cincinnati, is one of the busiest in this section of the West. The company makes a specialty of special railroad castings.

Recent sales of the Norton Machinery Company, Cincinnati, include a 100-kw. direct connected generator and engine to the Newport Rolling Mill Company, Newport, Ky.; a 1200-kw. generator and engine to the Cincinnati Traction Company, and a 250-hp. boiler to the Cincinnati Cooperage Company. The company also reports a good business in small engines and boilers for contractors.

The Mt. Vernon Electric Company, Mt. Vernon, Ohio, is reported to have plans under way for a large addition to its power house.

The Cincinnati Machinery Company, Cincinnati, has been incorporated with $30,000 capital stock by H. Williams, John W. Daly, Chas. Follett, Thos. H. Kelley and F. M. Kelley. The company has already been doing business as new and second-hand machinery dealers, with offices in the Johnston Building.

A meeting has been called of the Cincinnati branch, National Metal Trades Association, for November 17, at which will come up for discussion the proposed employers' liability law and the question of revising the apprentice system. Arrangements will also be concluded for the annual meeting to be held at the Business Men's Club December 8, at which a large number of manufacturers from other cities will be in attendance.

The Akron Belting Company, Akron, Ohio, has increased its capital stock from $100,000 to $200,000.

There is a persistent, but unconfirmed rumor, that the Baltimore & Ohio Railroad Company is preparing plans for a large repair shop to be located at a point near Columbus, Ohio.

The new foundry and machine shop additions to the plant of the Laidlaw-Dunn-Gordon Company, Elmwood place, Cincinnati, have been completed and the company expects to have its equipment installed and in operation before January 1.

The Rahn-Carpenter Company, Cincinnati, is working on an order for several of its gap lathes for shipment to Japan.

J. M. Robinson, president of the American Mfg. Company, Chattanooga, Tenn., manufacturer of hardware specialties, was in Cincinnati last week for the purpose of purchasing the necessary machinery to rebuild the Chattanooga plant recently destroyed by fire.

The roof is now being laid on the new four-story reinforced concrete addition to the plant of the R. K. Le Blond Machine Tool Company, Cincinnati. This building will be used entirely by the milling machine department.

The New Idea Spreader Company, Coldwater, Ohio, is making rapid progress on the construction of its new plant and it is expected that the main building will be ready for operation by February 1. Buildings now under construction have an approximate floor space of 100,000 sq. ft., and several other buildings are being planned for erection next spring. All machinery will be driven by electric motors, the power being generated in the company's own power plant. A good many special machines are being built to order.

The Vim Motor Mfg. Company, Sandusky, Ohio, has increased its capital stock from $25,000 to $60,000.

Press dispatches announce the incorporation of the Carr Furnace Company at Wheeling, W. Va. The capital stock is given as $10,000, and the incorporators are Peebles Tatum, A. S. List, C. E. Blue, W. M. Carr and S. M. Noyes, all of Wheeling.

Cleveland

CLEVELAND, OHIO, November 15, 1910.

The local machine tool market is still inactive. Little new business and few inquiries came out during the week. With the excitement of the political campaign over the feeling is better and dealers are looking for an improvement in the volume of business, although with the end of the year so near at hand it is expected that some who have been delaying their purchases of machinery will now wait until after January 1. Some prospective business in the shape of inquiries regarding machinery equipment for plant additions developed during the week, but these extensions have not yet been definitely decided upon. More second-hand machinery is being offered than for some time, the most of this coming from small machine shops that have been affected by the recent light demand for automobile work. The demand for mill supplies is only moderate and dealers are allowing stocks to run low, thinking that possibly prices may be lower later.

Among manufacturers in metal working lines the general situation shows little change, but the outlook is regarded as favorable. Plants are quite well filled with work and with few exceptions are being operated at full capacity.

In the foundry trade plants that make light castings for various purposes are well filled with work, but the demand for heavy and machinery castings is dull.

The new plant which was recently announced would be built in Cleveland by the Cleveland Foundry Company will be owned and operated by a separate corporation, composed by men who are officers and stockholders of the Cleveland Foundry Company. The new company has been incorporated under the name of the Cleveland Metal Products Company with a capital stock of $200,000. The company has purchased a 16-acre site at Callamer avenue and the Nickel Plate Railroad, and will at once erect two buildings of brick and steel construction. One building, 60 x 170 ft., two stories, will be used as a press shop, and the other, 80 x 200 ft., one story, will be used for an enameling plant. The company will do the enameling required by the Cleveland Foundry Company and will bring out a line of metal stampings, including lamp shades, outdoor lamps, railroad signals and other products. No power plant will be installed as the company will secure electricity for power from a commercial company. The only machinery to be purchased will be of a special character.

The Sabin-Curtis Machine Company, Cleveland, machinist and builder of special machinery, is building a new shop at 6536 Carnegie avenue, which will largely increase its present capacity. The new building is 46 x 130 ft., and two stories. Some new machine tool equipment has been purchased and the company is in the market for electrical equipment, which will probably consist of five 7½-hp. motors.

The Warren, Ohio, Board of Trade has closed a contract with the General Foundry Company at Bradford, Pa., to build a large plant in Warren. The company is to be given a 30-acre building site and agrees to expend $50,000 in buildings and machinery and to furnish employment for 150 men.

The Pilliod Bros.' Company, Toledo, Ohio, has been incorporated with a capital stock of $100,000 by Henry J. Pilliod, Julian H. Tyler, Charles J. Pilliod, John F. Kumler, Jr., and Robert Newbegin. It is announced that the company will manufacture a patented valve gear for locomotives and will occupy the old Shelby Tube Company plant on Dorr street.

The Perfect Fireless & Electric Cooker Company, Toledo,

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Ohio, has been incorporated with a capital stock of $50,000 by Luther D. Smith, W. A. Humphrey, Charles F. Nighswander, Max C. Roth and E. R. Kirkendall. The company will manufacture a fireless and electric cooker.

The Marine Boiler Works, Toledo, Ohio, will enlarge its plant by the erection of an addition, 80 x 120 ft. This concern, which has confined its product to marine boilers, will in the future make other types of boilers.

The Fremont Stove Company has an inquiry out for several grinders and polishing machines for a new plant that it is building in Fremont, Ohio.

The Taylor & Boggis Foundry Company, Cleveland, reports business good in all of its departments, and that the total volume of its business during the past 10 months equaled that of the entire year of 1909.

The Horsey Mfg. Company, Cleveland, has been incorporated with a capital stock of $15,000 by E. T. Horsey and others. The company will build a plant for the manufacture of the Horsey no seamer patcher for inner tubes of automobiles and general tire repair work. The company has all the tool equipment that it will need for the present.

The Reliable Machine Company, Cleveland, tool maker and machinist, will shortly move from its present quarters, 224 High avenue, to a new plant now being erected at 5320 St. Clair avenue. The building is 70 x 80 ft. and two stories. H. J. McGivern is manager of the company.

Because of the large amount of orders on hand the Thew Automatic Steam Shovel Company, Lorain, Ohio, expects shortly to put on a night shift, increasing its working force 40 per cent.

Plans are now being prepared for a large one-story shop, including power plant, to be erected at Bucyrus, Ohio, by the Summer Motor Company.

New England

BOSTON, MASS., November 15, 1910.

The Boston dealers are not doing a large business. A few isolated good orders have been booked, but as a whole trade continues dull. A few of the machine tool builders are busy, but the majority are producing at a rate exceeding the demand, filling their storerooms in anticipation of a better condition of business. Rumors of large requirements in this territory are current, but to date have not materialized in actual inquiries. The election has done no harm to the market. On the contrary, the popular opinion is that the atmosphere has been cleared, with the promise of distinctly beneficial results.

The suggestion is made that a closer union be formed between the various associations whose members are the manufacturers and dealers in machine tools and supplies; namely, the National Machine Tool Builders' Association, the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association, and the Southern Supply and Machinery Dealers' Association. The interests of these bodies overlap in an important way, yet they have never met, either in conventions of the whole, or in joint committees, excepting to discuss some special question which is up for action. One plan is to have a permanent joint committee, the duty of which would be to consider matters of mutual interest, and to report back to the associations which may be affected. The supply associations have met together, that is to say, in the same city. But the National Machine Tool Builders have not been included in the immediate deliberations, as a rule. At the recent New York convention of this latter organization the suggestion was made that the National Supply and Machinery Dealers' Association hold its next meeting coincidently with the Machine Tool Builders. This appears to be impossible. The Supply Association has its annual meeting in the spring, the Machine Tool Builders in the autumn. The American Supply and Machinery Manufacturers' Association will meet next spring in Louisville, Ky., and has invited the two dealers' associations to hold their meetings at the same time and place. Therefore, it is unlikely the National Supply and Machinery Dealers' Association can arrange even to hold its annual meeting in conjunction with the Machine Tool Builders at the latter's semiannual meeting at Atlantic City in May. The standing joint committee might have the effect of amalgamating interests; further, to the important benefit of both the machinery and supply trades.

The Autogenous Welding Equipment Company, 41 Bay street, Springfield, Mass., which does autogenous welding and cutting, and is a dealer for the Davis-Bournonville process, has established a branch at Hartford, Conn., the factory being located at 62½ Church street. Henry Cave is president of the company.

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., manufacturer of machinery, is contemplating the erection of an additional machine shop building, 64 x 100 ft., and one story. It is not definitely decided whether work on the building will begin immediately.

The Springfield Mfg. Company, Bridgeport, Conn. manufacturer of grinding machines and abrasive wheels, has brought out an improved machine known as the Springfield-Brandes vertical grinding planer, a massive tool designed to grind work 12 in. wide, 12 in. high and 4 ft. in length. The planer will constitute a standard type with its builders.

The Athol Machine Company, Athol, Mass., manufacturer of vises, grindstones, machinists' tools and hardware specialties, is building an addition to its foundry, 22 x 40 ft., which will be used for an annealing room, and for a sand blast apparatus for cleaning castings.

The Boston Fire Department has fitted up its temporary shops and will have no list of machinery for its new repair building for some time to come.

The Ellery Twist Drill Company, Portsmouth, N. H., manufacturer of carbon and high speed drills, is erecting a one-story hammer shop, 30 x 40 ft., of concrete blocks, which will replace the present shop, which is needed by another tenant of the building.

The Griffin Button Company, Shelton, Conn., states that the loss to its machinery in the recent fire was immaterial.

Yahnig & Cohoon, Bristol, Conn., brass founders, has purchased a tract of land upon which a new foundry will be erected, the initial unit consisting of a wooden frame building 40 x 60 ft., one story.

The Meriden Keyless Lock Company, Meriden, Conn., has been incorporated under Connecticut laws, and will manufacture keyless locks, egg beaters and adjustable curtain and shade supporters. The factory is located at 50 North avenue. B. Kreuzberger is the president, C. Yauch, vice-president, S. A. Minery, treasurer, and E. Marshall, secretary.

The latest announcement of the plans of the New York, New Haven & Hartford Railroad for improving its system is that $3,000,000 will be expended on the Air Line division between New Haven and Willimantic, including the rebuilding of the bridge across the Connecticut River, and other bridges, to cost $900,000.

New England shipbuilders are rejoicing in the probable award to them of the contracts for three of the new torpedo boat destroyers, two to the Bath Iron Works, Bath, Maine, and one to the Fore River Shipbuilding Company, Quincy, Mass.

Pittsburgh

PITTSBURGH, PA., November 15, 1910.

Orders for heavy machinery are increasing. In West Virginia there is a great deal of activity at present among mining, timber cutting, woodworking, quarrying and stone crushing plants, where extensive improvements have been planned. This is a feature of the trade of the district recently, and the coming year is expected to show important industrial growth. Many electric power plants are to be built, both for public service and commercial use, including the operation of traction lines, while pumping stations, filtration plants, &c., will also call for a great deal of new equipment.

In western Pennsylvania and eastern Ohio few new enterprises have been planned this season, and coming expansion will take the form of additions or remodeling. Railroad buying is gaining in volume, but still consists largely of purchases of miscellaneous material, with isolated orders for equipment designed for shop improvements, new roundhouses, water supply plants, terminal additions, &c. The demand for air brakes has been quite heavy lately.

While no official announcement on the subject has been made, it is understood here that the R. D. Nuttall Company, Pittsburgh, will build a large new manufacturing plant in Claremont, where a site was recently secured. Meanwhile, additional facilities are being provided at the present factory.

Contracts may soon be let for the construction of a car house and repair shops at Fairmont, W. Va., for the Fairmont & Clarksburg Traction Company.

The Morlan-Ricks-Hughes Company recently organized at Pittsburgh, Pa., by Lindley T. Morlan, Clarence L. Hughes and others, will establish a plant utilizing wood products.

The Gourley Water Company is planning the construction of a pumping plant at Big Run, Pa.

The Graham Light & Power Company has been organized at Graham, W. Va., to establish a public service plant, and the intention is to provide sufficient power for the operation of an electric traction line.

A shipment of electrical machinery, comprising 15 carloads, has just been made to the Braden Copper Company, Rancagua, Chile, S. A., by the Westinghouse Electric &

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Mfg. Company. This includes three large generators to be direct driven by hydraulic turbines.

The Dual Impulse Motors Company has been organized by Frederick C. Tygard, Pittsburgh, and Walter A. Koegler and Chas. H. Abbott, Mt. Oliver, Pa., with $100,000 capital stock, to manufacture an internal combustion engine.

Cuthbert Bros., Pittsburgh, have taken the contract for the new power plant building to be erected by the American Locomotive Company.

Machinery houses here will figure shortly on the equipment of a new plant to be erected by the Canestoga Portland Cement Company, Lancaster, Pa., consisting of a crushing plant, pulverizing mill, kiln house, finishing mill and stock house. A large electric power plant will also be erected and motors used for driving the machinery.

The gate valves, boxes, &c., for the new Parkersburg, W. Va., water works will be furnished by the Ludlow Valve Mfg. Company, Pittsburgh.

H. J. Koontz, Pittsburgh, manufacturers' representative and dealer in new and second-hand machinery, has recently purchased the machinery in a local plant which includes a 200-hp. McNaull water tube boiler, &c., and has also purchased a 5-ton and an 8-ton Frick refrigerating machine. Recent sales made by Mr. Koontz include a 30-ton Wolfe-Linde ice machine to a Philadelphia brewery.

The Imperial Company, Grove City, Pa., manufacturer of the Imperial line of plumbing goods, including self-closing and compression bibbs, basin and bath cocks, is increasing its capital stock from $25,000 to $100,000, for the purpose of enlarging its facilities and extending its business. Its foundry capacity is to be enlarged to accommodate six new molding machines, while the machine shop is to have about 12 new turret lathes added. The buffing department is to be more than doubled. J. M. Reynolds is manager.

Indianapolis

INDIANAPOLIS, IND., November 14, 1910.

The American Foundry Company, Indianapolis, has increased its capital stock from $26,000 to $40,000.

At the annual meeting of the National Wire Bound Box Company, held at South Bend, Ind., the following officers were elected: President, Guilford L. Babcock, New York; vice-president, Howard L. Babcock, Chicago; directors—Clarence L. Millard, Daniel P. Murphy and Harold N. Oldstead, New York; S. M. Robinson and Dr. S. Whitehall, South Bend. The company has factories in many cities.

John Paxson has been appointed receiver of the Clover Leaf Machine & Axle Company, South Bend, Ind., which manufactures axles and automobile parts.

The Court has ordered W. T. Durbin, receiver for the Anderson Carriage Mfg. Company, Anderson, Ind., to accept a bid for the plant of $17,500, made by E. L. Anderson of Union City, Ind.

The sawmill of Thompson, Thayer & McCowen, Evansville, Ind., which was burned October 30, with $30,000 loss, will be rebuilt.

The Board of Public Works, Terre Haute, Ind., is having estimates prepared for the erection of a municipal water works system.

The Hill-Tripp Pump Company, Anderson, Ind., has purchased the factory building of the Wilkie Mfg. Company of that city, and will begin at once the removal of its plant from its present location to the new building, where it will have larger manufacturing facilities.

The Mishawaka Folding Carriage Company, Mishawaka, Ind., which has been in the hands of a receiver, has been reorganized, with Feyer Bros. Mfg. Company, Toledo, Ohio, back of it. The Mishawaka Company manufactures collapsible go-carts.

The Orten & Steinbrenner plant at Chicago for the manufacture of locomotive cranes will be moved to Huntington, Ind., where much of the preferred stock of the company has been bought.

The American Woodwork Mfg. Company has been incorporated at Evansville, Ind., with $30,000 capital stock, to manufacture wood products. The directors are Louis Kramer, F. A. Larkin, E. P. Kramer, P. J. Euler and Owen H. Jean.

Some light is thrown on the financial troubles of the Rider-Lewis Motor Car Company, Anderson, Ind., by the report of the receiver, Thomas J. Delahunt, which says that the company sold 250 cars for $240,876 and that the cost of making them was $289,967, a loss in operation of $49,090. There is about $80,000 of material yet to be worked up and the plant will be kept in operation by the receiver.

Trustee Charles T. Peck has sold the Western Tin Plate Company's plant at Greencastle, Ind., at auction to Austin Lynch of Canton, Ohio, for $50,000. It had been valued at $200,000. The plant was built in 1902 and ran at intervals for four years, being reorganized several times and under different managements. Including a bond issue, the total indebtedness is about $140,000. Mr. Lynch represents the bondholders. An effort will be made to have the plant in full operation again.

The Oswald Motor Works, Goshen, Ind., after a month's shutdown to make changes both in the machinery and management, preparatory for next year's work, has resumed operations.

The Roberts Mfg. Company has been incorporated at Indianapolis, with $10,000 capital stock, to manufacture carburetors and other mechanical devices. The directors are J. N. Kelly, W. H. Roberts and Elmer Wetzel.

The Gosport Electric Light Company, Gosport, Ind., has purchased the lighting plant and system of the Gosport Electric Light & Power Company and is constructing a transmission line from Gosport to Spencer, Ind. The first named company will abandon its own power plant and will purchase its power from the Spencer Light, Power, Heat & Water Company of Spencer.

St. Louis

ST. LOUIS, November 14, 1910.

Business in the machine tool line has been very quiet the past week. Local houses are at a loss to account for this stagnation, as conditions seem right for a fairly active trade. However, the electrical companies, of which St. Louis has five or six prominent ones, keep full of orders, and are constantly increasing their facilities. The decisive vote against State-wide prohibition has put new confidence in the brewery interests, and these are becoming noticeably more active in extensions already.

The Everstick Anchor Company is now operating its new shop in the Cass avenue district. This concern manufactures a self-acting anchor contrivance for telephone and telegraph guy wires, &c.

The Davis Expansion Boring Tool Company has completed its reorganization. A new plant will be erected and considerable machinery will be required.

The Texas Company, the independent oil company in which J. W. Gates is interested, is preparing to erect a large refinery in the western part of the city.

The capital stock of the Gilinwater Mfg. Company has been increased from $10,000 to $20,000.

Philip Thierolf, T. H. Pollock, Henry Schneider and J. P. Falter are arranging to build at Omaha, Neb., a new foundry and gasoline engine works. Plans are now being drawn at Omaha.

The elevator of the Blair Elevator Company, Atchison, Kan., was burned November 1, with a loss of $125,000, partially insured.

The Century Electric Company of St. Louis has leased the two-story and basement building at 1822-24 Olive street, which will give it 15,000 sq. ft. more of floor space. The company also will erect a small building in the rear.

The Centralia Light & Power Company, Centralia, Mo., has been incorporated with a capital stock of $30,000, by R. H. Baldridge, S. M. Locke and E. R. Locke.

The Bimel-Ashcroft Mfg. Company, Morehouse, Mo., has been incorporated with $25,000 capital stock. The incorporators are Fred Bimel, Joseph Ashcroft, P. J. Kimener and others.

The Bruner Gate Mfg. Company, Kansas City, Mo., has been incorporated with $100,000 capital stock. The incorporators are T. T. Bathhurst, J. F. Swarens, Frank J. Morgan and others.

The shops of the Chicago, Burlington & Quincy Railroad at Hannibal, Mo., which were recently destroyed by fire, are being rebuilt.

The Vienna Pearl Button Company, Muscatine, Iowa, has commenced the erection of a large addition. An electric power plant will be installed and the machinery will be motor driven.

The Parker Cattle Guard Company of New Orleans and Birmingham, Ala., will establish a plant in New Orleans to manufacture its patent guard.

The South

BIRMINGHAM, ALA., November 14, 1910.

Trade throughout the Southern States, while still short of normal, is fairly good. A striking feature of the general industrial situation is the rapidly increasing number of woodworking plants, including not only sawmills, planing mills, sash and door factories, &c., but also the establishment of plants for the manufacture of highly specialized projects, such as fine furniture, musical instruments, &c.

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Many of the larger concerns in the North are establishing branch factories, particularly in the hardwood belts, and local capital is also finding similar investment. Practically all of these plants utilize the best character of modern equipment, with in most cases the application of electric motor drive.

Less has been heard lately than was the case a year ago about the growth of the textile industry in the South, but the new plants which were then started, together with those previously in operation, are now contributing largely to the support of the market. Within the next few months announcements of the building of quite a number of additional mills, as well as allied industries, will also be made in accordance with plans now maturing.

Advices from Marion, Ala., are that the plant of the Marion Light & Power Company, which is equipped with a Crocker-Wheeler generator of 100 kw., driven by a Harrisburg engine, will be enlarged.

De Buys, Churchill & Labouisse, New Orleans, are working up the plans for a large new factory to be erected there by the Orleans Mfg. Company.

A large new plant is to be erected before long by the Genesee Lumber Company, Genesee, La., in place of the one that burned some time ago.

The new shops of the Birmingham Rail & Locomotive Works at North Birmingham, Ala., are nearly completed.

Plans are now under consideration for the sawmill to be built at Clayroy, Fla., by the Clayroy Mfg. Company, which was recently organized in Pensacola, Fla.

The Louisville Metal-bound Box Company, recently organized at Louisville, Ky., has taken over the plant of the Louisville Wire-bound Box Company. The equipment is to be remodeled and considerably extended.

The oil mill of the Meridian (Miss.) Fertilizer Company was totally destroyed by fire October 31. The loss is estimated at $15,000.

The cotton gin near Covington, Tenn., owned by B. B. Lowese, and the Crescent Oil Company of Memphis, was burned November 2, causing a loss of $4000, with $2000 insurance.

The Greenville Chair Company, Greenville, Tenn., has begun the construction of a new plant at that place which will have a capacity of about 1000 chairs a day. The management of the plant will be in charge of Joseph C. Moore, formerly of Lenoir, N. C., who for a number of years was successful in that place in the chair and furniture making industry.

Detroit

DETROIT, MICH., November 15, 1910.

The past week has been rather quiet. Manufacturers and dealers, however, are experiencing a steady run of inquiries for shop and factory equipment or supplies, and the aggregate of bookings is large. In some cases the month of October was rather disappointing, in view of the expectations raised by several spurts of very active buying.

The demand for power and electrical machinery, together with steam, gas and motor driven pumping units, is again giving good support to the market, and it now seems probable that buying on this account will continue liberal through the winter, as numerous improvements recently under consideration are practically certain to be put through before spring.

The J. E. Bolles Wire & Iron Works has taken the contract for the structural part of a three-story shop building, 100 x 100 ft., for the Detroit Forging Company.

The Yeomans Box Company has been organized in Detroit with $50,000 capital to operate a box factory. Arthur and Fred. H. and George Yeomans are the incorporators.

Two return tubular boilers will be needed by John H. Burke, Kalamazoo, Mich., for a hotel building to be known as the New Burdick.

Edmunds & Jones, Detroit, have awarded contracts for their new three-story factory building, which will be 67 x 200 ft.

The Detroit Bridge & Steel Works, Detroit, Mich., has been awarded the contract by the city for the new steel structure to be erected over the Michigan Central Railway.

The Chalmers Motor Company, Detroit, is having plans drawn for a new boiler plant.

The Du Pont Powder Company is erecting a large storage plant at Ironwood, Mich., for which some mechanical equipment will be utilized.

A condensing plant of very large size is to be erected at Adrian, Mich., by the Van Camp Packing Company, Indianapolis, Ind.

The Victor Pump Company, Grand Rapids, Mich., has been incorporated with $12,000 capital stock to manufacture a self-measuring oil pump. The pumps are attachable to any tank or drum and have double ball valves with bronze bottom. Manufacturing will be commenced at once, and the company will purchase a turret lathe, drill press, pipe threading machine, a cutting machine and a buffing machine. The officers of the company are Elmer E. King, president; John Hiaeshutter, vice-president; I. N. Seamon, secretary and treasurer.

The Michigan Alkali Company, Alpena, Mich., is erecting a concrete building 200 ft. long to be used as a machine shop, blacksmith shop and storeroom.

The Auto Body & Specialty Company, Flint, Mich., is erecting a new factory building, one story and basement.

Toronto

TORONTO, November 12, 1910.

The manufacturing equipment of the country is being kept under a steady high strain, and the wear and tear and expansion keep on making places for new motive power and new machinery. There seems to be no over-production and no over-extending. Consumers are taking the goods and banks are not hesitating to take the paper that represents such of the business that is not based on cash.

The plant of the Ontario Wheel Company, Gananoque, Ont., destroyed by fire last week, will be rebuilt at once.

Mr. Vantelet, a member of the Board of Engineers the Government has put in charge of the construction of the Quebec bridge, says that the bridge will be 88 ft. high, as compared with 67 ft. as the hight of the bridge formerly under construction there. The span will be 1758 ft., which is 42 ft. less than that of the old bridge. It will be completed, he says, by 1914.

It is announced that the Atikokan Iron Company's furnace at Port Arthur, Ont., will be kept in operation all winter.

The Judicial Committee of the Privy Council in England, which is the court of last resort in the British Empire, has decided in favor of the Standard Ideal Company, Port Hope, Ont., in the litigation between that company and the Standard Sanitary Mfg. Company, Pittsburgh, Pa. The matter at issue was the use of the word "Standard" in the Port Hope company's name. In the Canadian courts the case was decided in favor of the Pittsburgh company. The Standard Ideal Company will now, it is said, increase its manufacturing capacity. It has already under construction at plant No. 2 a building that is to cost about $100,000.

New factories to cost $100,000 are to be added to the plant of the Office Specialty Company in Newmarket, Ont. The contract for the buildings has been let.

Beatty Bros., Fergus, Ont., manufacturers of conveyors, &c., propose to extend their plant.

The Ives Modern Bedstead Company, Cornwall, Ont., is making a large addition to its plant.

The great paper mills to be built by Price Bros. & Co., Quebec, Que., will be at Jonquiere, Que. They will be known as the Kenogami Paper Mills and will employ 800 hands. It is expected that they will be in operation by the spring of 1912.

The Schwab Boiler Heating Company has been incorporated under Dominion laws, with a capital of $100,000, the head office to be at Ottawa, Ont.

The Match Factory Company, whose building operations have been begun at Neepawa, Man., is to put in a large amount of machinery.

The Canadian Pacific Railway Company has given the Canadian Locomotive Company at Kingston, Ont., an order for eight more locomotives, making 18 in all, within the last few weeks.

The Graphite Company at Buckingham, Que., proposes to move its mill to the pits in the vicinity of the town and make improvements in the plant.

The Wilkinson Plow Company's works at Toronto, Ont., were seriously damaged by fire a few days ago.

Daniel Adamson & Co. of Dukinfield, near Manchester, England, are putting in a new exhaust steam turbine engine at the Dominion Steel Corporation's No. 2 Colliery, Glace Bay, N. S. It is to provide 1400 hp. of electrical power for the plants there. This is said to be the only exhaust steam turbine installed in Canada. Two similar engines will, it is said, be installed by the Nova Scotia Steel & Coal Company at its New Glasgow, N. S., works. Exhaust steam from the rolling mills is to be used to generate electricity. The engines are to be 680-hp. low pressure turbines. The statement is made that two 3000-hp. mixed pressure turbines are to be set up for blowing purposes in connection with Canadian blast furnaces.

The ratepayers of Windsor, Ont., voted tax exemption

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to the Penberthy Injector Company, which will build a factory there.

The Widespread Implement Company is putting up its buildings at Port Dover, Ont. Its planing mills are nearly ready for the machinery, and the foundry building is in a forward state.

The Winnipeg *Telegram* complains that hardly a day passes in which the design for some building or the contract for some large piece of construction is not awarded to architects, engineers, manufacturers or contractors in the United States. The architects, engineers and contractors from across the line have a tendency, it adds, to import materials, outfit and machinery from their own country, for the reason that they are more familiar with American than with Canadian articles of the kind required.

The Manitoba Iron & Bridge Company, Winnipeg, Man., has obtained the contract for the Canadian Northern Railway Company's train shed and viaduct in the city. For the train shed 750 tons of steel are required, and for the viaduct 900 tons.

Proposals have been made to the National Hardware Company, Orilia, Ont., to remove its lock works from that town, but the company has practically decided to enlarge the Orillia plant rather than build entirely new works elsewhere.

Lumby-Stenhouse, Ltd., is building a foundry and machine shop at Fort William, Ont., to cost $40,000.

The question of extending the transmission system of the Hydro-Electric Power Commission from St. Thomas, Ont., to Windsor, Ont., is now engaging the attention of the Commission and the Provincial Cabinet. The distance to be extended over is 120 miles, and the estimated cost of the extension is $1,000,000. Other extensions are under consideration, and a total outlay of $2,000,000 is calculated upon.

Plans have been prepared for a factory to be erected at Walldeeburg, Ont., for the manufacture of an explosive called carlite. The industry is to be carried on by the Dominion Carlite Explosive Company, with a capital of $100,000.

The Ottawa Vacuum Cleaner Mfg. Company, with a capital of $150,000, has been organized in Ottawa, Ont., to manufacture cheaners after a new device under the Gillespie patents. A factory is to be built.

A large addition is being made to the municipal power house in New Hamburg, Ont., in preparation for the installing of transformers for the Hydro-Electric Power Commission's system.

The Sault St. Louis Light & Power Company, Montreal, will apply to Parliament this session for an act extending the time for the completion of its works.

Steel Radiation, Ltd., the corporation recently formed, with head offices in Toronto to take over certain existing companies and to carry on larger operations in the manufacture of radiators, &c., has purchased a site on the Lachine Canal, Montreal, on which a large foundry plant is to be erected. Five hundred men are to be employed.

The buildings of the new stove foundry at Penetanguishene, Ont., are being rapidly brought to completion. The central building is 155 x 187 ft., and the molding shop 40 x 187 ft.

The Southwest

KANSAS CITY, MO., November 14, 1910.

Buying for interurban railroad, power and lighting plants has received fresh impetus lately from the placing of bond issues. The financial situation appears to have cleared within the past week or 10 days, inasmuch as money is moving more freely. Collections are easier and purchases more frequent than they were earlier in the fall.

A large box factory will be erected at Gravette, Ark., by F. F. Crawford and Charles Hockmeister, whose present address is not given.

The Copper Queen Mining Company, Douglas, Ariz., is planning extensive improvements, which will include reverberatory and McDougall furnaces, with auxiliary apparatus.

The Atchison, Topeka & Santa Fe Railway will purchase new tools and other machinery for use in repair work at Temple, Silsbee, Cleburne and Amarillo, Texas.

The Gila Valley Electric, Gas & Water Company, Globe, Ariz., of which A. T. Smith is the leading incorporator, will build a hydroelectric plant of 500 kw.

The contract for furnishing the complete machinery equipment of the new plant to be built by W. T. Carter & Brother at Camden, Texas, has been let to the Lufkin Foundry & Machine Company, Lufkin, Texas.

A bond issue to cover the cost of a pumping plant and water works system has been provided at Wortham, Texas.

Another steam turbine unit will be required before long for the municipal power and pumping plant at Austin, Texas, where one of 750 kw. was installed about two years ago.

An electric power and pumping plant for municipal service is to be built at Marionville, Mo.

The Butler Mfg. Company, Kansas City, Mo., manufacturer of steel tanks, has increased its capital stock from $18,000 to $165,000.

The United Mill Works of Stuttgart, Ark., has been incorporated. The company has a capital stock of $50,000, of which $14,000 has been subscribed.

Southern Texas

AUSTIN, TEXAS, November 12, 1910.

Business conditions in Texas and the Southwest are very satisfactory. While there was a shortage of the cotton crop the good prices that have prevailed for the staple have brought to the farmers as much revenue as is usually obtained from a normal crop. The demand for machinery for various lines of manufacturing is unusually large. Tentative plans are on foot for the establishment of many factories of considerable size in different towns and cities of Texas and Mexico. The development of irrigation enterprises promises to be extensive during the late fall and winter. Much machinery is already being ordered for these projects.

The authoritative announcement is made by Col. S. W. Fordyce of St. Louis, Mo., of the Pierce-Fordyce Oil Association which succeeded to the business of the Waters-Pierce Oil Company in Texas, that his concern will erect a large oil refinery to cost more than $1,000,000, either at Houston or Beaumont. The plans also involve the laying of an extensive system of oil pipe lines which will connect the producing fields with the refinery.

Dr. F. S. Pearson of New York and associates who own extensive lumber manufacturing enterprises in the State of Chihuahua, Mexico, will establish a paper mill at El Paso.

John A. Young of Alpine, Texas, and associates who are operating a large marble quarry near here will install new machinery.

At the American Smelting & Refining Company's smelter at El Paso about $250,000 will be spent in improvements, including new machinery.

C. D. Deal of Colorado Springs, Colo., who recently purchased the electric light and ice plants at Palacios, Texas, from Clyde Randolph, will install additional machinery.

The Inspiration Copper Company has under consideration plans for the erection of a 5000-ton concentrating plant at Globe, Ariz.

Extensive exploitation of the underground source of water supply of the State of Chihuahua is to be carried on under the direction of the Chamber of Commerce, Agriculture and Mines of the city of Chihuahua. This organization has appropriated $100,000 to be used in boring artesian wells. If sufficient water supply for irrigating arid areas of land is developed, considerable pumping machinery will be installed.

Rapid progress is being made in the construction of the extension of the Mexico Northwestern Railroad from Terrazas, Mexico, to Madero. The first 45 miles of road from Terrazas to Pearson is finished and in operation. Track laying will soon be started on the 40 miles of grade that has been finished from Madera north. R. M. Dudley has the contract for the construction of this extension.

The Compania Irrigadora de Santa Maria, which was recently organized, with principal office in the City of Mexico, will install a hydroelectric plant and construct an extensive system of irrigation in the Jojutla district, State of Morelos. The electric generating plant will be located at a waterfall on the Apatlaco River. The power will be conveyed by means of transmission lines to a number of towns and plantations of that section. A large amount of pumping machinery will be installed for irrigating tracts of land belonging to the company and others. The construction of a railroad through the lands of the company is now in progress.

The Santa Virginia Mine & Milling Company will install a reduction plant, with cyanide annex, at its mines at Amatlan de Canas, territory of Tepic, Mexico.

The Maravillas y Anexas Mining Company, which operates in the Pachuca district of Mexico, is in the market for considerable machinery for its properties.

Compania Explotadora de Minas will erect a reduction mill at its mines near Pachuca and construct a pipe line 3 miles long to transport its slimes.

The Almoloya Mining Company will install considerable new machinery at its mines at Ameca, State of Jalisco, Mexico.

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The Pacific Coast

PORTLAND, ORE., November 11, 1910.

One of the principal features of the present demand is the increase in orders for gasoline engines to be used for a great variety of service. Most of the standard types manufactured in the East are represented here by sales agencies, and the plants that have been established on the coast for the manufacture of such units all appear to be doing well. Further developments along this line may be looked for throughout the year.

In connection with the above there may also be noted a steadily growing volume of inquiries for agricultural machinery, steam or gasoline tractors, auto trucks and wagons, &c., together with repair outfits for small shops located in the midst of farming communities.

Hydroelectric enterprises continue to occupy the attention of commercial interests all along the coast, and many plans for industrial plants, especially in the various lines of woodworking, are dependent upon the success of these enterprises.

The Washington Water & Power Company, Spokane, Wash., is preparing to build another large generating plant on a new power site recently secured on the Spokane River.

The Twin City Light & Traction Company, Chehalis, Wash., which is now operating an electric station of about 400 kw., equipped principally with generating units supplied by the Allis-Chalmers Company, 115 Jackson street, Seattle, is working out plans for a new power plant of much larger capacity.

The erection of a sawmill at Wauna, Ore., followed by other woodworking plants, is contemplated by the O. K. Logging Company, Marshfield, Ore., whose main office is in Portland.

The plant of the Haines Electric Power Company, Forest Grove, Ore., which is equipped with hydroelectric and engine driven units aggregating 300 kw. capacity, has been purchased by A. Welch of Portland, Ore., and will be enlarged in the near future, a 25-year franchise for municipal service having been granted by the city.

The Portland Railway, Light & Power Company, Portland, Ore., is negotiating for a 10-acre tract, on which it is proposed to erect new car shops of large capacity equipped with a full line of motor driven machinery.

The Mountain Timber Company, Kalama, Wash., has put in service a heavy Heisler locomotive, purchased from the W. O. Haines Supply Company, Portland, Ore.

The Spokane Chemical & Brick Company, Spokane, Wash., is preparing plans for the erection of a new factory building. Trucks or cars for handling material and a concrete mixing machine will be purchased.

The Northwest

ST. PAUL, MINN., November 14, 1910.

In the general industrial field there is a fair amount of buying for shop, mill and factory equipment, although business in that line is not yet what it ought to be for this season of the year. It is doubtful whether there will be much improvement before the opening of another spring.

A bond issue has been authorized at Morristown, S. D., to provide funds for the construction of a municipal water works system.

Bradley, S. D., will take new bids on the construction and equipment of a water works system.

It is probable that the hydroelectric plant of the Grangeville Electric Light & Power Company, Grangeville, Idaho, which is equipped with an Allis-Chalmers generator of 200 kw., driven by a water turbine of the S. Morgan Smith Company's design, will be enlarged, as the requirements of the service are rapidly increasing.

A one-story boiler house 50 x 70 ft. and a three-story generating plant with 200-ft. stack are to be added to the plant of the Minneapolis Gas Light Company, Minneapolis, Minn.

It is proposed to purchase a new boiler and pumping engine for municipal service at Huron, S. D., the additional capacity required being about 2,000,000 gal. per 24 hours. A steel stack, elevated steel tank of large size, settling basins, &c., may also be purchased.

Contracts recently awarded for the construction of water works at Rochester, Minn., include a steel tower and tank of 100,000 gal. capacity, to be furnished by the Chicago Bridge & Iron Works, Chicago, Ill.

The Diamond Boiler Works, Minneapolis, Minn., in addition to its standard line of boilers and tanks, has taken a liberal number of orders this season for refuse burners, conveyors, smoke stacks, breechings, &c.

An elevated steel tank or standpipe will be included in plans for the municipal water works system at Highmore, S. D.

The Sioux Falls Light & Power Company, Sioux Falls, S. D., is installing a 400-hp. Heine boiler and an 800-kw. Allis-Chalmers steam turbine. The company has under consideration the erection of a new steam plant, but the matter has been postponed for the present.

Milwaukee

MILWAUKEE, WIS., November 14, 1910.

Local buying is not very heavy, but salesmen from the various machinery houses have a good many prospects in hand. Some of the new construction scheduled for this fall has been put off until spring. This condition applies more particularly to Milwaukee and other large industrial centers of the State. In the smaller cities the prevailing dullness does not seem to be so much felt. Many mill and factory extensions of moderate size are now in progress, which, with the usual percentage of buying for replacements or improvements in operating machinery, result in a fairly constant stream of inquiries from the northern and interior districts of the State. The larger manufacturing companies have orders in the shops sufficient to keep them going for some time.

A three-story and basement addition, 50 x 105 ft., is to be made to the manufacturing plant of the Milwaukee Chair Company, Milwaukee. Contracts are now being placed.

A 15-kw. belted dynamo will be purchased by the School Board of Beloit, Wis., to supply electric current for use in the manual training shop connected with the High School.

Work is now in progress on a two-story machine shop for the Smalley Mfg. Company, Manitowoc, Wis. An additional factory building is to be erected after the first of the year.

New boilers may be purchased in the near future for the city pumping station at Waukesha, Wis.

Construction contracts are to be let this month on the new one-story plant of Jos. Obenberger & Sons Company, Milwaukee.

Work has been started on a two-story factory, 175 x 200 ft., at Richland Center, Wis., for the Pacific Coast Condensed Milk Company. Machinery has been contracted for. Nine other plants are to be built in this State, the next one probably at Sheboygan Falls.

Kirchoff & Rose, Milwaukee, are taking bids on a two-story shop, 60 x 120 ft., for the Northern Machine Company.

Plans are under way at Neillsville, Wis., for rebuilding the plant of the Reliable Furniture Mfg. Company, which was burned last summer.

Among the contracts recently taken by the Worden-Allen Company, Milwaukee, is one for the erection of a new building for the Hubbard Steel Foundry, East Chicago, Ill.

The Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., will contract for additional substation apparatus, including transformers and a rotary converter.

Construction contracts are now being let for a new foundry addition at the plant of the Rundle Mfg. Company, Milwaukee, which will be 84 x 130 ft.

The capacity of the concentrating plant operated by the Peaceful Valley Mining Company, Platteville, Wis., is being increased to 100 tons.

It is proposed at Tomah, Wis., to expend $4000 in the improvement and extension of the water works system.

A large expenditure is to be made by the Berwind Fuel Company in improving its docks at Superior, Wis. Contracts for additional construction work and some of the unloading machinery have been let.

The American Seating Company, Racine, Wis., has recently completed a new power plant building 45 x 60 ft., which is equipped with three 150-hp. horizontal tubular boilers furnished by the Freeman Mfg. Company of Racine. Other improvements under consideration are being held up until spring.

Farther Central West

OMAHA, NEB., November 14, 1910.

Reports on the market for machinery, mechanical and electrical supplies continue favorable, with a firm undertone and general adherence by manufacturers and dealers to established prices. In the various States of this section quite a number of new companies were incorporated during

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the past month, and a fair percentage of these will establish new shops. From the mining districts inquiries for new equipment are slackening, for the reason that the bulk of this was ordered earlier in the fall, but there is already talk of extensions in the spring, and the leading manufacturers of power and mining machinery, including compressors, drilling outfits, hoists, &c., will be almost continuously busy between now and that time figuring on pending lists.

Plans are now in progress for remodeling the plant of the Des Moines Electric Company, Des Moines, Iowa, and installing additional power machinery. Work is not likely to be started before spring.

Bids are now being taken at Marshalltown, Iowa, on machinery for a hydroelectric plant to be operated by the municipality.

Contracts recently taken by the Des Moines Bridge & Iron Company, Des Moines, Iowa, include a steel tower and tank of 50,000 gals. capacity, to be erected in connection with the new water works system at Mulvane, Kan.

Plans for improvements in the water works system at Boone, Iowa, are now being prepared for the city, including the installation of three new pumping units aggregating 7,000,000 gal. capacity, three boilers of 150 hp. each, with auxiliary apparatus and valves, hydrants, &c.

An all-steel vehicle with roller bearings for use in hauling lumber and similar material is being put on the market by the Davenport Wagon Company, Davenport, Iowa.

The city of Nephi, Utah, will install in its new power and lighting plant a hydroelectric unit, consisting of a General Electric generator of 150 kw., driven from a water turbine, built in the shops of the S. Morgan Smith Company, York, Pa.

Contracts have been placed at O'Neill, Neb., for the erection of an electric plant to serve the community.

John Westover, Inc., with structural steel works at 920 U street, Lincoln, Neb., is about to let contracts for a foundry and other buildings.

The new silo manufacturing plant to be erected at Des Moines, Iowa, by the Farmers' Co-operative Company, will include a shop, 60 x 200 ft., and an electric power plant. All of the machinery is to be motor driven.

The Field Automobile Company, 245 North Ninth street, Lincoln, Neb., is planning the erection of a two-story factory, 50 x 150 ft. W. T. Field, manager of the company, will be in charge of the work.

The Hawkeye Pump Company, Fairfield, Iowa, has under construction a new factory building, 40 x 150 ft., two stories, of concrete, brick and steel construction, which is expected to be completed by January 1. The building will be equipped with machinery for the manufacture of steel pumps, tanks, troughs and sheet metal specialties.

The Waterloo Commercial Club and Board of Trade, Waterloo, Iowa, has closed with the McElroy Concrete Post Company for the removal of its plant to Waterloo. In addition to the manufacture of cement posts the company also makes molds for the latter.

North Texas

DALLAS, November 12, 1910.

All indications are that by the first of the year there will be many large buildings in course of erection in various cities of this section of north Texas. In nearly every instance these structures are to be of steel. Dealers in all kinds of heavy machinery report a good demand. In the past few weeks the Dallas Chamber of Commerce has received communications from manufacturers in various parts of the country inquiring about locating their plants in Dallas. One reason is that the census figures so far given out show that Texas has had a wonderful increase in population.

The Lone Star Iron Works of Dallas, Texas, has recently been incorporated, with capital stock of $100,000, by B. Kinsell, J. H. Leiber, W. S. Myers and others. The company is to engage in the manufacture of structural iron of all kinds and do a general foundry business. Promoters of the enterprise claim that they have enough work in view to keep the foundry going for months.

Bids for installing a steam heating system in the court house at Hillsboro, Hill County, Texas, are asked by the Commissioners' Court of that county.

Bids will be received until November 17 for the erection of three concrete and reinforced steel buildings for the Texas University at Fort Worth.

A permit to do business in Texas has been granted the Phoenix Iron & Steel Company of Birmingham, Ala. The principal Texas office is to be located at Galveston, Texas.

The cotton gin of McKinney & Morris, Van Alstyne, Texas, was burned October 27. Loss on the buildings, $10,000.

The machine shop of W. C. Forsythe, McKinney, Texas, was burned October 25, causing a loss of $10,000.

At a fire which took place October 31 in the flour mill owned by Paul Garritt, San Angelo, Texas, the entire plant, with the exception of the engine house, was destroyed. The loss was approximately $30,000. The building and stock was insured for $19,000.

The cotton gin belonging to R. E. Brown, Rosenthal, Texas, was destroyed by fire October 29, entailing a loss of about $5000.

Government Purchases

WASHINGTON, D. C., November 14, 1910.

The Paymaster-General, Navy Department, Washington, will open bids November 22, under schedule 3013, for two electric driven compound geared deck winches and controllers, and on November 29, under schedule 3051, for two turbine generator sets and two motor generator sets.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids November 29, under schedule 3051, for furnishing and installing two generator sets at Newport, R. I., and December 13, under schedule 3052, for one 30-in. planing machine for Mare Island, Cal.

R. C. Hollyday, chief of Bureau of Yards and Docks, Navy Department, Washington, will open bids December 3 for coal and ash handling apparatus for the central power station, United States Navy Yard, Norfolk, Va.

The Isthmian Canal Commission, circular 511 B, calls for bids to be opened November 25 for furnishing, under circular 611 B, one Scotch marine boiler and 100 20-in. car wheels.

Bids were opened by the Isthmian Canal Commission, Washington, November 4, for furnishing two hoisting engines, three-drum, under C. Z. 4802 A, as follows:

American Hoist & Derrick Company, St. Paul, Minn., $7221.20 and $6540; Lenher Engineering Company, New York, $4126 or $4276; Lidgerwood Mfg. Company, New York, $5752; Meade-Morrison Mfg. Company, New York, $6190; Motley, Green & Co., New York, $4815; Stroudsburg Engine Works, Stroudsburg, Pa., $5200; Vermilye & Power, New York, $5050; Williamson Brothers Company, Philadelphia, Pa., $5476; J. F. Fennell, New York, $2693 and $2619.50.

Bids were opened November 2 by the purchasing officer, Isthmian Canal Commission, Washington, for furnishing one bench grinder for 12-in. emery wheel, as follows:

Baldwin, Tuthill & Bolton, Grand Rapids, Mich., $37.75 and $42.50; J. P. Kemp, Baltimore, Md., $39.40; Manning, Maxwell & Moore, New York, $30; Vermilye & Power, New York, $19 or $30.25.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids November 8, as follows:

Class 1, one motor driven disk grinder—Bidder 9, Charles H. Besly & Co., Chicago, Ill., $826; 54, Frevert Machinery Company, New York, $781; 63, Henshaw, Bulkley & Co., San Francisco, Cal., $1219; 64, Harron, Ricard & McCone, San Francisco, Cal., $832.50; 83, J. P. Kemp, Baltimore, Md., $741.80; 106, Manning, Maxwell & Moore, New York, $1221; 118, Pacific Tool & Supply Company, San Francisco, Cal., $819; 126, Ransom Mfg. Company, Oshkosh, Wis., $900.

Class 61, four vertical simplex piston steam pumps—Bidder 11, Blake & Knowles Steam Pump Works, New York, $1337 and $1772; 41, M. T. Davidson Company, Brooklyn, N. Y., $1565; 47, Drew Machinery Agency, Manchester, N. H., $1945; 150, Vermilye & Power, New York, $1335; 153, Warren Steam Pump Company, New York, $1325.

Class 81, six complete sets of propelling machinery for motor dories—Bidder 29, Camden Anchor Rockland Company, Camden, Maine, $165; 48, Eagle Company, Newark, N. J., 140; 51, Fairbanks Company, Washington, D. C., $131; 52, Ferro Machine & Foundry Company, Cleveland, Ohio, $175; 71, Arthur P. Homer, Boston, Mass., $149.50; 90, Lackawanna Mfg. Company, Newburgh, N. Y., $225.00.

Class 95, two constant speed motors—Bidder 57, General Electric Company, Schenectady, N. Y., $144; 105, Montgomery & Co., New York, $145.80; 152, Wagner Electric Mfg. Company, St. Louis, Mo., $136.

Class 96, seven transformers—Bidder 2, Allis-Chalmers Company, Milwaukee, Wis., $88.75; 33, Crocker-Wheeler Company, Ampere, N. J., $91.65; 42, Duncan Electric Mfg. Company, Lafayette, Ind., $80; 92, Colonial Electric Company, St. Louis, Mo., $90; 105, Montgomery & Co., New York, $82.94; 108, National Electric Supply Company, Washington, D. C., $77.50; 124, Ramsey Electric Company, Philadelphia, Pa., $88; 152, Wagner Electric Mfg. Company, St. Louis, Mo., $83.60.

Passenger Rates in Europe and America

The *Official Railway Guide* for November presents an interesting array of figures regarding the cost of railroad transportation in Europe and North America, taken from notes made by a not inexperienced traveler, of amounts actually paid during a recent tour of several thousand miles on the European continent, in passing through countries having a total population of about 130,000,000 people and traveling between 16 cities with an aggregate population of about 9,000,000. A large number of the railroads used are owned and operated by the respective governments.

In the journeyings in North America with which a comparison is made the country traversed has a population of about 50,000,000, and the routes are between 16 cities having an aggregate population of a little less than 10,000,000. These figures are taken in both cases from the former, not the recent, census, as the complete statements of the latter are not as yet accessible. The figures for 1910 will doubtless show a large increase in both aggregates. Many of the European cities have made phenomenal growths in the past ten years, while our own cities have not stood still.

The territory covered in Europe was within a square of about 600 miles by 900 miles, and is therefore about equal to that part of the United States north of the Ohio River and between the Atlantic coast and the Mississippi River.

The comparison is made between the fares charged for tickets on each continent, such as an ordinary passenger purchases in traveling from place to place. In no instance was a "train de luxe" included.

Taking the figures as shown in the tabulated statements, the cost of railroad traveling in Europe is over 55 per cent. higher than in North America. To state the matter differently: A passenger with a trunk in Europe would travel first-class 500 miles in 16 hours and 27 minutes at a cost of $22.25; while a passenger in North America with the same baggage would travel in a parlor car 500 miles in 12 hours and 56 minutes at a cost of $14.30.

The figures given all show that under equal conditions the ordinary passenger fares in North America are considerably cheaper than in Europe, notwithstanding the much greater density of population in the countries of the latter. Judging from these figures, says the *Railway Guide*, the American people have no just cause of complaint of the cost of traveling by rail in this country.

The National Monetary Commission.—The National Monetary Commission has been holding sessions in New York the past week, Senator Aldrich presiding. The Academy of Political Science in the city of New York, which began its annual meeting Friday, November 11, at Columbia University, entertained members of the commission at its anniversary dinner Friday evening. A. Barton Hepburn presided. Addresses were made by Senator Aldrich, A. Piatt Andrew, Assistant Secretary of the Treasury, and others. Senator Aldrich said that the commission has completed one stage of its work, and after years of investigation of the financial and banking systems of the Old World can now turn to the bankers and economists of this country for aid in fashioning a banking system that will meet every need for years to come. The commission has no plan. He considered the character of bank note issues and the manner in which they shall be issued to be a matter second in importance to the question of the reorganization of the credit and banking systems of the country.

The Edgewater Iron Company's blast furnace at Lebanon, Pa., formerly known as the Lebanon Valley Furnace, is to be sold.

Savings Bank Life Insurance in Massachusetts

Harry W. Kimball, 161 Devonshire street, Boston, field secretary of the Massachusetts Savings Insurance League, states that the growth of the movement is evidenced by the fact that at the present time there is about $1,400,000 of insurance in force, and the following figures recently issued by the banks make vivid the growth of the movement during the last year:

A report issued by the Insurance Department of the People's Savings Bank of Brockton covering receipts for the month of October, 1910, shows that during that month there was received from the policy-holders as premiums $2,960.40 as against $2,075.12 for the month of October, 1909, a gain of 42 per cent. The report of the Insurance Department of the Whitman Savings Bank shows premium receipts in October, 1910, of $3,456.59 as against $1,975.46 for October, 1909, a gain of more than 74 per cent.

With the insurance departments in the above-named banks succeeding so well, other savings banks of the State have appointed committees to consider the advisability of establishing insurance departments, and the Massachusetts Savings Insurance League, with rare farsightedness, is aiming at the education of the next generation by conducting an active campaign in instructing the students of the high schools of the commonwealth in the principle and methods of savings bank life insurance.

One unique provision of the Massachusetts law is that agencies may be established in mills and factories so that policyholders can easily pay their premiums at the office of the company for which they work. Under this plan more than 80 agencies have been arranged for in the leading manufacturing plants of the State. In this work the local trades unions have been of great assistance. In some instances where employers have been reluctant to establish an agency, the union of that locality has requested that an agency be established for the benefit of the men, and in such cases this request has been acceded to. The law is also broad enough to permit local trades unions to become agencies for the insuring banks, and the unions of the State are beginning to awaken to the opportunity thus afforded to them to be of larger assistance to their own members.

Sixty Years' Service With One Company.—Thomas Ogram recently celebrated the completion of 60 years' continuous service with William Sellers & Co., Inc., Philadelphia. He entered the service of the company as an apprentice in 1850, when 18 years of age, and has since served successively as journeyman machinist, foreman and instructor, and latterly as instructor of apprentices. The completion of his 60 years was fittingly observed by a reception, at which the men in the shops and the officers of the company, some of whom had been connected with the company 50 years, greeted Mr. Ogram and presented him with an engraved album testimonial signed by the officers and staff, and by former officers. One of Mr. Ogram's sons, Wm. B. Ogram, is district manager of sales, of the American Bridge Company for Western and Central New York and Northwestern Pennsylvania, with headquarters at Buffalo.

ABC exhaust fans, made by the American Blower Company, Detroit, Mich., are being used for elevating seed cotton on the estate of the Czar of Russia, his plantation being entitled the Imperial Mourgab Estate at Bairam-Ali, Turkestan, Russia. On this same plantation is used a complete ginning outfit manufactured by the Murray Company, Dallas, Texas.

The William B. Pollock Company, Youngstown, Ohio, has recently issued its supplement No. 20, giving views of the new C furnace of the Youngstown Sheet & Tube Company, Youngstown, Ohio, which it built.

Personal

Hugo Wachenfeld of the iron and steel firm of L. Possehl & Co., Lübeck, Germany, is in this country for a stay of several months. He will visit various iron and steel works, including foundries, in the United States and Canada.

Herbert R. Culp has been elected secretary and treasurer of the Screw Cutting Company of America, Philadelphia, Pa., succeeding E. W. Crellin, resigned.

C. V. Erdman, who has been manager of the tin plate plant of the American Sheet & Tin Plate Company at Cleveland, Ohio, has resigned, to become manager of the tin plate plant of the Phillips Sheet & Tin Plate Company at Clarksburg, W. Va., succeeding E. L. Cronemeyer, who has been appointed assistant manager of the Weir plant of the latter company, at Weirtown, W. Va. These changes became effective November 1.

Kenneth Seaver has been appointed chief engineer of the Harbison-Walker Refractories Company, Farmers' Bank Building, Pittsburgh, Pa.

H. H. Bender has been appointed manager of the Cincinnati, Ohio, office of Francis J. Peck & Co., metallurgists and engineers, Cleveland, Ohio, and has opened an office in the Mercantile Library Building.

E. Plough of the Aluminum Company of America, Pittsburgh, read a paper on Thursday evening, November 17, before the Pittsburgh section of the American Engineers' Society on the subject of "Analysis and Uses of Aluminum."

James A. Campbell, president of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has returned from a two months' trip in Europe.

Obituary

CHARLES H. TUCKER, secretary and treasurer of A. Leschen & Sons Rope Company, St. Louis, Mo., died October 30.

WILLIAM C. JOY, a pioneer manufacturer of steam radiators, died in New York City November 11, aged 77. He was president of the Joy Radiator Company, Titusville, Pa., one of the companies merged in the American Radiator Company.

AUSTIN K. WHEELOCK, Boston, Mass., vice-president of the Firth-Sterling Steel Company and well known in the Eastern steel trade, died suddenly of heart disease at Washington, D. C., November 9. He was the senior partner of Wheelock, Lovejoy & Co., Boston and New York, and for nearly 4 years had been connected with the steel trade. He was an important importer of Swedish iron, but his largest interest was in connection with the manufacture of high grade tool steel and steel for ordnance. He was about 60 years of age.

LEWIS GREGORY, formerly treasurer of the Carpenter Steel Company, died November 12 at his home in New York City, aged 51 years. He was made treasurer of the Carpenter Steel Company in 1893. In 1903 he retired from business.

The Moose Mountain Mining Company has completed arrangements for installing at its iron ore concentrating works at Sellwood, Ontario, a supplemental concentrating plant to be operated by the Grondal process.

The Wolverhampton Corrugated Iron Company, Ltd., of Ellesmere Port, Cheshire, Eng., has recently contracted with Geo. J. Hagan, furnace engineer and contractor, Pittsburgh, for 14 annealing furnaces to be used in the box annealing of steel sheets.

Pittsburgh Steel Company Preferred Stock

In connection with the proposal of the Pittsburgh Steel Company to build two or more blast furnaces as referred to in *The Iron Age* of November 10, the new financing arranged for this week is of interest. The company has sold to Speyer & Co., New York, $7,000,000 of 7 per cent. cumulative preferred stock. The $3,750,000 of bonds now outstanding will be retired January 1, 1911. The capital stock of the company has been $6,000,000. Besides issuing the $7,000,000 of new preferred stock the company has increased the common stock to $7,000,000, the additional $1,000,000 of common stock being subscribed by the present owners of the property. The preferred stock will be a first charge on the company's net earnings, which, it is stated, have averaged in the last five years $1,400,000. The common stock has paid 8 per cent. for the last six years. The board of directors, which will be increased to nine, will include William H. Nichols, chairman of the General Chemical Company of New York; William A. Nash, president of the Corn Exchange Bank of New York, and Henry Ruhlender of Speyer & Co. Application is to be made to have the new preferred stock listed on the New York Stock Exchange. A considerable amount of it has been placed with investors and institutions both in this country and in Europe.

Opening of the American Museum of Safety

As a clearing house for every worthy device and every worthy thought for the safety of human life the American Museum of Safety has established a permanent safety exposition in the Engineering Societies' building, 29 West Thirty-ninth street, New York City. Here will be shown means for protecting operatives from injuries from machines or dangerous processes. Actual machines, models and photographs will demonstrate simple practicable safeguards adapted to the needs of employers for protecting the lives and limbs of their workmen in connection with motors, elevators, steam boilers, explosives, fire, collapses of scaffolding or buildings, falls from ladders, stairways, &c., transportation of all kinds and the use of tools.

At the exercises in connection with the formal opening of the new museum two gold medals offered by the Travelers Insurance Co. and the *Scientific American* to the individual industrialist or corporation that has done the most for the safe-guarding of its machines and processes and for the best safety device exhibited at the Museum, respectively, will be awarded by the trustees of the Museum, November 21, at the Engineering Societies' Building.

Among the exhibits already received are a series showing the work of the factory safety engineer and safety committees, another idea of the new thought in conserving human life, by establishing in the up-to-date plant an official whose sole work is the promotion of safety.

The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, has changed its firm name to the Youngstown Iron & Steel Company. This was done for the reason that its line of products is varied, consisting of black and galvanized iron and steel sheets, roofing and other products. The company has recently made some large additions to its plant.

The Phillips Sheet & Tin Plate Company, Weirton, W. Va., has established a district sales office in room No. 1013, New York Life Building, LaSalle and Monroe Streets, Chicago, under the management of J. J. Watson, who has been transferred from the general sales offices at Weirton.

Refunds to Shippers

The Status of Claims Based on the Missouri River and Denver Decisions

Traffic experts advise that claims for refunds should be filed promptly with the Interstate Commerce Commission on all shipments from Eastern territory during the past two years that are involved in the Missouri River rate case. The two-year limitation in the Hepburn law has already begun to run against these claims, and shippers who are entitled to refunds have no standing before the Commission to recover overcharges of this character unless their claims are filed within two years. It is estimated that the railroads will be obliged to refund many millions of dollars in order to comply with the decisions of the Interstate Commerce Commission which were sustained recently by the United States Supreme Court in the Missouri River and Denver cases.

The Missouri River Case

Two years ago the Interstate Commerce Commission decided, on complaints filed by Kansas City jobbers, that class rates from Atlantic seaboard territory to the Missouri River were unreasonable and ordered a reduction to become effective November 10, 1908. The railroads appealed to the United States Circuit Court, which sustained an injunction against the Commission and authorized the railroads to continue collecting the rates that had been in effect for many years. The United States Supreme Court has recently reversed the Circuit Court and upheld the power of the Interstate Commerce Commission, thus legalizing the reduced rates which the Commission had ordered in its original decision. This will make it necessary for the railroads to refund to shippers the money that has been collected during the past two years on the traffic involved, in excess of the rates which the Commission prescribed as just as reasonable.

The order of the Commission in the Missouri River case applied only to shipments originating in "Atlantic seaboard territory." This may be roughly defined as territory east of the corporate limits of Buffalo and Pittsburgh. It affects all shipments from this Eastern territory to points on the Missouri River, or to points beyond which take rates that are based upon the Missouri River. The specific reduction ordered was in the proportional rates between the Mississippi and Missouri rivers, which form a part of the through rates on this traffic. The reduction was 9 cents on first class, 7 cents on second class, 5 cents on third class, 4 cents on fourth class and 3 cents on fifth class. This reduction must now be made effective on all traffic that moved during the past two years, to shippers who file their claims for reparation in the usual manner before the Interstate Commerce Commission.

The Time Limitation on Refund Claims

A vast number of confusing questions have arisen in connection with this and the Denver case. One of the unsettled problems is as to the time when claims will become "outlawed" or barred by the limitation in the Hepburn law. The courts have never passed upon this particular question and the rulings of the Commission are somewhat confusing. In ordinary reparation cases, where a shipper asks for a refund of an excessive charge, the Commission has ruled that the claim must be filed within two years from the date of the expense bill, or delivery of the shipment. In another class of cases, however, in determining what rates should apply on any specific shipment, the Commission has generally held that the date of the shipment or delivery to the initial line is the controlling factor. In the Missouri River case the reduction ordered by the Commission was in the rate between the Mississippi and Missouri rivers. A shipment moving from the East would not be affected by the change until it reached the Mississippi, and it may eventually be held that the day when a particular shipment crossed the Mississippi River would be the date from which the two-year limitation would run. Owing to the fact that not many shippers filed their claims in this particular case within two years from November 10, 1908, this confusion may eventually be resolved by the courts before the Missouri River case is finally settled.

The Denver rate case was finally disposed of by the United States Supreme Court at the same time as the Missouri River case, but the effective date of the original order by the Commission in the Denver case was July 1, 1909, so there will be ample time for all claims to be filed with the Commission before the two-year limitation begins to run. In the Denver case the Commission ordered reductions in the rates from Chicago to Denver as follows: First class, 25 cents; second, 20 cents; third, 15 cents; fourth, 12 cents; fifth, 10 cents; A, 11½ cents; B, 9 cents; C, 8 cents; D, 5½ cents; E, 6 cents. From St. Louis the reductions ordered on these respective classes were: 23, 18, 14, 11½, 9, 10½, 8½, 7, 6½, and 5 cents.

The Complications Involved

Traffic experts assert that more confusion has grown out of these cases than has ever been known in the world of freight rates. In the Denver case, for example, the specific order of the Commission applies only on shipments from Chicago and St. Louis but includes all traffic from the East to Denver points which pass through the two cities named. A large amount of traffic from the East moves through Hannibal and other crossings of the Mississippi River without passing through Chicago or St. Louis, and the Commission or the courts will undoubtedly be called upon to determine whether the reduction should be allowed on all such traffic. Similar questions will arise on shipments from Milwaukee and other points whose rates to Denver are based upon Chicago or St. Louis, while the traffic does not actually move through either of those cities.

Both of these great cases will be fruitful of litigation during the next 5 or 10 years, as they involve more questions of law than any other cases that have ever come before the Interstate Commerce Commission. An interesting example of this is in the rates from Johnstown and Pittsburgh to Kansas City. Johnstown is in seaboard territory, and is entitled to the reduction which the commission ordered in the rate between the Mississippi and Missouri rivers. Shipments from Johnstown passing through Pittsburgh are subject to a lower rate than shipments from Pittsburgh, and the commission has therefore placed itself in the position of issuing an order, sustained by the United States Supreme Court, which violates the principle of the long and short haul clause of the law. The question may arise whether Pittsburgh is not entitled to a corresponding reduction, as well as other cities which take Pittsburgh rates to the Missouri River on iron and steel. If claims are filed by shippers who can show that the commission has discriminated against them, this in itself will raise a new problem in rate making, which may call for extended litigation.

Procedure for Shippers Having Claims

To protect their rights it will be necessary for shippers to file formal reparation claims, in the manner prescribed by the commission for such claims. A separate claim must be filed against each road which has participated in the overcharge, making the claim that the rate collected was unjust and unreasonable. Where the shipper cannot determine the intermediate lines which participated in the movement, it may be sufficient to make the claim against the delivering road which issued the expense bill. The commission

has advised that a statement be prepared to accompany each claim, showing the date of each shipment, the route, the weight, the amount of freight charged and the amount of overcharge which the complainant seeks to recover. The paid expense bill will ultimately be required as proof of the claim on each shipment, but it is understood that the filing of a claim need not be delayed until expense bills can be collected. In some cases the expense bills are in the possession of the consignees, who paid the freight as a part of their business expense, and will be entitled legally to the money refunded by the carriers. In many cases, however, goods are sold delivered, and expense bills are sent in as so much cash by the consignee, in making his settlement with the Eastern manufacturer or shipper from whom he purchased the goods. The possession of the expense bill usually identifies the party who is entitled to the refund, and for this reason the paid freight bills are generally required as proof of a claim.

Riverside Gas Engine Installations.—The Riverside Engine Company, Oil City, Pa., builder of gas engines of from 60 to 600 hp., is well supplied with orders. Recent installations made by the company include three double-acting tandem units of 160 hp. each, direct connected to 100-kw. alternating generators for the Standard Oil Cloth Company, Peekskill, N. Y. The engines are designed to operate in parallel, and each is fitted with a synchronizing device by which the speed of the engine can be raised or lowered 10 revolutions to bring it into synchronism with one or more engines working in parallel. Another installation is four 200-hp. units, equipped with vacuum cylinders and air compressor cylinders, with piston rod coupling for the Owens Bottler Works, Owens, W. Va. The vacuum cylinders are operated to draw glass into molds and the compressed air for blowing in shape to form bottles. An order has been received for two 100-hp. engines to operate pumps for the Dempseytown Gas Company. These engines will pump 2,000,000 ft. of gas daily through a 6-in. line, a distance of 6 miles to the Independent Piping Company on Oil Creek. The company is building two gas engine driven compressors for the Hazel-Atlas Glass Company of Wheeling, W. Va., for installation at its Washington, Pa., plant. One of the compressors will have a capacity of 700 and the other 1500 cu. ft. per minute. Two 75-hp. engines, to be operated on producer gas, are being installed at the Philadelphia House of Reform, Wawa, Pa. They will be direct connected to generators, and will operate at 300 rev. per min.

The Pittsburgh Foundrymen's Association.—The monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel, Pittsburgh, on the evening of November 7. J. A. Gearhart, Gulick-Henderson Company, Pittsburgh, read a paper on "The Inspection of Castings" from the inspector's standpoint. Several inspectors from other testing laboratories were present to participate in the discussion which followed.

The latest publication concerning the working forces in the various Krupp plants shows that on July 1 the firm employed 68,726 officials, clerks, and workmen; that 37,761 were employed in the steel foundry and the gun-testing grounds alone. The coal and coke consumption for the year amounted to 2,491,406 tons. The number of steam engines in use was 569, developing 89,430 hp.

The Antrim Iron Company, Mancelona, Mich., is relining its furnace and making other repairs.

National Founders' Association

(*Special Telegram.*)

CHICAGO, November 16, 1910.—The fourteenth annual convention of the National Founders' Association is now in session at the Hotel La Salle, in this city. The attendance promises to be the largest in the history of the association. The Administrative Council held a meeting yesterday, as usual, preliminary to the annual convention. It was followed last evening by the regular "alumni" dinner for the members of the council, at which Henry A. Carpenter was toastmaster. The number present was 35, establishing a record for this function.

The programme for the convention, which will close Thursday afternoon, provides for a report of the committee of investigation of the liability of employers for industrial accidents, followed by a discussion by members of the Minnesota and Illinois state commissions. also discussions on National trade schools and industrial education.

The speakers at the banquet this evening are to be Dr. Cyrus Northrup, president of the University of Minnesota, Hon. Frederick C. Stevens, St. Paul, and Hon. Frank M. Nye, Minneapolis. The officers' report is not yet available.

At Pittsburgh last week 15 officials and directors of the Imperial Glass Company pleaded *nolo contendere* before Judge Young in the United States District Court for violation of the Sherman Anti-Trust act, and each was fined $500. At the same time a fine of $2500 was imposed upon the Imperial Glass Company itself, with costs.

It has been officially announced that the Horton chucks, as made by the E. Horton & Son Company, Windsor Locks, Conn., have been awarded a gold medal at the Brussels Exposition. This is said to be the highest award ever given for chucks and, next to the "grand prix," is the highest possible award for anything.

The George M. Newhall Engineering Company, 136 South Fourth street, Philadelphia, Pa., announces that it will follow the example set by the steel rail manufacturers in quoting prices for new steel rails per pound instead of per ton, and its prices for relaying rails will hereafter be based on the pound or 100 pounds.

On November 7 the district sales offices of the American Sheet & Tin Plate Company were removed to the thirteenth floor of the Hudson Terminal Building, 30 Church street, New York. Theodore A. Gessler is manager of sales for the company in the New York district.

McClure & Spahr, architects of Pittsburgh, are preparing plans for the new office building of the Republic Iron & Steel Company, to be erected at Youngstown, Ohio, and which is expected to be completed about July 1, next year.

The Chicago, Milwaukee & Saint Paul Railroad is installing solid steel sleeping cars on trains out of Chicago. These cars are of the latest design and contain all of the modern improvements such as longer and wider berths.

Receipts of ore at Ashtabula Harbor, Ashtabula, Ohio, for October were 1,176,363 tons. The total for the season at that port up to October 31, was 8,895,958 tons, being 2,000,000 tons more than last year at the same time.

Trade Publications

Brick Making Machinery.—Chicago Brick Machinery Company, 77 Jackson Boulevard, Chicago, Ill. Booklet. Illustrates and describes the Elwood brick press, the special feature of which is the ease with which the molds may be changed. This machine is intended for a universal press for all brick making material and any shape of brick which it is practicable and economical to make on a power press.

Water Meters.—Thomson Meter Company, 100 Bridge street, Brooklyn, N. Y. Illustrated pamphlet. Devoted to the Lambert water meter, which is built in sizes ranging from ⅝ in. to 6 in., of bronze composition metal throughout. Space is given to various accessories and a list of repair parts and a brief table of specifications complete the pamphlet.

Regenerative Flaming Arc Lamps.—Adams-Bagnall Electric Company, Cleveland, Ohio. Form No. 141. Deals with the illumination of foundries and factories by the A-B regenerative arc lamp. An illustrated description of this lamp appeared in *The Iron Age* October 7, 1909.

Worm Gears.—Morse, Williams & Co., Inc., Twelfth and Samson streets, Philadelphia, Pa. Catalogue No. 4. Size 7 x 9 in.; pages 110. Illustrated. Refers to the Hindley worm gears and spirals. A brief description is given of the worm gear and its advantages over the ordinary straight type, followed by a number of dimension tables for gears having leads varying from 0.2068 to 9.4248 in. and a description of the spiral gears, with tables.

Motor Driven Ice Cream Freezers.—S. E. Whitney, 65 Sudbury street, Boston, Mass. Folder. Lists a number of different types of ice cream freezers for operation by direct connected electric motors.

Pile Drivers and Unloading Plows.—The Bucyrus Company, South Milwaukee, Wis. Two pamphlets. The first is concerned with a type of locomotive self-propelling pile driver, an illustrated description of which appeared in *The Iron Age*, December 23, 1909. The unloading plows described in the other pamphlet are designed for railroad companies and contractors for handling blasted rock, gravel and clay.

Brass Goods.—Milwaukee Brass Mfg. Company, Lapham and Barclay streets, Milwaukee, Wis. Catalogue C. Shows an extensive line of plumbers' brass goods. Each of the 269 pages has an illustration of some one part of the line and prices of the various sizes are given under the engraving.

Steam Engines.—Providence Engineering Works, 521 South Main street, Providence, R. I. Bulletin S-77. Relates to the steam consumption and friction losses occurring in the Rice & Sargent Corliss engines. The bulletin gives data regarding compound condensing and noncondensing engines and also simple noncondensing types, which were secured from tests made for the purchasers of these engines.

Industrial Cars.—The Orenstein-Arthur Koppel Company, Pittsburgh, Pa. Illustrated brochure. Concerned with the use of Koppel industrial cars and railroads for various purposes. In addition to cars for handling bulky material, others for handling small light weight castings are manufactured and an installation of this character was illustrated in *The Iron Age* July 21, 1910.

Pressure Regulating Valves.—Monash-Younker Company, 88 Centre street, New York City. Pamphlet. Covers the Monash line of pressure reducing valves, which are made in a number of different styles for various purposes. Two of the styles shown are intended for use on vacuum heating systems, but most of them are designed to be used where steam passing through is subjected to rapid pulsation or vibration.

Stoping Drill.—The Denver Rock Drill & Machinery Company, Eighteenth and Blake streets, Denver, Colo. Bulletin No. 8C-2. Illustrated. Concerned with the Waugh stoping drill, in which air is said to escape from the front end, thus making it practically dustless. Almost any shape of steel can be used, although the four-grooved section is the most popular.

Pressed Steel Cars.—The Pressed Steel Car Company, Farmers' Bank Building, Pittsburgh, Pa. Catalogue and booklet. The former covers completely the various sizes and styles of pressed steel railroad cars for freight and passenger service. Illustrated descriptions of a combined baggage and mail car and a quick dumping ore car appeared in *The Iron Age* May 5 and June 9, 1910, respectively. The booklet deals with a number of different styles of steel mine cars. In both the catalogue and the booklet the various types are illustrated and brief specifications supplement the engravings.

Electric Railway Supplies.—The Columbia Machine Works & Malleable Iron Company, Chestnut street and Atlantic avenue, Brooklyn, N. Y. Circulars. Relate to a line of electric railway supplies. This includes illuminated railway car signs, an axle straightener, adjustable armature stands, strain line anchors, gear cases, armature banding and heading machines, fuse boxes and gear cases.

Second-Hand Electrical Machinery.—The F. Bissell Company, 226 Huron street, Toledo, Ohio. Booklet. Concerned with a number of second-hand alternating and direct current motors and new and used alternating current and direct current dynamos which the company offers for sale.

Drawing and Stamping Presses.—Ferracute Machine Company, Bridgeton, N. J. Temporary Catalogue No. 17. Supersedes all previous catalogues and illustrates and describes the various kinds of presses built by this company. These include light and heavy stamping presses, drop hammers, foot, hand and gravity presses and all kinds of punching and cutting presses. *The Iron Age*, February 17, 1910, contained an illustrated description of a very large toggle drawing press for the production of large seamless metallic burial caskets.

Acetylene Burners.—American Lava Company, Chattanooga, Tenn. Circulars. Treat of the Hilo De Luxe burner employing acetylene for house lighting. The special feature of this burner is that the gas flame may be turned low without carbonizing.

Steam Boilers.—The Babcock & Wilcox Company, 85 Liberty street, New York City. Pamphlet. Illustrates and describes the Stirling boiler, which consists of three transverse parallel steam and water drums connected to one mud drum. The various features of the boiler are described and the special points supplemented by engravings.

Exhaust Heads and Grates.—H. L. Prentice Company, 24 Sherman street, Chicago, Ill. Booklet. Treats of the Prentice exhaust pipe heads which are made in 17 different sizes to care for the exhaust from a 1-in. pipe up to a pipe 18 in. in diameter. The Prentice rocking grates for locomotive and tubular boilers are illustrated, both when the surface is being rocked and also when it is flat. A table of specifications for these two types of grates completes the booklet.

Pumps.—The Barnes Mfg. Company, Mansfield, Ohio. Catalogue. Size 6½ x 9½ in.; pages, 248. Relates to a line of iron and brass pumps for hand, windmill and power use which are manufactured in a great variety of styles to meet almost any requirement and range from a small household pump to centrifugal pumps having a capacity of 5500 gal. per minute. Gas engines for driving the larger types are shown and space is given to various pump accessories.

Pyrometers.—Robert W. Paul, New Southgate, London, N., England. Booklet. Deals with the measurement of the temperatures in industrial operations by Paul's direct reading electrical pyrometers which are made to operate either by the thermo-electric or the resistance method. The construction of both types is briefly described and a partial list of users is appended.

Scales.—The Dodge Mfg. Company, Yonkers, N. Y. Set of loose leaf circulars. These pertain to a line of scales in which both springs and loose weights have been eliminated, the weight being obtained by the movement of a circular disk toward and away from the pan. A number of different styles are shown, all of which are made in sizes ranging from ¼ oz. to 40 lb.

Machinery.—N. O. Nelson Mfg. Company, St. Louis, Mo. Catalogue No. 36. Size, 7 x 10 in.; pages, 459. Describes and illustrates the various lines of machinery handled by this company. These range from a 600-hp. Corliss engine to a small hand operated forge blower. Where a number of different sizes of one article are handled, a brief table of them is given in addition to the text and the illustration.

Iron and Steel Shapes.—Horace T. Potts & Co., 316 North Third street, Philadelphia, Pa. Stock book. Covers the various sizes and shapes of iron and steel handled by this company, followed by illustrations and text describing a line of Swedish solid steel anvils. Standard price and extra lists and tables of weights and gauges and other useful information for workers in iron and steel complete the book.

Elevating, Conveying and Power Transmitting Machinery.—Weller Mfg. Company, Chicago, Ill. Illustrated Catalogue No. 19. Size, 6 x 9¼ in.; pages, 510. Concerned with elevating, conveying and power transmitting machinery and specialties. The different pieces of apparatus are all described and in a number of instances brief specifications in tabular form are given. A number of engravings of installations of apparatus manufactured by this company are scattered through the book.

Pumping Machinery.—The Weinman Pump Mfg. Company, Columbus, Ohio. Circular. Illustrates a few of the numerous styles of pumps for steam, belt and electric drive manufactured by this company. The models shown include pumps for boiler feeding and general service, light service pumps, automatic pumps and receivers, deep well pumps and electric mine and house service pumps.

Machine Tools.—William Sellen & Co., Inc., 1600 Hamilton street, Philadelphia, Pa. Pocket list of machine tools for railway and machine shop equipment. Contains illustrations and brief specifications of the company's leading machines.

Single Acting Open Back Presses.—The Manville Brothers Company, 27 Benedict street, Waterbury, Conn. Bulletin No. 2A. Gives general description and specifications for the No. 30 single acting open back press and also calls attention to the Manville standard four-slide wire forming machine, an illustrated description of which was printed in *The Iron Age*, October 6, 1910.

Metal Working Machinery.—Prentice Brothers Company, Worcester, Mass. Loose leaf catalogue. Size, 8½ x 11 in. Relates to a line of metal working machines which includes

engine and turret lathes, drilling machines with and without tapping attachments and radial arm drills. *The Iron Age*, January 27, 1910, illustrated a 12-in. single belt high speed engine lathe with motor drive, and June 2, 1910, the 21-in. drilling machine and the 7-ft. radial drill.

Surveying Instruments.—Buff & Buff Mfg. Company, Jamaica Plain Station, Boston, Mass. Pamphlet. Treats of the various engineering, surveying and mining instruments manufactured by this company. All of these are illustrated and described and brief specifications given.

Foundry Equipment.—The J. D. Smith Foundry Supply Company, Cleveland, Ohio. Loose leaf circulars. Call attention to a number of different pieces of foundry equipment, including the Cleveland drop pattern and stuffing plate, molding machine, the Cleveland squeezer, combination roll over and squeezer molding machines, saw for brass and aluminum and the Cleveland Junior core oven, all of which are illustrated. Their advantages are pointed out and brief specifications given.

Special Machinery.—P. F. Campbell, 55 Laurel street, Philadelphia, Pa. Catalogue. Size, 6 x 9 in.; pages, 72. Illustrates and describes a line of machinery for breaking, mixing, grinding, pulverizing and bolting various kinds of material. Besides these machines space is given to steel elevator buckets, link belts, sprocket wheels, pulleys, friction clutches, shafting hangers, wire cloth and millstones.

Automatic Gear Cutting Machines.—The Standard Mfg. Company, Bridgeport, Conn. Circular. Points out the advantages of the Standard automatic gear cutting machines which are claimed to reduce the cost of cutting gears, eliminate spoilage and increase production. Three different sizes of machines for cutting gears whose maximum diameters are 4, 6 and 8 in., respectively, are illustrated and complete specifications of the smallest model are given.

Electrical Wires and Cables.—The American Steel & Wire Company, 115 Adams street, Chicago, Ill. Catalogue and handbook. Illustrated. Presents in serviceable form interesting information to users, engineers and students. All the various types of bare and insulated electrical wires and cables commonly used are fully described and a considerable amount of engineering data and descriptive matter including an abridged dictionary of electrical terms has been introduced to make the book a fairly complete treatise on electrical conductors. General data are given on the properties of conductors, the manufacture, packing and shipping of wire and a number of wiring formulæ and tables are included. Bare wires and cables are next taken up and tables are given of the prices, sizes, weights, strengths, &c. Magnet and office wire are treated in the same way, as well as weatherproof and slow burning wires and cables and lampcord. Considerable space is given to rubber covered and lead encased wires and cables and the methods of manufacturing and installing them. A 42-page electrical dictionary follows and an extensive alphabetical index complete the catalogue.

Steel Tired Wheels.—The McConway & Torley Company, Forty-eighth street and Allegheny Valley Railway, Pittsburgh, Pa. Pamphlet. Describes the McConway car wheel, which is of the built-up type with a steel tire. The wheel center is a solid casting, the hub is iron and the tire is of the usual rolled steel type. The general construction of these wheels is given and the text supplemented by illustrations.

Water Meters.—National Meter Company, 84 Chambers street, New York City. "Blue Book." Treats of the various types of water meters manufactured by this company since its foundation in 1870 up to the present time. The special features of these different meters are given and attention is called to the straight reading register with which all are equipped.

Circuit Breakers.—The Cutter Company, Nineteenth and Hamilton streets, Philadelphia, Pa. Publication entitled *Protection*. Size, 5 x 7¼ in.; pages, 128. Gives a brief story of the protection afforded the electric motor and motor driven tools by the I-T-E circuit breaker. After comparing the protection afforded by the circuit breaker and the fuse, the operation of the I-T-E circuit breaker is described followed by a table of capacities of circuit breakers best adapted for direct current motors of a given size and voltage. Special types of breakers are next described and this is followed by a price-list and wiring diagrams for the various styles and sizes.

The Duncannon Iron Works, at Duncannon, Pa. which recently passed into the control of the Light interests at Lebanon, Pa., will be put into operation at an early day.

The Pittsburgh, Bessemer & Lake Erie Railroad, operated by the Carnegie Steel Company of Pittsburgh, has declared a semi-annual dividend of 3 per cent. on the preferred stock, payable December 1.

The Erie Stamping & Mfg. Company, Erie, Pa., increased its capital stock from $50,000 to $150,000.

The Pressed Radiator Company of America Continues to Grow

The steadily increasing demand for the products of the Pressed Radiator Company of America, Pittsburg, has made it necessary for the company to augment its manufacturing facilities. The company recently placed an order with the E. W. Bliss Company, Brooklyn, N. Y., for three large geared presses, weighing approximately 25 tons each, which are now being installed and will finish out the line of 12 large presses necessary to give one press for each of the 11 operations to complete a radiator unit, with one press to spare, thus making the operations continuous and doubling the daily output. The assembling, finishing, testing and shipping departments have all been enlarged so as to bring them up to the same daily capacity as the press department. This is the second time during the current year that the manufacturing facilities of this company have been practically doubled. During the month of October the actual shipments were the largest in the history of the company, while the orders booked during the same month exceeded the shipments by 60 per cent.

Cast Iron Pipe Foundry at Port Arthur, Canada.—In conjunction with the blast furnace of the Atikokan Iron Company, at Port Arthur, Canada, a large foundry is to be erected for the manufacture of cast iron pipe and car wheels. It is stated that $500,000 will be expended in the project. This will provide an outlet for much of the pig iron produced by the present furnace, which has a daily capacity of 200 tons. The enlargement of the furnace plant is under serious consideration.

The Vincent Steel Process Company, Detroit, Mich., has been allowed by the Treasury Department the benefit of the usual drawback in duty on the exportation of tools and automobile parts manufactured with the use of imported tools and parts by a special process of tempering. In liquidation, the quantity of imported parts and tools which may be taken as the basis for the allowance of drawback may equal the quantity used as declared in the drawback entry, after official verification of exported quantities, provided they shall not exceed a corresponding imported tool or part for each tool or other article exported.

The Duncannon Iron Works, at Duncannon, Pa., has been purchased by H. H. Light, president of the Lebanon Valley Iron & Steel Company, Lebanon, Pa. The new company, which will be known as the Duncannon Iron Works, is chartered with an authorized capital stock of $300,000, of which $150,000 is 6 per cent. cumulative preferred and $150,000 common. The company has since been organized with H. H. Light as president; S. P. Light, treasurer, and William S. Davis, secretary. The directors include S. L. Light and J. Warren Light, all of Lebanon, Pa., in addition to the officers named.

The Grove City Wire Novelty Company, Grove City, Pa., was organized some time ago by W. F. Fessler, late of New Castle, Pa., and residents of Grove City. The company has completed the erection of a plant, and is now making wire specialties. The site secured is about 75 x 80 ft., on which a concrete block building, 30 x 60 ft., equipped with wire cutting machines, punch, drill press, &c., and a 10 x 12 ft. tinning department has been erected. The company will sell its products from Grove City for the time being. Later on salesmen will visit the hardware trade.

Iron Hoops for Wooden Water Tanks

From a committee report presented at the annual meeting of the American Railway Bridge and Building Association at Denver, Colo., in September, the *Engineering News* condenses the following:

Flat Hoops.—Until recently flat hoops were used almost universally. Many advocate this style as the best, claiming that the hoops have a more uniform bearing on the staves, do not crush the fibre of the wood, and if properly put on and cared for will outlast the staves. The experience of others has been to the contrary. Flat hoops have been removed after a comparatively short service, badly corroded on the inside and with the staves badly decayed under the hoops. Location of the tank is a factor in the life of a hoop. At a terminal, perhaps next to an engine house or a clinker pit, the hoops will deteriorate rapidly. There are instances in which the water in the tank is especially injurious to the hoops, and location near salt water is also a severe test. In thickness they run from ⅛-in. to ⅝-in. and in width from 3 to 6 in. Some roads use a uniform thickness and vary the width; some use a uniform width and vary the thickness, while others use various widths and thicknesses. Steel hoops are found to be brittle, and often break while being tightened, or as the result of the swelling of the tank, or on account of unusual weather conditions. The most serious objection is that they corrode more easily than wrought iron. Galvanizing lengthens their life, but does not eliminate the brittleness, and many claim that the galvanizing covers surface defects that would otherwise cause the rejection of the material. Galvanized hoops should be inspected before and after galvanizing.

Round Hoops.—Round hoops have come into use only within the last few years and seem to be proving very satisfactory. Wrought iron is considered the best material and is more easily obtained in this form than in the flat shape. Mild steel is sometimes used, but has the objection of brittleness. One argument in favor of the round hoop is that fully 90 per cent. of its surface is exposed to view; deterioration is more easily discovered and painting is more effective. With the flat hoop, at least 40 per cent. of its surface is next to the staves and practically inaccessible. It is claimed that because the round hoop has less bearing surface on the stave it crushes into the fibre and not only weakens the stave, but induces decay. Others who have had experience say that if the hoop is properly put on there is no appreciable crushing of the fibre. The round hoop forms a ledge or pocket on the upper side which allows the accumulation of dirt, cinders and moisture. Some claim that this is not a serious matter because the sun and wind evaporate the moisture before harm can result. The Wheeling & Lake Erie Railway calks the round hoops with oakum and fills the top space with roof cement to shed water and also to protect the hoops.

Square Hoops.—The committee received no report from any railway using square hoops as a standard. The Illinois Central Railway has one tank equipped with hoops ¾ x 2 in., which may be called square hoops for all practical purposes. These have been in service for about 20 years, and show no great sign of deterioration. In parts of Mississippi are many wooden tanks with hoops from 1⅛ in. to ¾-in. square, put on in three sections.

Segmental Hoops.—The segmental hoop has one flat side and does away with the objection to the round hoop of crushing into the wood and of collecting and holding dirt and moisture. It has all the advantages of the flat hoop, with the added one of being narrower for the same length; and, because it is heavier at the center it is not weakened so quickly by corrosion. The material is a standard shape that is carried in stock.

In tanks 20 to 30 ft. diameter it is usual to have the hoops in three sections; some railroads use four and others use two sections. The two-section hoop is difficult to erect, and by using more sections the stress on the staves can be more uniformly distributed.

G. W. McClure, Son & Co., Bessemer Building, Pittsburgh, Pa., have under way the erection of 10 McClure three pass fire brick hot blast stoves, each 22 x 100 ft., for the Bethlehem Steel Company, South Bethlehem, Pa., five of which are about completed. This installation will make a total of 22 McClure stoves at the Bethlehem Company's works. The firm has also recently relined six stoves at the same plant. Four McClure stoves, 22 x 95 ft., are being installed at the new blast furnace of the River Furnace & Dock Company, Cleveland, Ohio, and four McClure stoves, 21 x 90 ft., at the blast furnace of the Josephine Furnace Company, Josephine, Pa.

The Harbison-Walker Refractories Company

The report of the Harbison-Walker Refractories Company for the year ending September 30, 1910, shows earnings of $2,073,340, after deducting $340,717 for depreciation and ordinary repairs and maintenance. Extraordinary expenditures and amounts charged off for depreciation of mining outfits and depletion of minerals were $205,594. Interest on bonds was $88,875; preferred dividend at 6 per cent., $576,000, and common dividend for three quarters, at 2 per cent., $270,000, leaving net surplus of $932,871. The surplus account is now $4,784,859. The statement is the best the company has yet made, but on account of the falling off in business only 73 per cent. of capacity was used. The gross business made a new record because of the increasing percentage of high grade products turned out. The balance sheet as of September 30, 1910, is as follows:

Assets.

Property account (properties and franchises owned and operated by the constituent companies)		$28,599,396.62
Betterments, completed		1,147,700.03
Betterments, uncompleted		497,551.22
Deferred charges to future operations		298,608.05
Current assets:		
Inventories at cost	$1,590,759.44	
Accounts receivable (accounts of constituent companies against each other omitted)	1,407,081.57	
Bills receivable	24,105.64	
Cash	565,437.22	
Investment securities:		
Investment of reserves	222,000.00	
Own bonds purchased by company and held in treasury	137,000.00	
Other securities	235,399.42	
		4,181,783.29
Total assets		$34,725,039.21

Liabilities.

Capital stock:		
Preferred	$9,600,000.00	
Common	18,000,000.00	
		$27,600,000.00
Bonds, total issue	$3,500,000.00	
Less purchased and canceled as per sinking fund requirements, $1,410,000; canceled in anticipation of sinking fund requirements, $525,000	1,935,000.00	
		1,565,000.00
Reserves:		
Bond interest and taxes (accrued but not yet due)	$26,842.08	
Reserve to cover premium at redemption of bonds	3,015.56	
Clay, coal and ganister properties depletion fund	141,695.76	
Sundry reserves	297,644.79	
		469,198.19
Current liabilities:		
Accounts payable (liabilities of constituent companies due each other omitted)	$209,270.09	
Pay rolls	96,711.12	
		305,981.21
Surplus		4,784,859.81
Total liabilities		$34,725,039.21

The Noble Electric Steel Company, Heroult, Cal., is preparing plans for four additional furnaces. The company's furnaces have been idle since July, owing to the inability of the Northern California Power Company to furnish sufficient power, but will be started up again as soon as heavy rains set in. The company is also developing a number of chrome properties near Chromite, Shasta County, and at Lowery, Tehama County. With the completion of the new furnaces the plant will have a daily capacity of nearly 100 tons of pig iron.

President W. C. Brown of the New York Central says that neither that road nor any of the New York Central Lines will make any effort to dispose of any securities in the immediate future. He adds that practically every engine and car owned by the various roads in the system is in service and there is a shortage of equipment.

New Publication

Edison: His Life and Inventions. By Frank Lewis Dyer, general counsel for the Edison Laboratory and allied interests, and Thomas Commerford Martin, ex-president of the American Institute of Electrical Engineers and secretary of the National Electric Light Association. Two volumes, octavo, cloth. Publishers: Harper & Brothers, Franklin Square, New York. Price, $4 per set.

A halo of romance surrounds the life of Thomas A. Edison, the greatest inventor and discoverer that the age of electricity has produced. The public has in a fragmentary and desultory way been informed of his achievements as, from time to time, he has startled the world with daring incursions into new fields, blazing a path for other investigators. His history from the time he began to earn a living as a newsboy and then as telegraph operator has been one of continuous and tremendous activity, usually crowned with commercial success. His inventive genius has been marvelous, his fame resting on no single accomplishment, but on a succession of important developments. Up to this time no full and authoritative story of Edison's life and achievements has been written. The authors of this work have most happily collaborated in the presentation of the history of Mr. Edison's life. As a result they have given to the world a publication which will not only afford a greatly appreciated fund of information regarding his inventions and discoveries, but will also prove a delight to those who take pleasure in records of personal triumph. The work is at once a contribution of permanent value to literature and an inspiration to all lines of human endeavor.

One of the chapters which will be read with special interest by iron and steel manufacturers is that which treats of Mr. Edison's efforts to concentrate into commercial form low-grade iron ore. The plant which he erected at Edison, N. J., was described in *The Iron Age* in 1897, at the time the concentrating plant was in operation and when it appeared likely to prove a commercial success. The great experiment aimed to give Eastern iron and steel manufacturers a supply of raw material which would make them better able to compete with manufacturers in sections having nearby deposits of much richer ore. Relative to this matter the book says: "If a person qualified to judge were asked to answer categorically as to whether or not that enterprise was a failure, he could truthfully answer both yes and no. Yes, in that circumstances over which Mr. Edison had no control compelled the shutting down of the plant at the very moment of success, and no in that the mechanically successful and commercially practical results obtained, after the exercise of stupendous efforts and the expenditure of a fortune, are so conclusive that they must inevitably be the reliance of many future ironmasters. In other words, Mr. Edison was at least a quarter of a century ahead of the times in the work now to be considered." The statement is made that over $2,000,000 was spent in this attempt. The knowledge gained in the concentrating plant was applied in building a plant for manufacturing Portland cement.

Applied Thermodynamics. By H. W. Spangler. Cloth bound. Size 6 x 9 in., 160 pages, 76 diagrams. Price $2.50. Published by John Joseph McVey, 1229 Arch street, Philadelphia, Pa.

The book contains the substance of lectures given by the author to the students in the engineering courses at the University of Pennsylvania, relating to the application of thermodynamics to engineering problems. It is assumed that before reading this book some short treatise on elementary thermodynamics, preferably the author's "Notes on Thermodynamics," has been studied as the methods developed there are used without derivation in this text. In many cases numerical problems have been solved directly without the development of algebraic formulæ in which numbers might be substituted. As far as possible the attempt has been made to avoid abstruse discussions and unnecessary refinements and to approach the subject from the standpoint of an engineering student properly prepared for the work.

The work is divided into twelve chapters, the first two of which deal with the flow of gases and vapors and the flow of steam, respectively. The third is devoted to a discussion of the various kinds of efficiencies and how they may be calculated. Air and steam engines occupy the next two chapters and chapter VI deals with tests of the latter type of prime mover. Refrigeration by air and volatile liquids is dealt with in chapters VII and VIII and the next chapter is concerned with absorption machines. The data available on these machines are so meager that any attempt at thermodynamic treatment is only tentative, and while reasonably consistent results may be obtained with the data at hand, the text of this particular chapter is of value in emphasizing the necessity of extended experimental work. Internal combustion engines are discussed in the next two chapters, the final one being devoted to evaporators, stills and cooling towers.

Notes on Mechanical Drawing. By Horace P. Fry. Size 6 x 9 in.; pages 61; 34 illustrations and 17 full-page plates. Bound in cloth. Price, 50 cents. Published by the University of Pennsylvania, Philadelphia, Pa.

This book is a series of notes prepared for the use of students in mechanical engineering at the University of Pennsylvania. The matter contained is not an exhaustive treatise on mechanical drawing but is intended to supplement the class instruction. The notes cover recognized standards and conventions used in American practice together with tables and other information valuable in the drafting room.

Instructions are first given regarding the preparation of drawings and the proper kinds of lines to be used, with instructions on lettering and sectioning followed by examples of the various standard types of letters. The making of assembly drawings is next taken up, after which come instructions for the representation of gears and screw threads of various standards. An index and a list of illustrations completes the book.

The Great Lakes Engineering Works and Its Products.—The Great Lakes Engineering Works, Detroit, Mich., has issued a 42-page brochure, which is largely a reproduction of articles that have appeared from time to time in marine journals, descriptive of vessels, marine engines and other work turned out by this company. The illustrations are numerous. Among them is one of a section of the Detroit River tunnel, 262 ft. 6 in. long and 23 ft. 4 in. in diameter, being one of 11 sections built for the Michigan Central Railroad. Excellent portraits are given of the officers of the company. The Great Lakes Engineering Works, which was incorporated in 1902, launched its first steamer May 5, 1904, and since that time has had the distinction of having turned out a larger tonnage of vessels than any other individual concern of like character in this country. Antonio C. Pessano is president and general manager; George H. Russel, vice-president; John R. Russel, vice-president and treasurer; H. W. Hoyt, vice-president and secretary.

The General Foundry Company, Bradford, Pa., has decided to remove its plant to Warren, Ohio, where it will be built on a much larger scale to meet the growing demands of the trade for its converted steel castings.

The Tariff Commission Campaign

The National Tariff Commission Association, formed to promote the creation of a permanent non-partisan tariff commission, has issued a statement showing the present condition of this movement, from which the following extracts are taken:

"The active movement in behalf of a permanent tariff commission began several years ago, when the National Association of Manufacturers appointed a tariff commission committee, which finally called the Indianapolis convention of 1909.

"The Indianapolis convention called the attention of the entire country to the need of a permanent tariff commission, and resulted in the formation of a Committee of One Hundred to conduct an aggressive campaign. This committee finally became the National Tariff Commission Association, with John Candler Cobb, of Boston, as president; Henry R. Towne, treasurer; H. E. Miles, chairman of the Executive Committee; and Henry T. Wills, well known in foreign trade matters, as secretary. So strenuous and well directed has been the work of the association in behalf of a tariff commission that practically every important State convention held this year has indorsed the movement.

"The Tariff Commission Association's educational campaign and its efforts in Washington led up to the appointment of the present Tariff Board. The board is recognized as an important step in the effort to secure a real commission and will doubtless be made a permanent organization. While possibly unsatisfactory to some advocates of tariff reform, the board certainly is an earnest of the present administration's honesty of purpose.

"That the Tariff Board has already proved the wisdom of its appointment in several ways is unquestionable. It has demonstrated that there is difficulty in securing foreign and domestic costs of production, but it has also convinced the country that tariff making can be put on a scientific and practical basis by means of thorough, impartial and technical investigations conducted by a competent and permanent board of experts, reporting to Congress and the President.

"The principal, and by far the most important, lesson it has taught, however, is that a Tariff Board consisting alone of advisors to the President, with a temporary status and no judicial powers, is inadequate and unsatisfactory. This fact is now thoroughly recognized, and is one of the reasons why the National Tariff Commission Association is making every effort to have the present board given additional powers, or, still better, to induce Congress during the session beginning December 8 to transform it into a genuine permanent tariff commission with a status equal to that of the Interstate Commerce Commission.

"A new and important development in the tariff commission problem, one in fact only now becoming appreciated by the country's business interests, is the vital necessity of the commission form of tariff making in order to prevent a radical swing of the pendulum to the other extreme. In other words, a non-partisan, permanent commission of tariff experts is now necessary to protect the industries actually deserving of protection.

"Protection equalling the difference in cost of production in this country and abroad, with a small additional margin for safety, is a reasonable policy on which to base the tariff. If this protection is removed, or unduly lowered, naturally it will be necessary to reduce wages, as wages constitute the larger part of the cost of production. Insufficient protection, or a half-high-enough tariff, would offer no bulwark against the manufactured products of low-wage Europe, and the result can easily be imagined.

"This form of tariff can only be constructed in any degree of accuracy, and of common honesty, through information obtained by a permanent tariff commission. To secure the creation of such a commission is the task of the National Tariff Commission Association. As an important part of its work, the association will hold a great tariff commission convention at Washington January 11 and 12, 1911, which will be attended by prominent advocates of the commission idea from all over the country, and which is sure to give a remarkable uplift to the general proposition."

The address of President Cobb is 60 State street, Boston, Mass., and of Secretary Wills is 66 to 72 Lafayette street, New York.

The British Iron Market

Changes in the market for pig iron and finished materials in Great Britain have not been of great moment in the past month. The latest reports concerning pig iron are rather more encouraging and in the first week of November an increase in pig iron buying was reported. The shipments from the Cleveland district in October were better than expected, the total being 111,374 tons, or 3838 tons more than in September, but 15,530 tons less than for October, 1909. The total has been exceeded in only two months this year. For the first 10 months of 1910 the shipments were 994,501 tons, or less than in the corresponding period of any year since 1905. At the close of October the stock of Cleveland pig iron in Connal's public stores was 486,492 tons, an increase in the month of 13,442 tons. Cleveland warrants, which were 50 shillings a ton in the last week of August, were steadily below that figure throughout September and for most of October, but on October 28 the price rose to 50 shillings 1 penny for No. 3, and merchants and manufacturers have latterly been maintaining 50 shillings per ton for early delivery. The lockout of boilermakers at shipyards has affected the market for finished materials, particularly plates and shapes. In October launchings were considerably cut down by reason of the strike, 14 vessels aggregating 22,500 tons being launched in that month, against 47,000 tons in September. Several orders were placed for steamers. Prices of plates and angles have been maintained at the October advance, quotations on the Northeast Coast being £6 15 shillings for steel ship plates and £6 7 shillings 6 pence for angles. Naval work has helped the Sheffield steel trade, armament manufacturers being good buyers. A stronger market for structural steel is reported in the Midlands. The makers of iron bars in South Staffordshire have been having rather strong competition from Belgian works. The export trade in galvanized sheets has been excellent, and domestic inquiry for both galvanized and black sheets is better.

The extensive manufacturing property of the Western Electric Company in Chicago, on Van Buren, Clinton, Jefferson and Harrison streets, representing an original investment of $3,718,316 has been sold recently to a syndicate of Chicago capitalists. Since the completion of the Western Electric Company's new plant in the Hawthorne district, the business has been gradually transferred from the old plant, which has therefore been on the market. The property sold comprises 26 buildings, the most important ones of fireproof construction, with an electric power plant of 1000 hp. It will now be rented to small manufacturing industries. W. V. Kelley, president of the American Steel Foundries Company, and R. P. Lamont and George E. Scott of the same company are members of the syndicate which has purchased the property. The Western Electric Company has retained a lease of 500,000 sq. ft. of floor space for two years for general office purposes.

The Inspection of Castings*

The Importance of the Foundry Inspector's Work Illustrated by Incidents from a Varied Experience

BY J. A. GEARHART.

The inspection of castings from an inspector's standpoint covers in the main just two conditions—that is, the castings are either good or they are bad. In other words, they are good enough for the service intended, or they are unfit for this service and should be rejected; but in the actual inspection of the work at the foundries to arrive at these two conditions, considerable responsibility rests on the shoulders of an inspector. He must be able to distinguish a real defect from a slight flaw. He must be able to decide whether a defect when found is of sufficient importance to affect the strength or wearing qualities of the casting, or, if it is in a part not subject to any strain in service, it will, therefore, answer the purpose for which it was designed and is good enough for use.

Details That an Inspector Must Know

To inspect castings and be just and fair to both employer and manufacturer, an inspector must know the exact place the casting is to be used, what its functions are in service, and all other information it is possible for him to obtain, so that he will be competent to decide whether it is good or bad. In checking to dimensions on prints he must know how close to drawing sizes the casting must be in all parts, so that it will fit in the place for which it is designed, as we all know castings of the same design and made from the same pattern are not always exactly of the same measurements in all their dimensions, nor ever will be, due to the variations in different heats or casts of the metal as well as differences in the molding and a dozen other variations too numerous to be mentioned.

There are some dimensions where ¼ in. variation can be allowed either above or below the given size, while on other dimensions 1-16 in. allowance either way is too great. Some surfaces must be straight and parallel with others so that clearances at other points may be maintained, while other surfaces must be at right angles so that certain points will have equal wear in service.

An inspector must know what pockets are to be cleaned, what corners are to be chipped square, what corners a fillet can be allowed and the largest radii permissible on any fillet. On castings of intricate design, where there are unequal shrinkages, the inspector must know when the manufacturer has cast these with shrinkage brackets to overcome any checking, if it will be necessary to chip these brackets to the original contour, or if the shrinkage brackets may be left on and the castings accepted. The inspector must know when he finds a shrinkage crack if it is of sufficient cause for rejection or if it is as good for the purpose intended as one on which no cracks appear. An experienced inspector will generally know from the shape of the casting and the method of molding where the shrinkage cracks or blowholes are most likely to occur. An inspector who knows where and how his castings will be used will save considerable money for the foundryman as well as time on the delivery of the work for his employer.

Welded Steel Castings

At the present time, with the different welding apparatus used so extensively in the foundries making steel castings, when the inspector finds a casting that has been welded it is a question whether to accept or reject it, as he has no means of telling how serious the defect was before it was welded.

The author knows of one company that objected at one time to any welding whatsoever of any part of a casting, and any casting showing the least indication of welding was rejected at once. Some foundrymen who had contracts to furnish castings to this company did all the welding that they required before annealing, after which the surface was ground or chipped smooth and then thoroughly annealed. The castings when offered to the inspector were coated with a heavy scale. It was very difficult to tell in these cases if the castings were welded or not. Differences of opinion arose between the manufacturers and the inspectors until so many castings were involved that shipments were seriously delayed and the company needed the castings.

This company now specifies that all castings that are intended to be welded must first be shown to the inspector, and if in his judgment the defect will not affect the strength or wearing qualities, and the welding will improve the appearance, he stamps the casting with his private mark near the defect, but not close enough to be obliterated in the welding; after the welding has been finished the casting is again shown to the inspector, and if done in a workmanlike manner is then accepted and restamped near the trademark or pattern number. This method has worked very successfully, and in my opinion is fair to both parties.

Manufacturer and Inspector Should Co-operate

It has been the author's experience that the best results have been obtained when an order has been placed subject to inspection by the manufacturer and the inspector going over the drawings together, so that important dimensions will be fully understood and can be watched by the manufacturer in the making of the patterns as well as in the molding and casting. This plan, if followed, will generally save the foundrymen considerable money as well as time in completing a contract. For instance, an order is taken; the patterns are made and placed in the sand, and when the first shipment is ready to go forward a request is sent for the inspector. On his arrival the manufacturer finds for the first time that the castings must fit certain gauges on which a very small limit of variation is allowed. This generally necessitates the castings being returned to the grinding or chipping room to be made to fit these gauges, but in some cases means their rejection entirely, as they cannot in their present condition be made to fit the gauges to the satisfaction of the inspector.

This could all have been avoided if the manufacturer and inspector had conferred together before the work was started and everything gone over and explained. The manufacturer would have known what were the important points on each casting, and could have governed the work accordingly when making the patterns as well as issuing the necessary instructions to his different departments. The author has found in his experience that both expense and trouble have been saved by following this plan. He does not wish to convey the thought that the manufacturer should request the inspector to check patterns.

The inspector should be glad to have the oppor-

* Read before the Pittsburgh Foundrymen's Association, November 7, 1910. Mr. Gearhart is connected with the inspection bureau of the Bullck-Henderson Company, Pittsburgh.

tunity to check sample castings, but never to check patterns, as he is not familiar with the shrinkages of the material nor the methods of molding at any one plant, as he is only interested in the finished product.

An instance that comes to mind is of two castings, one fitting into the other when in service. The top casting was made by one firm, while the bottom was made by another. Both manufacturers were notified that the castings must fit certain gauges and come within certain limits. The sample casting for the top was made and found to agree with the gauge. When the sample casting for the bottom was made, it was found too small to allow the gauge to enter. The manufacturer showed the inspector where an order for 500 castings of the same design had just been completed. They had been inspected and accepted, but had not been gauged. The patterns had not been taken from the sand, and were then running on the present order. As no objection had been raised by the parties assembling the 500 castings, it was assumed that everything was going together without any trouble and, therefore, no reason could be seen to change any patterns to agree with these gauges. It was conceded by the foundryman that the measurements were a little under the blue print size. It was about 3-32 in. in a 12 or 15 in. distance, but this was so small in his opinion that no trouble would be experienced. When it was explained by the inspector that all castings of that design must fit the required gauges so as to allow castings from different foundries to be assembled, and all be standard, it was at last agreed that one or two patterns would be changed so that castings to be shipped on this inspector's order would fit the gauges and be acceptable to him. The manager and inspector then returned to the office where a telegram was awaiting the manager advising that the 500 castings shipped on the previous order could not be used on account of being too small in the dimensions covered by the gauge. It is needless to say that orders were immediately given to change all patterns to agree with the inspector's gauge, and a duplicate gauge was made for the foundry to avoid any similar mistakes in the future.

Drawings and Specifications

The drawings should be made to show clearly every every detail necessary to guide the manufacturer in producing a casting as well as for the information of the inspector. Often it is necessary to show the use of a particular part of the design, as, for instance, in the making of a type of cast steel box form of bolster, ¾-in. holes were shown, and the inspector found the shop busy reaming these holes to exactly ¾ in. They were drain holes only, and should have been so marked on the drawing.

When castings are made to specifications prescribing test coupons for physical test, especially in cast steel work, the inspector should see that these coupons represent truly the casting from which they were taken, and that they have not had any additional treatment, either by hammering, additional annealing or otherwise. It is common practice for most inspectors to have a hammer with a private mark for stamping coupons and accepted castings, but the inspector should use judgment in the different shops in the method of handling the test coupons after they have been selected and stamped.

Specifications in all cases covering steel castings require that test coupons must be cast on the casting and broken off in the presence of the inspector. It is important to know on what part of the casting and the manner in which this coupon is attached to the casting, so that the results obtained will fairly represent the material.

The author has in mind castings weighing 15 tons each that had coupons attached made by the moulder pressing a round stick in the bottom of the drag after the pattern was drawn and the mold ready to close. This stick was 1½ in. in diameter, and was pressed about 4 in. in the sand at right angles to the casting, and no allowance was made for the gas to escape. The mold was gated at the bottom, and the metal running over the bottom of the mold had pushed all the dirt and loose sand down these holes. Tests and analyses made from these coupons did not represent the material in these castings. Very few bars were found without flaws, and other test pieces selected from the runner of the gate and from the castings taken with a hollow drill did not agree either in physical test or chemical composition with the results obtained from the test coupons.

Inspection of Steel Castings Requires Great Care

The inspection of steel castings calls for the most careful work on the part of an inspector, as it is on steel castings that to distinguish between a mere blemish and a real defect is the most difficult. One casting will be spongy and porous on the surface, but all holes will be small and shallow and will not affect its strength, while another casting will, to all appearance, have a smooth surface with the exception of a few small holes, which when explored will increase in width and volume with the depth, and the casting will be found to be only a shell.

The volume or area of blowholes is often determined by the amount of water the cavity will hold. This test is an old one, and it would be well to caution the inspector before making this test to be certain that the cavity has not been filled previous to his testing.

A number of years ago a workman in a foundry, appreciating the prying curiosity of an inspector on the job, filled the blowholes with hot wax to nearly the top of the surface, and when tried with water the inspector found only a shallow cavity. In another case a workman was found busily filling shrinkage cracks in the fillet of a large steel casting with a metallic substance, which was put in the crack in a soft condition; the crack was filled to the surface, burnt sand was rammed as a top dressing, and the result was, indeed, a work of art. These methods and many others were used a number of years ago to have castings accepted by the inspector, but it has been found cheaper and better for all concerned to so improve shop methods that defective castings will be reduced to a minimum.

Another case shows the results of the methodical habits of the inspector. A specification rigidly prescribed a certain mixture of different pig iron, &c. The inspector always arrived at the shop at a certain time and, unknown to him, his entrance at the gate was always announced to the charging room. He generally proceeded immediately to the charging room, where he found a number of buggies loaded with the prescribed mixture—a certain percentage of charcoal iron, coke iron, scrap, &c.—and while he was present one or two of these loads were dumped in the cupola. This seemed to satisfy him that all was well, and he would proceed to other parts of the works. The buggies charged while he was on the floor were all that were charged each day of that specified mixture; the others were held for his visit the next day and the work proceeded on the personal theories of the foreman.

Inspecting Brass or Bronze Castings

When inspecting brass or bronze castings, aside from the tests and analysis when specified, the inspector should break a few castings from each day's work. This will enable him to obtain an idea of the structure of the material, as well as give him an opinion of how well the metals have been mixed, and if they have been properly stirred in the melting. Any segregation or soft and porous spots will be detected, which is important in castings used for bearings, as any segregation generally develops a hard spot, while soft or porous spots act as a catch all for dirt, both of which in time cause unequal wear or hot journals.

On brass or bronze castings used for interior decorations it is necessary to pay particular attention to the color of the metal, so that it is uniform. The author knows of some racks and fixtures used on cars of which the mixture was specified so as to arrive at a certain shade. On some of the fixtures castings were to be brazed with rolled metal. Orders were placed with three different makers; two of them succeeded in purchasing rolled material similar in color to the castings, but the third depended upon using yellow brass, which he plated and expected to arrive at the desired shade. The inspector had been furnished with sample piece of the composition and color desired. As each strip of rolled material had been separately plated, a difference was noted immediately.

Some Special Points

On iron castings, particular attention must be paid to thickness of sections. These are generally designed to hold a certain pressure, as pipe and pipe fittings, or to bear certain loads, as car wheels, &c. The thickness of sections and walls has been worked out when the castings were designed to give the desired strength with a certain pressure or load. Any deviation in this thickness, especially on the low side, is apt to cause a failure in service, and is not what the purchaser pays for nor has a reasonable right to expect. On a large casting it is the best practice for the inspector to be at the foundry when the mold is closed and to witness the pouring.

A few years ago the author saw the base of a steam hammer that had broken in service. It weighed about 10 tons, and had been in service about four months. The failure was due to the fact that the center of the mold had been filled with old bolts, nuts, washers and other scrap; this center having been anchored in the mold in some manner that held it, the mold was then filled with the molten iron. From all outward appearance the casting was solid.

In the matter of tests these are generally covered by the specifications, and it is the inspector's duty to know that tests he selects are as fair a representative of the material in the castings as it is possible for him to obtain.

An inspector should be amiable, have good sense mixed with sound judgment, and be a gentleman at all times. The author has known instances where castings with small defects were rejected and thrown aside by workmen without asking the inspector to pass upon them, because he was well liked in the shop, and they would not offer any castings to him which they considered doubtful. In other cases, when the inspector has not been so agreeable, every casting was offered to him and the work of inspection made as hard as possible, the men on the shipping floor feeling it their right to match their wits with his and get by the inspector as many castings as possible, defective or not defective.

There is no question that it is the manufacturer's right to decide the manner in which the casting or other material is to be made, but it is also the right of the inspector to pass upon the casting after it is finished, and it is his judgment that must decide whether it meets the requirements or not, and if it is good enough for the purpose intended and designed.

When the mixture has not been specified in the contract, the manufacturer has the right to decide the kind of material to use in making his steel, iron or bronze and the process of making it, but the inspector must decide if each casting is of the grade of material desired, and if it meets the specifications under which it was purchased.

In conclusion, I have always been of the opinion that the heartiest co-operation on the part of both the manufacturer and the inspector is necessary to get the best results and the best work.

The Steel Corporation's Unfilled Orders

The monthly report of unfilled orders of the United States Steel Corporation published November 10 shows that on October 31 these amounted to 2,871,949 tons, or 286,157 tons less than on September 30. The figures for October 31 are the smallest in the history of the Steel Corporation. Chairman E. H. Garry points out, however, that the basis of reckoning unfilled tonnage has been changed, and therefore the present showing is not as bad as it seems. He says:

> The unfilled orders October 31, 1910, agregated 2,871,949 tons. This apparently is the smallest amount ever shown on the books, but the comparison is somewhat misleading, because the basis has been changed to show only orders received from companies ontside of our own interest. On the old basis the showing would be 3,583,990 tons, as of October 31, 1910. The low figures heretofore shown were 3,027,006 tons, as of September 30, 1904, but on the present basis they would have shown 2,434,736 tons.

Judge Gary does not indicate when the Steel Corporation ceases to include inter-company business in its published statements, but as it was stated about one year ago that the current figures for unfilled orders more nearly represented actual contracts than those previously given out, the supposition is that the new method of computation dates from that time. The decline in orders on hand between December 31, 1909, and October 31, 1910, was 3,055,082 tons, or 305,508 tons a month. In the following table the statistics of unfilled orders of the Steel Corporation are given beginning with the first issuance of these statistics in 1902:

September 30, 1910..3,158,106	September 30, 1906..7,936,884
August 31, 1910....3,537,128	June 30, 1906.....6,809,859
July 31, 1910.....3,970,931	March 31, 1906.....7,018,712
June 30, 1910.....4,257,794	December 31, 1905..7,605,086
March 31, 1910.....5,402,514	September 30, 1905..5,865,377
December 31, 1909..5,927,031	June 30, 1905.....4,829,655
September 30, 1909..4,796,833	March 31, 1905.....5,579,560
June 30, 1909.....4,057,939	December 31, 1904..4,696,203
March 31, 1909.....3,542,595	September 30, 1904..3,027,436
December 31, 1908..3,603,527	June 30, 1904.....3,192,277
September 30, 1908..3,421,977	March 31, 1904.....4,136,961
June 30, 1908.....3,313,876	December 31, 1903..3,215,123
March 31, 1908.....3,765,343	September 30, 1903..3,278,742
December 31, 1907..4,624,552	June 30, 1903.....4,666,578
September 30, 1907..6,425,008	March 31, 1903.....5,410,719
June 30, 1907.....7,603,878	December 31, 1902..5,347,523
March 31, 1907.....8,043,858	September 30, 1902..4,843,007
December 31, 1906..8,489,718	

Best Mfg. Company Contracts.—The Best Mfg. Company, Pittsburgh, has been awarded an important contract for a 16, 18 and 20-in. wrought steel water line, with necessary valves and fittings, for the new plant of the American Sheet & Tin Plate Company at Gary, Ind., the contract being for a similar installation to one furnished by the same company some time ago for the Indiana Steel Company, also at Gary. The contract includes fabrication and erection complete, and will enable the Best Company to operate its plant to practically full capacity for the next three or four months. Other contracts taken by this company for the Indiana Steel Company include high pressure pipe work for the No. 1 open hearth plant and high pressure pipe, fittings, &c., from 16 to 20 in., for the power end of the by-product coke oven plant. The company reports railroad orders to be somewhat improved. It is now operating its new iron foundry at Oakmont, Pa., and expects to move its machinery at the Twenty-fifth street plant in Pittsburgh to Oakmont in about 60 days. The general offices and all operating departments will also be located there.

A meeting of committees representing the International Iron Molders' Union and the Stove Founders' National Defense Association was held in Cincinnati at the Sinton Hotel November 9, for the purpose of discussing minor changes in their agreement.

The New Blast Furnace of the Detroit Iron & Steel Company

Features of Construction of the Second Zug Island Stack

In *The Iron Age* of June 1, 1905, details were given of the construction of the blast furnace completed a short time before by the Detroit Iron & Steel Company on Zug Island in the Detroit River, just below Detroit. The company, which is an identified interest of M. A. Hanna & Co., Cleveland, has operated the furnace almost continuously since that time. Meanwhile it has recognized that the growth of local consumption of foundry iron warranted an increase in capacity. Accordingly, in spite of the depressed condition of the iron market, preparations for a second furnace were begun early in 1909 and building operations went steadily forward, the new furnace being blown in immediately upon completion July 21, 1910.

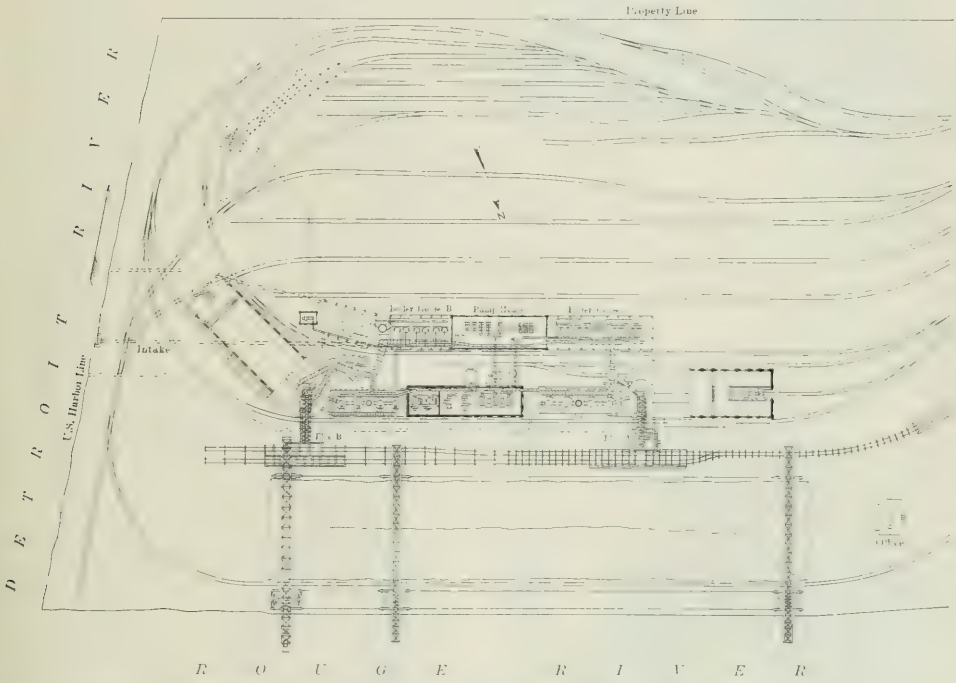


Fig. 1.—Plan of A and B Furnaces of the Detroit Iron & Steel Company on Zug Island, Detroit River.

The position of Furnace B with reference to the old stack A and the Detroit and Rouge rivers is east and toward the Detroit River from the old plant, with the River Rouge on the north, as shown in Fig. 1. The center lines of stoves, boilers, engines, dock, &c., parallel the corresponding installations of A furnace. The new cast house is built at an angle of 45 degrees with the above general direction for the purpose of simplifying the track layout.

The Furnace

The furnace, which was built for a nominal daily capacity of 300 tons, is 80 ft. high with bosh diameter of 18 ft. 6 in. The hearth jacket is built up of cast iron water cooled sections 4 in. thick. The inside diameter of the jacket is 18 ft. 6 in. at the top and 19 ft. 6 in. at the bottom; its hight is 9 ft. The sections are held together by shrink links and the assembled jacket is reinforced by three 1¼ x 12 in. bands. The take-up on each joint of these bands is made with three 2½ in. rods. There are six cast iron columns, resting upon a continuous base plate and supporting the shell, which is built up entirely of ¾-in. plate.

The bosh walls are cooled by means of seven rows of copper plates, in addition to the tuyere coolers, and are reinforced by seven bosh bands, supported from the mantle and bolted together in their exact location before brickwork starts. The brickwork above the mantle is cooled by means of eight rows of cast iron plates, 18 plates per row. Cooling water for bosh plates and hearth is drawn from six manifolds attached to a 10-in. pressure pipe. A smaller pressure pipe located at the mantle feeds the cast iron cooling plates higher in the furnace. Twelve tuyere stocks of the McKee type, illustrated in Fig. 2, are included in the furnace equipment. These stocks are notable for tightness, for low cost and for time saving in renewal of their parts.

The Distributing Device

A detail section of the top filling mechanism is shown in Fig. 3, while Fig. 4 is a general view taken from the platform of the stoves. The distributer is of the McKee type, which has been described heretofore in its essential features. The adaptations to the design of the new Detroit furnace which have been

made in the distributer and in the method of electrical control and not already described are as follows: The equipment is designed to carry the errors of distribution to six points, and is automatically controlled so that the first four skip loads will be dumped without revolving the top. Each of the next four skips is revolved 60 degrees before dumping; each of the next six 120 degrees; then, in sequence, 180, 240 and 300 degrees, and repeat. The top revolves in the same direction for all dumping positions. The automatic switch for starting the top is operated by the hoist engine and the limit switch in turn is actuated by the revolving top. An indicating lamp panel is located in the operator's pulpit and mounted thereon are seven lamps, one of which will be lighted whenever the motor, and consequently the top, is revolving; the other six are used to indicate at what station the burden is being dumped. An interlocking solenoid, energized whenever the hopper is revolving, is so mounted with respect to the small bell operating valve as to prevent motion of the latter when the solenoid is energized, thus preventing the dumping of the small bell while the hopper is revolving.

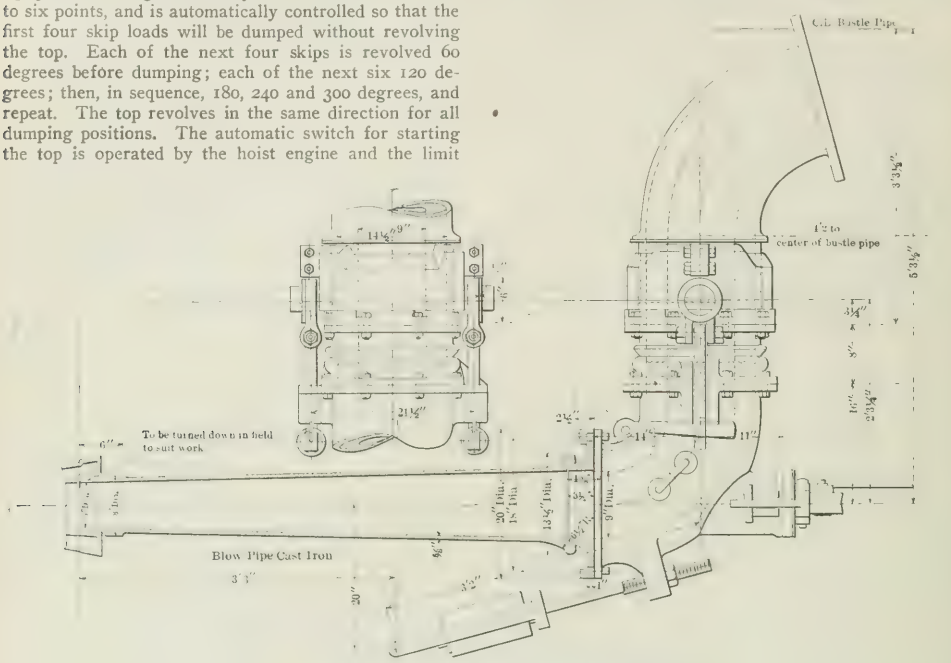


Fig. 2.—Details of the McKee Tuyere Stock.

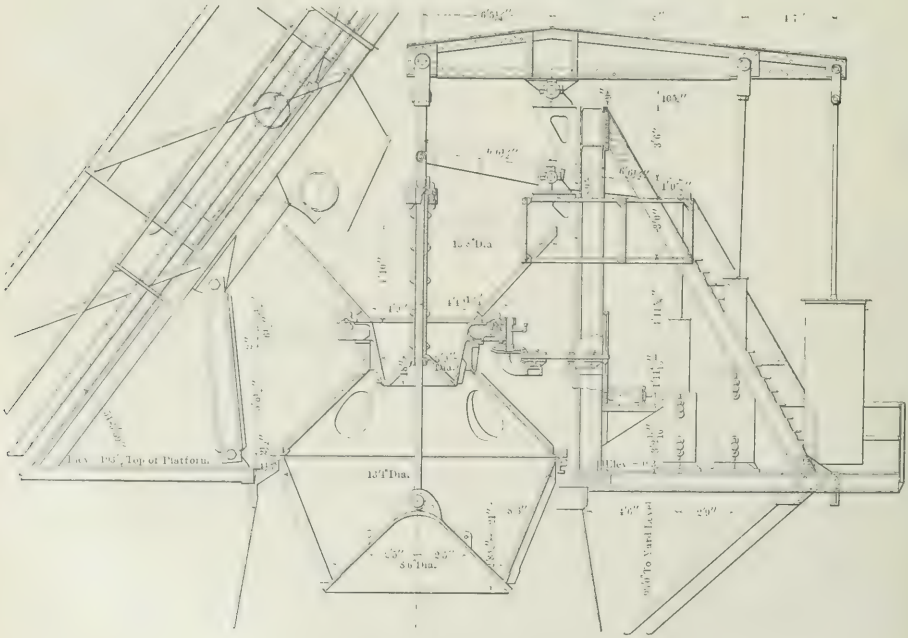


Fig. 3.—Section of Top Filling Mechanism.

Hoisting Equipment and Bin System

The stock is delivered to the McKee distributer from the stock house by means of a double track skip

bridge, which has a pin connection to the furnace platform. The large and small bells are controlled through bell beams by 14-in. and 10-in. steam cylinders, respectively. These cylinders are operated through fourway valves from the cage at the base of the skip bridge. The jib crane handles the parts from the furnace top to the ground. The skip cars are operated by a 12 x 14 in. double drum hoist engine located in a brick engine house on the opposite side of the furnace from the stock bins.

The gas is cleaned by being conducted through a single pass dust catcher having its outlet in a Mullen gas washer, which in turn distributes the gas direct to the stoves and boilers.

The cast house is of steel construction inclosed by brick curtain walls. There are 10 20-ft. bays of 70-ft. span. The house is equipped with a Brown pig breaker served by a 5-ton special Brown crane.

The steel stock bins, illustrated in Fig. 6, are all of a simple type. The ore and stone bins deliver their stock into the 10-ton McKee type scale car shown, while the coke bin discharges direct into the two skip cars from either side of the bridge. The ore bins are filled either directly from the stock pile by the ore bridges or by a 30-ton transfer car used in conjunction with the bridges. One new 188-ft. span Brown type bridge was added to the former equipment, with man trolley control. It has a 60 ft. 6 in. cantilever on the shore end and a 74 ft. 2 in. apron on the water end. The total travel of the trolley is 300 ft. The bridge is designed to handle a maximum load of 11 tons.

Four 20 x 85 ft. two-pass Nelson-McKee type stoves comprise the blast heating equipment. After two months' service these stoves have demonstrated their ability to come up to expectations in the matter of holding high heats for a long period of time.

Power Equipment

The boiler plant comprises five 400-hp. Wickes boilers connected to an independent self-supporting draft stack.

Service water is supplied by two Allis-Chalmers 8-in. double suction single stage centrifugal pumps, each direct connected to 120-hp. noncondensing Terry steam turbines. These pumps are designed to operate on a

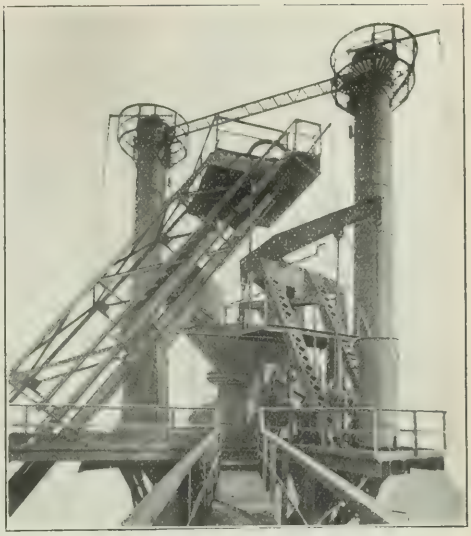


Fig. 4. General View of Top Filling Mechanism.

range of steam pressure of 50 to 125 lb. and will deliver throughout this range of steam pressure 3,000,000 gallons each against a total net head of 132 ft. The old standpipe used in connection with A furnace was raised 25 ft. to maintain the head necessary on the new furnace.

The blowing equipment was supplemented by the addition of a pair of 44 and 84 x 84 x 60 in. Allis-Chalmers long crosshead engines and the power plant by a 250-kw. Allis-Chalmers dynamo direct connected to a Skinner high speed reciprocating engine.

Reinforced Concrete Dock

On account of the poor subsoil encountered at the necessary location for the dock and ore floor, very heavy construction was determined on for this portion of the plant. The dock proper is of reinforced con-

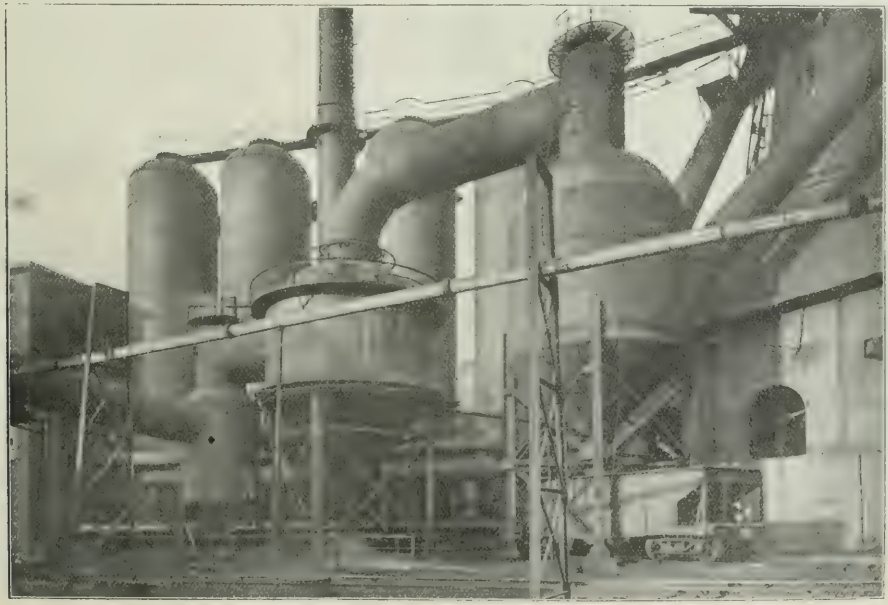


Fig. 5.—Dust Catcher and Mullen Gas Washer.



Fig. 6.—Ten-Ton McKee Type Scale Car Under Ore Bins.—Coke Bins at the Left.

crete, and is composed of two reinforced concrete girders of I-beam section, supported on a double row of piling and so spaced as to form a support for the front shear leg rails of the ore bridges. The girder sections are interconnected at suitable intervals by reinforced concrete girders and by a 6-in. reinforced concrete slab forming a floor between the upper portions of the girders. This slab extends as a cantilever at the front of the dock and is supported by reinforced concrete knee braces attaching to the front girder. The ore floor is a reinforced concrete slab supported on piling. Piles were spaced on 4 ft. centers over the entire floor, the reinforcing of the slab and spacing of piling being proportioned to an ultimate load of 6800 lb. per square foot. The ore floor is tied into a reinforced concrete girder at the rear, the girder supporting the rear shear leg rail of the ore bridges. The piling driven to support the ore floor varied from 30 to 45 ft. in length, and that supporting the dock proper from 40 to 55 ft. in length.

After the plant was completed it was decided to install a single strand Uehling pig casting machine for the purpose of giving the plant a range of product, including basic iron. The location of the machine is indicated on Fig. 1.

The designing and construction of the new furnace were under the supervision of Arthur G. McKee, consulting engineer for M. A. Hanna & Co.

The Marshall Foundry Company Secures a Government Contract.—The Marshall Foundry Company, Twenty-eighth street and Allegheny Valley Railway, Pittsburgh, has secured an important contract for pipage castings required in irrigation work. The plans as prepared by the Los Angeles office of the United States Reclamation Service of the Department of the Interior provide for special cast iron tunnel shaped pipe, of which there will be 11 sections, the largest having inside dimensions of 8 ft. wide and 7 ft. high, each section being 12 ft. long and weighing about 30,000 lb. All flanges are to be machined in the machine shop of the company. The complete contract includes steel grillage bars and I-beams and will take about three months to finish, after which shipment will be made to the new Belle Fourche project, S. D. The Marshall Foundry Company has excellent foundry and machine shop facilities for such work, one notable contract taken a few years ago having been for large cast iron pipe and fittings for the League Island Navy Yard, Philadelphia. The company is also completing an important contract for 36 large cast iron acid stills for the Aluminum Ore Company, East St. Louis, Ill.

Ellwood City and Its Industries

Ellwood City, one of the new manufacturing towns promoted in the Pittsburgh district within the past 15 years, is located in the southern part of Lawrence County, Pa. Its growth has been steady and substantial, year after year, until it has become of industrial importance, with much promise for the future. It now has two seamless tube plants, factories A and B of the Shelby Steel Tube Company, factory A being the largest seamless tube plant in the world, employing, when in full operation, about 1600 hands. It also has two steel forging works, one employing about 700 hands; two foundries and machine shops; a wire drawing and nail factory, and a number of other manufacturing establishments.

The promoter of the town, the Pittsburgh Company, has always encouraged the location of manufacturing interests and is at the present time offering factory sites free to legitimate enterprises. This company calls attention to the excellent railroad facilities enjoyed by the town, its cheap electric power, perfect sewerage system, immunity from floods, freedom from labor disturbances, abundance of native coal and natural gas, and its public improvements, all of which would seem to make it a desirable manufacturing location.

The final figures of the corn crop of this year, as estimated by the Department of Agriculture, place the yield at 3,121,381,000 bushels. This is considerably above the estimate of October 1 and far above the yield of any other year.

The Belgian Machine Tool Market*

Its Industries and the Field for American Products

BY CAPT. GODFREY L. CARDEN.

The Belgian machine tool industry is one of the most important in Europe. This applies both to imports and exports. Belgium is supplying many parts of the Continent with a varied line of machinery for making machinery. Many of these Belgian tools compete strongly with leading grades of German products and Belgian prices are, in many cases, sufficiently low to insure sales in German territory. Broadly speaking, the best grades of American machine tools are not excelled by the Belgian output, but the fact must not be overlooked that there are good Belgian lathes on the market which are underselling some of the lowest priced lathes of American origin.

Belgian Machine Tool Builders

The city of Liége may be regarded as the center of industrial activity in Belgium. The machine tool houses of de Longdoz, Fetu-Defize and Jaspar are located there, and at the time of the writer's visit last year all three plants were busy. In Brussels the Demoor Works are engaged in the sole manufacture of lathes, and just outside of Brussels, in the village of Loth, is located another lathe building plant known as Le Progrès-Industriel. In Ghent is the machine tool plant known as Phœnix Noveau, and this last-named works is probably supplying a greater variety of cheap tools than any other Belgian establishment. Jaspar of Liége is confining his attention largely to plain milling machines of the Lincoln type, and the writer found many of these machines in leading arsenal shops. The Pieper Gun Works of Liége gave a large order to Jaspar for these small milling machines, and the firm appears to have been highly successful in placing orders in Italy, Denmark and elsewhere.

The de Longdoz Works are devoting attention to a large variety of tools, and are catering especially to machines for locomotive work. The design of many of these machines is excellent and the workmanship highly creditable. The writer devoted considerable time to the inspection of this plant, and has little hesitancy in saying that many of the de Longdoz tools are worthy of serious consideration.

The Demoor Works of Brussels is one of the few Belgian shops which is specializing. M. Honoré Demoor stated that he is building all lathes in series of 20, and had found it well-nigh impossible to compete in price with the American F. E. Reed lathe until his shops were put on a specialty basis. The Demoor Works was selling its No. O machine for 1800 francs ($347.40) last year. This machine has a hight of center of 220 mm. (8.57 in.); swing in the gap, 610 mm. (24 in.); width in the gap, 300 mm. (11.8 in.); swing over the bed, 440 mm. (17.3 in.); swing over the carriage, 310 mm. (12.19 in.); the weights varying from 1500 to 2040 kg. (3310 to 4500 lb.). The Demoor Works found on attempting lathes without reference to series that there was involved a cost of $250.90 per tool. By having recourse to American machines and turning work out in lots, the cost was reduced to $154.40 per tool.

* Similar articles by Captain Carden on Austria-Hungary appeared in *The Iron Age* March 31 and May 12, 1910, and on Russia June 16, 1910.



Fig. 1.—The Assembling Department of the Cockerill Works, Liège, Seraing, Belgium.

Labor is cheap in Belgium, and good machinists can be employed on an average for 5 francs (96.5 cents) per day. A day's work is generally 10 hours, and when orders are plentiful Belgian manufacturers are found extending this time to 11 hours. An average rate of pay for foremen is $57.90 per month. Belgium has long been regarded as one of the greatest supply centers of the Old World for almost all classes of machine made products. Belgian locomotives are not only of excellent design, but are regarded as generally presenting the most advanced features in steam practice. This summary applies particularly to the Continent, and if the statement requires any qualification, it must be in the interest of Austrian shops. The writer does not mean that the Belgians and Austrians are turning out the best locomotives in Europe to-day, but rather that Belgian and Austrian engineers have been early looked to for the latest in locomotive designs abroad.

There are three well-known plants in Liége engaged to-day in locomotive work; namely, the Meuse Works, St. Leonard and the great Cockerill plant, the assembling room of which is illustrated in Fig. 1. Cockerill is to Belgium what Krupp is to Germany, Le Creusôt to France and Witkovitz to Austria. It is easier to make a comparison between Cockerill and Le Creusôt than between Cockerill and Krupp. While all three establishments are essentially iron and steel works, Krupp's outputs are confined to iron and steel forgings, artillery, railroad material and shafting. At the Cockerill and Le Creusôt works all of these materials are also manufactured, but in addition, both build locomotives and steam engines. In the case of Cockerill, the noteworthy feature is the production of large gas engines.

In this Liége district there is a noteworthy plant known by the name of Ateliers F. Recq de Malzine, but it is popularly referred to as the Malzine Works. There are perhaps not more than forty men in this shop, and the efforts of the plant are confined exclusively to turning out gears. Except at the Melnotte Works, there is probably no finer aggregation of machine tools anywhere in Belgium than on the Malzine floors, and with only a few exceptions, these tools have been drawn from the first makers in America. The assemblage is tantamount to an exhibition display, coupled with a scrupulous regard for order and cleanliness. Belgian machinery works, and especially those of Liége, find it decidedly to their interest to turn their gear work over to Malzine, and, in consequence, the latter shops are fully employed. The tools in use by Malzine are representative, for the most part, of the most expensive machines on the American market, and this fact should not be lost sight of as indicating the readiness of Belgian manufacturers to buy machine tools on merit.

In a country where so many varieties of cheap tools are procurable, as in Belgium, it is little short of folly for American manufacturers to hope to do business there, unless their machines possess marked superiority. Where merit is the underlying consideration, the question of price no more controls in Belgium than elsewhere. As a further illustration, attention is called to the Melnotte Works in Remicourt, a town about 45 minutes on the railroad from Liége. M. Melnotte established a plant there some few years ago, which is practically out in the open country, Remicourt being a mere village. The workmen, it is understood, are largely drawn from the country class, and because of the location of the plant, there is an absence of city influence. The Melnotte Works are engaged in the manufacture of cream separators, a group of which are shown in Fig. 2, and the installation of machine tools is probably the best single grouping in all Belgium. Fully 90 per cent. of the tools are of American origin, this proportion representing for the most part the highest grades obtainable in the United States.

From the machine tool standpoint, there is nothing better to be seen in Belgium than the Melnotte dis-

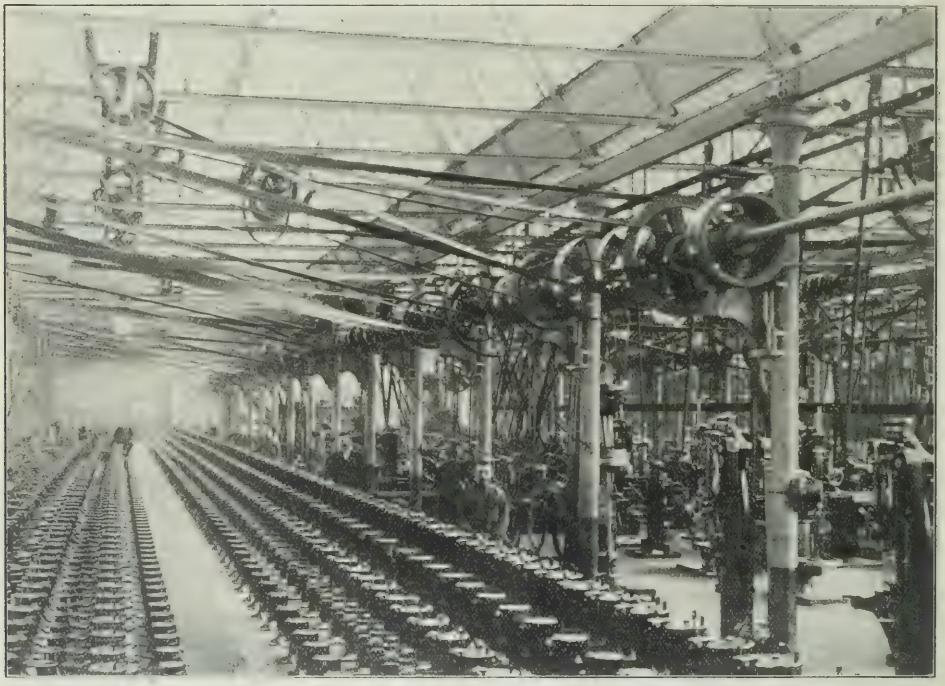


Fig. 2. Inspecting Cream Separators Made at the Melnotte Works, Remicourt, Belgium.

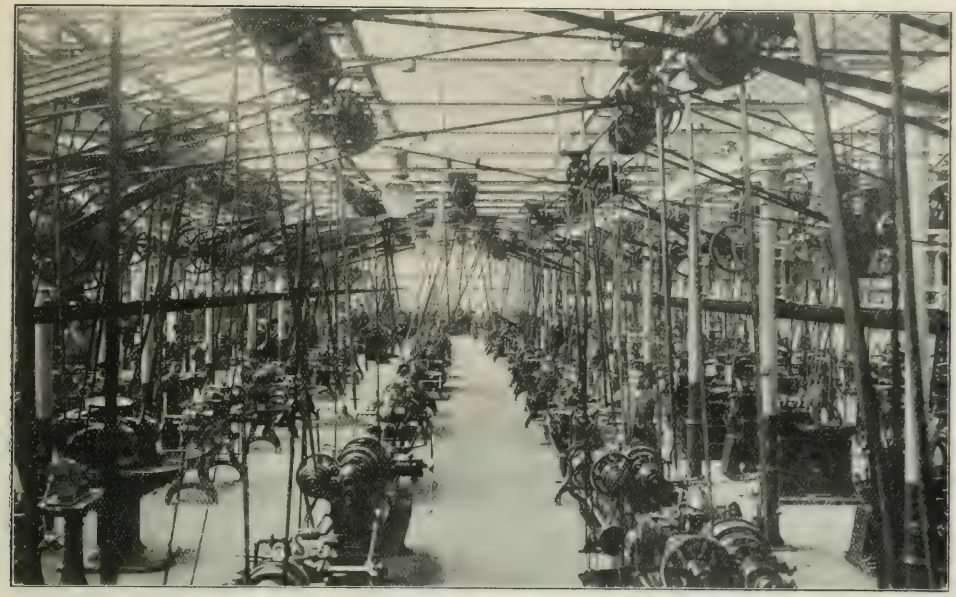


Fig. 3.—View Showing the Installation of Machine Tools at the Melnotte Works.

play, a partial view of which is given in Fig. 3. The annual output of separators approximates closely to 21,000 machines, and about 35,000 are said to be in actual use in Belgium. The methods employed in the Melnotte shops are patterned after the most advanced American practice, and Melnotte has carried the American idea so far as to incorporate American furniture in the offices. All machines turned out by Melnotte are guaranteed for two years, and the machine work on these separators is of the most exacting character. It is needless to say that there is a very large recourse to jigs in this plant, and the output speed is exceedingly high. Melnotte has not only adopted American standards and is using American machine tools, but has trained a highly efficient body of workmen. On these lines he has practically all the advantages of an American plant, plus the further advantages afforded in a country where the wage scale is low.

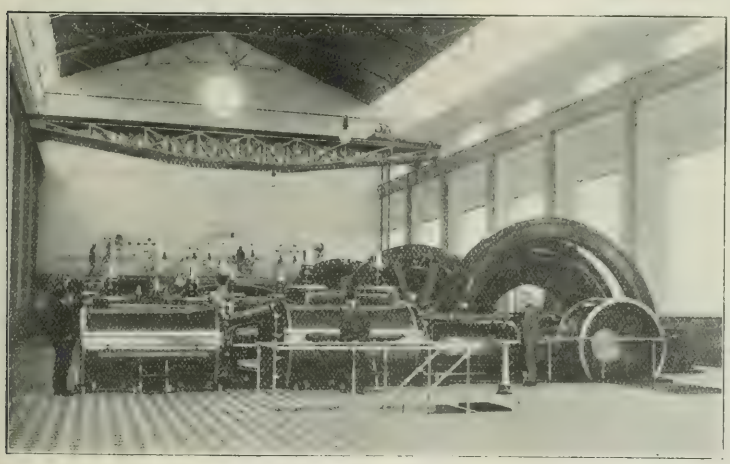


Fig. 4.—The Antwerp Tramways Power House, Showing Four 1000-Hp. Tandem Engines Built by Carels Frères, Ghent, Belgium.

Engine Building Plants

Attention has been called to Malzine and Melnotte as plants in Belgium where high-grade machinery is demanded. There are many others. To be sure, these two shops are engaged in a special class of work, demanding special tools of high development, but there are numerous shops in Belgium where the outputs rank among the first in Europe, and such shops are in the market at all times for the best machines obtainable. In the steam-engine building line, the works of Carels Frères, Ghent, have a world-wide reputation. There are quite a few American machine tools in the Carels shops, but not as many as one would expect to find in a plant of its high reputation. This establishment takes pride in its specialty of building engines required to run continuously day and night without a stop for, say, three months.

The Carels are generally regarded as the pioneers in Belgium in the building of superheated-steam engines, and an installation of four-tandem engines is illustrated in Fig. 4. Their experience shows that an engine with a steam consumption of 14 lb. of saturated steam per indicated horsepower requires only 9¼ lb. of superheated steam. The guarantees given for superheated-steam engines are 8½ lb. per indicated horsepower for triple expansion engines, 9¼ lb. for compound engines, 13 lb. for single-cylinder condensing engines; and 15½ lb. for single-cylinder noncondensing engines. All these engines are made with drop valves which are regarded by the firm as the only type suitable for superheated steam.

A guarantee is given on these drop valves for twenty years.

Lately, this company has brought out a new type of engine in which the efficiency of the steam jacket is increased by dividing the cylinder in three parts, and putting the valves in the cylinder cover. The Carels claim the advantages of higher efficiency of the jacket, direct and shorter steam passage, giving little resistance and rapid valve closing until passage of their overlapping and afterwards braking resistance for this arrangement which enables the construction of valves free from unequal expansion with their seats and thus remaining perfectly tight.

The Carels are also building locomotives and their output is practically all absorbed by the Belgian State Railways. This firm is also building Diesel motors but the fact should not be forgotten that they are essentially steam-engine builders. It was of this firm that a prominent American steam-engine builder declared, after inspecting all the steam-engines at the Paris Exposition, that in his opinion the best engines on exhibit were from the Carels of Ghent: Sulzer of Wintertur, Switzerland; and Tosi of Legnano, Italy. The Belgian engines are high priced, but when one considers the workmanship involved it is only natural for the products to command a high figure. In the writer's opinion there are probably no better castings put into engines anywhere in Europe than at Carels, and it is the practice of some of the French locomotive shops to draw on the Carels for various cast parts.

In Brussels the Bollinck Works are engaged in engine building much on the lines of the Carels, and an English writer declared not long ago that he doubted if the workmanship of the Bollinck engines was equaled by more than two British engine firms. In the Bollinck shops operators at machine tools are paid wages varying from 40 to 55 centimes (7.7 to 10.61 cents) per hour. A foreman in charge of from 10 to 15 men receives $42.46 per month. There are many American machine tools in the Bollinck shops, and correspondingly few German tools. This firm appears to have confined its installation to tools from the United States, Belgium and the United Kingdom.

On the subject of prices as between American and English heavy tools, the interesting statement was made by the technical director of one of the leading Belgian works that he had made a careful calculation based on the prices paid for machines from a well-known American and a prominent English house and his calculations showed that the prices charged per kilogram were practically the same. This statement related to heavy boring mills. And the director remarked that on the face of it the American machine would appear to be more expensive but the difference in price he found was made up by the greater weight in the American tool.

The American Rolling Mill Company's Research Laboratory

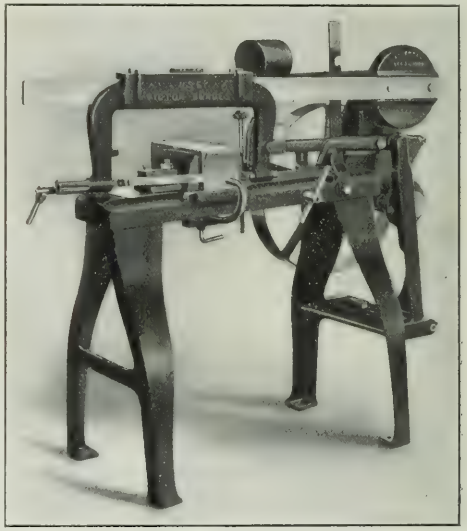
The American Rolling Mill Company, Middletown, Ohio, has just completed a splendidly equipped research laboratory costing approximately $40,000, and for which it has erected a special building. Every known appliance and all the apparatus modern ingenuity has devised that will, in any way, aid the company in its chemical and electrical development work have been included in this laboratory equipment.

The excellent organization that this company is known to have has been strengthened through securing the co-operation of Dr. Allerton S. Cushman, late of the Department of Agriculture, Washington, D. C., who is establishing an institute in Washington for scientific research work in several lines. The American Rolling Mill Company will especially benefit by such of his work as applies to every branch of the iron and steel business in which that company is interested. Under the arrangement effected Dr. Cushman will also give the work of the company's research laboratory personal supervision and direction. Under such able guidance, backed up by the laboratory above described and by the large modern new works now being built in Middletown, the company should certainly be in position to maintain its reputation in the manufacture of special high grade products in iron and steel.

Dr. Cushman's investigations of the causes of corrosion of iron and steel, have attracted much attention in both the metallurgical and commercial worlds.

New Massachusetts Power Hack Saw

A new power hack saw machine, known as the No. 6, has recently been added to the line made by the Massachusetts Saw Works, Chicopee, Mass. Particular care has been taken to make each part of the machine



A New Power Hack Saw Made by the Massachusetts Saw Works, Chicopee, Mass.

as accurate as possible and of high grade material and the tool is claimed to be especially rigid and strong, the frame being braced in two directions.

All side play and vibration are said to have been eliminated and a straight cut assured. The forward stroke is steady and even throughout its length of 6 in., and the cut is like the stroke of a man with a file. As is customary in tools of this character, the return stroke is at a higher rate of speed and the blade is lifted an amount varying from 0.001 to 0.125 in., a feature which saves wear on the teeth and increases the life of the blade. An adjustable stop regulates the depth of the cut, stopping the saw automatically when the desired depth is reached, so that no attention is required after the cut is started. A rest for the piece being cut off is furnished which prevents the saw blade from being broken when the stock is cut through.

Several requests have been received for unfolded copies of the Supplement to *The Iron Age* of October 20, 1910, reproducing the photograph of the participants in the annual dinner of the American Iron and Steel Institute, at the Waldorf-Astoria, October 14. In case other readers of *The Iron Age* desire to preserve this Supplement, unfolded copies will be mailed free on request.

Lodge & Shipley Shop Systems

BY H. M. WOOD.* CINCINNATI, OHIO.

Practically all machine shops, large and small, have some special features in the way of conducting work or handling their equipment. The Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, is no exception to this general rule, and a number of interesting arrangements are in use there. Two of these which deserve special mention are a system of lamps for signaling the operator of the traveling crane when his services are required in different portions of the machine shop, and the use of blackboards for posting shop order numbers for the information of the assembling force. Both of these features are shown in the accompanying engraving, which is reproduced from a photograph of a portion of the assembling floor. The crane signal lamps can be seen hanging from the roof in the center, while some of the blackboards are placed over the lathes at the left. A brief outline of the two systems and their use follows.



View Showing the Order Blackboards and the Crane Signal Lamps in the Shop of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.

Signaling the Traveling Crane

In most shops it is customary for a workman who needs the services of the overhead traveling crane to wave his arms and shout and whistle to attract the attention of the crane operator, and the noisiest man is generally the most successful. If the building is a long one it means a more or less extended trip down the floor to get within hearing distance of the crane operator, with consequent loss of time. By installing a system of signal lamps the time wasted in calling the crane has been eliminated and two traveling cranes are able to serve the center bay promptly, running the full length of the main machine shop, 680 ft.

Switches are placed at convenient intervals on the columns along the sides of the center bay, each controlling a red lamp hung from the ceiling directly over that portion of the floor. These lamps are all connected in parallel with the regular incandescent shop lighting system, although each is turned on and off by its own switch. When an erecting hand needs the crane he throws the switch nearest him, which lights the lamp over that portion of the floor. The crane operator is on the lookout for these signal lights and, if not already engaged, runs at once to the spot. If his crane is engaged at that moment he goes as soon as he is free. In either case the light remains burning until the crane reaches that point, when the erecting hand turns it off.

Posting Shop Orders

In common with other well regulated plants, we have our own shop order number for every job which enters the factory. An interesting method is in use to show at a glance what the various orders on the assembling floor are and the character of each. A blackboard 18 x 24 in. in size is hung above each lathe which is in course of construction on the assembling floor, just as soon as the bed is placed for the first operation. On this board are chalked the size of the lathe, its order number, the special attachments, if any, and the completion date.

The assembling work is divided among specialized groups and the data on the blackboard serve to keep prominently before each man the information necessary for his particular work. For example, those who align the headstocks know that they must complete their part of the work two weeks before the date chalked on the board. If a tool room lathe is to be fitted with a relieving attachment as an extra, it is plainly shown in black and white. Of course the same information is also given on the shop order tag which is wired to the lathe. The blackboard is merely an added convenience and timesaver, so that a person, even if a few yards away, can get the important particulars of the job at a glance.

* Lodge & Shipley Machine Tool Company.

The Sloss-Sheffield Company Passes a Dividend

The Sloss-Sheffield Steel & Iron Company's directors at their meeting November 9 passed the dividend on the common stock, which has been at the rate of 1¼ per cent. quarterly. In explanation the statement below was made:

Under ordinary conditions, either financial or otherwise, this company, notwithstanding its policy of providing for all of its improvements to its property without the issuance of additional securities would have made ample net earnings to pay dividends on all of its stock at the current rates and have available a substantial surplus. By reason of the flooding of the two slopes of one of the company's most important iron mines, the entire output of ore from this mine, for a period of eight or nine months, was unavailable for use. The ore from this mine contains sufficient lime to flux itself, and also 16 2-3 per cent. non-lime bearing ore, and the lack of this ore necessitated the shutting down of two of the company's furnaces and increased the cost of iron produced about $1.50 a ton. At great expense the water has been pumped out, and the mine is now in condition to be operated; but this unfortunate accident and the enormous loss, direct and indirect, occasioned thereby, coupled with the existing depression in the iron market (owing to which the company has accumulated 70,000 tons of iron in its yards), makes it seem to the board imprudent to declare this quarterly installment of dividend on the common stock.

The Pennsylvania Steel Company has blown out its No. 2 furnace at Steelton, Pa., and put No. 4 into operation after considerable improvements. The company is making about the same output as for several months past.

Gas Producer Design and Operation

Some Considerations Affecting Their Success

BY P. VON ZEIPEL, DUQUESNE, PA.

Nearly all of the modern gas producers have arrangements for admitting steam into the air supply. The quantity of steam used generally varies between 33 and 40 per cent. of the weight of the coal charge, but if it is desired to recover the by-product ammonia 150 per cent. of steam is needed. It is generally considered in the former case that one-fourth of the whole amount of coal is consumed by the oxygen in the steam. It is self-evident that a more efficient gas is produced by this method, as the percentage of nitrogen is reduced and that of the hydrogen increased, which may be desirable in certain cases. If the gas is intended for metallurgical purposes the hydrogen will no doubt have a deleterious effect, as it is shown in practice that the loss of iron through oxidation is proportional to the hydrogen which the gas contains. The steam will be reduced when in contact with the hot iron and hydrogen liberated according to the following equations:

$$4\ H_2O + 3\ Fe = Fe_3O_4 + 8\ H$$
$$3\ H_2O + 2\ Fe = Fe_2O_3 + 6\ H$$

The Fe_2O_3 generally escapes with the chimney gases and the Fe_3O_4 joins the slag. The ratio shows that the hydrogen is again delivered and at liberty to burn in regenerators and chimney flues, which naturally will cause unnecessary damage.

It is quite common to believe that the steam will dissolve the clinkers in the producer ashes, but this is hardly the way to put it. Heat is absorbed by the reduction of the steam, which lowers the temperature sufficiently, thus preventing the ashes from melting together. Clinkers are apt to accumulate if the fuel carries a high percentage of sulphur. Generally about 1 per cent. of sulphur is harmless, but any marked increase will produce conditions that are very trying. In the selection of coal great care should therefore be taken to provide against an excessive percentage of sulphur, rather than against a large percentage of ashes.

Operating Difficulties

The greater the clinking tendency of the fuel the slower the producer naturally must be run, so that the

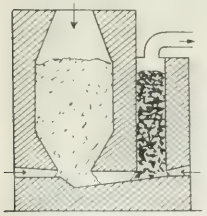


Fig. 1.—Ebelmen Producer, 1841.

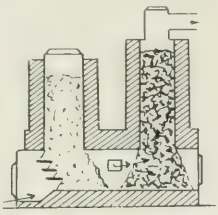


Fig. 2.—Riché Producer, 1902.

Two Producers Designed to Decompose Tar Forming Gases by Forcing Them Through a Layer of Coke.

temperature in the combustion zone will not reach the melting point of the fusible matter. The intensity of the gas generation depends to a certain extent upon the size of the grate area; smaller generators, whose consumption of coal averages from 20 to 25 lb. per hour per square foot of the grate area, run to better advantage than larger ones, which generally burn only about one-half of this amount satisfactorily. The reason for this diversity is the greater difficulties in the satisfactory running of larger generators. In this connection it might be said that the most common sources of trouble in operation arise from irregular distribution of the charge and neglect of attendants to close up by poking the channels that are always formed in the fuel bed and which permit air to pass through too freely and partly burn the gas within the producer proper.

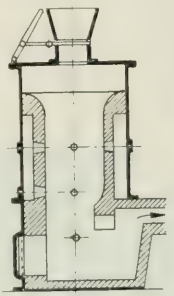


Fig. 3.—Ekman Producer, 1843.

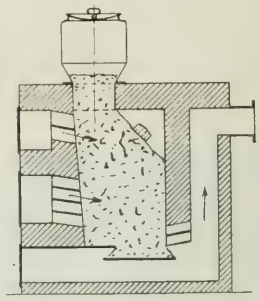


Fig. 4.—Koerting Producer, 1903.

Two Types in Which an Air Blast Is Used to Decompose Tar Gases.

This condition will also be present if the layer of coal is too thin or the gas generation too intense and the result will be a poor gas with a high percentage of carbon dioxide, low carbon monoxide and hydrogen and of high and varying temperature.

The loss through partially burned coal and coke in the ashes is often surprisingly large and is the result of an irrational manner of cleaning. Upon examination of certain producer types it will be found that only the outermost part of the ashes is removed and the cavity formed at this point will be filled with the nearest layer of coal and coke coming down along the sides and thus easily dropping into the ashes.

In order to obviate related difficulties and facilitate successful operation mechanical pokers are now coming into general use and through their action the air channels will be continuously destroyed, thus permitting the gas generation to be pushed, which means a reduction of the relative number of producers. The layer of coal, which formerly was kept relatively low on account of increased difficulty in poking, can now be higher, which is an important advantage. The outgoing gases thus have higher temperatures and a considerable percentage of available heat has been absorbed and returned to the fuel, which ratio will naturally increase the efficiency of the producer. The formation of clinkers is also reduced by mechanical agitation and continuous breaking up of the mass of fuel, thus making it possible to dispense with the use of steam if desired. With the introduction of mechanical pokers a decided step is taken toward the solution of the producer problem. In the final solution, however, the question enters of how to manage those condensable hydrocarbons if they are not wanted in their crude form.

Progress Made in Designing

As early as the beginning of the fourth decade of the last century Ebelmen in France and Ekman in Sweden built producers designed to disintegrate the tar forming gases and the ideas governing their construction are still fundamental. It is interesting to compare, for instance, the Ebelmen producer of 1841, Fig. 1, with Riché's of 1902, Fig. 2, and also Ekman's of 1843, Fig. 3, with Koerting's of 1903, Fig. 4. Ebel-

men and Riché decompose the tar gases by forcing them through an incandescent layer of coke, while Ekman and Koerting obtain the same result by admitting an air blast to the middle of the producer and having the gas outlet at the bottom. The gases are thus forced down through the combustion zone and the tarry vapors decomposed.

Ebelmen also constructed dry distillation producers, with the coal inclosed in a tube suspended from the top, Fig. 5. With this arrangement the tube also serves as a magazine for the charge, but, as Ebelmen also discovered, it is of very little use as regards decomposition of tarry hydrocarbons. The arrangement, however, is used quite extensively, though only with the view to serve as a fuel magazine.

Ebelmen as well as Ekman used inverted combustion and many later types are based on this principle. The purely down draft system—where the air is admitted at the top and the gases are led out at the bottom—has nevertheless a disadvantage, especially when applied to large producers. The decomposition of the tarry vapors and the reduction of carbon dioxide to carbon monoxide refrigerates the under part of the incandescent fuel bed, which results in a large waste of

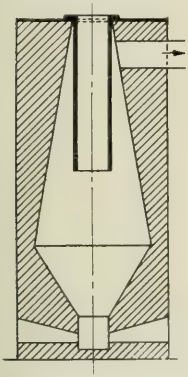


Fig. 5.—Ebelmen Dry Distillation Producer, 1840.

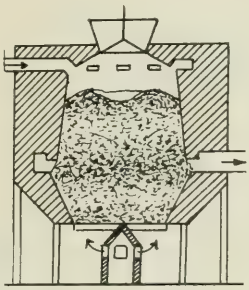


Fig. 6—Gorman Double Zone Producer, 1877.

carbon going into the ashes. The most intense combustion occurs about 2 ft. below the surface of the fuel bed and clinkers are therefore generally formed at this point. The removal of these clinkers is in some instances so difficult that the producer must be blown out to permit cleaning. As a consequence the ashes and clinkers are allowed to accumulate until the efficiency of the producer ceases, which usually occurs after three to ten days' time. Then the entire contents are removed and the process started anew. This, of course, means that the remaining producers have to be forced in a corresponding degree, until the new fire has been started, if the original quantity of gas is needed.

In order to combine the best features of both down draft and up draft producers Gorman, in 1877, designed a double zone type with two distinct zones of combustion, Fig. 6. In the upper zone the distillation products are decomposed and in the lower one the combustion of soot and coke takes place. The gases from both zones are mixed at the middle part of the producer, where the gas outlet is located.

The idea of conducting the distillation products through channels to the zone of combustion has been accomplished by Neshe in his construction of 1879, Fig. 7. The object was modified by Olschewsky in 1881, through the use of a suction apparatus under the grate, Fig. 8, and further improved by Genty in 1901, in whose construction the gas and the air blast are kept separate, thus eliminating the danger of explosion. In his construction the gases are admitted directly on a higher level to the zone of combustion, Fig. 9.

Reversible producers, built in pairs and first designed by Sutherland in 1882, Fig. 10, produce a good tar free gas. The operation is performed in the following manner: The charge in generator No. 1 is sup-

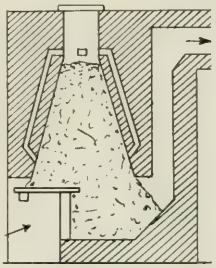


Fig. 7. Neshe Producer, 1879.

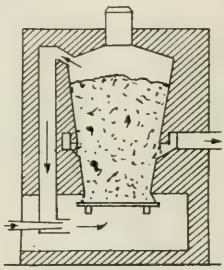


Fig. 8.—Olschewsky Producer, 1881.

posed to have parted with its products of distillation and is consequently at a high temperature; generator No. 2 is now charged with a fresh supply of fuel and the gases, together with their tarry vapors, are admitted into generator No. 1, where the hydrocarbons are decomposed by passing through the incandescent fuel bed. As soon as the charge in generator No. 2 is thoroughly coked and incandescent, the process is reversed by valves, thus changing the direction of the gas and the air currents. The reversing of the valves can be accomplished automatically and at fixed intervals by proper adjustment.

The distintegration of the tar gases in all these producer systems seems, however, to deprive the combustion zone of such a quantity of heat that the carbon dioxide is to a great extent not decomposed and therefore the efficiency of the producer is considerably reduced. The volatile matters, distilled from bituminous coal, form soot at a high temperature of distillation and tarry hydrocarbons if the temperature is relatively low. It seems, therefore, very probable that in the ordinary up draft producer a medium temperature exists, in which the products of distillation form neither soot nor tar vapors, but are passing off as fixed gases. This ratio can, however, only be obtained by a continuous and even distribution of the charge, which can

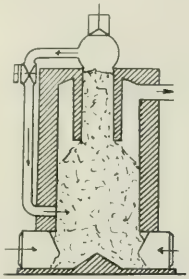


Fig. 9.—Genty Improved Producer, 1901.

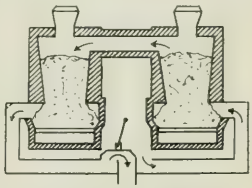


Fig. 10.—Sutherland Reversible Producer, 1882.

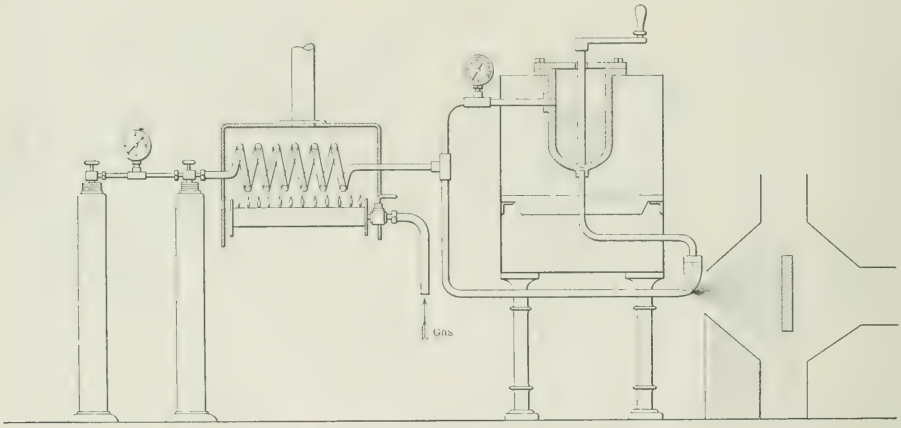
be more readily performed by automatic feeding devices.

If the coal consumption amounts to 100 tons per week or more, it will be of a greater advantage economically to have ammonia recovery apparatus in connection with the gas plant. The gas generation must then take place at such a low temperature that there will not be any decomposition of tarry hydrocarbons. The idea of washing them away by water seems very efficient, especially as this can be accomplished at such a high temperature that the ammonia vapors are not condensed; but this valuable ingredient can be recovered by a simplified method.

A New Method of Plating or Galvanizing

In a recent number of *La Revue de Metallurgie* is an article on a new method of plating or galvanizing invented by M. Schoop. This invention was communicated to the Society of Engineers and Architects of Zurich by Mr. Schoop, April 3, 1910, and a report on the process was presented to the Academy of Sciences of Paris by Professor d'Arsonval on April 19. The process consists in projecting a metal, which is by preference in a liquid state and at a high temperature, upon the object to be plated, in a fine jet or by centrifugal force. The state of fine division of the metal can be obtained in many different ways and does not constitute the invention. The new technical principle involved is the discovery that by means of finely divided liquid metal it is possible to produce a dense metallic coat that can be worked and that is either adherent or may be separated.

One possible arrangement is shown in the diagram. The molten metal is contained in a crucible, into which a suitable gas is admitted under pressure. The metal is forced down a capillary tube, is broken up by a stream of the same gas and blown in the form of a metallic mist or spray, with great force, against the object to be plated. The object is caused to pass through the spray in from 1 to 3 seconds. Of course, various metals vaporize or spray in different ways and many factors come into play, such as the melting point, the fluidity or viscosity of the metal, the affinity of the metal for the gas or vapor used as a spraying medium, the method of obtaining the metallic spray, the pressure employed, the previous treatment of the object to be treated, the construction of the apparatus and many operating conditions. In using aluminum, for instance, the crucible must not be of steel or iron or siliceous material, because of the action of aluminum on these materials.



Apparatus Employed in the Schoop Method of Metal Coating.

The deposits of pure tin vaporized by means of a pure and inert gas are distinguishable with difficulty from mercury or silver mirrors. The specific gravity of the deposit is equal to that of the forged or rolled material, showing its density. A very interesting fact is that the temperature of the metallic mist or spray is very much lower than that of the molten metal, so that substances such as wood, celluloid and organic bodies can be treated.

The surfaces to be treated should of course be freed from dust and grease, and if they are heated the coating is more tenacious. Tin plate produced by this new process has stood 10 to 12 bendings before breaking and the tin did not scale off. The fields of application of the invention are only touched upon briefly. They fall mainly into two divisions: First, the production of thin and adherent metallic deposits for the decoration or protection of surfaces; second, the production of removable deposits for printing. The coating of insulating bodies to make them conductors and the production of parabolic or other mirrors do not fall properly under either class. G. B. W.

The Philadelphia Foundry Foremen

The regular monthly meeting of the Associated Foundry Foremen of Philadelphia and vicinity was held in the Odd Fellows' Temple, Philadelphia, on the evening of November 8. The annual election of officers resulted as follows: Clarence R. Brown, E. E. Brown & Co., president; Joseph Whitehead, Abram Cox Stove Company, vice-president; George M. Benkert, Fairmount Foundry Company, treasurer, and D. M. Kittenger, Pencoyd Iron Works, secretary. Thomas M. Livezey, Haines, Jones & Cadbury Company, Norristown, Pa., was elected trustee, to serve three years. George C. Davis was re-elected official chemist of the association. The trustees were empowered to arrange for removing the headquarters of the association to the Manufacturers' Club. F. Sutcliffe, Norristown Pattern Company, Norristown, Pa., was elected to membership.

The programme for the evening provided for a debate on "Molding Machines vs. Hand Molding." Various members participated. While hand molding was strongly defended for some classes of work, machine molding was claimed to be better adapted for others. Referring to the relative output by hand and machine, one speaker said that if the hand molder was given the same care in preparation of patterns and general equipment as was given the molding machine, the relative production would not be at such variance. The judges of the debate (Thomas Devlin, Josiah Thompson, J. Howard Sheeler, Carlisle Mason, and J. Howard Evans) reserved their decision and advised that, as the information brought out was so interesting and valuable, the debate be continued at the next meeting.

The Western Steel Corporation, Seattle, with steel plant at Irondale, Wash., now has two mills running double turn, while a third train of rolls is on its way from the East for installation as soon as received. It is manufacturing merchant bars and twisted bars, and will soon be turning out angles, channels, I-beams and other structural shapes and light rails. It is also completing a plant for the manufacture of horseshoes.

Smoke Prevention

A Solution of the Problem for Heating Furnaces in Iron and Steel Working Plants

BY H. M. NICHOLLS, CHICAGO, ILL.

The difficulties encountered in solving the smoke abatement problem are many and the plants which come under the jurisdiction of the Smoke Inspection Bureau realize the necessity, both to themselves and the smoke inspector, of some satisfactory means to eliminate objectionable smoke from their furnaces. In the following the conditions met with in plants of the kind and experiments made along the line of smoke abatement are described. These experiments cover a period of 18 months and were conducted on a heating furnace in connection with which a 250-hp. Hyde water tube boiler is used to utilize the waste heat of the gases for power.

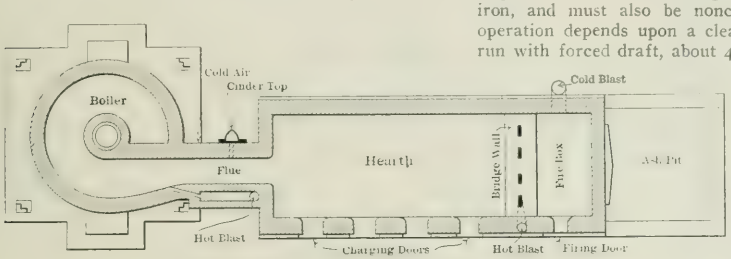


Fig. 1.—Plan View of Boiler and Heating Furnace.

The principles of perfect combustion are comparatively simple. The burning of coal is accomplished by bringing into intimate contact the oxygen of the air with the combustibles in the furnace under proper conditions of temperature. The main factor and the key to the problem is the proper amount of air intimately mixed at the right place and temperature with the burning carbon and volatile matter. Unfortunately these ideal conditions do not exist in heating furnace practice. The efficiency of a heating furnace is measured by the tonnage of good iron produced, and such things as fuel and smoke are of less concern to the furnaceman.

A brief description of a heating furnace and an outline of the practice will help to emphasize the difficulties of smokeless combustion in a furnace of this type. Referring to the line drawings, Figs. 1 and 2, a heating furnace with four charging doors is shown in sectional plan and elevation. The iron is charged either in the shape of billets or fagot piles. The latter are composed of small pieces of scrap iron wired together, while the billets are solid, having been rolled down to size from ingots or blooms. The iron is charged through the charging doors upon the hearth of silica sand. This hearth is 7 ft. 6 in. wide and 16 ft. 9 in. long and is separated from the firing chamber by a high bridge wall. The charge is brought to the proper temperature by the reverberatory action of the flame. The grate surface required in a furnace of this size is 30 sq. ft., with 24 in. as an average depth of fire.

The fuel used must essentially be a long flaming coal, due to the long hearth, and must be free from sulphur to allow the welding of the small particles of iron, and must also be nonclinkering coal, as good operation depends upon a clean fire. The furnace is run with forced draft, about 4 oz. pressure being carried under the grates. The bridge wall is hollow, with ports on top through which a hot blast is introduced into the furnace. Each furnace requires 30 to 35 tons of coal in a 24-hour run. The stoking is intermittent and is governed by the heat required by the charge.

When the hot blast in the bridge wall is on there is little or no objectionable smoke, because it catches the hydrocarbons and volatile matter as they come over the bridge wall, giving good combustion. As this heat comes up in the charge this blast must be shut off and a heavy fire put on, giving a heavy carbon flame, which acts as a blanket upon the iron, preventing the rashing action of the flame and allowing the heat to soak in and penetrate to the center of the pile. This gives the iron the soft, waxy appearance it should have when it is drawn.

The difficulty in securing the smokeless combustion arose when the hot blast was closed. It was evident that if anything was done it must necessarily be accomplished outside of the furnace proper, after the heavy flame had served its purpose at this stage of the heat. Experiments were made by introducing cold air and afterward hot air in the flue connecting the furnace and boiler, but the velocity of the gases was so great, owing to the contracted area of the neck and setting, and the distance so short, that the carbon did not get its proper amount of oxygen before striking the cooling surface of the boiler tubes.

The original boiler setting is shown in section in Fig. 3. After careful study of the conditions it was decided to design the boiler setting as shown in Fig. 4.

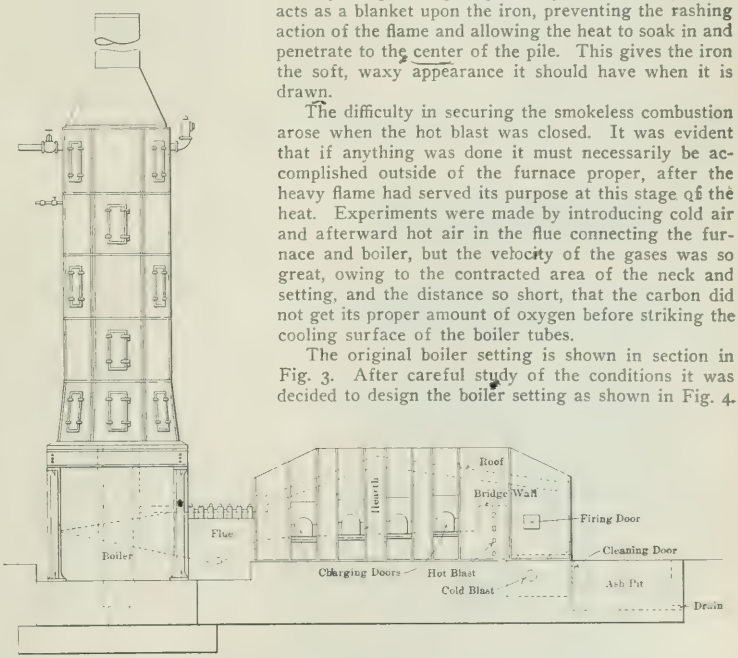


Fig. 2.—Elevation of Combined Boiler and Heating Furnace.

Three feet were added to the length of the central column, raising the tubes higher. The width of the circle was increased from 22 to 38 in., the distance for gases to travel lengthened from 7 to 17 ft., and a hot blast was introduced into the flue in the direction of travel of the gases.

The results obtained showed this to be a highly satisfactory and, in the opinion of the writer, the cor-

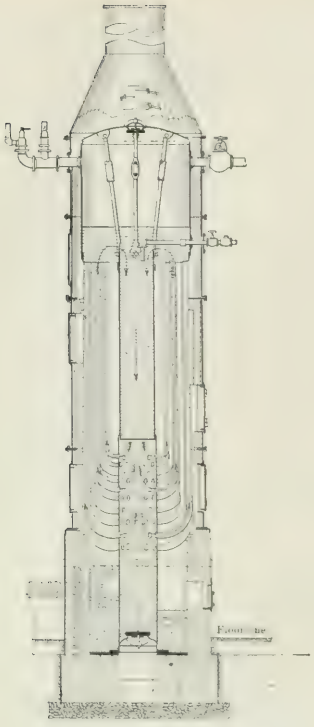


Fig. 3.—Original Boiler Setting.

rect solution of the smoke problem in connection with heating furnaces. With slight modifications it may be used in connection with any waste heat proposition. For auxiliary power purposes 72 in. by 18 ft. horizontal return tubular boilers are used. These boilers were incessant smokers until the setting was changed. The combustion chamber was deepened and smoke arches installed and also a hollow bridge wall. The air is forced through the bridge-wall, becoming heated to a high temperature before leaving the ports, when it is mixed with the gases as they are deflected by the smoke arches. This type of setting makes it possible to force the boilers and burn much poorer fuel without making any objectionable smoke. The solution seems, and is, simple, but much study and money were involved in solving the problem, and the writer hopes it may help clear the atmosphere in localities around the

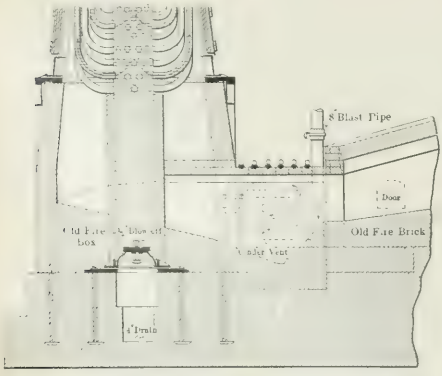


Fig. 4.—Lower Portion of Boiler Showing Modifications in Setting.

many plants of this character. All that is achieved in this and kindred lines should be chronicled for the good of the cause.

Strength and Size Tests of Manila Rope

Some interesting figures on the variation in the size and strength of 3-in. Manila rope have been obtained as the result of a series of tests conducted by the Plymouth Cordage Company, North Plymouth, Mass. A sample of the company's manufacture was used as a standard for both strength and size and the percentage variation from this of the 22 samples of other makes tested were plotted with the results shown on the chart reproduced herewith.

One of the samples tested for size was 3-in. in circumference, the nominal size, while three were smaller and the balance were larger. The maximum variations were 10.3 per cent. over and 7.3 per cent. under size with an average of 3.1 per cent. over the standard. The deviation in size as shown by this set of samples made by different rope makers and presumably of the best quality is very striking but not as much so as in the case of the strength tests.

In this latter series of tests there was a much greater variation shown and there seems to be no relation between these variations and the differences in size. The strength of the Plymouth specimen used as a standard was 8795 lb. and only two of the samples exceeded this

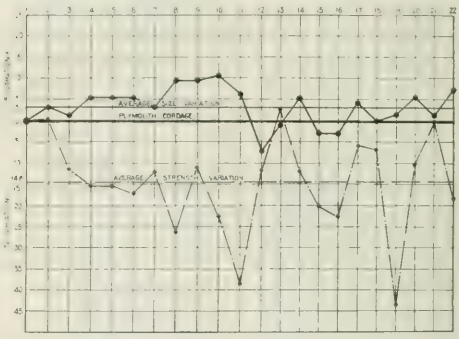


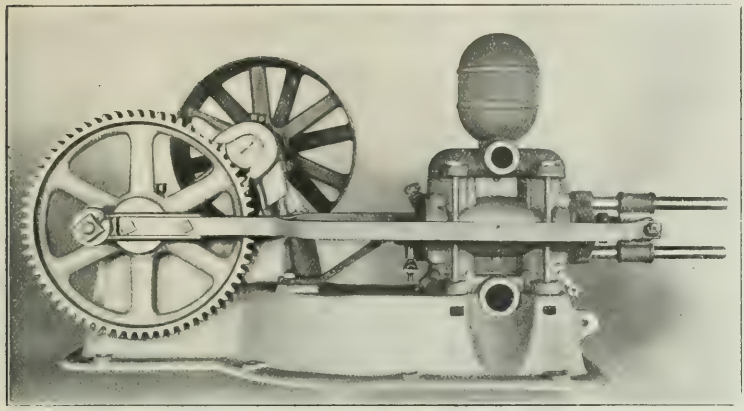
Chart Showing Results Obtained from Tests of Manila Rope Made by the Plymouth Cordage Company, North Plymouth, Mass.

value. The maximum strength was 9010 lb. or 2.5 per cent. above the standard while the minimum was 4946 lb. or 43.7 per cent. under. A curious feature about this particular specimen, which is No. 19, is that while the strength is very low, the size is above the standard and less than the average variation. An inspection of the chart of results will show a number of similar inconsistencies, especially in the case of Nos. 10, 12 and 13. The first is the largest rope but is the third weakest with a variation of about 23 per cent., the size and strength of the second are both subnormal 7 and 12 per cent., respectively, while the strength of the other is 2½ per cent. above standard, the maximum developed, and the size is ½ per cent. below.

The statement is made that this year's output of one automobile factory in Detroit, Mich., will reach a value of $19,000,000, which, it is asserted, is more than the output of the stove, paint, drug and freight car industries of the city amounted to in 1900. At that time these were the principal industries in the city of Detroit, and few, if any, automobiles were being built there. The comparison made shows the tremendous extent to which the new industry of manufacturing automobiles has developed.

New Peters Double Acting Power Pump

An inexpensive pump operated by a gasoline engine or an electric motor for filling pneumatic pressure water supply tanks which the Peters Pump Company, Kewanee, Ill., has recently brought out, is illustrated herewith. The special features of the new pump are durability, efficiency and simplicity.



A New Type of Double Acting Power Pump Built by the Peters Pump Company, Kewanee, Ill.

The pump has removable bushings which are easily replaced when worn and each bushing has its own individual oil cup, which insures efficient lubrication. The piston, which is of brass in common with the cylinder, is supported by the two steel guides projecting at the right of the pump and all wear of the piston is said to be eliminated.

The following table gives the principal dimensions and specifications of the pump:—

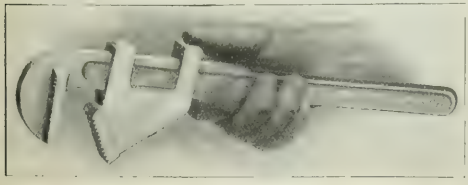
Diameter of piston, inch	3½
Diameter of cylinder, inches	3
Length of stroke, inches	5
Overall length of pump, inches	41
Width of pump, inches	22
Hight of pump, inches	20
Capacity, gallons per hour	750
Suction head, feet	28
Working pressure, pounds per square inch	125
Delivery head, feet	250

When an electric motor is employed for driving the pump, the maker recommends that one having a speed of 800 rev. per min. be used, or if that is not available, a pulley of sufficient diameter to reduce the number of piston strokes to 40 per minute should be employed.

The Stover Pipe Wrench

A new style of pipe wrench declared to possess a number of time saving features has been placed on the market by the Wright Wrench & Forging Company, Canton, Ohio. The Stover pipe wrench, as it is called, is quickly adjustable, having an automatic grip, which it is claimed will not flatten the pipe, while the instant release makes it practically impossible for it to lock on the pipe. Only one hand is needed to adjust the tool to any size of pipe, a feature which will appeal to pipe fitters, who frequently have to either use one hand to hold a light or grasp some object for support.

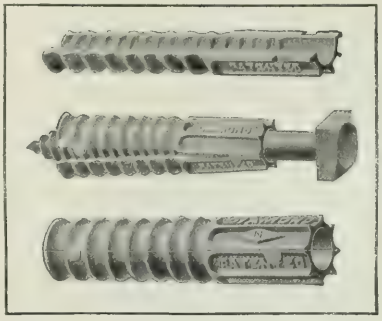
As will be seen from the engraving, the mechanism is simple, easy to understand, all parts are readily accessible, and the strength of the bar is not weakened by pin or screw holes. The positive stop on the movable jaw, it is claimed, will prevent the pipe from being flattened, while all sizes from ⅛ to 1½ in. are firmly gripped. The arc on which the jaw moves provides an automatic grip and an instantaneous release. The only wearing part of the tool, the grip, is interchangeable and can be readily replaced at the cost of a few cents. The weight of the wrench is ¾ lb., which is lighter, so it is stated, than any other pipe wrench of its capacity, while it is approximately 25 per cent. stronger.



The Stover Pipe Wrench, Made by the Wright Wrench & Forging Company, Canton, Ohio.

A New Diamond Expansion Bolt

There has recently been placed on the market by the Diamond Expansion Bolt Company, 90 West street, New York City, a new design of expansion bolt for lag screws, which it is said contains a number of improvements over the usual design. The principal advantages claimed for this new bolt, which is known as the Diamond N, are the employment of a corrugated holding surface and a new style of clamping lugs. Half of the holding surface is shown in the upper portion of the accompanying engraving, while the middle and lower views illustrate the bolt and the holding shield complete, respectively.



A New Type of Expansion Bolt Made by the Diamond Expansion Bolt Company, New York City.

In the older types of bolt the shells were held together by a wire or a spring, which frequently became detached and allowed the parts to separate, but in this new bolt a lug cast integral with one of the pieces and fitting into a groove on the other member is employed. The corrugated holding surface increases the gripping power of the bolt over that secured in the older types by a series of points, and to prevent the shield from turning in the wall when the lag screw is started the longitudinal ribs at the outer portion of the shield form an octagonal section. The shield diameter is slightly larger at this point, so as to insure the first grip being on the longitudinal ribs.

The Killing Little Giant Molding Machine

A New Rockover Type Handling Large Molds

A new molding machine the special features of which are large capacity and ability to handle comparatively big molds has been brought out by E. Killing's Molding Machine Works, Davenport, Iowa. This machine is of the jarring power rockover type and it is claimed to be very fast and effective in doing its work while the cost of installing it is comparatively small. As illustrated in the accompanying engravings, the machine is mounted with an oil box pattern having a 10-in. draw and the clean sharp molds it makes are clearly shown. Fig. 1 shows the pattern ready for the sand, Fig. 2 is a view of the machine with the pattern being rocked over and Fig 3 shows the pattern withdrawn from the mold.

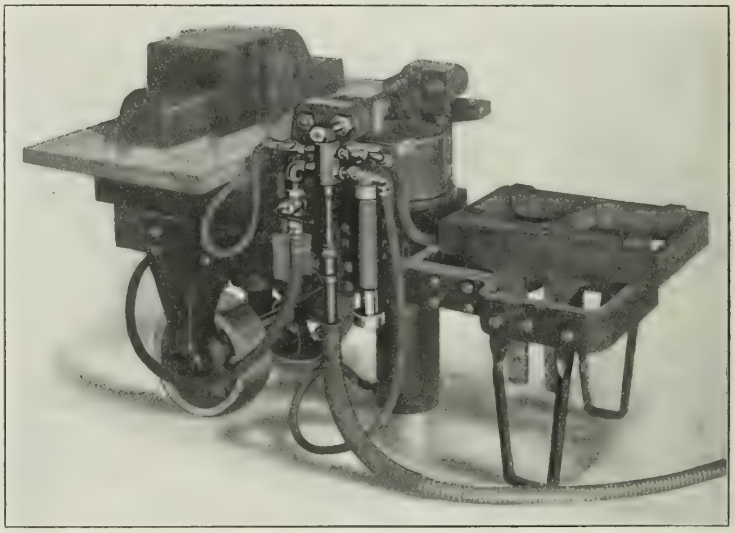


Fig. 1.—Pattern Ready for the Flask and Sand on the Little Giant Molding Machine Made by E. Killing's Molding Machine Works, Davenport, Iowa.

In operation, the pattern is mounted on the pattern board and the whole fastened to the rockover table. When in this position the flask is applied and filled with sand after which the mold is jarred to the proper density by compressed air which is alternately applied and released automatically in the cylinder under the jarring table. The flask is rocked over by air and the rockover table lies flat on the jarring table while the mold is being jarred. An elongated slot allows the rockover to move vertically with the jarring table while the latter is in motion but a clip holds the free end of this rod when the mold is being rocked over as in Fig. 2.

The construction of the jarring cylinder and the valve is said to be simple and possess many good points, viewed from the jarring standpoint. The latter is of the expanding ring piston valve type and the cylinder is fitted with metal rings which, it is claimed, insures a tight cylinder and saves air. The flask is set up on an equalizing frame of bars held in a frame which is adjustable to suit the flask hight. These bars are very sensitive and act without springs. They also lock automatically and require no blocking up which would strain and tear the mold due to the production of an unequal tension. This equalizing device assures a clean sharp mold and when vibrators are used the draft of the patterns need be very slight. Air is employed to draw the pattern just as fast or slow as the work will permit, which is a feature worthy of attention.

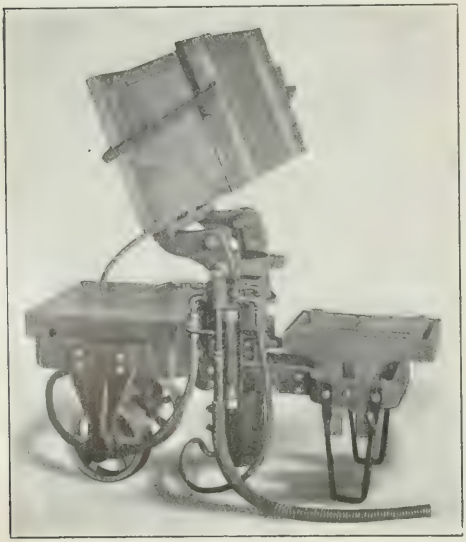


Fig. 2.—View of Machine While the Flask Is Being Rocked Over.

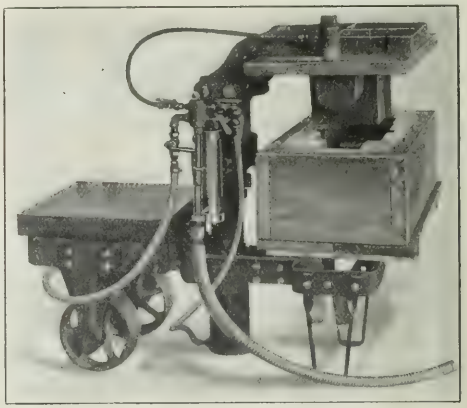


Fig. 3.—Machine After the Pattern Is Withdrawn from the Mold.

The following table gives the principal dimensions and specifications of the machine:

Length of draw, inches	10
Weight of heaviest molds, pounds	250
Weight of machine, pounds	600

Air consumption, cubic feet per minute	15
Floor space, inches	24 x 40
Hight of jarring table top from floor, inches	22

No springs are attached to the machine and all the working parts are protected against the wearing action of the sand. Feather key guides are used to keep the drawing cylinder in line and prevent shift while the patterns are being drawn. There is an automatic exhaust on the jarring cylinder and vibrators can be attached directly to the pattern plate.

A Large Allis-Chalmers Pumping Engine

There has recently been completed at the West Allis shops of the Allis-Chalmers Company, Milwaukee, Wis., a pumping engine for the city of Wheeling, W. Va., which is said to be practically equal in power to the one built by this company for Nashville, Tenn., that is claimed to be the largest ever constructed. The low pressure cylinder of the Wheeling engine is probably the largest ever used on a pumping engine, its diameter being 110 in. and the stroke 72 in. This engine is of the vertical triple expansion crank and flywheel type, and is designed for a steam pressure of 125 lb. and a vacuum of 27 in.

The diameters of the steam cylinders, all of which are steam jacketed, are 42, 74 and 110 in., respectively, and that of the water plungers is 33 in. The steam for the high pressure cylinder jacket is by-passed around the admission valve, while that for the intermediate and low pressure cylinders is taken from the first and second receivers, respectively, and the steam used to jacket the intermediate and high pressure cylinders is trapped into the second receiver and does useful work in the low pressure cylinder. Corliss type valves are used on both ends of the high pressure cylinder and on the admission side of the intermediate cylinder, while poppet valves are employed for the rest. All the valves are driven from eccentrics on a lay shaft supported on brackets on the main frame of the engine, which shaft is itself driven by drag cranks and connecting rods from each end of the main shaft. The surface condenser is located in a by-pass of the discharge line with cut-off valves on either side. A free exhaust for use when necessary is provided for the engine. The condenser pump is driven from an arm on the low pressure plunger.

The cast steel valve chambers, which are the largest ever built, are 78 in. in diameter, and the pressure chambers are also of cast steel. The 186 valves in each chamber are of a special gravity type, which does away with the use of springs and all are mounted directly in the steel valve deck without cages. The water end of the pumping engine, shown in Fig. 2, is self-contained and self-supporting. The steam cylinders are supported on double A frames, one end of which rests on the water ends and the other on a pier. Each piston has a single piston rod, which is screwed into a cast steel cross head and secured by lock nuts. Each of the steam cross heads is connected to the water cross head by four steel distance rods, and the water cross heads are connected to the water plunger by heavy cast iron pipe sections fitted with adjustable guides.

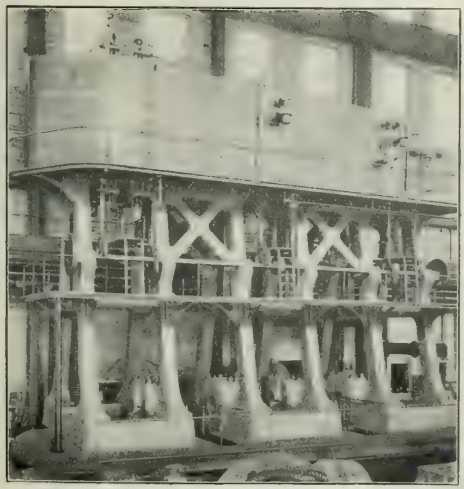


Fig. 1.—The Steam End of a Large Pumping Engine Built by the Allis-Chalmers Company, Milwaukee, Wis.

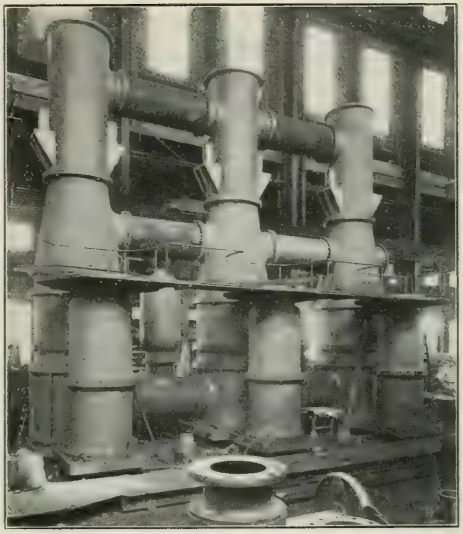


Fig. 2.—The Pump End of the Engine, Which Has a Capacity of 20,000,000 Gal. Per 24 Hours.

The water end is located in a pit 46 ft. deep, and the total hight of the engine is 84 ft. 8 in. from the base of the water end to the top of the steam end. There are four galleries; one at the level of the valve deck, one at the plunger chambers in the pit and two above the engine room floor. The lower of these last two gives access to the cross heads, eccentrics, &c., while the upper allows inspection of the valve gear and permits the use of the indicator motion. The tops of the cylinders are connected by platforms for reaching the upper poppet valves.

Cisco Lathe Tests.—An interesting test of a Cisco 14-in. lathe, made by the Cincinnati Iron & Steel Company, Cincinnati, Ohio, was made recently. Cuts were made in 0.25 per cent. carbon steel to a depth of 9-16 in. and 36 to the inch friction feed; in the same material to a depth of 3/8 in. at 18 to the inch screw feed, and in cast iron to a depth of 7/8 in. at 18 to the inch screw feed. In these tests it was endeavored to break the lathe but the only part that broke was the belt. This is justly considered exceedingly heavy work for a 14-in. lathe and indicates very forcibly its powerful construction. For these lathes the company has recently had three orders from Canada, two from California, one from Texas and one from New York, and it has also received orders for considerable equipment, including larger lathes from Florida and miscellaneous small tools from Arkansas and Tennessee.

The furnace of the Eagle Furnace Company at Attalla, Ala., has been blown out. It has produced charcoal iron for some months.

Concrete vs. Wood Flooring

Practical Experience with Concrete and Wood Floors in Machine Shops

James N. Heald, Heald Machine Company, Worcester, Mass., sent out a number of inquiries in investigating the above subject, asking these questions: "Are you using concrete floors at present and are they satisfactory to you and the workmen? If you were to build a new shop, what would your experience lead you to use for the floors, and how would they be constructed?" In answer 40 letters were received, and after tabulating these it was found that eight were distinctly in favor of concrete floors for machine shop use, 26 decidedly in favor of wood, and six noncommittal, being favorable to each under certain conditions and for certain work.

Based upon these reports, Mr. Heald presented a paper to the National Machine Tool Builders' Association at its meeting in New York, October 26, 1910, as follows:

These reports came with only one or two exceptions from those operating machine shops, although 16 of them were not machine tool builders. All of the eight who preferred concrete have had experience with both wood floors and concrete floors. Seventeen of the 26 who prefer wood floors have actually had experience with both; the other nine based their preference for wood upon investigations made by them when looking up this matter for their own benefit.

The general point of view of the writers of these letters can best be given, perhaps, by two or three extracts from the letters sent me, and I will quote, first, one in favor of concrete, written by the president of one of the leading machine tool builders of the country, which you will recognize readily from being located in a town in southern Vermont.

Satisfactory Concrete Floor in a Vermont Shop

We built a three-story cement and steel building in 1904, and in 1907 we put up a saw tooth single story building. In both of these buildings we have used concrete floors without wood. We noticed the men who were accustomed to stand on a wood floor became more foot-tired, at least at first, in the cement building, and possibly those whose work gave them an opportunity to move about were also slightly affected in the same way, but as for this we are not sure.

We do know that in these buildings with floors we provide a thin platform of wood for men who do not move about; we do not find it necessary to provide it for others. The planer and the bench hands whose work calls for standing in one position most of the time need the wood insulation.

Among other objections was that the cement was supposed to increase rheumatic troubles. We have had no such complaints, and have felt that the advantages more than offset the disadvantages.

It makes a cleaner, wholesomer shop, one in which it is possible to clean the floors from all of the objectionable matter that accumulates in the cracks of wood floors, and it also makes possible the introduction of cuspidors cast directly in the floor, into which we run a flushing stream at regular intervals.

If plants could be heated through simply warming the floor, as we believe has been suggested, then the only serious objection to the cement floor would be removed. It is possible that the hollow tile may serve for this purpose. A layer of this tile, with openings registering the entire width of the building and connected with conduit pipes on the lines already suggested, would give a very even distribution of heat and would not make an expensive floor, although the total thickness would have to be probably 2 in. under and 2 in. over of cement, with hollow tile of 4 or 6 in., according to the load.

This would bring the temperature of the floor up closer to that of the workmen's feet and would make the floor the warmest part of the building and do away with pipes of all kind. It might not be necessary to have any immediate openings into the room, except for a slight circulation. There is no reason why steam pipes could not be put in the same openings.

There remains the element that always enters into the use of concrete, which must be seriously considered by anyone building a more than one story building. A few shovelfuls of earth without the proper amount of cement, or a few shovelfuls of inferior earth material instead of sharp sand, may happen to be placed where it will cause serious disaster, but we have had no experience of this kind, except that we have had to worry about it, particularly at first.

A Plea for Wood Floors

Among the letters favoring wood floors, one from a leading manufacturer of twist drills in Cleveland, Ohio, is as follows:

We have one building in our group made all out of concrete. This building is three stories high and all the floors are concrete. We have been greatly disappointed in the concrete floors. In the first place, any water spilled on one of the floors filters through to the next. These floors are not suitable for running trucks over them, as they chip out and wear in grooves. Our men do not like them and complain of the effect that standing on the concrete floors has upon their legs. This may be imaginary, but it is to be considered. We have recently made an experiment on these floors by covering them with about 2 in. of first class paving asphaltum, put on by the company that does the asphaltum paving in this city. So far we think this is an improvement, and another year may extend this coating over all the floors in this building. In our judgment the best floor for a factory is narrow matched maple. It wears smoothly and is easily repaired.

Found Concrete Floors a Mistake

A manufacturer of automobile parts in Detroit, Mich., says:

We are using concrete floors in our factory building, which is devoted to light machine shop manufacturing operations. From our experience so far, we are quite firmly of the opinion that this is a decided mistake, and that wood floors would be much better and more economical in the long run for such occupancy. While there have been some few cases of complaint from workmen, this has not been at all serious. So our objection to concrete is more on the score of its being unsuitable as a wearing and working surface in general as applied to machine shop operations.

As a matter of wear, we find it giving way much more rapidly than we had anticipated, while, due to this, and at the same time aggravated by the presence of metal chips and oil, it is rather difficult to keep clean. Another serious objection to concrete is the invariable damage suffered by tools and finished pieces of work dropped upon it; 1 in. to 1½ x 3 in. maple is generally considered to be the best flooring material and is what we should use in future.

Uses a Concrete Body with a Wood Top

A manufacturer in Stamford, Conn., writes:

We have in two instances in our factory examples of concrete floors on which active manufacturing is being conducted, and in both cases, during the winter months, we have trouble in keeping the men comfortable in these rooms. The reason undoubtedly is due to the fact that the concrete floors abstract the heat of the body from the feet, chilling the blood and consequently producing a feeling of discomfort which is attributed by the employees to want of proper heat in the room.

The main portion of our factory is composed of wooden floor of three thicknesses—namely, a supporting floor of sufficient strength underneath, an intermediate floor and a top wearing floor of maple. We find that this construction of flooring gives us excellent satisfaction from the standpoint of the employees, and likewise has the advantage of being readily repaired by replacing the upper surface without disturbing the main features of the construction of the building.

In two of the buildings we have used the reinforced concrete form of construction as far as the floors and columns are concerned, and in this instance we have put screeds in the concrete, nailing down an intermediate floor and top wearing floor of hard maple as above. This method has given excellent satisfaction, and the writer has had the chance of studying, from his own personal feelings, the effects of such a floor on account of our main offices being laid in one of these reinforced concrete buildings.

On the ground floor we have used a method of tar concrete for a depth of 4 in. in which are buried screeds, and

an intermediate floor and top maple floor as in the above examples cited. This method for the ground floor work is highly satisfactory, as it keeps out the dampness and preserves the floor. The writer had the experience within the past six months of taking up a portion of a floor of this character, which had been down 30 years. The under flooring and screeds were just as clean and well preserved as if they had just come from the lumber yard.

In cases where we have found sensitive persons complaining as to the conditions arising from the use of concrete floors, we have made a lattice of wood for the employee to stand upon with a marked improvement in his apparent physical comfort.

The Trend Toward Concrete Construction

During the last three or four years the use of concrete for factory buildings has greatly increased and, when properly reinforced, has proved entirely satisfactory. Owing to the reductions in the cost of cement and increases in the cost of other materials, the use of reinforced concrete has become quite general, and therefore the floors of such structures are worthy of special notice. Reinforced concrete floors are made in numerous styles by different engineers, but the fundamental idea is that of using bars or other forms of steel as the tension members imbedded in concrete bodies. The floor proper is simply a slab like a cement sidewalk with reinforcement near the lower surface and supported by beams of concrete, also reinforced, which are formed as a part of the slab.

It is claimed by some of the advocates of concrete floors, that the real cause of the workman's complaint is undoubtedly the coldness and not the hardness of concrete floors. Everyone knows that the coolest seat on a hot day is a stone doorstep, and like the stone step, the concrete floor feels colder than the wood floor. When a concrete floor is in contact with the ground, it actively withdraws heat from its inner surface, because it is a good heat conductor.

At all seasons the concrete floor feels colder than the wood floor, and the effect of this on the operator who stands for hours in one place is gradually to chill his legs and thus still the circulation in them. In some shops the operators not only bring in boards and the like to stand on, but have gone so far as to wear heavy overshoes during working hours.

The actual heating of the concrete floor slab itself by means of contained steampipes or hot air ducts arranged in the substance of the flooring has proved remarkably successful in the plant of the Morse Chain Company, Ithaca, N. Y. In this plant the workrooms are heated by radiation from the concrete floors, with no direct admission of hot air except in extremely severe weather. The experience of this company seems to demonstrate that workmen have mistakenly attributed the effects of the cement floor to its "hardness," when in fact it was the "coldness" which was to blame.

The Wearing Qualities

Taking up now the requirements of satisfactory floors of concrete, we come first to the wearing qualities:

1. Liability of granolithic to wear into hollows, or ruts under heavy trucking.
2. Dust, due to abrasion of the floor surface, which is sometimes merely disagreeable, but which in some cases works damage to machinery and product.
3. The difficulty of making effective repairs in granolithic finish.
4. Trouble in attaching machines to granolithic floors.

Trucking, as shown by the letters received, develops quite a little trouble, especially where the concrete blocks are marked off into squares, as is usually done. It would be much better, so far as this point is concerned, if the marking off of the squares was omitted in such floors, which is done partly for looks and partly that any cracks which develop may run through these markings and in that way not show in the level surface.

One suggestion made by an advocate of cement floors is that flat iron bars slightly separated and not on edge be imbedded in the floor in the direction in which the trucking is done, and in that way take the wear of the trucks and save the concrete. They are better than solid flat plates, which become polished and therefore very slippery after a time.

With reference to the question of dust, this has been struggled with by all the advocates and builders of concrete floors. Various paints are offered to prevent this, but they are of little value. The floors can be kept painted, but the expense of this must amount to quite a little. No film as thin as the average coat of paint will permanently resist the usual wear of the shop. It is claimed that a boiled linseed oil, thinned with gasoline or naphtha until it runs into the pores of a porous surface, oftentimes prevents trouble and is cheaper than some of the floor paints. This preparation is incidentally a good waterproofing for porous surfaces, as well as a preventive of dust.

In the matter of repairs, the granolithic surface is obviously at a disadvantage compared with wood, because of the difficulty of firmly bonding new material to the old.

The difficulty of attaching machines to the concrete floor is probably overrated by those who have had no experience in this line. Many of the later types of machine tools are so heavy, so well designed and so self-contained that they require very little, if any, attaching or bolting to the floor, and therefore the drilling for plugs into which screws can be driven, or the use of expansion bolts, should be a comparatively simple matter, and this point should not claim much consideration.

The breakage of parts in process is something that must be considered individually. If manufactured articles are delicate and finished all over there is risk of serious injury to them in dropping on the floor, which would not be the case with a wood floor. Therefore, if the article being manufactured is fragile the wood floor is quite desirable.

With regard to cleanliness, there is not much question that the concrete floor can be kept cleaner than the wood floor, which has so many cracks, usually full of dirt. What dirt accumulates on the concrete floor is right on the surface and can much more readily be taken up.

Need for Careful Troweling

With reference to waterproof granolithic floors, experts say that they must be troweled hard to make the surface durable, and that this troweling also makes it practically water proof. There will be no leakage of water that may get into the surface, except at joints, and possibly in places that have been worn by use. The extent of damage would be simply whatever was done by the leaking water in the room below. The conclusion is that the highest success in the construction of a granolithic floor surface can be obtained only by following very carefully correct principles of construction and certain methods of manipulation.

There are certain situations where, in spite of its higher cost, the wood top floor is probably better than any granolithic surface for the owner to put in, simply because his case may require certain qualities which the wood top can provide, and which no masonry surface can give, and which he must have, even at a higher first cost.

The virtues of a wood floor are inherent in naturally formed material whose fitness is apparent at a glance. Saw up the tree, season the sawed and planed strips, let the carpenter make them into a floor, and you have a wearing surface of certain high and recognized value.

With the granolithic surface, it is necessary to select cement and other materials for certain qualities which are not evident in the appearance of these materials; correct proportions must be determined; materials must be put on the right kind of surface and at

the right time, and they must be manipulated in the right manner. The green surface must be protected for a certain number of days while it is setting. The mere statement of the procedure necessary with the granolithic finish is enough to show that the average granolithic floor will be more or less unsatisfactory, because the average concrete workman is inclined to hurry, and is often poorly informed as to the procedure necessary for getting a good surface, and for that reason, to a large extent, the success or failure of a granolithic surface comes down to the question of workmanship.

Comparative Thickness

There is one other feature which is often overlooked concerning concrete floors and wood tops, and that is the comparative thickness that is necessary for the two kinds. When concrete alone is to be used, the entire thickness of the slab, including that portion which is put on for the finish, if properly handled, can be bonded together and made to give strength as a single slab carrying no dead weight. With the concrete floor made with a wood top, the concrete slab should be just as thick as in the first case, but, in addition to its own weight, it has the weight of the screeds which are put on, also the weight of the cinder or concrete filling between the screeds, and not forming structurally a part of the floor slab; also the weight of the planking in the upper floor, together with ⅞-in. maple top floor, which all together reach a much higher total figure than might be supposed by anyone who has not gone into the engineering side of the matter.

If 6 or 8 in. concrete slabs were sufficient to support the load of any given floor, provided it was of concrete, a slab thicker than this would really be required when it was to be covered with a top flooring of wood, and the accompanying screeds and tar concrete necessary in this other type of construction. This, of course, adds to the expense and to the time required for putting in the floor, because the concrete should be thoroughly dried before anything is done with the wood floor above it. Ample time must be given to dry the slab out thoroughly before the kiln dried stock is put in place, else the floor will swell, curl and make trouble.

Guarding Against Dry Rot

If, when the slab is still damp, waterproof paper is laid between the under flooring and the top flooring, it is almost certain to cause dry rot in the under flooring and the screeds and make trouble later on.

In accordance with the suggestions made in some of the letters that I have received, it seems as though a very desirable floor can be made by using a concrete base, afterward covered with a thin layer of pitch or tar concrete, in which screeds are set and carefully leveled up, then filled between with soft concrete leveled off flush with the top of the screeds; on this put at least 2-in., or, better still, 3-in. plank running crosswise with the building and covered finally with ⅞-in. square edge boards, preferably tongued and grooved at the ends for the finished flooring. This gives the advantage of concrete so far as the foundation is concerned; it gives the waterproofing and preservative qualities of the pitch and tar concrete, and the advantages of wooden top floors which, while costing a little more in the beginning, will probably, in 90 cases out of 100, be found more satisfactory in the end.

With reference to the relative cost per square foot for different types of flooring, I would say that, owing to the limited time allowed for the paper, I shall not be able to go into this part of the subject, and also for the further reason that these costs would vary considerably in different localities, according to the relative prices of the materials at such points. In a general way it might be said that the finished granolithic floor would cost around 25 to 30 cents per square foot, and a concrete floor with wood top covering, as suggested above, would figure 12 to 14 cents additional.

New Tools and Appliances

This is essentially a news department for which information is invited.

Motor Mount for a Universal Miller.—The Garvin Machine Company, Spring and Varick streets, New York City, is equipping its No. 1½ universal milling machine with a motor mount, which is so designed that it can be attached to a stock machine thus avoiding the expense and delay of covering the motor drive requirements. The motor may be located on the floor beside the machine but preferably on a bracket at the rear, as in this way the entire outfit is self-contained. Although the distance between the two cone pulleys is short, the power of the machine is said not to be deficient on this account. A high-speed narrow belt transmits power from the motor to a two-step overhead cone pulley, which connects through double back gears to the main cone pulley, thus furnishing 16 speed changes, eight of which are obtained by gears and doubled by the steps of the pulley. Both the overhead cone pulleys run on a stationary shaft stud, which is keyed to eccentrics, one of which operates the belt tightener through a segment worm gear controlled by a crank. One of the special features of this belt tightener is that no locks are necessary to retain the tension and the ease with which the belt is tightened tends toward high productive capacity.

Large Adjustable Reamer.—The Lapointe Machine Tool Company, Hudson, Mass., has recently made an adjustable cylinder reamer, which is probably one of the largest ever manufactured. It is made with high-speed blades and a body of machinery steel which has a 4½-in. hole, with a ¾-in. keyway for convenience in fastening to the arbor. The over-all diameter of the tool is 10 in. and its weight 92 lb. The steel from which the body was made in the rough weighed 152 lb.

New Tool Holders.—The Ready Tool Company, Bridgeport, Conn., announces through its sales manager, Gorham C. Parker, that a number of special tools, including a roughing tool, an internal threading tool and a boring bar, are being developed in the experimental department of the company and it is expected will be perfected by the first of the year. Like the other tools manufactured by this company, the holders will be of standard size and section, while steel cutters of special designs are inserted in the holder and held fast. One of the special features of the entire line of tools is the fact that they work up to the stock much closer than those of the older type, which results in a considerably lessened amount of waste material.

A Universal Grinder.—The Modern Tool Company, Erie, Pa., is building a new type of universal grinder in the design of which special care has been given to rigidity. With this end in view the frame is made nearly as long as the ways themselves, which have practically no overhang and are consequently evenly supported throughout their entire length. The headstock and footstock, together with the wheel mountings are also exceptionally heavy and rigidity is a salient feature not only of every part of the grinder itself, but also of the fixtures and attachments. Aside from the rigid construction, the method of clamping the headstock and the footstock to the swivel table is also worthy of mention. In the arrangement used a large positive edge is obtained located out of the way of grit and water. By loosening the head and footstock gibs when it is necessary to relocate them on the table all wear on either the edge or the gibs themselves is prevented and it is claimed that this edge will remain perfectly straight throughout the life of the grinder without rescraping.

Inside Micrometer Caliper.—A set of two inside micrometer calipers is being manufactured by the Emerson Apparatus Company, 251 Causway street, Boston, Mass. The smaller of the tools has two screws and a range from ½ to 1 in., while the larger one measures from 1 to 2 in. The micrometer is graduated to give measurements di-

rectly in thousandths of an inch, and by estimating the operator can obtain measurements to a quarter of these divisions. The measuring screw is held in the body of the instrument and is advanced by a graduated nut, every revolution of the nut moving the screw 0.025 in. A pin is provided for locking the measuring screw after the adjustment has been made. All the parts of this micrometer are hardened except the measuring screw.

A Geared Feed Upright Drill.—The Sibley Machine Tool Company, South Bend, Ind., is equipping its entire line of drill presses above 20-in. swing with a positive geared feed. The power is taken from the top shaft through spur gears and is transmitted by spiral gears to the vertical feed shaft. The case in which these gears run is partly filled with oil, which insures thorough lubrication. The feed box is located on the head and is of the sliding key type, giving four changes and a neutral position, the changes being controlled by a small knob in the center of the hand wheel. An automatic stop collar on the sleeve of the spindle throws the latch which holds the feed worm in mesh with the bronze gear and the entire mechanism swings out of operation.

Grinding Machine for Hobs.—The Meisselbach-Catucci Mfg. Company, Newark, N. J., is building a new type of hob grinding machine, the important points of which are that the teeth are radially ground and water is abundantly supplied to prevent the burning of the edges of the cutter being ground. The face of the emery wheel can be set radially with the work quickly and its face is ground perfectly true by a simple fixture holding a diamond tool. Reliance is not placed upon the teeth of the cutter being ground for the spacing required in grinding them, but the work is independently redivided by a large index plate on the wheel, thus correcting inequalities caused by hardening or uneven wear. While primarily designed for grinding straight fluted hobs for cutting gears of the smaller pitches, an attachment for grinding spirally fluted hobs can be supplied, and gear cutters, forming cutters, screw machine round forming cutters, taps and similar tools can also be ground. The maximum diameter handled by the machine is 5¾ in.

Band Sawing Machine for Patternmakers.—P. Prybil, 512 West Forty-first street, New York City, is building a patternmakers' band saw capable of taking blades up to 2 in. wide. The frame is cast in one piece. The cast iron table tilts to raise the inner edge to any angle not exceeding 45 degrees and to lower it to a maximum of 5 degrees. The throat through which the saw passes is a disk that is easily removed when the wooden lining requires renewing. The wheels are of cast iron with rubber faces which are vulcanized in place, and the lower one is extra heavy and serves as a flywheel. The mechanism is entirely inclosed on the working side of the machine and the slack side of the saw runs in a cast iron channel, which protects the operator and prevents the saw from being thrown off the wheels if accidently struck.

A New Four-Head Drilling and Turning Machine.—A new type of four-head drilling and turning machine is being built by the Garvin Machine Company, Spring and Varick streets, New York City. The class of work for which this machine was especially designed is four-position pieces, but by using an index fixture pieces having 8, 12 or more positions can be drilled and turned. The box tool used with three or more tools is screwed on the end of the spindle and will turn one or more diameters, giving them a highly burnished finish and accurately cut shoulders. To eliminate trouble from chips the lubricating oil is fed under pressure through the spindles, while to confine the oil and chips a balanced hood is employed which can be readily lifted to permit the putting in and taking out of work. The extreme distance between the ends of the spindles is 16 in., with a travel of 6 in. for each head, which makes the minimum distance between the spindles 4 in. This construction permits holes 6 in. deep to be drilled with each head, and also the finish turning of work 3 in. on each end of pieces whose over all dimension is 10 in.

Gear Hobber.—The Barber-Colman Company, Rockford, Ill., has designed a gear hobbing machine for use in manufacturing work for cutting spur and spiral gears where rapidity and accuracy are required. The idea has been to produce a machine embodying the features which have made the ordinary rotary cutter type satisfactory. Long bearings insure continued accuracy of alignment of the work arbor with the hub slide and furnish means for adjusting for wear. The hub is horizontal, with long narrow taper gibbed guiding ways, and can be easily adjusted or swiveled to the correct angle, while lateral adjustment is also furnished. Special facilities for taking care of the chips are provided, and the lubricant is contained in a tank cast integral with the bed. The drive is of the direct single speed belt type, so that it is possible to belt directly from the main line shaft or from a motor as may be desired, while the speed changes are obtained through transposing gears. The feed is positive and any desired rate may be secured through change gears. The feed of the hob slide is automatically tripped at any point of its travel, and the single set of change gears governing the number of teeth and pitch of the spiral to be cut are located at the rear end of the machine.

Stoping Drill.—The Sullivan Machinery Company, 150 Michigan avenue, Chicago, Ill., has placed on the market a new type of stoping drill which is known as the DA-21 improved air feed drill. This drill is of the hammer type and the drill is rotated by hand, while an air piston strikes 1200 or more blows per minute on the end of the bit. The special advantages claimed for this particular type of drill are its light weight, the ease and rapidity with which it may be set up and handled, its high drilling speed and economy of power, labor and maintenance. These drills are said to cut from 25 to 50 per cent. faster than a reciprocating drill, and 8-ft. holes large enough to take 1-in. powder can be easily cut. The automatic air feed consists of a cylinder and a tightly fitting piston with a rod of the same length as the cylinder. The tool rests upon the point of this piston rod, and when air is admitted to the cylinder the pressure on the piston raises the machine up and feeds it automatically as the bit drills into the rock.

Saw Sharpening Machine.—The Hunter Saw & Machine Company, Pittsburgh, Pa., is building a type of saw sharpener in which the emery wheel arbor is supported on both sides of the pulley by adjustable bearings. The ram is square set, so that a vertical lines passes through the two vertical corners and the center and is held in place by an adjustable cap with liners, while a hand lever controls its movement. The arbor is adjusted approximately by hand on a vertical square shaft and the adjustment is completed by a screw and hand wheel. Automatic indexing is another feature of the tool. This machine will bevel the cutting points of milling saw teeth, as well as gumming, facing and topping them.

A New Type of Counter.—W. N. Durant Company, Milwaukee, Wis., has made an improvement in its standard model B counter. This change consists of a large thumb nut at the left end of the case, a single turn of which instantly brings all the figures to zero. The figures of these counters are large and prominent and the digit wheels are fully geared. The working parts are few in number and the counter is inclosed in a small neat case. A special type of driving ratchet enabling a very short stroke is used and is said to render skipping or jumping absolutely impossible even at high speed. Several styles of counters are made with this improvement, including types with rotating shaft, star wheel and lineal measuring wheel.

The Follansbee Brothers Company, Electrical Sheet Business.—Following the completion of large extensions and the installation of additional equipment in its sheet mills at Follansbee, W. Va., the Follansbee Brothers Company, Pittsburgh, Pa., is now in position to give its electrical sheet business much better attention. Owing to the fact that its output was disposed of in other special qualities of steel sheets, the company has hitherto been compelled to decline attractive orders for Follansbee improved electrical steel sheets. It now assures its customers of prompt deliveries of such sheets in large or small quantities.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square ..... ₱ ₶ 1.90¢
1½ to 4 in. x ⅜ to 1 in. ..... ₱ ₶ 2.10¢
1½ to 4 in. x ½ to 3-16 ..... ₱ ₶ 2.10¢
Rods—⅜ and 11-16 round and square ..... ₱ ₶ 2.10¢

Angles:

3 in. x ¼ in. and larger ..... 1.85 ₱ ₶
3 in. x 5-16 in. and thicker ..... 2.00¢
3 in. x 5-16 in. and thicker ..... 2.00¢
1½ to 2½ in. x ¼ in. ..... 2.00¢
1½ to 2¼ in. x 3-16 in. and thicker ..... 2.10¢
1 to 1¼ in. x 3-16 in. ..... 2.20¢
1 to 1¼ in. x ¼ in. ..... 2.30¢
⅝ x ⅝ in. ..... 2.40¢
⅜ x ¼ in. ..... 2.50¢
⅝ x ¼ in. ..... 3.55¢
½ x ⅛ in. ..... 4.35¢

Tees:

1 in. ..... 2.65¢
1¼ in. ..... 2.45¢
1½ to 2 x ¼ in. ..... 2.45¢
1½ to 2½ x 3-16 in. ..... 2.35¢
3 in. and larger ..... 2.15¢

Beams ..... 2.40¢
Channels, 3 in. and larger ..... 2.40¢
Bands—1 to 6 x 3-16 to No. 8 ..... 2.30¢
"Burden's Best" Iron, base price ..... 3.15¢
Burden's "H. B. & S." Iron, base price ..... 2.95¢
Norway Bars ..... 5.00¢

Merchant Steel from Store—

	per ₶
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C R Soft Steel	R G Cleaned.
	₱ ₶ 2.35	2.85¢
No. 16	₱ ₶ 2.40	2.90¢
Nos. 18 to 20	₱ ₶ 2.75¢	3.00¢
Nos. 22 and 24	₱ ₶ 2.80¢	3.10¢
No. 26	₱ ₶ 2.95¢	3.30¢
No. 28		

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₱ ₶ 12 @14½
Patent Planished, W. Dewees Wood's A, 10¢; B, 9¢ net

Galvanized.

Nos. 12 and 14 ..... ₱ ₶ 2.95¢
Nos. 22 to 24 ..... ₱ ₶ 3.20¢
No. 26 ..... ₱ ₶ 3.50¢
No. 28 ..... ₱ ₶ 3.80¢
No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ..... ₱ ₶ 5.75¢
No. 26 ..... ₱ ₶ 6.25¢
No. 28 ..... ₱ ₶ 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₱ 100 sq. ft. $3.85	4.80
No. 26	₱ 100 sq. ft. 2.9⁰	3.90
No. 28	₱ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IC, 14 x 20 ..... $6.35
IX, 14 x 20 ..... 7.60
A. Charcoal:
IC, 14 x 20 ..... $5.40
IX, 14 x 20 ..... 6.50

American Coke Plates—Bessemer—

IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating $8.50
IX, 20 x 28 with an 8 lb. coating 10.50

Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 ..... 19½¢ ₱ ₶

High Brass Rods—

List August 1, 1908 ..... 14½¢ ₱ ₶

Roll and Sheet Brass

List August 1, 1908 ..... 14½¢ ₱ ₶

Brass Wire—

List August 1, 1908 ..... 14½¢ ₱ ₶

Copper Wire—

Base Price ..... Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) ₱ ₶ 18¢
Sheet Copper Cold Rolled, 1½¢ ₱ ₶ advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, ₱ ₶ square foot.
Sheet Copper Polished over 20 in. wide, 2¢ ₱ square foot.
Planished Copper, 1½¢ square foot more than Polished

METALS—

Tin—

Straits Pig ..... ₱ ₶ 39 @39¼¢

Copper—

Lake Ingot ..... ₱ ₶ 14¾@15 ¢
Electrolytic ..... ₱ ₶ 14½@14¾¢
Casting ..... ₱ ₶ 14¼@14½¢

Spelter—

Western ..... ₱ ₶ 6¼@6⅝¢

Zinc.

No. 9, base, casks ..... ₱ ₶ 8¼¢ Open ..... ₱ ₶ 8¾¢

Lead.

American Pig ..... ₱ ₶ 5 @5¼¢
Bar ..... ₱ ₶ 6⅜@6½¢

Solder.

½ x ½, guaranteed ..... ₱ ₶ 22½@23 ¢
No. 1 ..... ₱ ₶ 20½@21 ¢
Refined ..... ₱ ₶ 18½@18¾¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₱ ₶ @10¢
Hallett ..... @10¢
Other Brands ..... @9½¢

Bismuth—

Per ₶ ..... $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
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Copper, Light and Bottoms	₱ ₶ 9.75@10.00
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Heavy Machine Composition	₱ ₶ 9.75@10.00
Clean Brass Turnings	₱ ₶ 7.25@ 7.50
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THE IRON AGE

Established 1855 | New York, November 24, 1910 | Vol. 86: No. 21

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

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Output Still Declining

Rail Specifications Under Discussion

Pig Iron Markets Quieter—Heavy Inquiry for Coke

Current developments in the iron trade are of small importance and little change is looked for in the remainder of the year. In pig iron production there is a slight falling off, but even so stocks are still increasing. The United States Steel Corporation has made a further reduction in active blast furnace capacity to prevent holiday accumulations.

In addition to rail orders already announced, the Lackawanna recently bought 9400 tons for new work, the order being divided between two mills. Its requirements for replacements have not yet been made up. The Lehigh Valley has placed 3400 tons, but its total purchases for 1911 are expected to be 20,000 tons. The Pennsylvania and New York Central orders, which together are put at 240,000 tons, are delayed by changes in specifications which have already had consideration at a meeting of rail company presidents. The total of pending rail business is about 400,000 tons.

Some of the railroads are figuring on bridge work, but car orders are coming out slowly. Chicago finds some indications of a more liberal buying policy by railroad car and repair shops.

The leading fabricating interest has five months' work ahead, and there are some good prospects in structural lines. One item is the practical certainty of early action on the New York Subway work. For the post-office at the Pennsylvania terminal bids will be opened next week for 6200 tons. A Pittsburgh company has taken 1700 tons for a ferry house at Cortlandt street, New York. The shaping of a new building code is holding up 20,000 tons of steel work represented in Chicago building projects.

Much has been made in the press of recent changes in prices on plain material from the warehouses of the leading interest. These apply to a relatively unimportant tonnage and readjust store prices to the reductions made earlier in the year on mill shipments.

Wrought pipe mills have been occupied largely on replacement orders for dealers' stocks. Line pipe inquiry has fallen off, but there is good prospect of the revival of the Busch-Everett Syndicate's plans for a gas pipe line from Louisiana to St. Louis, which would take about 450 miles of 20-in. pipe.

Bar mills are still receiving good specifications on agricultural contracts, and prices on steel bars are firm. Two companies which largely depend on this trade are operating an exceptionally high percentage of their capacity.

A change has been made in the method of quoting

on billets and sheet bars in the Pittsburgh district, and hereafter these prices will be f.o.b. Pittsburgh, with full freight added. The practice has long been for the mills to absorb a portion of the freight on these shipments.

Pig iron markets are quieter, though some fair sales have been made at Chicago, in which Southern furnaces have shared to a greater extent than for some time. The Southern situation is weaker, yet the principal producers there hold aloof, their $11.50 basis being below the competitive basis fixed by sales of Northern iron.

Steel making iron is firm. Bessemer iron is maintained at $15 by Valley furnaces, with several good inquiries pending, and $13.50 is minimum for basic, while $13.75 is asked for delivery over the first quarter of next year.

An effort is being made at Pittsburgh to establish a central selling agency for leading independent producers of coke. Of late, under the pressure of the large output, sales have been made below the cost of production. A number of blast furnace companies are in the market for the first half of 1911. One contract for a two years' supply was made by a Wheeling district consumer, on a sliding scale basis, settlements to be made at one-eighth the monthly average prices of basic iron.

Lake Superior ore stocks on Lake Erie docks at the close of navigation will be the greatest on record, due to the curtailment of blast furnace operations. Estimates put the December 1 total at 10,000,000 tons, as against 8,865,000 tons on the same date last year.

The Relation of Fixed to Liquid Capital

Those who hold that the readjustment of values and credits in the United States which seemed likely to follow closely the panic of 1907, but did not, is now under way, will find something closely related to their thinking on this subject in the presidential address of A. Barton Hepburn at the Chamber of Commerce dinner in New York last week. The predictions made by bankers in 1906 and 1907 of the consequences to be expected from a great conversion of liquid capital into fixed forms may not be forgotten. Mr. Hepburn, at all events, revives them in referring to the demand upon the banks resulting from the conversion of real into personal property. In many cases, he points out, the hope in incorporating or combining real property "is to sell the resulting stocks and bonds to the general public at prices which anticipate all accretion in values for many years to come." The effect upon banking operations is described thus:

> Many real estate properties heretofore financed by loans from mortgage companies, savings banks and insurance companies or individuals, by this transition to corporations, have brought into existence a new class of securities very large in volume. Naturally they seek a market in our money centers and this makes a demand upon commercial banks. This demand added to the requirements of current business has subjected the personal wealth of the country to a severe strain—a strain not upon our currency, but upon our mobile capital. Until this transition process somewhat abates a very strong demand upon personal capital must continue to exist.

President Hepburn's views bring this response from a thoughtful financial article in the *Evening Sun* of November 19:

> The upshot of most competent thinking on the situation denoted by banking statistics is that a large portion of the loan account of the banking institutions of the country as a whole has apparently become fixed in its character, that there is a well defined trend in bank loans to increase this fixed or abiding portion, and that banking resources, summed up under the general head of loans, are far from as liquid as they should be. What this means, if it means anything in the light of such utterances as those already quoted, is that the banks of the country have become to an undesirable extent partners and investors in the country's industrial enterprise instead of lenders to it. If this is the situation denoted by a loan account, which in the last decade has shown contractibility only in the most highly speculative quarters of its extension, by the heaping up of loans on occasionally falling reserves and by the discrepancies which appear in the changes in loan and deposit items, it is one which is more rather than less likely to be discussed gravely and in all seriousness in the times which are ahead.

The extent to which liquidation is yet to be expected, in credit and commodities, and in security and labor values, is a question of the highest importance. It goes deeper than railroad rates, the legality of consolidations, the proper level of the tariff and other issues that are popularly regarded as holding the making or the marring of our prosperity.

Stimulating Workmen's Ambitions

Some of the articles on conditions of labor, which appear from time to time in popular publications, exert an unwholesome influence upon the workman, in that he is made to believe himself to be regarded merely as a machine of no account to the owner beyond immediate results as a producer. If he succeeds in bettering his condition, according to this preaching, it is in spite of, rather than with the help of, the employer. The articles are usually well meant, but they are likely to do great harm in the impression which they may create, tending to widen any breach which may exist between capital and labor. In an article published recently in one of the most widely read of the weekly periodicals appears this paragraph:

> Full of blood, hope and curiosity, the young mechanic tackles his first job—say, in a boring mill. In two weeks or less he finds that any information about the use of the part he is making is curtly refused by the foreman, or as curtly given in a monosyllable; while the men around him, on similar work, don't know and don't care. A year or two of such conditions will either drive him into other employment or settle him doggedly into the regular routine groove.

Further on in the article is this astonishing statement:

> The superintendent of a manufacturing plant of over 800 hands states that, during the past two years, he has been obliged to replace five foremen by reason of deaths and resignations; and in each case he has gone outside and found his man.
>
> "It is possible," he said, "that there are men here in the shops capable enough, but I've never seen any evidence of it. And we can't take any chances. We have to hunt up foremen somewhere who've shown what they can do."

As to the assertion that a young mechanic is discouraged at every turn in his efforts after information, the foreman in most modern establishments who would refuse an answer to questions would have short shrift when the practice was discovered. The whole theory of present manufacturing management is to stimulate the workman's endeavor to ascend the industrial ladder. Owners realize very well that in the rank and file of their working forces exists a great latent brain force which it is very profitable to develop. A great many useful, sometimes very valuable, suggestions come from those who work at a machine or bench. Material for higher positions must be found, in preparation for vacancies to come. One essential of a superintendent or foreman is his ability to locate the good in his men and to bring it out. The surly "boss"

is known as a poor investment. Many concerns go to much expense and trouble to provide special ways of increasing the knowledge and efficiency of their men. Even money rewards for ideas are given. Premium systems are increasing in number, with this as one of the most useful purposes. The apprentice system is a part of the same effort, and manufacturers are co-operating enthusiastically in the various forms of trade schools.

The young machinist would do well to leave the shop where he is treated as stated in the paragraph above quoted. Probably he would have a hard time in finding a repetition of such conditions. In small establishments the owners themselves make it a practice to keep sharp watch for indications of exceptional ability among their employees. In larger works the division superintendents and their foremen are expected to exercise the function. Most foremen and many superintendents have had their initial training in the plants where they perform their administrative duties. Drafting rooms are recruited with young mechanics, whose ability as designers has been brought out by a paternal interest. While the trend of the day is toward specialization of labor, at the same time it is toward the advancement of a workman, where he is found to possess more than average ability. A great many men, constituting the large majority, will get into ruts, and nothing that any one can do for them will change them, but the man who stays in a rut does so in spite of the efforts of intelligent employers.

The statement that in a works employing 800 men the superintendent had no knowledge of his people, to the extent of finding one of them of sufficient ability to warrant promotion, indicates plainly that something was wrong with his system, a wrong that did not exist, apparently, in the plants from which he hired five foremen. He should have been in closer touch with his men, either directly or through his foremen. It is not too much to state that never has it been so well realized by employers that it is well worth while, from every point of view, to cultivate the ability of the workman, and that the movement promises to become more intensified as time goes on. The need of efficient men requires it.

Iron and Steel Stocks and Consumption

Lest the accumulation of pig iron stocks at the merchant blast furnaces of the country be given undue importance, it has been pointed out that statistics on this subject need interpretation. It has been said with truth that besides the figures representing pig iron in furnace yards it is necessary to know whether consumers have little or much pig iron in their yards. Twelve months have brought a complete reversal of the situation as to stocks, both in pig iron and in finished materials. A year ago the process of restocking was going on. Foundries, machine shops—all the metal working industries—were building up stocks that for two years or more had been allowed to run down. The same was true of jobbers and of dealers, large and small, in all iron and steel lines. It became well established early in 1910 that this rebuilding of stocks was making the remarkable demand upon blast furnaces and rolling mills, and that the country had not come so soon after the depression of 1908 to a consumption of more than 30,000,000 tons of pig iron in one year.

From what is known in a general way of the scale of operations in industries consuming iron and steel—that work the product of the rolling mill or the blast furnace into other forms—there has been no such shrinkage in the past 10 months as is represented by an annual rate of 31,600,000 tons in the pig iron production of February and of a little more than 24,000,000 tons in that of to-day. In the early months of the year the restocking movement culminated. To-day the consumer of pig iron buys sparingly and lets the furnace carry the stocks; the user of rolled steel, judging that prices will not advance and may recede, limits his purchases and lets his supply on hand run as low as prudence allows, and often lower. The volume of unfilled orders in the hands of manufacturers is meanwhile steadily cut down, and there is as much exaggeration of the actual decrease in consumption as 11 or 12 months ago there was exaggeration of the actual increase.

It is no easy matter, with such a reversal of conditions in so short a period, to determine the real consumption of iron and steel for the year. Pig iron production may be estimated at somewhat under 27,300,000 tons, or about 1,500,000 tons more than in 1907 and 1909, when the totals were 25,781,361 tons and 25,795,471 tons, respectively. Exports have been considerably more than in 1909, and stocks at furnaces are much larger than at the beginning of the year. However, with the offset of stock depletion by consumers, it appears that in spite of limited railroad demand, 1910 will establish a noteworthy record in the home consumption of iron and steel.

Shortening the Working Day

One of the most important matters brought to the attention of the National Founders' Association at its convention held in Chicago last week was the persistency of efforts to curtail the working day. This movement manifests itself in various directions. In his report to the convention President Briggs alluded to the condition of affairs on the Pacific slope where the Iron Molders' Union and the Machinists' Union have been successful in forcing an agreement with employers in San Francisco for an eight-hour day. As our readers have been previously informed, this movement for a shorter day began in 1907, when an agreement was made with employers of molders and machinists that the working hours in San Francisco were to be reduced 15 minutes every six months until the eight-hour day was reached, which was in June of this year. A condition was attached to this agreement, however, whereby the unions promised to have in effect at the same time the eight-hour day both north and south of San Francisco. Although aggressive efforts were made by them in enforcing strikes in both foundries and machine shops in other places on the Pacific Coast, the employers resisted so stubbornly that the unions have not been successful. Their failure, however, instead of resulting in the San Francisco unions retiring from their stand for an eight-hour day in that city, appears merely to have made those unions more determined in their position, with the result that an eight-hour day now appears to be a fixed regulation there unless the employers shall eventually decide to precipitate a struggle for the settlement of this question on a different line. It would seem that the Pacific Coast had been selected as good fighting ground by the unions for the establishment of a general shorter working day. Their

officers have declared that as soon as an eight-hour day was established on the Coast, as contemplated, they would then enforce it on this side of the Rocky Mountains.

Other developments in the establishment of a shorter working day have been the incorporation in certain legislation at Washington the provision that on Government work the eight-hour day shall be in effect, and the announcement as made by President Briggs that demands have been made by the Iron Molders' Union upon the Stove Founders' National Defense Association that the hours of molding in stove shops shall be reduced from seven to six. The goal of the Iron Molders' Union has been eight hours with ten hours' pay, with the expectation that if eight hours are reached the next step would be to make the day seven hours and then six hours.

In view of these conditions the action taken by the National Founders' Association is noteworthy. A resolution was adopted, as set forth in the proceedings of the convention printed elsewhere in this issue, stating that the association is opposed to any reduction in the hours of working below those now established, because it is believed that such reduction would be harmful to both manufacturer and consumer. It is pointed out that the movement of labor unions for a shorter workday, restriction of output and higher wage is directly responsible for higher cost of production and consequently higher cost of living.

Possibly no class of consumers in this country is more vehement in complaining of the high cost of living than wage earners. They blame everybody and everything for the advance in the cost of living but themselves. The workmen in the building trades in large cities complain of high rents, while at the same time, by the enforcement of short hours and the exaction of exorbitant wages, they have so increased the cost of building that owners are compelled to name higher rents for the purpose of getting anything like a satisfactory return on their investment in buildings. The movement travels in a circle, one set of wage earners demanding higher wages because the price of necessaries produced by another set of workmen has been advanced to a pinching point.

It would certainly appear as if the movement for a shorter workday should be opposed vigorously by all classes of manufacturers as an economic proposition. The working day as now established in many occupations is sufficiently short from a humanitarian and sociological standpoint. The hours are not the same in all occupations, and it is perhaps impossible and assuredly impracticable to try to make them uniform. The movement for a still shorter workday will not only further increase the cost of living, but will put this country more and more at a disadvantage in competition with manufacturers in other countries. The interrelation of industries throughout the world is now such that international competition must henceforth be seriously considered.

Correspondence

Typewriter Spacing

To the Editor: I note that at page 1110 you are asked by the W. J. Clark Company if you can influence typewriter manufacturers to arrange for a spacing between lines equal to one and one-half times the space of the present narrowest spacing. Permit me to say that the Remington typewriter can be arranged to give such spacing when required. FRED J. MILLER.

280 BROADWAY, NEW YORK, November 17, 1910.

L. R. Wister & Co. in Financial Difficulty.—Creditors filed a petition in the United States District Court at Philadelphia, November 19, asking that L. & R. Wister & Co., Rodman Wister, Jones Wister and J. N. M. Shimer, co-partners, iron merchants, 672 Bullitt Building, Philadelphia, Pa., be adjudged involuntary bankrupts. The act of bankruptcy alleged is allowing judgment to be entered on claims upon which execution has been issued. The petitioning creditors are the Farmers' National Bank, Ephrata, Pa.; Harrisburg (Pa.) National Bank, and the Southwark National Bank of this city. Counsel for the creditors in this case also ask that the Dunbar Furnace Company, Dunbar, Pa., in which L. & R. Wister & Co. are involved, and for which concern a receiver was recently appointed, be also adjudged an involuntary bankrupt. Both L. & R. Wister & Co. and W. C. Harris, receiver for the Dunbar Furnace Company, will present statements to the court at an early date.

Tables of Lake Iron Ore Values.—Announcement is made by F. M. Catlin, sales agent, St. Paul, Minn., that a book will be published soon after the fixing of prices for lake ores for 1911, with the title, "Hurd's Tables of Iron Ore Values of the Lake Superior District." It will contain schedules of ore values at Lake Erie for every per cent. and fraction, of every grade of ore from 40 per cent. to 61 per cent.; general statistical data of the Lake Superior region from 1855 and for each iron range for every year; shipments, rail and lake freights, ore and pig iron prices; geological and mineralogical description; the iron ore reserves of the United States, and the iron ore valuation and method of the Minnesota Tax Commission. The author is Rukard Hurd, C. E., secretary of the Minnesota Tax Commission.

The National Metal Trades Association's Annual Meeting.—The Administrative Council of the National Metals Trades Association has issued a call fixing the time and place of holding the next annual convention of that association. It will be held during the week of April 14, 1911, at the Hotel Astor in New York City. J. H. Schwacke, president of the association, has called a meeting of the Executive Committee to be held at the Hotel Astor December 6.

The Kroenert Smelting & Refining Company, 6620-6626 Kelly street, East End, Pittsburgh, Pa., manufacturer and dealer in metals, has recently increased its capital from $14,000 to $20,000, to give it additional working funds to carry on a larger business. The company operates a new plant, having melting furnaces and other equipment for the refining of metals, such as solder, babbitt, pig tin and lead, type metal, &c., and is operating day and night. It recently established a Western sales office in Chicago. G. A. Kroenert is secretary and treasurer of the company, and has personal charge of its general sales.

The National Association of Brass Manufacturers will hold its annual meeting at the Hotel Astor, New York, December 13 and 14. Questions of modern methods of production and trade policies will be taken up for discussion, and officers will be elected for the ensuing year.

The Colorado Fuel & Iron Company

Annual Report for the Year Ending June 30, 1910

The Colorado Fuel & Iron Company has issued its complete report for the fiscal year ending June 30, 1910. Following is the income account:

Gross earnings from operation	$23,639,813.08	
Operation and management	19,897,197.93	
Net earnings from operation	$3,742,615.15	
Add:		
Income from securities	499,079.84	
Interest and exchange	127,839.65	
		$4,369,534.64
Deduct:		
Bond interest	$2,097,682.50	
Taxes	218,764.64	
		2,316,457.14
Surplus over fixed charges		$2,053,077.50
Less:		
Provision for sinking funds, etc.	$171,457.56	
Insurance, &c.	154,908.11	
Equipment renewal	164,945.44	
Traffic contract guaranty	36,000.00	
Prospecting	18,947.51	
		546,258.62
Surplus for fiscal year, to credit of profit and loss		$1,506,818.88

The balance sheet, as of June 30, is as follows:

Assets.

Iron ore, coal, limestone and other lands		$57,650,115.00
Equipment at steel plant, coal mines, coke ovens, &c.		28,082,010.53
Railroads		5,854,000.49
Cooperage plant		34,037.65
Timber lands, franchises, buildings, &c.		36,184.41
Store buildings, lots and equipment		389,628.45
Inventories—Supplies and manufactured stocks		4,033,465.51
Accounts receivable		3,111,117.07
Cash on hand		2,683,951.00
Bills receivable		84,784.05
Securities—Stocks and bonds		238,958.90
Cash held by trustees		16,549.41
Reserve funds		99,840.77
Accrued interest on securities		6,077.34
Payment of royalties in advance		37,720.38
Total assets		$102,358,240.96

Liabilities.

Capital stock of Colorado Fuel & Iron Company:		
Common stock	$34,235,500.00	
Preferred stock	2,000,000.00	
		$36,235,500.00
Funded debt:		
Colorado Fuel & Iron Company general mortgage 5 per cent. bonds	$5,515,000.00	
Colorado Fuel & Iron Company 5 per cent. 10-year convertible debentures	993,000.00	
Colorado Fuel Company general mortgage 6 per cent. bonds	363,000.00	
Colorado Industrial Company 5 per cent. bonds	33,848,000.00	
Rocky Mountain Coal & Iron Company first mortgage 5 per cent. bonds	554,000.00	
Grand River Coal & Coke Company first mortgage 6 per cent. bonds	877,000.00	
Pueblo Realty Trust Company 6 per cent. mortgage bonds	575,000.00	
		42,725,000.00
Accounts payable, payrolls, &c.		1,908,629.24
Accrued bond interest, not due		862,746.68
Accrued taxes, not due		113,500.00
Total liabilities		$81,845,375.92
Excess of assets over liabilities		20,512,865.04
		$102,358,240.96

The production of the company's mines, furnaces and mills was as follows, in tons of 2000 lb.:

	Year ended June 30, '10.	Increase.
Iron ore mined	879,630	298,846
Limestone quarried	407,517	43,542
Pig iron produced	385,602	90,068
Coal mined:		
For making coke	1,566,549	
At company plants	636,883	
Commercial sales	2,519,900	
	4,722,832	628,481
Coke manufactured	905,599	260,055
Finished iron and steel	412,749	52,956

In his accompanying comments President J. F. Welborn says that the gross earnings from operation showed an increase over the last previous year of 16 per cent.; operating expenses, an increase of 14 per cent.; net earnings from operation, an increase of 29 per cent.; net income from all sources, an increase of 34 per cent.

"After providing for all fixed charges, sinking funds, &c., there remains a surplus of $1,506,818.88 carried to the credit of profit and loss. The debit balance in profit and loss account June 30, 1909, was $467,505.30, the lowest it had been since June 30, 1905, when it was $1,877,402.95. The surplus for the past year takes care of this balance, as well as various small charges to profit and loss, and leaves a credit balance in the account amounting to $983,554.09.

"The demand for coal was fully up to our capacity during practically all of the year, but operations at the coal mines were so retarded by shortage of railroad cars during the fall and winter months as to cause a loss in output of close to 200,000 tons; yet the total coal production for the year was 4,722,832 tons, being 628,481 tons, or 15 per cent. greater than the previous year. Of this 3,100,000 tons, or 65 per cent. were sold as coal and in the form of coke, and the remainder used in the operation of steel works and other plants.

"The physical condition of the plants has been well maintained and in many respects improved during the year, yet the increasing demand for open hearth steel will make necessary some enlargement of the open hearth department in the near future. The surplus from the past year's operations will enable us to proceed with these additional improvements without borrowing money, and business conditions warrant this increased equipment.

"Business for the current year promises well and earnings in the first quarter just closed compare favorably with corresponding period last year. Operations since August 1, however, have been interfered with by shortage of railroad cars to an extent unusual at this season of the year, the loss in coal production during August and September from that cause having been in excess of 100,000 tons."

It is announced that when the Grand Trunk track elevation work now in progress in Montreal is completed, the use of steam locomotives in the company's intra-city lines will be discontinued and electrically driven engines will take their places. Additional capital for the terminal and electrification purposes will, it is said, be provided for by legislation to be obtained in the present session of the Canadian Parliament. The plant which the Canadian Light & Power Company is erecting at St. Timothy, Montreal, is owned by interests close to the Grand Trunk directorate. This plant, which will produce 100,000 hp., is expected to be ready for operation by the time the Grand Trunk has completed its track elevation and other terminal arrangements in Montreal.

The Kelker Blower & Forge Company, 533 Elk street, Buffalo, N. Y., which is having plans prepared for a new factory building at Westcott and Milton streets and the Pennsylvania Railroad, will require considerable equipment for the new plant in the line of shears and riveting machinery, also electric motors.

The Linde Air Products Company, Cecil Lightfoot, general manager, Chandler and Manton streets, Buffalo, N. Y., is having plans prepared for a branch factory to be built at Newark, N. J., to be 130 x 130 ft., two stories, brick and steel construction.

The Thomas Iron Company has blown out one of its Saucon furnaces at Hellertown, Pa.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov.23, 1910.	Nov.16, 1910.	Oct.26, 1910.	Nov.24, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	*$15.50*	$15.75	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	*14.75*	14.75	15.00	18.75
Basic, Valley furnace	**13.50**	13.25	13.00	17.25
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	*13.90*	14.15	14.15	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*23.00*	23.50	23.50	27.50
Forging billets, Pittsburgh	*28.50*	28.50	29.00	31.00
Open hearth billets, Philadelphia	*25.50*	25.50	26.00	30.60
Wire rods, Pittsburgh	*28.00*	28.00	28.50	33.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	*13.50*	13.50	13.75	18.00
Iron rails, Chicago	16.00	16.00	16.00	19.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	*13.50*	13.50	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.50*	13.50	13.75	18.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.37*	1.37	1.40	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.60
Common iron bars, Pittsburgh	*1.40*	1.45	1.45	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	*1.25*	1.25	1.30	1.55
Skelp, sheared steel, Pittsburgh	*1.30*	1.35	1.40	1.60
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.60*	1.60	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	13.00	12.87½	14.00
Electrolytic copper, New York	**12.87½**	12.87½	12.80	13.75
Spelter, New York	**5.95**	5.95	5.60	6.40
Spelter, St. Louis	**5.80**	5.80	5.45	6.25
Lead, New York	**4.50**	4.40	4.40	4.40
Lead, St. Louis	**4.40**	4.30	4.27½	4.27½
Tin, New York	**36.90**	36.50	36.15	31.30
Antimony, Hallett, New York	7.75	7.75	7.75	8.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ½-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

Butt Weld,	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld,				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	59	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld } Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.

2, 2½ to 4 in.... Lap Weld }

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 23, 1910.—(*By Telegraph.*)

Pig Iron.—Several large lots have been sold. The American Steel Foundries has bought 10,000 tons of basic for its Alliance, Ohio, plant and local consumers have bought 3000 to 3500 tons of gray forge for first half at $13, Valley furnace, or $13.90, Pittsburgh. A sale of 1200 tons of standard Bessemer for first quarter is reported at $15 at furnace. Several large lots of Bessemer are under negotiation and may be closed within a week. Although there is more pressure by furnacemen and dealers to sell iron, prices are strong, especially basic, which is now held at $13.50 minimum at Valley furnace. We quote for delivery in first half of next year as follows: Standard Bessemer, $15; malleable Bessemer, $13.75 to $14; gray forge, $13; basic, $13.50 to $13.75, and No. 2 foundry, $14, all at Valley furnace, the freight to Pittsburgh being 90c. a ton.

Steel.—Reports that an inquiry is in the market for 40,000 tons of sheet bars for first half of next year cannot be confirmed and are believed to be untrue. However, there is some inquiry for billets and sheet and tin bars for first quarter. The steel mills now quote entirely on an f.o.b. basis, Pittsburgh, with freight to destination added. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., at $23, base, and sheet and tin bars in 30 ft. lengths $24.50, f.o.b. Pittsburgh, full freight to destination added.

(*By Mail.*)

Reports from several of the leading steel companies indicate that specifications against contracts so far this month have been about equal to, or slightly in excess of, the same period last month. While the feeling for the future is optimistic, it must be admitted that general conditions in the iron trade are quieter now than they were two weeks ago, and the material swell expected in volume of business after the election has not materialized. Not much betterment is looked for until after the turn of the year, as we are now close to inventory period and as little material as possible will be taken in by consumers until January. There is more pressure by furnaces and dealers to sell pig iron, but so far there has been no easing off in prices. Bessemer pig iron continues firm, at $15, at Valley furnace, for first half, while basic has advanced squarely to $13.50, at furnace, some sellers declining to accept this price for deliveries running through first half. A change has been made in the method of quoting billets, and sheet and tin bars and now all quotations are made f.o.b. Pittsburgh, full freight to destination added. Under the old method of quoting prices the mills absorbed part of the freight. Some of the leading coke operators are working on a project to establish a central selling agency, and endeavor to raise prices, which have been badly demoralized for some months. A meeting of those interested was to be held in this city November 25, but it has been postponed until a later date.

The scrap trade is quiet, and probably will remain so until after the turn of the year.

Ferromanganese.—The low prices ruling on ferromanganese are attractive to buyers. A large consumer in the Mahoning Valley has bought 1500 to 2000 tons for first half on the basis of about $38.50, Baltimore, and another consumer in the Shenango Valley has closed for about 1500 tons for first half at about the same price. We quote foreign 80 per cent. for first half delivery at $38.50 to $38.75, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—There is practically no new demand, consumers being well covered. We quote 50 per cent. for delivery over the first six months of next year at $55 to $55.50, and for prompt delivery at $56 to $56.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—A sale of about 1200 tons of sheared steel skelp is reported on the basis of about 1.35c., Pittsburgh. Most consumers who buy in the open market are pretty well covered for the next two to three months. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—The market is very quiet, the new demand being only for small lots. Specifications against contracts are not coming in at a satisfactory rate, a good deal of tonnage being held up. We quote Bessemer rods at $28 to $28.50 and open hearth and chain rods at about $28.50, Pittsburgh.

Muck Bar.—We do not hear of any new demand, consumers being pretty well covered for some time ahead. Local makes of best grades of muck bar, made from all pig iron, are held at about $30, delivered, buyer's mill, Pittsburgh, while Eastern muck bar is being offered here at $29 or less, delivered.

Steel Rails.—A number of small contracts for standard sections have been closed, but the expected large orders from the leading railroad systems have not yet developed. New demand and specifications against contracts for light rails have fallen off, actual sales made by the Carnegie Steel Company last week having been much the smallest for some time. This company reports a sale of 800 steel railroad ties to a leading road. Quotations on light rails are now as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb. 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—While the new demand is fair, no large jobs involving heavy tonnages are in the market. No important contracts for steel cars have been placed, and expected inquiries from leading roads that have been talked about a good deal lately have not developed. Specifications against contracts so far this month have been running about the same as in October. We quote ¼ in. and heavier plates in the wider sizes at 1.40c., Pittsburgh, but on the narrow sizes two or three mills are naming 1.35c., Pittsburgh, on attractive orders.

Structural Material.—Inquiries have been much better in the last week or ten days, a number of leading railroads figuring on bridge work that will require a very heavy tonnage. The McClintic-Marshall Construction Company has taken 1700 tons for a ferry house for the Pennsylvania Railroad at Cortland street, New York. Bids have gone in on 4000 tons of steel for the East Cambridge, Mass., extension of the Boston Elevated Railway Company, and bids will go in December 1 for 6600 tons for the New York City Post Office. The Riter-Conley Mfg. Company has taken a steel building, about 1500 tons, instead of 800 tons as reported last week, for the Oil Well Supply Company. We continue to quote beams and channels up to 15-in. at 1.40c., f.o.b. Pittsburgh.

Sheets.—There is a fair amount of new inquiry for both black and galvanized sheets for delivery in first quarter, and the mills are reported as having more actual tonnage on their books at present than at any time for several months. Prices are being well maintained, with the exception of several points of delivery on which concessions of not over $1 a ton are somtimes made. The market on sheets is on the basis of 2.20c. for No. 28 one pass black sheets and 3.20c. for No. 28 galvanized. The full schedule of prices in effect on black and galvanized and on roofing sheets is given on a previous page.

Tin Plate.—The improvement in demand for tin plate, noted in this report last week, has continued, and the leading interest has been obliged to start a number of hot tin mills that were closed down several weeks ago. Some heavy contracts for bright plate have been closed, deliveries run-

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ning into first quarter and in some cases through first half of next year. Specifications against contracts are coming in at a fairly satisfactory rate, but are not as heavy as some time ago. Prices are reported as firm, and we continue to quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—Several of the leading steel bar mills state that specifications against contracts so far this month show a slight increase over the same period in October. There is a fair amount of new demand, but mostly for small lots to cover current needs. Prices are firm, 1.40c. on steel bars being absolute minimum. The new demand for iron bars is light and specifications against contracts are not satisfactory. We quote steel bars at 1.40c. and common iron bars at 1.40c. to 1.45c., f.o.b. Pittsburgh.

Hoops and Bands.—Several large consumers of both hoops and bands are reported as having inquiries in the market for their supply for first quarter and first half of next year. Specifications against contracts are coming in at a fairly satisfactory rate, but are not as heavy as they were some time ago. Prices are reported as being well maintained. We quote hoops at 1.50c. in large lots, and 1.55c. in small lots; bands, 1.40c. in carload and larger lots, and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—The season is pretty well over in this product, only a few small orders coming in, and specifications have been pretty well cleaned up. The price of cotton ties for November shipment is 77½c. per bundle.

Spikes.—Some new inquiry is in the market for fair sized lots of railroad spikes from two of the Western roads, and it is believed that considerable business will be closed up between now and January 1, for delivery in first quarter and first half of next year. The new demand for small railroad and boat spikes is light, and is only for small lots to cover actual needs. We understand that some low figures are being made on railroad spikes for delivery in Western territory. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—A meeting of rivet manufacturers was held in New York last week, at which regular prices of 1.90c. for structural and 2c. for boiler rivets were reaffirmed. We are advised these prices are being rigidly held. The expected better demand for rivets has come, more business now being placed than for some time.

Spelter.—The high prices ruling for some time are still being maintained. On Monday, a sale of 100 tons was made at 5.90c., East St. Louis, equal to 6.02½c., Pittsburgh.

Merchant Steel.—One prominent mill reports that its specifications against contracts so far this month have been slightly in excess of the same period in October. The general new demand, however, is quiet and is confined to small lots to cover actual needs. There does not seem to be any desire among consumers to contract. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base, under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—Specifications against contracts are coming in at a little better rate, but the new demand is still confined to small lots to cover actual needs. The automobile makers are taking in more shafting at present than they have for some time, but the implement trade is not specifying very freely. It is stated that regular discounts are being fairly well maintained, and are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—The new demand for wire nails and other wire products is only fair, being confined to small lots to cover actual needs. Neither distributers nor consumers of wire products seem disposed to contract ahead, but are content to place such orders as they actually need for current requirements, or to maintain a complete assortment of stocks. It is now the off season in the wire trade, but a better demand for both wire nails and wire is expected soon after January 1. The demand from the South usually opens up in the latter part of December, and some heavy contracts from this section are looked for in the near future. The favorable weather has allowed the farmers to go ahead with fence building later than usual this year, and shipments of fence wire by the mills have been fairly heavy. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—No large inquiries for line pipe for gas or oil lines are in the market, but the project of the Busch-Everett syndicate to pipe gas from Shreveport, La., to St. Louis is again active; while this contract may not be placed for some months, it is in such shape that it may come out at any time. A party of bankers went over the ground recently with a view of financing the project. This job, if it goes through, will take about 450 miles of 20-in. pipe. The general demand for merchant pipe is fair, but is now showing a falling off, December, January and February usually being the dull months in the year in the pipe trade. Regular discounts on both iron and steel pipe are reported as being well maintained.

Boiler Tubes.—Some nice contracts have been recently placed by the railroads for charcoal iron tubes, deliveries running through first quarter. For merchant tubes the demand is light. Prices on both iron and steel boiler tubes have been somewhat demoralized for some months and do not show signs of early strengthening.

Iron and Steel Scrap.—Not much new business is being placed by consumers. The end of the year is approaching when the mills take inventory and close up the year's business, and naturally they will take in as little material as possible. The new demand for heavy steel scrap, cast iron borings, turnings and low phosphorus melting stock is fairly active, but the other grades are very dull. We note sales of 2500 to 3000 tons of borings on the basis of about $8.25 per gross ton, f.o.b. cars Pittsburgh; about 2000 tons of turnings at $9; 500 tons of heavy steel scrap at $14.50 delivered, and upward of 3000 tons of low phosphorus melting stock, running 0.04 or under in phosphorus, on the basis of $17.25 per gross ton, f.o.b. cars Pittsburgh. Dealers quote about as follows, per gross tons, f.o.b. cars Pittsburgh or elsewhere as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.00 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.25 to 16.50
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.25 to 17.50
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.75 to 14.00
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turning	8.75 to 9.00
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	11.50 to 11.75
Heavy steel axle turnings	10.25 to 10.50

Coke.—The item of interest in the coke trade just now is the effort of a number of the leading independent producers of coke to form a Central Selling Agency. This has been under way for some time, and has been figured out to have operators controlling about 8,000 ovens sell their coke to one buyer at say $2.25 per net ton at oven, this buyer in turn to sell the coke to consumers. A meeting to complete this project was called originally to be held in this city, November 25, but has been postponed until a later date, as some of the details have not been arranged. At present the coke trade is in very unsatisfactory condition, there being a large overproduction, and a good deal of coke is being sold at lower prices than it can be made. There is some heavy inquiry in the market for furnace coke for next year, and within a week or two several large contracts will likely be closed. A local coke producing interest recently closed with a large consumer of coke in the Wheeling district, covering his entire supply for two years from January 1, on a sliding scale, based on the price of basic iron, or in other words the consumer of the coke pays for it on the basis of eight tons of coke for a ton of basic iron. A Mahoning Valley consumer is also in the market for a large tonnage of furnace coke for delivery over first half, and this will also likely be closed on a sliding scale, based on the price of basic iron. An Eastern consumer of blast furnace coke is also figuring on his supply for first half. There is a fair amount of inquiry for foundry coke. Prices on both furnace and foundry coke, especially for prompt delivery, are running very low. We quote standard makes of furnace coke for prompt shipment at $1.45 to $1.50 per net ton at oven, while for delivery over first half of next year $1.70 to $1.75 is being quoted. Standard makes of 72-hour foundry coke are about $2 per net ton at oven for prompt shipment, while for first half quotations run all the way from $2.10 to $2.50. The output in the Upper and Lower Connellsville regions last week was 327,860 net tons, a falling off over the previous week of nearly 13,000 tons.

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W. S. Boyd, formerly purchasing agent for the Page Woven Wire Fence Company, at Adrian, Mich., and Monessen, Pa., and later assistant purchasing agent of the Pittsburgh Steel Company, is now connected with the Ohio Iron & Metal Company, iron and steel scrap, Farmers' Bank Building, Pittsburgh, his title being assistant district manager. H. D. Stalnaker is district manager of the Ohio Iron & Metal Company.

Chicago

FISHER BUILDING, November 23, 1910.—(*By Telegraph.*)

There is an improvement in the general demand for steel which is indicated by the large number of orders for small lots from store. The railroads are relaxing to a slight degree their restrictions on current purchases. A few weeks ago their orders for bar iron were limited to 100 tons for prompt shipment, but inquiries have come out from railroads the past week for several lots of 500 to 1000 tons each. While this is a small item in general trade conditions, it indicates that the situation is improving. Activity in structural contracts have been confined to the Pacific Coast for several weeks, but in the near West a large amount of business is pending. In Chicago plans for several large buildings which will require 25,000 tons of steel are held up awaiting action by the City Council on a new building code. Important developments may also be expected in railroad projects in the near future. The railroads are slow in coming forward with inquiries for steel cars, and may not come into the market until severe weather increases the car shortage to a degree that will force action. While new buying is light, prices are firm on bars, structural shapes and plates. There is sharp competition for sheet business, with a fair amount of new orders. Specifications for wire products are falling off somewhat, after an active fall season. The scrap market maintains about the same level of values that has prevailed for three or four months. There are large stocks which must pass into the hands of consumers before the dealers can obtain higher prices. Consumers of copper and other metals are buying only for prompt shipment.

Pig Iron.—Buyers have been taking more interest the past week in Southern iron for first quarter and first half delivery, and a fair tonnage has been sold by the furnaces. A local manufacturer has bought 4500 tons, principally Southern. An electrical interest has purchased 1000 tons of high silicon Southern and several implement manufacturers have purchased lots of 1000 to 2000 tons for first half. A considerable amount of iron has been sold in lots of less than 1000 tons. An unusual amount of business has been done in Southern iron running 3 per cent. and upward in silicon, on which prices are weak and the usual differentials are not maintained. Special prices are also made on round lots of silvery iron. There are not so many inquiries for Northern iron for first half as there were a week or two ago, and the larger buyers seem to have reverted to some extent to the plan of purchasing smaller lots for prompt shipment as they have done the past six months. The furnaces seem to favor this policy, as they figure that the market cannot go lower, while a large demand, which would raise prices, is still a possibility. There are several inquiries for round lots of malleable Bessemer pending for first half delivery, which have not been closed. The market for charcoal iron is quiet, but the furnace interests decided recently not to authorize any reduction. The most favorable indication in the Northern market is that prices in the valleys are reported firmer. A local buyer who had an option on 5000 tons of basic from a Valley furnace at $13 recently attempted to secure an additionay 2500 tons at the same price, but could not do better than $13.25. The following quotations are for November and December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—The Chicago market is quoted at $28, base, for current lots of forging billets, but concessions are necessary on any attractive tonnage. One lot of 500 tons was sold recently at $27.

Rails and Track Supplies.—The large Western railroad systems have not yet appeared in the market with their rail specifications for 1911. Small orders which were taken last week by the leading interest in this market amounted to about 4000 tons. Quotations for light rails are revised as below to correspond with the new plan of quoting rails by the pound. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—Plans for several large buildings in Chicago, which will require over 20,000 tons of steel, are awaiting action by the City Council on the new building code. Among other projects the Brooks Estate will erect a large office building, leases for several floors having already been signed. A large building for the Otis Estate, a large theatre, and several other buildings are included in the prospective work. Contracts closed in the West last week amount to a little over 4000 tons. The American Bridge Company booked 250 tons for a railroad bridge for the Duluth, Mesaba & Northern at Duluth, over the St. Louis River, and 366 tons for the Union avenue bridge at Pueblo, Colo. The Northwest Steel Company of Portland, which has the contract for the Corbett Building in that city, has ordered 900 tons of steel columns from the American Bridge Company and will use 1000 tons of Carnegie beams. A contract for a club house for the Native Sons of the Golden West at San Francisco, 750 tons, has been let to the Pacific Rolling Mill Company, Bethlehem shapes specified. The general contract has been let to an Eastern interest for a plant for the Servier County Sugar Company in Colorado, 800 tons. A city engine house at Milwaukee, 100 tons, was let to the Milwaukee Structural Steel Company. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The Chicago mills of the leading interest received good specifications last week, amounting to about 4000 tons, for car material. A good part of this order was for passenger equipment, including material for 100 sleeping cars. The steel men in this market have no definite advices regarding car orders from Western roads. The market for plates, however, has firmed up considerably in the past month. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The demand for open hearth sheets continues on a fairly good basis. Although the Inland mill is not crowded, the volume of current specifications is considered satisfactory in view of the backward conditions that have been reported for some time in other finished materials. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are; No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Orders from the railroads for bar iron are not so far between as they were some time ago. This is giving the rolling mills a little more tonnage and is helping out a weak spot in the market. Conditions are quiet in soft steel bars, but prices are firm on new business. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Cold weather is having its effect on specifications for several staple lines of wire products, especially barb wire, field fence and fence wire. Specifications from manufacturing consumers are keeping up at a good rate and some contract business has been taken for delivery through the first half. Prices have been announced on poultry netting for spring trade on a basis somewhat lower than the prices of a year ago, but about on a level with the prices which actually prevailed last spring. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Manufacturers continue to specify for normal quantities of steel. While automobile buying is light, the implement manufacturers at Moline and other Western cities have begun to run 12 hours a day for the winter, and the mills will be kept busy during the coming winter in supplying agricultural specialties to this trade.

Cast Iron Pipe.—The market is now between seasons and only an occasional small letting it taken by the foundries outside of routine mail orders. It is expected that several

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Northern cities will be in the market next month for round lots of water pipe for winter shipment. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The hesitation that has appeared the past week in the market for finished materials is also apparent in the scrap market. Railroad buying of equipment and supplies has not reached the volume that is necessary to stimulate the purchase of scrap by mills or foundries. Dealers are carrying large stocks and also have a good deal of scrap in transit and their instinct enables them to locate a customer without waiting for him to appear in the market with an inquiry. There was a little activity last week in railroad malleable scrap but it has quieted down. Eastern steel mills have bought a considerable tonnage of borings in Chicago recently and this is the only item in the list that shows any tendency to advance. The open hearth steel mills have been steady buyers all fall and this has maintained the value of several other grades that were formerly not in much demand for steel mills. With magnets it is easy to handle small scrap which used to be classed as No. 2 wrought, and this has kept the market for wrought scrap on a higher basis than the demand of the rolling mills would have justified. Couplers and other special grades of steel which bring a premium when the steel foundries are active have been held steady by the demand from open hearth mills. Steel car wheels are beginning to come back from the railroads and are sold at a discount of $1.50 to $2 under heavy melting steel, as they cannot be broken and can only be used in an open hearth furnace with a large door, being classed with heavy castings and steel tired wheels. The moods of the sensitive scrap trade seem to reflect the uncertainty in the financial world, since the results of the election have been weighed and found somewhat in excess of what was anticipated. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., November 22, 1910.

The situation is being closely watched by both consumers and producers, who are awaiting developments before coming into the market or further curtailing production. Transactions in crude materials have been smaller. Pig iron prices are irregular and some foundry grades have been sold at a concession from recent quotations. More interest is shown in steel making irons, particularly low phosphorus grades, which have been sold for extended delivery. The Eastern Pig Iron Association, which held its regular monthly meeting last week, reports the situation as practically unchanged; orders declined very slightly, while a small increase in stocks was noted, but not sufficient to affect market conditions. In finished materials the absence of any active demand continues, although a better volume of business is expected. Rail orders have been few, but car and locomotive builders are reported to be figuring on a greater amount of prospective work. A better inquiry for plain shapes, against orders for fabricated work, is reported, but the demand for heavy steel plates still drags. Steel billets are quiet. More inquiry for soft steel bars is noted, but the demand for refined iron bars still drags. Old material continues dull. There has been little movement in coke; in foundry grades prices are a trifle lower, while consumers and producers appear to be apart on ideas of furnace coke prices for next year's delivery.

Iron Ore.—The market is absolutely at a standstill. Importations at this port during the week ending November 19 aggregated 12,640 tons, valued at $48,508.

Pig Iron.—With the larger transactions in foundry iron, which have had the attention of the trade for some weeks, now practically closed, the market has become quieter, with new business confined principally to small and moderate lots on which deliveries range from near future to first quarter of next year. The largest transaction reported was for 3000 tons of No. 2 X foundry, for first quarter, at a price slightly below last week's quotations. Recent sales have brought to light a wider range of prices for foundry grades, but the tendency has been downward rather than upward. Individual conditions have much to do with quotations and, while some sellers are still unwilling to take business at less than $15.75 delivered for No. 2 X foundry, prompt or forward shipments, other makers of standard eastern Pennsylvania brands are willing to accept $15.50 delivered, if the business is of a desirable nature, and sales very close to that figure have been made for first quarter delivery, while in instances sales of less well known brands are reported at prices slightly under that price. Moderate sales are, however, still reported by some sellers at $16 delivered for No. 2 X. The cast iron pipe foundries continue in the market for low grade iron; one inquiry for 6000 tons for early 1911 delivery has come out, but no important sales have been announced. The Virginia foundry iron situation is rather complex, and there appears to be little uniformity as to prices. Quite a few moderate lot sales for first quarter shipment have been made to buyers in this territory at $13 furnace, for either No. 2 X or No. 2 plain grades, while in other instances $13.25 furnace has been done, and in the case of one or two sellers concessions from the $13 basis have been reported. Individual conditions at the different furnaces play an important part in quotations, and in the case of one of the low priced sellers it is understood that the low prices have been brought about by a cleaning up process, prior to blowing out. No movement in Southern iron is reported in this territory, which at the present price is above that of Northern brands. Forge iron is in moderate demand; rolling mills are inquiring for quantities ranging from a few hundred up to 1000 tons, but appear in no haste to close. Greater interest is being shown in the steelmaking grades, low phosphorus being the most active; one sale of 6000 tons of standard analysis iron, for extended delivery, is reported at $22.50, while negotiations are pending for several large blocks on which the delivery in instances extends throughout the next year. Small lots of off low phosphorus have also been sold for first quarter at prices slightly under those prevailing for standard analysis. Inquiry for basic iron is still before the trade, one melter, who has been in the market for several weeks, not yet having closed. One sale is reported covering 2500 tons for November-December shipment, at $15 delivered, although some sellers would no doubt be willing to accept the recent $14.75 quotation for this year's delivery, while for strictly first-quarter shipment makers' ideas are closer to $15.25. The following range of prices about represents the market for standard brands, delivered in buyers' yards in this vicinity, shipment ranging from near future to first quarter of next year:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.25
Virginia, No. 2 plain	15.80 to 16.05
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—Business in this territory is still very light, no fresh inquiries of importance having developed. Some sellers maintain quotations for 80 per cent. ferro at $39, Baltimore, but this figure could no doubt be shaded.

Billets.—The market continues along narrow lines, orders seldom exceeding a few hundred tons, mostly for early delivery. While melters are feeling around for prices for deliveries extending into next year producers show little interest in such business. For ordinary prompt lots basic open hearth rolling billets are quoted at $25.50 to $26, delivered in this vicinity, dependent on the quantity involved. Forging billets are firm at $28, f.o.b. Eastern mill, the usual extras for high carbons and special sizes being added.

Plates.—While there has been no betterment in the immediate demand, the outlook for a larger volume of business is considered favorable. Considerable locomotive and car work is being figured on, some of which is expected to develop into business before the year end. Current orders are, as a rule, small and cover only immediate requirements of consumers, the aggregate volume of business coming to the Eastern mills showing no material gain. Prices are being well maintained, the minimum quotation for carload lots being 1.55c., delivered in this vicinity.

Structural Material.—A better demand for plain shapes is reported, inquiries coming out in connection with esti-

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mates for various classes of work. There have been no developments in building work. The McCaull Company, which has the general contract for an eight-story building in Savannah, Ga., has let the contract for the steel work, some 1100 tons, to Milliken Brothers. Cramp & Co., who have the contract for the Union League addition in this city, have, it is understood, awarded the contract for the steel work, 900 tons, to the Phœnix Bridge Company. There is a fair demand for miscellaneous material and prices are well maintained at 1.55c. to 1.60c., delivered, for plain shapes, according to specifications.

Sheets.—Quite a fair volume of business has been taken by producers, and consumers are more disposed to place orders to cover them beyond the usual year end suspensions of operations at the mills. There is also some feeling around for prices for even more extended delivery, but no definite inquiry has come out. Mills now have a very fair volume of orders on their books and prices are well maintained, the following range being named by Eastern makers for prompt shipments: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—While there has been a somewhat better demand for soft steel bars, refined iron bars have scarcely been so active. For the latter class of material inquiries are small and mills are anxious for orders, and while the open quotations for refined iron bars are still about 1.37c. to 1.42c., delivered in this vicinity, they can be shaded for desirable specifications. Steel bars are comparatively firm, at 1.55c., delivered in this district.

Coke.—There has been little change in the situation. Some inquiry is pending for furnace coke for first half, but prospective buyers and sellers are somewhat apart on prices, with quotations ranging from $1.65 to $1.85 per net ton at oven. Foundry coke has been quieter, with prices tending downward, sales of moderate tonnages, delivery over the next four months, being made at $2 at oven, although other sellers hold as high as $2.35. The following range of prices, per net ton, about represents the market for delivery in this territory:

Connellsville furnace coke	$1.85 to $1.95
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.50 to 3.90
Foundry coke	3.85 to 4.05

Old Material.—Very little movement is to be noted in any grade, both consumers and sellers awaiting further developments. Melters still take on odd lots of steel when they can get the material at bargain prices. Merchants pay $13.50 for small lots of No. 1 heavy melting steel, to apply on old contracts, but melters do not appear interested unless they can pick up this grade at about $13, delivered. There is no demand for rolling mill grades, buyers scarcely showing interest, even in bargain lots. In the majority of grades not enough business has been done to establish market quotations. An interesting arrival at this port during the week was a cargo of 1000 tons of steel scrap from the Pacific Coast, assigned to one of the local merchants. This was largely rails, trolley and railroad steel scrap. The following range about represents sellers' ideas of the market, delivered in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to 1.35c. per gross ton, although buyers would probably not purchase at those figures, unless in need of material:

No. 1 steel scrap and crops	$13.50 to $13.75
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 19.00
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50
Old iron rails	18.00 to 18.50*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.50 to 12.00
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cincinnati

CINCINNATI, OHIO, November 23, 1910.—(*By Telegraph.*)

Pig Iron.—Some complaint is made that the market lacks snap. Fewer inquiries are being received. Neither are prices so firm as they were two weeks ago, this applying especially to Southern iron, it being rumored that some furnaces will now take on business running through the first quarter, on the basis of $11, Birmingham. This only applies to a few interests, $11.50 for shipment through the first half being the regular quoted price. At this figure a St. Louis firm contracted for 700 tons and two Indiana consumers booked 300 and 500 tons, respectively, of No. 2 foundry. For the same delivery an Indiana melter bought 1100 tons at $11, on the basis of No. 3 foundry analysis. Northern foundry is still quoted at $14 to $14.50, Ironton, for the first half, and several furnaces are soliciting business at the first named figure. A local manufacturer is inquiring for 500 tons of different grades of foundry iron for first quarter shipment and a central Ohio company is expected to close for about 2000 tons of Southern foundry within the next few days. Other inquiries being worked on are principally for small lots of 100 to 300 tons and customers appear very indifferent about placing orders. Malleable continues firm at $14.25 to $14.50, Ironton district. Local agencies are not discouraged over the present dullness, but state that lately business has been moving in waves and that the next few days may develop a comparatively active buying movement. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, No. 1, 8 per cent	19.50
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Continued dullness characterizes the local market. Some foundry coke, for spot shipment, is being sold, and a few contracts have been made with consumers who were not supplied longer than thropgh December. Furnace coke is only moving fairly well on contracts, but no new business has been closed during the past week. Spot furnace coke is quoted around $1.55, per net ton, at oven in the Pocahontas, Connellsville and Wise County fields, and contract prices are $1.65 to $1.85. Some good brands of foundry coke are obtainable in all three fields around $2, but the contract price remains about $2.25, per net ton, at oven.

Finished Iron and Steel.—This is one line in which there has been some improvement in this section lately. Structural material is moving better, and hoops and bands are in much better demand. The quotable mill price on hoops is 1.50c. and on steel bars and bands 1.40c. The warehouse price on steel bars is 1.80c. and on iron bars 1.70c. to 1.75c. Beams and channels, cut to lengths, are sold around 1.90c. warehouse.

Old Material.—No new developments are reported, and business continues very dull from both a buyer's and seller's standpoint. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

An error was made in stating in a recent issue that the Eagle Furnace Company, Attalla, Ala., had blown out its blast furnace. The company advises that it has no intention of shutting down at the present time.

Birmingham

BIRMINGHAM, ALA., November 21, 1910.

Pig Iron.—The tonnage placed during the past week has been fairly attractive in the aggregate, although but a small proportion of the inquiries received resulted in sales. The difference in opinion of buyers and sellers as to the price for deliveries after January 1 is as pronounced as at the time of last report, and order book requirements for such delivery have increased but little. As a matter of fact, the transactions recorded have in practically all cases covered only such tonnage as was actually required by the melters, without any indication of speculative purposes. Evidence is seen of a disposition among the leading interests to buy heavily for next year if material concessions could be had from current quotations, a number of offers for round tonnages having been refused. It is understood that a round tonnage for prompt shipment has been accepted by a large producer at a lower price than $11, Birmingham, represents, but in that particular case it is quite probable that a slight freight advantage accounted for the concession. The price of $11, Birmingham, for No. 2 foundry is

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considered the market for shipments to cover the remainder of this year, with an additional 50c. per ton being asked by all producers for strictly first half shipments. In one or more cases it is believed that a price of $11.25 could be made to apply to shipments during December and through March, yet no such quotation has been made and no sales have been reported at such figures. The asking price of all interests for grades below No. 3 foundry is decidedly firmer than for some weeks, with gray forge and No. 4 foundry generally quoted at the same price. Offers of $9.50, Birmingham, for white iron have been refused, and forge has readily brought $10, with mottled quoted at $9.75. The aggregate of such grades as just mentioned now on furnace yards is very small and inquiries involving some 1250 tons are pending. The demand for charcoal iron continues fairly strong, and an additional 500 tons of such iron will probably be placed early in this week.

Cast Iron Pipe.—It is understood that the water pipe requirements for the city of Denison, Texas, was awarded the United States Cast Iron Pipe & Foundry Company to be furnished from one of its Southern plants, but the price has not been made public. The orders recently placed aggregate but a small tonnage comparatively, and prices received are understood to be about in line with the prices received during last week. With the exception of several lots of 100 to 250 tons to be placed within the next week or 10 days, the principal letting mentioned in recent reports is for 600 tons of gas pipe and 400 tons of water pipe at Portland, Ore. This letting will probably take place within 30 days, although specifications are already in the hands of bidders. We quote water pipe as follows, per net ton, f.o.b. cars here, 4 to 6 in., $21; 8 to 12 in., $20; over 12 in., average, $19, with $1 per ton extra for gas pipe. These quotations are nominal and are not considered as representative of prices obtainable on large municipal contracts.

Old Material.—The sale of several small lots is reported, but prices are very much at variance and the demand is rather desultory. No additions of consequence have yet been made to dealers' stocks, but with the approach of inventory time and the usual clean-up at foundry plants dealers are more interested in that regard than formerly. We quote dealers' asking prices nominally as follows, per gross ton, f.o.b. cars here:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, November 21, 1910.

General business conditions in this city and section are admitted to be excellent, and this is indicated in many ways, notably, for example, in an increase, both here and at Kansas City, of 10 per cent. in the bank clearings last year. week, over those of the corresponding week last year. Building operations and the demand for building material are also larger. In pig iron it would appear that buyers are quite generally ready to place their orders for next year on the basis of the present market for prompt shipment. If holders stand firm for a stiff premium for 1911 iron, it is likely that most buyers will pursue a hand-to-mouth policy. Shipments are moving fairly well, and but few requests are being received to hold them up. The manufacturers of bearing metal report business good and more doing with railroads. Collections in all lines are reported to be satisfactory. Deposits are rising in the leading banks in a marked degree.

Coke.—Most of the leading sellers report a fair degree of activity for small lots, and specifications on contract are being satisfactorily received. The only sale of importance mentioned was 30 cars of Virginia coke, for shipment over the first half. The market is barely steady, and we quote for Connellsville foundry best selection $2.25 to $2.50; wkhile second quality is offered as low as $2 per net ton, f.o.b. oven; prompt shipment and contract rule at the same figures.

Pig Iron.—The improved conditions in the pig iron market, both as respects inquiry and sales, noted the previous week, were still in evidence the past week. Nearly all the leading sales agencies report quite free inquiry, and even allowing a part to come from concerns desiring to keep posted, there is still good indication of many intending buyers, mainly for 1911 iron. A number of the inquiries previously reported are still pending, notably one for 2500 tons. Among the new inquiries are the following: 300 tons Lake Superior charcoal iron, for early shipment; 300 tons Southern basic, shipment over the first half; scattering inquiries for various grades and shipment were received by one house for 600 tons; another broker closed a contract for 1250 tons of Nos. 1 and 2 Southern foundry for shipment over the first half. A third seller's transactions for the week were, in the aggregate, 1500 tons of various kinds and shipment, with an inquiry for 200 tons of low grade iron. A leading seller reports a sale of 7500 tons of Missouri basic for shipment over the first half. Prices continue to show quite a range as regards contract iron. We quote Southern No. 2 foundry for shipment prior to New Year's, $11 Birmingham; for shipment for first quarter and first half the range is from $11.50 to $12, with doubtless some shading of these figures with some furnaces on firm offers for first quarter delivery.

Old Material.—While there was not much improvement the past week in the volume of trade from consumers, there is more inquiry. Relaying rails, light sections, are rather active, and all standard sections are in request. There was but one railroad offering on the market, that of the list of the St. Louis & San Francisco of 560 tons of miscellaneous scrap. Steel scrap is in better request than iron and prices are relatively stronger in consequence. Prices are nominally unchanged and rather weak. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50

The following quotations are per net ton:

Iron fish plates	$11.50 to $12.00
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.75 to 11.25
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad tank and sheet scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.50 to 8.00

Buffalo

BUFFALO, N. Y., November 22, 1910.

Pig Iron.—The stiffening of price schedules by furnaces in this district has been followed by a lull in the placement of orders of any considerable size, and the inquiry has also fallen off as compared with the active demand of the preceding week. Notwithstanding the dropping off in large orders, the week has shown a fairly good run of medium-sized sales, from carload to 500 ton lots, in foundry grades and malleable, with some basic. Shipments on contracts have been heavy. The advance in prices is being steadily maintained by the furnacemen, the determination evidently having been reached to refuse to accept the extremely low and unremunerative prices previously prevailing. The leading pump manufacturing concern has placed orders for a considerable tonnage of foundry grades and has further inquiries pending. There are some indications of increasing inquiry from foundries supplying the railroad trade and from electrical machinery manufacturing interests. Furnaces are busy during the closing days of the month taking in the final ore cargoes of the season. For current quarter and first quarter, 1911 deliveries, we quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No. 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—Good tonnages continue to be specified on contracts in most finished lines; but in new buying both consumers and jobbers are still practicing the hand to mouth method, which has been the policy for some time, with very little buying in excess of immediate requirements, resulting in smaller aggregate placements than had been hoped for by producers and selling agencies. There was some exception in wire and wire nails, in which the new buying has been in larger quantities and prices have firmed up in this line, so that the concessions that were noticeable in the market two weeks ago have disappeared. There has also been some contracting during the week in

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tin plate and tin mill products. While sellers are hopeful for improved buying conditions before the holidays, it is not believed that there will be no general buying movement until after the first of the year. Steel reinforcing bars to the amount of 140 tons will be required for concrete work on the Mount Prospect reservoir at Binghamton, N. Y., by the Sand & Gravel Company, East Liverpool, Ohio, which has the general contract. Export trade to Canada is very good, with several large orders reported of 1000 to 1500 tons each—in bars, plates and shapes. In structural lines considerable new work is in sight. Bids are to be asked for next week for steel for the group of four buildings to be erected by the Buffalo Orphan Asylum, about 600 tons, also for a church at Syracuse, 300 tons, and for bridge work at Oswego. The steel required for the German Deaconess' Home in this city, for which figures are now being taken, will amount to 250 tons instead of 100 tons, as previously reported. The Steel Storage & Elevator Construction Company, Buffalo, has been awarded contract for the lift bridge over the Erie Barge Canal at Franklin street, Syracuse, requiring 125 tons of structural steel and 23,700 lb. of operating machinery, and is now receiving bids for the steel and fabrication. The erection work has been sublet to J. P. Wright, contracting engineer, Buffalo.

Old Material.—The demand has been very limited for most lines, with the exception of wrought scrap, cast scrap and borings, for which there was a fair inquiry at well sustained prices. Shipments on contracts are somewhat lighter. Prices are ruling about the same as last week, except for heavy melting steel, the price for which is a little weaker, due to decreased demand from outside districts. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.25
Locomotive grate bars	10.75 to 11.25
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.75 to 7.00
No. 1 busheling scrap	11.00 to 11.75

Cleveland

CLEVELAND, OHIO, November 22, 1910.

Iron Ore.—The tonnage on Lake Erie docks at the close of lake navigation this year will break all previous records, as a result of the heavy movement during the season and the falling off in the consumption. It is estimated that such stocks December 1 will aggregate over 10,000,000 tons, as compared with 8,865,789 tons on the same date a year ago. Some of the ore firms have stopped shipments and others will be through this week, so that the shipping season is almost closed. Ore buying for next season will probably be delayed until quite late next spring, and a late opening of navigation is expected next year. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—While no large transactions are pending, there is a good volume of inquiry for small lots of foundry iron for first quarter and first half. The largest sale reported is 1,500 tons of No. 2 foundry iron for first half to a central Ohio manufacturer. Of this 1,000 tons was Northern and the remainder Southern. Indications now point to a fairly active buying movement during the next few weeks by the smaller consumers in this territory, but some of the larger consumers, who have not yet covered for their first half requirements, are expected to wait until after the first of the year. Prices remain stationary, and while lower quotations are not looked for there is nothing to indicate a firmer market in the near future. This is having the effect of delaying purchases by some consumers until they can tell better what their first half requirements will be. Sales for the first half are being made mostly on the basis of $14, at furnace, for No. 2 foundry. Some shading of this price is reported for spot shipment and remainder of the year delivery. Among the larger inquiries is one from an Akron furnace manufacturer for 500 tons of No. 2 foundry for the first half. While there are reports of some shading on prices of Southern iron, nearly all producers are holding firmly to $11.50, Birmingham, for No. 2 for the first half. For prompt shipment and December delivery we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.50 to 14.75
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	14.00 to 14.15
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—The market continues very quiet. Furnaces seem in no hurry to contract for their first half requirements, and foundries not under contract are buying spot coke as they need it. We quote standard Connellsville furnace coke at $1.50 to $1.55, per net ton, at oven, for spot shipment, and $1.75 to $1.90 for delivery through the first half. Connellsville 72-hour foundry coke is held at $2 to $2.10 for spot shipment and $2.25 to $2.50 for contracts extending through the first half.

Finished Iron and Steel.—The demand in finished lines continues rather quiet, although some of the mill agencies report a little improvement. Orders are still for small lots of material, but more are coming out for larger tonnages, few, however, being for more than carload lots. Consumers generally are ordering only for their immediate requirements and many are expected to delay ordering for stock until after the first of the year. Some manufacturers, however, who have been out of the market for some time, have about exhausted their stocks and are placing small orders to replenish them. Some of the bolt and nut manufacturers have removed suspensions of shipments on steel bars and are now taking their material in moderate quantities. Agricultural implement makers continue to specify freely. The business outlook has improved among manufacturers of heavy handling machinery and the placing of prospective orders will improve the demand from this source. Prices on steel bars and structural material are firm at 1.40c., Pittsburgh, and the leading plate producers are also adhering firmly to this price. The demand for small lots of structural material continues fairly good. No large work is expected to come out soon, but considerable is in prospect for early next year. The demand for sheets is fairly active. While some mills are holding for firmer prices, concessions of from $1 to $2 a ton are still being made on black and galvanized and $1 a ton on blue annealed. The demand for wrought iron pipe has become quite active and orders for shafting continue good. The demand for reinforcing bars is also still good. There is a good demand for light rails, and some business in small lots of standard sections is pending. The Riverside Bridge Company, Wheeling, W. Va., has taken the contract for the Dunham Road bridge, near Cleveland, requiring 400 tons of structural material. The leading interest will furnish the shapes and plates for a lake passenger boat, for which the American Shipbuilding Company recently secured the contract. About 400 tons of material will be required. The demand for iron bars is light and prices are unchanged, at 1.30c. to 1.35c., at mill.

Old Material.—There has been some activity in borings and turnings during the week. Dealers having orders came into the market to cover, and prices on these grades were advanced about 50 cents a ton. Heavy melting steel is also slightly firmer and is quoted about 25 cents a ton higher than a week ago. While the general condition of the market does not show much change and consumers are limiting their purchases to immediate needs, there is a better feeling among dealers. The only railroad list this week was from the Nickel Plate, which received bids November 21 for a small tonnage. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	13.25 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.25 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

The German Iron Market

Price Cutting on Bars

BERLIN, November 10, 1910.—The market situation remains quiet, but producers are in the main satisfied with the state of business. In some sections of the trade buying has been checked by organization troubles. This is particularly true of the bar market, in which, as can no longer be doubted, price cutting is becoming rather common. Some sections of the trade, too, are affected by the winter quiet, which is now beginning. That the situation in general, however, is still pretty strong is indicated by the movement of prices at last week's trading on the Düsseldorf Exchange. Band iron was quoted at 142.50 to 145 marks against 140 to 145; heavy plates at 122 to 124 marks, against 120 to 124; and light plates at 140 to 145 marks, against 137.50 to

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142.50. All grades of pig iron remained unchanged. An advance of two francs per ton in puddling iron at Longwy, in the north of France, has attracted attention in the German market this week as a hopeful sign. The price situation in Belgium appears also to have grown steadier.

The ore market continues firm. Although the imports of ores in October were unusually heavy—1,266,000 tons, against 524,400 tons in October, 1909—furnace owners still complain of the scarcity of Swedish ores. There is an especially strong demand for the latter, and producers of iron are disposed to place orders for several years where this is possible. Shipments from the north of Spain still feel the disturbing effects of the strikes at Bilbao. There is a heavy demand for fine hematite ores. Foreign hematite of 50 per cent. commands 22 to 22.50 marks delivered on the lower Rhine. High-grade manganese ores from the Mediterranean have been contracted for, reaching to the middle of 1911, at higher prices. Domestic ores are being called for delivery at a satisfactory rate.

Pig Iron Firm, with a Record Breaking Output

The pig iron market is firm, notwithstanding the record breaking production. Germany's make in October reached 1,291,379 metric tons, being about 59,000 tons more than in September, and about 178,000 tons more than in October, 1909. The new Essen Pig Iron Syndicate has not succeeded in selling as much iron for 1911 delivery as had been expected. Many contracts had been placed before the combination was finally effected; and, besides this, not a few consumers are turning to the independent furnaces, which are selling about one mark per ton below the syndicate's prices. This latter fact has led to a considerable increase of activity at the Siegerland furnaces, which are not in the syndicate. Considerable export orders for spiegeleisen and other high-grade iron have also come in. In old material there is some irregularity in prices for some grades; but, in the main, prices are steady, notwithstanding the fact that much is coming upon the market.

In steel billets most consumers have placed their orders for the first quarter of next year, but there is still some supplementary ordering for the current quarter. Export business remains steady; some good orders for 1911 delivery have recently been taken. The active market for muck bars in England creates a demand for German goods there.

The market for commercial bars, as already intimated, has grown quieter. Little new business is offering in view of the price cutting. It is also feared that the existing price convention will break down and leave the market in a more demoralized condition than ever. In the western part of the country a big dealer is offering bars 5 marks below the convention's price; and there is much questioning as to which manufacturer is his backer. The export trade in bars is also unsatisfactory, prices having been badly beaten down by the Belgian mills. A special combination in their export business was made at the beginning of October by the chief exporting mills; but their expectations have thus far not been realized.

In plates of the various grades business is very good; the demand for ship plates begins to look up. The trade in wire rods and wire is very quiet; specifications upon order are coming in slowly, and little new business is doing.

In steel rails the principal business is for export, for which increasing orders at rather better prices have recently been taken. There is a prospect of increased requirements in light rails for minor railroads.

New York

NEW YORK, November 23, 1910.

Pig Iron.—The market is quieter and has developed no decided tendencies in the past week. Sellers in the Buffalo district have taken a firmer stand after selling rather freely for first quarter and first half of 1910, but in other districts the price basis seems little changed. Here and there a buyer is unwilling to meet some of the low prices reported, but in other quarters sales are being made at concessions. Stocks of iron in Eastern Pennsylvania increased about 11,000 tons in the past month, while orders on the books of furnaces are practically the same as at previous report. Some low priced business has been done in New Jersey, and further inquiries from that quarter are up including 1000 tons from a manufacturer of furnace castings and 500 tons from another foundry. The Lackawanna Railroad is in the market for 1500 tons for its foundry at Scranton, Pa. Buying by brake shoe interests is looked for, and the formal inquiry will probably come out this week. One other large buyer is in the market for from 500 to 10,000 tons. Virginia furnaces are still quoting $13 at furnace for No. 2 X, but little is heard in this district or in New England of Alabama or Tennessee irons. We quote as follows at tidewater: Northern No. 2 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—No significant changes have been noted in conditions during the last two or three weeks, but in that time prices have been a trifle firmer than just previously. The Carnegie Steel Company is reported to have made a reduction of about $1 a ton on structural material from store, Waverly, N. J., but this has no bearing on mill prices. The general belief is that business will gradually improve soon after the first of the year, but remain on the present level until then. The steel bar trade is taking little new business, but, of course, looks for little at this season. Specifications on contracts are not up to expectations. Plates are very quiet. Bids on the construction of battleship No. 35 will be opened December 1, and specifications for the steel for both Nos. 34 and 35 are expected shortly. No. 34 will be built in the New York Navy Yard and No. 35 by a private shipyard. In comparison with other lines, bar iron is doing fairly well. One of the leading mills reports a large order for track supplies from one of the railroads. The moderate buying movement by the railroads of bridge material continues and quite a number of small orders have been placed in the past week. The Phœnix Bridge Company took 200 tons for the Boston & Maine; the McClintic-Marshall Construction Company, 160 tons for a small bridge at Laurel, Del., for the Pennsylvania, and 750 tons for track elevation work for the Baltimore & Ohio at Chicago, leaving 650 tons still to be placed; the American Bridge Company, 170 tons for a bridge at Baltimore for the Pennsylvania, and 200 tons for the Duluth, Missabe & Northern. The New York, New Haven & Hartford is in the market for another lot of small bridges, aggregating 200 tons and the Norfolk & Western for 12,000 tons, but it will probably be a month or more before any figures are asked on the latter. Contracts for building material closed include 900 tons for the Corbett Building, Portland, Ore., taken by the American Bridge Company, and 600 tons for the Tennessee Coal, Iron & Railroad Company, taken by Charles Stewart & Co. In the market are the Baltimore Bargain House, to cover an entire block, and probably require eventually several thousand tons, although the first section to be built may take only 1500 to 2000 tons; a school building in San Francisco, about 1500 tons; a City Hall at Sacramento, Cal., 600 to 700 tons; office building and freight shed for the Southern Railroad, at Atlanta, 1000 tons; steel for the custom house and other Government buildings at San Juan, Porto Rico, and a post-office at Carbondale, Pa. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Steel Rails.—The Lackawanna Railroad recently bought 9400 tons of rails for new track, the order being divided between the Lackawanna Steel Company and the Bethlehem Steel Company. The latter company has booked 3400 tons for the Lehigh Valley, but this road has not covered its requirements for 1911 with purchases of 20,000 tons, as has been reported. The Illinois Steel Company has taken scattering orders amounting to 2500 tons and the Carnegie Steel Company has sold 500 tons to the Republic Iron & Steel Company. The Tennessee Company has sold 750 tons of standard sections to Metzger Brothers.

Old Material.—The market is exceedingly quiet. Steel works and rolling mills are not buying to any extent, while the foundries are purchasing cast scrap in small quantities only to meet their immediate requirements. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.00 to $12.50
Old girder and T rails for melting	10.50 to 11.00
Heavy melting steel scrap	10.50 to 11.00
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	6.00 to 6.50
Wrought turnings	6.00 to 6.50
Wrought pipe	9.50 to 10.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	12.00 to 12.50

Ferroalloys.—There are some good inquiries out for ferromanganese, and transactions have been made in this market at $39 seaboard, covering requirements for the first half of next year. Ferrosilicon is in decidedly good demand, and quotations are strengthening. The market is quoted at $56 to $56.50, Pittsburgh.

Cast Iron Pipe.—No important public lettings are at present in sight. More than the usual private buying, however, is in progress for spring delivery. Naturally, these

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buyers include many of those who have the reputation of being the shrewdest in this branch of trade. The market for prompt delivery is still largely in the hands of those who have large stocks of standard sizes, which they are pressing for sale. Carload lots of 6-in. are therefore available at $22 or less per net ton, tidewater.

Metal Market

NEW YORK, November 23, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
		Electro-		New	St.	New	St.
Nov.	Lake.	lytic.	Tin.	York.	Louis.	York.	Louis.
17	13.00	12.87½	36.55	4.40	4.30	5.95	5.80
18	13.00	12.87½	36.40	4.50	4.40	5.95	5.80
19	13.00	12.87½	....	4.50	4.40	5.95	5.80
21	13.00	12.87½	36.90	4.50	4.40	5.95	5.80
22	13.00	12.87½	36.85	4.50	4.40	5.95	5.80
23	13.00	12.87½	36.90	4.50	4.40	5.95	5.80

The market in all metals is strong. Lead has been advanced ten points. Copper is firm, although not in very great demand. The tin market is steady. Spelter continues strong at recently advanced prices.

Copper.—The copper market is firm. A number of heavy buyers, who have been sounding the producers with a view to making purchases of lake copper at something under 13c., were disappointed. In every instance sellers were not interested in any offers at less than 13c. As a matter of fact, the holders of all grades of copper show considerable indifference at this time, evidently expecting a better price. The position of copper at present is stronger than it has been in many weeks. Electrolytic copper cannot be had at less than 12.87½c. The London market closed to-day with spot coffee selling at £57, 12s., 6d., and futures at £58, 11s. 3d. The sales amounted to 100 tons of spot and 500 tons of futures. The market closed steady.

Pig Tin.—The pig tin market is quiet but firm. There has been no tin of any amount moving during the last week, and it appears that buyers are not in urgent need of the metal. The market has been steadier during the last week than at any time in the last three months, and although tin has gone up a little in London in the last two days, holders of stocks here failed to follow the lead of the London market. Stocks are more plentiful and better distributed and altogether the market is less sensitive. In New York this afternoon pig tin was sold for 36.90c. The London market closed with spot tin selling at £167, 15s., and futures at £167, 17s., 6d. The sales amounted to 100 tons of spot and 300 tons of futures. The market closed firm.

Tin Plates.—The tin plate market is quiet and stocks are plentiful. The strike among the sheet metal workers in New York is having an effect on trade here, and orders are being noticeably curtailed. The price of 100 lb. coke plates remains at $3.84.

Lead.—The leading interest advanced the price of lead November 18 to 4.50c., and outside sellers who have been offering the metal at around 4.45c. promptly raised their price also. Coming at this time, the advance is something of a surprise. Five months ago, when lead was in heavy demand, an advance was looked for, but for some reason the principal sellers continued to hold the New York market at 4.40c., and lead was selling here relatively cheaper than in the West. It is said that there have been some good bookings during the last two weeks. The price of lead in New York now is 4.50c., and the market in St. Louis is from 4.40c. to 4.42½c.

Antimony.—There is nothing new in the antimony market. There was some buying a week ago, but things have quieted down again. There is less talk of price cutting, however. Cookson's is quoted at 8.15c.; Hallett's at 7.75c.; Chinese brands, 99 per cent. guaranteed, are 7.40c. to 7.50c., and Hungarian grades are selling at around 7.12½c.

Old Metals.—The market is dull. Dealers' selling prices are continued, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Spelter.—Although there has not been a great deal of buying, prices are being upheld very firmly. Some consumers were frightened into the market during the week by rumors of a further advance, and several are said to have purchased to cover their requirements for the next six months. The call for spelter from the general trade, however, has been very light. Sales were made in New York during the week at 5.95c., and in East St. Louis the price of spelter is around 5.80c.

Metals, Chicago, November 22.—Consumers of copper are buying chiefly for prompt delivery and are not taking so much interest in future shipment as was shown a few weeks ago. Tin has bounded upward again. The leading interest in lead has marked the price up 10 points, but not as a result of any unusual demand, as this is the wrong season of the year for lead to advance. The price of spelter is very firm, but buyers do not seem active in purchasing. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13⅛ c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 37½c.; small lots, 39c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½; per 100 lb. higher; spelter, 5.90c. to 5.95.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 24½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, November 21.—Lead is higher and firm at 4.37½c.; spelter is active and strong at 5.90c., both at East St. Louis. Zinc ore is in demand and firmer, being quoted at $45 per ton, Joplin base. Tin is quoted at 36.70c. per pound; antimony (Cookson's), 8.45c.; lake copper, 13.35c.; electrolytic, 13.22½c., all at St. Louis. For finished metals, the demand the past week was quite good, with continued railroad buying, one company taking four carloads.

Notes on Prices

Rope.—The cordage business is jogging along in the ruts that have been worn by retarded trade. One manufacturer states that this month's trade will be less than the corresponding month of last year. Some years ago there were about three recognized grades of manila fibre. Now there are in the neighborhood of eight grades, which means that there is 12½ per cent. difference between the different qualities. This renders it difficult for any one except an expert to decide which grades are used in making any particular rope under discussion, and equally hard to tell what the rope is actually worth. Coloring manila and sisal fibers to improve their looks and make them appear to be of higher grade than they really are is sometimes indulged in. Because of this and the comparatively small difference between the different grades of fiber, the average buyer has to depend upon reputable manufacturers to be sure that he gets the grade of rope he pays for. Lower quotations on sisal fiber and competition for business have caused a lowering of prices. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure manila of the highest grade, 8¾c. to 9¼c. per pound; second grade manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 5¾c. to 6¼c. per pound; No. 2, 5¼c. to 5¾c. per pound.

Linseed Oil.—Prices are firm and oil is difficult to obtain, even in comparatively small lots, by manufacturing consumers who continue buying in limited quantities. The season for the use of oil in painting is about closing, this being shown by the decrease in demand. The desire of Eastern crushers to obtain seed for shipment down the lakes before navigation closes November 30 has given the seed market an upward turn at Northwestern receiving points, where seed continues to arrive slowly. From this time forward is usually regarded as the dullest period of the year, but because of the small stocks in consumers' hands the demand is above what it naturally would be under normal conditions. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
Out of Town, raw	97 to 98
City, raw	97 to 98

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance over raw.

The Harlan & Hollingsworth Corporation, Wilmington, Del., launched November 19 the steamship Northland, building for the Norfolk & Washington Steamship Company, for service between Washington, D. C., and Norfolk, Va. The vessel is 305 ft. long and 52-ft. beam, and will have a speed of 19 knots per hour.

The Machinery Markets

Business continues fairly steady in machinery selling centers, but there is no notable buying. The railroads have withdrawn from the market in the East, but in Chicago and the farther central West there are some good inquiries from that source. Business continues to improve in the Chicago market, and some attractive business is in sight there for the first of the year. There is complaint of the scarcity of skilled labor in Detroit, which should mean that a good deal of manufacturing is going on there, and a steady volume of business is being done. Conditions are unsettled in Milwaukee, but there is a good call for heavy power and water works equipment. In Milwaukee, as well as in the Eastern markets, the export business continues good. In Cleveland and in Cincinnati the machinery markets show a gradual improvement, but in both those markets the business is largely of a single tool character. There has been some good buying in the Northwest and steady improvement is shown in the Southern trade. In San Francisco and on the north Pacific coast there is an excellent demand for electrical equipment, and many machinery plants have been busy there with marine work. The shipyards on both coasts and along the Great Lakes are busy just now with winter work and are good customers for all classes of repair shop equipment.

New York

NEW YORK, November 23, 1910.

There is a noticeable absence of business in this market. Many inquiries which have been before the trade for the last few weeks have failed to materialize, and prospective buyers show great caution in placing orders. The railroads are picking up a tool here and there, but they are doing nothing of any great consequence in the purchasing line. The last railroad buying of any note done in this market was closed out by the Delaware, Lackawanna & Western Railroad for its Scranton shops, and this purchasing hardly came up to the expectations of those who had in hand the extensive list of requirements sent out by the company last May. There are plenty of inquiries out, but it is hard to tell whether many of the people asking for bids are feeling the market with a view to satisfying their curiosity or whether they actually mean business. It is a noticeable fact that when times are rather slack in the metal industries a heavy volume of curious inquiries comes before the trade. In other words, it appears that a great many people who have nothing else to do feel out the machinery market with a view to finding out how trade is. Prices in the machinery trade are being well maintained, and in the second-hand machinery line especially quotations on used machines are high. Jobbing foundries in this vicinity are fairly busy, but many foundries that make a practice of securing large contracts could take more work if it were offered. There are some lines that are especially busy. Manufacturers of automatics continue behind in their deliveries and have all the business they can take care of for six months. Manufacturers of some classes of milling machines are also a little behind in their orders, but most machine tool builders have caught up and can furnish equipment on short notice.

The New York, Chicago & St. Louis Railway Company has prepared plans for a structural steel lift bridge over the Buffalo River, at Buffalo, N. Y., to be used jointly with the Pennsylvania Railroad and submitted them to the Bureau of Engineering of the city of Buffalo for approval. This bridge will be located a short distance east of the new steel lift bridge of the Lake Shore & Michigan Southern Railroad.

The National Police Signal Company, Buffalo, N. Y., has been incorporated with a capital stock of $100,000 to manufacture signal apparatus for police departments. The directors are Augustus F. Schen, Jno. F. Nagel, Louis W. Miller, 200 Ellicott Square Building.

The Otis Elevator Company, Buffalo, N. Y., is building a fireproof testing tower at its plant on Northland avenue and Griden street and the New York Central Railroad Belt Line.

The Crosby Company, manufacturer of stamped metal work, Buffalo, N. Y., is adding a pickling building and a warehouse of brick and steel to its plant on Pratt street.

The Rochester Can Company, Rochester, N. Y., has plans in progress for a two-story brick factory building, to be erected early next spring on Hague street.

The Stecher Lithographic Company, Rochester, N. Y., is completing plans for the erection and equipment of a three-story brick addition to its plant, to cost about $50,000. Frank A. Stecher, 274 Goodman street, is president.

The Westinghouse Machine Company, Pittsburgh, was low bidder at $248,180 for three steam turbine electric generators—5000 kw. each, with jet condensers—for the new waterworks pumping station at the foot of Porter avenue, Buffalo.

The Shur-on Trolley Guard Company has been incorporated at Buffalo, N. Y., with a capital stock of $25,000, to manufacture trolley safety devices—Henry J. Tiedt, Frank J. Nolan, and Howard J. Young are directors.

The Frontier Rubber Company, Buffalo, N. Y., recently incorporated to engage in the manufacture of pneumatic and hard rubber tires, has secured a two and three story factory building at Niagara street and New York Central Belt Railroad at West Delavan avenue, formerly occupied by the Preston Hose & Tire Company, with necessary machinery and equipment and will begin manufacturing at once. Charles F. Bensing is manager.

The Victor Appliance Company has been incorporated at Watervliet, N. Y., to manufacture automobile and motorboat supplies and operate a general custom machine shop—Augustus Bigelman, Gustav Garrow, and Dewitt Tappan are directors.

The Frey Auto Supply Company has been incorporated at Buffalo, N. Y., with a capital stock of $25,000, to manufacture automobile parts and supplies—John W. Frey, 700 Main street, is manager.

The Gath Machine Tool Company has been incorporated at Buffalo to take over and continue the business of Gath & Gardner, manufacturers of and dealers in machine tools, at 61 The Terrace. The new company will also handle as agents a line of metal working and small tools, as well as electric cranes and hoists and woodworking machinery. Andrew L. Gath is president of the new company.

The Steel Storage & Elevator Construction Company, 730 Main street, Buffalo, N. Y., was low bidder for the construction of a steel lift bridge over the Erie Barge Canal at Franklin street, Syracuse; amount of bid, $38,245.

The New York Central Railroad contemplates expenditures for improvements at Utica aggregating $2,000,000, including yard extensions, freight houses, and a new passenger station, the latter to cost $500,000.

The Consolidated Casting Company has been incorporated at Mechanicsville, N. Y., to manufacture castings of all kinds—Arthur H. Trumbull, Syracuse, and R. V. Tompkins, Mechanicsville, N. Y., are among the incorporators. The capital stock is $20,000.

Business Changes

The De Laval Steam Turbine Company, Trenton, N. J., announces that the Dravo-Doyle Company, by whom it has heretofore been represented in Pittsburgh, Philadelphia and Cleveland, will open an office in Chicago at Marquette Building in charge of H. S. Budd.

The American Woodwork Mfg. Company has succeeded the business of the New York Dimension Supply Company, and will continue to manufacture at its plant at Evansville, Ind., plumbers' wood work and table stock.

Chicago

CHICAGO, ILL., November 22, 1910.

The improvement in the machinery trade continues and encourages the expectation of a larger volume of business this winter. There are more inquiries from the general trade from the class of buyers who purchase one or two tools at a time, and there are also good inquiries from large corporations which find it necessary to increase their facilities. Some very attractive business has appeared in the market, which will not be closed until after the first of the year, but this is not far in the future now, and dealers are glad

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to see inquiries of this character which will afford them a substantial beginning for the new year. There is a fairly steady demand for used tools. In smaller tools and specialties the trade has been fairly good throughout the past year. The improvement at the present time is more pronounced in the heavier tools, which run into higher prices. There are several good inquiries from railroads which are not putting out large lists. The gasoline engine manufacturers are prosperous and are making many additions to their equipment. The agricultural implement people are unusually busy for this season.

The Wastemo Chemical Company, Springfield, Ill., has increased its capital stock from $5000 to $100,000, and will erect a new building, for which battery machines, mixers, label compounders, &c., will be purchased.

Orton & Steinbrenner, Chicago, will erect at Huntington, Ind., a factory building, 80 x 160 ft., mill construction, to be operated by electric power. The company manufactures locomotive cranes. It is understood that a considerable amount of new equipment will be installed.

The Brunswick-Balke-Collender Company, Chicago, has recently looked over a number of towns with a view to erecting a factory, but advises that a definite location has not been decided upon and probably will not be selected for some time.

The Electric Cleaner Company, Chicago, will move to Des Moines, Iowa, and will hereafter be known as the Wilson-Des Moines Electric Cleaner Company. The company has secured temporary quarters, which will be occupied until a new factory building can be erected. The company manufactures vacuum cleaners, and will be under the active management of Lucius and Samuel Wilson of the Wilson Machine Company, Des Moines.

The Northern Illinois Light & Traction Company, comprising the lines of the McKinley system, has awarded to the L. E. Myers Company, Railway Exchange Building, Chicago, a contract for building a hydroelectric plant at Marseilles, Ill., at a cost of $300,000. The traction company has secured from the Marseilles Land & Water Power Company a contract for the use of all surplus power in the Illinois River, amounting to several thousand horse power, which will be used to operate the interurban systems, which will start out from or be connected in any way with this section of the State. There will be installed 12 vertical turbine water wheels in individual flumes and supported on suspension roller bearings. It is believed that this plant will be of sufficient capacity to supply all the power needed for the lines in northern Illinois, and substations will be installed through which the power will be distributed to the lines as it is desired. High tension lines will be run from the main plant to the substations, and the smaller plants will be controlled by automatic devices from the main plant, thus equalizing the power all along the line.

The Pekin Garage & Outing Company, Pekin, Ill., has been incorporated, with a capital stock of $5000. The incorporators are Walter E. Green, Herman Kaemmerling and William Kaemmerling. The company will engage in manufacturing and repairing automobiles.

The Joliet Rolling Mill Company, Joliet, Ill., has been incorporated, with a capital stock of $150,000. The incorporators are T. F. Donovan, J. L. O'Donnell and J. A. Bray.

The Elgin Giant Case Watch Company, Elgin, Ill., has been incorporated, with a capital stock of $25,000. The incorporators are Walter Bachrach, Chas. J. Wendland and S. Sidney Stein.

The Meadows Sheet Metal Works, Meadows, Ill., has been incorporated, with a capital stock of $15,000. The incorporators include Edwin Whorrell, D. N. Claudon, R. L. Rathbun.

The Richards-Wilcox Mfg. Company, Aurora, Ill., certifies to an increase in capital stock from $124,000 to $800,000.

Philadelphia

PHILADELPHIA, PA., November 22, 1910.

Transactions reported during the week by both manufacturers and merchants indicate that there has been no change in the demand in this territory. Occasionally an order for a few tools is placed, but there is not enough business of this class to go around, and gains by such orders have hardly been sufficient to bring the aggregate volume up to a fair average. The railroads still show no real interest in the market. Machine tool builders report unchanged conditions, orders coming in irregularly and in many instances hardly filling up the gaps made by deliveries on old orders. There is a trifle better demand for special machinery and equipment in diversified lines.

Second-hand machinery merchants report the demand as a trifle less active, but fair when the general trade situation is taken into consideration. A moderate inquiry for second-hand power equipment is noted, but the demand for engines and boilers of the larger capacities has not been particularly active.

The demand for tools, machinery and general equipment for export continues rather dull.

The fact that the large industrial establishments are operating, for the most part, at a productive rate not over 50 per cent. of their capacity retards business from a class of trade which is usually comparatively good buyers of machine tool and machinery equipment.

The wagon, truck and carriage works of H. Kaiser & Co., Twenty-third and Race streets, was partially destroyed by fire on November 17, at a loss of $25,000 to $30,000. The burned portion of the plant will be rebuilt at once. Considerable damage was done to the equipment, and purchases of woodworking tools and machinery and power transmission equipment will have to be made.

An application for a charter for the South Penn Railway & Light Company, with a capital stock of $4,500,000, has been filed with the County Clerk of Camden, N. J., under the laws of the State of New Jersey. V. A. Murray, D. Billinger, and J. R. Bradley, of Pittsburgh, Pa., are named as the incorporators.

The Pennsylvania Equipment Company, West End Trust Company Building, is in the market for a number of 30-ton box cars, three trailer cars, and three motor cars of the semi-convertible type. Second-hand equipment is preferred.

Ballinger & Perrot, engineers, have bids in hand for a power house and tank tower to be erected at Forty-fourth and Thompson streets, for Chalfant Brothers. The building will be two stories and contain provisions for an engine and two boilers. The engine to be installed is already in hand, but boilers and minor equipment are yet to be purchased.

Frank Toomey reports the demand for second-hand machinery and tools a shade less active, but might be considered fair when the general trade condition is taken into consideration. He has just purchased a complete automobile manufacturing plant and will endeavor to sell it entire or dispose of the various tools and equipment separately.

A slight fire in the bolt department of the Lebanon Valley Iron & Steel Company, Lebanon, Pa., was reported last week, but the damage was insignificant and will in no way interfere with the operation of the plant.

The Crucible Steel Casting Company, Lansdale, Pa., will install an 8-ton electric melting furnace, furnished by the American Electric Furnace Company, 45 Wall street, New York. An engine and General Electric Company generator have been purchased to supply power for the furnace, which is to be ready for operation by February.

Plans are under way for the formation of a company to be known as the East Greenville Wooden Novelty Company, with a capital stock of $10,000, to erect and operate a plant for the manufacture of washing machines and wooden novelties at East Greenville, Pa. The major portion of the capital stock is already subscribed.

The Philips Pressed Steel Pulley Company has recently established an agency for the sale of its pressed steel pulleys with the Techniche Handlungs Gesellschaft, in Vienna, Austria. This company reports a good export demand for pulleys, particularly from Australia, France and India. The domestic demand is most active on the Pacific Coast and in the middle West. Business generally continues fair and the various departments of the plant are averaging about 70 per cent. of full capacity.

The City Council of Wilmington, Del., is considering the advisability of the installation of a municipal lighting plant. It is said that the Water Department had sufficient water power at its disposal for use in connection with such a plant.

In the Common Pleas Court, Lebanon, Pa., decrees of foreclosure and sale have been announced in the proceedings brought by the Valley Trust Company, of Palmyra, as trustee for the bondholders, against the Lebanon Chain Works, Lebanon, Pa., and the Farmers Trust Company, Lebanon, Pa., trustee for the bondholders of the West End Iron Works of that city. The order states that no bid under $20,000 shall be accepted. The time of holding the sale is left to the trustees, S. P. Light and C. H. Killinger. These transactions are in connection with the receivership of the late Iron & Steel Products Company.

The Nazel Engineering & Machine Works reports a very satisfactory demand for Béché patent pneumatic forge hammers, of which it is the sole manufacturer for the United States and Canada. One of the 250 lb. type, with motor drive, forging up to 5 in. stock, has just been furnished the Baldwin Locomotive Works. These hammers are built in six sizes, from 66 to 770 lb. ram weight, the latter size having a capacity of forging 9 in. stock. The Nazel Works

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is also busy on special machines for spring forming and on special paper machinery. This concern now has under consideration the erection and equipment of a forging plant to be operated in connection with its machine department.

A prospective purchaser, who is not yet prepared to announce the details in connection with the project, is in the market for the following new or second-hand equipment: Three 250 hp., water tube boilers, 160 lb. steam, or equivalent in hp., with stack, feed pump, heater, &c.; one simple, non-condenser Corliss engine, 25 to 30 in. diameter, 48 to 52 in. stroke, fly-wheel 90 rev. per min., 140 lb. steam; one, any type, simple non-condenser, direct connected to 125 or 150 kw. generator, 250 V. D. C.; two 10-ft. diameter gas producers complete; one 20 to 24-in. rolling mill, three-high rolls, two stands, complete with housings, pinions, couplings, &c., set of power driven feed rollers for runway; roll lathe; one track scale, 100-ton complete; one shallow throat standard punch, motor driven, capacity 2-in. hole through 1-in. plate; one 5 to 10 ton traveling crane, 3 motor, 220 V. D. C., 80-ft. span; 800-ft. I-beam runway, rails, &c. Communications are to be addressed to Box 240, care *The Iron Age*, Philadelphia.

Cleveland

CLEVELAND, OHIO, November 22, 1910.

The general outlook in the local machinery market shows an improvement. The outlook for a better volume of business in heavy machinery is particularly promising. Good inquiries have come out during the past few days for ore and coal handling machinery, gas producers and other steel plant equipment and hydraulic turbines. These in nearly all cases are good live inquiries that are expected to result in the placing of orders without much delay. Makers of some lines of machine tools also report more business in prospect than for some time. The statement has been frequently made that the machine tool market in northern Ohio and adjacent territory has not got back to its normal condition since 1907, the bulk of the activity since that time being in a demand for machinery used directly or indirectly in the manufacture of automobiles. An indication that a more general buying is now in prospect is shown by the statement of a local manufacturer of drilling machinery to the effect that his company now has more general inquiries than at any time during the past three years. These are mostly for the heavier type of machines, for which the demand has been light, sales to the automobile manufacturers having been confined almost entirely to the lighter drills.

Business with the local machine tool dealers shows some improvement in the volume of orders, but they are mostly for single tools in small sizes. The most of this business is coming from small machine shops. Few orders are coming from large manufacturing plants. There is a fair demand for second-hand machinery.

The Superior Drop Forge & Mfg. Company, which is building a new plant in Cleveland, placed an order during the week for the greater part of its machine shop equipment. The company has completed its organization by the election of the following officers: W. H. Lucas, president; F. V. Eurich, vice-president and general manager; and C. H. Walker, secretary. The company expects to buy 12 steam hammers.

The Adams-Bagnall Electric Company has purchased the plant and business of the Jandus Electric Company in Cleveland and will move the equipment of the latter company to its own plant. The Adams-Bagnall Company will add to its present line the manufacture of electric fans, which have been one of the products of the Jandus Company.

The Stuyvesant Motor Car Company has bought out the Gaeth Company of Cleveland, which recently went in the hands of a receiver. The Stuyvesant Company has acquired the plant of the Warren Mfg. Company, at Sandusky, Ohio, which is being fitted up for the manufacture of automobiles.

The Norwalk Drilling Tool Company, Norwalk, Ohio, has been incorporated with a capital stock of $10,000 by Edgar G. Martin, E. O. Boughton, G. P. Hogan, and C. P. Venus.

The Mineral Ridge Mfg. Company, Mineral Ridge, Ohio, has increased its capital stock from $5,000 to $50,000, and, it is reported, will enlarge its plant. The company makes miners' supplies.

The D. C. Mfg. Company, Canton, Ohio, maker of plumbers' supplies, which is building a new plant, has increased its capital stock from $40,000 to $75,000.

The Buckeye Aluminum Company will soon begin the erection of a new plant in Wooster, Ohio.

The Vim Motor Company, Sandusky, Ohio, which recently increased its capital stock from $25,000 to $60,000, has just completed a new factory building 80 x 132 ft.

The Bauroth Machine Company, at present operating a shop at 454 Earl street, Toledo, Ohio, has acquired a site along the Lake Shore Railroad, near Dorr street, in that city, and will build a new plant for the manufacture of dies and drill presses. The officers of the company are Leonard Bauroth, president; August Bauroth, vice-president, and Henry Stautzenbach, secretary.

George D. Claflin has purchased a vacant pottery building in Lancaster, Ohio, which, it is reported, will be fitted up for the manufacture of wood fibre machinery.

The Troy Wagon Works, Troy, Ohio, maker of dump wagons and other vehicles, will build a $12,000 addition to its plant.

The Bay View Foundry Company, Sandusky, Ohio, has let contract for an addition to its core room.

Cincinnati

CINCINNATI, OHIO, November 22, 1910.

Both machine tool builders and dealers report a slack business in the larger sized tools, but the smaller ones have been fairly good sellers during the past few days. Business men generally did not expect any great improvement to take place immediately after the elections, but they anticipate a gradual upward trend in every line, and some predict the opening of spring will show general conditions above normal. The continued absence of railroad orders has convinced most of the trade that it is bad policy to look entirely to any one particular industry for support. Local bankers report money rather tight, but some of them state this is due largely to the call for funds from Kentucky banks to handle the tobacco crop.

The foundries are only fairly active, and the majority of them do not look for any change until after January. Second-hand machinery appears to have dropped back in the rut again and no sales of consequence can be reported for the past week.

Boiler makers are among those who anticipate a satisfactory spring business. Many municipal water works plants are planned and there are quite a number of inquiries already being figured on, in a tentative way, for equipment to be installed in large manufacturing plants. The sale of small boilers and engines is somewhat curtailed by the almost general use in this vicinity of internal combustion engines, using natural gas.

Secretary Manley of the Cincinnati branch, National Metal Trades Association, has issued a circular letter to all members urging a full attendance at the meeting to be held at the Business Men's Club, December 8. The following speakers will address the gathering: J. F. Deems, superintendent of motive power, New York Central Lines; William Hodgdon, freight traffic manager, the Pennsylvania Lines; D. C. Buell, director, bureau of education, Union Pacific Railroad, and W. H. Taylor, treasurer and general manager of the David Williams Company, publisher of *The Iron Age*. A large number of manufacturers in other cities will attend, and all local members are expected to be present.

The new plant of the Bahmann Iron Works Company, Winton place, Cincinnati, has been completed and is now occupied. The company's output will be greatly increased.

The Gramm Motor Truck & Car Company has nearly completed its plant at Lima, Ohio, and announces that operations will commence in January. About 400 men will be employed, which number will be increased as occasion demands.

Plans have been completed for additions to the plant of the Jewell Carriage Company at Carthage, Ohio, recently mentioned. The company recently increased its capital stock from $250,000 to $400,000.

The plant and business of the Cincinnati Chuck Company, Colerain avenue, Cincinnati, has been sold to New England capitalists, and it is understood that the machinery will be moved to a new location in Massachusetts.

It is stated that the Cincinnati Traction Company will commence work at an early date on new car shops to be erected in Winton place, Cincinnati.

The capital stock of the United States Electrical Tool Company, Cincinnati, has been increased from $25,000 to $100,000. The company has completed the foundations for its new plant, but has decided to postpone further work on it until early next spring.

The Hardin-Wyandott Lighting Company has been incorporated at Kenton, Ohio, with $10,000 capital stock, by W. B. Whiting, C. C. Owens, Sterling Newall, Ellis R. Diehm, and Donald McBride.

The Troy Foundry Company is a new incorporation at

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Troy, Ohio, with $10,000 capital stock. The incorporators are J. W. Merkle, Jacob Lust, L. H. Shipman, G. Miller, and Louise E. Eichts.

The E. H. Huenefeld Company, Cincinnati, has purchased the good will, patents and plant of H. Franke, Cleveland, Ohio, and will operate the factory at that point for the manufacture of metal specialties.

The capital stock of the Jas. R. Shanklin Coal Company, Cincinnati, has been increased from $150,000 to $175,000. Some extensive improvements at its mines in the Pocahontas field, are contemplated for next year.

The John B. Morris Foundry Company, Cincinnati, is working on an order for several Schellenbach lathes to be shipped to Austria.

Excellent weather conditions have enabled the American Rolling Mill Company to push work on its new mill at Hamilton, Ohio, and it will probably be completed ahead of the scheduled time.

Kirk & Baum, Cincinnati, sheet metal workers, are just finishing up the sixteenth of a series of exhaust systems for the National Cash Register Company, Dayton, Ohio. Other late contracts include systems for the Jeffries Mfg. Company, Columbus, Dayton Planing & Mfg. Company, Dayton, and the American Seeding Machinery Company, Richmond, Ind.

The Marine Boiler Works, Toledo, Ohio, has prepared plans for a one-story addition to its plant, 80 x 120 ft., on Front street. Heretofore the company only made marine boilers, but expects now to engage in the manufacture of all kinds. John Weber is president.

The city of Portsmouth, Ohio, has voted favorably on a $100,000 bond issue to be used in building a new water works plant.

The John A. Stewart Electric Company, whose offices are in the First National Bank Building, Cincinnati, is erecting a one-story, 56 x 112 ft., steel and concrete warehouse at Langdon and Eastern avenues, which will be used as a storage building for electric and steam machinery.

The combination machine and blacksmith shop and round house buildings at Melbourne, Ky., now being erected for the Chesapeake & Ohio Railroad Company, by the Westinghouse-Church-Kerr Company, New York, are nearly completed, and the necessary tools and equipment are expected to be installed before February. The coal elevator will not be finished for some time.

The Canton Bridge Company, Canton, Ohio, has been given the contract for 25 bridges to be built in the vicinity of Nowata, Okla.

Detroit

DETROIT, MICH., November 22, 1910.

The scarcity of new enterprises, noted last week, continues, and there is less heard than formerly of the extension or remodeling of existing plants. Routine inquiries, however, have shown a fair aggregate, and there is a great deal of quiet buying which it is difficult to trace for the reason that it consists mainly of repeat orders or applies on what are practically season contracts.

It is reported from Muskegon, Mich., that the National Boat & Engine Company has been organized there with a capital stock of $10,000,000 to include many of the leading boat manufacturing concerns of the country, the largest of which is the Racine Boat Mfg. Company of that place. Others are the Truscott Boat Mfg. Company, St. Joseph, Mich.; Pope Boat Company, Fond du Lac, Wis.; Shell Lake Boat Company, Shell Lake, Wis.; Western Boat & Engine Works, Michigan City, Ind.; West Mystic Mfg. Company, West Mystic, Conn., and Inland Lakes Boat Company, Lake Geneva, Wis. It is stated that these companies produce nearly 90 per cent. of the motor boats and pleasure craft built in the East and Middle West, and that it is the ultimate intention of the combine to take up the manufacture of aeroplanes also. The president is Wm. J. Reynolds, and the secretary John Q. Ross, both of whom are residents of Muskegon.

The Blesch Metal Mfg. Company has been organized in Detroit with a capital stock of $15,000, by Otto Blesch, Edward E. Pratt and Hugh M. Edwards.

A bond issue of $400,000 has been voted at Flint, Mich., to cover the cost of improvements to the water works system, including a modern filtration plant.

S. F. Dobbins, Marshall, Mich., is awarding construction contracts for a two-story shop, 146 x 468 ft.; foundry, 100 x 162 ft., and an office building, 40 x 44 ft., for the Marshall Furnace Company.

A large addition, more than doubling its present capacity, will be made to the manufacturing plant of the Adjustable Table Company, Grand Rapids, Mich.

A new type of gasoline motor is to be produced in Detroit by the Automobile Mfg. & Engineering Company, which is planning the erection of a factory, the initial structure being 55 x 60 ft., with frontage on Harper avenue. R. H. Evans of this city is secretary and treasurer of the company.

The American Motor Castings Company, Detroit, is busy on orders from the automobile companies.

A bond issue has been voted by the city of Durand, Mich., to cover the cost of installing a municipal pumping plant.

Work has been commenced on the addition to the manufacturing plant of the Wagemaker Furniture Company, Ltd., Grand Rapids, Mich., which will consist of two stories and a basement, 46 x 100 ft., and a storage building, 20 x 40 ft.

It is reported from Saginaw, Mich., although without direct confirmation, that the Brooks Boat Company of that place will arrange shortly for the manufacture of aeroplanes, having secured an expert in that line of work as superintendent.

Provision will be made shortly for a new shop, foundry and roundhouse, with complete modern equipment, to replace the structure of the Boyne City, Gaylord & Alpena Railway, Boyne City, Mich., which was recently destroyed by fire.

A new company, with which W. A. Foote, Lansing, Mich., president of the Commonwealth Power Company, is stated to be identified, is planning the construction of an electric traction line from Lansing to Battle Creek, and will be in the market toward spring for considerable equipment.

The Hancock Consolidated Mining Company, Hancock, Mich., will erect its own stamp mill as soon as the plans for it have been definitely worked out. Meanwhile, its ore will be treated at one of the other plants in the vicinity.

The Michigan United Railways, Lansing, Mich., will install a very complete machine shop for repair work in connection with the new carhouse to be built there.

Plans are reported to be in progress for a new factory building of the Auto Parts Mfg. Company, Detroit, which will be a one-story structure, 75 x 180 ft.

Negotiations are now pending at Big Rapids, Mich., which include the taking over of a local electric plant by the city and changing the arrangement of the pumping station to permit of motor drive instead of steam operation.

The N. Michelson Company, Michelson, Mich., is adding a planing mill to its timber cutting plant, and will equip it with the most modern machinery.

The Prescott Company, Menominee, Mich., will furnish machinery to double the present capacity of the newly completed Von Platan sawmill at Iron Mountain, Mich., but the addition will not be made much before spring.

The Allouez Mining Company, Allouez, Mich., is planning the installation at its No. 2 shaft of a new high duty air compressor and hoisting plant with steel rock house, crushing equipment. These improvements are not, however, to be carried into effect before next summer.

The Handy Press Company, Grand Rapids, Mich., has been incorporated with $42,500 capital stock. The officers of the company are: William C. Brummeler, president; A. J. Brummeler, vice-president; R. J. Brummeler, treasurer; W. N. Edson, secretary.

Indianapolis

INDIANAPOLIS, IND., November 22, 1910.

The Eureka Mfg. Company has been incorporated at Newcastle, Ind., with $15,000 capital stock, to manufacture household furniture. The directors are H. C. Land, T. M. McKee, J. A. Royer.

The Floyd Mfg. Company has been incorporated at New Albany, Ind., with $10,000 capital stock, to manufacture agricultural implements. The directors are John Floyd, P. L. Hamilton, C. G. Smith.

The Roller Door Hanger Mfg. Company has been incorporated at Elkhart, Ind., with $10,000 capital stock, to manufacture hangers, tracks and other articles. The directors are George W. Stuyverson, E. J. Browne, George S. Stuyverson.

James J. Quinlan of Muncie, Ind., has bought a site at Indianapolis of four acres for a proposed plant to manufacture boilers and machinery, which will cost $200,000.

The Indiana Novelty Company has been incorporated at East Gary, Ind., with $10,000 capital stock, to do a general manufacturing business. The directors are F. D. Covington, George Earle and William Earle.

The Leesburg Light & Water Company has been incorporated at Leesburg, Ind., with $10,000 capital stock, to supply electricity. The directors are F. Boetz, W. H. Stanley and A. H. Brown.

The McDougall Kitchen Cabinet Company, Frankfort, Ind., has bought the Biggs Mfg. Company at Lafayette, Ind., whose kitchen cabinet plant was about ready to start.

The Peerless Pacific Company has been incorporated at Evansville, Ind., with $10,000 capital stock, to manufacture

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plumbers' supplies. The directors are George R. Smith, M. D. Helfrich, H. F. Weaver.

The Midland Furniture Company has been incorporated at Evansville, Ind., with $50,000 capital stock, to manufacture furniture. The directors are J. C. Stephan, F. W. Gumberts, I. Rosenthal.

The Madison Mfg. Company has been incorporated at Elwood, Ind., with $50,000 capital stock, to manufacture glass factory supplies. The directors are I. H. Deakin, John Klumpp, Sr., John Klumpp, Jr.

The American Drill Company, Marion, Ind., has increased its capital stock and is preparing to enlarge its output of farming tools. At the annual meeting of the company, recently held, the following officers were elected: H. D. Hunter, president; J. A. Work, vice-president; J. S. Hunter, secretary; John C. Haswell, treasurer.

The Banner Mfg. Company, Ferdinand, Ind., is erecting a factory building, 40 x 88 ft., which will be used as a foundry and machine shop. The building when completed will be equipped with a 24-hp. engine and boiler, two pipe machines, four lathes, three drill presses and complete foundry equipment.

Pittsburgh

PITTSBURGH, PA., November 22, 1910.

Within the past week the market has been characterized by renewed vigor, but this is evidenced more in the tone of pending inquiries than by the actual volume of purchasing, which continues rather light for the season.

The contract recently placed with the Westinghouse Electric & Mfg. Company for machinery to be installed near Dante, Va., by the Clinchfield Coal Corporation has attracted much attention here, as well as elsewhere through the country, from the fact that it amounts to $500,000; but this is only one of numerous improvements that have been among the mainstays of the machinery market, and more are to follow. Some of the leading coal mining and handling companies have decided definitely upon a policy of expansion which will find expression in a large aggregate of purchases both of mechanical and electrical equipment.

The filtration plant of the Monessen Waterworks Company, Monessen, Pa., will be considerably extended and improved. Chester & Fleming, Pittsburgh, are the engineers in charge of the work.

One of the large equipment companies here will figure shortly on material and machinery for the Blue Ridge Railway Company, Hagerstown, Md., which is about to start construction work on its line. J. Clarence Lane of that place is one of the leading incorporators.

The Cyclops Steel Company, Titusville, Pa., will begin the new year with considerably enlarged and improved manufacturing facilities, the extension of which is now in progress.

A 50-ton refrigerating plant is to be installed by P. C. Schuller, Pittsburgh, in a new two-story building on Short street, adjacent to Stormer Alley.

There are indications that the work of enlarging the Schoen Steel Car Works at McKeesport, Pa., will be undertaken in the near future, additional land having been secured for that purpose by the Carnegie Steel Company.

The electrically operated units for the new Scioto River Pumping Station at Columbus, Ohio, will be furnished by the Platt Iron Works Company, Dayton, Ohio.

Plans for a modern water works system for Lowellville, Ohio, have been prepared by J. Richard Kommer, Pittsburgh. Very little equipment will be required, as a gravity flow can be utilized.

Included in the bond issues voted by the city of Pittsburgh at the recent election is an appropriation of $100,000 to cover the cost of erecting an incineration plant.

Manufacturers of pumping machinery located in this district are preparing to bid on three centrifugal pumping units, of 5,000,000 gal. each, for the city of Dayton, Ohio. Preliminary figures are also being made on two new pumping engines for Cleveland, Ohio, each having a daily capacity of 25,000,000 gal., and four centrifugal pumps of 10,000,000 gal. each to be operated either by gas engines or electric motors. In both cases other equipment is expected to be purchased at the same time, or a little later, but the full list has not yet been announced.

An eight-story warehouse building on First avenue, Pittsburgh, has been leased by the Westinghouse Electric & Mfg. Company, and will be used in place of the structure now occupied by that company on the North Side, the facilities of which have been outgrown. It is stated that in the new building a very complete repair shop will be installed, something which the company has not heretofore maintained outside of its plant at East Pittsburgh.

The new buildings and other improvements at the works of the Pittsburgh Plate Glass Company in Ford City, Pa., will be completed by January 1 and all departments placed in full operation. Some minor details of equipment are still to be provided.

The Keefer Coal & Coke Company, Pittsburgh, of which W. W. Keefer is the principal incorporator, has been organized to operate in Fayette County, W. Va.

Milwaukee

MILWAUKEE, WIS., November 21, 1910.

Power pumping, air compressor and hoisting outfits are selling to excellent advantage as compared with other lines of production, and the demand for such has been fairly well maintained all through the fall, due to the fact that these units enter into so many phases of the industrial life of the country and are needed in every part of the world. The export demand has, of itself, been sufficient to cut quite a figure in the situation, particularly when the sales made to Northwestern Canada and the states of Mexico are considered as export trade.

It is reported from Sheboygan, Wis., that the Jacob J. Vollrath Mfg. Company is taking bids on a gas producer house 28 x 80 ft. of steel frame structure and on other details of factory buildings, warehouse, &c., now under construction.

The Hardwood Products Company, Neenah, Wis., has let a contract for its steam generating equipment to Wickes Brothers, Saginaw, Mich. The initial battery will include two boilers of 250 hp. each.

The Kissel Motor Company, Hartford, Wis., is installing two elevated steel tanks, a pumping unit and a sprinkler system of fire protection.

A new factory will probably be erected in the spring by the Northwestern Furniture Company, Milwaukee.

The Mosinee Electric Company, recently organized at Wausau, Wis., by Neal Brown and others, will build a power and lighting plant at Mosinee, Wis., operated from a transformer station.

The Tomahawk Iron Works, Tomahawk, Wis., has overhauled in its shops and put in shape for reselling a number of heavy logging locomotives.

An addition will be made shortly to the box factory of the Water-Clarke Lumber Company, Superior, Wis., and considerable new machinery provided.

The Fred M. Prescott Steam Pump Works and the Allis-Chalmers Company of this city are among the bidders on a 6,000,000 gal. pumping engine for the city of Wellsburg, W. Va.

The Oslo Lighting & Power Company, Manitowoc, Wis., will purchase, shortly, the equipment for a steam engine-driven power plant, including boilers, for installation at Valders, Wis.

The new plant to be operated by the Wisconsin Furniture Mfg. Company, which will be built at Neilsville, Wis., to replace the factory of the Reliable Furniture Mfg. Company, that burned some time ago, will consist of two buildings, one 80 x 200 ft., two stories, and the other 80 x 140 ft., one story. A complete line of modern woodworking machinery will be provided, but it has not yet been decided whether to install a steam power plant or to purchase current. In either case, however, electric motors will be used.

P. J. Holme Company, manufacturer of gasoline engines at Eau Claire, Wis., is removing to a larger plant and increasing its facilities for the season's production.

A generating plant will be built in the spring by the Endeavor Electric Light & Power Company, Endeavor, Wis., of which William H. Burwell is manager.

The Lamsen Automatic Pump Company, Eau Claire, Wis., recently incorporated for the manufacture of automatic pumps for irrigation, city water works and private plants, advises that it will not erect a factory until next spring. The company will contract for the manufacture of its product until its own factory is completed and is now interested in getting prices for this purpose. The pumps weigh from 280 pounds to four tons.

St. Louis

ST. LOUIS, November 21, 1910.

While the machine tool business continues quiet, there seems to be evidence of a fairly early resumption of activity. Inquiries for some heavy tools have come into the market from parties not buying recently, and some pretty good orders have been actually placed by the large steel casting companies here during the last week.

The Crane Company has purchased property on the

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Terminal tracks and will start work on a large addition to its warehouse facilities here at once.

The Acme Truck & Tool Company has been reorganized and the name changed to the Acme Tool Company. It makes a line of heavy forging specialties.

The St. Louis Trunk Hardware Mfg. Company finds business fairly good for this season.

The National Chair Company, with a paid up capital stock of $25,000, is purchasing machinery for its new plant in North St. Louis. Joseph J. Yawtz, formerly treasurer of the Mound City Chair Company, is president.

The city of St. Louis is advertising for bids for furnishing pumps as per requisitions.

The Woods Electric Vehicle Company, St. Louis, has been incorporated, with a capital stock of $25,000. The incorporators are Louis E. Burr, Thomas Clements and A. B. Schaeffer.

The Carter Aeroplane Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $7000. The incorporators are O. H. Hyde, D. B. Hyde, L. A. Carter and others.

The John Stanard Bronson Machinery Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $5000. The incorporators are L. B. Bronson, L. E. Jacques and J. S. Bronson. The company will engage in the manufacture of machinery.

The Sunrise Iron & Mining Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $200,000. The incorporators are Wm. A. Bright, Frank M. Overlees and Pascal Parker, all of Liberty, Mo.; L. G. Bronson of Joliet, Ill., and Frank Daughmer of Douglass, Ill.

The National Gas Machine Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $100,000. The incorporators are Bert F. Fenn, M. Laux and R. G. Lewis. The company will engage in the manufacture of gas machinery and devices for making and supplying gas.

The Tombs Roller-Bearing Wheel Company, St. Louis, has been incorporated, with a capital stock of $50,000. The incorporators are J. M. Tombs, B. S. Adams and Thos. J. Edwards.

The Central Screen Mfg. Company, St. Louis, certifies to an increase of its capital stock from $35,000 to $100,000.

The American Shoe Machinery & Tool Company, St. Louis, has been incorporated, with a capital stock of $15,000. The incorporators are Abraham Black, Benj. Medalla and Louis A. Black.

The Memphis & North Arkansas Railroad will erect machine shops at Leslie, Ark., and also a passenger station. Work on the shops will be started within 30 days.

The plant of the Galena Lead & Smelter Company at Galena, Kan., owned by Hammar Bros. of St. Louis, was almost totally destroyed by fire November 13. The loss is $20,000, partially covered by insurance.

The Fort Worth Glass Mfg. Company, Fort Worth, Texas, has been incorporated, with a capital stock of $100,000. The incorporators are David Watson, J. D. Lattimore and C. A. R. Gotesman.

Toronto

TORONTO, November 19, 1910.

The demand for machinery of nearly all kinds is still well sustained. Complaints continue to be made about the scarcity of skilled labor. There is also a shortage of unskilled labor. It is stated that inability to man factories up to the required strength is causing orders to be sent to the United States for machinery that would otherwise be made here. Trade would be still better, too, if the condition of the roads were better.

At its meeting on November 14 the City Council of Montreal, Que., adopted a resolution providing for the preparation of many by-laws for the borrowing of $10,000,000, the money to be applied toward the construction of necessary public works. The expenditure is to be distributed as follows: $1,000,000 for the enlargement of the water works plant, $1,500,000 for a filtration plant, $1,000,000 for a municipal lighting plant, $1,000,000 for underground conduits, $4,500,000 on street improvements, &c., and $1,000,000 for working capital. It was also decided at the meeting to purchase an electric motor and pump from the John McDougall Caledonian Iron Works Company, Montreal.

W. C. Franz, manager of the Lake Superior Corporation, says that arrangements have been made for the building and equipment of a $1,000,000 paper mill at Sault Ste. Marie, Ont.

The Ottawa Car Company is making extensive additions to its works in Ottawa, Ont., where 400 men are now employed.

The Gilson Gasoline Engine Company, Guelph, Ont., is making an addition to its works, and will install new machinery.

W. W. Hesson and W. E. Rothwell, Toronto, are preparing to begin operations in the manufacturing of carpet sweepers, vacuum cleaners, clothes washers, &c., in Guelph, Ont.

The Dorchester Electric Light Company has received permission to enter the city of Quebec and carry on business there, one of the conditions being that before the end of next year it shall erect and operate workshops to cost at least $200,000.

The town of Pembroke, Ont., has under consideration water works improvements to cost $65,000. These will include the putting in of new pumping machinery.

On November 17 the Lake Superior Corporation began the use of the first of the gas blowing engines it is to install at its blast furnaces at Sault Ste. Marie, Ont. Seven other such gas driven engines are to be put in.

The Superior Rolling Mills Company, in which C. R. Hosmer, H. S. Holt, F. W. Thompson and other Montreal capitalists are prominent, has acquired a property in Fort William, Ont., on which it is proposed to establish steel works next spring.

Some Montreal men have associated themselves to go into the business of manufacturing automobiles in the town of St. John's, Quebec, if that municipality will grant a bonus of $20,000, a free site, and exemption from taxation. The cars manufactured will be equipped with 30 to 35 hp. engines. The officials of the company are: Julien Therien, president; Theophile Trudeau, vice-president; A. Vinet, secretary-treasurer. The capital stock of the company is to be made up of $200,000 common and $100,000 preferred stock.

The issue of £1,000,000 bonds by Price Bros. & Co., Quebec, Que., who will use the money for the construction of great paper mills, was oversubscribed in London.

A company is being organized to take over the two former concerns at Grand Falls, N. B., and to build a large pulp mill and paper plant there. Sir William Van Harne is mentioned as the principal figure in the new project, and it is stated that the pulp and paper works will cost $7,000,000.

Theodore A. Burrows, a Winnipeg man of large timber and lumbering operations, will build a sawmill costing $60,000 on the McLeod River near Medicine Lodge on the Grand Trunk Pacific Railway.

The Canadian Auto-Press Company, Ltd., Toronto, Ont., will build and equip a large addition to its recently acquired plant at Eastern and Carlaw avenues, Toronto, for the manufacture of printing presses.

The Cockshutt Plow Company is building a large addition to its works at Brantford, Ont.

The Gurney Scale Company has commenced construction of its new manufacturing plant at Hamilton, Ont.

New England

BOSTON, MASS., November 22, 1910.

The dealers have experienced little change in business conditions. The demand is "so-so," to quote one house. It could be a great deal worse, and it could be better. Probably it reaches the average of dull and good times, and the inclination is upwards. Inquiries are somewhat more promising. A good-sized list of the General Electric Company for the Lynn Works is held up temporarily. The United Shoe Machinery Company continues buying as a matter of routine, following its almost invariable custom.

Among the manufacturers of machinery the tendency is toward a better business. Some works have received an important access of orders, which are exceeding production, where the contrary was true a month ago. Foreign business is considerably better than it has been for some time. Certain shops have curtailed their output and have laid off men, but skilled labor is retained, the vacancies being confined to the classes of labor most easily replaced. The supply of first-class mechanics has shown no very noticeable increase, since the absorption of the men who were released from employment by the absorption of the Plant shoe machinery interests by the United Shoe Machinery Company. Employers look to see another labor famine, increasing in its effect with the gradual growth of business, which is expected from now on, gradual at first, but culminating rapidly after the begining of 1911.

The mechanical department of the New York, New Haven & Hartford Railroad has recommended the extension of the repair shops of the Boston & Maine system, an allied company, at Concord, N. H. The report calls for a new machine shop and boiler shop, the installation of electric cranes of huge capacity and a 130-ft. extension of the erecting room. The report means that, if it is acted upon favorably, a large amount of new machinery will be purchased.

H. D. Smith & Co., Plantsville, Conn., manufacturers of

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vehicle and special drop forgings and drop forged tools, have completed plans for a new manufacturing building, which will replace that destroyed by fire recently. It will be 40 x 415 ft., one story, of brick and steel, with concrete foundations, and will house the die sinking department, machine room, finishing department and assembling department. The company is now purchasing machinery and other equipment.

H. R. Sinclair, of the W. & S. Mfg. Company, Worcester, Mass., has acquired the interest in the business of J. Fred Wilson, who retires from the firm. Mr. Sinclair, who has had charge of most of the estimating and of the manufacturing, will continue to conduct these departments. During the past five years, since the modern factory was erected, the company has made important improvements, including the installation of better machine tools for die making, light and heavy single and double action presses, special armature notching machinery, drop hammer with gas furnace for hot forming, increased polishing and plating facilities, and a large increase in standard sizes of round, square and hexagon dies. The company does metal punching, die making, polishing and electro plating, and makes a specialty of all kinds of special washers and stamped work, flat, formed or drawn, up to 10-in. discs from 3-16-in. steel, or 5-in. discs from ½-in. steel.

The business of the Lounsbury Machine Works, State and Wall streets, New Haven, Conn., has been absorbed by the Lounsbury & Riley Works, a new Connecticut corporation with capital stock of $20,000. John C. Lounsbury is the president and secretary and F. C. Riley, treasurer, the third incorporator being S. C. Riley. The company manufactures small special machinery and at the present time is producing a special wrench on order and some special riveting tools. A small household grinder, which the company will market under its own name, is now being manufactured. The company is in the market for a second-hand universal milling machine and a 24-in. engine lathe.

The proposed absorption of the Boston, Revere Beach & Lynn railroad by the Boston & Maine, and New York, New Haven & Hartford interests, which will go through if legislative permission is granted this winter, entails large engineering works, comprising the building of a tunnel under Boston harbor, connecting East Boston and South Station, and the standardizing of the line to be acquired, which is now a narrow gauge.

Middletown, Conn., held its first industrial exposition last week, which was so great a success that it will undoubtedly be repeated. The exhibits included manufactured products of Wilcox, Crittendon Company, marine hardware; W. & B. Douglas, pumps; Prentice Mfg. Company, rules; New England Enamelling Company; I. E. Palmer, hammocks; and the Noiseless Typewriter Company.

Additions to general manufacturing plants include the following: Cushnoc Paper Company, Augusta, Maine, pulp grinding mill of reinforced concrete, 60 x 74 ft.; Draper Bros., Canton, Mass., blanket mill, 60 x 100 ft., two stories; Providence Box & Lumber Company, Providence, R. I., factory at Arlington, R. I., 80 x 200 ft., with wing 40 x 40 ft., and power house 32 x 67 ft.

The Ball Bearing Shade Roller Company, Naugatuck, Conn., has made a large increase to its capital and states that the money will be used for extending the business.

The Malleable Iron Works, New Britain, Conn., manufacturer of malleable iron castings, will erect a brick addition to its foundry, 40 x 80 ft., with saw tooth roof and skylights.

The Roberts Mfg. Company, Somerville, Mass., manufacturer of bolt clippers, has removed its factory to a modern building at Beacon and Park streets, and will gradually add new machinery.

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has awarded the contract for its new building, which will be about 64 x 100 ft., one story, of mill construction.

San Francisco

SAN FRANCISCO, November 16, 1910.

A report, in the nature of a compromise, has been submitted by the Committee of Arbitration, which has been considering the questions at issue between the San Francisco iron working shops and the labor unions. The committee's recommendations are not binding, however, and it is by no means certain that the arrangement proposed will be adopted. In view of the uncertainty which still exists, none of the local shops is buying any machine tools, except such as are absolutely necessary, and the equipment in most shops is fully adequate for the work on hand. Some of the larger shops in the interior are also hampered by labor conditions, and no business of much importance is coming from any quarter. A general curtailment has been noted since the first of the month in the foundry business throughout the district tributary to San Francisco.

Wood working machinery is dull, and while there are a few scattered inquiries of some importance very little new business is expected before the first of the year. Several mines in the northern district of California and Nevada are placing new orders for motors, pumps, compressors, &c., but traveling men returning from the southern district, including Arizona, report little business. There is some prospect, however, that the southern mines will come into the market more actively before spring. New inquiries, which will doubtless result in substantial orders within the next few months, are coming in from some of the rock and stone quarries in the southern district, and figures are being taken on large additions to some of the cement mills. Contracts are to be placed shortly for a lot of new machinery for a mill of the Standard Portland Cement Company of this city.

In addition to several large gold dredger contracts recently let by California parties, mining engineers returning from the Nome and Iditarod districts of Alaska state that at least 12 dredgers will be required there next year, and consider the outlook excellent for future business throughout that territory. It is stated that hand placer mining has about reached its limit, and improved machinery will be needed to reach deposits lying at a greater depth.

Since the visit of Secretary of the Navy Meyer to this coast, it is announced that the channel leading to the Mare Island, Cal., navy yard is to be deepened, which is taken as an indication that the needed improvements will soon be made in the equipment of the yard itself. Local machinery firms also look for considerable business in the future from the navy yards on Puget Sound and at Pearl Harbor, Hawaii.

Various interurban traction companies in California have shown considerable activity in the last few weeks in extending their lines, and are entering the market to some extent for rolling stock and general equipment. S. N. Griffith, who is working on a line between Fresno and Clovis, has been in the city conferring with representatives of the Western Electric Company on specifications for power equipment. The Central California Traction Company is planning extensive improvements to its service in Stockton, Cal. The Northern Electric Company is building the largest electric locomotive in the state at its shops at Chico, Cal., to be equipped with a 660 hp. motor. It is reported that the Redondo Railway Company will erect a large car shop at Hawthorne, Cal.

The Holt Mfg. Company, Stockton, Cal., recently shipped a harvester to Argentina, and expects to get considerable business in that country in its lines of harvesters and caterpillar traction engines.

Refrigerating machinery is in fair demand, and considerable business is expected during the winter and spring by several local firms which specialize in this line. The Vulcan Iron Works has had considerable work of this nature recently, and the Parker Iron Works of San Bernardino, Cal., has taken a number of small contracts in the southern territory. The Union Ice Company is adding a new unit to its Los Angeles plant.

Electric power plants and general equipment of moderate capacity are in steady demand, and plans are being developed for a number of large installations to be carried out during the next few days. Surveys are being made for a large addition to the Great Western Power Company's plant on the Feather River, for which a four-mile tunnel will be required.

The Auto Mfg. Company, E. C. Collins, president, has secured a tract of land near Sacramento, Cal., and will, according to announcement, erect an automobile factory, including foundry, machine shops, &c., plans for which are now being drawn.

C. Ruehle and Geo. Eltiste have taken over the forge and machine shop formerly conducted by J. C. Williams & son, at Orange, Cal.

The Morton Gas Engine Company, Fresno, Cal., will hold a meeting of stockholders January 16 to increase the capital stock.

H. E. Boyrie, formerly Seattle manager for C. C. Moore & Co., is now sales manager for the Tracy Engineering Company, San Francisco agent for Nordberg Corliss engines, &c.

The Berkeley Sheet Metal Works recently took over the business of Riddle, Vaughn & Co., San Francisco, and has secured a location for a new factory on the Southern Pacific line in West Berkeley, Cal.

The North Star Mining Company is putting in equipment for a narrow-gauge electric tramway connecting its two mines near Grass Valley, Cal.

The Riverside Portland Cement Company has completed plans for additions to its plant near Riverside, Cal., to be carried out during the winter. Eight ball mills, 10 tube

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mills, and a large amount of other machinery will be installed.

F. J. Lea, vice-president and general manager of the New Pedrara Mexican Onyx Company, is visiting the quarries in Lower California to prepare for the installation of new machinery. A number of pneumatic drills and a lot of surfacing machinery will be installed.

The fire and police commissioners of Oakland have recommended the appropriation of $51,750 for additional fire apparatus, including three motor propelled chemical and hose wagons, motor propelled pumping engine, and two steam fire engines.

The Los Angeles Improvement Company, Los Angeles, has started preliminary work on a woodworking plant, which it announces will be the largest in California, the estimated cost being about $500,000.

The Southwest

KANSAS CITY, MO., Nov. 21, 1910.

Municipal buying continues to exert the most important influence upon the machinery market, particularly in the purchase of steam and gas engines, electric units, pumping machinery and auxiliary appliances. A good many private companies have, however, recently been formed to establish public service plants, which frequently include refrigerating outfits; and the building of electric traction lines is still bringing out a good many inquiries for construction, power and operating equipment. Mining operations are also offering good opportunities for the sale of equipment; and in the line of irrigation, drainage, water power and other development projects there has recently been much figuring on future requirements.

It is reported from Guthrie, Okla., that the Attorney-General of the State, since March 24, 1910, has approved of the following water works bond issues for cities and towns in that State, which are about to build municipal plants in the near future. There are 31 issues, totaling $1,323,000: Krebs, $5000; Gage, $30,000; Spiro, $40,000; Cherokee, $5000; Chelsea, $58,000; Weatherford, $30,000; Wewoka, $35,000; Wetumka, $36,000; Apache, $30,000; Altus, $130,000; Coalgate, $30,000; Grandfield, $28,000; Pryor Creek, $65,000; Okeene, $30,000; Gotebo, $28,000; Poteau, $12,000; Durant, $20,000; Medford, $12,000; Isabel, $40,000; Enid, $25,000; Maud, $10,000; Elk City, $15,000; Lawton, $200,000 for a dam and reservoir; Stigler, $45,000; Krebs, $10,000 more; Lawton, $40,000 more; Cushing, $25,000; Hominy, $25,000; El Reno, $250,000; Roosevelt, $20,000; Granfield, $16,000 more. Under an act that went into effect March 24, the Attorney-General of Oklahoma is made State Bond Commissioner, and must pass upon and approve all State, county, municipal, city and school district bonds issued in Oklahoma before they can be sold.

The Climax Mining Company, operating in what is known as the Hassayampa district, near Prescott, Ariz., will remodel its plant and install some new machinery.

The Silver Hill Mill & Mining Company, recently organized at Shafter, Texas, has secured a large section of mineral land there and will install machinery sufficient to inaugurate extensive development work.

The King City Light & Power Company, King City, Mo., will install a producer gas engine unit, including an alternating current generator of about 50 kw.

Machinery for a pumping plant and water works system to be installed at Yukon, Okla., will be purchased during the coming month.

Plans for the proposed hydroelectric power development near Tucson, Ariz., to furnish power for municipal pumping and lighting service, will probably be put into effect by or before spring.

Improvements which will probably be made to the water works at Newton, Kan., include a new pumping engine of large capacity and a motor driven deep well pump.

A project for the enlargement of the water works system at Oklahoma City, Okla., which will involve the expenditure of a large sum for the purchase of machinery, has taken definite form in the appointment of an engineer to prepare the necessary plans, specifications and estimates.

The O'Neil Enginering Company, Dallas, is at work on plans for a municipal pumping plant to be constructed at Hearne, Texas.

There will in future be a good market for motors and other electrical apparatus among the mining companies in the vicinity of Jerome, Ariz., where the new system of machinery drive is being generally introduced. With the completion of a power transmission line from the large hydroelectric plant on Fossil Creek it will go into effect.

Extensive improvements, which include the purchase of considerable power equipment, will probably be entered upon in the near future by the Citizens' Light & Transit Company, Pine Bluff, Ark.

Work is about to begin on the foundations of the new shops and roundhouses to be erected at Sweetwater, Texas, by the Atchison, Topeka & Santa Fe Railway.

Southern Texas

AUSTIN, TEXAS, November 19, 1910.

Good rains have fallen over most of the agricultural portions of the state during the last few days and have had the effect of stimulating various lines of business. Machinery dealers report that the condition of trade is better than this time last year. There is a wider demand than ever known.

D. Z. Evans, Philadelphia, Pa., contemplates the erection of a plant at Austin for the manufacture of cement brick and blocks. He expects to invest $30,000 to $50,000 in the enterprise. It is claimed by experts that the sand and cement material here are specially suited for the purposes which Mr. Evans has in view.

J. A. Logwood, San Antonio, has been granted a franchise by the county commissioners of Bexar County for the construction of an electric railway from Harlandale through a suburban district extending some distance beyond that place on the Corpus Christi road.

The City Council of Beaumont is considering the matter of requiring the owners of the municipal water works system to provide a new water supply. It is estimated by W. C. Teter, principal owner of the system, that it would cost not less than $300,000 to develop a new source of water supply for the city. The rice irrigation canals are taking an enormous quantity of water from the river during the growing season, and this causes salt water to enter the bed from the Gulf and impregnate the water supply of the city.

An application for a gas plant and distributing system franchise has been made to the City Council of Brownsville, Texas, by Caloni Moody of Corpus Christi, Texas. He contemplates investing from $50,000 to $60,000 in the enterprise.

Fordyce Ridley of Galveston and associates will construct a street railway line in Texas City, Texas. It will run from the bay shore to Texas City Heights.

Lon C. Hill, Harlingen, Texas, has finished revising the plans for the large sugar mill that he will erect at that place. The plant will cost about $400,000.

W. C. Day, state superintendent of public buildings and grounds at Austin, will ask the legislature to make an appropriation of $10,000 for the purchase of new machinery for the state power and heating plant here.

The issue of $50,000 of water works bonds by the municipal government of Denison, Texas, has been formally approved by the attorney general. The proceeds will be used to extend the water works distributing system and to enlarge the pumping plant.

The Beeville Ice & Power Company will install a light and power plant at Beeville, Texas. It will be operated in conjunction with the company's ice factory.

The Guerrero Mining & Milling Company will install a large ore reduction mill at its mines in the Balsas district, state of Guerrero, Mexico. Collin Timmons is manager and principal owner of the property.

The Compania Explotadora de Minas, Puebla, Mexico, has adopted plans for a new cyanide plant, which it will install at its mines.

The Magistral-Ameca Copper Company, Ameca, Mexico, will enlarge its reduction mill, install a compressor and make other extensive improvements at its mines.

The Inde Consolidated Mines Company, Inde, state of Durango, Mexico, will install new boilers and pumps at its Gran Lucero mine.

The Inde Gold Mining Company, Inde, Mexico, contemplates enlarging its cyanide plant from 100 tons to 150 tons daily.

The Guadalupe Mines Company, Inde, Mexico, has under consideration the matter of installing a large reduction mill.

The Candelaria Mining Company, Santa Barbara, state of Chihuahua, Mexico, contemplates installing a 50-ton cyanide plant. George C. Hackstaff is manager.

It is announced that the American syndicate, headed by A. J. McQuatters of Dallas, Texas, which recently purchased the extensive mining, railroad and other holdings of the Hidalgo Mining Company, Parral, Mexico, will purchase a large amount of new machinery and equipment for the mines and mills.

The Rio del Oro Exploration Company, Placeres del Oro, state of Guerrero, Mexico, will install considerable mining machinery in order to carry on extensive development work on its properties in that district.

The Patombo Mining Company will install a 40-ton amal-

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gamation and concentrating plant at its mines in the Placeres del Oro district, state of Guerrero, Mexico.

The Compania de Madera de la Sierra, Llano Grande, state of Durango, Mexico, has just been granted a concession by the government of that state for the construction of a lumber mill of 190,000 ft. daily capacity, and the erection of factories for the manufacture of boxes, doors, sash, etc. The company is required to expend not less than $800,000 in the establishment of these industrial plants. A large amount of machinery will be purchased. The construction work must be commenced at once and the improvements finished within two years, under penalty of forfeiting the concession. The company will also install a hydroelectric plant to provide power for operating the mill and factories.

An irrigation enterprise of great magnitude is planned by a syndicate of San Antonio men which includes A. Y. Walton, Jr., Terrell Bartlett, Willis Ranney and Duval West. They have filed on all of the unappropriated waters of the Medina River and its tributaries in Texas, comprising a watershed of about 700 square miles. The syndicate will construct two large dams. The irrigation of approximately 150,000 acres of land is contemplated. A large amount of pumping machinery will be installed.

The City Council of Rush, Texas, is arranging for the construction of a water works system at a cost of $18,000.

Wortham, Texas, will award contracts in the near future for the construction of a water works system at a cost of $8,000.

The South

NASHVILLE, TENN., November 21, 1910.

The Tennessee Traction Company, of which W. K. Burton, Memphis, Tenn., is president, will start construction work early in the spring, and plans for the complete equipment of the line, including power machinery, are expected to be worked out during the winter. It is the intention to build from Memphis to Nashville, via Jackson, Tenn.

The proceeds of a bond issue of $30,000 are now available at Patterson, La., for the purchase of pumping machinery and other equipment needed in a modern system of municipal water works.

Ladshaw & Ladshaw, Spartansburg, S. C., have complete plans in hand for the construction of a large hydroelectric plant for the Nolachucky Power Company, work upon which will be well under way by spring.

A large new duplex pump has been installed in the municipal water works station at New Iberia, La., by the Platt Iron Works, Dayton, Ohio.

S. J. Warren & Co., Jacksonville, Fla., have been installing new equipment in their mill and will probably effect further improvements in the spring.

A new manufacturing plant will be established in or near Birmingham, Ala., by the Birmingham Frogless Switch Company, recently organized there, the officers of which are S. E. Risher, president; Charles T. Stacks, vice-president, and W. C. Hawkins, secretary and treasurer.

A saw mill, the equipment for which has been partially provided, will be built by the Dixie Coal & Lumber Company at Peavine, Tenn.

A traction line to be operated by electric power will be built for the Atlanta & Northeastern Railroad Company, recently organized in Atlanta, Ga., which will run as far as Cumming, Ga.

Bids will be taken until December 7 on equipment for the new water works system at Timmonsville, S. C., including a steam plant of 100 hp., fire service pump, air compressor, &c., together with a steel tower and tank. Specifications can be obtained by addressing the Commissioners of Public Works.

A new electric railway system will be built in Montgomery, Ala., and vicinity by the Alabama Traction Company, which has been organized by Chas. G. Abercrombie of that place and others. Plans for power equipment have not yet been definitely determined upon.

The Lexington Railway Company, Lexington, Ky., is having plans prepared for a new power house, details of which have not been completed.

The Northwest

ST. PAUL, MINN., November 21, 1910.

With the approach of winter there is more of a rush than ever to get construction work finished, machinery installed, heating plants in operation and other arrangements made in preparation for cold weather; consequently the efforts of contractors and dealers have been more largely given of late to the completion of work in hand than to the ordering or placing for future delivery of additional equipment.

Interests identified with the Great Northern Power Company, Duluth, are planning the construction of a new traction line traversing the iron ranges, to be known as the Mesaba Electric Railway. Oscar Mitchell, secretary of the Great Northern Power Company, is president of the new organization.

A new water works station is to be built at Eveleth, Minn., and a pumping unit of 2,000,000 gal. daily capacity purchased, together with other apparatus.

The contract for furnishing the new pumping engine to be installed in the municipal water works at Owatonna, Minn., has been placed with the Laidlaw-Dunn-Gordon Company, Cincinnati. Some additional equipment is to be purchased by or before spring.

A three-stage centrifugal pump has been ordered from the Byron Jackson Machine Works, San Francisco, Cal., for installation in the municipal pumping station at Red Wing, Minn.

Provision is being made for a system of modern water works at Ardmore, S. D., including a gas engine driven pumping unit and an elevated steel tank serving the distribution mains.

The Imperial Iron Works, Duluth, Minn., now has under way an addition to its plant 60 x 160 ft., which will considerably extend its facilities for production in the various lines of the company's activity.

The Missoula Copper Company, Wallace, Idaho, is erecting a new compressor building and repair shop. A large air compressor has been ordered and will be installed about January 1.

Equipment will be purchased within the next few months for the new electric line to be built by the Billings Traction Company, Billings, Mont. R. D. Long, general manager of the Muskogee Electric Traction Company, Muskogee, Okla., is one of the incorporators and will select the apparatus to be used.

The Athol Water & Light Company, Athol, Idaho, has been organized to establish a public service plant.

N. E. Wayland, Crawford Falls, Idaho, will install an electric power plant at Tamarack, Idaho, for a company now being formed there.

North Pacific Coast

SEATTLE, WASH., November 18, 1910.

With the large number of clearances this fall from ports on the North Pacific Coast and the consequent periods during which vessels from all parts of the world were lying at the various docks, there has been an amount of marine work which materially helps to swell the aggregate volume of business of the metal working industries. The only cloud upon the horizon has been the renewed threatening of labor troubles, which, however, were effectually averted before becoming serious.

The Lewiston-Clarkston Improvement Company, Clarkston, Wash., is about to enter upon the contemplated remodeling and enlargement of its power system, including the installation of additional steam-driven electric units.

The Seattle Car Mfg. Company, whose main offices are in the Alaska Building, Seattle, has had a large output this year of logging trucks and flat cars for use in transmitting timber. By another season its facilities will need to be considerably extended.

It is reported from Concully, Wash., that the Okanogan Irrigation & Improvement Company is planning heavy expenditures for development work in that section which will include the use of large pumping units, electrically operated.

The city of Centralia, Wash., has completed arrangements for the installation of a municipal power plant, including a battery of boilers and steam turbine sets aggregating 1000 kw. in capacity, together with auxiliary apparatus.

The Globe Mill Company, Globe, Wash., is planning to rebuild the plant recently destroyed by fire.

The Hunter Mfg. Company, Seattle, is making a feature of the manufacture of models and experimental work on machinery. A full line of engineers' supplies, instruments, &c., is also carried.

The Crook County Water, Light & Power Company, Redmond, Ore., is preparing to build a new electric generating plant in that vicinity by or before next spring.

An electric lighting plant is being installed by the Crown Lumber Company at its mills in Mukilto, near Everett, Wash., and other improvements are to be made later.

An engineer engaged by the city for the purpose has prepared plans and estimates for a system of municipal water works at North Bend, Ore.

The United Copper Company, Chewelah, Wash., has recently installed considerable new machinery, including an ore crusher, jig, air compressor, hoist, &c.

A manufacturing plant will be built at Chehalis, Wash.,

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by the Pacific Tank & Silo Company, recently organized, one of the incorporators of which is W. A. Bricker, of the Summit Mill Company, Seattle.

The Washington Water Power Company, Spokane, Wash., has completed at Wardner, Idaho, a new transformer station of 1500 kw., to furnish power for operating motors in the mine and ore handling plants of the Bunker Hill & Sullivan Mining Company.

Farther Central West

OMAHA, NEB., November 21, 1910.

Conditions all through this section of the country have become more favorable from one week to another, and the present month, taken in its entirety, can hardly fail to show an excellent aggregate of buying, both for present and future needs.

The installation of a pumping plant and modern system of water works is under consideration at Afton, Iowa. Gasoline engine or electric motor-driven units will probably be utilized.

The plant of the Oelwein Light, Heat & Power Company, Oelwein, Iowa, will be remodeled and enlarged, having been acquired by a newly organized company, of which C. B. Chambers, Oelwein, is an officer.

The Northwestern Zinc Company, Dubuque, Iowa, has started work on the foundations of a large concentrating plant at Day's Siding, Ill.

A hydroelectric plant will be constructed by the city of Gunnison, Colo., on the Gunnison River, for the operation of its power and pumping station, with consequent enlargement of both the lighting and water distribution systems now under the control of the municipality.

A new shaft house will be built and operating machinery installed by the Gilpin-Orion Coal Mining Company, Central City, Colo.

The authorities at Wynot, Neb., have had plans for a pumping plant and water works system prepared by Arnold C. Koenig, a consulting engineer of Omaha.

The Grasselli Chemical Company, Park City, Utah, is erecting a new mill, with a daily capacity of 125 tons, as an addition to its present plant.

The Chief Mining Company, Eureka, Utah, has installed a new hoisting plant and will enter upon further improvements a little later on.

Plans are now being completed by the W. K. Palmer Company, Kansas City, for a municipal power and pumping station at Norfolk, Neb.

The Farley-Loetscher Company, Dubuque, Iowa, is planning the erection of a branch manufacturing plant and warehouse at Des Moines, Iowa.

The construction of a municipal pumping plant is being urged at Massena, Iowa.

The Potthast Gas Machine Company, Greeley, Colo., has been incorporated with $100,000 capital stock. The company is considering the erection of a factory, but a definite location has not been decided upon. The company will manufacture a machine for making gas from low gravity gasoline for heating and lighting purposes.

Government Purchases

WASHINGTON, D. C., November 21, 1910.

Bids will be opened by the Constructing Quartermaster, Fort Leavenworth, Kan., December 5, for furnishing and delivering f.o.b. Fort Leavenworth, one 40 to 45 ton standard gauge locomotive.

The Paymaster General, Navy Department, Washington, will open bids December 6, under schedule 3072, class 51, for one locomotive wrecking crane schedule 3073, class 52, one swing lathe; class 53, two swing lathes; schedule 3074, class 55, one universal milling machine and one tool room engine lathe; schedule 3075, class 61, one vertical stranding machine.

Bids were opened by the Bureau of Supplies and Accounts, Navy Department, Washington, November 15, as follows:

Class 1.—Two Hartness flat turret lathes—Bidder 91, Jones & Lamson Machine Tool Company, Springfield, Vt., $1536; 176, Warner & Swasey Company, Cleveland, Ohio, informal.

Class 21.—Two steam deck winches—Bidder 78, Hyde Windlass Company, Bath, Maine, $800; 106, Lidgerwood Mfg. Company, New York, $769.50 and $803.70; 170, Williamson Brothers Company, Philadelphia, $625.

The Isthmian Canal Commission, Washington, opened bids November 11, under Canal circular 611 A, as follows:

Class 1.—Two 75-kw. motor generator sets—Bidder 7, Fort Wayne Electric Works, Fort Wayne, Ind., $5186; 8, General Electric Company, Schenectady, N. Y., $5110; 24, Westinghouse Electric & Mfg. Company, Baltimore, Md., $4371.

Class 2.—One turret lathe—Bidder 13, Manhattan Supply Company, New York, $2082.50 and $2567.50, parts extra; 14, Manning, Maxwell & Moore, New York, $2800 and $2500, parts extra; 16, Niles-Bement-Pond Company, New York, $4760 and $5162.

Class 3.—One milling machine—Bidder 2, Brown & Sharpe Mfg. Company, Providence, R. I., $2304.82, $2830.37 and $2610.87; 4, Cincinnati Milling Machine Company, Cincinnati, Ohio, $2364.65 and $2633.65, $2675.65, $2608.65, $2710.65, $2675.65 and $2790.65; 11, Ingersoll Milling Machine Company, Rockford, Ill., $3089; 14, Manning, Maxwell & Moore, New York, $2320 and $1890.

The Secretary of the Navy, Washington, opened bids November 12 for completing the power plant at the United States Naval Academy, Annapolis, Md. The various alternate bids are as follows:

The Camden Heating Company, Camden, N. J.—Item 1, $93,644; item 2, $21,500; item 3, $1325; item 4, $400, and item 5, $925. Albert & J. M. Anderson, Boston, Mass., $5310 for switchboard and $5425 for making certain changes; D'Olier Engineering Company, Philadelphia, Pa.—item 1, $36,293; item 2, $1800; item 3, $1350; item 4, $285, and item 5, $1300. John W. Danforth Company, Rochester, N. Y.—item 1, $92,481; item 2, $1700; item 3, $1300, and item 5, $1700. Evans Admiral Company, New York—item 1, $90,545; item 2, $1500; item 3, $1250; item 4, $60, and item 5, $1000.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Duty of Employer to Inspect Appliances.—The general rule with respect to the installation and use of a given machine or other article is that an employer discharges his duty of exercising ordinary care to provide a reasonably safe place to work if he buys the machine from a reputable manufacturer and uses ordinary care in inspecting it before using. But his right to assume that the appliance is safe is not absolute in the sense that it absolves from all duty of reasonable inspection, nor in any case does it relieve from an inspection as to defects discernible by superficial examination. In a suit against an iron works company for death of a workman caused by explosion of a valve in an air compression line, which was defective on account of blowholes in the iron, it was a question for the jury to decide whether the company would have discovered the defect by using ordinary care and whether ordinary care required an inspection of the interior of the valve, which was 12 in. long and 5 in. in diameter, and which was bought from a reputable dealer. The blowholes were concealed by the paint on the outside of the valve, but were visible on the inside when the seat was removed. The jury found for plaintiff.—United States Circuit Court of Appeals, Sixth Circuit, Boyle *vs.* Petroleum Iron Works Company, 179 Federal Reporter 433.

Form of Orders to Employees.—An order to a workman to do an act, as affecting the employer's liability for injury to him while doing it, need not be in set words; it may be inferred from any words or acts reasonably justifying an inference of such order.—Alabama Supreme Court, Republic Iron & Steel Company *vs.* Williams, 53 Southern Reporter 76.

Right of Workmen to Rely on Safety of Appliances.—A workman is entitled to rely upon the assumption that machinery and appliances furnished him by his employer are safe and suitable, and need not even use ordinary care to ascertain if they are so, but if he knows that they are not, or if it is obvious or apparent that they are not, and he uses them and is injured, he may be held, as a general rule, to have assumed the risk, or to have been guilty of contributory negligence, precluding recovery for the injury.—South Carolina Supreme Court, Dover *vs.* Mills, 68 Southeastern Reporter 525.

Liability for Injury to Machinist.—A machinist while operating a machine drill with unguarded cogwheels, and while inspecting the lower part of the machine, slipped without apparent cause, and thrust his hand into the cogwheels, resulting in injury. Held that the slipping on the floor, and not the unguarded condition of the wheels, was the primary cause of his injury, relieving the employer from liability for the injury.—New York Supreme Court, Appellate Division, Second Department, Valentine *vs.* Garvin Machine Company, 123 New York Supplement 959.

Presumption in Favor of Employees Killed.—In a suit against an employer for death of an employee in the line of his work, it will be presumed that decedent used ordinary care for his own safety, in the absence of a showing to the contrary.—Springfield, Mo., Court of Appeals, McMenamy *vs.* Scullin-Gallager Iron & Steel Company, 130 Southwestern Reporter 357.

Liability for Injury to Operator of Rivet Heater.—One employed in a boiler factory to heat rivets on an oil heater is entitled to recover from his employer for injuries caused

by the blowing out of a valve stem, which permitted burning oil to escape, igniting his clothing, unless he knew of the defective condition which caused the accident. The award of $22,895 was not excessive recovery since the employee's face, neck, chest and arms were badly burned.—Rhode Island Supreme Court, Carr *vs.* American Locomotive Company, 77 Atlantic Reporter 104.

Liability of Employer for Injuries Caused by Latent Defects.—An employer is presumed to know of defects in appliances furnished his workmen, though the defects be latent, requiring him to disprove such knowledge in a suit by an employee to recover damages for injuries caused by a defect.—South Carolina Supreme Court, Dixon *vs.* Chiquola Mfg. Company, 68 Southeastern Reporter 643.

Care Required of Foreman.—A foreman in a manufacturing establishment, on learning of the existence of electric currents in the ground where men are at work, caused by a defective wire, must, regardless of any other matter in which he is engaged, take immediate action to remove the danger. If he fails to do so and permits employees to continue their work there, the employer is liable for resultant injury to workmen.—St. Louis, Mo., Court of Appeals, Frazier *vs.* St. Louis Smelting & Refining Company, 130 Southwestern Reporter 485.

Liability for Negligence—Duty of Employer—Assumption of Risk by Employee.—It is negligence to omit to provide a device to prevent a belt shifting from a loose to a tight pulley, where such devices are generally used and no other reasonably safe means to prevent shifting have been adopted in the particular case. Where the operator of a machine is not required to keep it in repair he assumes such risks of injury from it as ordinarily prudent persons of his intelligence and occupation should appreciate. On the question whether an employee assumed the risk of injury from unguarded machinery, the nature of his previous employment, his mechanical experience, his opportunities to learn by observation and experience, the equipment employed to prevent the occurrence which caused the injury, and his knowledge respecting such matters should be taken into consideration.—Colorado Supreme Court, Kent Mfg. Company *vs.* Zimmerman, 110 Pacific Reporter 187.

Employer's Liability for Injury Caused by Defective Appliance.—An employer is not liable for injury caused an employee by a defective appliance, unless negligent in failing to discover and remedy the defect.—Alabama Supreme Court, Tennessee Coal, Iron & Railroad Company *vs.* Harmes, 52 Southern Reporter 827.

Liability for Injury Inflicted by Employee.—An employee, under the control and management of an independent contractor, was his employee, though the employee's wages were paid by an iron company with which the contractor had dealings, and hence the company is not liable for injury to another employee of the contractor caused by the first mentioned employee's negligence.—Alabama Supreme Court, Woodward Iron Company *vs.* Brown, 52 Southern Reporter 829.

Employee's Rights Respecting Appliances.—An employer must furnish reasonably safe appliances. An employee directed to use any one of several trucks was not bound to inspect the one selected.—Washington Supreme Court, Graaf *vs.* Vulcan Iron Works, 109 Pacific Reporter 1016.

Contributory Negligence.—A machinist cannot recover from his employer for injury caused by the running of an overhead crane over his hand while he was descending from the runway, where he placed his hand on the track of the crane and failed to notice the moving of the crane, and where the operator was under his direction and the direction of another employee, at whose instance the crane was moved.—United States Circuit Court, Eastern District of Pennsylvania, Gallagher *vs.* Worth Brothers Company, 179 Federal Reporter 1016.

Abandonment of Invention to the Public.—Where a device was in commercial use for more than four years before the inventor conceived an additional element and applied for a patent, the invention was abandoned to the public, so far as it embodied the device before that element was added.—United States Circuit Court of Appeals, Seventh District, Star Mfg. Company *vs.* Crescent Forge & Shovel Company, 179 Federal Reporter 856.

Employers' Liability Under Kansas Factory Act.—An establishment wherein railroad iron, old waste iron and scrap iron of every description is cut into lengths by means of alligator shears and operated by power, to meet standing specifications of mills which purchase the product, is a "manufacturing establishment" within the meaning of the factory act.—Kansas Supreme Court, Casper *vs.* Lewin, 109 Pacific Reporter 657.

Strike Insurance Contract.—A policy of insurance against loss on account of strikes by employees was based on an application which contained the question, "Are you a union shop, and, if so, how many and what unions do you recognize?" The answer was, "Only so far as the National Founders' Association and National Metal Trades Association." In answer to another question requiring insured, if it conducted a nonunion shop, to state the different lines of craftsmen employed and the number, insured stated that it was nonunion in certain departments, and gave the number of employees, and, in reply to a further question as to what national and local organizations it was a member of, gave the two first-named associations and their local branches. Held, the insured represented only that it was a union shop and recognized unions only through its membership in the two associations referred to, and not that it was no more a union shop than such associations. The insurance company having accepted and retained the premium, knowing that the conditions in the warranty in the application had not in fact continued throughout the entire period after the application, and, before delivery of the policy, it waived insured's failure to notify it of the changed conditions. The policy provided for an indemnity not exceeding $50,000 against all direct damage from suspension of operations caused by strike, and that, if a strike entirely suspended the production of goods, insurer should be liable for loss of net profits and for fixed charges, not exceeding $166 2-3 per day for each working day, and that, in case a strike prevented the making of a full daily average production of goods, insurer should be liable for that proportion of the net profits and fixed charges, which the production so prevented from being made "bears to the average daily product," not exceeding the amount insured. It further provided that the average daily product should be determined from the amount of goods last produced during a period of 12 months' full work previous to the day of the strike, and that losses should be computed from the day of the strike to such a time as insured should be able to produce the former daily average, &c. Held, that in case of partial suspension of operation the net profits of the preceding year furnished the basis of estimate, as in case of entire suspension, and that insurer was liable for such proportion of the net profits and fixed charges as the production prevented bore to the average daily production.—Connecticut Supreme Court of Errors, Buffalo Forge Company *vs.* Mutual Security Company, 76 Atlantic Reporter 995.

Iron and Industrial Stocks

NEW YORK, November 23, 1910.

The stock market has displayed considerable strength and prices of securities have steadily moved upward from the time of last week's report. The advance was especially noteworthy in Can preferred, Bethlehem preferred, Pump common, Steel common and General Electric. The quiet condition of the iron trade is apparently without effect on those interested in stock market movements. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis Chalm., pref.	32 - 34	Railway Spr., com.	34½ - 36
Beth Steel, com.	32 - 33	Railway Spr., pref.	97⅞
Beth. Steel, pref.	60⅝ - 63	Republic, com.	33⅝ - 35¼
Can. com.	96⅛ - 105⅞	Republic, pref.	97½ - 98
Can. pref.	75⅞ - 82¼	Sloss, com.	51 - 52
Car & Fdry. com.	54½ - 55⅞	Pipe, com.	16 - 17½
Car & Fdry. pref.	111½-115	Pipe, pref.	58 - 58¾
Steel Foundries	47¼ - 48¼	U. S. Steel, com.	78⅞ - 81⅝
Colorado Fuel	34 - 36⅜	U. S. Steel, pref.	117⅝-118¾
General Electric	153 -156½	Westinghouse Elec.	71 - 73
Gr. N. ore cert.	59½ - 60⅝	Am. Ship, com.	78
Int. Harv., com.	112 -113½	Chi. Pneu. Tool	101 - 104¾
Int. Harv., pref.	121¾	Cambria Steel	43 - 44½
Int. Pump, com.	12 - 15	Lake Sup. Corp.	23½ - 28
Int. Pump, pref.	84⅜- 85¾	Pa. Steel, pref.	104½-105
Locomotive, com.	39 - 40¾	Crucible St., com.	125⅞ - 133¾
Locomotive, pref.	136⅜	Crucible St., pref.	78 - 79⅞
Pittsburgh St., pref.	100½-101	Harb.-W. Ref., com.	32 - 32¼
Pressed St., com.	32½ - 35	Harb.-W. Ref., pref.	95
Pressed St., pref.	96 - 96⅞		

Dividends.—The American Brake Shoe & Foundry Company has declared the regular dividends of 7 per cent. per annum on the common and preferred stocks, payable in quarterly installments of 1¾ per cent. The first quarterly payment is due December 31.

The Ingersoll-Rand Company, 11 Broadway, New York, has acquired an important addition to its manufacturing interests in the purchase of the property and business of the A. S. Cameron Steam Pump Works, whose plant is located at the foot of East Twenty-third street, East River, New York. The pump company is enjoying an active trade and its plant is running on full time.

The Carnegie Steel Company has established a suboffice in Syracuse, N. Y., at 608 Kirk Building, to be under the general supervision of the Buffalo sales office. This company also has a salesman located in Rochester, reporting to the Buffalo district office.

Trade Publications

Oil Engine.—De La Vergne Machine Company, foot of East 138th street, New York City. Bulletin No. 101. Illustrated. Gives general description and specifications for the type F H De La Vergne oil engine. This new model is said to possess the mechanical perfection of the company's H A engine and to excel in thermal efficiency any practical engine heretofore obtainable.

Insulating Materials and Packings.—Robert A. Keasbey Company, 100 North Moore street, New York City. Catalogue. Calls attention to a line of pipe and boiler coverings made from insulating material containing 85 per cent. of magnesia, the remainder being asbestos and cork. These include sectional and block coverings, asbestos molded sectional coverings and blocks, air cell covering and board constructed of successive layers of corrugated asbestos paper with intermediate air spaces, &c.

Vises and Machinists' Tools.—Athol Machine Company, Athol, Mass. Catalogue No. 30. Size 4¾ x 7 in.; pages 80. Illustrated. Lists a number of different styles of vises, grindstones and bench grinders and machinists' tools, such as calipers, dividers, steel rules, straight edges, squares, bevels, screw pitch gauges, wrenches, clamps and levels.

Grinding and Polishing Machinery and Engines.—J. C. Born & Brother Machine Works, Belleville, Ill. Catalogue. Illustrated. Lists a line of grinding and polishing machines and horizontal and vertical engines. These machines are so designed that they may be driven by a belt from an overhead countershaft, or if desired the belts can be run up through the columns from below. The vertical engines are built in four sizes ranging from 4 to 10 hp, and the horizontal models in three sizes ranging from 20 to 40 hp.

Iron Pipe and Sugar Mill Machinery.—Reading Iron Company, Reading, Pa. Three circulars. List various sizes and shapes of iron manufactured by this company, wrought iron pipe, line and drive pipe, lap welded well casing and boiler tubes, with tables giving the weights and thicknesses of the different sizes. The last circular shows a nine-roller sugar cane mill and crusher driven by one engine.

Couplings.—Falls Rivet & Machinery Company, 206 Fulton street, New York. Folder. Illustrated. Covers a line of patent compression couplings. The various types include single and double compression flange couplings and two styles of compression clutch shell couplings. The special advantages claimed for these couplings are that keys and their seats are done away with, the shafts do not have to be centered if there is a slight variation in diameter, facing the couplings is eliminated and a gripping power is obtained which it is stated will break the shaft before slipping takes place.

Power Pumps.—The Buffalo Steam Pump Company, Buffalo, N. Y. Catalogue No. 229. Size 6 x 9 in.; pages 64. Illustrated. Concerned with a line of single, duplex and triplex power pumps for general water supply, boiler feeding, tank work, mine pumping, &c. Space is also given to a triplex hydraulic pump, triplex automatic house pump and starting devices, valves, gauges, revolution counters and pressure regulators.

Feed Water Heater.—National Pipe Bending Company, 156 River street, New Haven, Conn. Booklet. Treats of the National feed water heater for boilers from 5 to 4000 hp., which consists of one or more coils of seamless drawn tubing inclosed in a cast iron or steel shell to which exhaust steam is admitted, heating the water as the latter passes through the tubing. Directions for erecting the heater and its use in condensing steam plants are included.

Electric Motors and Motor Driven Machines.—The Mechanical Appliance Company, Milwaukee, Wis. Two pamphlets and a bulletin. Illustrated. The first is devoted to the type K induction motors, the special features of which are high starting and pull out torque, liberal overload capacity, low temperature rise and good speed regulation. The second pamphlet calls attention to the Watson grinders and buffers, which have been developed to meet the call for medium sized equipments. The machines making up this line are a pedestal grinder, a bench buffer and a bench grinder. Bulletin R-1 describes the Ajax electric riveting machines, which were illustrated in *The Iron Age* July 14, 1910.

Reflectors and Shades.—H. G. McFaddin & Co., 33 Warren street, New York City. Pamphlet. Refers to a line of reflectors and shades for electric, gas and kerosene fixtures made of a special material called Emeralite, which consists of a pure white opal glass plated outside with a rich emerald green glass, the two being carefully annealed. The results are included of comparative tests made with an Emeralite reflector and a prismatic extensive shade on a 60-watt, 110-volt Madza lamp, in which the former showed a higher efficiency.

Bell Ringing Transformers.—Edwards & Co., Exterior and 140th streets, New York City. Folder. Refers to a line of self-contained transformers for operating small bells, annunciators and door openers from electric lighting circuits, thus avoiding the use of small dry batteries. They are made with a laminated steel core and the insulation is tested with an alternating current of 2500 volts, the whole being encased in a japanned iron shell.

Electrical Machinery and Appliances.—Crocker-Wheeler Company, Ampere, N. J. Four bulletins. No. 120, superseding No. 100, contains considerable useful information on direct current motor design and more especially regarding the company's form I machines. No. 122, superseding No. 101, deals with the form D belt type direct current machine and describes the special features of its design, which are the construction of the magnet frame, the armature and commutator, the design of the field coils and the arrangement of the brush rigging. No. 123, superseding No. 89, refers to a line of adjustable speed motors, which range from ½ to 32 hp. No. 125 is concerned with the Remek transformers for light and power service.

Automatic Hydraulic Vacuum Pump.—Bishop & Babcock Company, Cleveland, Ohio. Folder. Calls attention to its Reliable automatic hydraulic vacuum pump, and shows how existing heating systems, either steam or hot water, can be converted into a practical and efficient vacuum system by this pump.

Pipe Vise and Bender.—Dandy Specialty Mfg. Company, 565 Van Buren street, Chicago, Ill. Folder. Deals with a combination pipe vise and bender. The jaws are curved at the ends so that the pipe can be easily bent without kinking.

Structural Steel.—Belmont Iron Works, Twenty-second street and Washington avenue, Philadelphia, Pa. Loose leaf catalogue. Contains a number of reproductions of photographs illustrating some of the various classes of work which this firm has designed, fabricated and erected. Among the contracts illustrated is the underbody shop of the Harlin & Hollingsworth Corporation, Wilmington, Del., which was illustrated in *The Iron Age* December 9, 1909.

Zinc Ore Separating.—The American Zinc Ore Separating Company, 55 Congress street, Boston, Mass. Pamphlet. Refers to the separation of zinc from complex sulphide ores and especially that known as blackjack. Various methods for handling the different kinds of ores are described.

Lifting Magnets.—The Cutler-Hammer Clutch Company, Milwaukee, Wis. Folder. Relates to the first magnet made by this company, which was shipped in February, 1907, to the Donora Works of the Carnegie Steel Company. An illustration shows the magnet lifting 2080 lb. of sand cast manganese iron pigs, which is claimed to be the record at the time this magnet was sold. The special features of the present type of Cutler-Hammer lifting magnet are briefly touched upon. A short description of the original magnet appeared in *The Iron Age* September 26, 1907.

Feed Water Heater.—W. D. Garrett & Co., 136 Liberty street, New York City. Folder. Illustrated. Deals with the Garrett exhaust muffler, oil separator, return tank filter and feed water heater, which combines in one all the essential features of five separate appliances formerly used.

Boilers and Grates.—James Beggs & Co., 109 Liberty street, New York City. Two illustrated catalogues. Special catalogue No. 30 pertains to the Directurn horizontal return tubular steam boiler. The other catalogue describes the McClave grate for burning all grades of hard or soft coal under boilers and the Argand steam blower for furnishing blast to burn the cheaper grades of hard and soft coal.

Aerial Wire Rope Tramways.—Broderick & Bascom Rope Company, St. Louis, Mo. Catalogue. Illustrated. Points out the advantages of using the B. & B. automatic loader system of aerial tramways of the continuous double rope type, in which the buckets or carriers are permanently attached to an endless rope moving constantly in the one direction. The carriers in which the material is transported travel on parallel stationary track cables supported at intervals by intermediate towers, and the motion is transmitted to them from the small endless pulling rope to which they are attached by a patented tramway clip. The buckets are automatically loaded at the loading station, and upon arriving at the discharging station the bucket engages a tripping device which automatically releases the bucket latches, allowing the load to be discharged.

Oil Cups.—The Economy Oil Cup Company, Montgomery Building, Augusta, Ga. Pamphlet. Devoted to the Economy oil cup for lubricating electric and street railroad cars. *The Iron Age*, August 4, 1910, contained an illustrated description of this oil cup.

Brick Press.—Chisholm, Boyd & White Company, Fifty-seventh and Wallace streets, Chicago, Ill. Catalogue No. 20. Illustrates the Boyd brick press and accessories for the manufacture of pressed brick and also contains a few suggestions concerning the design and the equipment of brick plants. These presses are made in three styles, using 2, 4 and 6 molds, respectively, and having outputs of 10,000, 20,000 and 30,000 bricks per day. Space is given to a self-contained dry pan and a clay mixer and feeder.

Horizontal Center Crank Engines.—B. F. Sturtevant Company, Hyde Park, Mass. Bulletin No. 182. Illustrated. Describes a type of horizontal center crank engines which were originally designed for direct connection to the fans and elec-

tric generators built by this company and embody a number of special features in their design and construction. They are built for both throttling and automatic regulation for high, medium and low pressures, and are capable of continuous operation for long periods with but little attention.

Pneumatic Hammer Drills.—Sullivan Machinery Company, 150 Michigan avenue, Chicago, Ill. Bulletin No. 60-D. Illustrated. Pertains to the Sullivan hammer drills for mining and construction work. Shows the DA-21 air feed stoping drill, which is designed for use where the holes point upward and the cuttings run from the holes by gravity, and the DB-15 and the DB-19 hand drills. The advantage claimed for these drills is high speed

Electrical Machinery.—The General Electric Company, Schenectady, N. Y. Three illustrated bulletins. No. 4774, superseding No. 4534, deals with centrifugal air compressors for industrial air blast and exhauster service with pressures ranging from 0.75 to 4 lb. per sq. in. and capacities from 500 to 36,000 cu. ft. of free air per minute. No. 4775 describes the type KS single-phase induction motors, designed for establishments which can secure only single-phase current. In general this motor is adapted to drive geared and belted machinery requiring constant speed with light or moderate starting torque. No. 4776 refers to the RB and RBO type for direct current generators for two and three wire systems.

Pulverizing Machinery.—The Raymond Brothers Impact Pulverizer Company, 520 Laflin street, Chicago, Ill. Catalogue No. 10. Illustrations and descriptive matter explain the operation of a line of pulverizing machines which will handle a great variety of material ranging from hay and bark to cement, zinc and marble.

Wire Rope Tramway.—A. Leschen & Sons Rope Company, 920 North First street, St. Louis, Mo. Illustrated pamphlet. Size 8½ x 11½ in.; pages 28. Relates to an aerial rope tramway carrying zinc ore from a point in Coahuila, Mexico, a distance of six miles, and delivering it in Texas. This tramway is of the builder's special automatic type and was adopted as the only practicable method of working the Mexican property, which was located about 100 miles from the nearest railroad, while the country lying between was of such a character as to make it impracticable to pack the ore on burros or handle it by any other means of transportation.

Belt Dressing. — Cling Surface Company, 1032 Niagara street, Buffalo, N. Y. Circulars. Deal with the use of Cling-Surface for keeping leather and cotton belts and rope pliable and waterproof, preventing all drying or cracking and stopping the slipping of the belts. A notable Australian installation where this compound was used to enable an English system rope drive to deliver its maximum horsepower even though the slack portions have sagged and run between the driving ropes was illustrated in *The Iron Age* January 27, 1910.

Draft Gear.—The T. H. Symington Company, Baltimore, Md. Catalogue A. Illustrated. Concerned with the Farlow draft gear, the fundamental idea of which is to eliminate the coupler yoke and rivets and at the same time provide a direct distribution of the pulling and buffing shocks to the car underframing at six or eight places, instead of concentrating the stress at two points on the center sills.

Air Compressors.—The Platt Iron Works Company, Dayton, Ohio. Bulletin No. 549. Illustrated. Describes the Smith-Vaile air compressors for operation either by direct connection to steam engines or by belting. Brief specifications of the various compressors making up the line are included and space is given to a number of pumps for different uses.

Woodworking Machinery.—The Ober Mfg. Company, Chagrin Falls, Ohio. Catalogue. Shows a number of lathes for turning odd shapes, sanders, shapers and other woodworking machines. Two types of sanders are described and space is given to a number of saws and a combination boring and chucking machine.

Mine Cars and Wheels.—Heckensmith Wheel & Mine Car Company, Penn Station, Pa. Catalogue. Describes and illustrates a line of mine car wheels and a number of different types of cars. Space is also given to various mining and mine car accessories.

Windmill and Pumps.—Baker Mfg. Company, Evansville, Wis. Catalogue No. 39. Size 5½ x 7¾ in.; pages 164. Illustrates the Monitor line of windmills, steel towers, pumps and gasoline engines. The windmills are made with both steel and wood vaneless wheels for pumping and power purposes. The different style of towers include three and four post windmill towers and four-post towers for tanks. The line of pumps includes lift and force pumps, underground force pumps, windmill regulating pumps and a number of small types for household use. The gasoline engines are of the four-cycle type and are intended for use in connection with pumps, feed grinders and saws.

Unions.—The E. M. Dart Mfg. Company, 136 Clifford street, Providence, R. I. Folder. Illustrated. Refers to a number of different types of unions and flanges, which are made in all the usual styles. The special features are the use of two bronze seats to prevent corrosion and malleable iron pipe ends and nuts to secure strength and durability.

Clutch Pulleys and Cut-off Couplings.—Allis-Chalmers Company, Milwaukee, Wis. Pamphlet No. 4023. Deals with the Allis-Chalmers friction clutch, which is made in sizes adapted for use in any place where power is employed. The special features of the clutches, such as ease of adjustment, maximum power transmission, freedom from repairs and continuous service, are discussed.

Flare Lights. — International Marine Signal Company, Ltd., Ottawa, Canada. Pamphlet. Describes and illustrates the Willson flare light, which burns acetylene gas and is especially designed for use in connection with all kinds of outdoor construction work and also in mines and tunnels. The different sizes of light are shown and instructions are given for its operation.

Friction Clutches and Couplings. — American Twist Drill Company, Laconia, N. H. Catalogue No. 20. Illustrates the Worrall friction clutches, pulleys and couplings, which are built on the principle of a solid flange coupling with the additional advantage of instant connection and disconnection in a number of sizes transmitting from 1 to 2000 hp. The construction of the clutch is described at length and directions given for its operation. Space is also given to an improved friction countershaft and a jack and quill shaft.

Automatic Dovetail Glue Jointer. — Linderman Machine Company, Muskegon, Mich. Bulletin. Describes the operation and advantages of using an automatic dovetail glue jointer, which combines all the operations necessary to complete a piece of work, including sizing the finished panel to the correct width.

Emery Wheel Machinery.—Joseph T. Ryerson & Son, Sixteenth and Rockwell streets, Chicago, Ill. Illustrated catalogue. Relates to a line of emery wheel machinery which includes bench and stand grinding machines, wet tool grinders, an automatic planer knife grinder and two styles of buffing lathes. In addition to the descriptions of the machines, space is also given to a discussion of the characteristics of emery wheel machinery and the use of emery wheels.

Valves.—Eddy Valve Company, Waterford, N. Y. Catalogue C. Size 5¼ x 8½ in.; pages 302. This is the company's 1910 catalogue, describing and illustrating gate valves, sluice gates; check, foot and air valves, indicator posts, filtration specialties, and fire hydrants. The gate valves have either taper or parallel seats and are suitable for light, medium, heavy, extra heavy and hydraulic pressures.

Foundry Supplies.—J. S. McCormick Company, 2428 Railroad street, Pittsburgh, Pa. Circulars. Concerned with various foundry supplies, such as rapping plates, lifting screws, fillets, gaggers, shop pans, tote boxes and steel barrels.

Personal

Benjamin Talbot, Middlesbrough, England, is making a business trip to the United States.

Wilhelm Ohl, who is connected with the Allgemeine Elektricitäts Gesellschaft, Berlin, Germany, has returned home after a tour of the United States occupying several weeks.

Paul Koning has resigned as president of the New York Metal Exchange, and Vice-President James E. Pope will be acting president until the next annual election. Mr. Koning has been resident partner in New York of Brandeis, Goldschmidt & Co. of London. He will leave for Europe shortly to represent important American metal interests.

Capt. Godfrey L. Carden, who has been in the Behring Sea patrol service since early in the year, commanding the United States steamer Manning, is in New York and Washington on a brief leave of absence.

Walter Brinton, superintendent of the manganese steel department of the Taylor Iron & Steel Company's plant at High Bridge, N. J., since 1895, has resigned, and has become consulting engineer for the Edgar Allen American Manganese Steel Company, which is manufacturing manganese steel at Chicago Heights, Ill., and at New Castle, Del. Mr. Brinton's headquarters will be at the New Castle plant.

Charles M. Jarvis has been elected president of the American Hardware Corporation, New Britain, Conn., to succeed the late Philip Corbin. Charles H. Parsons has been elected to succeed Mr. Jarvis as first vice-president. Mr. Jarvis was largely instrumental in the organization of the corporation in 1902. He had been for a number of years president of the Berlin Iron

Bridge Company, and later was vice-president of the American Bridge Company. Mr. Parsons has been connected with P. & F. Corbin for over 37 years, and has been second vice-president of the American Hardware Corporation. Philip Corbin, Jr., grandson of Philip Corbin, has been elected a director of the American Hardware Corporation.

Andrew Carnegie, according to an announcement made by President Frew of the Board of Trustees of the Carnegie Technical Schools at Pittsburgh, celebrated his seventy-fifth birthday last week by giving $3,500,000 to that institution. Of this amount $1,500,000 will be at once available for buildings, while $2,000,000 will be applied to endowment.

D. H. Creider, formerly in charge of the employing bureau of the Westinghouse Companies, Pittsburgh, Pa., has been elected secretary of the Manufacturers' Association of Pittsburgh.

Chas. M. Bigger, formerly with the Firth-Sterling Steel Company, has been appointed sales manager at Cincinnati, Ohio, for the Vanadium Alloys Steel Company, Latrobe, Pa., manufacturer of Red Cut high speed steel, and has opened offices in the Mercantile Library Building.

F. G. Bolles, commercial engineer of the Allis-Chalmers Company, has resigned to devote his entire attention to the Reliance Engineering & Equipment Company, 1417-19 Majestic Building, Milwaukee, Wis., in which he has an equal interest with C. A. Tupper and others. The company, which is taking on a number of additional exclusive agencies, will remove December 1 to offices 415, 416 and 417 Engineering Building, and considerably extend the scope of its operations.

R. B. Shaw has been appointed Cleveland, Ohio, manager of Hill, Clarke & Co., of Chicago, machinery merchants, to succeed S. E. Hale, who recently resigned to engage in a manufacturing business in Detroit. Mr. Shaw was formerly connected with Hill, Clarke & Co., but more recently has been sales manager of the machinery department of the Davis Sewing Machine Company, Dayton, Ohio.

Obituary

CHARLES E. PEASE, president of the Buckeye Iron & Brass Works, Dayton, Ohio, since its organization in June, 1876, died November 8, aged 74. As a young man he worked in a machine shop at Dayton, and from the shop entered the University of Wisconsin. Leaving school in 1859 he returned to Dayton to assist his father in the management of a flour mill. Later he engaged in a similar enterprise with his brother. A residence of several years in the South was followed by his return to Dayton in 1870, when he purchased an interest in the metal working firm of Hoglen & Griffen, which afterward became Hoglen & Pease. The firm continued until 1876, when Mr. Pease purchased his partner's interest. The Buckeye Iron & Brass Works, which was then formed, has developed into one of Dayton's prominent industries. For 12 years Mr. Pease was a member of the Dayton City Council. He is survived by his widow and a son, Edward Pease.

RALPH S. BUCK, vice-president and manager of the Bridge & Beach Mfg. Company, St. Louis, Mo., died November 11, aged 50 years. He was the son of Charles H. Buck, the founder of the Buck's Stove & Range Company, and entered the employ of his father's firm in 1877, being elected vice-president four years later. He resigned in 1888 and became identified with the Bridge & Beach Mfg. Company. In 1899 he was elected second vice-president of this company and later vice-president and manager. At the time of his death he was chairman of the Executive Board of the National Association of Stove Manufacturers and a member of the Conference Committee of the Stove Founders' National Defense Association.

HARRY B. HUMPHREY of Humphrey & Sons, Joliet, Ill., manufacturers of wire mill machinery, well known in the Western foundry and machinery trades, died November 15, aged 46 years. He was shot in the latter part of October while guarding employees of his firm against rioting molders who were on a strike.

EDWIN J. HULBERT, who died recently at Rome, Italy, was a prominent figure in Lake Superior copper mining for many years. He was the discoverer of the Conglomerate lode and originally purchased from the Government the property now owned by the Calumet & Hecla Mining Company. He put down the first successful vertical shaft in the Lake Superior copper district, and was in many respects a remarkable miner. Owing to financial reverses he left the copper country and had lived in Italy for 30 years. He was born in 1829.

HARRY B. HUMPHREY, president of Humphrey & Sons, Joliet, Ill., died November 14, as the result of a bullet wound which he received October 25. He was born in Joliet, May 3, 1864, and when of sufficient age began work in his father's foundry and machine shop. In 1882 the father, Horace Humphrey, gave a third interest to each of his two sons, finally retiring in 1889. In recent years Harry B. Humphrey has been interested in the development and improvement of wire drawing benches and other equipment for the manufacture of wire products. On account of a strike in the shops the company was having difficulty with union pickets representing the Iron Molders' Union, and while protecting a party of workmen and escorting them to their homes Mr. Humphrey was wounded by one of the pickets. He leaves a widow, two sons and a daughter.

IRVING M. BEAN, one of the leading iron men of the Northwest, died at his home in Milwaukee, Wis., November 20, aged 72 years. He had been president of the Northwestern Iron Company about 40 years, and was also president and principal owner for a number of years of the Spring Lake Iron Company. Captain Bean was born in Essex County, N. Y., April 27, 1838, the family removing to Milwaukee in 1840. He was educated in Milwaukee schools and graduated from Carroll College. He attended law school at Poughkeepsie, N. Y., and was admitted to the bar in that State in 1860. Returning to Milwaukee in that year he began the practice of law, but continued only a few months until the outbreak of the Civil War. He enlisted as a private in the Fifth Wisconsin Infantry, but was soon appointed captain and served through the Peninsular campaign. Two brothers who enlisted with him lost their lives in the war. Returning to private life, he was elected president of a bank. In 1867 he became president of the Northwestern Iron Company, Mayville, Wis., an old charcoal enterprise, which was converted into a coke furnace. He disposed of his interest and retired about three years ago. His father had been the president of the Milwaukee & Lacrosse Railroad, one of the first important railroads built in Wisconsin. He was married in 1868, and his wife died in 1885. He leaves two sons and a daughter.

CHARLES H. TUCKER, secretary and treasurer of A. Leschen & Sons Rope Company, St. Louis, who died in Clifton Springs, N. Y., October 30, had been identified with the wire rope industry for 26 years. He was born in New York City 50 years ago. His first employment was with the Western Union Telegraph Company, and later he engaged in newspaper work. He entered the New York office of John A. Roebling's Sons Company in the eighties, growing steadily in that service until 1898 when he went with A. Leschen & Sons Rope Company, with whom he remained until his death.

A Pennsylvania Tribute to John Fritz

The Elliott Cresson Medal Presented to Him at a Dinner Given by the Manufacturers' Club of Philadelphia

Honor heaped upon honor has been the portion of John Fritz of Bethlehem, in a way that has been the lot of no other man among two generations of leaders in the American steel trade. The celebration of his seventieth birthday at South Bethlehem, Pa., in 1892, and of his eightieth birthday at New York in 1902 are well remembered, for they brought together two distinguished companies of engineers and manufacturers. The Bessemer Medal and the John Fritz Medal have expressed in lasting form the deliberate judgment of the engineering world concerning the place he has taken as a man and a worker. And now, added to all the rest, his own State of Pennsylvania has paid him a tribute that will long be memorable.

It was with the thought of making a distinctively Pennsylvania expression of regard for him that the Manufacturers' Club of Philadelphia recently asked Mr. Fritz to be the guest of honor at a dinner to be given at the club Thursday evening, November 17. What was intended as a tribute of the State and the locality broadened until the participants included a goodly number of Mr. Fritz's friends in the iron trade beyond the bounds of Pennsylvania, the company numbering about 175. The reception before the dinner showed to many who had not seen him in years that "Uncle John" Fritz bears remarkably the weight of his more than 88 years and of physical and mental labor that were literally herculean. Only a special endowment of vitality could have carried him through the successive functions which the enthusiasm of his friends has made such a conspicuous and heartening feature of his years of retirement.

Seated beside Mr. Fritz at the speakers' table was another Pennsylvanian to whom the iron industry of the country owes much—James M. Swank, general manager of the American Iron and Steel Association. Because of the large number of participants in the dinner some of the guests were given places in a room apart from the banquet hall. That the guest of the evening might have some part in the good cheer of this second party he was escorted from one room to the other in the midst of the dinner, his guide being a modern personator of Vulcan, whose entrance was announced by a herald. Mr. Swank was similarly piloted to the detached banquet room and presented to his friends there. For the after dinner programme all the guests found places in the main hall.

On the menu souvenir was the accompanying résumé of important events in Mr. Fritz's life.

JOHN FRITZ

1822—August 21, born in Chester County, Pennsylvania.
1838—Apprenticed to the blacksmithing trade.
1846—Employed by the Norristown Iron Works.
1851—September 11, married Ellen Maxwell.
1854-60—Chief engineer and superintendent of the Cambria Iron Works, Johnstown, Pa. During this time Mr. Fritz invented the three high rolls.
1860—Built the Bethlehem Iron Company Works, of which he was general superintendent.
1892—Celebration by iron and steel interests at Bethlehem, Pa., of Mr. Fritz's seventieth birthday.
1893—Made an honorary member of the Iron and Steel Institute.
1894—November 8, awarded the Bessemer gold medal by the Institute, at Sherry's, New York.
1896—Presidential Elector on the Republican ticket.
1902—October 31, mining, civil, electrical and mechanical engineering societies tendered him a banquet at the Waldorf-Astoria, at which they created the John Fritz medal.
1906—June 13, Stevens Institute conferred degree of doctor of mechanics.
1910—November 17, banquet by the Manufacturers' Club of Philadelphia.

Mr. Fritz ran one of the first Baldwin locomotives from Parkesburg to Downington, Pa.

Presentation of the Elliott Cresson Medal

Nathan B. Folwell, president of the Manufacturers' Club, introduced the speaking programme, presenting first John Birkinbine, who told in an entertaining way the story of the celebration of Mr. Fritz's seventieth birthday at South Bethlehem, Pa., September 28, 1892, when he was tried by the assembled engineers for "practicing engineering with a country school education as a basis." The trial ended in a verdict that "John Fritz was guilty of all the good things which had been stated concerning him," and sentencing him to "time"—a handsome cathedral chime clock being presented. Turning to some of the great developments in mechanical and metallurgical engineering which had come in the span of Mr. Fritz's life, the speaker said:

INDUSTRIAL CHANGES IN ONE LIFETIME.

Do we realize that the span of 88 years, which has been allowed John Fritz, covers the industrial and transportation development of the country and much of that of other nations; that the settled area of the then United States (in 1820) was 500,000 square miles (equal to Alaska), supporting a population of 11,000,000, while continental United States now has 3,000,000 square miles, settled by nearly 100,000,000 people? In Fritz's childhood the first railroads in the United States were laid, short lines whose rails were wood scantling capped with strap iron; and he passed his majority before the pioneer iron rail was rolled in this country. He was eight years of age when the first American locomotive, weighing six tons, was put in service; but he has seen the transportation system developed until the United States is gridironed by 334,000 miles of railroad, exclusive of what we recognize as trolley systems, and our steel works are turning out 3,000,000 tons of steel rails a year (many weighing 80 to 100 pounds per yard), while the locomotive industry has grown until one works, our "Baldwin," finished 2,666 in one year, some weighing with tenders as much as 300 tons each.

His earliest knowledge of iron production was of charcoal blast furnaces, stone stacks, located in or adjacent to forested areas for a supply of charcoal. They operated by cold blast furnished by wooden blowing tubs whose leather jacketed pistons received motion from weary water wheels and woke the forest echoes by their mournful screeching. The ore, dug near by, the flux and the charcoal were hauled by wagons or carts to the furnace, and the product of two or three tons per day reached distant markets by animal transportation. He was familiar with the forge, the refinery and slitting mill, also the early manufacture of nails by hand, and has seen all of the steps by which the iron and steel industry of the United States has developed to proportions greatly in advance of any other nation, and our per capita is also greater. Mr. Fritz is personally responsible for some of the wonderful mechanical appliances used to make this result, this dinner and other testimonials being recognitions of the leading part he has borne in the development of a great industry.

THE FOUNDATION OF THE MEDAL.

Referring then to the organization of the Franklin Institute in Philadelphia 86 years ago "for the protection of the mechanic arts," Mr. Birkinbine said that its unexcelled technical library, its lecture courses and its night schools have done much for the advancement of the nation. At the celebration of its seventy-fifth anniversary in 1899, John Fritz presented a paper on the

"Development of Iron Manufacture in the Past Seventy-five Years." He then continued:

One of the special features which has been maintained throughout the existence of the Franklin Institute is the encouragement of invention and effort through a Committee on Science and the Arts, which after careful and thorough consideration awards diplomas of merit, or medals where these appear to be justified. The committee on its own initiative, after reviewing the work of John Fritz, has awarded to him the Elliott Cresson gold medal and a diploma—its highest prize—and as past president of the Institute it is my proud privilege to present these to our honored guest.

The Franklin Institute awards the Elliott Cresson Gold Medal under the provisions of the deed of trust from Elliott Cresson of the city of Philadelphia, dated February 18, 1848, on the recommendation of its Committee on Science and the Arts. This medal is to be awarded "either for some discovery in the arts or sciences, or for the invention or improvement of some useful machine, or for some new process or combination of materials in manufactures, or for ingenuity, skill, or perfection in workmanship."

The number of these medals which have been so far awarded is limited, and John Fritz is in very good company as one of the few who have received this recognition. The basis on which the award is made, as set forth in the diploma, is "for distinguished leading and directive work in the advancement of the iron and steel industries." We all agree that the award is well merited, and I am sure that the Franklin Institute medal will be prized by the recipient as a fit companion to the Bessemer medal and the Fritz medal, of which he is the worthy possessor.

Mr. Fritz's Response

President Folwell introduced Col. W. F. Donovan as the toastmaster of the evening, and Colonel Donovan told how as a salesman he once went to Bethlehem to sell Mr. Fritz "something I, young and inexperienced, knew he needed, but he, being experienced, know he didn't." The toastmaster then presented Mr. Fritz, who was given a resounding ovation. Using manuscript, he read that portion of it which made acknowledgement of the honor done him by the participants in the dinner. He then passed the address to Robert W. Hunt, Chicago, who finished the reading. Mr. Fritz said at the outset:

I appreciate fully this kindly manifestation of your esteem. It gives rise to feelings of emotion, which carry me back to my youth when I was working on the farm from daylight until dark, bare footed, as was the custom at that time, driving the cattle into the yard, milking the cows, feeding or working the oxen. In the fall of the year we would stand on the ground where the cattle had lain to warm our feet. The wildest flight of boyhood imagination of that day could not have conceived the grandeur of the ovation which you have given me to-night. I most thoroughly appreciate your kindly greeting and am truly sensible of the great honor you have conferred. It gives rise to sincere joy and takes precedence over all other emotions, and I only regret that I have not the command of language to properly express my sense of gratitude for this manifestation of your respect and good will. I can only say that I thank you from the depth of my heart. But what have I accomplished to render me worthy of this hearty and cordial reception? I am quite sure that what little I have done has been much overrated, and I feel conscious that I am the recipient of honor much beyond that which I deserve. Whatever little I may have accomplished is largely due to the brave and loyal men who so nobly stood by me throughout all the trials and perplexities encountered during my long connection with the iron and steel industries. But, alas, the majority of these loyal associates are gone and the grave has closed over them. Yet they are not forgotten and they shall ever have a green spot in my memory. . . . Much of my success may be attributed to the wonderful progress that has been made in the arts and sciences within this most remarkable century. Having inherited some mechanical ability and being of an investigating turn of mind and disposed to lead rather than to follow, and being possessed of the faculty of drawing able men around me, which is essential at all times to success and more especially at that period, it seemed, in a measure, that I should blend the old and the new.

FIRST ROLLING MILL EXPERIENCE.

Some of Mr. Fritz's narrative of his earlier experiences has already appeared in print. One extract will suffice to indicate its simple straightforwardness, while it will show the fiber of the young mechanic who made his way into rolling mill work in eastern Pennsylvania. Going to Norristown as a young man, after he had learned the blacksmith's trade, Mr. Fritz met the "general manager" of a new rolling mill then under construction. The youth had never met a "general manager" before, and did not know what the title meant. The general manager was a "large, fine looking man, with a pair of dark, keen looking eyes."

I told him what I wanted. He said they had plenty of men and business was very dull. He then wanted to know if I had been used to hard work. I told him I had and that was what I was looking for. He then asked what I could do. I told him I was a blacksmith and had done some work on a lathe and drill press and could use a hammer and chisel. He told me to come down the next morning. The next morning I was in the mill before 7 o'clock, and I was put to work as a machinist's helper at $1.25 per day, and in a short time my wages were raised to $1.50 per day. Those were regular machinist's wages at that time.

When the mill started I decided that puddling was the most important branch of the iron industry and the hardest work, but I made up my mind to learn it, and my only chance was to learn it at night; consequently, as soon as I got my supper I returned to the mill and worked at night until 10 or 11 o'clock and followed it up until I got a good knowledge of puddling. I also learned much about the construction of puddling and heating furnaces, which was of great value to me in after life. I think no student at college ever worked harder to obtain his diploma than I did to obtain a knowledge of the iron business.

Some of Mr. Fritz's experiences at Johnstown in the fifties and sixties were told in the same engaging style. In conclusion he said:

STEEL IN THE MODERN WORLD.

While we have properly received great credit for unprecedented developments we have made in the iron and steel industry in the United States, we should not forget that it was the inventions of Cort, of Mushet, of Bessemer, of Siemens, and Thomas that enabled us to accomplish such important results, and to them all civilized nations owe a debt of gratitude for the incomparable blessings their inventions have conferred on society. As a result of the inventions of these men the demand for pig iron was so great that the output increased from 286,903 tons in 1840 to 25,795,471 tons in 1909.

Yet, how few of us, even for a moment, think of the trials, troubles, disappointments, mental anxiety and bodily toil these men underwent in the introduction and perfection of their inventions, besides suffering the sneers and jibes of those who imagined that an inventor was nothing but a wild enthusiast, and treated him accordingly. The story of many inventors is truly pathetic—and none more so than that of the lamented Thomas. The personal side of the story of the inventor of the basic process can only be appreciated by the reading of his life.

It is largely to the invention, introduction and perfection of the modern system of steel making in this country that we are indebted for the education of our people in science and in the mechanical and metallurgical arts, which have enabled them to erect such manufacturing plants as were necessary to supply our Government with the sinews of war, making it possible to achieve those glorious victories which at once placed us in the front rank among the nations of the earth.

In conclusion, the modern practice of steel making, in the hands of the mechanical engineer, the metallurgist, chemist and intelligent workman, has produced a material which in quantity, physical qualities and cheapness would have been regarded as utterly impossible some sixty years ago, when steel rails, plates, beams and angles were not thought of and steel was regarded as a luxury.

At this time its cheapness permits its use for the most ordinary purposes as well as for the most expensive machines produced by the skill of the mechanic, and no structure is so grand as to refuse its services. It is the material used in the construction of our vast bridges as well as for the housewife's needle; in the great leviathan that crosses the ocean with the regularity of a railroad train. We find steel asserting its value through every walk of life and extending through every clime, linking hands in bonds which grow broader and stronger with the years, till even now we can see dimly on the horizon the promise of the universal brotherhood of man, the longed-for era of eternal peace.

Address of James M. Swank

Mr. Swank was given a notable reception as he was introduced to speak of his own knowledge of John Fritz's earlier and later successes. He said:

It affords me great pleasure to join with the members

of the Manufacturers' Club and my friends in the iron trade in paying a well-merited tribute to my old friend, John Fritz. My acquaintance with Mr. Fritz began 55 years ago in 1855, when he came to Johnstown as the general superintendent of the Cambria Iron Works, which had been leased on May 15 of that year for a term of seven years by the firm of Wood, Morrell & Co. These works had been built in 1853 and 1854 by the Cambria Iron Company as an iron rail mill, with several blast furnaces. They made their first rail on July 27, 1854. Only iron rails were made in this country for several years afterward.

SUCCESS AND TRIALS AT JOHNSTOWN.

A great problem confronted Mr. Fritz. He had to so manage the works as to make them a financial as well as a mechanical success. He succeeded in both undertakings. In 1856, the year following his assumption of this difficult task, the Cambria Iron Works rolled 13,206 tons of rails, and their annual production was thereafter increased under Mr. Fritz's management. The production in 1856 was only 5386 tons less than the largest production of any rail mill in the country in that year—the mill of the Phœnix Iron Company rolling 18,592 tons.

When Mr. Fritz took charge of the Cambria Iron Works he soon discovered that good rails could not be made from pig iron that had been made entirely from Cambria ores; so, after much tribulation, he introduced a mixture of Cambria and other pig iron, which worked well.

But Mr. Fritz was not satisfied with the results he was accomplishing. The Cambria rail mill was equipped with two-high rolls, and as these could not be operated as economically as was desirable, and besides often invited accidents, Mr. Fritz conceived the idea of introducing three-high rolls, which had never before been used in any country in the manufacture of rails. This was done, and in July, 1857, the innovation proved to be a great success. Mr. Fritz had conspicuously shown his skill as an engineer. Soon there were three-high trains in all the rail mills of the country.

But a great trial came to Mr. Fritz the day after his successful use of three-high rolls. On that day the Cambria Iron Works burned down. We well remember that catastrophe. All but the stoutest hearts were appalled. Mr. Fritz was equal to the emergency. He infused courage into the breasts of all his men and at once began the work of clearing away the débris and rebuilding the works. In precisely four weeks the new works were running, and they made 30,000 tons of rails before any interruption occurred from any cause whatever.

Mr. Fritz was surrounded at Johnstown by a remarkably bright collection of engineers and mechanics, all young men, who gave him loyal support, but who also learned much from him. They were long known as John Fritz's "boys." We can mention only a few of them: Jacob M. Campbell, Alexander Hamilton, George Fritz, William R. Jones, Daniel N. Jones, William Canam, James Bell, Thomas H. Lapsley, and Benjamin Watkins. Robert W. Hunt, the first chemist of the Cambria Iron Works, came just as Mr. Fritz left Johnstown for Bethlehem. Captain Hunt is with us to-night.

BETHLEHEM CAREER AND LATER HONORS.

Mr. Fritz's connection with the Cambria Iron Works continued until July, 1860, when he resigned to superintend the erection and operation of the Bethlehem Iron Works, to embrace an iron rolling mill and a number of blast furnaces. The rolling mill was successfully started in 1863. In 1873 Mr. Fritz introduced at these works the manufacture of Bessemer steel and Bessemer steel rails, and in 1890 he made for the Navy Department at the works of the Bethlehem Steel Company the first heavy armor plate that had ever been made in this country. The armor plate plant of this company had been built under Mr. Fritz's direction.

A few years ago Mr. Fritz retired from all active participation in the management of iron and steel works, after more than fifty years of unbroken success, which has brought him many honors. Included in these honors we may mention honorary membership in the British Iron and Steel Institute, which has conferred upon Mr. Fritz the Bessemer gold medal. We may also mention a magnificent banquet which was tendered to Mr. Fritz by a large number of prominent engineers and iron and steel manufacturers at the Waldorf-Astoria in New York in October, 1902, in celebration of his 80th birthday anniversary.

But we feel sure that no honor that has ever come to Mr. Fritz has afforded him more heart-felt pleasure than the testimonial which he received at Johnstown on July 4, 1860, immediately prior to his departure for his new field of labor at Bethlehem. On that day a superb set of silverware was presented to Mr. Fritz at the rolling mill of the Cambria Iron Works by the employees of Wood, Morrell & Co. Between 1500 and 2000 persons were present at the presentation, including many ladies. Their presence testified of itself to the esteem in which Mr. Fritz was held by the whole community. The set of silverware included a remarkably handsome water pitcher. On it were inscribed these words: "To John Fritz, Esq., General Superintendent of the Cambria Iron Works, as a Testimonial, by the Employees. July 4, 1860." This pitcher was exhibited at the New York Crystal Palace during the World's Fair in 1853, and it took the first premium as the finest piece of silverware among many specimens that had been collected from all parts of the world. Several addresses were delivered, Col. Jacob M. Campbell presenting the tea set in behalf of the donors and Mr. Fritz thanking them, as the Johnstown *Tribune* said, "in a very feeling, frank, and earnest speech." Mr. Fritz was then 38 years old. He had been general superintendent of the Cambria Iron Works for five years. He was succeeded by his brother, George Fritz.

The *Tribune* devoted much space to an account of the testimonial to Mr. Fritz, remarking at the close of the account that "the gift is but properly in keeping with the measure of the man," and that "in Mr. Fritz the company and this community lose a man and citizen whose place is not easily filled." Mr. and Mrs. Fritz were among the best people who ever lived in Johnstown.

We are all glad to see Mr. Fritz looking so well to-night. He has hosts of absent friends who would share this pleasure if they were here. I know of no man in the iron trade who has been so universally respected and loved as John Fritz. His personal qualities have been as lovable as his engineering achievements have been notable. From first to last, from the beginning of his career to the present time, he has beautifully illustrated Shakespeare's wonderful characterization:

> "A combination and a form indeed,
> Where every god did seem to set his seal,
> To give the world assurance of a man."

Response of Charles M. Schwab

President Schwab of the Bethlehem Steel Company said that it was not the John Fritz of Johnstown in the old days nor the John Fritz of later years in charge at Bethlehem of whom he would speak, but the John Fritz of to-day in the community in which he lives. While Mr. Fritz might be proud of the medal just presented to him and the other medals bestowed at various times in his career, his greatest medal and the one that would live for all time is that which he has impressed upon the hearts of all who know him. He told of the trouble Mr. Fritz had stored up for him, for in all the proposals the speaker had brought forward at the Bethlehem works, no matter how fortified, the clinching argument of any one who differed with him was that "Uncle John wouldn't have done it that way." The buildings Mr. Fritz left at Bethlehem are models of construction. Only the other day a remark was passed at South Bethlehem that the old converter building was the best in all the plant. Mr. Schwab paid a tribute to Mr. Fritz that was eloquent in its spontaneity, saying in conclusion that John Fritz will be known longer than any steel works that was ever built, and deserves to be.

Honor from Temple University

Rev. Russell H. Conwell, D.D., president of Temple University, Philadelphia, eulogized Mr. Fritz in terms that evoked the most enthusiastic response from his auditors. He made the pleasing announcement that the trustees of Temple University had conferred upon Mr. Fritz the degree of Doctor of Science. Hampton L. Carson, ex-Attorney General of Pennsylvania, followed in an address which was pitched on a high plane, referring to the guest of the evening as the representative of a class that is the bone and sinew of the community. He dwelt upon the importance of the John Fritz type of citizenship in a time when there is such a demand for manhood in public life. Capt. Robert W. Hunt was also called upon and spoke entertainingly as "one of John Fritz's boys," concerning the experiences of early Bessemer days.

Response of Joseph E. Thropp

The well-known Pennsylvania ironmaster, Joseph E. Thropp, made the concluding address of the evening. He said, among other things:

> You have seen the trade develop from the little cold blast driven furnace making 30 to 50 tons per week until to-day our mighty furnaces can produce 36,000,000 tons per annum, and this favored land of ours leads the world. Just think—nearly half a ton of iron per annum for every man, woman and child in the United States! You have seen

us produce and lay in our country railroad iron which if welded together would make a band long enough to put hoops 30 times around the world. God created the billions upon billions of tons of limestone, coal and iron ores seemingly without value. When in considering them for development, what is required to make a ton of iron is worth only about 70 cents royalty in the ground. We take these raw materials and drive our drills, picks, and shovels into them, assemble them over our railroads. By analysis we determine their exact composition and then extract the iron, the first step, and start it on its further development by which we help these boastful but dependent cotton and woolen captains of industry to till the land to raise and pick their cotton, to raise the crops to feed their flocks, and further to clip, gather, card, spin, and weave their products with our iron-made implements. We make the cars and engines for the palatial trains in which they ride and the rails upon which the trade of the world is largely carried.

They may take a piece of iron ore and throw it into the water and say it sinks; but you, Mr. Fritz, have helped show them how we extract the iron from such ores and fashion it, step by step, until we rivet the great plates into a mighty vessel 104 ft. high, 882 ft. long and weighing thousands of tons. We let it glide out upon the water and, supplied with every equipment and luxury, we carry in it 5000 passengers in a single trip from shore to shore across the ocean in five days. We fashion the mighty engines of war which help shape the destiny of nations, and we make the delicate instruments which are used in treating the wounds of "the men behind the guns." Or we turn our skill in other directions and develop the fine main and hairsprings of the watches and we again help these and other dependents to time their hours of work and to move trains; we help the scientists to estimate the speed of the moving planets through the heavens, or the doctors to count the pulse beats of the human heart.

Let us consider right here the degree of efficiency and skill which has been reached in a single direction. A fine hairspring of the finest watch weighs 1-125,000 pound Troy, and when we calculate its value and remember that but one of ten can possibly be used and how many it would require to make a gross ton, we find that the 70 cents value hidden in the ground would be worth in the finest watches thirty-five billions of dollars. Should we not all, then, take off our hats to John Fritz, who has been one of the leaders in a business we rightly call the King's business? His life has been an inspiration to me and doubtless to hundreds of others. Well do I remember when I was employed as assistant superintendent at what was then thought a large furnace at Conshohocken. Right soon I heard of what John Fritz was doing at Bethlehem and was told he had been an engine driver at a little furnace at Spring Mill. I felt that "what man has done man can do," or at least make a try at it. Ever since then I have had in mind men like John Fritz and Mr. Patterson of Hughes & Patterson, both of whom started as blacksmiths not many miles from where we sit.

You, sir, our honored guest, have left "footprints in the sands of time" that others "seeing may take heart again." Following in the footsteps of Him who worked as a carpenter at the bench you have helped dignify labor. We hope we add to your happiness by this banquet. We cannot add to your honors. We honor ourselves by honoring you.

Participants in the Dinner

J. Arthur Adamson, L. A. Amonson, Joseph W. Adams.
A. C. Buzby, J. Clifton Buck, Louis Burk, Robert Balfour, James C. Brooks, Elmer E. Brown, Calvin T. Beers, Edward H. Burr, James B. Bonner, Joseph G. Butler, Jr., Robert E. Brooks, Robert W. Bailey, Horace Boyd, J. Max Bernard, John Birkinbine, Alfred E. Burk, Albert Broadhead, Cyrus Borgner, L. D. Berger, John W. Brown, Robert B. Beahm.
Hampton L. Carson, T. I. Crane, John J. Caine, Charles N. Cressman, Edgar S. Cook, Isaac H. Clothier, Edward Bailey Cook, Joel Cook, Horace W. Castor, S. A. Carson, George M. Ccstello, George A. Chandler, Walter Clark, Rev. Russell H. Conwell, D.D., T. W. Coleman.
A. J. Dull, W. F. Donovan, Charles M. Dodson, George C. Davies, George W. E. Doster, Ernest A. De Bergh, George D. Dobbins, Henry S. Drinker.
Cyrus Elder, George A. Elsasser, J. E. Elverson, J. G. Eberlein, Thomas M. Eynon, H. S. Evans.
John Fisler, William H. Folwell, N. T. Folwell, J. W. Fuller, Jr., B. F. Fackenthal, Jr., A. E. Fletcher, E. F. Freeman, A. I. Findley.
E. G. Grace, J. B. Gibbs, O. J. S. Gaige, M. R. Gano, James Gayley, Alex. C. Graham.
Richard Hirst, J. D. F. Hendrickson, Dr. Henry D. Heller, Charles R. Hall, William T. Hunter, Clement R. Hoopes, Charles T. Hess, H. D. Hughes, Robert W. Hunt, W. P. Hopkins.
Hugh M. Irvin.
J. W. Jewett, Archibald Johnston, Lester B. Johnson.
Joseph D. Kelly, Howard Knecht, Julius Keller, Samuel R. Kirkpatrick, Thomas J. Koch, Charles F. Kolb, Jr., Hugh Kennedy, Dr. Wilmer Krusen.
Joseph T. Leiter, Wm. H. Llewellyn, C. G. A. Loder, O. C. Lippincott, Horace A. Luckenbach, J. Bertram Lippincott, H. J. Laclar.
August A. Miller, Michael Murphy, A. E. Maltby, George D. McCreary, Benjamin Miller, J. Jacob Mohr, A. Markle, W. Park Moore, Charles E. Morris, Hugh McCaffery, Charles A. Matchum, A. D. Mixsell, Aaron P. Miller, J. King McLanahan, Eugene J. McAleer, O. H. Meckley, W. B. Myers, De Coursey May, H. F. Martin, J. King McLanahan, Jr., Henry W. Moore.
James W. Nagle.
George Ormrod, John D. Ormrod, Col. C. T. O'Neill.
G. A. Pfeiffer, Leonard Peckitt, Lincoln K. Passmore, Michael G. Price, W. G. Pursel, H. B. Price, William J. Pedrick, Jr., Thomas J. Price, Harold Peirce.
M. P. Quinn.
Frederick A. Riehle, J. W. Rawle, James P. Roe, W. B. Robinson, F. C. Roberts, Samuel Ruby, David Reeves.
Charles D. Schoen, James M. Swank, F. C. Smink, Charles M. Schwab, James F. Sullivan, Abraham S. Schropp, A. J. Sanders, Powell Stackhouse, H. S. Snyder, W. T. Smith, C. J. Stark, Mitchell Stead, Robert S. Sahlin.
Harry E. Trexler, Joseph E. Thropp, Benjamin Talbot, William R. Tucker, William L. Todd, David Townsend, Edwin Thomas.
C. von Philp.
Warren Webster, Edward R. Wood, John S. Wentz, W. A. Wilbur, S. B. Wetherill, Howard Weiss, Eldredge P. Wilbur, Robert E. Wilbur, Elmer P. Weisel, W. P. Worth, N. P. Wittman, Francis Whitaker, C. C. Wanamaker.

The Joseph Joseph & Bros. Company's New Scrap Yard at Lebanon, Pa.—The Joseph Joseph & Bros. Company has leased a tract of 18 acres at Lebanon, Pa., for the establishment of a scrap iron yard, which is to be the largest of its kind in the country. The work of putting the yard in shape for business will commence at once. It is understood that the Reading Railway Company has the contract to build 2½ miles of track on the property. Contracts for necessary buildings will soon be awarded, including several very large storing sheds. The company has purchased one locomotive for use in Lebanon, and arrangements for a second are under way. The company has large yards at various points in the country, including Cincinnati, Chicago, St. Louis and Worcester, Mass., but has hitherto had none in eastern Pennsylvania. Lebanon was chosen as the site for the new yard because of its good shipping facilities and also because of the heavy local demand for scrap. Mayo Fechheimer, formerly connected with the New York office of the company, has been appointed to manage the Lebanon branch.

Steel Production in France in 1910.—The production of steel in France in the first half of 1910 amounted to 1,632,000 tons, against 1,506,329 tons in the first half of 1909 and 1,364,979 tons in the first half of 1908. The distribution by processes is as follows in metric tons:

	First half 1909.	First half 1910.
Bessemer, acid	46,143	41,107
Bessemer, basic	909,995	1,033,365
Open hearth	541,598	542,774
Crucible	7,973	8,143
Electric	620	6,611
Totals	1,506,329	1,632,000

The production of finished steel as classified was 1,106,919 tons in the first half of this year. The principal items are 156,828 tons of rails, 111,490 tons of beams, 458,759 tons of merchant bars and shapes and 192,155 tons of plates and sheets.

The Cambria Steel Company's Improvements.—The Cambria Steel Company, Johnstown, Pa., is trying out its new 8-in. Morgan continuous merchant mill. It has a capacity of about 6000 tons a month and rolls rounds and squares from ¼ to ¾ in., and flats from ⅜ to 1¼ in. in width and from ⅛ to ½ in. in thickness. The new mill will add materially to the capacity of the bar department and will enable the company to take care of its constantly increasing business in this line. A 12-in. Morgan semicontinuous merchant mill is also under construction and will be ready for operation about February 1. The new rod mill will be completed about March 1 and the wire mill will be started a few months later.

The Hudson River Ore & Iron Company's property at Burden, Columbia County, N. Y., was sold under foreclosure of mortgage November 10. It was bought in by representatives of the bondholders. The portable property, comprising mine supplies of all kinds—locomotives, cars, rails, bridge material, wrought pipe, tool steel, &c.—will be disposed of at private sale by the new owners.

Contracts for Iron and Steel Products

Manufacturers' Views on Methods of Making Them More Than Options on Material

One of the important matters considered at the New York meeting of the American Iron and Steel Institute October 14 was the long prevailing laxity in respect to contracts for iron and steel products and the steps which should be taken by co-operative effort to make contracts binding. The subject was opened up in a paper by Willis King, vice-president of the Jones & Laughlin Steel Company under the title, "Contract Obligations." It was given in *The Iron Age* of October 27, page 970. The discussion of Mr. King's paper was participated in by Charles M. Schwab, president of the Bethlehem Steel Company; John A. Topping, president of the Republic Iron & Steel Company; Charles S. Price, president of the Cambria Steel Company; H. P. Bope, vice-president of the Carnegie Steel Company; J. A. Farrell, president of the United States Steel Products Company, and E. J. Buffington, president of the Illinois Steel Company. From the report of the discussion, as just published by the Institute, we take the following:

Charles M. Schwab

It seems to me that this paper so ably presented by Mr. King admits of no discussion. The facts and premises as set forth are so evident to all that what it needs is our approval and our co-operation rather than a discussion of the subject. It was my pleasure at a meeting of this Institute last winter to state that I had seen men in this industry honored for scientific attainments, for reduction of production costs and for other achievements, but that was the first time I had seen a man honored, as Judge Gary had been honored, for the introduction of a new principle of such advantage to our business. It does seem to me that if the principles and foundation of this Institute are carried out, as we have planned to carry them out, and as the gentlemen here have so ably seconded, this matter of business contracts must necessarily follow. I do not believe that there will be much necessity for contracts, especially what we call "requirement contracts" when purchasers know at all times that they are going to be fairly treated and will receive their supplies at fair prices. The contracts that have been made in the past, and I have had my fair share of making them, were those which could fill every requirement. Those contracts allowed people to take any tonnage they desired when the price was good and none if the price was not favorable. That I think is not fair. We do not want to carry this out in any way other than in the broadest spirit. The ablest lawyers with whom I have consulted in the drawing of contracts have never in my experience been able to draw a contract sufficiently tight to prevent some clever man from evading it, and I believe we should carry these matters out in the broad spirit which Mr. King has outlined.

John A. Topping

I agree with Mr. King in his general premise that the world is making progress toward better things, which I believe is due to the more progressive spirit of the times and to broader and more tolerant views now entertained by our leading men. I also believe that the business world is in step with this spirit of progress. In the iron and steel trades, our greatest advance, perhaps, has been in the direction of mechanical inventions and new processes, and while we have made some progress commercially, in our general methods of doing business, yet abuses have crept in and have been allowed to continue, because our attention has been too much absorbed in other directions.

The greatest progress which we have made commercially, in my opinion, has been in the direction of co-operation, as advocated by Judge Gary, which has resulted in establishing the iron and steel business on a more substantial basis, so that I believe we now have a foundation upon which we can safely build for the future and work out in concert whatever reforms or improvements may seem necessary and advisable from a mutual benefit point of view.

I quite agree with Mr. King that much has been accomplished in the way of a general uplift movement, by greater attention to sociological questions, in an effort to raise the standard of living and intelligence of our labor. Profit sharing is also now much in vogue and a better understanding as a whole exists between capital and labor in the iron and steel trade than ever before. In saying this, I do not mean to suggest that we have reached an ideal state in any direction; in fact, it is my opinion, that there is much room for further progress in all directions, both in methods and economies, and also in broadening and defining the plan of co-operative work, so far as co-operation can be admitted within the spirit of the law.

I agree with Mr. King in the proposition that no greater abuse exists than the indifference of both buyer and seller to the maintenance of contract obligations. I can well remember, in my own early business experience, that a violation of a contract was then considered a matter of such business dishonor, that no self-respecting business man would contemplate repudiating his agreements, regardless of conditions, any more than he would repudiate the obligation of a note or commit a dishonest act.

CAUSES OF PRESENT CONTRACT ABUSES.

Mr. King has given you some of the reasons which have brought about the present situation, but in my opinion the principal reason for the present abuse of contract obligations, is due to the practice of price guarantees, options and sales allotments established during the early period of the so-called trust formation. Being then associated in the management of one of the companies merged, I quite well remember that the arguments advanced by associated managers of sales to justify guarantees under contracts and other privileges mentioned, were that as production at the period mentioned in most lines of iron and steel represented approximated 80 to 90 per cent. of the total output of the United States, there was some equity in the claim made by merchants and the general consumers of iron and steel that entitled them to protection against shrinkage, in view of the fact that natural laws regulating values were not operative. To stimulate confidence and to overcome the fear entertained by many buyers of iron and steel, and to stimulate warehouse stocks on a price basis somewhat artificial, guarantees were resorted to; in time, the practice thus established became a fixed policy. As competition developed and independent operators came into the field, they were also compelled to give their customers the same protection as was being extended by the larger companies, who were substantially in control of production. The reasons which then obtained, however, no longer exist, as the markets to-day are not under the control of any one company and iron and steel values are now more nearly influenced by the natural law of supply and demand; and I believe that buyers of intelligence should not be penalized by placing them on a parity with their less intelligent competitors who depend upon the paternalism of the seller rather than upon intelligence of management for their business success.

BUYERS WOULD WELCOME CONTRACT REFORM.

I have talked with a number of important buyers of iron and steel, and while I do not pretend to say what would be the general consensus of opinion on the part of all buyers or consumers of iron and steel, it is my opinion, from interviews I have had, that a reform in the matter of contract guarantees would be very generally welcomed, it being freely admitted that no objection could be raised to the enforcement of contracts, provided the rule was generally observed, and that no hardship would result, as merchants would then have proper moral support for the enforcement of their contracts against their customers and also against the seller. From the seller's point of view there is no valid reason justifying the continuation of present practice, except for reasons of expediency, as Mr. King suggests, and from the buyer's point of view, no objection could be raised if no exceptions are made to the enforcement of contracts. Therefore, why not make a concerted effort to apply the same general spirit of reform to our business methods that public sentiment demands in matters political and otherwise, by considering at once ways and means to effect a change.

What Lord Palmerston said, relative to reforms in the British War Office, in 1811, is entirely apropos of this business subject: "There was a time when it was not the fashion for public men to say, 'Show me an approved abuse, and I will do my best to correct it.' Times are changed. Men now say, 'Show me a practical improvement, and that improvement I will do my best to realize.'" On account of the timidity of the smaller operator, a reform of the kind discussed cannot be made successfully effective unless we have the moral influence of a leader who is big enough to put it into effect and sufficiently resourceful to defend it. Fortunately for us, we have such a leader and one power-

ful enough as a trade factor, broad enough and sufficiently discreet to show us the way. I refer to Judge Gary; and of him I think you will all agree with me that the sentiment expressed by Bulwer reflects our sentiment: "In families well ordered, there is always one firm, sweet temper, which controls without seeking to dictate. The Greeks represented persuasion as crowned."

Should the United States Steel Corporation decide to adopt for its policy the enforcement of contract obligations, I believe that uniformity of practice would speedily follow by concerted action on the part of other leading producers adopting a similar individual policy for the enforcement of contract obligations. So far as my own company is concerned, we are not big enough to enforce the policy single handed, but we would be glad to follow the leader I designate, provided other leading interests follow.

Charles S. Price

As Mr. King states in his paper there has developed in the steel industry in recent years "a laxity or indifference to the moral obligations of a contract" which "does not seem to have obtained a foothold in any other manufacturing or commercial line." Mr. King has endeavored to put himself in the place of the buyer and has advanced the only justification possible in the circumstances, but he immediately points out that the so-called items of justification are no justification whatever.

Concisely, the evil, for so it is best called, in our present sales system is that contracts are made covering tonnages for more or less long periods, to be specified against by the buyer practically as he needs. On a falling market he does not specify, or actually cancels. The so-called contract has, therefore, become an "option."

WHY CONTRACT BREAKING IS TOLERATED.

Why? Because of competition and fear—anxiety under keen competition to get business, even under this now customary contract, and fear to hold the buyer to his contract because he would be lost forever as a customer so long as he finds the other makers ready to give him these options.

Both from a moral and a legal standpoint, the cancellation or attempted cancellation by the buyer of a contract for the purchase of material is wholly unwarranted, unless the seller has done some act which justifies it. It is a vicious practice from every point of view, and it is vitally necessary for the manufacturers to enforce all obligations of the character covered by these sales contracts; otherwise, any general recognition of the right of purchasers to cancel orders in whole or in part might any time grow into a trade custom, to which we are now dangerously close, and make it difficult to enforce contracts of this character.

The practice of booking tonnage far in excess of the possible capacity of either the seller or buyer to handle within the period of the contract, has much to do with the instability of the contract. Assuming a valid contract with all the elements of mutuality, the proposition that one party to it can cancel it in the absence of any act of the other to justify the same, need only be stated to be denied. It is indeed something about which there can be no argument. Under the existing treatment of these contracts, all of the burden is borne by the seller (the contracts for materials entering into his manufacture are rigidly lived up to), and all benefits are reaped by the buyer because he can, and does, repudiate any contract that proves unsatisfactory to him.

SUGGESTED REMEDIES.

As to the correction of this contract-option practice, I would make the following suggestions:

There are two general classes of buyers of steel—the merchant and the consumer. The problem of making a satisfactory contract with the merchant is a simple one. It should be a contract for a short term; say, not to exceed ninety days, and including a clause providing that specification shall be furnished in only equal monthly quantities, and that any unspecified monthly quota may be cancelled at the option of the seller without notice to the buyer. The merchant, if he wishes to speculate, should do so with his own capital. It is his business to keep in close touch with the trade, and if in his opinion prices have touched bottom he should have the courage of his convictions to replenish his stock by outright purchase, furnishing the steel maker with immediate specifications.

In general, a period of six months should be ample time for a contract with consumers of steel. By inserting the monthly specification clause the seller can protect himself against the common practice of the buyer holding back specifications on a falling market and then dumping a load of orders on the seller at the last moment just as the market is advancing.

There is a class of buyers who claim that the nature of their business requires a yearly contract. If this claim can be substantiated and if, as is claimed by them, a great decline in the price of steel would necessitate a similar decline in the price of their product, a clause calling for adjustment of prices every three months would appear to be fair to both parties. By giving the buyer the privilege of naming a maximum and a minimum tonnage, the maximum not to exceed the minimum by more than 25 per cent., the seller has good grounds for enforcing the sending in of specifications.

With some such features as herein suggested, there is no reason why the contract should not be equally binding on both parties. Individual effort to bring about a reform in this matter of contract obligations will be futile. It must be through the co-operation of the steel industry as a whole, and unquestionably there can be no better medium to effect this than the American Iron and Steel Institute. To this end, my recommendation would be that the president of this body should appoint a special committee to draft standard forms of contract which could be universally adopted by the industry, submitting them for action and approval by the Institute at as early a date as possible.

H. P. Bope

It is not sufficient for us to recognize that an evil exists; it is necessary to find a remedy for that evil. All that we have heard to-day from the speakers who have preceded me has been from the standpoint of the manufacturer. You have been asked to believe that he is the only party who has suffered, and that the poor customer has no rights which the manufacturer is bound to respect. Now, there is something to be said on the other side. What shall we say of instructions in congested periods of business to "sell and repent"? Unquestionably all of us have done that more or less, resulting in obligations assumed by the manufacturers as to delivery, which obligations the buyers not only acceded to but would have been willing to meet had those obligations been lived up to by the manufacturers, and would have made such contracts as binding and honorably fulfilled as any other obligations in commercial life.

TWO KINDS OF CONTRACTS.

In order that we may have clearly before us the groundwork upon which we must decide the question, there are two general forms of contracts; first, the specific; second, the blanket. And while these two may be further divided, for general purposes these classifications will answer. A specific contract is one where the buyer contracts for a specific piece of work, or for the materials required in such work. He obtains his own price in making his contract with the purchaser and when he places his order for the materials required he is morally bound to pay the price at which he agrees to take them because he suffers no loss, having based his purchase upon his own contract price for the particular piece of work. It may be admitted that there is a certain amount of moral obliquity in all of us, and, of course, the buyer is no more exempt than the seller. We have had concerns of high commercial standing come to us, after they had agreed to pay a specific price, and a reduction had occurred in the market during the life of the obligation, to have the price reduced, but we have almost invariably refused such requests.

Then there is the blanket contract, which in the past, as you have heard, has placed no obligation upon anybody. When the market was high the seller tried to sell all he could, regardless of future conditions, and when the market was low the buyer tried to buy all he could possibly obtain. In neither case was there any obligation, specific or implied, on the part of either party to the transaction that the terms of the obligation would be lived up to in full, and our contracts under such conditions naturally became mere options. It has created the abuse which has crept into the steel business, although, in addition to the causes recited by Mr. King, certain other facts have helped along the situation: First, the tremendous growth in the steel business in this country, which Judge Gary so strikingly illustrated in his opening remarks; second, the fact that the mills in this country are widely scattered. Conditions differ in different localities, and in their natural desire to retain the home trade, mills meet conditions which they find near at hand. In addition there has been, until comparatively recently, great fluctuations both in price and demand. So it is not surprising that we are to-day confronted by conditions not known elsewhere; and recognizing that these conditions are detrimental to the interests we serve, we must now hunt for a remedy.

SHORT TIME CONTRACTS THE SOLUTION.

Mr. Price has made a suggestion which seems to me to open the way; only, in my judgment, he does not go far enough. My opinion is that the solution of this problem is in the short time contract. I do not believe it is necessary to-day, if indeed it ever was, to protect buyers in requirement contracts over a long period of time. We know from experience that buyers will not take out what they have purchased if there is a reduction in price resulting from a diminution in demand. I believe a ninety-day contract in all cases is amply sufficient to protect the buyer and seller. It gives each equal rights, and if there is a turn within that period each is equally protected. If prices advance the seller is given an opportunity within a

reasonable period to take advantage of such advance; if prices decline the buyer is not compelled to suffer any considerable loss over a long period of time. Such contracts, of course, must carry the provision that the buyer must not be permitted to buy any more than he can reasonably consume in the given period, and on the other hand the seller is not to sell more than he can reasonably deliver in that same period. By the methods of business employed today most manufacturers know within a reasonable amount what a given buyer can consume in a given period, and with this data at command the obligation of buyer and seller to deliver and take can certainly be reasonably met. As a salesman I know how difficult it is to restrain one's natural inclination to reach out and take business, and undoubtedly we have not always been as careful of the rights of our neighbors as we should have been; but if we are to believe Mr. King's statement that the world is growing better, that we are on a high moral plane of business, which I hope and believe to be true, then buyers, recognizing the moral as well as the legal obligation of a contract, will be just as anxious to meet us under proper conditions as we are to secure their business.

NO GUARANTEE AGAINST DECLINE.

Then I would absolutely refuse to give any guarantee against decline. I believe it to be a vicious practice, and it should never have been grafted on the steel business. It puts an obligation upon the seller only, and no contract is equitable which has not the mutual feature of advantage to both contracting parties.

Assuming that we have reached the point of the short time contract, of which there can be no legal question as to form, "the outward and visible sign" having never been questioned, we have made a long step in advance. Our trouble has been that the "inward and spiritual grace" on the part of both the buyer and seller has been lacking, because, to restate the situation, the tendency in recent years has been in periods of high prices for the seller to sell all that he can possibly put upon his books, with little or no consideration as to how such material is to be delivered—and often delivered at higher prices to the exclusion of tonnage taken at a lower figure—which makes a practice as vicious on the part of the seller as for the buyer to endeavor to obtain at a low price more than he knows he can possibly use, with no real intention of ever taking out such tonnage if conditions go against him. We do not like to say these things to our brethren from across the sea, yet we must admit that such conditions do exist. And while the causes have been so compelling that they may be condoned, they cannot be excused.

We are here to-day to find, if possible, a remedy, and as a summary of what I have tried to put before you I would suggest: First, short time contracts; second, no guarantee against decline; third, by such contracts to prevent the buyer from buying more than he requires for use in the given period; fourth, an equal obligation put upon the seller not to sell more than he can deliver within the term period. If we can put such a basis of contracting into use—and I am sure that it is possible from the experience of the Carnegie Steel Company last year, when we reached in many cases the perfection in this method of contracting—then Mr. King's millenium will have arrived.

James A. Farrell

I quite agree with Mr. King that the habit, on the part of buyers of steel products, of regarding a contract for future delivery as not morally binding on them if the market or circumstances are not favorable to their taking delivery when the time arrives, is not evidence of any moral laxity on the part of the buyers. It is a trade custom which has been allowed to develop, and for which the manufacturers are themselves chiefly, if not wholly, responsible. It has grown, partly from the very natural desire of manufacturers to provide for the continuous operation of their mills, partly from the equally natural desire of middlemen and large consumers to cover their possible future requirements to best advantage, but chiefly from the overweening desire of salesmen to do all of the business in their territory. This, of course, is a manifest impossibility, but that has not deterred salesmen from trying to do it.

For the purpose of making a good showing in the volume of sales and contracts, buyers, and particularly the large wholesale merchants, have not infrequently been induced, not to say inveigled, into placing contracts covering as extended a period as possible, for tonnages which they may hope to sell, and in some instances which they can have no reasonable expectation of being able to sell. The same procedure is repeated with their competitors, and it is often repeated with the same buyers by salesmen representing a number of competing manufacturers. Consequently if the order books of all the manufacturers could be compared it would frequently be found that the aggregate contracts with buyers in a given territory far exceeded the maximum possible consumption under the most favorable circumstances. To carry out all these contracts would mean the flooding of the market with an immense unsalable tonnage which could only be worked off during an extended period which, to the manufacturers, would necessarily be one of extreme depression, low prices and closed plants. To the merchants it would mean, in many cases, bankruptcy pure and simple. It is perhaps fortunate that since the organization of the American Iron and Steel Institute the practice has, to a large extent, decreased.

CONTRACTS BETTER REGARDED ABROAD.

In dealings with other countries similar practices are not encouraged. With most of our friends abroad contracts are contracts, to be carried out whether the market goes up or down, and consequently, buyers have learned to look before they leap and generally do not purchase more than they can reasonably expect to be able to take. There is, however, a practice not as prevalent now as in the past in some lines of the steel industry, of making sales subject to what is known as the "fall" clause, which obligates the seller to reduce the contract price if the market falls during the life of the contract. This clause is sometimes limited to what is known in this country as "guaranteeing the buyer against the seller's own decline," but in other cases the contract provides that the buyer will not have to pay more than the market prices ruling at the time deliveries are made.

To my mind, the objectionable practice of entering contracts which are not binding contracts can be very considerably restricted, if manufacturers generally will only take effective steps to discourage the booking of such contracts by their salesmen. So long as a salesman's prospects of advancement are dependent wholly, or principally, upon the volume of his sales, so long will he be tempted to place tonnage ahead of all other considerations. Of all the influences tending to promote excessive and unnecessary competition, resulting in unremunerative prices, and unsatisfactory conditions generally, the agent on commission is probably the greatest.

In any commodity where business is principally conducted through commission agents, prices are usually lowest and conditions most unsatisfactory. The agent, depending for his remuneration on the volume of his sales, becomes, perhaps unconsciously and unintentionally, the buying agent of the buyers, rather than the selling agent of the manufacturer, and his chief endeavors are devoted to inducing the manufacturer to constantly reduce prices to the level necessary to undersell every other manufacturer. If, on the other hand, a salesman's remuneration and chances of advancement depended, not upon the volume of his sales and contracts, but upon the *profits* derived from the goods actually delivered to the buyers, he would be just as anxious as the manufacturer to secure the best possible prices, and would not waste his energies and time in securing contracts which might and probably would be mere waste paper.

E. J. Buffington

The subject of contract obligations has been so ably presented and so ably discussed that it leaves very little to say on the subject. I am glad that the responsibility of manufacturers for existing conditions in these respects has been recognized. I believe that the cause of any laxity—I will not say in business ethics—in business methods in respect of contract obligations is due altogether to the manner in which manufacturers conduct their sales. And the cure of any evil tendencies that have been spoken of this afternoon in discussing contract obligations rests entirely within the command of the sellers, the manufacturers. I have become so imbued with the idea of the benefits of co-operation that I look to it as a panacea for all ills and ailments that we may find in our business. Co-operation seems to be the logical way of doing those things which we desire to have done. We recognize its efficiency in school work and in college work. We recognize its usefulness in departments of manufacture and there term it "team work." We have seen the good that comes from co-operation, and manufacturers should avail themselves of the opportunity to co-operate in all proper ways for the regulation of all business methods and for correcting any business tendencies.

The troubles which arise through lapses in contract obligations are not difficult to correct if we apply the remedies which are within our reach. The selling of merchandise is represented by a contract, resulting in mutual obligations. These obligations should be recognized and lived up to by both parties to the contract. These obligations are legally binding.

Mr. Bope has referred to one obligation assumed by manufacturers in selling their products, which at times some of us are not as regardful of as we should be—the obligation of making deliveries to the buyer. In seeking to correct any tendency toward laxity in contract obligations, let us remember to start right and keep our record clear from any charge of laxity in recognition of our obligations.

Motor Trucks and Delivery Wagons

The Various Industrial Types Used and Special Features of Their Construction

BY H. W. PERRY.

Self-propelled vehicles are coming into extensive use in American cities and suburban places for a great variety of industrial purposes. The awakening of interest in commercial motor vehicles has been widespread during the last four or five years, and the future progress and development of the motor car industry is said to lie largely in this direction. A number of leading pleasure car manufacturers have already embarked in the production and sale of motor trucks and delivery wagons as an extension of their activities, and most of the others are or have been experimenting with the same end in view as soon as it shall become apparent that the rapid increase of manufacturing facilities threatens an overproduction of pleasure cars. This is the insurance that automobile manufacturers are investing in during the years of prosperity.

Many manufacturers have entered the commercial vehicle field solely in the belief that the development of the commercial vehicle should not wait for production to overtake demand in the pleasure car field, and that a special knowledge and experience apart from that gained in the manufacture and sale of runabouts, touring cars, and town cars is essential to the design, construction and sale of machines for transporting dead loads.

Carefully compiled records show that there are now very nearly 100 active builders of motor trucks, delivery wagons and other special forms of industrial motor vehicles in the United States. Some have a very limited output, but others are either known to be or claim that they are turning out from 25 to 50 machines a week. Unfortunately, there are no reliable data that even approximate the true conditions, either as to the production or the use of such vehicles.

City Delivery Work

There are estimated to be over 4000 commercial motor vehicles in use in New York City, which takes the lead in this respect. The most extensive users are the express companies, the public service corporations, department stores and dry goods houses, delivery contractors, breweries, silver ware and jewelry establishments and large retail merchants in various lines.

It is the expressed intention of some of the largest users to supplant all their horses with motor equipment as rapidly as will be consistent with good business judgment. The H. C. & A. I. Piercy Company, which does all of the delivering for more than 80 retail firms in Manhattan and Brooklyn, and formerly maintained 200 wagons and trucks and about 300 horses, has already installed 30 electric wagons of the type shown in Fig. 1, and has placed a blanket order for 300, to be delivered as called for, with the purpose of displacing all of its horse equipment as fast as the company can convince its patrons of the superiority of motor service.



Fig. 1.—Electric Delivery Wagons Used for Retail Delivery Work in New York City Built by the Studebaker Brothers Mfg. Company, South Bend, Ind.

Another instance that is indicative of the trend of the times is the decision of Gimbel Brothers to do all of the transfer and delivery work in connection with their recently opened New York store with motor trucks and delivery wagons. Five new 3-ton gasoline trucks have been ordered for the hauling of goods to the outlying depots in half a dozen different parts of the metropolitan district, to be distributed to the houses of customers by electric wagons of 1000 and 2000 lb. capacity. It will thus be possible to deliver all purchases within 24 hours to points within 30 miles of the store. The system is based on a total service of 100 motor cars.

John Wanamaker has recently installed a unique delivery system, the main feature of which is eight 3-ton gasoline trucks, built with removable inner bodies. These inner bodies or crates are mounted on small iron wheels, so that they can be withdrawn from the closed bodies of the trucks at the rear and rolled upon hand trucks, which are run upon large freight elevators and taken to any floor in the store to be loaded. While this loading is going on a loaded crate can be placed in the motor truck, as shown in Fig. 2, and sent away to one of the outlying stations of the

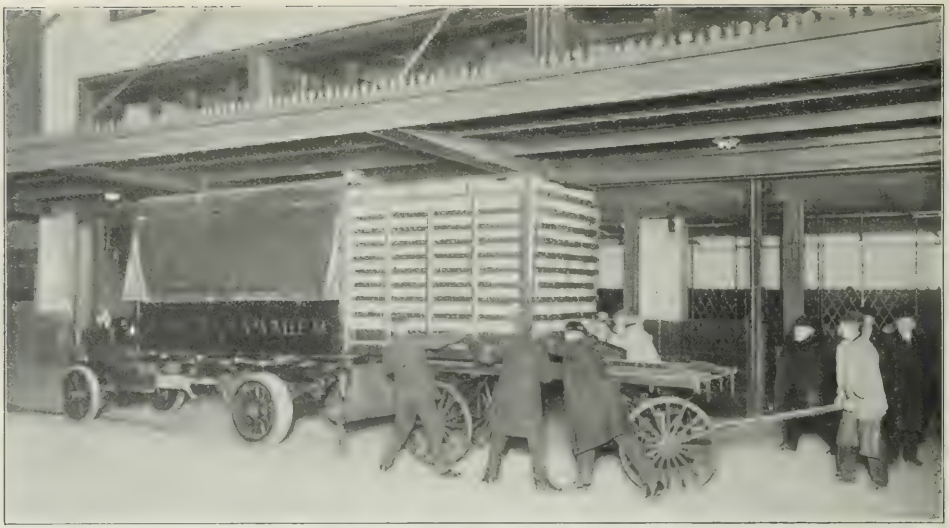


Fig. 2.—Loading a Large Gasoline Truck.—The Loaded Crate Is Brought Down from One of the Upper Floors on a Hand Truck on the Elevator in the Background.

store, where the crate is drawn out and the parcels distributed to customers by smaller wagons. Thus, the costly trucks are kept at work almost constantly throughout 18 out of the 24 hours. Some idea of the service rendered by these trucks may be gathered from the statement that they average 115 miles per day and that as many as 3000 separate packages and parcels have been carried in a single load. One day shortly before last Christmas five loads were hauled to the Bronx station at 177th street, a distance of 10 miles, which were sufficient to keep 25 horse-drawn wagons busy with local deliveries throughout the day.

Fields of Both Classes of Vehicles

While there is no well defined line dividing the respective fields of utility of the electric vehicle and the gasoline motor truck, in general, the former is better adapted to city delivery work and the gasoline truck to long hauls with large loads, either in the city or to points in the surrounding territory. The American Express Company has operated 15 3-ton gasoline trucks, built by the same maker as that illustrated in Fig. 3, for more than a year, running each machine 20 hours a day when the work was heavy. The trucks are operated on a regular schedule resembling a railroad time table, with fixed hours of arrival at and departure from outlying express stations. The longest run without a stop is 12 miles, and the route is covered in a little more than one-third of the time formerly consumed by horses, the regular time allowance being 70 min. Complete records show that the motor trucks have about 30 per cent. greater capacity than the horses and wagons used by the company, while the total expense for operation and upkeep has been just about the same for a 3-ton motor truck as for a wagon of equal capacity and the two teams of horses required for hauling it, with a change at noon.

Operating Cost

The question of probable cost of operation and upkeep is one that a prospective user of a motor truck or delivery wagon is most interested in, after he has satisfied himself of the dependability of the mechanism. Such costs vary, but in one case it was found in actual service that a 3000-lb. motor truck was able to take care of the work formerly done by four teams and a 4000-lb. wagon at only a little more than one-third of the daily cost. The cost of operating an electric 1-ton delivery wagon based upon the experience of users for a period of five years and of the operating expenses of five horses and two 1-ton wagons to do the equivalent work in the Middle West showed a saving of $1052.77 per year on an investment of $2000.

Details of Construction

The main principles of construction of these vehicles have not become standardized, as they have in pleasure car manufacture and every general statement has its exceptions. However, in gasoline trucks of 3 tons capacity and upward the prevailing practice is to employ a four-cylinder, vertical, high-speed internal combustion engine having mechanically operated valves, magneto ignition, pumped water circulation and force-feed lubrication. This engine is mounted at the forward end of the frame. The transmission or speed changing mechanism is of the sliding gear type carried in a gear box under the center of the truck, and is made of ample size and good material to stand the enormous stresses of moving such big loads up grades and through heavy going. The final drive is invariably by roller side chains from a differential countershaft to sprockets on the rear wheel brake drums. The axles are solid one-piece forgings, the rear axle usually of square section and the front axle of I-section. The wheels are usually of wood, though a few pressed steel disk wheels are in use and run on taper roller bearings. In the best examples the countershaft and sliding gear shafts run on roller or annular ball bearings.

Frames of the largest gasoline trucks are now variously made of pressed steel, rolled channel steel or armored wood according to the convictions of the



Fig. 3.—A 3-Ton Gasoline Truck, Built by the American Locomotive Company, New York City.



Fig. 4.—A 7-Ton Gasoline Coal Truck with Special Side Discharging Steel Body Built by the R. L. Morgan Company, Worcester, Mass.

builders. They are supported on the axles by heavy leaf springs of platform type. The driver's seat and the dash are built as an integral part of the chassis, but invariably the body is a separate unit, the chassis being so designed that any preferred type of body may be put on. This method is not peculiar to the class of heavy gasoline trucks, but applies to all sizes and kinds of modern motor vehicles.

Although there are some notable exceptions, it is a characteristic of American trucks to have the driver's seat directly over the engine compartment with the radiator forming, or immediately in front of and partly below, the dash. The European practice has been to follow touring car design, in which the dash and driver's seat are back of the engine, where the seat and foot boards, with their pedals, steering column and dashboard attachments occupy considerable space in the middle section of the frame. This makes it necessary to give the body a great overhang beyond the rear wheels and brings the weight of practically all of the load on the rear axle. Some of the European builders are now adopting the American plan of putting the driver over the engine, where he has a better view of the traffic, and utilizing all of the space back of the engine for loading. This permits of a shorter wheel base and less overhang, so that the machine can be turned and maneuvered more readily in narrow streets and confined quarters, and the load will also be more evenly divided between the front and rear axles.

Gasoline delivery wagons and light trucks up to 1 ton and 1½ tons capacity vary widely in design. But when the construction does not follow the plan already described it usually embodies a two-cylinder opposed engine placed horizontally in the frame. In the heavier vehicles it is commonly under the middle of the frame, and in the lighter ones is most often placed across the front. In at least two well-known makes the engine and its attachments are mounted slidably in the frame so that the engine can be drawn forward and removed bodily if desired. Should examination show that extensive work upon the engine is required, another engine or complete power plant can be substituted for it very quickly, and the vehicle sent about its work while the deranged engine is undergoing repairs and adjustments in the shop.

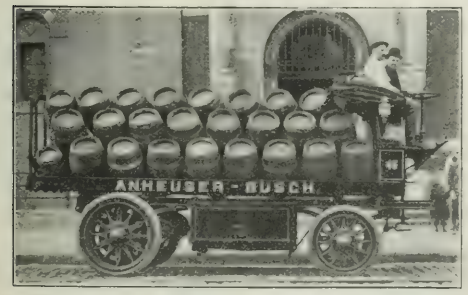


Fig. 5.—A Heavy Electric Truck Built by the Studebaker Brothers Mfg. Company, South Bend, Ind.

In these lighter trucks and delivery wagons planetary gear systems are commonly fitted for securing changes of speed with single roller chain drive to a differential gear on a countershaft and final drive by a pair of roller side chains. Pressed steel, armored wood and rolled angle or channel steel are generally used for frame constructions, with a growing tendency toward the first as best for the purpose. Within the last year several shaft drive commercial vehicles have made their appearance, and are now undergoing practical service tests in the hands of buyers.

Electric Vehicles

In their general points, electric trucks and delivery wagons are quite similar, almost universally having channel steel frames, railway type motors, side chain drive and underslung batteries. The bodies are independent of the chassis and interchangeable. A single motor is used on wagons and trucks up to 1-ton capacity, with silent chain drive to a differential countershaft giving one speed reduction, and side chains to the road wheels giving a second reduction. It is common practice to use twin motors on the larger trucks up to 5 and 7 tons capacity, with a single roller chain driving from the armature shaft of each motor to the rear wheel on the same side of the vehicle. Using two motors makes a differential countershaft unnecessary, as the two armatures may turn at different rates and so compensate for the difference in rotation of the inner and outer wheels of the truck when turning. Practically all motors are now hung from the main frame members, so that they get the benefit of the spring suspension and the whole construction is thereby saved from unnecessary racking and vibration. Speed changes, starting, stopping and reversing are all accomplished in the electric vehicle by means of a controller and controller handle, which govern the amount and direction of electric current flowing to the motor.

Many improvements have been made in electric commercial vehicles during the last five years, and in their storage batteries also, so that they are far more efficient and reliable than formerly. The weight has been reduced, they have been provided with antifriction bearings, spur and internal gear drives have given way to the less noisy and more flexible chain drive, motors have had their armatures mounted on ball bearings and their windings improved and a new type of battery has been placed in the market that weighs only about half as much for a given output of energy as the old type and requires no more attention than filling of the jars twice a week with pure water and an occasional external cleaning of the jars.

A 1000-lb. delivery wagon fitted with one of these batteries weighing 700 lb. regularly covers a route of 43 miles a day on one charge, making an average of 175 stops to deliver packages in the service of a New York dry goods house, and a 1-ton wagon fitted with a 1200-lb. battery has run between 87 and 90 miles on suburban routes, making deliveries along the way. This wagon regularly covers from 63 to 67 miles a day with an average of 150 deliveries, and has maintained these averages since last fall without missing a working day. This is all the work that the driver and his helper are physically able to handle, so that there is no requirement for greater capacity.

Norwegian Electric Furnaces

Notes on Their Use in the Manufacture of Steel

At the meeting of the American Electrochemical Society in Chicago, October 15 to 19, 1910, the secretary, Prof. J. W. Richards, made a verbal report covering his investigation of the use of electric furnaces in Norway and Sweden and specially referred to the Hiorth and Soderberg electric furnaces. In the following are given a translation of a Swedish paper which deals with the experience with a Hiorth installation, and a brief description of the Soderberg electric induction furnace.

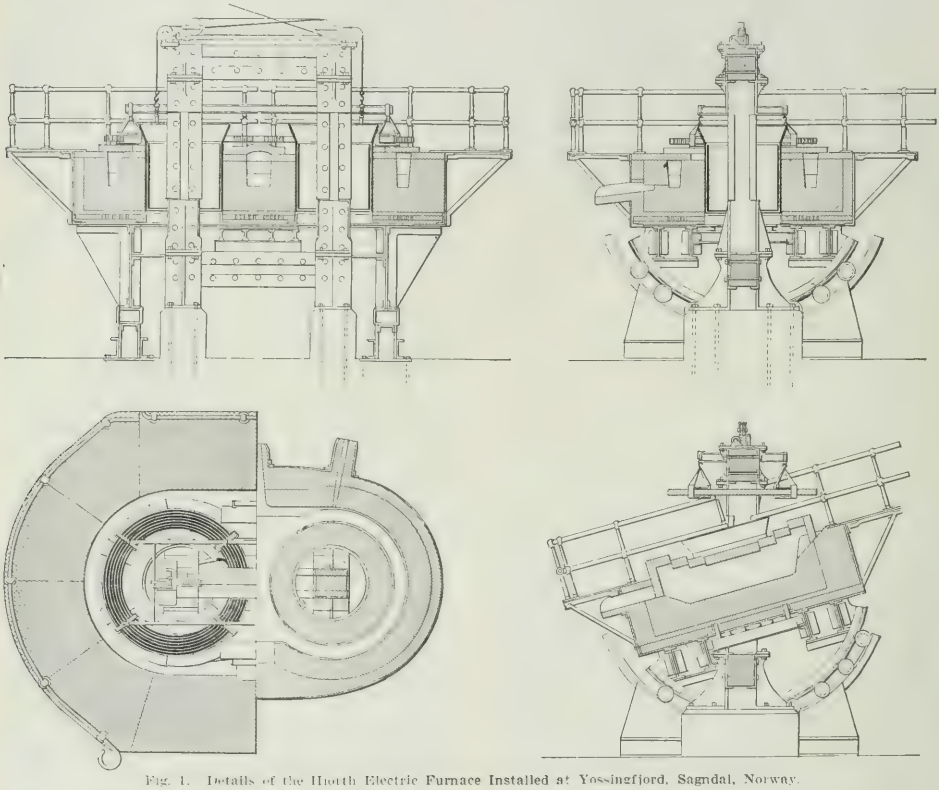


Fig. 1. Details of the Hiorth Electric Furnace Installed at Yossingfjord, Sagndal, Norway.

Notes on the Manufacture of Steel and on the First Electric Steel Mill in Norway

Steel manufacturers have shown little interest in the electrochemical production of steel and such electrotechnical men as Ferranti, Heroult, Kjellin, Stassano, Girod and others are to be thanked for the development of the electric furnace. Progress in this field is very recent, and as late as 1905 there existed but few furnaces, a Kjellin furnace at Gysinge, Sweden, a few Heroult furnaces (in Sweden, Savoy and Westphalia) and a Keller furnace in France, while now about 60 furnaces are running or under construction. A few years ago the capacity of the furnaces was exceedingly small, averaging 1 ton, while some of the new furnaces reach a capacity of 15 tons.

A plant has been installed at Yossingfjord, Sagndal, Norway, which uses a furnace patented by A. Hiorth. This furnace is shown in Fig. 1. The furnace is heated by means of upper and lower induction coils. The lower induction coils are water cooled and the upper as well as the magnets are self-cooling. The essential feature of this furnace is that it is a combination induction and electrode furnace. Between the electrodes is a wall made of such hight that it will separate the metal in the bath, but let the slag bridge across. The current arcs over from the electrodes to the slag, heating this and enabling the metal to be refined, as is done in the open hearth process.

At this plant about 2000 hp. is available in water power. The generator delivers 250-volt, 12.5-cycle alternating current to the furnace through copper cables 1.58 in. in diameter.

One of the greatest difficulties was found to be in obtaining a fireproof lining that would stand up to the extreme temperatures obtained in the electric furnace. In isolated instances it was found that even magnesite would melt. But the furnace as now constructed works admirably, both from a mechanical and metallurgical viewpoint. The bath is exceedingly quiet and the electrical efficiency is surprisingly high, the power factor averaging 0.75 to 0.8 and at times reaching 0.84.

Some of the steel manufactured has been tested and analyzed, with the results appearing below:

No.	Mark.	Diameter, inches.	Sectional area, square inch.	Elastic limit, lb. per. sq. in.	Modulus of elasticity.	Elongation at elastic limit, per cent.		Ultimate strength, lb. per sq. inch.	Elongation measured on 6 in. per cf.	Greatest contraction, per cf.
		C.	Si.	Mn.	S.	P.	W.			
58,277	0.60	0.590	0.274	54,600	....	0.187	...	100,000	12.3	31.7
58,278	1.00	0.593	0.277	65,600	....	0.230	...	138,000	2.3	2.3
58,277	0.60	0.56	0.14	0.61	0.016	0.031	0.03	....	...	...
58,278	1.00	1.00	0.16	0.56	0.015	0.026	...	....	...	...

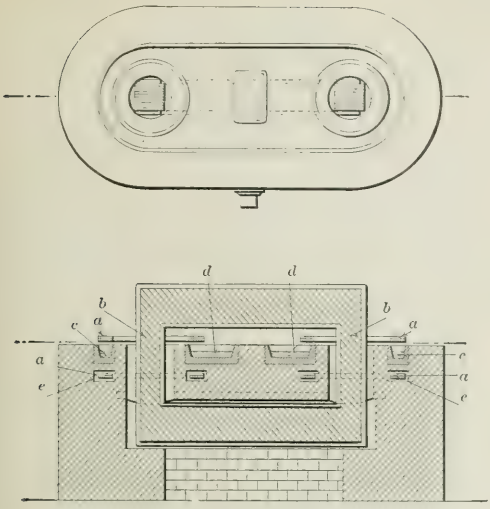


Fig. 2.—Horizontal and Vertical Sections of the Soderberg Electric Induction Furnace.

For comparison, an analysis is here given of steel manufactured in Roechling & Rodenhauser's electric furnace and delivered to the Prussian Government Railroad in the shape of rails, also an analysis of rails made from the ordinary Thomas steel:

	C.	P.	S.	Mn.	Si.	Ultimate strength, pr. ct.	Elonga-tion, pr. ct.	Con-trac-tion, pr. ct.
Electric steel	0.54	0.056	0.042	0.984	0.21	119,000	15.4	24.1
Thomas steel	0.36	0.073	....	1.127	...	97,000	17.6	26.2

The following estimate of cost is given by V. Engelhart in *Stahl und Eisen*, 1905, No. 3, page 18:

Cost Per Long Ton of Steel from Kjellin's Furnace of 736-Kw. Capacity of 30-Ton Daily Capacity.

All costs per long ton:		
Cast iron charge	Cold.	Melted.
Wrought iron charge	Cold.	Cold.
Electric power at 0.477 cents per kw.-hour and a consumption of—		
0.27 kw.-hour per pound with cold charge	$2.90	....
0.23 kw.-hour per pound with melted charge	...	$2.39
550 lb. pig iron at $13.20 per ton	3.30	3.30
1,750 lb. wrought iron scrap, $10.70 per ton	8.50	8.50
26 lb. ferrosilicon at $27.40 per ton	.33	.33
Labor	.35	.29
Warming up the charge	.04	.04
Furnace lining	.10	.09
Miscellaneous materials	.27	.27
Molds	.31	.24
Interest, &c	.29	.24
Superintendence and miscellaneous	.72	.60
Totals	$17.11	$16.29

It appears that the only item that can vary to any extent is the cost of electric power. *The Electrochemical and Metallurgical Industry* (June, 1909, page 266) gives the cost per kilowatt year at $51 and the cost of molten Thomas steel at $15.54 per ton, and figures the cost of steel rails at $18.62 per ton and boiler plates at $19.78. The melting of 6 or 7 tons of steel requires 1 hp.-year, and figuring with a cost of $8.02 per horsepower-year and scrap iron at $14.70, the melting costs will amount to $4.15, and allowing for royalty on the patents the steel can be delivered f.o.b. at $20 a ton. It may be noted that the quotations in the fore part of this year were $27.50 for Bessemer and $28 for open hearth steel billets, and for best grade open hearth ingots $30 at English mills.

But it is particularly in the finer grades of steel where the electric furnace will make the greatest inroads. To pour 7 tons of crucible steel will take 200 crucibles and a large force of skilled labor, while an electric furnace will melt this quantity in one charge. In fact it is predicted that the electric furnace will eventually entirely replace crucible steel.

As to cost of power, it may be pointed out that the Swedish Government has obtained power at $4.54 per horsepower per year at an outlay for power station of $36.50 per horsepower at Trolhätta, and it would be possible in favored localities to obtain power at $4 a horsepower at an outlay of only $27 a horsepower.

The Electrochemical and Metallurgical Industry (June, 1909, page 265) gives the following table for various sizes of the Roechling-Rodenhauser furnace:

Capacity, pounds.	Kw.	Volt.	Cycles.	Cos. ϕ	Cast in pounds. Production per day. Cold charge.	Molten charge.	Cold charge.	Molten charge.
2,200	175	500	50	0.8	1,540	2,200	9,240	35,200
6,600	350	3,000	50	0.6	4,620	6,600	27,720	106,600
11,000	550	3,000	25	0.65	7,700	11,000	46,200	176,000
15,400	750	3,000	25	0.6	10,870	15,400	64,680	246,400

Another item that is worth considering is that while the price of a modern blast furnace in Europe is $400,000, an electric furnace complete costs only $10,000, and an electric furnace plant of the same capacity as a blast furnace can be erected at one-third the cost.

The Soderberg Electric Induction Furnace

Diagrammatic views of the Soderberg furnace are given in Fig. 2, the invention of Carl Wilhelm Soderberg of Ski, near Christiania, Norway. This is an induction furnace of the transformer type. As is known, an electric induction furnace theoretically consists of a transformer with its secondary coils short circuited, the latter mostly consisting of one or more liquid metal baths which replace the coils, the ohmic resistance of which is so adjusted that a suitable load is obtained. It is important in order to obtain a minimum leakage of the power lines that the disk transformers have the coils so distributed that the whole number of ampere-turns is not concentrated in one coil. It was the purpose of this invention to provide an induction furnace of the disk transformer type in which this electrical feature as well as means for facilitating the metallurgical operations are embodied.

The illustration shows horizontal and vertical sections of the furnace. The primary windings are distributed on the four coils *a*, surrounding both of the vertical parts of the iron core *b*. The secondary consists of a metal bath, *c*, contained in a hearth arranged between the primary coils and formed with an intermediate portion in two semiannular channels, *d*, which, together with the intermediate portion, inclose both of the vertical parts of the iron core. By the arrangement of four coils the leakage of the power lines is cut down to about one quarter of what it would otherwise have been under similar circumstances in known constructions of induction furnaces of the disk transformer type having iron cores.

The lower primary coils are cooled by currents of air which pass through channels, *e*, in the foundation of the furnace, which may be of masonry or any suitable material, as the effect of the intensity of the current is proportional to its square. The above mentioned cooling diminishes the resistance and the intensity of the current is increased. The efficiency of the furnace per unit of time thus increases, an advantage which is the more important in this construction, because the coils inclose both of the vertical legs of the transformer.

To facilitate the metallurgical operations, which are rendered difficult on account of the primary coil covering part of the metal bath, the extended parts of the bath are situated outside of the current carrying parts of the bath and not covered by the primary coils. Such channels have been used in some prior constructions, but never in furnaces of the disk transformer type for the above mentioned purposes of providing working space, and facilitating the metallurgical operations, the feed and the treatment of the slag. Repairs may be easily made without removing any part of the primary coils of the furnace.

The National Founders' Association

Fourteenth Annual Convention, Chicago, November 16 and 17, 1910

Diminishing Labor Troubles Give a Better Opportunity for Construction Work

The National Founders' Association held its fourteenth annual convention at the Hotel La Salle, Chicago, November 16 and 17. The interest taken in the affairs of this organization is shown by the excellent attendance, the enrollment reaching 165 names, among them being an unusual percentage of the largest employers of foundry workmen. Labor troubles being comparatively unimportant at present, the proceedings and discussions had little to do with strikes or kindred subjects, and the attention of the convention could therefore be given to the consideration of broader questions affecting the relations of employers and their workmen. One of the most important topics which thus came up for extended discussion was the liability of employers for industrial accidents. Throughout this discussion no disposition was shown to treat workmen other than fairly in the adjustment of compensation for accidents happening in the discharge of their duties. Industrial education also came in for a good share of attention. President O. P. Briggs brought out a most important point in his report in dwelling upon the fact that there are good unions as well as bad ones, commending those practicing "open shop unionism," whereby the members do not refuse to work with nonunion men. Upon this point the public appears to be sadly in need of education.

THE OPENING SESSION

The session on Wednesday morning was taken up with routine matters, such as the appointment of committees and reports of officers. President Briggs named the following committees:

Finance Committee.—C. Bermingham, Canadian Locomotive Company, Kingston, Ont.; G. E. Emmons, General Electric Company, Schenectady, N. Y.; H. Woodland, Allis-Chalmers Company, Milwaukee, Wis.; E. L. Dawes, Standard Sanitary Mfg. Company, Pittsburgh, Pa.; W. S. Winslow, Winslow Bros. Company, Chicago.

Resolutions Committee.—H. D. Miles, Buffalo Foundry & Mfg. Company, Buffalo, N. Y.; C. N. Power, St. Paul Foundry Company, St. Paul, Minn.; A. N. Abbe, American Hardware Corporation, New Britain, Conn.

Nominating Committee.—H. A. Carpenter, General Fire Extinguisher Company, Providence, R. I., chairman.

The President's Report

The report presented by President Briggs was a comprehensive review of the affairs of the association, in part as follows:

The fourteenth annual convention of your association closes a year of practically normal prosperity in the foundry industry. Neither extreme activity nor dullness has prevailed for any length of time or in any large number of industries. That branch of the business with which this association was organized to cope, the labor branch, has been, insofar as labor difficulties are concerned, rather more active than the year before. The efforts of the union with which this association has to contend have been directed against quite a large number of foundries, by far the largest portion of them, however, outside of the membership of this organization.

MEMBERSHIP.

The membership of the association has increased handsomely as you will note from the secretary's report. Your Council has considered several applications for membership which have not been accepted, it being the policy well defined by the Council for several years to admit none to the association who do not have a record of treating their men fairly and carrying on a successful and enterprising business, irrespective of the size of the firm.

Had your Council been disposed to admit all classes of foundrymen, irrespective of standing in this regard, the membership during the last year could have been further increased very materially. The wisdom of the Council in this respect requires no comment of mine.

GOOD AND BAD UNIONISM.

During the year there have transpired many cases of interest to those who believe that the question before the people who wish this problem solved permanently is not that of unionism or non-unionism but of good or bad unionism.

I believe I have referred to this subject in every report I ever made you. It is most gratifying, at this time, to note several cases in which marked progress seems to have been made, also several cases verifying citations I have made as to open shop unions. I may perhaps be a little vain in this latter respect, due to the fact that my statement of 1906 that certain railroad unions were open shop unions has been discredited.

I refer particularly to the Brotherhood of Locomotive Engineers. I have stated that, while being one of the strongest unions in the United States, the members never refuse to work with non-union men. In proof of my statement, I wish to call your attention to a public utterance recently made by Warren S. Stone, grand chief of this organization, in which, commenting upon this question, he says:

> I do not believe in forcing men to join a union. If a man wants to join, all right; but it is contrary to the Constitution and the principles of free government to try to make him join.
>
> We of the engineers work willingly side by side with other engineers who do not belong to our union, although they enjoy without any objection on our part the advantages we have obtained.

Again, I wish to call your attention to a recent publication in the *Century Magazine* of September, where the above statement is practically reiterated. The *Century Magazine* is sponsor for the statement that this is the most powerful union on the globe; that it has within its ranks 90 per cent. of the workingmen in that craft; that there has been no strike of any importance with these engineers since 1888—22 years, mind you, with no strikes. To those who are not posted, this article in the *Century Magazine* is a revelation in unionism.

I repeat what I have said to you on numerous occasions in regard to this organization, that it is one of the best organizations of men known on this continent. It is inspired by a spirit of fairness, a brotherly love, a desire to help the craft and place it in as prominent position among other trades as possible.

Scarcely less important and noteworthy are the conductors, who pursue the same policy, and have had practically the same results, having no strikes of any magnitude whatever, for many, many years. Following closely upon the methods of these two unions come the Brotherhood of Railroad Trainmen and Brotherhood of Locomotive Firemen and Enginemen. Would that the methods of these unions could be exploited. Especially is it desirable, and in my judgment demanded, that these facts be placed before the non-employing public, the educators, clergymen, and statesmen more especially.

CLOSED SHOP UNIONS.

Strangely contrasted with the purposes and methods of these open shop organizations come the unions allied as the American Federation of Labor, and I wish here to call your attention to another step in the history of that organization which has been written since we convened last. I refer to the last convention of the American Federation of Labor, which was held almost coincident with our convention in November, 1909.

Pages might be written in regard to these American Federation of Labor conventions, but the whole undertaking of this organization is best sized up in the proceedings of this last convention, published in a book of 352 pages. Read this book from cover to cover, and you find not one word of a report of any effort, undertaking or desire on the part of the officers of this American Federation of Labor to make one single move in any manner, shape or form, to assist their employers; and, worse yet, you find not one iota of an effort put forth having for its object creating friendly relations between employer and employee.

On the other hand, from start to finish it brands the employers of this country as tyrants. In proof of my as-

sertion I want to call your attention to just one of the acts of this convention on the question of injunctions, and its action in the case of the Buck's Stove & Range Company, which is now in the hands of the Supreme Court of the United States. Its action upon this question is typical of all its acts and shows a most wanton disregard for and defiance of the laws of this country

I beg of you to weigh the action of this American Federation of Labor convention upon this subject, and especially consider the position taken by Gompers and Mitchell. Boycotts have been declared illegal in some 46 States in this Union. They have been declared illegal for years and years in England. No one on this continent is better aware of that fact than the two gentlemen named —Gompers and Mitchell.

Here you find these great leaders of the American Federation of Labor, in convention assembled, counseling, advising, and by act of its convention directing that their followers disregard and defy the law, and when they are dissatisfied with a court ruling, they are advised by Mr. Gompers, supported by act of its convention, and emphasized by a vigorous speech of its vice-president, John Mitchell, to take the law into their own hands, and do as they please.

No one knows better than Gompers and Mitchell that this action on behalf of this convention and the attitude of these officers are little less than treasonable. So far as the action of these officers is concerned, personally, it amounts to but little, but think of the effect it has upon their following.

This report of the convention of one year ago is teeming with sentiment hostile to the employers on every hand. Not a friendly word for the employer is in it. It is spread to some two millions of people directly, and indirectly a great many more working people have access to these reports.

EFFICIENCY OF WORKINGMEN AND HIGH COST OF LIVING.

The public mind and press are full of agitation, condemnation, and adverse comment upon the high cost of living prevailing at the present time. The sentimentalist has his reason for it; the politician has his reason; the workman has his reason, and the non-employing public has its reason.

Nobody knows just who is right, but as touching upon the enterprises in which the members of this organization are engaged, I wish to refer to the subject, coupled with the efficiency of workingmen generally, and I spread this efficiency phase of it beyond the confines of the molders' trade.

The condition of the working people of this country, compared with those of other countries, is the best on the globe. This is conceded by employers and employees, members of labor unions and non-union men, wherever and whenever investigation has been made and an honest opinion given.

Our workingmen are receiving from two to three times as much annual wages; their living expenses are not to exceed 60 per cent. more than those of any other country on the globe; for which reason, comparatively speaking, their condition on this continent to-day is as near ideal as anything we have, enabling them to enjoy more of the luxuries of life than any other people of their class.

Notwithstanding this, they are dissatisfied, discontented, and uneasy, believing they are not getting that which is their due. As a result of this discontentment, this unsatisfied condition of mind, their efficiency is at an extremely low ebb. There is scarcely a member of this association who has not had experience touching upon this point directly, where the working people are prone to limit the amount of work done to a most unreasonable extent.

As an illustration generally, I wish to step outside of our particular trade for just a moment. I recently had an opportunity to examine the costs of manufacturing lumber in one of the great lumber institutions of the Pacific Northwest.

It is the custom of many of these lumbermen to contract the delivery of their logs on stream or railroad at so much per million feet. Contractors whose sole business is cutting these logs are numerous in that country. In the case I examined, a contract had been taken several years ago, covering a period of five years. This contract was based upon the employment of 10 men, to deliver 1,000,000 ft. of logs in a certain manner.

This was based upon actual experience. During this five years considerable improvement had been made in improved methods of handling logs, but, omitting these improvements entirely, for the last two years of the contract it required 35 men per 1,000,000 ft. in place of the 10 men upon which the contract was based. In other words, the efficiency decreased to the extent of its costing three and one-half times as much to perform that portion of the work, not including a raise in wages which occurred. This was a fair criterion by which to measure the entire cost of manufacturing lumber from the cutting of the logs to delivery at the lumber yard.

At a glance you will observe that the raise in wages during that time is insignificantly small as compared with the inefficient service rendered.

This condition prevails to an alarming extent in all lines of trade, and without doubt is caused by discontentment in the minds of the workmen. Manifestly, it has much to do with the high cost of living.

I believe the cause for this discontent originates with the leadership of the American Federation of Labor. The effect of the acts of that organization can be nothing less than a disturbance of the state of mind of the working people. Added to this influence, too many of our leading people in public life are continually supporting these labor leaders. Would that the politicians of the country to-day, who are going from town to town in special trains, espousing the cause of the working people, prolific in their statements of what they propose to do for labor, and what ought to be done for labor, could dwell for a moment with the essayist who said: "A contented mind is a continual feast," and would that they could direct their great energies along reasonable lines first, to showing the working people of this country that they have the best there is on the globe in their particular class or occupation.

LABOR LEGISLATION.

Throughout the different States a great deal of legislation has been proposed. Not many very extreme measures have been passed. The same is practically true in national legislation.

The most difficult problem of this kind your officers have had to contend with is the proposed anti-injunction legislation that was pending before Congress last winter. Certain officials of the Government were extremely anxious that an anti-injunction bill be passed. Your committee felt that any disturbance of the present court practice in injunction cases would be inimical to the welfare of employee and employer.

It is to be regretted that prominent political parties feel that the present method should be changed. Many of our officials advance the argument that the proposed change is merely a writing into statute of the practice of the equity courts to-day. For the sake of argument, admit it to be true. My great objection to such modification of the injunction procedure is the fact that it opens the doors wide to further amendments and modifications of this procedure. I care not what the law may be that this United States Government may enact. Let the politicians once disturb a precedent that is now as old as the Government itself, a practice that has been most beneficial to the working classes, and which at its inception had for its purpose the protection of the working people, and within an inconceivably short time you will see the precedent of modification of this injunction procedure forced by the other side until the radicals, anarchists and socialists who are so concerned about this court procedure will have secured such a law as they want.

If the newspaper accounts of the attitude of the White House for the incoming session of Congress are correct, this same proposed legislation will be forced to the front the coming winter. I cherish the hope that proper ways and means will be provided for discontinuing this effort, and urge that a committee be kept in readiness to cope with the situation.

THE SHORTER WORK-DAY.

While to the membership at large the question of a shorter workday has not appeared very pronounced during the year, to your officers who have been watching the trend of affairs continuously several important points have been noted, until, in my judgment, it is now advisable that this convention take it up for consideration.

The goal of the Iron Molders' Union, especially its president, has been 8 hours, with 10 hours' pay, with the idea that if they ever reached 8 hours, the next step would be 7, and then 6. In fact, demands have already been made by the Iron Molders' Union upon the Stove Founders' National Defense Association that the hours of molding in stove shops shall be reduced from 7 to 6.

In 1907 the presidents of the Iron Molders' Union and the Machinists' Union, respectively, were successful in negotiating an agreement with the foundrymen and employers of machinists in San Francisco whereby they were to reduce the working hours 15 minutes every six months, until eight hours was reached. That point was reached in June last. A condition was attached to this agreement, whereby these two unions agreed to have in effect at that time the 8-hour day both north and south of San Francisco. The 8-hour working day had not been established at that time in the Pacific Coast territory except at San Francisco, notwithstanding the fact that these unions had made aggressive efforts, placing on strike a large number of employees in both foundries and machine shops. The proprietors in San Francisco determined to take a stand and avail themselves of this opportunity to abrogate the agreement for shorter hours. They so notified the unions, the result of which was a series of conferences and a final referring of the entire matter to what is known as the San Francisco Conciliation Board, which, as reported by the secretary of the California Metal

Trades Association, has conceded eight hours for another year.

These two unions, by way of their officers, have been extremely pronounced in their statements that as soon as the shorter work day was established in San Francisco and other coast points, as was contemplated, they would then establish it in short order on this side of the Rockies. Up to the present time we have had no strike where the question of hours was the only issue, notwithstanding which there have been demands for shorter hours in several localities within our territory.

I hope I may be pardoned for suggesting in this report and at this time the advisability of resisting a shorter workday. I do not believe in it, taking the viewpoint of the workingman alone, irrespective of the viewpoint of the proprietor. Years ago, when machinists and molders worked 12 and 15 hours per day they were justified in individually and collectively attempting to reduce the hours. The hours were reduced, and be it said to the credit of this organization that no body of men in the world has brought working hours down to their present state more freely, willingly and quickly than the foundrymen of this country. Their action in this respect is proverbial.

There comes a time, however, when reduction of hours must cease, or the workmen will not get their just dues. Manifestly, if we reduce working hours, the cost of the article produced must be raised. The present high cost of living is now at a point where further increase seems almost intolerable by the working people.

In my judgment it is not possible for the working classes to produce the consumption of this country in 8 hours, neither do I believe they can produce it in less than 10 hours. I believe that the majority of working people in a degree realize this. I believe, if they could have the say, that a vast majority would vote to-day for 10 hours' work and 10 hours' pay, believing that depriving them of working this length of time is taking from them that which is their greatest wealth, the power of producing a livelihood by the sweat of their brow.

I do not wish to be understood as saying that all classes of workers should be on the same schedule of hours. Far from it. This is where the unions make a horrible mistake in attempting to secure the same working day for every class of artisans and laborers, irrespective of the trade or craft.

There are trades, crafts and occupations where 8 hours' work is more wearing upon the human system than 10 hours in other crafts, but for such trades as molders I do believe a shorter workday is extremely detrimental to their own interests.

The would-be friends of labor, especially of the political class, are continually demanding that something be done for labor. They shout from the housetops the fact that labor must be protected, cared for and considered.

It is an amusing fact that the majority of these agitators are not people who come up from the working classes. Few of them know what it is to put in a year's good, hard work, either as employer or employee. They lose sight of the fact that the very greatest thing that can be done for labor is to see that it has a job at good pay with reasonable hours, thus providing an opportunity for it to convert its efforts into the necessities of life, and if these so-called, would-be labor protectors wished to do something in the interest of this particular class, let them change their attitude of destruction to that of maintaining a job for them.

The Commissioner's Report

Commissioner A. E. McClintock's report is in part as follows:

The advent of spring of this year witnessed much unrest in labor conditions throughout the country. The public press contained extended and frequent comment on the increased cost of living. The many agents and organizers already in the field seized this opportunity and used it as an argument for workmen to align themselves with a union in order to get an increase in pay. This condition was felt in every branch of trade, in every part of the United States and Canada.

Foundries employing union molders began to receive demands from the molders' union early in January, the season having started about two months earlier than in previous years. From that time, until the middle of July, union foundries in 60 cities and towns of which we have record made adjustments of wages with their molders. The shops of 15 members of the association were involved in strikes. During the same period the molders went on strike at the shops of 88 non-members of the association, involving 1854 men, in 49 of which shops strikes are still being supported by the union. At the present writing, strike benefits are being paid to molders at 76 shops, originally involving 2364 molders and coremakers—13 of the above-mentioned 76 strikes having been started in previous years.

In the combating of these strikes, our members were confronted with the usual strike conditions with which so many of you are familiar. Our energies were directed toward using molding machines wherever possible, and placing under the instruction of competent molders as many boys and laborers as the shops could care for; in no instance did we attempt to rush in a large number of non-union molders to take the places left vacant, and thus hope to get satisfactory results.

Our members are profiting by the experience of strikes in association shops in previous years, and are rehabilitating their foundries by instructing a new crew of workmen recruited from the locality in which the shop is located. Many of these men who have worked about foundries and shops as laborers show marked ability when given help and encouragement. All of the above-mentioned shops are making steady progress and will be successful in establishing open shops.

FOUNDRY LABOR SUPPLY.

An adequate foundry labor supply has been a prominent topic at previous conventions. Your officers have had much to say on the subject, but it is a matter of such vital importance and has such an important bearing on the work of the association from day to day, that I feel it my duty to again bring it to your attention.

Every employer of labor knows that when trade is dull and workmen are plentiful the union agitator is less active, and that the reverse is true when business is good and workmen are in demand. Every foundryman has been through this experience many times.

Early in the month of January of this year, many foundries, members and non-members, found themselves in need of molders. Advertisements for "molders wanted" appeared in the daily papers. The officers of the association were in receipt of many requests for aid in procuring men. During February and March these calls at times would aggregate vacancies of 100 or more molders, and in some instances the firms would authorize us to furnish transportation up to $10 per man for the number wanted, they to reimburse the association promptly. These shops were not involved in strikes; they were simply short of molders and took these means of getting them.

Your officers found on investigation that considerable of the work for which molders were being sought could profitably be made on molding machines with handymen labor. In one instance, a jolt ramming machine was purchased and the firm was so well pleased that a second one was ordered. It was three months before the work on the machines was progressing in good shape, but the member is now convinced that this is a much more profitable method than importing molders from distant points, and being obliged to pay a premium. I mention this to illustrate the point that much of the demand for skilled journeymen molders could be lessened if each foundry would give more attention to educating its own workmen, and by improving the methods lessen the skill required on a vast number of jobs.

HOW TO EDUCATE UNSKILLED MEN.

In this matter of using handymen, it would be well to bear in mind the experience of others. Engage men between 20 and 35 years of age, pay them helper's or laborer's wages at the start, and put them in charge of an instructor or assistant foreman, who will give them constant attention. An advertisement in the local paper for young men wanted to learn a trade with good wages at the start will undoubtedly bring plenty of applicants, from whom the most likely can be selected. Start these young men, one or two at a time, selecting the simpler patterns first, and those from which possibly a number of castings are wanted. Have the instructor remain with them, watching every operation from day to day, advancing them to more difficult work as they improve. By this method, you will be enabled to provide a supply of foundry labor, which I venture to assert will be found much more satisfactory than molders recruited from a distance and unlikely to become permanent residents.

There are many members of the association who are doing their full share in this matter. They have found the training of their foundry operatives to be a profitable and satisfactory method of conducting their business. The policy of taking on green men and instructing them in molding, which is given such careful attention by these members, is doing more to promote the principles for which you have founded this association than all the dollars they may pay into the treasury as dues. In other words, the foundry proprietor who is devoting so much of his time and energy to the education of the raw recruit and thereby increasing the available supply of competent molders is certainly conferring a lasting benefit on the foundry industry as a whole which cannot well be measured in dollars and cents.

While on this subject, I wish to say a word regarding the old fashioned apprentice—the boy that is indentured and to whom an effort is made to teach the various branches of the trade. It is a pleasure to go into one of those shops where a systematic effort is made to keep a certain number of apprentices at work all the time. This policy is most commendable, and I urge you not to lose sight of it.

Those who are daily confronted with foundry labor prob-

lems cannot help but be impressed with the fact that a great many of the labor troubles of the foundrymen and much of the expense of the association are due to the scarcity of molders and core-makers. This condition, in my judgment, will never be overcome until a more widespread effort is made to impart a knowledge of the trade to a larger number of workmen.

MOLDING MACHINES.

During the past year the use of molding machines of the various types has been extended and a good healthy gain in that direction can be reported. In considering this subject, it is well to bear in mind that machine molding is still in its infancy and that constant advancement is being made and better results obtained by individual foundrymen who are giving careful constructive thought to the rigging of different jobs, the construction of flasks, etc.

Some months ago, I visited the shop of a member of this association who informed me that his molders were demanding more money; that his costs were already too high, and he was wondering what to do. It is a large and successful manufacturing firm, the foundry being one of a number of departments. He stated that they had used molding machines a great many years, and that their shop had everything in the way of equipment. I found they did have a number of machines, many of them designed and rigged up by the firm itself, and in some cases very much worn and in bad order. Other machines were modern and doing very well. Two power machines, of late design, which had been installed at considerable expense, were not in use and had been condemned. The member remarked that that particular type of machine was greatly overrated and he would be glad to dispose of the two for 25 per cent. of their original cost.

The shop impressed one as possibly 12 or 15 years ago having been advanced in molding machine practice. The superintendent had been with the firm over 30 years, is now past 60 years of age, and has slowed up without knowing it. I stated that other shops doing similar work were getting good results, and my first suggestion was that the proprietor take a few days and visit shops in other cities. This was something he had not done in years. A trip was planned, and after visiting four shops the proprietor in question said he was astonished to find how far his firm was behind the other fellow in many respects. He found power machines similar to the two he had condemned were being operated with marked success in other shops, and stated, instead of being willing to sell them for one-fourth their cost, that if he didn't have them he would order some immediately. He also found his flask equipment was much out of date, and with a different style of flasks, he saw in some cases two and in others three times the output being obtained on almost identical work. He saw handymen successfully making work more difficult than anything in his own shop.

Here is an illustration of a firm getting its foundry into a rut and resting quietly under the conviction that its methods were far advanced until called upon to give consideration to foundry wages and costs.

IMPROVED METHODS HELP THE OPEN SHOP.

Another case to which I would like to refer is that of a member operating a large modern foundry, run in connection with a manufacturing business. The foundry is the only closed shop department. About once a year they have a dispute about something with the molders or the union officials and are confronted with a strike. They have always hesitated about combating a strike, for the reason that they have a certain line of heavy floor work which is made in green sand and requires a high degree of skill in molding. When molding machines have been suggested, the head of the firm has always stated they have investigated the matter carefully and were satisfied there is no machine on the market suitable for this work. Until about six months ago, this was the honest conviction of the management as well as the best engineers and mechanical men employed at the plant. Now, however, they find by making some slight changes in design, certain pattern difficulties can be overcome, so that these jobs can be fitted for a jar ramming machine, the molds made in dry sand instead of green sand, and eliminate fully 75 per cent. of the molders' skill. The last time I saw the head of this firm, he informed me that he felt sure the plan above outlined would work and that the saving in labor cost would soon pay for the outlay in equipment, but, best of all, he said: "The fear of a molders' strike in our foundry has had the stinger taken out."

The molding machine and the handyman molder have made possible the open shop in the foundry. To some of you the economies that have been effected would be astonishing. I base this statement on what I know regarding conditions in the large number of foundries which have successfully combated strikes and established open shops. Much of this information regarding output and costs is given me in the strictest confidence, and consequently I am not at liberty to tell you some things which I believe would be of interest.

The open shop foundry, with its freedom from restrictions on molding machines, handymen and apprentices, the rewarding of individual effort, has been much more profitable to many members of this association than they are willing to publicly admit. That some are more successful than others in getting results is true in this as in all other lines of human endeavor.

The rule of some successful shops to put in any machine, flasks or rigging which will effect economies sufficient to pay for the outlay in a year, is, I believe, sound reasoning. As one foundryman put it: "Even if my profits have not been increased at the end of the year, the machines, flasks, &c., have some value as scrap iron, which otherwise would have been absorbed in labor costs, and in addition I have been able to conduct my business without the highly skilled molders that would otherwise be required." Then, too, he is playing safe in not losing orders because of inability to get workmen to fill his shop.

The experience of the past year has brought home to your officers the fact (which has been emphasized in previous reports) that too often the foundry is neglected, and it is not until labor troubles are threatened or actually occur that anything like a careful analysis is made and steps are taken to improve the equipment or methods.

Reports of the Treasurer and Secretary

The report submitted in behalf of the treasurer, the People's State Bank, Detroit, showed the finances of the association to be in most satisfactory shape.

F. W. Hutchings, secretary, reported a total membership of 492 foundry plants, a net gain having been made the past year of 25 plants. In addition, the Administrative Council acted favorably on three applications for membership during this convention, as follows: Cadillac Motor Car Company, Detroit, Mich.; Great Western Mfg. Company, Leavenworth, Kan.; Lincoln Iron Works, Rutland, Vt. Four more applications are pending.

Marshall Cushing, legislative representative of the association at Washington, presented a most interesting and comprehensive report on the legislative and political record of the past year. He dwelt specially on four features, as having most significance. One is the beginning of eight-hour legislation; another, the effort made by President Taft to secure anti-injunction legislation; third, the defeat of the so-called Hughes amendment to nullify, in the case of organizations of laboring men, the provisions of the Sherman anti-trust act, so that boycotting would be permitted; fourth, the overwhelming change in the political complexion of the House of Representatives at Washington. He stated that "any one who has advocated the employment of educational methods in the treatment of the labor question now finds himself justified as never before in going to the fullest extreme in pressing such an urgent need upon the attention of manufacturers and employers generally."

WEDNESDAY AFTERNOON SESSION

The report of the Committee of Investigation of Liability of Employers for Industrial Accidents was read by Thomas E. Durban, Erie City Iron Works, Erie, Pa. It favored the enactment of legislation in which the interests of both workmen and employers shall be properly safeguarded, but the committee was not yet prepared to make specific recommendations, except that it was held to be extremely desirable that the legislation by the different States should be uniform.

The discussion which followed was exceedingly interesting. The first three speakers took up the legal aspects of the question. They were H. V. Mercer, attorney and chairman of the Minnesota State Employers' Liability Commission; Judge Paul D. Carpenter, Manufacturers' Association of Milwaukee; George F. Monoghan, Detroit, attorney for the National Founders' Association. Among those who spoke as employers were H. I. Shepherd, Toledo Shipbuilding Company, Toledo, Ohio; Thomas Devlin, Philadelphia; C. A. Chase, Syracuse Chilled Plow Company, Syracuse, N. Y.; G. E. Emmons, General Electric Company, Schenectady, N. Y., and E. L. Dawes, Standard

Sanitary Mfg. Company, Pittsburgh, Pa. Many important points were brought out in this discussion, which will doubtless be of great use in handling the subject before State commissions and legislative committees. It was exceedingly interesting to note the spirit of kindliness toward employees, the desire to extend to them fair treatment and the general disposition to treat them as liberally as possible shown by the employers throughout this discussion. The report was approved and the committee continued.

THURSDAY MORNING SESSION

Prof. Herman Schneider, University of Cincinnati, reviewed the evolution of the continuation school. This work was inaugurated by the University of Cincinnati, which established a six-year course for engineering students, arranged so that they could spend alternate weeks in theoretical study and practical commercial work. This plan has since been adopted in the high schools of Cincinnati and has proved so successful that manufacturers and other employers have found it profitable to pay full time wages to boys who spend half their time in school. Under this system of education their efficiency is increased to a degree that enables them to do more work in half their time than is usually performed by boys who do not have the advantage of this course of practical education.

The latest development of the Cincinnati system is the continuation school for foremen and mature mechanics. This is a night school and has become very popular.

Prof. J. J. Flather, University of Minnesota, read a paper on the "Education and Development of the Apprentice," in which he reviewed the several plans of continuation schools, manual training schools and student-apprentice systems, and outlined a method of industrial education which he recommends.

The Winona Technical Institute

C. A. Bookwalter, Indianapolis, made an interesting talk on the subject of the Winona Technical Institute. He has recently been appointed receiver for this school and its property, owing to financial difficulties which had overtaken it. He is engaged in working out a plan to have the institute taken over by the public school authorities of Indianapolis. Before this can be done it will be necessary to get a bill through the Legislature which will authorize a school tax levy for an educational institution of this character. The property held by the institute has proved a very fortunate investment. The ground cost originally less than $200,000 and is now valued at $1,000,000, and Mr. Bookwalter as receiver expects to issue bonds which will take up the present indebtedness. The necessary legislation and other legal steps in transferring it to the school authorities will require more than a year to carry them out and meantime the school will be dependent upon private support.

One object in view in making the school a part of the educational facilities of the city is to make it more popular with boys and overcome the caste feeling which interferes with industrial education. When manual training schools were first established in Indianapolis this caste feeling proved a serious obstacle, but it was slowly overcome, and the manual training high schools are now more popular with boys than the old classical schools. The Winona Institute, however, continues to suffer from this caste feeling on account of its private character, as many boys or their families look upon it as a "charity enterprise." When it becomes a recognized part of the public school system this feeling will undoubtedly disappear.

The school has proved very successful in its practical work. The foundry, operated under the able direction of Prof. E. A. Johnson, does a large amount of commercial work, and many of the boys are able to pay their tuition and all expenses, so that they do not require outside support. In some cases the international labor unions have interfered with the efforts of the school to do commercial work, especially in the printing school.

Against Shortening the Working Day

F. C. Caldwell, H. W. Caldwell & Son Company, Chicago, submitted the following resolution, which was approved by the Committee on Resolutions and unanimously adopted by the convention:

Resolved, That this association is opposed to any reduction in the hours of working below those now established, because we believe such reduction would be harmful to both manufacturer and consumer.

It is our opinion that the existing hours of labor, at least in our own industry, are not excessive, viewed with reference either to the physical capacity of the workman or his social, moral and intellectual welfare. The actual physical exertion required from the shop workman has been in the last few years greatly reduced by the general introduction of labor saving appliances in every department of the shops, and this condition is rapidly increasing.

The present capacity of the plants in our industry is no more than adequate to supply the demand under normal business conditions and to maintain that capacity with a shorter workday would make necessary additions to plants and equipment, with the consequent added interest charges and overhead burden. The increased cost of manufacture, due to the greater capital investment, added to the higher labor cost resulting from the payment of fair living wages for the shorter workday, must increase the cost and selling price of our products and this increase must ultimately be borne by the consumer.

We point out to the public generally, including, of course, workingmen in every industry, that the greater cost of manufacture, due to shorter working hours and other restrictions of production, is a direct and important, though often overlooked, factor in increasing the cost of living.

We further wish to record our definite opinion that the movement of the labor unions for a shorter workday, restriction of output, and higher wage is directly responsible for higher cost of production and consequently higher cost of living.

THURSDAY AFTERNOON SESSION

P. W. Gates, Hanna Engineering Works, Chicago, second president of the association, was requested by President Briggs to take the chair. Henry A. Carpenter, chairman of the Nominating Committee, reported that Vice-President Charles M. Jarvis, American Hardware Corporation, New Britain, Conn., owing to the death of Philip Corbin, would not be able to give the necessary attention to the affairs of the association, and, therefore, requested that his name should not be considered in connection with any official position. The list of officers as recommended by the committee and unanimously elected by the association is as follows:

President, O. P. Briggs, Minneapolis, Minn.; vice-president, Henry D. Miles, Buffalo Foundry & Machine Company, Buffalo, N. Y.; secretary, F. W. Hutchings, Detroit, Mich., treasurer, Peoples State Bank, Detroit.

DISTRICT COMMITTEES.

First District.—F. D. Wanning, Birmingham Iron Foundry, Derby, Conn.; E. A. Jones, E. D. Jones & Sons Company, Pittsfield, Mass.; Henry B. Sargent, Sargent & Co., New Haven, Conn.; Thos. W. Fry, Sullivan Machinery Company, Claremont, N. H.; D. K. Bartlett, Builders' Iron Foundry, Providence, R. I.

Second District.—G. H. Johnson, Isaac G. Johnson & Co., Spuyten Duyvil, N. Y.; S. L. Moore, Moore Brothers Company, Elizabeth, N. J.; F. E. Wheeler, International Heater Company, Utica, N. Y.; C. A. Chase, Syracuse Chilled Plow Company, Syracuse, N. Y.; E. S. Dean, United States Radiator Corporation, Geneva, N. Y.

Third District.—J. H. Schwacke, William Sellers & Co., Inc., Philadelphia, Pa.; Chas. J. Mesta, Mesta Machine Company, Pittsburgh, Pa.; Thomas Shipley, York Mfg. Company, York, Pa.; W. R. McClave, McClave-Brooks Company, Scranton, Pa.; Alex Jarecki, Jarecki Mfg. Company, Erie, Pa.

Fourth District.—R. H. Jeffrey, Jeffrey Mfg. Company, Columbus, Ohio; William Gilbert, Buckeye Foundry Company, Cincinnati, Ohio; H. J. Boggis, Taylor & Boggis Foundry Company, Cleveland, Ohio; C. H. Gifford, American Blower Company, Detroit, Mich.; E. B. Perry, Industrial Works, Bay City, Mich.

Fifth District.—F. C. Caldwell, H. W. Caldwell & Son Company, Chicago, Ill.; H. T. Hornsby, United Iron Works Company, Springfield, Mo.; H. R. Robinson, Robinson &

Co., Richmond, Ind.: J. H. Steedman, Curtis & Co. Mfg. Company., St. Louis, Mo.; H. Ainsworth, Williams, White & Co., Moline, Ill.

Sixth District.—Otto H. Falk, Falk Company, Milwaukee, Wis.; Oliver Crosby, American Hoist & Derrick Company, St. Paul, Minn.; Theo. O. Vilter, Vilter Mfg. Company, Milwaukee, Wis.; J. L. Record, Minneapolis Steel & Machinery Company, Minneapolis, Minn.; Frederick Robinson, J. I. Case Threshing Machine Company, Racine, Wis.

Seventh District.—J. A. Milne, Allis-Chalmers-Bullock, Ltd., Montreal, Que.; L. L. Anthes, Anthes Foundry Company, Ltd., Toronto, Ont.; C. H. Waterous, Waterous Engine Works Company, Brentford, Ont.; J. A. Kilpatrick, Canada Iron Corporation, Ltd., Hamilton, Ont.; Geo. W. Watts, Canada Foundry Company, Ltd., Toronto, Ont.

Eighth District.—W. D. Tynes, Hardie-Tynes Mfg. Company, Birmingham, Ala.; W. E. McClamroch, Southern Engine & Boiler Works, Jackson, Tenn.; G. T. Thayer, South Side Foundry & Machine Works, Charleston, W. Va.; W. S. Mosher, Mosher Mfg. Company, Dallas, Texas; W. J. Oliver, Wm. J. Oliver Mfg. Company, Knoxville, Tenn.

It is understood that the new Administrative Council will reappoint the commissioner, A. E. McClintock, Detroit.

On being escorted to the chair President Briggs made a brief address, congratulating the members of the association that at present they were hearing no talk of strikes or labor troubles, but would be able to give their attention to constructive work in the improvement of their relations as employers with their employees. The convention was declared adjourned.

THE BANQUET

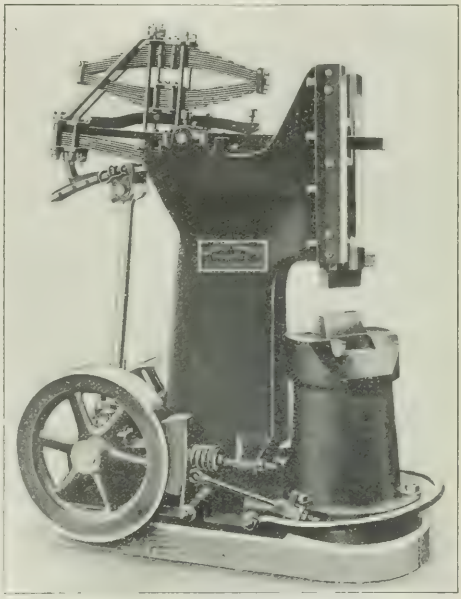
The annual banquet on Wednesday evening, which was held in the Hotel La Salle, proved in every way fully equal to previous functions of this kind enjoyed by the members of the association. It was a Minnesota evening, befitting the occupancy of the presidential office by a Minnesota man. The speakers were Dr. Cyrus Northrop, president of the University of Minnesota, and two Minnesota members of Congress, Frederick C. Stevens and Frank M. Nye of St. Paul and Minneapolis, respectively. The addresses were scholarly, instructive and inspiring. George F. Steedman, St. Louis, who was toastmaster, filled the duties of that exacting position most admirably.

The Alinder Power Hammer

Endeavors have been made in recent years to improve the power hammer and make it more effective, extending its field farther into that of the more expensive steam hammer. In the Alinder hammer, which is being marketed by the Reliance Engineering & Equipment Company, Milwaukee, Wis., it is claimed that a machine has been produced that will meet all the demands usually made on a power hammer. Its points of special excellence are that the ram comes down against the die in all positions which does away with the necessity for making adjustments while the hammer is in use, the adjustment for different strokes can be quickly made, increasing the force of the hammer blow due to the spring arrangement, small power consumption, supporting the ram on a heavy steel arm and having long guides, a heavy flywheel and locating the pulleys and flywheel at the base of the machine which does not disturb the stability of the hammer. This hammer is adaptable for all kinds of forgings, and it is said that its sensitive adjustment and the firm, powerful, quick elastic blow it strikes will allow even hard weldings to be made with it.

The main feature of the machine is the spring arrangement which is patented. The arm carrying the hammer head or ram is made in two parts, and is pivoted to the frame in the center. This arrangement makes it possible for the arm to adjust itself automatically for widely varying thicknesses of stock without the necessity of any adjustment by hand and without lessening the force of the blow. The arrangement is one which, it is claimed, is not possessed by any other spring hammer. Another result of this construction is that the blow is many times heavier than the weight of the ram. This is caused by the compression of the upper spring, which will store the energy it receives from the momentum of the ram and give it back to the ram at the next blow. The momentum of the ram is produced by the speed of the hammer, which causes the ram to continue going upward after the connecting rod has passed its lowest point and started on the up stroke; forming an angle on the upper side of less than 180 degrees between the two parts of the carrying arm and thereby compressing the upper spring.

The adjustment of the stroke is made by moving the cross head, to which the upper end of the connecting rod is fastened, either in or out on the cross head



A New Type of Power Hammer Sold by the Reliance Engineering & Equipment Company, Milwaukee, Wis.

guide, but on account of the spring arrangement it has been found that no adjustment is necessary except in a very few special cases.

The hammer head or ram is made of cast steel, and runs in long adjustable guides. The ram is carried by a heavy, tempered steel arm. This hammer has no sensitive or weak springs, rubber cushions, leather straps, links or rollers or the numerous other wearing parts ordinarily used for transmitting power to the ram.

The frame is cast in one piece, with an independent anvil guided by the frame, but in such a way as not to transfer any shocks to the frame. The anvil is formed at the bottom with a large base. The pulleys and the flywheel are placed at the floor so as not to disturb the stability of the hammer. The simple construction of the hammer makes it possible to bring the loss from friction down to a minimum and thereby effect a saving in wear and repairs.

Around the base is the treadle or foot lever by which the hammer is started and stopped. The speed and the force of the blow is regulated by this same lever by varying the foot pressure on it. A brake, clearly shown in the engraving, connected with the foot treadle, acts on the flywheel as soon as the foot is removed from the treadle, instantly stopping the hammer.

Lake Superior Iron Mines

MARQUETTE, MICH., November 19, 1910.—The State of Minnesota will realize a good sized sum of money this year in the way of royalties on iron ore taken from lands owned by the commonwealth and which have been leased to mining operators. The output of these properties will approximate 1,200,000 tons. The revenue to the State from this particular source will steadily increase the next few years. A very large acreage of mineral lands has been leased to various concerns and individuals, and there is little doubt that its exploration will result in the development of other shipping mines. A number of deposits of ore that already have been found are, in fact, being held in reserve at the present time, the holders being content to pay the minimum royalty until it suits their convenience to begin mining operations.

The Grant Mine

One state-owned property which is being actively wrought is the Grant mine, which is under the control of the Jones & Laughlin Steel Company of Pittsburgh. The Grant is the property at which the clamshell system of stripping was given a prolonged and costly test, only to be discarded in favor of the steam shovel method generally in vogue on the Mesaba. Much of the overburden has now been removed and the mine is fast getting into condition where it can make a larger production, its shipments recently having averaged 30,000 tons a week. Aside from the Grant, the Jones & Laughlin Steel Company controls a number of other Mesaba properties, among them the Lincoln, Leetonia, Longyear, Fowler, Meadow, Nassau and Hector. It has large holdings on the Marquette range, also, and it is interested to some extent in theGogebic, Menominee and Cuyuna districts. Its shipments from the Lake Superior region will not fall far under 2,000,000 tons this year, 1,500,000 tons of this from the Mesaba, aside from which it has made purchases from other companies. The Jones & Laughlin underground mines will all be wrought actively throughout the winter, and no small volume of open pit work will be conducted.

What promises to be a mining field of considerable importance is the territory in the vicinity of Pokegame lake, at the extreme western end of the Mesaba range. Ore in large quantities has been found as a result of drilling operations conducted the past few years, and it it not improbable that the coming year will see development work in progress. Tests preliminary to activity of that nature are, in fact, now being conducted by M. A. Hanna & Co., of Cleveland. The Hanna interests control the Poole property. Ore has been located in this tract, but it lies so close to the lake, if actually it does not dip under the Pokegame basin itself, that its mining may prove something of a problem, the conditions being somewhat similar to those at the Syracuse mine, in the Lake Embarrass region, at the eastern end of the Mesaba, where, after a very large expenditure of money and several years of time, the work of opening the property was abandoned a few months ago because of the remarkably heavy inflow of water. To determine not only the seepage from the lake, but the exact character of the overburden and of the ore itself, the Hanna Company is putting down test pits. On the outcome will depend the character of the proposed development work.

New Mesaba Shippers

The United States Steel Corporation, which is opening a gigantic open pit mine at that point, will carry on very extensive operations at the Hill property at Marble, western Mesaba range, during the winter. The Hill is one of the so-called Great Northern tracts taken over by the Steel Corporation. It contains many million tons of ore and for two or three decades to come it will be one of the very heaviest shippers in the Lake Superior country. The open pit already has attained extensive proportions and by next summer much more of the overburden will have been removed. The stripping work is being pushed vigorously. Another new mine on the Mesaba, but one of comparatively small importance, is to be opened in the Chisholm district by a pool of Minnesota men. The property has been named the Jackpot. The ore deposit contains probably somewhat in excess of 500,000 tons and is to be taken out by the underground system. It is expected to begin shipping the latter part of next season.

Most of the principal Mesaba towns will be connected by a trolley line within the next two years, providing the plans of the Mesaba Electric Railway Company are carried out as now projected. A franchise authorizing the establishment of the system has been granted by the St. Louis county commissioners. The line will extend from Stevenson to Gilbert, as at present planned, and with its various branches will have a total length of 50 miles.

The Swanzey District

In the belief that the northwestern extension of the Swanzey iron bearing formation penetrates the territory, a considerable acreage of government land in the Flat Rock country south of Ishpeming, Marquette range, has been filed upon latterly, under the homestead laws of the United States. It is in the Swanzey field that the Cleveland-Cliffs Iron Company has made some of its most important discoveries of ore the past few years, and where it is conducting mining and development work on a large scale. The operations of the company attracted the particular attention of the public a year or two ago, with the result that there was a rush for government homesteads and timber and stone claims in the district east and southeasterly, and entries were made covering a large acreage. This movement is now being repeated in the opposite direction. No ore other than float deposited by a glacial action centuries ago has ever been found in the Flat Rock country, and as far as indicated by the present geological maps the prospect of mines ever being opened is very dubious. The drift is heavy, which means that any exploration which may be conducted will be difficult and expensive. It may be that a tongue of the ore bearing strata extends into the district, but if so the soil and the rock characteristics are lacking or else they escaped attention when the geologists mapped out the district years ago. Some of the land is capable of being converted into fairly good farms, but for the most part the acreage is of little value, the bare possibility of mineral wealth excepted.

As was expected, denial is made that there is in progress of negotiation any deal by which the Lake Superior mining interests of Corrigan, McKinney & Co. of Cleveland would be transferred to the United States Steel Corporation. The Steel Corporation is not contemplating any immediate expansion of its holdings in the Lake Superior country, nor does it appear that Corrigan, McKinney & Co. have any intention of retiring from the mining business.

Cuyuna Range Railroad Connection

After having been in course of construction for a year or more, the Cuyuna Range division of the Soo Line is now going into commission. Trains will be run from Crosby to Duluth, passing through the towns of Moose Lake, Aitkin and Deerwood. It is over this division that all the ore from the Cuyuna Range mines now being opened will be transported to Lake Superior, unless the Northern Pacific, which serves a portion of the territory, should decide to reach out for a share of the traffic, and this freight service will be started next spring or when the ore dock now being built on Allouez Bay is ready for duty.

According to information from Ely, Vermilion

Range, an excellent showing is being made at the old Chandler mine, formerly operated by the Steel Corporation, and which is now in the hands of a company composed of Minnesota men. An ore body, apparently of large extent, has been found, and it is being developed, and it is said that by next spring the property will be in condition to produce at the rate of 500 tons daily. The ore is of high grade.

Texas Iron Ore in Eastern Pennsylvania

Dr. William B. Phillips, chief of the Bureau of Economic Geology, University of Texas, has prepared the following on the iron ore situation in East Texas:

On June 15, 1910, the first coastwise shipment of east Texas iron ore left Texas City for Philadelphia. It consisted of 568 tons and came from Cass county, on the line of the Jefferson & Northwestern Railway. The shipment was a test lot to be tried in a Pennsylvania blast furnace and was not intended as the immediate precursor of other and larger shipments. The results of the test were so favorable that contracts involving 1000 tons of ore a day can now be placed in eastern Pennsylvania. The Texas Iron & Coal Company, with a capital stock of $3,000,000, has been organized by New York, Philadelphia and Texas people and a permit to transact business in Texas will shortly be applied for. This company has acquired 52,000 acres of iron ore lands in east Texas and proposes to engage in the business of mining and shipping iron ore on a large scale.

There are two outlets for this ore, disregarding such shipments as may go by rail to St. Louis or to the Birmingham district in Alabama. These are from the ore fields by rail to some Gulf port, Port Arthur, Beaumont (later), Bolivar or Texas City, and from the ore fields to some point on the Mississippi River, such as Vicksburg or Baton Rouge. It depends to a large degree upon the railroads contiguous to the ore districts whether this ore will go out through a Texas port or down the Mississippi River in steamers by way of New Orleans. If the railroads will give a rate of $1 a ton to tidewater, it is likely that the greater part of the ore will go out from some Texas Gulf port. If they will not do this, it is likely that the traffic will be diverted from the Texas Gulf ports and seek an outlet by way of the Mississippi River and New Orleans. The traffic will not stand a higher rate than $1 a ton to tidewater, for the ore must be laid down at Atlantic ports at a total cost not to exceed $3 a ton.

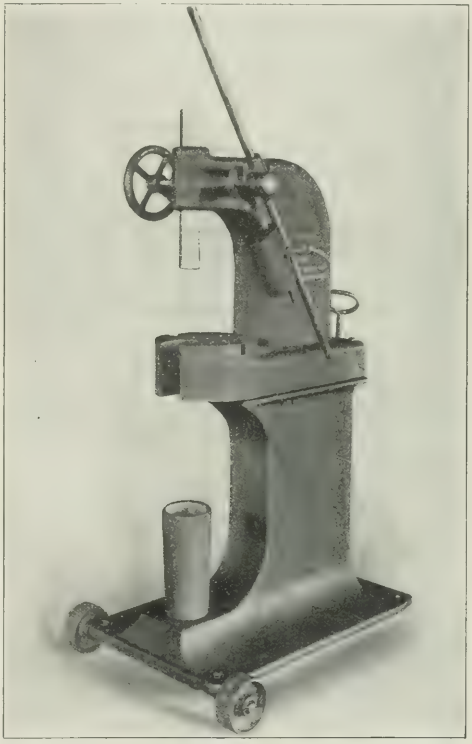
The railroad haul to tidewater does not exceed 325 miles and a rate of $1 a ton means 0.3 cent per ton mile. In the Birmingham district, Alabama, such traffic has been handled for 0.25 cent per ton mile for distances of 100 miles. Applied to our own conditions this would mean a rate of 75 cents a ton for a haul of 300 miles, so that it would appear reasonable to expect a rate of $1 a ton. The rate to St. Louis, 541 miles, is $2 a ton. Shipments have been made to Birmingham, 512 miles, for $2.20.

There is a very large tonnage of iron ore to be moved in the one direction or the other. The 300,000 tons a year can easily be increased to 1,000,000 tons a year, for the ore fields are practically inexhaustible. Unloading and loading facilities are nearing completion at Texas City, and about $250,000 has already been expended there for the rapid handling of such ore as will naturally seek that outlet. The development of the east Texas iron ore fields will certainly go forward, and if our roads want the business they must establish a rate that will secure it.

The annual meeting of the Society of Automobile Engineers will be held in New York, January 11 and 12. A number of technical questions will be discussed and reports will be made by the society's Committee on Standards, including the divisions on plain, ball and roller bearings and on aluminum and copper alloys.

The Cleveland Portable Arbor Press Stand

It is frequently desirable in machine shops to have an arbor press located near where work is being done, and in a number of cases the press cannot be mounted on a bench conveniently or a stationary stand used. To meet these conditions in shops where only one or two of these tools are required the Cleveland Machine Specialty Company, Cleveland, Ohio, has placed on the



A Portable Stand for Arbor Presses Made by the Cleveland Machine Specialty Company, Cleveland, Ohio.

market the portable stand illustrated herewith, which is designed to accommodate its Nos. 5 and 6 arbors presses. The former was illustrated in *The Iron Age* September 29, 1910.

As will be noticed from the engraving, the stand is of box construction. The back is open, and three internal ribs in the column supply shelf room for arbors, broaches, collars and other special fixtures which have to be kept with the machine and moved about from place to place with it. The depth of throat in the stand is 10 in., which is the same as the company's No. 5 press, thus giving a clearance under the bed of the press for work 20 in. in diameter or less.

When the arbors are expelled from the work they fall into a pot with a lead lined bottom, which prevents the arbors from being injured. This pot is easily removable from the base. If desired the stand can be furnished without a truck and used as a stationary one. The weight of the stand alone is 450 lb., and with the manufacturer's No. 5 press, as illustrated, 880 lb. The floor space occupied is 24 x 41 in.

The Morehead Condenser Trap

A New Device for Draining Heating Returns Automatically

For draining exhaust steam and reduced pressure heating systems of both air and water and at the same time producing a vacuum which will insure positive and rapid circulation, the Morehead Mfg. Company, Detroit, Mich., has invented and placed on the market the device illustrated herewith. It is known as the Morehead condenser trap, and in general appearance is similar to the return steam trap of its maker. In detail, however, the two differ, as the former has a cold water connection with the tank of the trap which is made through a flexible tube, both being clearly shown in Fig. 1. The flexible connection terminates in a perforated pipe running the entire length of the trap tank, so that the trap may be considered as a combination of the principles of the jet condenser with those of the maker's automatic return steam trap.

When the condenser trap is connected to the return line of a vacuum heating system where a difference of pressure is maintained between the ends of the system it draws the line condensation and the accumulating air into the tank with more power than the ordinary return trap because of the vacuum created therein. In operation the cold water supply valve is opened slightly when the steam is turned on in the various lines of the heating system which are full of cold

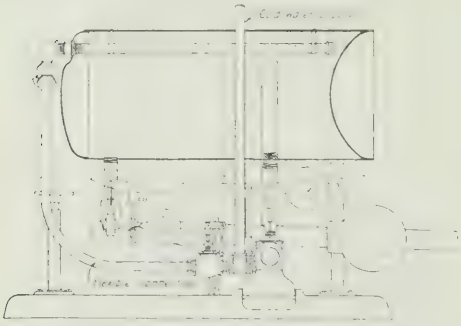


Fig. 1.—View Showing Construction and Condensing Apparatus of the New Trap Made by the Morehead Mfg. Company, Detroit, Mich.

air. When the tank is filled by the condensation from the returns and the condensing water, it tilts, which opens the live steam valve, thus allowing steam to enter and discharge the contents by its pressure into a return steam trap above the boiler or into an open heater. As soon as the tank empties, it resumes a horizontal or filling position, and this movement automatically opens the control valve on the cold water inlet and the cold water comes in contact with the steam in the tank, condensing it and producing a vacuum. The cold water supply may be taken from any available source, and it is claimed that very little is required. A receiver is always used in connection with the condenser trap, the water seal in the former taking the place of the thermostatic valves in the heating system. The condenser trap is used as a lower trap, taking the place of the return trap in a standard double trap installation and discharging into the return trap above the boiler.

There is a typical installation of the trap at the E. M. F. Motor Car Company, Port Huron, Mich. This plant is a two-story brick building, with numerous large windows and electricity supplied from an outside source is used for power. A special 125-hp. boiler was installed for heating purposes, and the condenser trap, shown in Fig. 2, which is located on the boiler room

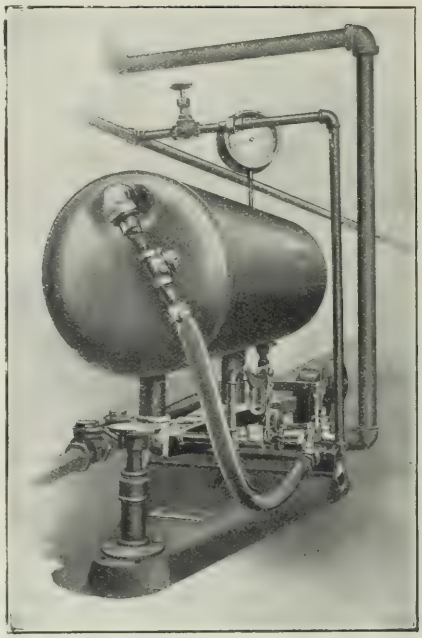


Fig. 2.—One of Two Traps Installed at the Plant of the E. M. F. Motor Car Company, Port Huron, Mich.

floor alongside the boiler, discharges the water of condensation into the steam trap on top of the boiler, which is illustrated in Fig. 3. The return lines and the condenser trap are connected by a receiver located about 5 ft. below the boiler room floor. The piping system, which is equivalent to 60,000 ft. of 1-in. pipe, is so arranged that the wall coils in the factory, and the cast iron radiators in the office are all fed from above, while the returns are run along the first floor with no fall until just before entering the boiler room. Here all the returns are gathered in one 3-in. pipe, which carries the condensation to the receiver. From the receiver the water is carried to the condenser trap and lifted from there to the return trap on top of the boiler, a distance of 15 ft., and discharged into the boiler. The pressure at the boiler is between 25 and 40 lb.,

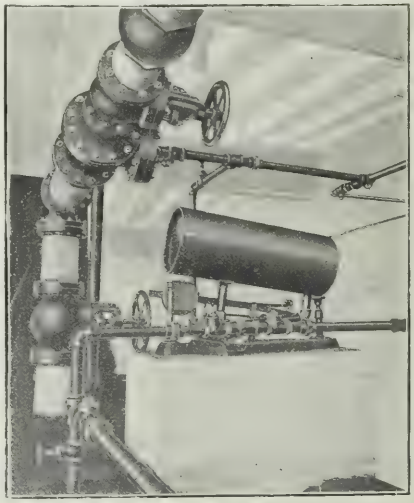


Fig. 3.—Return Trap on Top of Boiler Tilted for Discharging

and is reduced to 1¼ lb. in the system which produces a vacuum of 25 in. in the trap tank. In a test of this plant made in zero weather, the heating plant was operated for 23 consecutive hours on 3 tons of coal.

The New Marshall & Huschart Building

The new building of the Marshall & Huschart Machinery Company, at 17 South Jefferson street, Chicago, was formally opened on the evening of November 19. Invitations were issued to machine tool buyers and the experts of large tool using industries in the West, as well as to manufacturers whose product is represented in the "demonstration room," and met with a hearty response. Nearly 200 machine tool men assembled to take part in the occasion. A light buffet lunch was served, and addresses were made by several of the visiting manufacturers.

The building occupies a plot 80 x 160 ft., and has light on all sides. It is three stories and basement, of combination steel and mill construction, with a front of plate glass and white enamel brick. The demonstration room occupies the greater part of the main floor, providing ample space for belt driven tools, as well as those driven by individual motors. The leading manufacturers in attendance expressed the opinion that this new building is the best equipped for the display of machine tools of any establishment in the United States, if not in the world.

The principal machines that were demonstrated during the evening were a Bullard vertical turret lathe, Cincinnati high power miller, Lodge & Shipley high-speed lathe, Gould & Eberhardt gear hobber and gear cutter, Cincinnati planer, Bickford new type radial drill, Cincinnati high-speed shaft driven drill, Gould & Eberhardt high duty shaper, Landis high-speed bolt cutter and Rockford automatic manufacturers' drill. These machines were all put through their paces by factory experts, whose work was watched with the keenest interest.

As an introduction to the demonstration of these machines, President Marshall of the Marshall & Huschart Machinery Company invited the guests to be seated and hear a few words from manufacturers present. The first speaker introduced was Fred L. Eberhardt, Gould & Eberhardt, Newark, N. J., who made a technical talk on gear cutting. He discussed with the guests of the evening in a very frank manner the advantages and limitations of gear hobbers, giving the result of eight years of experimental work which his company has carried on. E. P. Bullard, Jr., Bullard Machine Tool Company, Bridgeport, Conn., discussed the question of shop efficiency. He took for his text the maxim, "The best way of cutting costs of production is to cut the time between cuts." From this point of view he discussed the value of time saving devices and improvements which enable the workman to handle his machine with greater ease and speed, thus increasing the rate of production. Brief addresses were also made by W. H. Shafer, Cincinnati-Bickford Tool Company, and Charles S. Gingrich, Cincinnati Milling Machine Company.

Other manufacturers present were: A. H. Tuechter and Sherman C. Schauer, Cincinnati-Bickford Tool Company; S. H. Reck and Robert Milne, Rockford Drilling Machine Company, Rockford, Ill.; P. O. Geier, Cincinnati Milling Machine Company; N. Chard, Lodge & Shipley Machine Tool Company, Cincinnati, and C. Meiers, Cincinnati Planer Company. Among the visiting dealers were Herr Schuette of the A. H. Schuette Company, Cologne, Germany, and M. Buehling, Paris, France.

Anti-Accident Boards Advocated.—Thomas D. West delivered an address Saturday evening, November 19, before the Cleveland Superintendents' and Foremen's Club, allied with the Cleveland branch of the National Metal Trades Association, dealing with the general subject of accident liability and accident prevention. He advocated the establishment of municipal anti-accident boards, to be created and managed after the manner of boards of health, but with the special function of safeguarding life and limb in industrial and commercial operations. The club decided to appoint a committee to draw up resolutions to be presented to the Ohio Employers' Liability Commission.

The Inland Steel Company's Earnings

The report of the Inland Steel Company, Chicago, Ill., for the year ending June 30, 1910, shows a large increase in net earnings. The figures for the year, with comparisons with the preceding fiscal year, are as follows:

	1909-10.	Increase over 1909.
Sales, less discount and exchange	$9,816,093	$3,498,594
Cost of sales	8,184,130	2,608,961
Net earnings	$1,631,963	$889,633
Other income	2,174	*10,319
Total income	$1,634,137	$879,314
Deduct —		
Interest	$168,750	$65,769
Dividends, 7 per cent.	404,577	404,577
Depreciation reserve	150,000	150,000
Total deductions	$723,327	$620,346
Balance surplus	$910,810	$258,968

* Decrease.

The Greater Indianapolis Industrial Association has been organized at Indianapolis, Ind., with $25,000 capital stock, and has taken an option on a large tract of land in the southwestern part of the city, where it is proposed to found a manufacturing suburb. The association will try to induce manufacturing companies to locate there. J. N. Carey, head of the Stewart Drug Company, is president of the association, other members being prominent capitalists and business men of the city.

The Detroit Shipbuilding Company, Detroit, Mich., has secured the contract for the construction of a steel passenger excursion steamer 240 ft. long, 60 ft. wide, to be built for Ashley & Dustin, Detroit, to cost $275,000. The steamer will be built from plans of Frank E. Kirby, naval engineer, Detroit.

The Hinckley Construction Company, 805 D. S. Morgan Building, Buffalo, N. Y., has been incorporated, to deal in iron, copper, tin and all other metals. The directors are Eugene L. Falk, Edward C. Schlenker, Jay C. King, Lynn Bentley, E. L. Marshall and M. E. Robinson.

On November 11 the two blast furnaces of the Lake Superior Corporation, Sault Ste. Marie, Ont., made a new record for that plant, turning out 680 tons of Bessemer pig iron. The average for the previous month was 652 tons a day.

The Foote-Burt Company, Cleveland, Ohio, maker of drilling machines, has opened a branch sales office in Detroit, Mich., at 827 Ford Building. Howard C. Rose is manager of the office.

The Cleveland, Ohio, office of the Waterbury Farrel Foundry & Machine Company reports the receipt of an order during the week for a 24 x 72 in. hot copper rolling mill for rolling copper sheets.

The Van Norman No. 3 Miller

A New Duplex Machine of the Constant Speed Type

A new milling machine has been placed on the market by the Waltham Watch Tool Company, Springfield, Mass., which is claimed to embody a number of improvements over other types of millers. This machine is known as the No. 3 Van Norman duplex miller, and among its special features are a movable cutter head mounted on a ram or frame, which can be adjusted either in or out over the table of the machine to adapt the cutter for use in either horizontal or vertical positions or any intermediate one, a constant speed drive with gear changing mechanism within the ram for varying the spindle speeds, a gear feed mechanism, an improved box type of knee and an overhanging arm of solid steel with a tie strap mechanism to give rigidity under both horizontal and vertical cuts. Fig. 1 is a general view of the machine, Fig. 2 shows the spindle

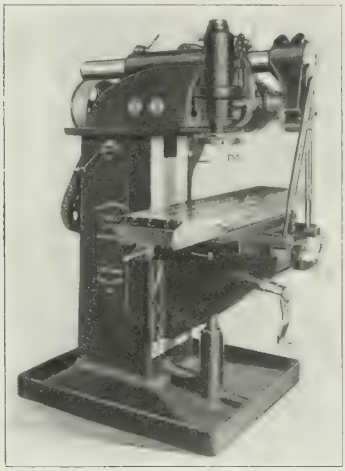


Fig. 1.—The No. 3 Van Norman Duplex Milling Machine, Made by the Waltham Watch Tool Company, Springfield, Mass.

in the horizontal position, while Figs. 3 and 4 give details of the drive and spindle speed gear changing mechanism. In all the engavings the same reference letters indicate the same parts.

The machine is solidly constructed throughout. The main head frame or ram is 35 in. long and 11½ in. wide, and its movement of 13 in. in and out of the column is controlled by the crank handle shown near the top of the column in Fig. 1. When the proper adjustment has been made, the ram is clamped in position by two lever binders. The cutter head is attached to the side of the ram, and can be moved to either horizontal or vertical position, or any intermediate one and securely clamped there.

The spindle, which is 18 in. long, has a No. 13 B. & S. taper at the front end that is adapted for reducing collets to take large split collets or tapers of other numbers. Cone bearings having a maximum diameter of 2 15-16 in. are used. Twelve spindle speeds, varying from 15 to 276 rev. per min., are provided, all of which are instantly available without stopping the machine. A chain-driven gear box furnishes 16 feed changes from 7-16 to 13 in. table feed per minute. Both of these sets of gears are of steel and run in oil.

The driving pulley A, Fig. 2, and *a*, Fig. 3, runs at a constant speed, and its splined shaft, *b*, is supported with it in the bracket *c*, which is attached to the side of the column. The bevel gears *d* and *e* connect this shaft with the one marked *f*, Figs. 3 and 4, within

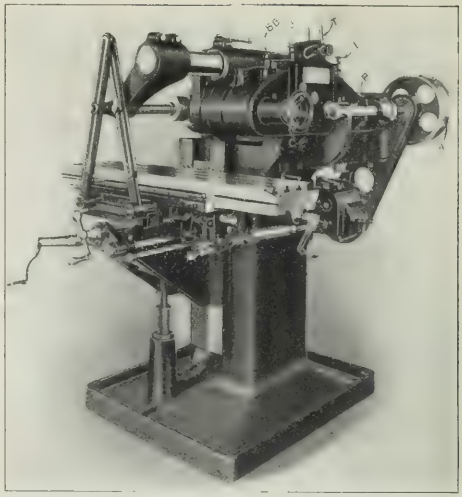


Fig. 2.—View Showing Machine with Spindle in Horizontal Position, Also General Arrangement of Feed and Drive Mechanism.

the ram. The loose clutch gear *g* is mounted on this shaft, and the combined sliding clutch and gear *h* is keyed to this shaft also, the former having its movement controlled by the lever *i*, Fig. 4. The gears *g* and *h* engage the two gears *j* and *k*, which are keyed together and revolve on the stationary shaft or stud *l*. Pivoted on this stud is the swinging frame or yoke *m*, which has a shaft or stud, *n*, that carries a sliding gear, *o*, meshing with the long gear *j*. At the upper end of this swinging frame is a spring pin mechanism, shown in Fig. 4, which locates the frame in its different positions, and the locking lever *t* clamps it securely in place. The stud *s* has a cone of gears, *p*, *q* and *r*, mounted on it, and the sliding gear *o* meshes with one of the three cone gears according to its position, which is controlled by the index lever *u* with the pinion *v*, which engages the rack on the sliding fork piece *w*. The loose clutch gears *x* and *y* on the shaft *z* mesh with the gears *p* and *r*, and the clutch *aa* is controlled by the lever *bb*. The handwheel *cc* on the end of the shaft *z* aids to bring the gears in mesh when making changes. In operating these various gears it will be noticed that *f* and *s* are shafts which revolve with their gears, while *l*, *n* and *s* are studs with freely running gears mounted thereon. The cutter head *dd*, Fig. 3, pivots on the trunnion ring *ee*, and is clamped securely in position on the face of the ram by three

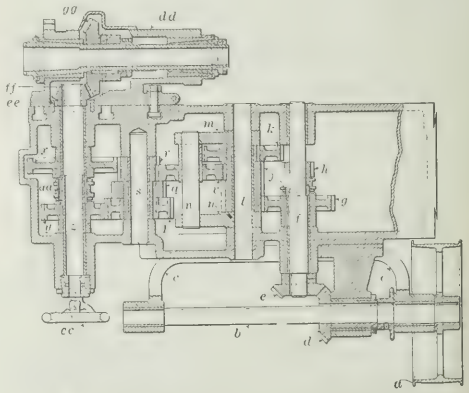


Fig. 3.—Section Through the Drive and Spindle Gear Change Mechanism.

locking bolts moving in circular slots. The drive connection between the pulley and the cutter head is completed by a bevel gear, *ff*, on the end of the shaft *z*, and another gear, *gg*, on the spindle.

The following table gives the principal dimensions and specifications of the machine:

Movement of ram, inches	13
Length of ram, inches	35
Width of ram, inches	11½
Length of spindle, inches	18
Morse taper of spindle	No. 13
Number of spindle speeds	12
Minimum spindle speed, revolutions per minute	15
Maximum spindle speed, revolutions per minute	276
Driving pulley diameter, inches	12
Driving pulley face width, inches	4¼
Driving pulley speed, revolutions per minute	300
Number of feed changes	16
Minimum feed of table, inches per minute	7/10
Maximum feed of table, inches per minute	13
Length of table, inches	48½
Working surface of table, inches	10 x 45
Longitudinal feed of table, inches	30
Length of saddle, inches	26½
Traverse feed of saddle, inches	12
Vertical movement of knee, inches	19
Diameter of overhanging arm, inches	3½
Diameter of countershaft pulleys, inches	13
Face width of countershaft pulleys, inches	4½
Speed of countershaft pulleys, revolutions per minute	300
Width of swivel vise jaws, inches	7
Depth of swivel vise jaws, inches	1½
Opening of swivel vise jaws, inches	4½
Approximate weight of machine, pounds	4,000

The regular equipment furnished with each machine consists of draw-in spindle for holding large taper shank mill mounts or arbors securely, a ⅞-in. split collet, one reducing collet with No. 7 B. & S. taper hole, a 2¾-in. end mill, one cutter arbor, one vise, a set of wrenches and a countershaft. When desired the builder is prepared to furnish at a slight additional cost, semiuniversal or full universal centers and subhead and a slotting attachment.

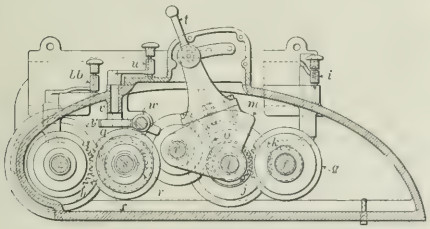


Fig. 4.—Sectional Elevation of Driving Mechanism.

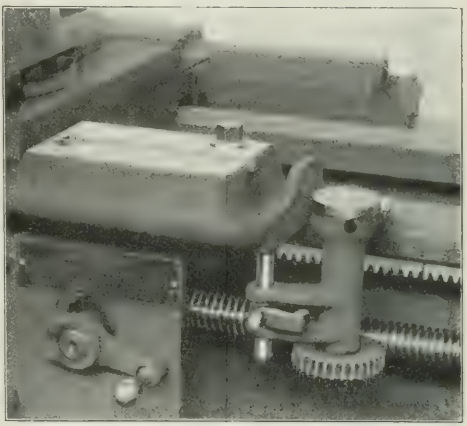
The Jones "Step" Process

MARQUETTE, MICH., November 21.—It is reported from Iron Mountain, Mich., that the Ardis furnace there, used by John T. Jones in his "Step" process for the production of wrought iron, made a successful test run last week. The Jones process contemplates the use of low grade ores. Up to this time the difficulty has been to find any material for the furnace lining which would stand up under the intense heat required to "metallize" the ores. The Ardis furnace went into service Thursday. The first of the continuous charges of ore went into the tube about 1 o'clock in the afternoon and was expected to work through the tube about 10 o'clock Friday. Its "metallization" at the start was hardly expected, as there was every chance that proper gases could not be produced at the start. But instead of the iron coming through the tube at 10 o'clock Friday, as was expected, it made its appearance between 3 and 4 o'clock, or about six hours earlier. The reduction of time consumed in the process is considered an important development, as it greatly increases the productive capacity. The ore used was from the Kloman property at Republic, Mich.

It is stated by the inventor that the ore is "metallized" by the hydrocarbons contained in gas from bituminous coal, the residue in the ovens being coke. The coke is then used in the cupola, in which the product of the Ardis furnace is manufactured into muck bar. Mr. Jones is confident that with 1200 lb. of coal he can produce 1 ton of product containing 98 per cent. iron.

Lodge & Shipley Thread Indicator

The chasing dial or thread indicator as known to most mechanics is a lathe attachment for thread cutting to permit disengaging the half nut at the end of each cut, running the carriage back by hand, and reengaging the half nut to pick up the thread at the proper point. Running the carriage back by hand not only saves time, but also allows both countershaft driving pulleys to be run forward, thus giving the lathe twice as many forward speeds as would be obtained if one backing belt were used. For these reasons the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, is now furnishing a thread indicator as part of the regular equipment of every lathe. As shown in the illustration, this thread indicator, which is attached to the right of the front arm of the carriage, has several novel features.



An Indicator for Use on Lathes in Connection with Thread Cutting Made by the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio.

The worm wheel of the indicator is held lightly against the lead screw by a coil spring, and can be swung back out of engagement when desired. Or, if a quantity of work which requires no threading is to be machined, the whole attachment can be quickly removed. Attached to the front of the apron close to the thread indicator is a brass instruction plate reading as follows: "Directions—For all even threads, close half-nut at any line on dial; for all odd threads, close half-nut at any numbered line; one-half threads any one-quarter revolution; one-quarter threads, any one-half revolution." Thus all necessary instructions for using the attachment, briefly stated, are continually before the operator.

The population of Trenton, N. J., is 96,815, as compared with 73,307 in 1900, an increase of 32 per cent.; of Springfield, Ohio, 46,921, against 38,253 in 1900, an increase of 22.7 per cent.; of Huntington, W. Va., 31,161, against 11,923 in 1900, an increase of 161.4 per cent.

Iron and Steel Works Labor

The Questions of Hours and of Accident Liability

The paper of Wm. B. Dickson, first vice-president of the United States Steel Corporation, read at the meeting of the American Iron and Steel Institute in New York, October 14, was printed in *The Iron Age* of October 30, page 1030, under the title, "Betterment of Labor Conditions in the Steel Industry." The discussion on Mr. Dickson's paper was participated in by Charles Kirchhoff; Edgar S. Cook, president of the Warwick Iron & Steel Company, Pottstown, Pa., and Edward Bailey, president of the Central Iron & Steel Company, Harrisburg, Pa. A revised report of their remarks is just now available for publication and we reproduce it below:

Charles Kirchhoff

Mr. Dickson's admirable presentation of some of the greatest problems not alone to the iron and steel industry, but to all the manufacturing industries of the country, has been made in an exceedingly forcible way. He has put his hand upon some of the most important points. I was struck with one statement and that was that "law is a crystallization of public opinion." In this country that is true, because we do not rely upon paternal help from above but expect improvement to come from below. That has its advantages, but it has its great drawbacks too. It means first of all that we must educate public opinion and that usually falls to the lot first of enthusiasts and only too often to the lot of demagogues. It is therefore one necessary preliminary that public opinion be educated along sound and safe lines. I have had the pleasure of being associated for a number of years with a movement aiming at improving the conditions surrounding the employment of men in works. We have found that, as Mr. Dickson has said, there was always danger of indifference on the part of manufacturers which robs them of the opportunity of influencing legislation. Legislation in this country, I am afraid, is going to take very radical directions. It is already doing so, and there is danger that it will be very much worse and that the voice of common sense will not be heard at the right time. There is a tendency already expressed in legislation to relieve the men completely of all responsibility. That tendency is even shown among those who have their interests most at heart. I think that is a grave mistake, because it goes too far; it inflicts injustice, injustice upon the manufacturer, injustice, too, upon the fellow workman. I believe that there should be some penalty, some retention of benefits from those who are reckless and above all those who break the rules which have been established for their own safety, or who mutilate or remove the appliances for safety.

In connection with this matter there is something that I believe was not alluded to because it was probably considered a minor detail by Mr. Dickson in his presentation of the splendid work the Steel Corporation is doing, and that is that they are gaining the sympathy and the interest of the men. They are doing this by trying to secure among the men themselves from time to time representatives who shall act on shop committees, and I have been told that the selection of these very men for greater intelligence and greater interest has made service on such committees a badge of honor in many of the works. That I believe, gentlemen, is the best way to get at it, rather than to make the law embrace everything, good, bad, and indifferent.

Edgar S. Cook

It is a matter of great gratification to me that the United States Steel Corporation is setting such a good example, and I am in hopes that it may lead to conservative legislation, which shall bring about the necessity of all employers expending some money in the care of their employees. At this time of very close competition, when one concern is inclined to expend considerable money in the care of employees, to have other concerns neglect it absolutely is a matter of discouragement to those who would like to help their men along from a humanitarian standpoint.

IMPROVEMENT WORK AT POTTSTOWN.

My connection with the iron business is altogether from the blast furnace standpoint. The grade of employees in the blast furnace will average lower in intelligence than in the more advanced form of manufacture, as, for instance, steel works and finishing mills. With the advent of foreign labor in the Schuylkill Valley, about 1885, gradually replacing, as it has, American labor, our conditions in regard to accidents, &c., became more and more serious. More recently, however, there has been an improvement. The difficulties of communicating with and talking to these people added very much to the troubles of the management.

When I first commenced to employ Hungarian and Slavic labor, I could not get any boarding places for them in Pottstown. We had to build shanties for their accommodation. The shanties were of a very temporary character, as we had no suitable location. We have now built what we think is a model village. It shows a vast improvement, realizing in part my hopes and wishes in the matter, and it proves that the work people are capable of advancement, if they are treated with consideration and properly instructed. Notwithstanding that the houses are furnished with bath rooms and bath tubs, and that many of them were used for all sorts of purposes except that for which they were designed, most of the people are now using them for the purpose for which they were put into the houses.

In the turmoil and the boiling of the social kettle, those that have the greatest mentality and the greatest thrift come to the top and graduate into other occupations. It is only unskilled labor that will continue to work around a blast furnace. These men are trained to do the routine work, so that while they may become semi-skilled, as it were, yet the work itself calls for little, other than so-called common labor. The fittest men, as determined by natural selection, become foremen and furnace blowers, developing occasionally into well-equipped furnace managers. Compared with the number of men employed, the positions calling for experience and skill and accompanied by attractive salaries are limited. The men, therefore, that develop industry, application and brain power, outgrow their opportunities at the furnace, seeking employment where there are better chances for advancement. These changes apparently come about entirely irrespective of the working conditions at blast furnaces, as related to the hours of work.

THIRD PARTIES IN ACCIDENT CASES.

For many years I have been in close personal contact with our men. In fact, there has been more or less of a paternal government, if a personal acquaintance and an intimate knowledge and sympathy with working conditions count for anything. Some few years ago, we realized a change of sentiment on the part of our employees, influenced no doubt by designing agents or a low grade of so-called lawyers, which resulted in threats to bring suits for all sorts of accidents. We were thus compelled to make use of employers' liability insurance policy, in order that we might be relieved from the annoyances attending settlements with third parties. I do not think that this change has proven of any particular advantage to our men, as the tendency has been to substitute compliance with laws regarding damages.

In many instances, I have no doubt, the injured employee has not fared as well, after paying fees and charges, as he did under the former regime, when each particular case was treated on its merits by our company, without the intervention of any outside agency.

BLAST FURNACE WORKING HOURS.

Considering the class or type of laborers employed at blast furnaces, I feel that a great deal of sympathy is wasted so far as the hours of work are concerned. The man who is on duty 12 hours out of 24 is not continuously employed. His labor is specialized, and his position is higher than that of the man who is working ten hours a day. In fact the latter, if at all ambitious, strives to get the job of the man who is working 12 hours. He shows a preference for working 12 hours instead of ten, for the reason that the 10-hour work is continuous hard work, and the 12 hours' work is intermittent, to say nothing of the higher dignity of a turn position. All my friends who have come in contact with the blast furnace, not from the standpoint of an office distant from the works, but from the office of the manager of the works, will understand and appreciate the facts I am stating. If these men are not working 12 hours, what are they doing? They have just enough of the beginnings of education to get together and make themselves unhappy and discontented, but with no resources to occupy their time profitably. If they are employed, they have their work to think about, although they may not do much thinking about that. At the same time, however, they are busy, without being overtaxed, either physically or nervously. I am assured that eight hours would be to their unhappiness, to our discomfort, and to the benefit of no one. An eight-hour turn would only add to the

general high cost of living, which comes from everything costing a little bit more than it ought to, without any corresponding benefit in many instances.

There are, doubtless, many forms of physical work, where the surroundings are unfavorable, or when the physical exertion is continuous and severe, accompanied by more or less nervous strain, and for these eight hours is the limit of reasonable human endurance. Conversely, there are other occupations where 12 hours' employment is to the benefit of the employee in more ways than one. During the years 1893 to 1898, when there were more men seeking employment than there was work to be performed, reducing the hours of work indiscriminately divided the work more evenly between the employed and unemployed, and by so much reduced the number of idle men. During the past decade, as a rule, there have been jobs ready and waiting for all able and willing to do a day's work.

I feel assured, from an experience extending through many years, that an eight hour work day, as applied to the average employee of the blast furnace would be to the disadvantage of the men both morally and physically. There are exceptions, of course. Certain individuals would make use of the time to their profit and advantage, but the mass would not know how to employ the four hours to their benefit in any way. In other words, they must learn to make good use of time. As they learn, they move up higher, and make room for another set of beginners. As long as there is laboring work to be done, requiring no particular skill, no brain power, but only good physique, there will be men fitted to perform such work and nothing more, except as they are trained for better things.

The blast furnace may be likened to a preparatory school, fitting boys for a college course, or business career. A wise master knows that the boys must be kept busily employed, either in recitation room, study, or play. All must be laid out according to rule, so that every hour of the 24, including the hours of sleep, has its particular duty. Lacking such an organization, the pent-up energies of the boys would concoct all sorts of mischievous schemes, working injury to themselves, and destruction to the school.

Many men never get beyond the school age, and it is necessary for their protection and advancement, that they should be surrounded by an organization that will guide them along the lines best suited for their capacities.

THE SEVEN-DAY WORK WEEK.

So far as working seven days in the week is concerned, that is a matter of comparatively easy adjustment. I do not find that our men object to blast furnace work on that account, because they can usually get a day off. They generally manage to take a day off, whether with or without the consent of the foreman. The only hardship is working 24 hours on the long turn. Under certain conditions especially, that is objectionable, but I do not see how it can be avoided. A change, however, may be brought about. Some of my friends in the charcoal furnace business have told me that in years gone by, they stopped their furnaces for 12 hours on Sunday. If we could adapt this practice to all the blast furnaces, in the present condition of business, I think it would be desirable, as it would cut down the product materially. Nevertheless, in talking to our men on the subject, the men in whom I put the most reliance and trust tell me that if we should pursue the plan of shutting down the furnace on Sunday, they would all go to farming, or some other occupation, because they know well that the stoppage would be accompanied by very hard work Monday or Tuesday. They would rather take the chance of working 24 hours every other week, than to have the shutdown.

I think there is a great improvement in our so-called foreign laborers. I have found a great deal to encourage me in my contact with them. We have had men working for us from 10 to 20 years. Their children are working for us, and they are going to make good citizens. The class who do not drink, who save their money, make good workmen, and I think will make good citizens, if we only give them a chance and surround them with the environment of a decent home.

Edward Bailey

Mr. Dickson's paper must commend itself to every thoughtful American manufacturer, whether engaged in the production of iron or steel or other products. As manufacturers I feel that we are all indebted to the Steel Corporation for what it has done toward ameliorating the conditions of its workmen. I have been asked to criticise Mr. Dickson's remarks, but I have nothing but the heartiest approval of everything he has said, from the humanitarian as well as the economical point of view. I believe that he has struck the keynote in practically everything.

Those of us who are large employers of labor realize that conditions have radically changed during the last 20 years. Mr. Cook spoke of that, in the change from American labor to what we are pleased to call foreign labor. I think we will have to get away from that idea of calling it foreign labor. It has come to stay. We can't get along without it. We could not to-day fill the orders of the manufacturing industries unless we had that labor. And it seems to me that the only way to make that labor as we would like to have it is by educating many of those men coming here. Many of them stay but two or three years. They don't speak our language, and they don't get into the spirit of our institutions. If any little accident happens, and if any money is realized, the workman gets possibly 10 or 15 or 20 per cent. of the total, whereas, if he is entitled to anything, he is entitled to it all.

Now you all know what changes have taken place in the last 10 or 15 years. The larger works have trained surgeons constantly on hand to look after their employees. Many of you know what has been done by one large concern—a large employer of labor. They have gone farther than the mere question of looking after the physical welfare of the employee in his place of work. They have employed a trained nurse, whose duty it is to visit the homes of those employees, and to see that their home conditions are satisfactory, and the man who is not using his money as he should, for the maintenance and support of his family in a proper way, that man is marked to go on the sliding board, whenever opportunity offers. Now that may be a pretty radical illustration of paternalism, but with a certain class of employees, until they are educated through the spirit of our institutions, it is a question whether some such method is more to their benefit than to our benefit.

Mr. Dickson has touched upon the subject of employers' liability. We all know the stringent laws passed in the State of New York and in the State of Ohio, with others pending in other States. I heartily approve of what he said about joining in that movement. Most of the laws as prepared to-day are by the representatives of organized labor—some of them not even organized labor. They are prepared solely from one point of view—their own point of view. They do not consider the other point of view. Now why should not we as employers join in that movement and try to advance it along scientic lines—lines that would be fair to the employer as well as to the employee? It's in the air. It is coming, and if we can shape it properly, it would be to their advantage and ours.

The Proposed Southern Iron and Steel Merger

In a recent visit to Birmingham, Ala., Cecil Grenfell, representing English bondholders of the Southern Iron & Steel Company, said that an effort would be made to bring about a consolidation of certain iron and steel companies in Alabama. Reports to this effect have been current in the iron trade for some weeks, but no definite steps have been taken. The Southern Iron & Steel Company and three blast furnace companies, all of which own considerable ore and coal properties have been mentioned. One of these companies is understood to have named a large figure and to have indicated that only a cash consideration would be entertained.

The St. Paul Machinery Mfg. Company.—The St. Paul Machinery Mfg. Company, St. Paul, Minn., recently incorporated with $450,000 capital stock, has absorbed the Dovetail Box Machine Company and the St. Paul Ditcher & Carrier Company. In addition to the wedge dovetailing machinery manufactured by the former company and the Hovland tile ditching machine manufactured by the latter company, the new company will manufacture the Hovland caterpillar plow tractor, the principles of which are the same as those used on ditching machinery, with the exception of improvements which enable the machine to turn around in its own tracks. The advantage claimed for this tractor is that it is possible to use it on wet farm lands from two weeks to two months earlier than is possible for wheel tractors. The company is contemplating the enlargement of its manufacturing facilities, but it has not been decided at this time what the additional equipment and capacity will be.

More than 1,000,000 tons of iron ore has been shipped from Bell Island mines, Newfoundland, this year by the Dominion Steel Corporation and the Nova Scotia Steel & Coal Company.

The Seneca Falls New 14-In. Lathe

New Features Include a Micrometer Cross Slide Stop

A new 14-in. quick change feed engine lathe has been brought out by the Seneca Falls Mfg. Company, 255 Water street, Seneca Falls, N. Y., which contains several new features tending toward convenient operation and accurate production of work in large quantities. These include a special type of quick change feed mechanism, a new micrometer stop for the cross slide and the reversing mechanism for the cross and longitudinal feeds and the lead screw. Fig. 1 is a general view of the lathe and Fig. 2 shows the top view of the micrometer stop.

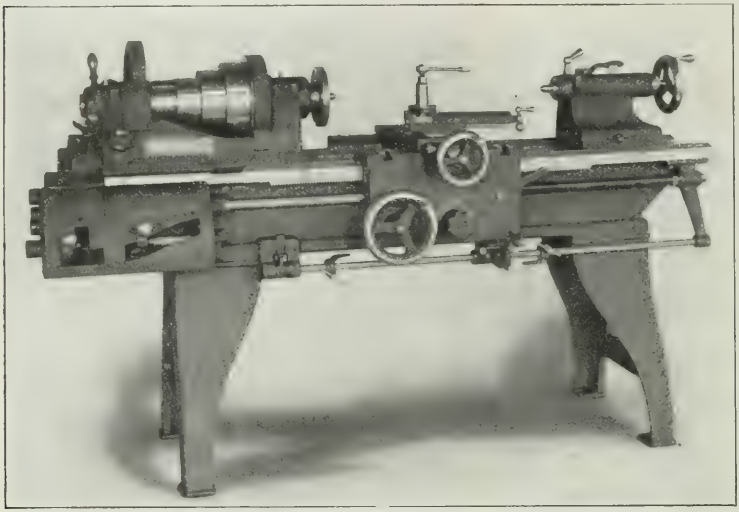


Fig. 1.—The New 14-In. Quick Change Lathe Built by the Seneca Falls Mfg. Company, Seneca Falls, N. Y.

In all 48 different rates of feed are available through the quick change feed mechanism, consisting of a cone of eight steel gears located on the lead screw (which also serves as the feed rod) at the right side of the feed cage. Gears and a tumbler yoke connect any one of this cone of gears with the lower shaft, which has three changes of speed given to it through a second tumbler and set of gears at the left end of the cage. This last set of gears has two different speeds controlled by the lever on the end of the headstock, which doubles the 24 rates provided by the eight steps of the cone of gears and the three speeds of the lower shaft, thus giving a total of 48 feeds, ranging from 0.0023 to 0.144 in. per revolution of the spindle. The settings necessary to procure any one of these feed rates, as well as cut any standard thread from 1½ to 92 per inch, are indicated on the index plate attached to the headstock, and any desired feed or thread can be conveniently and instantly obtained.

The micrometer stop for the cross slide, shown in Fig. 2, is said to be radically different from any other stop device now on the market and receives its name from the micrometer feature, which enables very fine adjustments to be made easily and quickly. A worm gear operated by a knurled head screw changes the relative positions of the stop and controls the advance of the tool, as indicated by the graduations on the micrometer barrel, which are about ⅛ in. apart and read to 0.00025 in. The pushing in and out of the knob inside of the hand wheel throws the stop mechanism in or out of engagement. The stop acts directly on the cross feed screw, which is said to be more effective than one acting on the cross slide. The stop is positive in action and no matter how far away from the work the tool may be fed it will always stop as indicated by the graduations. In this way accurate cutting to a given depth on both inside and outside work is insured and time is saved, because there is no guessing at the depth of the cut, the taking of several trial cuts to obtain a desired measurement is eliminated and there is no necessity for stopping the lathe to caliper a piece of work. Uniformity in making duplicate parts is secured, as the depth of cut cannot be varied by crowding the tool. If desired the stop can be used with a taper attachment.

A set of spur gears and a clutch in the headstock comprise the reversing mechanism for the cross and longitudinal feeds and the lead screw and is operated by a hand lever on the apron, which is connected to the reversing rod through levers. The special advantages of this feature are that the operator has control of his lathe from the apron, which greatly facilitates the production of work in large quantities and does away with the necessity of having a reverse belt on the countershaft. Adjustable stops on the reverse rod give an automatic stop for the carriage in either direction.

A deep web pattern of headstock is provided, with a large diameter cone pulley with steps wide enough for a 2½-in. belt. The spindle is of forged crucible steel and revolves at any one of 16 different speeds in large ring oiling bearings. The carriage is wide, with full length solid bearings on the V ways, which are kept free from dirt by felt wipers, which also spread the oil. A new patented binding device fastens the plain and the compound rests to the cross slide. This construction facilitates adjustments and the omission of the customary slots for the bolts of the binding device makes the cross slide stronger. A taper attachment

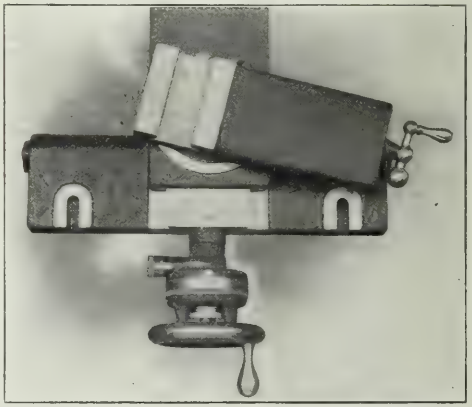


Fig. 2.—View Looking Down on Micrometer Cross Feed Stop.

can be affixed at any time, as all the carriages are so arranged. The cross feed screw has a large collar graduated to read in thousandths of an inch and the graduations are easily read, being spaced about 1-16 in. apart.

The apron is strongly reinforced by ribs and the gears are of coarse pitch with wide faces. An automatic safety device prevents the engaging of opposing feeds, as one is automatically disengaged as the other is thrown in. When cutting threads the feed gearing is disengaged and the longitudinal hand wheel does not revolve. The countershaft pulleys are of the improved friction type, with a large friction surface on the rim, and wear on the friction parts has been eliminated when the pulley is running idle. Ample wearing surfaces on the shaft are provided by extra large pulley hubs, and the belts do not need to be thrown off when oiling the pulleys.

New Tools and Appliances

This is essentially a news department for which information is invited.

New Applications of the Johannson Gauge.—A number of new uses for the Johannson gauges which are handled in this country by the Grönkvist Drill Chuck Company, Jersey City, N. J., have been recently made. In one the base has a vertical member similar to a surface gauge and is used as a measuring machine for testing measuring rods. A second application is to use the gauge in combination with a scribing block to form a hight gauge and in the third the gauge is used as a precision trammel for accurately scribing distances or circles from a prick punch mark as a center.

Continuous Milling Machine.—The Barber-Colman Company, Rockford, Ill., is manufacturing a milling machine, which is designed to load and unload without stopping and to be continuous in operation. This feature is secured by strapping a number of pieces in a suitable fixture to a rotary table, the feed being continuous in one direction and passing the pieces under the cutters in a circular path, each one being removed after it has been milled and its place taken by a rough casting or forging. It might, perhaps, be inferred that the machine is designed for circular work, but such is not the case, as while such work can be handled conveniently the machine is designed primarily for handling those pieces which can be milled with face, side or straddle cutters. The drive is of the direct gear type from constant speed tight and loose pulleys, and the machine may be belted direct to the line shaft or to a jack shaft as desired. Six speed changes, ranging in approximately geometrical progression from 20 to 200 rev. per min., are available through the use of transposing gears. The table is rotated through gearing and six feed changes are obtained by transposing gears. Setting the work and the cutters is accomplished by graduated micrometer dials in connection with hand wheels, the dials reading to thousandths of an inch. The table may be rotated by the hand wheel or power, the power being controlled by a clutch and lever. A hardened steel bushing in the center of the table enables the fixtures to be located accurately and there are eight slots for clamping the fixtures to the table. These are of simple construction owing to the character of the work machined. A movable chip pan is placed directly under the cut and oil and chips are conveyed to this point. The oil tank is cast integral with the bed which is of box section and a pump and fittings are regularly furnished. The floor space occupied by the machine is 44 x 68 in., and the net weight is approximately 3300 lb.

Floating Reamer.—The Kelly Reamer Company, Cleveland, Ohio, has made an improvement in its floating reamer which insures both accuracy and finish without grinding in cylinders ranging from 1 to 12 in. in diameter. The change consists of an adjustable, rigid, high-speed boring blade which is set immediately ahead of the reamer proper to take a final boring cut of about 0.01 in., leaving only 0.003 in. for the reamer to remove and thus reducing the amount of work done by the reamer blades.

A Worm Driven Vertical Milling Machine.—A new design of vertical milling machine has been brought out by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa. The special feature of this machine is that the drive is through worm gearing. The driving worm wheel is of large diameter and has a bronze ring with teeth of steep lead. The sleeve rotates in a bushed capped bearing which is bolted to the frame to permit adjustment. The spindle, which is 6½ in. in diameter and 21½ in. long, is driven with the sleeve by a double keyway. The power is taken through a 7-in. belt from a 30-hp. electric motor, having a speed of from 400 to 1200 rev. per min. The driving worm is of hardened steel fitted with roller thrust bearings and with the worm wheel runs in an oil bath. The feed and fast power traverse are carried through a double train of bevel gears, giving reverse to both motions. All gears are steel or bronze and all movements are clutched. The circular table is 60 in. in diameter, entirely surrounded by an oil pan and has an exceptionally large center bearing in the table saddle. The cross saddle has square lock gibbed bearings on the base and adjustments are made by taper shoes.

The British Iron Market

The London *Ironmonger* of November 12 comments as follows on iron trade developments:

The situation is still overclouded by the labor troubles, which, so far from clearing off, are rather becoming more ominous. The ballot of the boilermakers shows a big majority against the acceptance of the agreement arrived at between the employers and the employees at York, and it is beyond the wit of man to foresee the end of the turmoil. As for South Wales a squabble about the rate of pay for working in what is known as abnormal places—that is, places where the coal is difficult to get at, and where it is therefore harder to earn an average day's pay—has led to a state of affairs not far removed from civil war. Under these circumstances there is little room for surprise that the tendency of No. 3 Cleveland warrants should have been reactionary, but it is astonishing that prices should not have sustained greater depreciation than is the case. Makers of Cleveland iron, however, are taking matters very calmly, having pretty good order books, and under the circumstances being content to wait for higher prices. The shipments are better than last month and show an improvement all around, while stocks continue to increase. Finished iron is quiet, but steady, and steelmakers have a big tonnage on their books, but are becoming nervous at the prolongation of the shipbuilding trouble. Some people are looking for a moderate "boom" in American trade following upon the Democratic victories, but America is still trying to postpone deliveries of Spanish ore, which does not look very hopeful. Business continues very slack in the steel rail trade. A couple of orders have been placed on the West Coast—1300 tons for the India Office and 5000 tons for the Burma Railways being intrusted to the Barrow Hematite Company. Belgian works are reported to have booked fair orders lately, including 4000 tons for Uruguay, 10,000 tons for Mexico and 6000 tons for Chili and Portugal.

Plans have arrived from England for the dry dock that is to be built at Owen Sound, Ont. It is stated that $750,000 preferred 5½ per cent. stock has been placed in the British market. The plans include arrangements for a shipbuilding plant.

The Springfield-Brandes Vertical Grinding Planer

A Powerful Machine Containing Various Improvements

The Springfield-Brandes vertical grinding planer contains a number of important improvements upon its predecessors in the line of the Springfield Mfg. Company, Bridgeport, Conn. It is a heavy, substantial tool, grinding pieces 12 in. wide, 12 in. high by 4 ft. long, or is built with a longer capacity if so desired, and has been adopted by its builder as a standard type. The size of the tool may be judged from its weight, which is 8000 lb. The wheel is 16 in. in diameter, mounted in a chuck which permits of changing quickly, and is protected by guards to insure against accidents in case of injury to the wheel. Fig. 1 gives a general view of the machine, while in Fig. 2 are shown samples of work ground.

The wheel head and spindle are of exceptionally heavy design, the latter being of large diameter and mounted in long bearings, which are arranged with a ball thrust on the under side and with a ball bearing spring take-up on the upper part, to prevent back lash when the wheel is running off the work. The driving pulley is mounted upon an independent bearing, which relieves the spindle of all strain of the belt. The aim has been to give the machine the stiffness and rigidity of a modern planer. The table drive is of the usual planer construction, except that the power is transmitted through a worm and worm gear on the rear of the machine direct to a substantial screw which runs in a long nut to insure long life and a smooth action of the table. The guard around the table is made in sections on the front side, to permit of easy access to the work. Fig. 1 shows a part of the upper section of the guard removed.

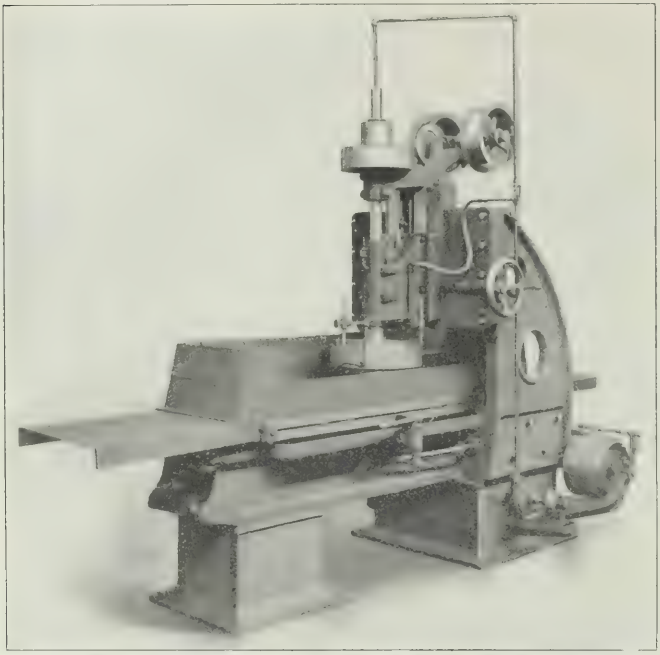


Fig. 1.—The Springfield-Brandes Vertical Grinding Planer Built by the Springfield Mfg. Company, Bridgeport, Conn.

The machine is shown equipped with a hand wheel for feeding the wheel to the work, and with a micrometer dial to facilitate the setting and for getting sizes. The planer is furnished with a power feed, if desired.

A pump supplies lubricant to the wheel, reaching it either through the spindle or from the outside. A new feature is a deflector for use when water is admitted through the spindle. Being located on the under side of the wheel the deflector serves to force the water to the periphery, constituting an essential feature in grinding narrow or interrupted surfaces.

The sample pieces shown in Fig. 2 are all cast iron with the exception of four; F, H, J and K. The piece A is 22 in. wide and 6¼ in. high, with two grooves about 15 in. long, and both sides were ground in

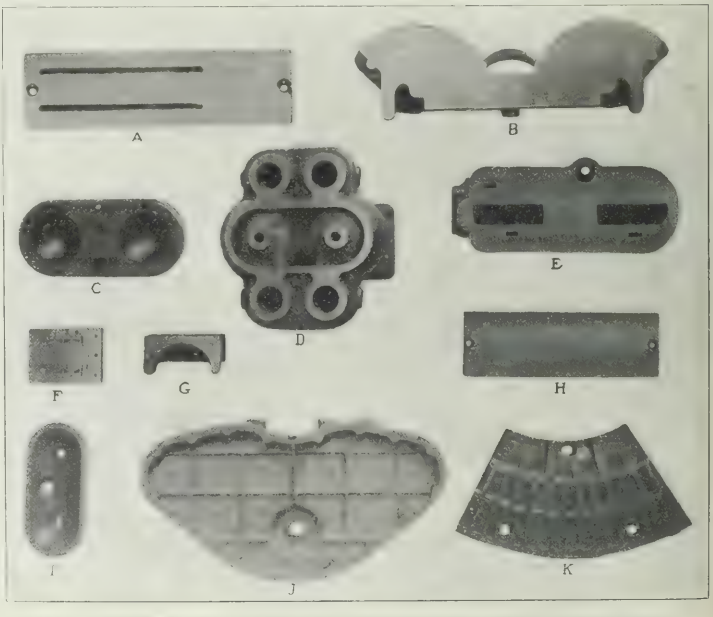


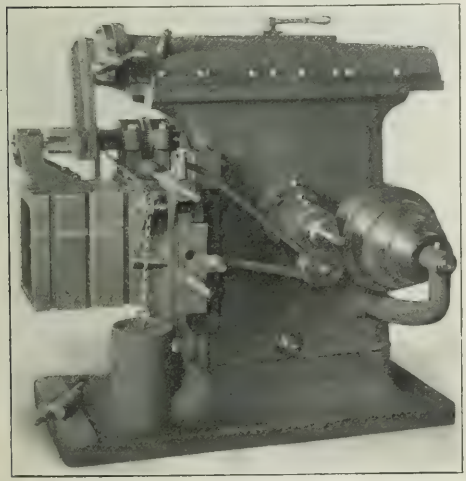
Fig. 2.—Examples of Work Ground on the Springfield-Brandes Vertical Grinding Planer.

14 minutes. B measures 24 in. long by 8 in. high, and required the same length of time. The casting C was finished in 8 minutes, and is 13 in. wide and 6 in. high. The piece D was ground in 12 minutes, while the casting E, measuring 7 x 16 in., took 10 minutes. F is a piece of hard die steel 6 in. wide and 4½ in. high, which was ground to a smooth surface in 4 minutes. The casting G was finished in 1 minute, its dimensions being 3 x 6¼ in. The mild steel piece H, measuring 15 in. wide and 5 in. high, was ground from the rough in 4 minutes. I is a casting 5 in. wide by 10½ in. high, which was finished in 1 minute, and J is a piece of aluminum, the hight of which was 12 in. and the extreme width twice that dimension, that required 3½ minutes for finishing. The segmental hard white iron piece K has an overall length of 18 in. and a radial length of 8½ in. Five minutes was required to grind this piece to a finish. In this connection it should be borne in mind that all of the above pieces were ground from the rough, which necessitated the removal of from 1-32 to ⅛ in. of stock, and that if the proper oversize for grinding had been allowed the time in every instance would have been very materially reduced, as much less stock is required for grinding than for planing or milling.

A New Rockford Shaper Attachment

A shaper attachment for machining the exhauster impellers of vacuum cleaners automatically was recently built by the Rockford Machine Tool Company, Rockford, Ill., for a customer and, as illustrated, is attached to one of the builder's 16-in. shapers, the tool with which it is designed to be used. A finished piece is shown on the base of the shaper and another impeller, ready for machining, is in position.

The construction of the fixture can be readily understood from the engraving. It consists of a head bearing, carrying a hollow spindle, with the work driver and the master plate on the inner end. The latter is of the exact shape of the work to be produced by the shaper. In operation the cross feed screw of the machine is removed, leaving the saddle with the work table free to move on the cross rail slide. A weight serves to hold the master plate against the roller, and the worm is fitted to the feed shaft with a sliding key, thus allowing the table to move forward and back with the rotation of the work. A casting clamped in a fixed position to the vertical slide of the shaper column supports the roller carrying stud. A round cutting tool of the same diameter as the roller is employed.



A 16-In. Shaper with Attachment for Machining Exhauster Impellers Made by the Rockford Machine Tool Company, Rockford, Ill.

In use this attachment has been found to be very satisfactory, it is stated, and the impellers are accurately and rapidly finished. Besides machining impellers, this fixture can be used for turning out cams or other irregularly shaped parts that can be rotated against the roller, the only restriction being that the pieces shall be free from curves.

Opening of the Permanent Exhibition of Safety

Several hundred persons were in attendance Monday evening, November 21, at the exercises marking the formal opening of the permanent exhibition of safety of the American Museum of Safety at the Engineering Societies Building, 29 West Thirty-ninth street, New York. Philip T. Dodge, president of the Museum, presided. Greetings were read from President Taft, Associate Justice Hughes, Director Kaufmann, president of the German Imperial Insurance Office, and directors of the European museums of safety. Remarks were made by Dr. Norman E. Ditman, chairman of the Department of Sanitation of the Museum; T. Commerford Martin, chairman of the Executive Committee, and Edson S. Lott, president of the United States Casualty Company. Mr. Martin said that the immediate need of the Museum is funds for increasing its exhibit space. He made a plea for $25,000 for this expansion.

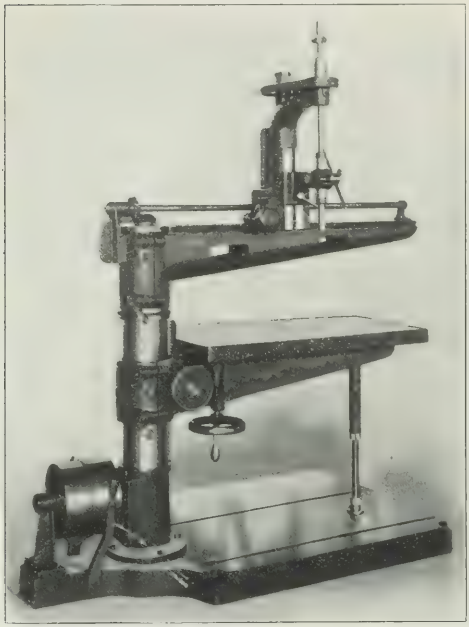
S. C. Dunham, president of the Travelers' Insurance Company, presented to the United States Steel Corporation the gold medal offered by his company to the individual firm or corporation that has done most for the protection of the lives and persons of their workmen by means of safety devices for machines and processes. W. B. Dickson, first vice-president of the Steel Corporation, accepted the medal on its behalf and reiterated what he had said on a previous occasion, that the Steel Corporation is willing to give to any other industrial company the benefit of its experience or the privilege of using its safety appliances. Prof. F. R. Hutton, chairman of the Jury of Awards, announced that the *Scientific American* gold medal for the best safety device exhibited at the Museum had been awarded to the Safety Scaffolding Company of New York for its design and construction of suspended platforms. He said that while these platforms are primarily designed for laying up wall, yet the results from their use had been so remarkable in safeguarding workmen that they must be classed as safety appliances of the first grade. The annual reports of the New York Health Department showed that in five years ending with 1908, when the old style of cantilever platform with horses was used, the falls of men from buildings and scaffolds were 660, of which 177 were from scaffolds. In the past two years 267 buildings have been scaffolded by the company mentioned and 6300 men have worked on them without the loss of a single life. Alfred E. Davidson, president of the Safety Scaffolding Company, accepted the medal.

The director of the Museum, Dr. W. H. Tolman, who spent the past summer in Germany studying accident prevention, showed lantern slides illustrating how Germany is saving 50 per cent. of the accidents to labor. He threw on the screen also some views illustrating the appliances employed by the United States Steel Corporation.

After the exercises in the auditorium opportunity was given for inspecting the various exhibits of safety appliances in the Museum on the sixth floor of the building.

The Taylor & Fenn Radial Sensitive Drilling Machine

The radial sensitive drilling machine shown is being built by the Taylor & Fenn Company, Hartford, Conn., for drilling holes up to ¾ in. in diameter, where it is necessary to cover surfaces on work that is too large or too heavy to be handled conveniently with the usual equipment. The adjustment of the arm and head, in



A Radial Sensitive Drilling Machine for Covering Large Surfaces Built by the Taylor & Fenn Company, Hartford, Conn.

conjunction with the application of drilling heads of different styles, enables the machine to cover nearly all drilling requirements within its range. Automatic power feed, lever feed, high speed sensitive drilling or tapping head, may be employed either singly or in combination.

The arm is rigidly constructed of heavy cast iron and is tubular in section. It has long bearings on the column, supported by a ball bearing thrust collar which permits it to swing with very little effort on the part of the operator. Under test, with heavy duty, the error in drilling at the end of the arm was very small, there being little spring even with large diameter drills. The drill head is of the company's standard type, with three changes of speed in a gear box. The spindle is positively driven by silent chain and gears, and is bored with a No. 2 Morse taper hole. The head is moved on the ways of the radial arm by a rack and pinion operated by a hand wheel, constituting a sensitive movement which in connection with the sensitiveness of the arm permits the drill point to be moved from one position to another on the work with much facility. Both the head and the arm are locked in position by binders, as is also the table, which is heavily ribbed and is furnished with a support for the outer end, for use with heavy work. The drive is from tight and loose pulleys, so that no countershaft is needed.

The details of the machine follow:

Length from center of column to end of arm, inches	42½
Maximum distance center of spindle to column, inches	36
Minimum distance center of spindle to column, inches	11
Maximum distance end of spindle to base, inches	48
Minimum distance end of spindle to base, inches	36
Maximum distance end of spindle to table, inches	26
Minimum distance end of spindle to table, inches	3¼
Traverse of spindle, inches	11
Length of feed, inches	4¼
Width of table, inches	20
Length of table, inches	35
Width of base, inches	24
Length of base, inches	36
Diameter of driving pulley, inches	10
Width of belt, inches	3
Speed of driving pulley, revolutions per minute	310
Hight overall with spindle at highest point, inches	79
Depth of base, inches	4
Floor space, feet	2 x 5
Approximate net weight, pounds	1,070
Approximate weight, crated, pounds	1,270

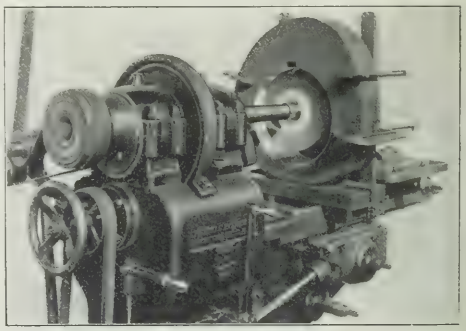
The accessories furnished with this drilling machine include all those ordinarily supplied with a tool of this nature.

A Heald Special Grinding Job

The adaptability of the cylinder grinder built by the Heald Machine Company, Worcester, Mass., to handle various classes of work, was recently shown by the special job which is illustrated herewith. The cam mounted in the grinder is one of two used on the shaft of an exceptionally large drawing press. When an effort was made to assemble the press it was found that the hole in the cams was too small, and it became necessary to enlarge it by grinding until its diameter corresponded with that of the shaft.

The cams were mounted on parallels on the table of one of the company's cylinder grinders and adjusted so that the axis of the hole to be enlarged was parallel with the grinding spindle and also with the travel of the table. Special grinding wheels had to be employed on account of the great diameter of the hole, and to secure the correct circumferential speed of the grinding wheel a large diameter wooden pulley was mounted at the left end of the spindle. Some idea of the difference in size between this wooden pulley and the one regularly used for grinding cylinders of automobile and gas engines can be obtained from the fact that the wooden pulley used was clamped outside of the regular pulley.

One of the particularly interesting features about the grinding of these cams was that it demonstrated



Enlarging a 14½-In. Hole in a Cam on a Cylinder Grinder Built by the Heald Machine Company, Worcester, Mass.

that the cylinder grinder is capable of handling more than the limited range of work usually expected. While it was, as its name indicates, particularly designed for grinding automobile cylinders, it can nevertheless handle a large amount of grinding on parts that are too large or inconvenient to rotate, and it is stated that for this reason results can be secured with it which are impossible on internal grinders of the ordinary type.

These two cams each weighed about 500 lb. The diameter of the hole through them was about 14½ in. and the amount removed by the grinder was between 0.025 and 0.03 in.

Improved Eclipse Concrete Mixers

An article in *The Iron Age,* April 8, 1909, illustrated the Eclipse concrete mixer made by the Standard Scale & Supply Company, Pittsburgh, Pa., and called attention to its advantages, especially its low charging platform, which is only about 24 in. high, and is mounted on a truck and carried with the outfit. The advantage of this is seen in the accompanying illustration showing Eclipse mixers in use; the saving of labor and material is evident.

Having the charging end of the drum entirely open has proved to be of great advantage in practice, enabling the operator to inspect the batch while mixing to see that it is in the desired condition before discharging, and also allowing easy access to the drum interior if necessary. The improved arrangement of mixing blades gives a thorough mix in a very short time, eliminates clogging and prevents the materials from slopping out. The Eclipse mixer will also mix cement, mortar or top dressing which is an important advantage. The discharge, which can be operated from either end of the drum, is claimed to be the simplest and quickest on the market, and is placed high enough to allow loading directly into barrows or carts. That the advantages of the Eclipse mixer are convincing to the contractor when they see the machines in operation, the company reports, is shown by the orders received from new sections where the mixer is operated for the first time, as many as six additional outfits have been sold to one locality within a few weeks after the first machine was started, and also by the fact that the output has had to be increased several times this year.



Eclipse Concrete Mixers Made by the Standard Scale & Supply Company, Pittsburgh, Pa., in Use on Street Paving Work.

The Eclipse Junior mixer, which was first placed on the market this season, has proved very popular, securing the advantages of batch mixing for small contracts, sidewalks, block plants, &c., where a light portable or small capacity machine is desired. It is of the same construction as the larger machine. To meet special conditions several new designs and outfits have been manufactured, including the following: A rear discharge machine with the gasoline engine beside the mixer at the rear of the truck, which allows a clear platform at the front of the truck for wheeling material and charging the mixer, and was designed for street paving work; an outfit with a charging hopper and hoist, the hopper being provided with a partition dividing it into two parts, one for stone or gravel and the other for sand, the cement being placed on the sand and the materials are shoveled directly into the hopper without the use of barrows and wheeling; an outfit with a hoist on the rear of the truck operated by the engine that drives the mixer, which is used for raising mixed concrete for high walls or different floors, and a traction outfit for moving the mixer forward on the job by power from the engine operating the mixer. Special mixers are made for other materials than concrete.

At the Cement Products Exhibition in New York about the middle of December and in Chicago the middle of January, popularly known as the New York Cement Show and the Chicago Cement Show, respectively, the Standard Scale & Supply Company will have a complete line of Eclipse mixers on exhibition.

Record Concrete Laying at Gatun Locks

The Lidgerwood Mfg. Company, 96 Liberty street, New York, states that all hourly records for concrete laying were broken October 6 by the cableways used in constructing the great locks on the Panama Canal at Gatun. Two million cubic yards of concrete are to be used in building these locks. Lidgerwood cableways are used for placing the concrete. These cableways are arranged in duplex form on four pairs of towers. The pair of cableways which broke the record are known officially as strand A and strand B of cableway No. 1. Strand A placed 49 cu. yd. in one hour and strand B placed 50 cu. yd. during the same hour. This means that the carriage on each strand made 25 trips per hour. The cableways were sold under a guarantee that they would make 20 trips per hour.

These cableways are arranged to give higher carriage speed than was ever attempted before for this class of work. This speed is rendered possible by important improvements made by Spencer Miller in anticipation of just such needs. With these improvements it is possible to use carriage speeds up to 2500 ft. per minute, as against speeds of 800 or 900 ft. per minute, which were as great as were before practicable. The cableways each have a span of 800 ft. between towers. They are actuated by electricity, and the control is as easy and simple and of the same character as the control of an up-to-date electric train. One operator controls the entire operation on each strand.

The statistics of the American Railway Association show that in the two weeks ending November 9 the increase in idle cars in the United States and Canada amounted to 6246, bringing the total idle up to 13,581. Of the increase, over 4000 cars are reported by the Northwestern States, being due to the lull following the active crop movement.

Washington advices are that it is not expected that a reciprocity agreement with Canada will be sanctioned at the coming short session of Congress, which ends March 4. Representatives of the Canadian Government are expected to visit Washington in January to take up the final negotiations.

The B. H. Rotary Cleaner for Raw Material

The problem of removing scale and rust from structural steel before fabricating is more or less of a serious one to companies handling pieces of this nature. Scrapers, wire brushes, emery grinders, sand blast, &c., are variously used, but generally are open to the objections of expense, slowness or ineffectiveness. Its own unsatisfactory experience led the Brown Hoisting Machinery Company, Cleveland, Ohio, to get out the tool illustrated herewith which is now called the B. H. rotary cleaner for cleaning raw material after it has been unloaded in the store yard and cut to size before

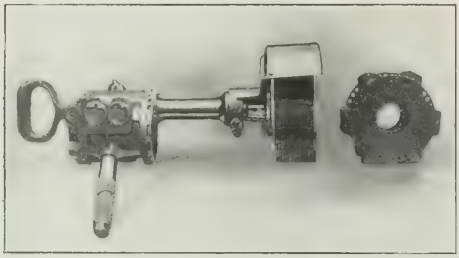


Fig. 1. The B. H. Rotary Cleaner Made by the Brown Hoisting Machinery Company, Cleveland, Ohio.

going into the shop. It was designed to eliminate all the faults of the other methods, and was given a thorough test on actual work before being offered to the trade. Fig. 1 shows the cleaner attached to a pneumatic high-speed grinder, Fig. 2 is a view of the tool in use for removing rust and scale from structural iron, and Fig. 3 illustrates pieces of structural iron both before and after cleaning.

As will be noticed from Fig. 1, the cleaner consists of two circular plates mounted on the same hub and supporting a series of pins at their circumferences upon which steel blades or cutters are carried. These blades are rectangular in cross section, and the hole through which the pin passes is elongated to secure the maximum efficiency in service.

In operation the cleaner is used with a high-speed electric or pneumatic grinder, as shown in Fig. 2. The manufacturer claims that it is more convenient, efficient and economical than the sand blast or emery grinder, and its effectiveness is said to be due to the chipping blows of the blades, which remove the scale and rust from structural iron readily. The design is simple, and all parts are interchangeable. The tool is free from jar in use, and one man is said to be able to turn out as much work as 8 or 10 men with scrapers



Fig. 2.—Removing Rust and Scale from Structural Iron with a B. H. Rotary Cleaner.

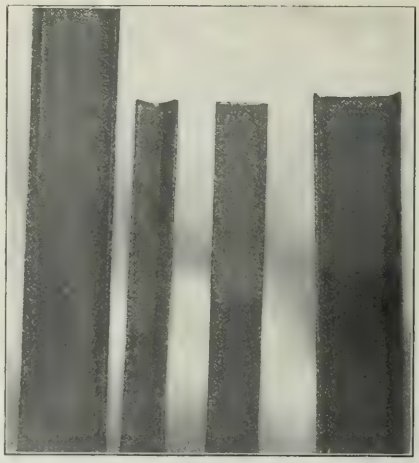


Fig. 3. –Specimen Pieces of Structural Material Before and After Cleaning.

and with better results. Besides cleaning structural steel with the results illustrated in Fig. 3, the cleaner can also be used for cleaning castings, surfacing building stone and removing barnacles from ship bottoms.

The Promotion of Industrial Education

Friday's sessions of the fourth annual convention of the National Society for the Promotion of Industrial Education, at Boston last week, were given over to the subjects of apprenticeship and corporation schools, part time and evening schools, and in the evening to an address by Dr. Georg Kerschensteiner, superintendent of schools of Munich, Germany, on "Continuation Schools of Germany."

The apprenticeship and corporation schools were discussed by Magnus W. Alexander, General Electric Company, Lynn, Mass., chairman of the section; Tracy Lyon, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.; F. W. Thomas, supervisor of apprentices, Atchison, Topeka & Santa Fé Railway, Topeka, Kan.; Samuel F. Hubbard, superintendent North End Station, Boston, and George C. Cotton, Solvay Process Company, Syracuse, N. Y., with a summation by G. M. Basford, assistant to the president, American Locomotive Company, New York.

In the afternoon Dr. Paul H. Hanus, Harvard University, was chairman; W. B. Hunter, director of the industrial department, Fitchburg High School, Fitchburg, Mass., read a paper on "The Fitchburg Plan"; Adelbert L. Safford, superintendent of schools, Chelsea, Mass., on "The Beverly Industrial School"; Frank B. Dyer, superintendent of schools, Cincinnati, Ohio, on "The Public Schools and the Apprentices of Cincinnati"; Stratton D. Brooks, superintendent of schools, Boston, on "The Evening Schools of Boston," and C. A. Prosser, deputy commissioner of education, State of Massachusetts, on "Evening Industrial Schools of Massachusetts." The summation was by Dr. David Snedden, commissioner of education of Massachusetts. A large attendance filled the spacious hall of the Boston Public Library.

Dr. Georg Kerschensteiner, who is visiting the United States upon the invitation of the National Society for the Promotion of Industrial Education, is to give two public addresses in New York City, one on Monday, November 28, at 8 p.m., at the De Witt Clinton High School, Fifty-ninth street and Tenth avenue, upon "Day Technical Schools of Germany," and the other under the auspices of the American Society of

Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Mining Engineers, at the building of the United Engineering Societies, 29 West Thirty-ninth street, on Thursday, December 8, at 8.15 p.m., upon the "Industrial Continuation Schools of Munich." Dr. Kerschensteiner has stood for many years at the head of the progressive movement in Germany for more practical industrial education. He is largely responsible for the development of the part-time schools in Munich that are attended by all the apprentices and other boys and girls at work between 14 and 18 years of age.

The Tracy Fan Dynamometer

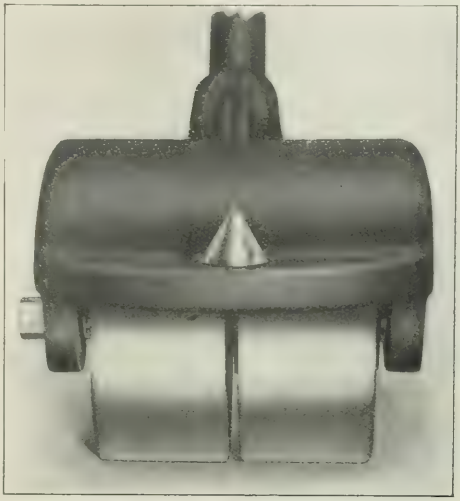
The fan type of dynamometer illustrated was designed by Joseph Tracy, 116 West Thirty-ninth street, New York City, as a convenient and inexpensive means for testing stationary gas and other engines of 100 hp. or less at comparatively slow speeds. Heretofore the fan dynamometer has been used for testing fast running automobile engines, direct connection being made between the engine and the fan, but it is said that the application of the belt drive in testing slow running motors has worked out satisfactorily. This type of dynamometer may also be used for supplying a load to absorb the power when "running in" an engine or working down the piston and bearings. No electrical or water connections are required and all the power developed by the engine is employed in driving the fan against the resistance of the atmosphere. The absence of all mechanical or electrical resistance in connection with the dynamometer does away with troubles due to heating or seizing, and it can be run indefinitely without any attention. Readings of the speed and power can be taken from the dial at any time.

The accompanying illustration shows a simple method of testing an engine with this dynamometer where a pulley is mounted on the shaft of the latter and connected by a belt to the flywheel of the engine. It is recommended that the diameter of the pulley be smaller than the flywheel, especially in cases where the speed is less than 800 rev. per min., as that is the speed at which the dynamometer is the most efficient. In operation, the pointer on the dial indicates the horsepower developed, less a slight transmission loss through the belt. The speed of the engine is obtained by dividing the indicated speed on the dial by the ratio between the pulley and the flywheel diameters.

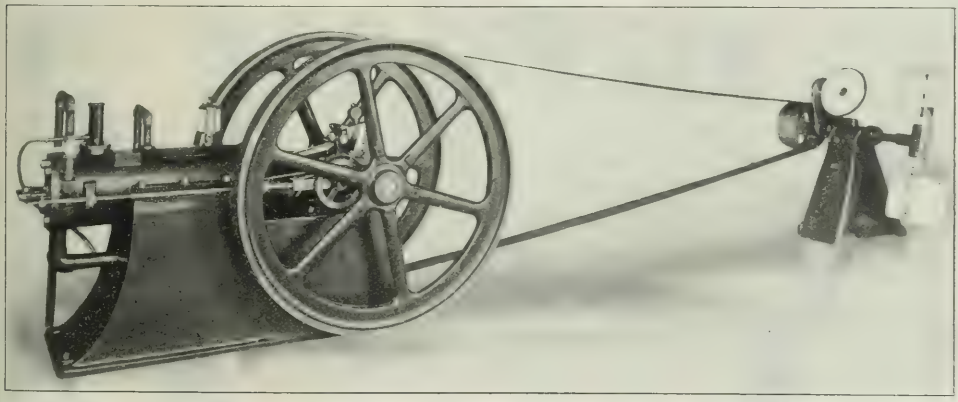
The Dominion Iron & Steel Company's output in October consisted of 22,058 tons of pig iron, 27,034 tons of steel ingots, 26,113 tons of blooms, 15,375 tons of rails, and 4743 tons of wire rods.

The Grover Hand Truck for Industrial Plants

A truck for handling extraordinarily heavy pieces by hand in manufacturing plants has been designed by the Grover File Company, Nashua, N. H., and is illustrated herewith. It operates on the principle of a lever in which the power is applied through a long handle fitting into the socket shown in the upper part of the engraving. The wheels are the fulcrum and the nose, which contains a steel point to secure a better grip on the work, is the lever arm. The two wheels revolve independently of each other, thus facilitating the turning of corners. Several of these trucks are used for large pieces, which gives a three or four point bearing, as may be required. The proportions of the truck are very similar to those of the ordinary heavy crowbar.



Details of the Nose and Wheels of a Special Truck Designed by the Grover File Works, Nashua, N. H.



A Fan Dynamometer for Testing Stationary Engines Designed by Joseph Tracy, New York City.

The Universal Portland Cement Company, Chicago, states that its plant No. 6 at Buffington, Ind., will have an output of 4,000,000 barrels per annum when completed, giving the company a total output of 12,000,000 barrels per annum. This plant, however, will not be completed until July, 1911, and will therefore only produce about 2,000,000 barrels during the coming year, making the total output for 1911 10,000,000 barrels.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square	1.90¢
1 to 4 in. x ⅛ to 4 in.	2.10¢
1 to 4 in. x ¼ to 6 in.	2.10¢
Rods ⅝ and 11-16 round and square	2.10¢
Angles:	
3 in. x ¼ in. and larger	2.05¢
3 in. x 5-16 in. and 4 in. x ¼ in.	2.05¢
1½ to 2 in. x ¼ in.	2.10¢
1½ to 2 in. x 5-16 in. and larger	2.10¢
1 to 3 in. x ⅜ in.	2.30¢
1 to 1½ in. x ⅛ in.	2.10¢
2 x 1½ in.	2.70¢
3 x 1½ in.	3.75¢
5 x ⅜ in.	4.55¢
½ x ⅛ to ½ in.	2.65¢
Tees:	
1 in.	2.65¢
1½ in.	2.45¢
1½ to 2 in. x ¼ in.	2.45¢
1½ to 2 in. x ⅜ in.	2.55¢
3 in. and larger	2.45¢
Beams	2.40¢
Channels, 3 in. and larger	2.40¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.50¢

Merchant Steel from Store—

	per lb.
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C. R. Soft Steel.	R. G. Cleaned
No. 16	2.55¢	2.80¢
Nos. 18 to 20	2.75¢	2.90¢
Nos. 22 and 24	2.75¢	3.00¢
No. 26	2.80¢	3.10¢
No. 28	2.90¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, per lb. 12@14½¢

Patent Planished, "W. Dewees Wood," per lb. A, 11¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	2.95¢
Nos. 22 to 24	3.30¢
No. 26	3.50¢
No. 28	3.80¢

No. 30 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	5.55¢
No. 26	6.25¢
No. 28	6.50¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24, per 100 sq. ft.	$3.85	4.80
No. 26, per 100 sq. ft.	3.25	4.40
No. 28, per 100 sq. ft.	2.90	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:	
IC, 11x20	$6.35
IX, 11x20	7.40
A. Charcoal:	
IC, 11x20	$5.40
IX, 11x20	6.35

American Coke Plates—Bessemer—

IC, 11x20	$4.10
IX, 11x20	5.40

American Terne Plates—

IC, 20x28 with an 8 lb. coating	$8.50
IX, 20x28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 1, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13 1908. Base price 18¢

Copper Tubes—

List November 13 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 19½¢ per lb.

High Brass Rods—

List August 1, 1908 14½¢ per lb.

Roll and Sheet Brass—

List August 1, 1908 14½¢ per lb.

Brass Wire—

List August 1, 1908 14½¢ per lb.

Copper Wire—

Base Price. Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) per lb. 18¢

Sheet Copper Cold Rolled, 1¢ per lb. advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 2¢ per square foot.

Sheet Copper Polished over 20 in. wide, 2¢ per square foot.

Planished Copper, 1¢ per square foot more than Polished

METALS—

Tin—

Straits Pig	per lb. 39 @39½¢

Copper—

Lake Ingot	per lb. 14¾@15 ¢
Electrolytic	per lb. 14¼@14¾¢
Casting	per lb. 14¼@14¾¢

Spelter—

Western	per lb. 6¼@6½¢

Zinc.

No. 1 base, casks	per lb. 8¼¢ Open per lb. 8¾¢

Lead.

American Pig	per lb. 5.05@5.15¢
Bar	per lb. 6¾@6¾¢

Solder.

½ & ½ guaranteed	per lb. 22½@23 ¢
No. 1	per lb. 20½@21 ¢
Refined	per lb. 18¾@18¾¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	per lb. @10¢
Hallett's	@10¢
Other Brands	@9½¢

Bismuth—

Per lb.	$2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting	34¢
Rods & Wire	Base Price 31¢
Sheets	Base Price 33¢

Old Metals.

Dealers Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	per lb. 11.00@11.25
Copper, Heavy and Wire	per lb. 10.75@11.00
Copper, Light and Bottoms	per lb. 9.75@10.00
Brass, Heavy	per lb. 7.25@ 7.50
Brass, Light	per lb. 5.75@ 6.00
Heavy Machine Composition	per lb. 9.75@10.00
Clean Brass Turnings	per lb. 7.25@ 7.50
Composition Turnings	per lb. 8.25@ 8.50
Lead, Heavy	per lb. @ 3.75
Lead, Tea	per lb. @ 3.50
Zinc Scrap	per lb. @ 4.00

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NICHOLSON

NICHOLSON U.S.A. TRADE MARK

Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

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NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 | New York, December 1, 1910 | Vol. 86: No. 22

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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The Pennsylvania Rail Order

Another Conference of Steel Manufacturers

Some Months of Quietness Ahead of the Trade—More Idle Blast Furnaces

The announcement by the Pennsylvania Railroad that it has given orders for 150,000 tons of rails for 1911 is the chief event of the week. Contracts have not been signed, nor has the distribution among the mills been finally decided. The Steel Corporation mills and the Buffalo and the three independent Pennsylvania mills are expected to share in about the same percentages as for 1910, but points in the terms have not yet been agreed upon. The order is larger than was looked for, but is less than the total placed by the Pennsylvania Railroad for this year.

Following a meeting of the directors of the American Iron and Steel Institute, a conference is being held in New York, as this is written, in which other steel manufacturers are also participating. Recent changes in conditions are being canvassed, but no action affecting prices is anticipated at this time.

There is no dissent among leaders in the trade from the view that a quiet time is ahead of the industry. The more hopeful look for improvement by the spring of 1911. November has shown a gradual slowing down in the rate of production, and this is expected to continue through December. That the readjustment now going on will extend further and in a way that will eventually affect labor is a growing conviction.

November showed a smaller volume of structural business than any month in the year, but railroad contracts now pending should make a better record for December. At Chicago 40,000 to 50,000 tons of steel will be required for buildings whose erection is likely to be financed in the next six months. One of these is the Underwriters' Building, which will take 12,000 tons. The New York State Prison Commission will open bids December 15 for a building requiring 10,000 tons.

Plate manufacturers, whose business has lagged for months, find some encouragement in recent car and locomotive contracts. Lake shipyards have had some good repair orders, but cannot count greatly on new vessel work for the winter.

The wire trade is somewhat more active following a lull, but prices show further irregularity.

A number of independent sheet mills have sold their capacity for the next three months, but current business is only moderate, and on good sized contracts a

2.10c. basis for No. 28 black sheets has been reached.

Under the new Pittsburgh basing, semifinished steel has been more uniformly held at $23, Pittsburgh, for billets and $24.50 for sheet bars.

Pig iron markets are settling into greater quietness as the year end approaches. More Southern iron has been sold at $11, Birmingham, for the first quarter of next year. An offer of $10.50, made by a foreign syndicate, for 50,000 tons of Southern No. 2, found no producer willing to entertain it, but it may have inspired reports of shading below $11. Two blast furnaces of the Tennessee Company have gone out this week and a number of merchant furnaces have been added to the idle list, including one in New Jersey, one in New York and two in Virginia.

Discussion of the question of Lake Superior ore prices for 1911 brings out views ranging from a reduction of 50c. to a reaffirmation of this year's basis. Cleveland selling firms look for larger shipments next year to Eastern furnaces in view of the strong demand in England and Germany for Swedish and Spanish ores at high prices, and the great advance in ocean freights. The ore canceled by Eastern furnace companies this year was all readily resold abroad, but it is a little early to predict that high freights and high ore prices on the other side will likewise be a factor when Lake ore sales are made for 1911.

Tin has again advanced above 37c. The November statistics, showing deliveries of 3800 tons, were about 25 per cent. beyond expectations.

Efficiency Engineers to the Help of the Railroads

That they have not applied scientific methods to the management of their business, and, that if they should do so, economies would be realized, making it unnecessary to advance freight rates—this was in substance the case of the Eastern shippers against the railroads at the hearings in Washington last week. Some of the statements made in the heat of argument were of the same species of accusation and complaint that have grown so common in this country of late. They reminded us again of the way in which the American people have given themselves up to the business of bringing charges against the existing order of things, political, industrial, commercial and financial. The tariff, the currency, the corporations, the politicians, the labor unions, the farmers, the automobile and, by no means least, the railroads—all have been blamed for conditions which have seriously disturbed the minds of the people ever since the average desire for material satisfactions has been so rapidly outstripping the average income.

It is not new to hear that the efficiency of our industrial operations is not what it should be. The railroads are in numerous company in being under this accusation. The doctors of efficiency, whose excellent work in many fields is greatly to be commended, have long brought almost as sweeping an indictment as the Washington one of last week, against the heads of manufacturing industries generally. They have told us that the managers of industrial companies are as a rule more at fault for the lack of efficiency in their workmen than the workmen themselves. In the relatively few plants in which outside efficiency engineers have had opportunity to apply their methods, particularly in those of the larger companies, they have had some notable successes in increasing output and reducing unit costs. So they assert with a good deal of confidence—or some of them asserted at Washington—that the railroads could save $1,000,000 a day by scientific management. But so far as any "scientific" basis for this estimate is concerned, it might, with almost equal reason, have been put at $2,000,000 a day.

Yet the advice given the railroads by witnesses experienced in other fields than railroad management is not by that token to be disregarded. Nor will it be competent for the railroads to retort that if all industrial companies were efficiently organized and operated the latter would so lower their costs that higher freights would be no burden. Railroad presidents may have been satirical in telling of the large rewards awaiting those who shall show the way to a tithe of the economies the roads are charged with neglecting. At the same time it may well be that they have found food for thought.

It is well, too, that such wide publicity has been given to this phase of the subject. It is the first time in all the multiplied discussions of our high prices that economy has been seriously suggested as a remedy. We have been simply running the circle of higher prices, higher wages, and then higher wages, higher prices. The cure for high wage and material costs, we have steadily been told, lies in a higher charge for the finished product. The railroads have simply used the argument made to their hand. Now that economy in production has been pointed to as the desideratum, we may hear much more of lower prices as the way out of present economic troubles.

The Position of Spelter

The present spelter situation is commanding much attention among market statisticians who are not agreed as to the reason for the recent advances in price. While it is generally believed that leading smelters and some large sellers are in a measure manipulating the market, it is generally conceded that the smelters are warranted in holding out for higher prices. Their claim that, with increased cost of labor and ore, spelter cannot be produced at a profit under 6 cents a pound is worth some consideration.

As to the restriction in production affecting the supply, it is admitted that while some retorts have been closed down a considerable stock, visible and invisible, has been carried over from last year. Estimates as to the probable output of prime Western spelter made at this time are not based on actual figures, as none have been given out by the smelters, and not until the end of the year will the actual statistics of production be known. It is known, however, that spelter has not gone into consumption very rapidly during the last three months. That the prevailing price of the metal is not so very high as compared with the average price of some years is shown by the following table of New York quotations, averaged from reports in *The Iron Age:*

Year.	Cents.	Year.	Cents.
1904	5.11	1907	6.05½
1905	5.89¾	1908	4.73¾
1906	5.25¼	1909	5.50¾

The daily price of spelter in New York last week was steadily 5.95c. Some statisticians make comparisons on spelter prices with lead quotations, but not since 1908 has spelter been sold as low as lead, and the former metal has been gradually advancing since that year. Accordingly, any argument based on the price of the two metals should not carry much weight. Whatever the Government statistics may show as to the production and consumption during the year 1910, it is safe to assume that those who control the situation will keep the price up until those figures appear.

It is claimed by some that the present condition of the spelter market is owing, primarily, to a shortage of the metal in Europe, and that there is already the prospect that a shortage may arise in this country. In addition, it is stated that the smelting capacity is out of line, being excessive, a condition which also confronts other branches of the metallurgical industry.

Furthermore, the consumption of spelter has greatly increased within the last decade, in consequence of which smelters were built in the newly discovered Kansas gas fields. Gas was of course a cheap and satisfactory fuel, but of late the supply has been diminishing. Changes that are deemed necessary to meet the present and prospective conditions in the Kansas district, in which more than half of the smelting retorts are located, are estimated to require two years to accomplish. A continued increase in the consumption of spelter is confidently predicted, in which event, taking into consideration the other factors mentioned above, it would appear that an appreciation in the price of this metal is inevitable in the near future.

Machinery Buying Systems and Prices

Machine tool prices have not been influenced by the let-up in the demand following the cancellation of orders and the cessation of buying on the part of the automobile people and by the long absence from the market of the railroads as large buyers. It has been fully demonstrated that reduced prices in the machinery trade have little effect in increasing the volume of sales. During very good times the cost to the purchaser has been of small moment as compared with deliveries. When the depression came, in 1908, price was a small factor in inducing business; so little existed that no stimulus could be effective. In recent months, a period of demand ranging from normal to very moderate, purchasers have again shown that they are ready to pay the price for what they need, and that their ideas of their wants are on a higher plane than ever before. The tendency of modern machinery buying, to get the right tool, whether cheap or expensive, which has been mentioned from time to time, has been given an even stronger accent. The work to be done is studied more carefully. Pains are taken that a machine be secured which will accomplish the task in the most economical manner, taking into account all such elements as rapidity of manufacture, quality of product and the labor cost, together with the price of the equipment under consideration. The mere fact that a machine is very expensive as an initial investment does not count, if the other factors warrant the expenditure. Occasionally the error is made, in the zeal to get the best, of purchasing costly tools, where greater economy would have followed the use of a cheaper type of machine. The subject is given intelligent thought by the cost department and the office management, as well as by the mechanical department. The whole effort is toward a more nearly perfect production unit, a fact which, naturally, puts the builder of machinery on a sounder basis as to his prices. His fight is on the merits of his machines in their relation to the work. If his price is maintained, the same to all, the buyer recognizes the fact and respects it.

In connection with the modern practice in buying, some users fall into the error of believing that they know the complete field of machinery from which to make a selection. They fail to take into account that new tools are coming on the market constantly, the builders of which cannot get into touch with immediate buyers of equipment, because of their ignorance of who the buyers are. To send out broadcast information as to requirements brings a largely increased knowledge upon which to establish the best equipped plant. Those concerns that seek the general information have the advantage of those pursuing the opposite policy. Instances arise constantly to prove this fact, in the experience of the customer as well as of the manufacturer and dealers. Very often the builder will be able to assist his customers richly in the creation of economical methods of production. Builders are specialists, and the services of their experts are at the disposal of buyers, constituting an important part of the sales system. Many cases could be cited to show that this engineering advice has been followed by large economies. It is therefore an element to be taken into consideration in the selection of equipment. The wider its scope the more valuable it may be. Certain officials having to do with the purchasing departments try to avoid publicity on the ground that they are well enough in touch with conditions in the machinery market, through the salesmen whom they are accustomed to seeing regularly and through other users of machinery, and because they dislike the flood of information by letter, circular, catalogue and visiting representatives which publicity brings with it. It is an erroneous conclusion, for the information rarely fails to be of actual financial value to their houses.

The Use of Re-export Tin Plate

As one tariff law of the United States closed the domestic market to the Welsh tin plate mills, so our cousins across the water seem unable to give up the idea that another may open it again. Interest has lately been aroused in England over an increase in Welsh tin plate exports to the United States, and the suggestion is made that the Payne-Aldrich tariff law is responsible. It is needless to state that such is not the case. Indeed, its reduction in the duty from 1.5 cents to 1.2 cents per pound was voluntarily suggested by the tin plate manufacturers at the Ways and Means Committee hearing as feasible, without introducing the likelihood of disturbance in the industry. Whatever our imports of Welsh tin plate amount to, they are, as they have been for more than a decade, almost solely for re-export purposes.

The increase in British tin plate exports to the United States may be stated briefly to consist in this, that while in both 1907 and 1908 the year's exports amounted to 60,000 gross tons, in 1909 this quantity was reached in eleven months, while this year the

quantity was reached in nine months. British tin plate exports to the United States in the first nine months of this year amounted to 60,857 gross tons, and in October to 5216 tons, making a total for ten months of 66,073 tons. It should be observed that the October exports were not large, the 5216 tons comparing with an average of 6960 tons during the preceding nine months, and with 8644 tons in October of last year.

We have used the British figures in making the comparison because for a given month the British figures become available somewhat earlier than our own, while of course for the same month they reflect changes in the movement more promptly, by the time the material consumes in crossing the ocean. Over a period of time our own statistics agree quite closely with the British, as we import very little tin plate from other sources. Our tin plate imports in the past four fiscal years have averaged 63,900 gross tons per year, or at the rate of about 12,000,000 pounds per month. The imports during July, August and September this year and last have been as follows, in pounds:

	1909.	1910.
July	11,559,955	24,170,637
August	11,358,453	9,120,322
September	9,735,998	6,091,330
Totals	32,654,406	39,382,289

It will be observed that were it not for the quite unusual total in July last the average of the quarter would be considerably lower than in the corresponding quarter of last year.

Thus, on the whole, there is no evidence of any sudden increase in our imports of tin plates. The statistics of the drawback trade in tin plate have not lately been studied with the care which used to be given to them when hopes were entertained that a large part of this trade might be captured by the American mills. A hope of this sort has recently been revived, and the drawback figures are given a fresh interest. As no attention has been paid to them for several years we give the full statistics for the past 13 years, beginning with the fiscal year 1898, which was the last year in which there were any considerable tin plate imports for strictly domestic consumption.

In the first column of the table below is stated the number of pounds of tin plate upon which drawback was allowed during the fiscal year named. The allowance is made, not upon the precise quantity of tin plate existing in the exported articles, which comprise chiefly cans containing oil, fruit, meat, &c., carpet sweepers and lined cases, but upon the amount of tin plate it is computed is required in the manufacture, allowances being made for waste. In the second column is stated the difference between the imports of tin plate in the year named and the drawback of tin plate in the same year.

Tin Plate, Fiscal Years, Pounds.

	Drawback.	Excess of imports.		Drawback.	Excess of imports
1898	137,897,570	33,764,775	1905	151,677,870	9,388,950
1899	122,906,682	*14,421,856	1906	120,455,345	364,387
1900	125,269,156	22,694,648	1907	102,712,630	39,816,776
1901	127,261,883	*9,381,571	1908	158,911,418	*18,171,446
1902	125,340,511	73,655,575	1909	116,829,347	482,827
1903	123,088,272	*13,174,979	1910	141,732,141	12,834,458
1904	111,058,352	15,251,008			

* Excess of drawback over imports.

It will be observed that the drawback trade has fluctuated in volume in such an irregular way that no generalization can be made as to what has been the average in the most recent years, or whether there has been an increase or decrease in the past few years. Were the statistics extended farther back the confusion would not be reduced. The first drawback allowance was made in 1884, upon 97,415,089 lb., and in 1889 the maximum of the whole period was recorded, 166,087,740 lb. The movement decreased to 119,928,083 lb. in 1892, only to increase to 161,758,361 lb. in 1894.

In October, 1902, an arrangement was effected between the leading tin plate interest and the organized workmen whereby the latter would work at reduced wages upon tin plate intended for what was conveniently called the "rebate trade," the material being sold to consumers upon the usual terms, but an allowance being made the consumer upon the exportation of packages, &c., made from the tin plate. The amount of business so done during the ensuing five years probably averaged between 25,000,000 and 50,000,000 lb. per year, and to this extent the regular drawback business in important tin plate was reduced. It will be observed from the table, however, that no great reduction from the previous rate was effected.

Of late there does not seem to have been so much of this rebate business done by the American mills, but it is possible that greater efforts will be put forth in the future to take a larger share of it. The chief obstacle to making the close terms necessary is the high labor cost in the American mills, compared with the Welsh. Since the termination of relations between the Amalgamated Association and the leading interest, some seventeen months ago, there is no wage concession on this class of tin plate. In steel the domestic producer has an advantage, as it has been possible lately to export sheet bars to Great Britain. In favor of selling tin plates at home, to replace rebate plates, rather than selling sheet bars abroad, are these considerations: The double freight on sheet bars is saved, also the 1 per cent. duty which the government retains, and the disadvantage to the buyer of rebate plates of doing business at long range with Welsh makers—besides a number of minor reasons.

It will be observed from the table already given that the imports of Welsh tin plate for strictly domestic consumption are negligible. In the past six fiscal years, 1905 to 1910 inclusive, the net excess of imports over tin plate upon which drawback was allowed averaged only 8,000,000 lb. a year. A part of this probably represented waste upon which an allowance could not be secured, the remainder being fancy charcoal bright and roofing plates, probably imported chiefly at out-of-the-way places. Even the whole 8,000,000 lb. would represent only one-half of 1 per cent. of our present production, and there is not the slightest prospect of any increase in the strictly domestic consumption of Welsh tin plate.

Insuring the Important Man

The importance of one man in some manufacturing plants is instanced by the growing custom of insuring the life of such an individual in favor of the company, so that in case of his death the loss may be made up in part by a large cash benefit. While it is true that no man is so essential to a business that his loss will be

permanently as well as seriously felt, yet occasionally an establishment is built about a genius whose removal would be a serious blow to the industrial organization. Granting that his niche would be filled acceptably by another in due course of time, a period must ensue during which his absence might mean less earnings. The insurance policy safeguards the company's resources during this time. Stockholders feel that their interests are protected, and the insurance may have its effects upon credits. The custom has prevailed for years in some large commercial institutions, but in manufacturing lines it has been less common.

Correspondence

Shortening the Working Day

To the Editor: The last three paragraphs of your article in this week's issue headed "Shortening the Working Day" should be put in the hands of every wage earner in the land; certainly howlers for a shorter day for work are debarred from complaining of increased cost of living. But this demand for a shorter day is largely due to the same well meant agitation by some publications to which you refer in your article on "Stimulating Workmen's Ambitions." There are a host of economic and sociological mollycoddles abroad in the land, and they are an extremely valuable asset to the ignorant labor agitator for shorter hours of work. These two classes are aided by the yellow press, of course. Their editors seem to be too well educated to believe in the doctrines they preach.

SHORTENING OF HOURS NOT THE WORST EVIL.

But according to the report of President Briggs of the National Founders' Association it would seem that the shortening of hours is not in itself the worst evil which manufacturers find themselves up against; it is the fact that the output per capita has declined in greater ratio than the percentage of decreased hours warrants; in short meter, the efficiency of wage earners has decreased out of proportion to the shortening of hours; and this is a very grave symptom to any one capable of recognizing what it portends. It is of much greater influence in raising cost of living than is the shortening of hours; it would not be were the output per capita to be decreased only pro rata as the hours of labor were shortened.

If we can locate the cause of this drop in the efficiency of labor it follows that we can locate, at least measurably, the cause of something which is responsible for increased cost of living to a greater degree than is the shortened hours of labor. My experience and observation lead me to the conclusion that in the last solution it is due to the employer. He (or it, if a corporation) is supposedly the most intelligent man around the factory, and if an ignorant superintendent or foreman is employed it is a fair inference that he or they are reflexes of their employer. For instance, the foreman of whom mention is made in your article "Stimulating Workmen's Ambition" could not possibly carry out so ignorant a policy were his superiors possessed of any higher grade of intelligence than his; or, if they have a higher grade of intelligence, they are lacking in a sense of their responsibility—are very careless at the best. And their men are aware of that, even if the employers are not. In such a shop the efficiency would surely be low.

IGNORANT MANAGEMENT BREEDS INEFFICIENCY.

I have been in open shop foundries running on 59 hours per week schedule and the output per capita was much lower per day than was the case in closed shop foundries where the schedule observed was 54 hours per week—that is to say, higher efficiency with shorter hours in a closed shop than longer hours in an open shop. Of course, it was a case of ignorant management, but that kind of management was epidemic in that part of the country in respect of foundries at that time (1906). The price of castings was very much higher than the increased freight rate warranted (due to distance from furnaces, &c.). And from what I hear foundry management has not improved very much in that part of the country since then.

Taking another line of work. I have been in car shops where the output per day on a given job, for instance, turning off Pullman car wheels, was four pairs per day, and I have been in car shops where the output per day on the same kind of work was seven pairs. As the nine-hour day ruled in each case the difference in output was not caused by a difference in hours. The lathe in neither case was modern, hence the difference in output could not be charged up to that. I am satisfied that it was due to ignorant management. Perhaps this is the kind of management to which H. R. Towne had reference when testifying before the Interstate Commerce Commission. It will be remembered that he said railroad shop management was far behind the times. Be this as it may, it is this kind of management which premiumizes inefficiency; hence raises unduly the cost of living.

EFFICIENT MANAGEMENT BY MANUFACTURERS AND RAILROADS.

Governor-elect Wilson made a remark to the effect that the tariff plank in the last Republican platform premiumized, in effect, inefficiency; to do that is an economic crime, and carries its own punishment. The elections on November 8 carried an installment on account of punishment, and during the next two years or so we will feel the effects thereof. It is a safe guess that the next Republican platform, while maintaining the protective principle, will not guarantee manufacturers a duty which equalizes differences in cost of production plus a fair profit. They will have to look to "efficient management" for profit, and efficient management will increase the output per capita; hence decrease, at least to some extent, cost of living.

If Mr. Towne is right in his judgment of railroad shop management it follows that to let the railroads raise rates instead of forcing them to revise their methods, would be an economic error of the gravest sort. As a writer in the *Evening Sun* says, to raise the rates would only provoke new demands for increased pay on the part of the men, and where would it all end? Of course, it is easier to raise rates (if you can) than buckle down to the wearisome job of reducing costs, but that is what manufacturers have to do, then why exempt the railroads? And why do not the gentlemen of the Railway Business Association get the facts from Mr. Towne before indorsing the railroads' request for higher rates? Are they willing to take the responsibility for "premiumizing inefficiency," or is their attitude a case of "acceleration"?

No one with whom I have spoken among shippers objects to a raise in rates for personal reasons; they see the underlying fallacy and fear its ultimate effect. If railroads increase the efficiency of their shop management and are still shy of income no shipper will object. In that event the raise will be granted for sound economic reasons; but, in the meantime, the shippers have been fairly specific in respect of their criticisms, while railroads have confined themselves to generalities. For instance, no one undertook to question Mr. Emerson's statement in regard to his achievements on the Santa Fe; nor was the reason why the other roads did not follow the Santa Fe methods explained. If Mr. Emerson's statements are facts, the railroads are "in wrong," both from a political as well as from an economic standpoint; it follows that they should either demolish his statement or withdraw their application for leave to raise the rates.

HOW TO LOWER THE COST OF LIVING.

The *Sun* has intimated that an era of readjustment is about due; that the first step is a lowering of wages. I think that the cost of living has got to be reduced by increased output, among other ways; and if for no other reason than that we no longer have an exportable surplus of breadstuffs; hence our obligations abroad have got to be squared by exports of manufactured articles. This

means that an era of really economical—*i. e.*, efficient—management in all lines is an imperative necessity all around. The process of adjusting ourselves to changes which these conditions will enforce is not a very comfortable one. J. J. Hill cannot be charged with not having warned us. The reduced output per acre shows that the drop in efficiency has also reached our farmers. Efficiency has got to be raised, not prices. And, as you say, this is no time to talk of shortening the hours of labor. MAX H. C. BROMBACHER.

NEW YORK, November 26, 1910.

Foreign and Domestic Prices of Tin Plate

The *Bulletin* of the American Iron and Steel Association contains the following relative to the prices paid for tin plates in the United States, when Welsh sources were depended upon entirely and the prices that have prevailed under domestic establishment of the tin plate industry.

We give below a table which shows the actual prices paid at New York by a large consumer for foreign coke tin plates, No. 30 gauge, freight and duty paid, from October 27, 1888, to June 22, 1891. The McKinley bill, increasing the duty on tin plates, became a law on October 6, 1890, but the tin plate provision did not become operative until July 1, 1891. The table, therefore, covers a period of almost three years before this provision took effect. It was furnished to the American Iron and Steel Association several years ago by the consumer:

Date.	No. boxes.	Price per box of 112 lb.	Date.	No. boxes.	Price per box of 112 lb.
October 27, 1888	535	$5.66	November 18	195	$5.54
November 5	257	5.64	November 19	190	6.07
December 13	823	5.56	November 20	195	5.84
January 3, 1889	509	5.57	November 28	195	5.79
January 14	300	5.57	December 2	195	5.79
May 21	216	4.97	December 26	196	6.08
May 21	324	4.99	December 29	196	6.09
June 3	260	4.98	January 14, 1891	195	5.34
August 27	864	5.46	January 27	195	5.54
August 27	495	5.41	January 28	195	5.32
October 2	400	5.40	February 3	390	5.40
January 2, 1890	190	5.43	February 3	195	5.53
January 9	190	5.43	February 16	390	5.53
February 17	570	5.51	March 14	390	5.90
February 24	570	5.62	March 28	390	5.88
June 23	195	5.89	April 6	195	5.91
June 30	585	5.93	April 27	195	5.94
July 3	585	6.00	May 11	390	6.00
July 12	390	6.00	June 1	390	5.95
October 13	195	6.21	June 1	195	5.97
October 27	585	5.54	June 22	390	5.70

The average cost of tin plates in the 32 months covered by the above table was $5.67 per box. The price, however, it will be noticed, often ranged above $6 per box. The following table gives the average yearly prices of domestic tin plates, IC, 14 x 20, per box of 100 lb., at tin plate mills in Pennsylvania, from 1899 to the end of 1909:

	Price.		Price.		Price.
1899	$4.06	1903	$3.74	1907	$3.90
1900	4.47	1904	3.41	1908	3.70
1901	4.00	1905	3.50	1909	3.50
1902	3.93	1906	3.69		

The average annual price of tin plates of domestic manufacture in these 11 years was $3.81 per box. In recent years tin plates have been imported chiefly by the oil and canning interests to obtain the benefit of the drawback.

Howell C. Rockhill, trustee of the Fort Wayne Rolling Mills, Fort Wayne, Ind., states that the last of a debt of $375,000 was to be paid off December 1 and the property would then revert to the original stockholders. The company became involved in 1905 and the creditors put it in the hands of a trustee. A holding company was organized to take over and operate the plant.

The Population of New York State

New York State has a population of 9,113,279, according to statistics of the 13th census just made public. This is an increase of 1,844,385, or 25.4 per cent. over that of 1900. The increase from 1890 to 1900 was 1,265,257, or 21.1 per cent. The New York *World* makes the following striking comparisons:

"The State of New York, with 9,113,279 inhabitants under the new census, has more people than any one of these European kingdoms: Belgium, Holland, Portugal, Denmark, Norway, Sweden, Bulgaria, Servia, Roumania, Montenegro, Bavaria, Saxony or Würtemberg. It has as many as Scotland and Ireland combined. It has twice as many as Australia, and it exceeds all Canada by at least one-third. Its population is the same as England's at the first census of that country, taken in 1801, and two and one-third times greater than that of the entire United States at our own first census, taken in 1790. New York State is more populous than any country in South America except Brazil, and it exceeds any other country in North America except Mexico. Its increase of 1,844,385 for the last decade is greater than the population of any State west of the Missouri except California, and is almost exactly equal to that of Maine and Connecticut combined. But what is still more interesting, the population of New York City exceeds by more than 400,000 the population of the rest of the State."

The American Society for Testing Materials

Circular No. 53 of the American Society for Testing Materials announces the adoption of the specifications submitted to the members some months ago on staybolt iron on yellow pine bridge and trestle timbers and on methods of testing. The annual volume of the *Proceedings*, which will contain about 650 pages, will be distributed in December. Notwithstanding the increase in dues from $5 to $10 a year, only 40 resignations have been received, but in the same time 137 new applications have come in, so that the present membership is 1303. The American membership in the International Association is growing, being now 438, Germany being next to this country with about 400 members. A further large increase in the American membership is expected before the next International Congress, which will be held in New York in the fall of 1912, Prof. Henry M. Howe presiding. Among papers now being arranged for that meeting will be one by James E. Howard, Bureau of Standards, Washington, on "The Effects of Temperature on the Strength of Structural Materials."

Against Further Tariff Revision.—James M. Swank, vice-president and general manager of the American Iron and Steel Association, has addressed a letter to President Taft giving reasons against further tariff agitation. The letter concludes with the following: "We respectfully submit that no good reason exists for a further revision of the tariff or any part of it at the present time or at any time in the immediate future, and that it would be unwise to recommend that this revision be made. If recommended and undertaken the country's industrial conditions, which have been subjected during the past three years to a great strain, would be still further depressed, and the capitalists who provide employment for workingmen would have their anxiety still further increased. We respectfully suggest that nothing be done to increase the general discontent, but that everything possible be done to allay apprehension, especially in business circles. Stability is greatly needed and not continual agitation. The country wants industrial, financial and political peace."

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov.30, 1910.	Nov.23, 1910.	Oct.26, 1910.	Nov.24, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	14.75	14.75	15.00	18.75
Basic, Valley furnace	13.50	13.50	13.00	17.25
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	13.90	13.90	14.15	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.50	27.50
Forging billets, Pittsburgh	28.50	28.50	29.00	31.00
Open hearth billets Philadelphia	25.50	25.50	26.00	30.60
Wire rods, Pittsburgh	28.00	28.00	28.50	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	16.00	16.00	16.00	19.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	13.50	13.50	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.00*	13.50	13.75	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.35*	1.37	1.40	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.60
Common iron bars, Pittsburgh	1.40	1.40	1.45	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.30	1.55
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.40	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.30
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.60	1.60	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.00	13.00	12.87½	14.00
Electrolytic copper, New York	12.87½	12.87½	12.80	13.75
Spelter, New York	5.95	5.95	5.60	6.40
Spelter, St. Louis	5.80	5.80	5.45	6.25
Lead, New York	4.50	4.50	4.40	4.40
Lead, St. Louis	4.40	4.40	4.27½	4.27½
Tin, New York	**37.35**	36.90	36.15	31.30
Antimony, Hallett, New York	7.75	7.75	7.75	8.25
Tin plate, 100-lb., box, New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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	Plugged and Reamed.	
1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅞ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 30, 1910.—(*By Telegraph.*)

Pig Iron.—The only sale of moment during the week is one of 6000 to 8000 tons of basic to a local open hearth steel plant, for first half of the year delivery, but the price paid has not been given out. In conformity with an agreement reached sometime ago, all the Valley furnaces are holding Bessemer iron at $15 minimum for first half, and several furnaces will not sell at that price. The pig iron market is likely to be very quiet until after the first of the year, and with the heavy output and light demand, together with the large stocks piled up, prices are none too strong. We quote for delivery in first half of next year as follows: Standard Bessemer, $15; malleable Bessemer, $13.75 to $14; gray forge, $13; basic, $13.50 to $13.75, and No. 2 foundry, $14, all at Valley furnace, the freight to Pittsburgh being 90c. a ton.

Steel.—A sale is reported of 1500 tons of Bessemer sheet bars for prompt delivery at $24.50, Pittsburgh, freight to destination added. New inquiry for steel is very light, and the market is heavy. Some of the smaller steel mills are said to be slightly shading prices quoted by the larger interests on both billets and sheet bars. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24.50, f.o.b. Pittsburgh, full freight to destination added.

(*By Mail.*)

The two items of interest in the iron trade this week are the placing by the Pennsylvania Railroad of contracts for 1911 delivery for 150,000 tons of steel rails, divided among the usual mills, and by the New York Central Railroad an order for something over 200 locomotives with the American Locomotive Company. The latter was the remainder of a contract for 323 locomotives placed early in the year, but deliveries on which were held up after 100 or more of the locomotives had been built. Otherwise the week has been quiet, and the impression prevails that December will probably be a dull month. It is believed, however, that shortly after the first of the year the demand will materially improve. It is estimated that the leading steel mills are operating only to about 60 to 65 per cent. of capacity, and this rate of operation may be lessened during the month. In spite of the lack of new demand prices generally are no lower, although here and there concessions from regular quotations are being quietly made. The efforts of a number of the leading coke producers to form a central selling agency have about been given up, but it is said that another plan is under way which, it is hoped, may lift the coke trade out of the slough of despond in which it seems to have fallen. The scrap trade is quiet and prices are only fairly steady.

Ferromanganese.—A leading consumer in the Shenango Valley has closed for about 800 tons of 80 per cent. foreign for delivery through 1911, on the basis of about $38.50, Baltimore. Leading consumers are now pretty well covered for first half, and in some cases through all of next year. We quote 80 per cent. foreign for delivery through 1911 at $38.50 to $38.75, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—A local consumer is reported to have bought about 100 tons for first half on the basis of about $55 f.o.b., Pittsburgh. There is still a scarcity of ferrosilicon for prompt shipment, but it does not strengthen prices. We quote 50 per cent. for delivery over the first six months of next year at $55 to $55.50, and for prompt delivery at $56 to $56.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—Inquiries are rather light. The pipe mills are getting ready to take inventory and close the year's business and will not take in any more material in December than is absolutely necessary. Consumers are pretty well covered through the first quarter of next year, and the mills rolling skelp thus have a fair amount of work ahead. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—A sale has been made of 500 tons of Bessemer rods at $28.70, delivered, Pittsburgh, netting about $28.25, f.o.b. at mill. Specifications against contracts are not coming in very freely, and new inquiry is light, being confined mostly to small lots for actual needs. We continue to quote Bessemer rods at $28 to $28.50, and open hearth and chain rods, $28.50, Pittsburgh.

Muck Bar.—Consumers are pretty well covered, and the few makers of muck bar for the open market have their product well sold up through the first quarter. No inquiries are reported. Best grades of rolled muck bar made from pig iron are held at about $29.50 to $30, delivered buyer's mill, Pittsburgh, while Eastern muck bar is being offered at $28.50 to $29, delivered in this district.

Steel Rails.—The Pennsylvania Railroad contract for 150,000 tons of steel rails for delivery next year has already been referred to. It is probable that several other prominent roads will shortly make contracts for 1911 delivery. The Carnegie Steel Company had a very good week in light rails, orders entered and specifications received against contracts having been heavier than in any one week for several months. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—The Carolina, Clinchfield & Ohio Railroad has placed contracts for 1000 50-ton steel hopper cars, divided among three steel car companies; the Boston Elevated has placed 50 cars with the Laconia Car Company, and the New York Despatch Refrigerator Line has ordered 300 30-ton cars from the Whipple Car Company. It is stated that the Buffalo, Rochester & Pittsburgh Railroad will soon be in the market for 1500 to 2000 freight cars, 15 to 20 passenger cars and 10 to 15 engines. The giving out of these contracts and the prospects of additional work have enlivened the plate trade to some extent. The general demand for plates is also slightly better than for some time, specifications against contracts coming in more satisfactorily. We quote ¼ in. and heavier plates in the wider sizes at 1.40c., Pittsburgh, but on the narrow sizes two or three mills are naming 1.35c., Pittsburgh, on attractive orders.

Structural Material.—Inquiries for bridge work from the railroads is more active, the Norfolk & Western, the Great Northern and several other roads having inquiries out for a considerable tonnage. The new office building of the Republic Iron & Steel Company at Youngstown will likely be placed at an early date and will take about 1000 tons. The McClintic-Marshall Construction Company has taken 300 tons for the Nineteenth Ward school building in this city, and about 150 tons for a new building for the Fairmount Mining Machinery Company, Fairmount, W. Va., covering foundations and superstructure. The McClintic-Marshall Company is going more and more into the business of taking contracts for the complete erection of buildings, including foundations. The Jones & Laughlin Steel Company has taken about 1500 tons for an extension to a hotel in an Eastern city. We continue to quote beams and channels up to 15-in. at 1.40c., f.o.b. Pittsburgh.

Sheets.—Several of the independent mills report they are pretty well filled up for the next three months, but the actual amount of new business being placed is only fair. There is still some shading in prices on black sheets, but not so much on galvanized, the high price ruling for spelter

THE IRON AND METAL MARKETS

having a stiffening effect. For exceptionally attractive orders 2.10c. on No. 28 black sheets is sometimes being accepted. The general market on sheets is on the basis of 2.20c. for No. 28 one pass black sheets and 3.20c. for No. 28 galvanized. The full schedule of prices in effect on black and galvanized and on roofing sheets is given on a previous page.

Tin Plate.—Fairly heavy contracts for bright plate from salmon packers, meat packers and can makers have been placed in the past two or three weeks, some being for first quarter and some running through first half. There has thus been a decided betterment in conditions, and quite a number of hot mills that were shut down in the early part of November have been started up. The Demmler Works of the American Sheet & Tin Plate Company have been put on full time. It is stated that 10 more hot mills are to be added to the Shenango Works of the same company at New Castle, Pa., which will make a total of 40 hot mills in the plant. The market is reported as being very firm, and we continue to quote 100 lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—A slightly better demand for iron bars from railroads is reported, while specifications against contracts for steel bars are coming in at a fairly satisfactory rate. It is probable that shipments by the mills in December will show a falling off as compared with November, consumers probably taking in as little material as possible before taking inventory and closing up the year's business. We quote steel bars at 1.40c. and common bars at 1.40c. to 1.45c., f.o.b., Pittsburgh.

Hoops and Bands.—Several fairly large contracts for both hoops and bands for delivery in first quarter and first half of next year have recently been closed. Specifications against contracts are not coming in as freely as some time ago. We quote hoops at 1.50c. in large lots, and 1.55c in small lots; bands, 1.40c. in carload and larger lots, and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—The price of cotton ties for December delivery is 78c. per bundle, but contracts have been pretty well gathered in and only a few scattering orders are being placed.

Spikes.—The inquiry for spikes is only fair, the demand being confined mostly to small lots for repair work. It is stated that some large tonnages for spikes are coming up for railroads running west of Chicago, but most of this business will go to the Chicago makers. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—The new demand for rivets is reported as more active than for some time, and specifications against contracts are also referred to as being received at a more satisfactory rate. It is stated that regular prices, which are 1.90c. for structural and 2c, for boiler rivets, are being absolutely maintained.

Spelter.—Inquiry is light. We quote prime grades of Western spelter at 5.90c., East St. Louis, equal to 6.02½c., Pittsburgh.

Merchant Steel.—The tonnage shipped out by the mills in November is stated to have been only slightly less than October. One leading maker reports that specifications against contracts in the last half of November were much better than in the first half. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base, under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—Conditions in the shafting trade are quiet, specifications against contracts being light and new demand dull. The automobile builders are usually heavy consumers of shafting, but they have been taking in very little for some time. It is stated that regular discounts are being fairly well maintained, and are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—New orders for wire nails and wire are only fair and are for small lots to cover actual needs, while specifications against contracts are coming in only at a moderate rate. December is expected to be a dull month in the wire trade, but a material betterment is expected early in January. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—This is always the dull season in the pipe trade. The demand has quieted down considerably, while shipments from the mills in December will probably show a falling off as compared with November. A report is out that the Busch-Everett syndicate, which proposes to build a line to pipe gas from Shreveport, La., to St. Louis, has been dissolved, and that the project has fallen through. This report, however, has not been confirmed. Regular discounts on iron and steel pipe, printed on a previous page, are said to be well maintained.

Boiler Tubes.—The demand for merchant tubes continues very dull. Prices on both iron and steel boiler tubes are more or less irregular, and some sales are said to have been made below cost.

Iron and Steel Scrap.—Consumers of scrap will *take* as little material in December as possible, owing to inventory period being near at hand, and hence trade during this month will likely be quiet. No sales of importance have transpired. Dealers quote about as follows, per gross ton. f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	9.00 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	16.25 to 16.50
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.25 to 17.50
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.75 to 14.00
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.75 to 9.00
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	11.50 to 11.75
Heavy steel axle turnings	10.25 to 10.50

Coke.—The project of leading independent coke operators to form a central selling agency, in an effort to put the coke business on a more profitable basis, is reported to have been abandoned. It is stated that another plan is under consideration. The Youngstown Sheet & Tube Company last week contracted with the Estate of W. J. Rainey for a large supply of furnace coke running through all of 1911 at a flat price. The minimum amount involved is 20,000 tons and the maximum 35,000 tons per month. An Eastern blast furnace interest, which has heretofore used Mountain coke, is also reported to have closed for a large tonnage of Connellsville coke for delivery over first half. We continue to quote standard makes of furnace coke for prompt shipment at $1.45 to $1.50 per net ton at oven, while for delivery over first half $1.75 to $1.80 is quoted. Best makes of 72-hour foundry coke for prompt shipment are held at about $2 per net ton at oven, and for first half from $2.10 up to $2.50. The output in the Upper and Lower Connellsville regions last week was 326,056 net tons, a decrease over the previous week of about 1800 tons.

The offices of Goff, Horner & Co., Ltd., iron and steel factors and district sales agents for the American Rolling Mill Company, Middletown, Ohio, have been removed from the Frick Building to the eighteenth floor of the Henry W. Oliver Building, Smithfield street, Pittsburgh.

The offices of the Pittsburgh Shovel Company works at Leechburg, Pa., have been removed from the Frick Building to the eighteenth floor of the Henry W. Oliver Building, Pittsburgh.

Chicago

FISHER BUILDING, November 30, 1910.—(*By Telegraph.*)

While prices of finished materials continue firm the amount of new business that is being taken by the steel mills does not account wholly for their confidence. Railroads are now willing to contract for bar iron through the first half of 1911 at present prices; but, while their willingness to purchase for extended delivery is encouraging, the mills are not disposed to commit themselves so far ahead at prices which return little or no profit. The growing car shortage has not yet stimulated any extensive car purchases. The structural steel manufacturers and fabricating interests are encouraged by the fact that financial conditions are becoming more favorable for new building projects. The tonnage represented by new buildings in Chicago, on which work will begin next spring, is larger than for some years past, and in all the Western cities plans are under way for steel buildings. During the past year the fabricating interests in this territory have felt severely the competition of concrete construction. The general merchant bar trade is quiet. The wire mills are getting more business than a

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week ago. There is a fair amount of inquiry for sheets, and store distribution is more active. The larger buyers, however, are disposed to await developments.

Pig Iron.—The month of November has developed a fair buying movement for Southern iron, and sales by Southern furnaces through Chicago offices for deliveries in this territory have amounted to something over 75,000 tons during the month. There have been inquiries for perhaps a larger tonnage of Northern iron the past month, but this business has not been closed. In fact, the actual sales of Northern iron during November are not estimated at more than half the amount of Southern that has been sold. Most of the sales of Southern have been for first quarter and in some cases for the full first half, while the Northern furnaces have been very reluctant to sell into next year except at an advance of about 50c. over the current price for prompt shipment. Among the sales closed last week a boiler interest at Kewanee has purchased 5000 tons, principally Southern iron, and an implement manufacturer west of Chicago has purchased 3000 tons for first half. Several lots of Virginia iron have been sold in this territory recently for first quarter delivery, and one recent transaction included 1500 tons of Valley iron, first quarter, for Chicago delivery. The Northern market is waiting for the malleable foundries, and they in turn are waiting for specifications from the railroads and manufacturers of railroad equipment. The malleable foundries have bought very little iron for the first half owing to the fact that many of them overbought for the last half of this year. The present depression in the pig iron market is largely due to the curtailment of railroad specifications for foundry work. This curtailment is estimated at more than half a million tons of iron in the United States, it being estimated that stocks of merchant iron at all furnaces have increased about half a million tons this year. Prices are apparently holding about even, with Northern iron a trifle stronger. Some Southern iron has been sold for first quarter delivery at $11 Birmingham, but a majority of the Southern furnace interests are holding for $11.50 for first half. The following quotations are for December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(*By Mail.*)

Billets.—Open hearth forging billets are quoted at $28, base, Chicago, for current lots.

Rails and Track Supplies.—Orders taken by the Illinois Steel Company last week amounted to about 8000 tons of standard rails. There have been several inquiries from Western roads for small lots, which are apparently intended as preliminary orders to delay the issue of contracting for a year's requirements. Sales of light sections this year have amounted to about the average tonnage for this class of rails. Track supplies are weaker and are quoted lower. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.20c. to 2.30c., base, all in carload lots, Chicago. Light rails 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—While current bookings are light the fabricating interests are encouraged by the enormous amount of building tonnage in prospect throughout the West. In Chicago alone work will commence during the next six months on several large buildings which will require 40,000 to 50,000 tons, including 10,000 tons contracted by Mandel Brothers last winter, on which work will commence next spring. Financial arrangements are reported to have been finally closed on a project that has been pending a long time for an office building to occupy the block west of the Board of Trade. This will be known as the Underwriters' Building and will require at least 12,000 tons. Other important buildings that are in prospect are backed by strong estates or investing interests which are not likely to have trouble in financing their plans. In all of the growing cities of the West there are plans pending for steel office buildings, and a favorable money market will bring out a very large amount of this business. The U. S. Gypsum Company has let to the Indiana Bridge Company, Muncie, Ind., contracts for 680 tons for two factories, at Alabastine, Mich., and Rochester, N. Y. The American Bridge Company took the Hoge Building, Seattle, Wash., 1750 tons. The Brown-Ketchum Iron Works, Indianapolis, Ind., was the successful bidder for a 750-ton building for the Anheuser-Busch brewery at St. Louis. The Wisconsin Bridge Company booked 450 tons of bridge work for the Duluth, Winnipeg & Pacific Railroad. A warehouse for the McMurtrie Mfg. Company at Denver, 100 tons, went to the Lowith Brothers Iron Works Company of that city. The Trostel tannery at Milwaukee, 70 tons, was let to Scobis Brothers of that city. The market for plain material is firm and the mills are getting more specifications from miscellaneous sources. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—One of the encouraging features in the market is that the plate mills are maintaining prices. The going business is well distributed now, and the mill interests undoubtedly expect a larger demand in the near future from car shops and fabricating interests. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The market is holding steady, especially on open hearth sheets, although the current demand is less than the full capacity of the mills. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The railroads are slowly increasing their specifications for bar iron, but current business is still considerably short of the capacity of the mills, and prices for this product are very close to cost. The weakness in the price of rerolling rails encourages close prices on inquiries for hard steel bars. Specifications for soft steel bars are now coming in at a rate which keeps the price firm. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—It was noted last week that there had been a considerable drop in specifications for wire products. This appears now to have been a temporary lull rather than the end of the season, as new orders and specifications have picked up again. The mills will soon begin taking contracts from manufacturing interests for the full first half, where such contracts are necessary. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Specifications continue at a normal rate from the agricultural trade, the gain in the volume of business from this source being sufficient to overcome the drop in the requirements of the automobile trade for special grades of steel.

Cast Iron Pipe.—The only letting of any moment that is pending this week is one of 900 tons at Harbor Springs, Mich. Municipalities have not begun to advertise to any extent their specifications for next year, but developments in this line are expected during December. A favorable indication for the pipe trade during the coming year is that money is growing easier and the market for railroad bonds has improved. Cities have been hampered by difficulty in selling their bonds. In many States the law forbids issuing municipal bonds at a discount and 4 per cent. bonds cannot be sold at par. A favorable bond market this winter will bring out a large amount of pipe business. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The influence of railroad buying begins to appear in the scrap market in a little better demand from foundries for railroad malleable scrap, as from steel foundries for steel couplers and knuckles. The railroads have placed a good many contracts with malleable foundries with a cancellation clause contingent upon getting their advance in rates. This places the foundry in an unhappy position, as it has given an option on its product without knowing whether to buy pig iron and scrap to cover the tonnage. The present demand for malleable scrap apparently grows out of small orders given by the railroads for prompt shipment. Other grades of scrap are holding about even, except that rerolling rails are easier. Small lots have been sold recently at sacrifice concessions below $15, bringing them back to the old differential of $1.50 above heavy melting steel. The mills continue to take all the melting steel that comes along, paying about the same price that they have paid for the last six months, which allows the

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dealer about $12.50 per gross ton, delivered. Foundries are taking all the cast scrap offered them at present prices, as they can mix it with Northern iron and make the cheapest foundry mixture that the gray iron foundries have had in this territory in the last six years. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.75 to 12.25
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., November 29, 1910.

The market for both crude and finished materials still drags. While there has been no heavy movement in pig iron sellers feel more encouraged with the situation, not that it is believed that there will be any marked buying in the immediate future, but more particularly with the fact that curtailment of production continues, if only in a moderate way. In several cases sellers have practically withdrawn from the market at the present price level, while in instances iron on the banks has been cleaned up before suspension of operations. The finished material situation remains unchanged; orders coming in are generally small, although makers of plates and shapes are more encouraged with the volume of business in sight. Billet makers report a falling off in demand. Refined iron bars are dull and show a tendency toward lower prices. The coke movement is very light. There is still little demand for old materials, and in the absence of business prices for principal grades show a lack of strength.

Iron Ore.—The market is at a standstill. Importations at this port during the week ending November 26 aggregated 24,963 tons, valued at $111,625.

Pig Iron.—While there has been no heavy curtailment of production, the fact that some of the merchant furnaces in eastern Pennsylvania, New Jersey and Virginia have recently blown out or are about to blow out is taken as an encouraging feature. Musconetcong Furnace was blown out November 24; Princess in Virginia was blown out on the 29th, while Victoria Furnace, also in Virginia, will go out in the very near future. In the case of the Virginia furnaces, practically all the iron on the furnace banks has been sold, and these producers are now out of the market. In a few other instances producers have practically withdrawn from the market at the prevailing prices. The principal transactions in the pig iron market recently have been in low grade iron. One of the Delaware River cast iron pipe foundries has purchased practically the full tonnage against its recent inquiry for 6000 tons. This was taken in various lots, about one-half Southern and one-half Northern, among which were forge at $10, Birmingham, and No. 3 at $10.50. Report has it that a 1000 ton block of forge was also included at $9.75, Birmingham. Other pipe makers have been picking up odd lots, running up to 400 tons, both Southern and Northern low grade being taken at prices varying according to the grade. The movement in the higher grades of foundry iron has been less active. Large lot buyers have temporarily withdrawn from the market, awaiting further developments. Moderate buyers are feeling around to get a line on prices, but the bulk of the sales have been under the 300-ton mark, a good share of which is for prompt delivery, although in a number of instances shipments also extend through the first quarter. The bulk of this business is done at prices ranging from $15.50 to $15.75, delivered in this vicinity, for standard brands of eastern Pennsylvania No. 2 X foundry, although occasional sales at $16, delivered, are reported. Virginia No. 2 X foundry, both for prompt as well as first quarter delivery, has been selling in carloads up to a few hundred tons at $13, at furnace, equal to $15.80 to $16.05, delivered in this territory, with occasional sales at $13.25, at furnace, and it is said that producers who were willing to dispose of iron under that basis have sold all they want and are now either out of the market or have firmed up on quotations. Very little movement in the higher grades of Southern foundry iron is reported, although one sale of 100 tons of No. 2 at $11, Birmingham, for prompt delivery, is announced. Few sales of Northern forge iron have been made, although some inquiry is still before the trade. Prices are nominally quoted at $14.25 to $14.50, delivered, but it is reported that concessions might be made for desirable orders. Negotiations for basic are still under way for a moderate tonnage for first quarter delivery. Further sales of low phosphorus iron are reported both in standard grades—at prices equal to $22.50, delivered here—and in less desirable brands. Sales of high manganese low phosphorus iron are reported at $21.50, delivered in this vicinity, while Lebanon low phosphorus, with high copper content, has been sold in round lots for first half delivery at prices ranging from $17 to $17.25, delivered. The general range of quotations shows practically no change. Prices for standard brands, for prompt or first quarter shipment in buyers' yards, eastern Pennsylvania and nearby points, are named as follows:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.25
Virginia, No. 2 plain	15.80 to 16.05
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—There is practically no demand from consumers in this territory, although local sellers have disposed of small lots for Western shipment at $38.50, Baltimore. While some sellers are firmer in quotations, the market will no doubt remain easy until speculative importations, which continue to arrive, have been cleaned up.

Billets.—Little encouragement is derived from the volume of business offered. Producers in this section, in the majority of cases, still report a small hand to mouth business, the aggregate tonnage of which is somewhat less than a few weeks ago. There is still an absence of any definite inquiry for delivery beyond the year end. Prices remain practically unchanged, ordinary basic open hearth rolling billets for prompt shipment being quoted at $25.50 to $26, delivered in this vicinity, dependent on the size of the order. Forging billets are a trifle more active than rolling billets and are quoted at $28, Eastern mill, the usual extras for high carbons and special sizes being added.

Plates.—While occasional sizable orders, running up to a few hundred tons, come to the mills, the bulk of the business taken is small and largely for prompt shipment. Immediate orders show no material gain in aggregate volume, but mills, from the betterment to be noted in car, locomotive and bridge orders, look forward to a better demand. Some moderate ship plate orders are in sight, with larger tonnages for material of this character to follow. Prices are being well maintained by Eastern makers, who name 1.55c., delivered, as the minimum price for carload lots of ordinary plates delivered in this vicinity.

Structural Material.—The most important project in this district now before the trade is that of the new warehouse for the Baltimore Bargain House, which is estimated to require from 2500 to 3500 tons of structural material. Some garage work and smaller building propositions, requiring upward of 100 tons, are also being figured upon. No fresh contracts for fabricated work of any size has been placed in this vicinity, the bulk of the business being of a miscellaneous character. Prices are firm, at 1.55c. to 1.60c. for plain shapes, according to specification, delivery in this vicinity.

Sheets.—A very fair volume of business is reported, not quite so large in the aggregate, however, as in the previous week. Mills are pretty well engaged and have in some cases enough work to see them through the first three weeks of December. While there is still some testing of the market for early 1911 shipment, no business of that character has yet been reported. Prices are unchanged, the following range being named by Eastern makers for prompt deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The volume of business offered in refined iron bars is small and competition for desirable specifications sharp, with the result that prices are again easier; in fact, it is difficult under existing conditions to name quotations which would actually represent the range of the market. For the ordinary run of business prices of refined iron bars are close to 1.35c. to 1.40c., delivered in this territory. Small lots and undesirable specifications, however, command a somewhat higher figure, while it is not unlikely that the

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quotations named would be shaded for a desirable tonnage. Steel bars are unchanged, at 1.55c., delivered.

Coke.—Quieter conditions are reported. Several large contracts for furnace coke for 1911 delivery are under negotiation, but buyers and sellers are, for the most part, still deadlocked on prices. Moderate sales of foundry coke are reported, but there is no real activity in the market. Prices are practically unchanged, $1.65 to $1.85, at oven, being named for furnace coke, with foundry grades at $2 to $2.35, at oven, according to quality. The following range of prices about represents the market, per net ton, delivered in this vicinity:

Connellsville furnace coke	$3.85 to $4.05
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.50 to 3.90
Foundry coke	3.85 to 4.05

Old Material.—Little interest is being taken in the market, either by consumers or sellers. Mills' requirements are well taken care of by deliveries against old orders, and offerings must be in the nature of a bargain to arouse any interest. No. 1 heavy melting steel is evidently easier, although there has been little business transacted. One or more 1000-ton lots of strictly No. 1 grade, for delivery during the next two months, have been sold at $13.50, delivered, although in the majority of instances mills hold to their nominal offering price of $13, delivered, Eastern mills, but this figure brings out practically no tonnage. Rolling mills show no anxiety to enter the market, but in instances will take small lots, if the price is low enough. Quotations, under the circumstances, are practically nominal. The following range about represents sellers' ideas of the market for delivery in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia, ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$13.00 to $13.50
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 18.50
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.50 to 18.00*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.50 to 13.00
No. 1 forge fire	11.00 to 11.50
No. 2 light iron	7.00 to 7.50
Wrought turnings	8.50 to 9.00
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Buffalo

BUFFALO, N. Y., November 29, 1910.

Pig Iron.—General inquiry has slackened to some extent, evidently for the reason that a good many consumers have covered present requirements and are comfortably fixed for some time. There is still considerable tonnage to place to cover forward needs, however, as indicated by inquiries received and quoted on prior to the current week and not yet acted upon, for pump, radiator and pipe work, and from a good many of the smaller melters who have been carrying light stocks and are not covered for any great length of time. The week's inquiry, though light in total, included two or three lots of fairly good size for foundry irons, including one for 6500 tons from the leading electrical machinery manufacturing interest for its Eastern plants. Orders for the week have also fallen off in some degree as compared with the past week or two. Most of the tonnage booked was composed of carload to 100-ton lots, comprising foundry grades from small and medium sized melters, with a few orders for charcoal iron and specialties. In the face of the inactive market for new business, shipments from furnaces on contracts are going forward in good volume. The recent advance in price schedules by Buffalo district furnaces is being rigidly maintained. We quote as follows for remainder of year and first quarter:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No. 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—The market has been comparatively quiet, with less inquiry for bar material and other finished lines than for some time. The demand for wire nails, fencing and other wire products has fallen off noticeably, except for small lots, most of the large consumers having closed for first quarter requirements. This is the case also with users of tin plate and black sheets, many of whom have supplied their needs for some time ahead, although orders for small lots continue to come in. Notwithstanding the slackened demand, prices on steel bars are firmly held at 1.40c., Pittsburgh, for large lots, and 1.45c. for small and miscellaneous lots. The Canadian export trade continues good, with a fair demand in all lines, but an especially good demand in bar material, plates and shapes. In structural lines a fair amount of business is going on, with considerable in sight for the early part of next year, if projects now talked of are carried out. Plans are soon to be out for a building to be erected at Erie, Pa., by the St. Johns Kanty College Association, requiring a considerable tonnage, and plans are also nearly completed for a branch factory to be erected at Newark, N. J., by the Linde Air Products Company of this city, calling for 100 tons. The Buffalo Structural Steel Company received the contract for fabrication and erection of steel, about 100 tons, for the Crosby Company's warehouse in this city, and the Syracuse Bridge Company the contract for steel work for convention hall and skating arena building to be erected at Syracuse by the Syracuse Arena Company, 200 tons. Bids opened to-day show the George Kellogg Structural Company to be low bidder for fabricating and erecting 100 tons for the H. D. Taylor Company's warehouse in this city. The New York State Prison Commission, Albany, is to receive bids December 15 for the 10,000 tons of structural material required for the new State prison at Wingdale, N. Y.

Old Material.—The market is quiet in all lines, and the indications point to a very dull December, as mills continue to curtail shipments on contracts, and there is practically no inquiry. Although dealers are offering scrap freely, the consumptive demand is exceedingly limited. Prices are somewhat easier. The schedule quoted below is largely nominal, but represents the market as accurately as possible, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.00 to $12.50
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.25
Locomotive grate bars	10.75 to 11.25
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.75 to 7.00
No. 1 busheling scrap	11.00 to 11.75

Cincinnati

CINCINNATI, OHIO, November 30, 1910.—(*By Telegraph.*)

Pig Iron.—Local agencies report a large number of inquiries being worked on, although few requests for prices have been received. While the market was expected to be rather dull during December, the present stagnation was not anticipated. Buying is subsiding, although for the first half 2000 tons of Northern foundry was taken by a southern Ohio melter at $14. An Indiana manufacturer bought about 2500 tons of Southern foundry on a reported basis of $11.25, Birmingham, and a local firm sold 2400 tons of malleable to a St. Louis consumer. Other sales include only carload lots to 500 tons, with the total about equally divided between Northern and Southern iron, shipments generally running through the first quarter. Southern iron is now freely quoted at $11, Birmingham, for the first quarter, and some interests would not be averse to taking on business from old customers at the same figure, extending the delivery date through the second quarter, although $11.50 is still being adhered to by some producers. Northern iron is quoted at $14, Ironton, for either prompt or first half shipment, and the furnace interests state that they positively will not shade this figure. A few inquiries are out for Ohio silvery, but with the exception of a 200-ton sale for January-March delivery, very little has changed hands. Malleable is firm around $14.25 to $14.50, Ironton, for shipment as desired during the next seven months. The consensus of opinion locally is that the market will probably drag along until January, when most agencies believe there will be an improvement both in prices and amount of sales. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

THE IRON AND METAL MARKETS

(*By Mail.*)

Coke.—A local agency closed a contract this week for about 6000 tons of Connellsville furnace coke, for first half shipment, to a Virginia consumer. This represents the largest coke sale made here during the past few days. Foundry coke is being bought in carload lots, but no contracts for round tonnages can be reported. Spot furnace coke in the Connellsville district is available at $1.50 to $1.60 per net ton, at oven, while the contract price is from 5c. to 10c. over these figures. In the Pocahontas field furnace coke is now quoted for prompt shipment around $1.65 to $1.70, with the contract figure remaining about $1.75 to $1.85 per net ton, at oven. Wise County operations report the usual slack business and prices range from $1.60 for spot furnace coke to an average of $1.75 to $1.80 for contract coke. Foundry coke in all three fields is obtainable at $2 for prompt shipment and at $2.25 per net ton, on contract.

Finished Iron and Steel.—Continued activity is to be noted, especially in structural material from warehouse. Prices remain around 1.75c. to 1.80c. from warehouse on beams and channels and steel bars. Iron bars are slow sellers and are quoted at 1.70c., from warehouse.

Old Material.—A prominent dealer attributes the present dullness in the market to the low price of pig iron and predicts that there will not be any pronounced activity until pig iron prices advance. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, November 29, 1910.

Iron Ore.—The lake shipping season will practically close November 30. Regular insurance will expire on that date, or five days earlier than last year. One or two shippers are still moving a little ore, but the last cargoes of the season will probably be sent from the upper lake ports tomorrow. While the general outlook for next year in the ore trade is not very favorable, ore firms predict a better volume of sales to Eastern furnace interests in 1911 than the very light tonnage taken during the past season. The improved Eastern demand is expected because of the heavy demand in England and Germany for Spanish ores and because of the advance in ocean freight rates that will increase the cost of Spanish ore delivered on the Atlantic seaboard. If the Lake Superior ore producers decide to reduce prices this will also stimulate their sales in the East in competition with foreign ores. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—Several sales of fair sized tonnages of foundry iron for first half were made to northern Ohio consumers during the week, and a moderate volume of new inquiries came out, most of them being for small lots. The foundry trade is rather quiet, some consumers being disposed to wait to see how business starts out after the first of the year, but others, particularly the smaller consumers, apparently see no reason for delaying their purchases until later. Prices remain stationary at $14 at furnace for No. 2 foundry for the first quarter and half. This price was shaded by a local furnace on a sale of 500 tons of No. 2 to an Akron furnace manufacturer made during the week; other out of town inquiries, particularly where Valley furnaces are competitors for the business, will doubtless bring out slight concessions from the $14 price. One local furnace that has been practically out of the market for some time, holding for $14.50 for delivery after the first of the year, is now taking on tonnage at the $14 price. For Cleveland delivery during the first half No. 2 foundry is quoted at $14.25 to $14.50, delivered. We note the sale of 1000 tons at the former price, but some sales have been made at the higher price. We also note the sale of 2000 tons of No. 2 foundry to another local consumer for the first half. Among the larger inquiries is one from a Cleveland stove manufacturer for 1500 tons, half Northern and half Southern. A local furnace manufacturer has bought 1000 tons of No. 2 Southern for first half at $11.50, Birmingham, and is in the market for a similar tonnage of Northern foundry iron. Considerable Southern iron has been offered in northern Ohio during the past week at $11, Birmingham, for No. 2 for the first half, but it is claimed that this low priced iron has either about all been sold or withdrawn from the market. A northern Ohio consumer has an inquiry out for 1500 tons of malleable iron for first half. For the remainder of the year we quote, delivered Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.50 to 14.75
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.90
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—A local interest is in the market for its first half requirements. There is very little inquiry for foundry grades, except for prompt shipment. Prices remain about stationary. We quote standard Connellsville furnace coke at $1.45 to $1.55 per net ton, at oven, for spot shipment, and $1.70 to $1.80 for delivery through the first half. Connellsville 72-hour foundry coke is held at $2 to $2.15 for spot shipment and $2.25 to $2.50 for first half.

Finished Iron and Steel.—The demand is only moderate. Mill agencies are getting a fair volume of orders, but they are nearly all small lots. Manufacturers are ordering only for their immediate requirements and are expected to allow their stocks to remain low until after inventory time at the first of the year. There is a fair demand for plates from boiler and tank makers. Reports indicate that manufacturers in these lines in northern Ohio are quite busy. With the coming on of winter, the demand for structural material has fallen off. Fabricating shops are not filled with work and are not specifying their usual tonnages on contracts. Considerable new structural work now in prospect will not be let until after the first of the year. The demand for reinforcing bars for concrete work continues quite active. The demand for shafting also continues good. Prices on steel bars and structural material are firm at 1.40c., Pittsburgh. Local mill agencies are adhering to that price on plates and claim not to be affected much by the competition of mills that are shading that price on narrow sizes. The demand for sheets is fairly active, but prices are not firm, concessions of $1 a ton and possibly more being made by some of the mills on both black and galvanized. The demand for iron bars continues light and local mills are not getting enough orders to keep them running full. We quote iron bars at 1.30c. to 1.35c., at mill. The Director of Public Service of Cleveland will receive bids December 12 for 3500 tons of cast iron pipe for the City Water Department.

Old Material.—The market is in an unsettled state as regards prices. While dealers are still showing a firmer feeling, consumers are unwilling to pay more, and there are not enough transactions to establish well defined prices, the market having again quieted down after the recent spurt in porings and turnings. Local mills have good sized stocks on hand, so that with the exception of small lots little business is expected during the remainder of the year. The Erie Railroad list will close December 1 with about its usual tonnage. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	13.25 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

James D. Frisbie, formerly manager of the Cleveland office of L. I. Bregman & Co. of Chicago, scrap iron dealers, has opened a brokerage office at 324 Garfield Building, Cleveland. He will deal in iron and steel scrap and relaying rails.

Birmingham

BIRMINGHAM, ALA., November 28, 1910.

Pig Iron.—The consumer has won out, it seems, in his fight for a basis of $11, Birmingham, for pig iron to be shipped the first quarter, and during the past week three of the large producers have made that price pretty generally to favored customers. A large tonnage has been booked, relatively speaking, and it is now believed that buyers will cover to the extent of the business they have on their books. It is a well established fact that with the majority of the furnaces $11 for No. 2 foundry means no margin of profit,

THE IRON AND METAL MARKETS

practically no allowance for royalties on raw materials consumed nor any charges for depreciation of plant. In this market several orders have been booked for lots of 1000 tons each on the $11 basis, while there have been good sales of special irons and special grades. Several lots of silvery gray changed hands at $12 to $13, depending upon the silicon content. There is no material change in the price of spot iron and no evidence is at hand to show that the $11 schedule has been cut even for immediate shipment. Production remains at just about the same rate as for the first four weeks of the month. Furnace yards, in some instances, show evidence of slight accumulations during the current month, but so small that it will take a careful check on December 1 to really determine whether such be the case.

Cast Iron Pipe.—No new orders of consequence have come to the surface. Producers are hopeful that with the turn of the year business in all lines will have settled down to some steady basis and that a number of contracts that have been held up will then be placed. Quotations remain nominally about as follows: 4 to 6 in., $20.50 to $21; 8 to 12 in., $20; over 12-in., $19, with the customary difference of $1 in favor of gas pipe. Naturally, on any large inquiries these prices could be shaded.

Old Material.—There is a better feeling among the scrap dealers. Some lots that have been on the market have been taken up and, in the opinion of the principal factors, prices are certainly no weaker. There is no change in the schedule as compared with last week and we continue to quote as follows, per gross ton, on board cars here:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, November 28, 1910.

A speculative demand for pig iron is developing in this territory, and, while the price obtained for a round lot of Southern iron for forward delivery is not known, it is supposed to have been made at the current price for this iron for prompt shipment. It would appear that there is a disposition on the part of large buyers or speculators to regard iron as a purchase at around the market price. At the same time attention is called to the fact that Northern iron is relatively cheaper than Southern at competitive railroad points. General business is in satisfactory shape.

Coke.—All the leading offices report a very quiet market for the past week. While the tone of the market is rather easier we continue our quotations of the previous week. For best Connellsville 72-hour foundry, $2.25 to $2.50; second quality, $2 per net ton, f.o.b. oven.

Pig Iron.—With but two exceptions all the leading brokers report a quiet week, as far as sales are concerned, though some of them were in receipt of a fair number of inquiries, many of which were regarded as having been made for the purpose of keeping posted on the market. Most of the inquiries reported the week previous are still pending, and several are undoubtedly from bona fide intending purchasers. One sale referred to above was 2500 tons of malleable Bessemer to a local foundry, for shipment over the first half. The other transaction was a sale of 7000 tons of Southern iron for first half delivery, for speculative purposes. An inquiry for 150 tons of Southern No. 2 foundry for shipment up to July, 1911, is mentioned. The irregularity in prices already noted still continues, and is doubtless occasioned by a disposition to force sales on the part of one or more Southern interests, while, on the other hand, notices of furnaces withdrawing from the market are mentioned. We continue our quotations of the previous week, as follows: Southern No. 2 foundry, shipment prior to new year's, $11, Birmingham; for shipment over the first quarter and first half the range is nominally $11.50 to $12.

Old Material.—A feature of the market is a growing demand for old rails for reinforcement of concrete construction in building. There continues to be considerable inquiry for scrap iron and steel, but actual business, so far as any was in sight the past week, was mostly postponed to the following week, when a more active demand is anticipated by the leading dealers. Stocks in dealers' hands are moderate for the season, and there were no railroad offerings. Prices are not strong, but it is believed they are near bottom, or, in other words, after the turn of the year, an appreciation is likely to take place. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft.	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.75 to 12.25
Frogs, switches and guards, cut apart	11.75 to 12.25

The following quotations are per net ton:

Iron fish plates	$11.50 to $12.00
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.75 to 11.25
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad tank and sheet scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.50 to 8.00

James B. Fisher has recently been appointed sales agent for the Sloss-Sheffield Steel & Iron Company for St. Louis territory, with offices at 1113 Central National Bank Building. Mr. Fisher has been with the company for several years and is well known to the trade in this section.

The work of installing the first 100 miles on the Illinois Traction System will begin in a few days, a contract having been signed with the Union Switch & Signal Company for the work, which will cost approximately $150,000.

Metal Market

NEW YORK, November 30, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Nov.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
25	13.00	12.87½	37.35	4.50	4.40	5.95	5.80
26	13.00	12.87½	[illegible]	4.50	4.40	5.95	5.80
28	13.00	12.87½	37.30	4.50	4.40	5.95	5.80
29	13.00	12.87½	37.20	4.50	4.40	5.95	5.80
30	13.00	12.87½	37.35	4.50	4.40	5.95	5.80

The copper market is listless. Pig tin is higher than last week, but not very active. Spelter continues strong. Lead is firm at the advanced price made November 18.

Copper.—As is usual toward the last of the month, the copper market is quiet; both sellers and buyers seem to be awaiting the monthly announcement of stocks and production. While it is not thought that the statistics will show any unusual amount of domestic deliveries during the month, the report on exports will be encouraging, as to date 26,454 tons of copper have been sent abroad during November. Prices continue strong and prospective purchasers who have been feeling the market with a view to getting concessions have withdrawn without placing orders, which indicates that the holders of stocks are firm in their intention to keep the price up. Lake copper cannot be had for less than 13c., and electrolytic copper is firm at 12.87½c. At the close of the London market to-day spot copper brought £57 5s. and futures were selling for £58 3s. 9d. The sales amounted to 350 tons of spot and 700 tons of futures. The market was steady.

Pig Tin.—Although the market has strengthened, there has been very little buying. A Banca sale occurred November 24, when 2200 tons was sold at auction at a price equivalent to 36.50c., c.i.f. New York. This created a good impression in the London market, and prices here promptly advanced from 36.82½c. to 37.35c. During the week the market fell off about 15 points again. The New York Metal Exchange tin statistics for November will be out to-morrow, and they will show deliveries during the month of about 3800 tons. This will surprise many, as it is from 600 to 800 tons more than has been anticipated. The statistics will also show available stocks of 1674 tons, and it is probable that there will be a continued scarcity of spot tin. Pig tin was sold in New York this afternoon for 37.35c. The London market closed to-day with spot tin selling at £169, 15s., and futures at £170, 5s. The sales amounted to 220 tons of spot and 440 tons of futures. The market was firm.

Tin Plates.—The tin plate market is rather quiet. Some salmon packers have inquiries out for delivery over the first half. The price of 100-lb. coke plates remains at $3.84.

Lead.—Notwithstanding the fact that there have been insistent rumors that the leading interest intends to make a further advance in lead, consumers have not come into the market. Outside sellers appear to be optimistic over the future, as they are demanding from three to five points

THE IRON AND METAL MARKETS

more than the leading interest. The price of lead in New York continues at 4.50c., and in St Louis, where the market is quite strong, it cannot be had under 4.40c., with some sellers demanding five points more than that.

Spelter.—The call for spelter is very light and the market is without interest. Sellers continue to hold spelter very firmly at 5.95c., New York, and 5.80c., St. Louis.

Antimony.—Antimony is quiet and slightly weaker. There is talk again of price cutting. It is certain that liberal concessions are being made by some sellers in Chinese and Hungarian brands. Cookson's is quoted at 8.15c.; Hallett's, at 7.75c.; Chinese brands, 99 per cent. guaranteed, 7.40c. to 7.50c., and Hungarian grades are around 7.12½c.

Old Metals.—The market continues dull. Dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, November 29.—Buyers are generally confining their purchases of metals to spot or nearby deliveries. The best brands of casting copper command a shade better than 13c., Chicago, but other brands can be had at that figure or slight concessions. There is somewhat of a deadlock between sellers and buyers of spelter, as buyers are not satisfied to pay the present market price for any extended delivery. Spelter experts, however, predict a curtailment in the supply during the coming year on account of the transition in that industry from gas to coal, which is now under way. Lead is quiet.

New York

NEW YORK, November 30, 1910.

Pig Iron.—Inquiry for pig iron has fallen off in the past week, and though it has seemed for some time that prices were on the bottom fresh concessions are reported on latest transactions. Furnaces in New Jersey and eastern Pennsylvania have been doing business for some time without profit, and it has been considered more likely that furnaces would generally be blown out than that iron would go lower; but, as a matter of fact, furnaces are still going for the most part and further reductions have come. In the past week several lots have been taken by pipe foundries, and three such companies have taken a total of about 9000 tons. A New Jersey company making heating furnace castings bought from 2000 to 3000 tons last week, and in the past few days has taken 1000 tons additional. The General Electric Company has an inquiry out for about 7000 tons for various grades of iron, deliveries to be made at Schenectady and Lynn. Considerable low phosphorus iron is called for in this case. Virginia furnaces are more actively seeking business, and $12.75, at furnace, for No. 2 X is the basis of several transactions in New England and in New York territory. Alabama and Tennessee irons have sold at lower prices, but are not yet low enough to meet the cuts made by Northern furnaces in Eastern markets. Two steel companies in eastern Pennsylvania have bought about 18,000 tons of basic iron, deliveries in one case beginning in December and running through January. The other transactions were for the first quarter of 1911, and $14.75 is reported to have been shaded. The foreign ore situation has taken such shape that business with Eastern furnaces is not likely to be done for some months. Ocean freights are high and the demand for ore in England and Germany has been so well sustained that all foreign ore canceled by buyers in this country a few months ago has been taken up. It is probable that if there were any demand on the seaboard just now for Swedish or Spanish ores 10c. a unit would be charged for ore that earlier in the year sold at 7½c. to 8c. a unit. We quote pig iron for 1910 delivery and the first quarter of 1911, as follows, at tidewater: Northern No. 1 foundry, $15.50 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—November closes the poorest month in the year so far in the amount of new business taken. At the end of the year it will probably still be the low month, for during December the railroads and manufacturers will be in the market with the deferred contracts for their spring requirements. The week just closed has been particularly quiet in all lines. Even bar iron, which has been holding up rather better than other lines, shows a marked falling off. Nothing in the present outlook indicates a further reduction in prices, for it is very generally agreed that the present lack of orders is not a consequence of holding for lower prices. Bids for the private building of battleship No. 35 will be opened December 1 and it is probable that specifications for the material for No. 34, which will be built in the New York Navy Yard, will be out about the middle of the month. The Hay Foundry & Iron Works has the fabricating of the 4000 tons of structural material for the building being erected by Henry Corn on Madison Square, New York, and it is understood that the contract for the steel was placed with an Eastern mill about a month ago. The steel work for the Sloane warehouse is being redesigned and will eventually be in the market again, about 6000 to 8000 tons, but the material will not be needed before about the middle of next year. Bids close to-day on the contract for the Post Office at the Pennsylvania Terminal, and it is known that a good many fabricators are bidding. The placing of the steel, about 6400 tons, is expected in the fairly near future. No decision has yet been reached on the 4500 tons, or thereabouts, required for the extension of the Boston Elevated Railway. Bids go in to-morrow for the 1911 requirements in bridge material, 3500 tons, for the Norfolk & Western. The Phoenix Bridge Company has taken 900 tons for the Union League Building in Philadelphia; the Eastern Steel Company, 400 tons for a hospital at Retreat, Pa.; the Bourne-Fuller Company, 220 tons for the Case School of Applied Science, Cleveland, and 300 tons for the Perry-Payne power house in the same city; the Wisconsin Bridge Company, 450 tons for the Duluth, Winnipeg & Pacific, and about 400 tons in small bridges for the Lehigh Valley has been divided between the Phoenix Bridge Company and the Cambria Steel Company. It is understood that the general contractor has decided on the placing of the contract for the steel for the Washington Irving High School. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Ferroalloys.—Some excellent sales of ferromanganese have been made in this territory, and there are inquiries out for some good round lots. Prices have not been strengthened, quotations being $38.50 to $39 seaboard. Several large sellers, however, are holding ferromanganese firm at the higher figure. There is an excellent demand for ferrosilicon, which is somewhat scare for spot delivery. The market is quoted at $56 to $56.50, Pittsburgh, and it shows signs of strengthening.

Steel Rails.—The Pennsylvania Railroad reports that it has given the steel companies orders for 150,000 tons of rails. There are no details as to the amounts the various rail companies are to receive, but some questions as to terms are yet to be arranged. The Illinois Steel Company took orders for 8000 tons of rails last week. Two contracts were closed by the Tennessee Coal, Iron & Railroad Company, one for 1000 tons of 60-lb. rails for the Fairburn & Atlanta Railway & Electric Company, and the other for 700 tons of 80-lb. rails for the Shreveport Traction Company.

Cast Iron Pipe.—The city of New Bedford, Mass., will open bids on 1500 tons of water pipe December 8. The general demand for pipe continues to be somewhat better than usual at this season. More contracts are being placed for spring delivery. Sharp competition is still being experienced for any business coming up for prompt delivery, as the stocks of standard sizes held by some of the Eastern manufacturers have not yet been disposed of. Carload lots of 6 in. continue to be available at $22 or less, per net ton, tidewater.

Old Material.—Conditions in this branch of trade appear to be steadily growing worse. Sales of fair-sized quantities of heavy melting steel scrap and of some other classes of old material have been made, but only at reduced prices to meet buyers' views. Another cargo of Panama scrap was sold during the week, the successful bidder paying $10.42 per ton. Prices generally are lower except on foundry stock, which is not in over supply and is therefore rather steady. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$11.50 to $12.00
Old girder and T rails for melting	10.50 to 11.00
Heavy melting steel scrap	10.50 to 11.00
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	5.00 to 5.50
Cast borings	5.50 to 6.00
Wrought turnings	5.50 to 6.00
Wrought pipe	9.50 to 10.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	12.00 to 12.50

The Machinery Markets

Business in the machinery trade is dragging somewhat in a number of selling centers, due to a certain extent to the absence of railroad buying. Manufacturers as a rule continue optimistic as to the future, however, as many of them are making machinery for stock with a view to supplying the demand they expect will develop. Philadelphia, Baltimore, Cincinnati and Detroit all report business quiet. In Chicago a better demand has developed, but lack of orders from the automobile makers is still felt. Business is very good in the South, and municipal improvements in Virginia are contributing largely to the demand from that part of the country. A good business is being done on the North Pacific Coast for boilers, tanks, pumping machinery and heavy equipment, and in the Northwest many plans for municipal development denote that there will be a good call for machinery for power plants, water works, &c., in the near future. The Pittsburgh market is improving slightly and there is an excellent demand for electrical equipment. The export demand continues especially good, and from all markets where the export trade is a feature come reports of a good call for about every class of machinery.

New York

NEW YORK, November 30, 1910.

Business continues quiet in the New York machinery trade and it appears that the pre-holiday lull, which usually arrives a couple of weeks before Christmas, is here ahead of time. There is an actual absence of railroad buying, and beyond a few scattered orders for small lots of tools very little has been done during the last week in this market. A number of new enterprises which have been before the trade for some time seem to have been held up, as machinery houses report great reluctance to place orders on the part of people who were expected to be buying at this time. There are some very good inquiries before the trade, but it is hard to determine whether the people asking for bids on equipment are in earnest or not.

Fortunately for the trade at this time, export business continues good. Men connected with the largest foreign machinery house selling American equipment declare that the business outlook in Europe is especially good and they are looking for a great deal of machinery trade in that direction. There has been a good, steady volume of buying from all of the European countries during the last few weeks, and some decidedly good business is in sight. About the only exception to the rule is the present condition of the machinery trade in Italy, where the automobile industry has fallen off noticeably. Automobile manufacturers were the largest buyers of American machinery in that country, and many of them have of late been cramped for funds because of a sudden falling off in the demand for their products. The company which was formed by French automobile manufacturers a couple of years ago to manufacture machine tools, with a view to providing their wants in equipment which they were obliged to buy from this country, has not been entirely successful, as it has been unable to duplicate American machine tools and it certainly has not cut into the trade, according to statements made by those familiar with the situation. As a matter of fact, France has been one of the largest buyers of American machine tool equipment during the last year, and the automobile manufacturers there were among the best customers. It is a significant fact that a number of companies which hold stock in the machine tool manufacturing corporation mentioned above have been liberal purchasers of American machine tools. Some good business is looked for from Germany, as the last 12 months have been very prosperous in the machinery trade there. It is declared that about every machinery manufacturing house of any consequence in Germany and France increased its dividends during the last fiscal year. The only exception to this rule has been the bicycle industry. The bicycle has retained its popularity in Europe to a far greater extent than in this country, but there has been a certain amount of overproduction of bicycles in the German manufactories especially, which has resulted in considerable money being tied up in that industry. The German Government has been placing some especially large orders for railroad equipment during the last few weeks, and manufacturers of railroad supplies there will be busy for many months to come. Some of them are already planning enlargements and their inquiries indicate that their machinery purchases will be especially heavy. The demand for American machine tools from England has been very good, and from all accounts business in the metal industries there is much better than it has been in this country of late. There are some very good inquiries in the market from English manufacturers for American machine tools and woodworking machinery for delivery over the next three months. Taken altogether, this information, which comes from an authoritative source, should mean that the export trade will continue to strongly support the machinery market here.

It is announced that the business of the A. S. Cameron Steam Pump Works, which was recently taken over by the Ingersoll-Rand Company, 11 Broadway, New York, will be conducted as a separate enterprise, and to that end the Cameron Company has been incorporated. No change will be made in the policy of the company nor will any immediate change be made in the line of manufacture. The incorporators declare that the affairs of the Cameron Company will not be merged with those of the Ingersoll-Rand Company beyond that the latter organization will control the new corporation's stock. The Cameron Company elected the following officers: President, George Doubleday; first vice-president and treasurer, W. R. Grace; second vice-president and general manager, George W. Fuller; secretary, F. A. Brainard. All of the above named and W. L. Saunders, president of the Ingersoll-Rand Company, and Joseph P. Grace are directors.

The United International Motor Companies, Ltd., has been formed in England to manufacture the United States Motor Company's line of equipment in Europe. The designs and patents of the Maxwell, Brush, Columbia, Stoddard-Dayton, Courier and Sampson automobiles will be turned over to the English company and the plant will be constructed there for the manufacture of at least some of these cars. While it is announced that machinery for the proposed manufacturing plant will be purchased abroad, it is certain that a large line of American machine tools will be installed in the plant.

The American Smelting & Refining Company has been purchasing generously in this market within the last few weeks for a number of its smelting plants. Among other orders placed by this company is one for 58 automatic stokers given to the American Stoker Company, 11 Broadway, New York. This is the largest order for automatic stokers ever placed in the trade and it represents an expenditure of $60,000. The equipment will be used at the plant of the Ray Consolidated Copper Company at Hayden Junction, Ariz., and at the Chino smelter at Santa Rica, Mexico.

The Victor Appliance Company, Watervliet, N. Y., has leased a manufacturing building and has purchased a line of equipment for manufacturing automobile and motor boat specialties. The company may later on be in the market for a lathe with about 30-in. swing, a drill and some small tools such as reamers, taps, twist drills, &c.

The boiler department of the Brooks plant of the American Locomotive Works at Dunkirk, N. Y., has been moved into new buildings recently completed. An addition is to be built to the old boiler shop, of concrete, brick and structural steel, and will be equipped for use as a part of the machine department.

The city of Binghamton, N. Y., has completed plans for the erection of a sewage disposal plant to be located on the south side of the Susquehanna River, opposite Riverside Park. Jno. A. Giles is city engineer.

A water works pumping station for artesian well supply and an electric lighting plant is to be built by the village of Silver Springs, N. Y. An issue of bonds has been authorized and the village clerk will receive bids for plant construction.

The Commissioner of Public Works, Buffalo, N. Y., Francis G. Ward, Municipal Building, is receiving bids for one or more sand blast machines for cleaning structural steel work of city viaducts and bridges.

The J. W. Storandt Mfg. Company, 322 St. Paul street, Rochester, N. Y., has plans completed for a showcase factory 122 x 318 ft., one story, which it will erect on Lyall avenue early next spring.

F. C. Stevens, Superintendent of Public Works for the State of New York, Albany, is receiving sealed proposals for

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the building and equipping of a hydroelectric power plant on the Erie Canal, near the east end of Crescent Dam, contract No. 91. Also for the construction of lock No. 1 and dam No. 1, near Cayuga, contract, 91a; for gate house, culverts, &c., for the Erie Canal feeder between Trenton Falls and Nine Mile Creek, contract No. 51, and construction of bulkheads and dam across the Oswego River at Phœnix, N. Y., contract No. 80.

Catalogues Wanted

The King Sewing Machine Company, Buffalo, N. Y., desires catalogues of manufacturers of melting furnaces and apparatus for tinning, plating, &c.

Chicago

CHICAGO, ILL., November 29, 1910.

The machine tool trade in the West is slow in recovering from the depression of the past six months, but there is some improvement in the volume of inquiry and a little more business is being done. There has not been enough growth in the demand for high class tools to make up for the loss of automobile trade. The slump in that industry has had a widespread effect on the market, as it influences a great deal of trade outside of automobile factories. A surprisingly large number of factories and machine shops in other lines did a thriving business a year ago in supplying parts and accessories. Most of their machine screws and products of screw machines and other automatic tools were purchased outside from shops which had the equipment to supply what was wanted. A great many foundries in Chicago territory furnished machine finished castings in gray iron, steel or brass, and the loss of this trade has had a dampening effect on purchases of new tools in scores or even hundreds of manufacturing plants which were not publicly known to be identified with the automobile industry. While these plants are still doing a fair amount of business, many of them are not operating at the present time more than half of the tools in their shops. Dealers who specialize in railroad shop equipment have also been disappointed, as very few purchases have been made this fall by Western railroads and in some cases this business has been handled in a manner that invites criticism. Railroad shops are all the way from 10 to 20 years behind commercial machine shops in their equipment, and when they do make a purchase of new tools it is not uncommon for them to specify something out of date. Their method of shop management does not keep them in touch with the progress of the machine tool industry and their shops are stagnant backwater in the stream of mechanical evolution. Dealers who follow this trade still have hopes that the railroads will buy more liberally after the first of the year, but meantime they are giving prompt attention to all the inquiries they get from manufacturers and other progressive buyers.

The Avery Company, Peoria, Ill., is preparing for the erection of a new warehouse at Aberdeen, S. D., 98 x 300 ft., which will be equipped with modern apparatus for handling heavy machinery.

The Dower Place Automobile Company, Aurora, Ill., certifies to a change of name to Morlock Mfg. Company; also to an increase in capital stock from $25,000 to $50,000.

The Swanson Mfg. Company, Shenandoah, Iowa, will remove its plant to Marseilles, Ill., where it will occupy the entire plant recently vacated by the Marseilles Mfg. Company. The company manufactures farm implements and its business has outgrown its present manufacturing facilities.

Philadelphia

PHILADELPHIA, PA., November 29, 1910.

From present indications neither manufacturers nor merchants in this territory will be able to report any material change for the better, as far as business during November is concerned; in fact, quite a few have already stated that the aggregate month's sales would be smaller, not only as compared with the previous month, but also for the same period last year. Speaking generally, business continues to drag and there is little promise of marked betterment in the near future. Railroad buying is apparently as far off as it was some time ago. Tool purchases by the railroads in this territory were extremely light during the month, consisting of odd lots. Purchases by industrial concerns have been few; with plants operating at practically half capacity, as is largely the case in the iron and steel industry, there is little incentive to purchase new equipment; the local locomotive builder has, however, purchased a few tools, mostly planers, but is now understood to have its requirements filled. Transactions are confined, as a rule, to single tool propositions, recent sales being principally of the smaller class of equipment. In the majority of instances prompt deliveries are factors, as purchasers have put off actual buying until the last moment; practically all sellers can, however, meet this condition, the only exception noted being in some makes of milling machines.

Inquiries are light and mostly of a small size. One or two fair sized propositions are being figured on, however, by some sellers, but these have not come before the general trade. A trifle better movement in second-hand machine tools is reported, in some instances tools being taken for temporary equipment.

Charles H. Casper, engineer, West End Trust Building, is taking subbids for construction work on an addition to the refrigeration plant for Weger Brothers, Thirty-second and Master streets. The building will be of brick, steel and concrete. There will be a considerable amount of wrought iron pipe work required, as well as a number of wooden tanks.

The National Ammonia Company of Pennsylvania is asking for bids for the erection of a warehouse, 37 x 50 ft., and an anhydrous ammonia factory building, 48 x 85 ft., to be erected at its plant on the Delaware River near Wissinoming lane.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for several standard gauge flat bottom gondola cars for hauling heavy stone blocks. They should be of 30 to 40 tons capacity and have drop bottom doors in the center of the car.

The contract for the erection of the new crucible steel casting plant for the Hess Steel Company, Bridgeton, N. J., has been let. The building, it is understood, is to be of brick, 70 x 120 ft., and will contain 16 crucible steel melting furnaces, as well as the molding floors. It is stated that immediately on the completion of this building a second one of like size will be erected. John A. Coyle, Bridgeton, N. J., can furnish any information desired.

The Hess Machine Works reports a continued fair demand for special file making machinery, both from foreign and domestic buyers. Orders have recently been booked for one set from a European buyer. An order for five sets of file making machines, from a user in the Middle West, is also noted. There has been a moderate demand for special machinery of various kinds and the plant continues actively engaged.

The C. H. A. Dissinger & Bro. Company, Wrightsville, Pa., has acquired several acres at Lancaster, Pa., on the main line of the Pennsylvania Railroad, on which is being erected a plant for the manufacture of its Capital line of gas and gasoline engines. The foundry will have a capacity of 10 to 15 tons per day. Pattern shops, cleaning rooms, &c., are also being erected. The machine shop will be 64 x 210 ft. A main electric generating plant will be installed, while the tools will be driven by individual motors.

Fire damaged the plant of the Philadelphia Iron Works, Eighteenth street and Pennsylvania avenue, early last week, entailing a loss of about $25,000. The tool room, machine shop and a portion of the main boiler shop were destroyed. Efforts are being made to get the plant in shape for temporary operation, and some portions will resume work about December 1. A large share of the tools and machinery was destroyed, and the company is purchasing temporary equipment, including punches, lathes, shapers, drills and tool room machinery.

New England

BOSTON, MASS., November 29, 1910.

The situation as it relates to the demand for machinery and other equipment remains unchanged. The market is dull, and November's business has perhaps not exceeded October's. As in earlier months of the year, the machinery builders have varying experiences. Some reports of improvement are heard, but as a whole production is well in excess of orders. The general feeling is that no economic obstacle exists to a steady improvement, perhaps slow, perhaps with an acceleration that will make the first months of 1911 entirely satisfactory. Everyone, apparently, looks for a good year to come. Export business is improving more rapidly than domestic.

A notable group of manufacturing plants will be built immediately at South Framingham, Mass., creating the nucleus of what promises to be an important industrial suburb of Boston. The Ames Plow Company, Boston and Worcester; the Guyler Engineering Company, Worcester, and the Gurney Heater Company, Boston, will each erect large works, involving a total expenditure of some $500,000, including the purchase of much new machinery and foundry

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and other equipment. More than 500 men will be given employment. The plans of the Gurney Heater Company, manufacturer of heating apparatus, have been mentioned in this column. South Framingham, 20 miles from Boston, is located advantageously on the main line of the Boston & Albany Railroad, as well as on the New York, New Haven & Hartford, and the Boston & Maine systems.

The Ames Plow Company, with works at Worcester and main office in the Quincy Market, Boston, has purchased about 9 acres in South Framingham, on the New York, New Haven & Hartford Railroad, a short distance from the freight and passenger depots of the several railroads. A complete plant, modern throughout, will be erected on the premises, giving between 110,000 and 115,000 sq. ft. of floor space. While details are not completed, the works will consist of a one-story main building, with saw tooth roof, if the topography of the site permits of an arrangement with a northern exposure, or, as the alternative, with triple monitor roof. The building will be given over to the machine shop and woodworking department. Another large one-story structure, with double monitor, will be occupied by the foundry, forge shop and cleaning department. A power plant, storage building with several floors, and storage sheds for foundry materials and lumber, will complete the works. A complete electrical installation will be purchased, including motors and transmission for electric drive in units. A large part of the foundry equipment will be new. An industrial railroad will be built. Much new machinery for the shops will be bought. New equipment will mean the expenditure of between $30,000 to $40,000. Two spur tracks will serve the shops. The shops at Worcester, on Prescott street, have been occupied for many years, and no longer meet the demands of the business. The future of the old plant is not definitely determined. The Ames Plow Company manufactures plows and agricultural vehicles and wheelbarrows in extensive lines, together with other farming implements. A large business has been done for years, export orders constituting an important part of the total.

The Guyler Engineering Company, better known as Marcus Mason & Company, Worcester, builds coffee and sugar machinery, and does a large business, especially with Central and South America and the West Indies. The company has purchased a large tract of land in the general vicinity of the new properties of the Ames Plow Company and the Gurney Heater Company, and, it is given out, will build in the near future. The present shops are in an old building on Union street, Worcester.

The first expenditure under the $2,500,000 appropriation for the repair shops of the Boston & Maine Railroad will be for modernizing existing facilities with the purpose of securing immediate results. The new shops, for car and locomotive repair, will be pushed along, and plans are now well under way. But considerable time will elapse before the great works will be available, and in the mean time the old shops will be brought up to date. Engineers are busy studying the problem. By replacements of old type machinery, additional equipment and rearrangement, it is believed that a very much larger producing capacity will be created. The Boston & Maine shops have long been inadequate—in fact, most of them are antiquated and expensive to operate. Even the new running repair shop for locomotives at Somerville received some old tools from old shops. The first shops to be modernized are those at Lyndonville, Vt., and Concord, N. H.

C. O. Churchill and L. Holst, Binghamton, N. Y., will establish works at Westfield, Mass., for the manufacture of valves and foundry products. A tract of land has been purchased on the Boston & Albany Railroad and a foundry building will be erected immediately, to be followed later by a machine shop. Messrs. Churchill and Holst are connected with the Georgian Mfg. Company, Binghamton, the former as superintendent and the latter as general foreman, and both were formerly with the Chapman Valve Company, Indian Orchard, Mass.

The new plant of the Baird Machine Company, Oakville, Conn., to be built at Bridgeport, Conn., will consist of a main factory building, forge shop, foundry, power plant, pattern shop, storage building and office building. The Fletcher Engineering Company, Bridgeport, is getting out the preliminary plans and specifications. No details are as yet available.

A company headed by Charles B. Rood, Chicopee Bank Building, Springfield, Mass., is establishing a factory for the manufacture of an instrument known as the telegraphone.

The Penobscot Realty Company has begun work on a power plant at Orono, Maine, which will develop between 3000 and 5000 hp. and is estimated to cost about $300,000.

Cobb, Butler & Co., Rockland, Maine, have been awarded the contract to build two large fishing steamers for the Atlantic Fertilizer & Oil Company, New York, while a third steamer of the same class will be built by A. D. Storey, Essex, Mass. The contract for the boilers, engines, electrical apparatus and other equipment has been given to the Portland Company, Portland, Maine.

The New London Ship & Engine Company, Groton, Conn., will erect a new boiler house and a storage building in connection with the new machine shop at its plant.

The New England Electric Supply Company has purchased the business of the New England Engineering Company, Hartford and New Britain, Conn., and will conduct a wholesale electrical jobbing business in Hartford. The New Britain office has been closed. H. E. Page is the president, T. J. O'Brien secretary and F. W. Drager treasurer.

The Waterbury Tool Company, Waterbury, Conn., has purchased 5 acres of land on Watertown road, across the track from the property of the Waterbury Rolling Mills Company. H. G. Hoadley, president and treasurer of the company, states that no definite plans have been made for utilizing the land.

General industrial projects include the following: B. F. Smith Company, Pawtucket, R. I., contractors, three-story carpenter shop to cost $15,000; Palmer & Parker Company, Charlestown, Mass., woodworking mill, 60 x 110 ft., two stories; Soule Mill Corporation, New Bedford, Mass., picker house, 64 x 95 ft., with five-story cotton storage building and a wastehouse; Cheney Bros., South Manchester, Conn., silk weaving mill, 100 x 425 ft.; Dummer Cotton Mills, plant at Brattleboro, Vt., to employ 300 hands. A dispatch from Providence, R. I., states that a British syndicate has taken the Niantic Dyeing Company, Niantic, R. I., and proposes to spend $1,000,000 in the construction of a new bleachery and other buildings.

Cincinnati

CINCINNATI, OHIO, November 29, 1910.

A machinery salesman who recently returned from a trip through West Virginia comments on the rapid development work going on in that State. He also advises that Cincinnati is not getting a full share of business in this particular territory. Several municipal water works and electric light plants are either in the course of construction or contemplated, and also the demand for mining machinery, including pumps, boilers, &c., is on the increase at the present time. The mining district further furnishes a fairly good market for the smaller sizes of machine tools, and he states there is no good reason why the bulk of this business should not be booked by Cincinnati manufacturers and dealers.

The machine tool business is very spotty now. One builder reports some nice orders received during the past few days, while his neighbor, making the same class of tool, is compelled to put part of his output in stock to avoid shutting down. Nearly every local plant continues running full time, but a few have been compelled to curtail working forces. Generally speaking, November business has only been fairly good in most manufacturing lines in this vicinity, and as December is always a dull month, no big improvement is anticipated until after the first of the year.

The Mastic Wall Board & Roofing Mfg. Company, whose Cincinnati offices are at 33 East Third street, has purchased a 6-acre site at the corner of Spring Grove avenue and Este street, on which will be erected six manufacturing and storage buildings, one and two stories, all of concrete construction. The company makes a patented substitute for lath and plaster, sheathing, roofing and shingles, and now operates plants at New Orleans, La., and Alma, Mich. The Cincinnati plant will more than double the combined output of the factories named. The executive offices, now in New Orleans, will be moved to Cincinnati on completion of the new plant.

The Triumph Electric Company, Oakley suburb, Cincinnati, reports an increased number of inquiries and a decided improvement in the small motor business. Recent contracts include seven motors, ranging from 5 to 60 hp., for the Cincinnati Bickford Tool Company; six for the Marrowbone Coal & Coke Company, 28, of various sizes, for the Cincinnati Butchers' Supply Company, and several large and small capacity motors for H. T. Lloyd, Spokane, Wash. In late orders for generators is a 600-kw. one, for the Factory Power Company, Oakley; two of smaller capacity for the University of Cincinnati, two for the Westinghouse-Church-Kerr Company, and a miscellaneous lot of both motors and generators for shipment to customers in this country and Canada.

Secretary Manley has received a large number of acceptances to invitations for the December 8 meeting and dinner of the Cincinnati branch of the National Metal Trades Association, and the meeting is expected to be the banner one of the year.

To manufacture boilers, the Sistersville Boiler Works has been incorporated at Sistersville, W. Va., with $25,000 capital stock. The incorporators are E. A. Ryan, J. P. Ryan,

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H. W. McCoy, S. G. Messer and A. C. Jackson, all of Sistersville.

The Pioneer-Peerless Gas Coal Company has been incorporated at Dry Branch, W. Va., with $25,000 capital stock, for the purpose of mining coal and manufacturing coke. The incorporators are J. G. Vaughan, W. D. Vaughan, W. A. Kennedy and J. H. Vaughan of Charleston, and P. E. Gallager of Pratt, W. Va.

The Rassel Motor Car Company has been incorporated at Toledo, Ohio, with $125,000 capital stock, by E. C. Rassel, R. S. Logan, Wm. E. Brown, Edwin Tait and N. W. Rassel.

The Universal Pattern Works, Cincinnati, is moving from its old location on Eighth street to a newly constructed one-story concrete building on State avenue.

The Grafton Light, Heat & Power Company, Grafton, W. Va., has been incorporated, with $200,000 capital stock, by John T. McGraw, A. S. Warder, Jr., Chas. R. Durbin, A. Hood Phillips and John T. McGraw, Jr., all of Grafton.

The Hazleton Milling Company is a new incorporation, with $10,000 capital stock, at Hazleton, W. Va. The incorporators are J. J. Kelley, A. J. Moyers, T. W. Wakefield, R. Frazee and W. D. Arthur. A feed and flour mill will be erected.

The Cincinnati Bickford Tool Company commenced last week moving equipment from its Spring Grove avenue plant into its new home at Oakley. It hopes to have the new plant in operation by January 1. The D. T. Williams Valve Company, that leased the Spring Grove avenue factory, is transferring its machinery from the downtown location as fast as the space is vacated by the tool company.

Bids will be opened December 20 for furnishing and installing an additional compressor, piping, &c., in the power and lighting plant of the Boys' Industrial School, Lancaster, Ohio. Specifications are on file in the office of Harold M. Bush, engineer, 69 North Fourth street, Columbus, Ohio.

Work on the new three-story plant of the American Valve & Meter Company, Spring Grove avenue, Cincinnati, has progressed far enough to insure the company having all its machinery installed by February 1. The company manufactures railroad specialties, and states that the large number of small orders received has kept its present plant on Gest street operated up to full capacity all during the past year.

The new plant of the Straub Machinery Company in Cumminsville suburb, Cincinnati, is 140 x 250 ft., of concrete, brick and steel construction, two stories. It will be ready for occupancy before January 1. Burr stone mills for grinding wheat or corn are manufactured, and the company reports both its domestic and export business as having been excellent almost the entire 11 months past.

The Sidney Mfg. Company, Sidney, Ohio, has increased its capital stock from $75,000 to $100,000.

Cleveland

CLEVELAND, OHIO, November 29, 1910.

The improvement noted in the local machine tool market last week continues. Dealers received a few good inquiries during the week from manufacturers who are contemplating plant extensions, and some business that has been pending for several months has finally been placed. Dealers are looking for a better volume of orders during the coming month than in November, although orders during the last month of the year are expected to be largely for single tools. Dealers are hopeful of considerable increase in the volume of business soon after the first of the year. Some of the machine tool builders report an improvement in their orders. Builders who with a good demand are unable to keep up on deliveries are taking advantage of the quiet spell to make tools for stock, and continue to run their plants at full capacity, being confident that they will not have to wait long to dispose of their surplus stock.

In electrical equipment the demand for small motors has improved somewhat and is fairly good. The outlook for orders for large units is more promising than for some time, some good business being in prospect in large equipment for central stations and railroads.

In the foundry trade the demand for light castings is only moderate, although some of the foundries have about all they can do. A better volume of orders is looked for after the first of the year.

Sealed bids will be received by the Director of Public Service, Cleveland, December 12, for two vertical triple expansion pumping engines, each of 25,000,000 gal. daily capacity, for the enlargement of the Kirkland pumping station.

The Premier Vacuum Cleaner Company, Cleveland, has been formed to place on the market a portable electric suction cleaner. The company has offices at 514 Columbia Building and has established a factory in the Commercial Building. Officers have been elected as follows: President, Charles A. Kolp of Canton; manager, E. L. Frantz; treasurer, F. J. Miller; secretary, R. E. Hyde.

The National-Acme Mfg. Company, Cleveland, reports a fair volume of orders in its screw machine department, an improvement being noticed in both the domestic and foreign demand. The company is now operating this department overtime, making some machinery for stock in order to be in better shape to make deliveries when the demand for automatic machinery becomes more active.

The Ohio Sheet Metal Works, Cleveland, has been formed by Robert Kain and E. F. Aunger, both until recently connected with the Ohio Roofing Company in Cleveland. The new concern has established a plant in a two-story building, 35 x 80 ft., at 2491 East Thirty-seventh street, and will do all kinds of sheet metal work and manufacture sheet metal specialties. A large press and probably some other equipment will be purchased.

The Cleveland Metal Stamping Company, now located at 321 Frankford avenue, Cleveland, has commenced the erection of a new plant at Payne avenue and Thirty-first street. The building will be of brick construction, 65 x 100 ft., two stories, and will provide nearly four times as much capacity as the present plant. The company will install an additional plating plant and will buy some new presses and screw machines. The plant will be equipped with a 35-hp. gas engine, and a little later another engine of the same capacity will be added.

Through the efforts of the Board of Trade and Business Men's Club in Canton, Ohio, several new industries will shortly be established in that city, and two large manufacturers in metal working lines have now under consideration propositions for the removal of their plants to Canton. The Clay Products Company and Sala Brothers, the latter garment manufacturers now operating a plant in Minerva, Ohio, with a branch in Canton, will erect new plants in Canton. The Union Metal Post Company in Canton is looking for a site for a new plant with the view of doubling its present capacity. Some of the Canton manufacturers of sheet metal products are also considering plant extensions, which are expected to be started in the spring.

The Kline-Marshall Furnace Company, recently incorporated at Canton, Ohio, with a capital stock of $40,000, to manufacture warm air furnaces, will begin the erection of a new plant as soon as a site can be secured. This will include two buildings, a foundry, 40 x 120 ft., one story, and an assembling building, 40 x 80 ft., two stories. The company will be in the market for the necessary foundry and other equipment. The company now has offices at 210 East Fifth street. Offices have been elected as follows: President, Dayton Marshall; vice-president, C. T. Clewell; secretary and manager, George L. Viers; treasurer, Walter Kline.

The Toledo-Massillon Bridge Company, Toledo, Ohio, has changed its name to the Toledo Bridge & Crane Company, the new name being more appropriate to the company's present line of products, which include electric cranes and hoists.

The Huebner-Toledo Breweries Company, Toledo, Ohio, will shortly enlarge its plant by the erection of three large buildings. One of these will be a refrigerator plant, 93 x 226 ft., four stories, of brick and steel construction.

The Board of Trustees of the Boys' Industrial School at Lancaster, Ohio, will receive sealed proposals December 20 for additional compressors, piping, &c., for the light, heat and power plant of that institution.

The Faultless Machine & Mfg. Company, Akron, Ohio, has been formed with a capital stock of $10,000 by C. A. Wild, Edward C. Paul, E. G. Major and others.

Pittsburgh

PITTSBURGH, PA., November 29, 1910.

The attention of manufacturers, jobbers and dealers in this district is being turned more and more toward the opening of the new year, as with the holidays and inventory period intervening there can be no prospect of any sustained revival in trade meanwhile. In the various related branches of the electrical industry, however, the demand from all parts of the United States, as well as some foreign countries, continues excellent.

An order for a direct current generating unit of 200 kw., engine driven, has been placed with the Westinghouse Electric & Mfg. Company, Pittsburgh, by the Sunday Creek Company, Carbondale, W. Va., as a result of important improvements in the company's equipment that are to be effected.

The Iron City Spring Company, Pittsburgh, will remove shortly to new quarters at 2920 Smallman street, its present

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location on Allegheny avenue being no longer adequate to the requirements of the business.

An increase is to be made after January 1 in the equipment and daily capacity of the plant heretofore operated by the Apollo Silica Brick Company, Apollo, Pa., which has just been purchased by Bruce H. Campbell, J. Waters and W. H. Hill of Johnstown, Pa.

Following the completion of the new boiler and tank shop, which will soon be ready for service, the Erie City Iron Works, Erie, Pa., will take up the plans for the new foundry building to be erected in the spring. The details of the latter have not yet, however, been fully determined upon.

The city authorities of Erie, Pa., now have under consideration the purchase of a pumping engine of 20,000,000 gal. daily capacity, and the water commissioners will visit other cities in order to inspect recent installations with a view to deciding upon machinery of the most efficient type.

It is reported from Mt. Vernon, Ohio, that extensive improvements are to be made in the plant heretofore operated by the Mt. Vernon Railway & Light Company, which has been taken over by the Mt. Vernon Electric Company, newly incorporated. The present equipment includes five General Electric generators totaling 500 kw. in capacity, driven from engines built by the Ball Engine Company.

The new plant of the Harwood Electric Heating & Power Company, at Freeland, Pa., which was recently placed in operation, will furnish power to mines and industrial plants in that vicinity; and, as its service is gradually extended, there will be many more opportunities than heretofore for the sale of motors and electrically operated machinery, such as hoists, compressors, &c.

A modern pumping plant, water and sewage system is to be constructed at Masontown, Pa., where a bond issue of $25,000 for the purpose was recently voted.

The Backus Novelty Company, Smethport, Pa., is receiving figures for a two-story factory, 40 x 100 ft., which it will erect at that place.

St. Louis

ST. LOUIS, MO., November 28, 1910.

Business continues dull on the whole, although some pretty good orders have been placed, including several pretty heavy tools. Opinion seems divided concerning the prospects, but some who watch the situation closely are satisfied that the turn of the year will see a great improvement. A great deal of general merchandise is moving, but this cannot be said to apply to the tool market. Little inquiry seems to be coming from the South, which is something of a surprise in view of the generally satisfactory agricultural situation there.

The Block-Pollock Iron Company has just installed at its scrap yard on the Oak Hill Railroad, St. Louis, a new Niles-Bement-Pond rail drill press and a Ryerson high speed friction saw.

The United Railways Company is in the market for a traveling crane for one of its power houses.

The large metal bedstead manufacturers, several being located in St. Louis, find business moving briskly, and some of them are making extensions.

Some of the trunk lines have been placing a few small orders for tools this week. On the whole there has been little stirring in the railroad department.

The Catto-Waxo Products Company, St. Louis, has been incorporated, with a capital stock of $300,000. The incorporators are J. C. Punch, Samuel C. Punch and Montague Punch. The company will engage in the manufacture of floor sweeping compounds, &c.

The Standard Casting Machine Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $25,000. The incorporators are Marshall Fellhauer, James M. Allen, E. M. Fellhauer and L. F. Allen. The company will manufacture and construct machines for casting aluminum, bronze, &c.

The Autongenous Welding Devices Company, St. Louis, certifies to an increase in its capital stock from $5000 to $10,000.

The McQuade-Morris Mfg. Company, St. Louis, has been incorporated, with a capital stock, fully paid, of $100,000. The incorporators are George S. Johnston, Wm. K. Norris, Louis E. McQuay and others. The company will manufacture automobile and machine supplies.

The Penn Central Coal Company, Jamestown, Ark., suffered a loss of $75,000, November 11, by the burning of its engine room, coal tipple, electric light plant and valuable machinery.

The L. J. Smith Locomotive Equipment Company, Kansas City, Mo., has been incorporated, with a capital stock of $100,000. The incorporators are L. J. Smith, Scott Mitchell and R. C. Stripp.

The Double Mitre Mfg. Company, Kansas City, Mo., has been incorporated, with a capital stock of $50,000. The incorporators are Frank G. Taggart, Robert L. Macey and Allen E. Macey.

Detroit

DETROIT, MICH., November 29, 1910.

Trade here continues quiet. During the past week there were few announcements of any importance. Manufacturers are, however, fairly busy, and sufficient new business is coming in from the general industrial field to keep the local plants operating well up toward their capacities, prompt deliveries usually being specified. A good deal of stock will also be accumulated within the next few weeks, as sufficient confidence is felt in the future to warrant the belief that disposition of this stock can readily be made a little later on.

The automobile trade has again become an important support to the market, but the buying is of a less spectacular character than in other recent seasons, and is done almost altogether in small lots. Factory supplies of all kinds form the most considerable item in purchases from this source. The brass foundries and shops in which finished products of brass, bronze, aluminum or other alloys are manufactured have also come into the market lately for a great deal of equipment and material, but their purchasing is likewise very quietly carried out and attracts little attention. For many of these plants further additions are being planned, but contracts for them will not be let until late in the winter.

It is reparted that a syndicate headed by F. R. McMullen of Chicago has purchased the property and rights of the Interurban Light & Power Company in Mason County, and proposes to construct three dams as a part of an extensive hydroelectric development to provide power and lighting for the region around Hamlin Lake, as well as for an electric traction line to be built between Muskegon and Manistee. No plans in detail appear, however, to have as yet been worked out.

The Linderman Mfg. Company, Muskegon, Mich., is proceeding to carry out its plans for a branch factory at Woodstock, Ont., and the principal equipment will all be contracted for within the near future.

A new timber cutting plant is being installed at Soo Junction, Mich., by the Hunter & Love Lumber Company.

The Prescott Company, Menominee, Mich., will furnish the complete operating machinery for a new mill to be built next April at Masonville, Mich., by the Escanaba Lumber Company, Escanaba, Mich., and is now preparing the necessary plans.

It is reported from Big Rapids, Mich., that D. H. Vincent, superintendent of the municipal water works plant, has been directed to secure plans and estimates for an auxiliary steam plant, to be installed as a reserve for the hydroelectric equipment from which power is now derived.

The Morehead Mfg. Company, Detroit, Mich., has had a large sale this season of its return steam traps, which are now being put to service of a character that was only a short time ago considered entirely beyond the scope of such apparatus.

The American Blower Company, Detroit, has found this an excellent season for extending its foreign trade, which now forms a very considerable percentage of the total volume of business transacted.

The Light and Power Commission, Marquette, Mich., is contemplating improvements to the municipal power plant, equipped with hydroelectric machinery, which include the rebuilding of the Silver Lake dam.

The Ross & Young Machine Company has been organized in Detroit by Albert E. Young, John L. Ross and others to operate a manufacuring plant. The company is incorporated at $35,000.

To provide for the extension of its business the Boyne City Chemical Company, Boyne City, Mich., has increased its capital stock from $125,000 to $500,000.

A mechanical filtration plant will be included in the plans for new water works at Flint, Mich., for which a fund of $400,000 will soon be made available.

The construction of a new pumping plant and water works system at Harbor Springs, Mich., will begin this winter, instead of next spring as originally contemplated. Bonds for the purpose have already been sold. Machinery is to be purchased soon after the new year.

The city of Munising, Mich., is considering the construction of water works, and an engineer has been engaged to prepare recommendations and estimates.

The S. P. C. Motor Company has been organized in

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Detroit with $50,000 capital stock by I. V. Sigsbee, W. C. Pratt and N. C. Carter.

As soon as the installation of power transformers has been completed the new hydroelectric plant of the Cleveland-Cliffs Iron Mining Company, on the Au Train River, near Ishpeming, Mich., will be put in operation. A part of the current is to be used for a paper mill and other industrial purposes, thereby broadening the market for motors and other electrical equipment in that vicinity.

The roundhouse and machine shops of the Boyne City, Gaylord & Alpena Railroad Company, Boyne City, Mich., were totally destroyed by fire on November 10.

Toronto

TORONTO, November 26, 1910.

Business shows no perceptible falling off notwithstanding that the season when cold weather usually checks operations has come round. But the fall has been an exceptionally fine and open one, the roads—except in some places—have continued good, and there has been a steady movement of trade activity from the training of grain to market to the placing of orders for all kinds of equipment. It is possible that the trade activity is being compressed, and that there will not be enough of it to last at this rate until the time comes round for starting fresh from the basis of another crop. There may be spring dullness to offset autumn briskness, but the banks seem to have no apprehension of this, for they are not sparing of accommodation to concerns that are on a good financial footing. Enlargements of demand begin to be marked on the side of pulp and paper mill equipment, flour mill plant and electrical apparatus. From the mining camps dependent on winter roads for supplies orders still come.

Canadian industrial undertakings are now receiving attention at the hands of British capitalists. Coal companies, steel companies, cotton companies, power development companies and like enterprises are much more in favor with British investors than they ever were before.

The National Iron Works, Ltd., Toronto, has doubled the capacity of its plant.

The Transit Elevator Company's new $500,000 plant at Godwich, Ont., is now completed and in operation.

The Brown Machine Company, New Glasgow, N. S., has recently completed the erection of large new shops. It manufactures machinery used in and about the coal mines of the Province.

The Diamond Arrow Motor Car Company and the Modern Machinery Company of Ottawa are reported to have decided to join forces. To do the greater business thus arranged for, the works of the Modern Machinery Company will be greatly enlarged.

The City Council of Edmonton, Alberta, is arranging to buy a hundred acres of land to be used as the site of an industrial quarter, on which manufacturers can locate upon favorable municipal terms.

The Waterloo Mfg. Company, Waterloo, Ont., which manufactures portable engines, threshers, &c., will increase its warehouse accommodation at Portage la Prairie, Man., by the addition of a building, 70 x 136 ft.

W. R. Sweet is erecting a foundry at Cobalt, Ont.

The E. B. Eddy Company, Hull, Que., manufacturer of paper, woodenware, matches, &c., will apply to Parliament for authority to increase its capital stock to $5,000,000.

The Atlantic Sugar Refining Company has filed plans for a refinery it proposes to build in St. John, N. B.

The McKinnon Chain Company is erecting a new plant at St. Catharines, Ont.

The Canada Forge Company, Welland, Ont., has taken up the manufacture of tool steel in addition to its other lines.

A new wing has recently been added to the building of the Springer Lock Mfg. Company, Belleville, Ont. The company has recently gone into the manufacture of various articles of builders' hardware as well as locks.

The Georgetown Coated Paper Mills is putting up a large factory in Georgetown, Ont.

North Toronto proposes to expend $162,000 for the construction of a sewage disposal plant.

The Canadian Heating & Ventilating Company, Owen Sound, Ont., has asked the Town Council for a loan of $20,000 to assist in financing contemplated extensions of its works. The ratepayers will probably vote on the matter in January.

The Allis-Chalmers-Bullock Company, Montreal, has secured the order for the erection of a 30 stamp plant at the Timmins mine in the Porcupine district, northern Ontario. All the machinery has to be shipped by the middle of February. A 20-hp. vertical boiler and a 5 x 5 in. hoist and a Cameron pump have just been shipped by the Jenckes Machine Company, Sherbrooke, Que., to the Rea Mines, Porcupine district. The Foley O'Brian Mining Company in the same camp has ordered from the Canadian Rand Company, Montreal, a four-drill compressor and two 50-hp. boilers. The Canadian Rand Company also secured the order for the large compressor at the Dome Mine in Porcupine.

The plant of the Swift Motor Car Company in Chatham, Ont., has been taken over by the Walker Motor Car Company. Additional machinery is to be put in the Chatham works. The new company has a capital stock of $200,000.

A new steel dredge has just been launched from the Government shipyard at Sarel, Que. It will be fitted with engines to develop 450 hp. The construction of another steel dredge is to be begun at once in the yards.

E. & T. Fairbanks, Ltd., Sherbrooke, Que., is calling for tenders for the construction of buildings which, when equipped, will enable it to double its output of weighing machines, &c.

C. Whitehead, of Ely Bros., London, England, has informed the secretary of the Board of Trade at Fort William, Ont., that he will recommend that firm to establish at Fort William the assembling plant projected for the making of ammunition. It is intended to make the wads in Canada and to bring in the other parts of the ammunition made for assembling here.

The Bishop Construction Company, head office in Montreal, has been incorporated under Dominion laws with a capital stock of $500,000.

The Canadian Mono-Rail Car Corporation, head office in Montreal, has been incorporated under Dominion laws with a capital stock of $2,000,000.

The Eastern Pipe & Construction Company, head office in the town of Alexandria, Ont., has been incorporated under Dominion laws with a capital stock of $50,000.

The Public Utilities Commission of Quebec Province has issued an order requiring the Montreal Street Railway Company to refrain from putting any more single truck cars in use; to reduce the number of those it has in use by 50 every year; to equip with air brakes all cars 30 ft. or more in length and weighing not less than 25,000 lbs.; to equip with emergency brakes all cars on routes with severe grades; to equip all cars with automatic mechanical drop wheel guard of Hudson & Browning type or similar; to remove the fenders after cars have been so equipped, the tripping gate also to be placed not more than 6 in. from the ground, and the apron of the wheel guard not over 5 in. The portion of the order respecting wheel guards and brakes is to apply to all electrical railways and tramways in the Province.

The Canadian Walverine Brass Company, Chatham, Ont., is about to add another building to its works.

The expanding use of electricity since the completion of a great part of the Hydro-Electric Power Commission's transmission line has brought the new Edison storage battery into prominence in Ontario.

A by-law to raise $200,000 for water works extensions is to be voted on by the ratepayers of Vancouver, B. C., at the approaching municipal elections. This by no means provides financially for all the water works improvements the city has to make in the near future. Another sum, estimated at not less than $700,000, will have to be expended on that account in the next year or two, and a by-law to raise this additional and larger sum is expected to be submitted later in the season.

The Elder Carriage Works Company, Toronto, Ont., has obtained a permit to erect an addition to its factory.

T. E. Reeb & Sons' foundry and automobile supply warehouse in Humberstone, Ont., was burned on November 23. Partially insured.

The Vancouver Dry Dock & Shipbuilding Company has entered into an agreement with the Dominion government to construct at Roches Point, Vancouver, a dry dock to cost $1,214,154. The work is to be commenced within the next six months.

The Tobin Arms Company's large factory, Woodstock, Ont., is being built as speedily as possible, and so is the new building of the Eureka Planter Company there.

The Western Dry Dock & Shipbuilding Company will soon have its dry dock at Port Arthur, Ont., made to receive vessels requiring repairs.

George A. Troutt, general manager of the Van Dyke Motor Car Company, Detroit, has sent word to the municipal authorities at Ottawa that he will visit Ottawa in a few days to negotiate for the establishing of a factory there for the making of commercial motor cars.

The rate-payers of Pembroke, Ont., will vote on a by-law to raise $65,000 to apply to water works improvements.

The McLaughlin Motor Car Company, Oshawa, Ont., is putting up a $40,000 building in London, Ont., to be used as a warehouse and garage.

The Millar Electric Company, Chicago, has opened an

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office and factory in London, Ont., where it will make electrical heating appliances for the Canadian trade.

The Municipal Corporation of the City of Prince Albert, Saskatchewan, is applying to the Provincial Legislature for authority to construct and operate works for the development of the water power at La Colle falls on the North Saskatchewan River, to transmit and distribute the electricity there produced, and to borrow $500,000 for the carrying out of this municipal undertaking.

The construction of the foundry that Lumby-Stenhouse, Ltd., is building at Fort William has been begun. Mr. Stenhouse is making a tour of some Canadian and American cities for the purchase of the machinery required. At South Bend, Ind., he will endeavor to secure rights for the handling of certain articles in Canada.

It is stated that the Goodyear Tire & Rubber Company, which has taken over the factory of the Durham Rubber Company at Bromanville, Ont., will make large extensions there so as to be able to employ 200 hands more by next midsummer.

Baltimore

BALTIMORE, MD., November 28, 1910.

A gradually diminishing volume of business is generally reported in the various branches of the trade associated with the iron, steel and machinery field. This is not unusual at this season, but in some instances has been more pronounced than is customarily the case. With the year end approaching buyers make only such purchases as may be absolutely needed, deferring if possible such action until after the turn of the year. In the machine tool field the demand has been particularly quiet during the past month. Occasional sales of tools of the standard type are reported, but individual transactions are small. In special machinery some little business has been done, but the demand is by no means active. There has been less general business coming from the South, although fabricators of structural material have taken a few contracts and several moderate sized buildings are being figured on. Several fair building propositions in this city are also before the trade, the most important being that for the new building for the Baltimore Bargain House. Subcontracts on a number of the buildings now under way are still held up.

Heating and ventilating engineers have been handicapped to some extent by labor difficulties with pipe fitters and helpers, who, not having their demands for higher wages granted, have been on strike during the greater part of the month. In a number of instances employers have been operating on an entirely open shop principle and obtained sufficient mechanics to enable them to keep up with the usual run of work.

There is a considerable falling off in the demand for contractors' supplies, merchants feeling the lack of demand on the part of the railroads, which were quite active buyers this time last year. Machine shop supplies and small tools have been fairly active, but transactions are confined to small lots, sufficient to run buyers up to the end of the year. Inquiries for all classes of machinery tools, power equipment, &c., have been slowly falling off and little new business of importance is expected during December.

While there has been no pronounced demand in the foundry trade, makers of castings are gradually gaining ground lost during the molders' strike several months ago, and in a number of instances are more actively engaged.

The T. C. Bashor Company has just shipped three Morrison internally fired furnace boilers, 250 hp. each, to the Metropolitan Dredging Company, New York.

The Simpson-Doeller Company, Patuxent and Preston streets, is taking estimates for a manufacturing building, 217 x 248 ft., two stories, of brick, steel and concrete construction, from plans by Otto G. Simonson. A power plant for steam and electricity is to be installed.

The Ellicott Machine Company has completed the addition recently reported to its machine shop and installed a number of new tools. No new contracts for dredging machinery of any size are reported, but the plant is fully occupied with work in hand which will keep it so engaged for some time.

Plans have been submitted to contractors for the building of the new factory of Becker Bros. & Son, Frederick and Lexington streets. The building will be of mill construction type, with concrete and steel shaving and sawdust houses, boiler, engine and machine shop departments. The mechanical equipment to be installed, and for which contracts have not been fully decided upon, includes boilers, engines, electric lighting plant, elevators and conveyors. A sprinkler system will also be installed.

The Aumen Supply & Machinery Company, W. J. O'Brien, receiver, reports a very fair demand for small tools. That for heavy tools has been rather irregular, although some satisfactory orders have recently been booked from the United States Government. Quite a good demand for refrigeration machinery is reported and orders for several plants have recently been taken.

The contract for the boiler plant of the Hochschild-Kohn department store addition, consisting of two 250 and one 300 hp. boilers, has been awarded to the Edge Moor Iron Company, Edge Moor, Del. The contracts for the engines and for the heating and ventilating plant for that addition are understood to be unclosed.

Contractors have been invited to bid on the construction of the first section of the new building to be erected for the Baltimore Bargain House, previously mentioned. This section will be 90 x 150 ft., eight stories, and will require, it is estimated, from 2500 to 3000 tons of steel. Purdy & Henderson are the engineers. The cost of the entire new building represents an outlay of about $1,250,000.

The Crook-Kries Company has recently installed a complete heating system in the Walbrook Station for the Western Maryland Railway. While no large contracts have been closed recently, several for heating and power installations are being figured on.

Booz Brothers have improvements in contemplation in connection with their ship repair yard. The plant is to be supplemented with a special electric double chain lifting device for service in connection with its marine railway, which will have a lifting capacity of 2000 tons. Other minor improvements are also being considered.

John D. Adt reports a good demand for special machinery and is quite busy in the various departments of the plant. An order recently taken was for six 4000-lb. capacity direct connected electric elevators, together with all appurtenances, for installation in the new buildings of the Crown Cork & Seal Company at Highlandtown, Baltimore County.

The Crook-Horner Supply Company has removed from 17-19 East Pratt street to its new warehouse, 7-9-11 Balderston street, where it will have three floors, 55 x 86 ft., for warehouse and office purposes. This concern continues as the agent for boilers, engines, pumps, supplies and general equipment formerly represented by the Crook-Horner Company, which recently retired from business.

Announcement has been made of the completion of plans for a new building to be erected on the site of the old Regester foundry and warehouse, at the corner of Holliday and Saratoga streets, destroyed some years ago by fire. The proposed building, which is to be erected for E. J. Ellinger, will be 97 x 139 ft., four stories, and will be used for general manufacturing purposes.

The Baltimore Bridge Company has taken a very fair amount of structural work during the month, both for this country and for export. Among the latter was an extension to a sugar house at Nipe Bay, Cuba, and one for two 100 and one 150 ft. bridge spans for the Northern Railway of Costa Rica. An order for one 198-ft. span and one 134-ft. span across the Erie Barge Canal near Weedsport, N. Y., has also been recently taken. Orders for work in the vicinity of Baltimore have been confined to small jobs, although several good propositions are being figured on. This concern has recently completed delivery on the structural work for the new Twenty-second Regiment Armory in New York City.

Dietrich Brothers have begun work on the new additions to their plant, briefly reported last month. The improvement consists of a five-story warehouse, 31 x 115 ft.; a three-story ornamental iron shop, 31 x 115 ft., and a one-story structural shop, 115 x 225 ft. The buildings will be of concrete, brick and steel. While contracts for some of the equipment for the shops have been placed, others are still to be decided upon. An order for a 15-ton electric traveling crane for the structural shop has been given to the Pawling & Harnischfeger Company, while orders for two 5 or 10 ton hand power cranes are still to be placed. The demand for structural and ornamental iron and steel work during November is reported lighter than in the previous month, the bulk of the business taken being of a rather miscellaneous character.

The Impervious Product Company, Fairview, Anne Arundel County, Md., is having plans prepared for the erection of a large plant. Two buildings 62 x 130 ft., one to be two stories and the other one story, are proposed, of concrete and frame construction, which will be equipped with general machinery, details regarding which are not available at this time.

Plans for the new power house for the Union Power Company, Hagerstown, Md., are being prepared by P. O. Keilholz, Continental Building, Baltimore, Md. The building will be one story, steel and reinforced concrete, 50 x 160 ft. The engineer will take bids at an early date.

The Canton Box Company, Canton, Baltimore County, Md., is having plans prepared for a two-story steel and concrete factory building 117 x 125 ft. Wilson L. Smith, Law Building, Baltimore, is making the plans.

Bids have been invited by Calvin W. Hendrick, engi-

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neer, for the erection of several concrete structures at Back River, Md., in connection with the sewage disposal plant for the city of Baltimore. The principal building will be used as a transformer station, laboratory and other purposes in connection with the operation of the plant.

Indianapolis

INDIANAPOLIS, IND., November 29, 1910.

J. J. Quinlan, 2327 North Pennsylvania street, Indianapolis, has taken out a building permit for factory and office buildings to cost $20,000. The factory will have 35,000 sq. ft. of floor space. The buildings will be of steel and fireproof. The plant will manufacture boilers.

John C. Keller, secretary of the Evansville Business Association, Evansville, Ind., states that contracts to locate in that city have been made with a woodworking plant and an engine manufacturing company.

The Orton & Steinbrenner Company has been organized and incorporated at Huntington, Ind., with $200,000 capital stock, to manufacture heavy machinery. The directors are P. A. Orton, H. G. Steinbrenner and E. B. Ayres.

The Commercial Club of Parker City, Parker City, Ind., has been incorporated. It will endeavor to have industries locate in that city. The directors are W. E. Baker, S. B. Keckler and Omer Clevenger.

The Midland Furniture Company has been organized at Evansville, Ind., and will build a factory to employ 200 men. Jacob Fisher, president of the Indiana Stove Works, will be president of the new company. The capital stock is $50,000.

The American Automobile Mfg. Company of Kansas City, which recently acquired factory buildings for a plant at New Albany, Ind., expects, according to the statement of Louis A. Boli, Jr., vice-president and general manager, to begin installing machinery by December 15 and to begin manufacturing cars a month later.

Reeves & Co., manufacturers of threshing machinery, Columbus, Ind., are adding to their line a gasoline traction engine, the first of which will soon be turned out.

The Imperishable Silo Company, Huntington, Ind., has been incorporated, with $75,000 capital stock, to manufacture silos. The directors are E. H. Baker, J. M. Tuggs and F. A. Bash.

The Peat Products Company is the correct name of the company which has built a plant at Lakeville, Ind., for the manufacture of peat. The working capacity of the plant is about 100 tons of marketable peat per day. The muck or raw peat is made into briquettes for fuel purposes, and also manufactured into fertilizer filler which contains from 3 to 5 units of ammonia and nitrogen per ton of dry material. The muck is not made into peat by a chemical process. An error was made in the item regarding this company which appeared in *The Iron Age* of October 27, referring to it as the American Peat Product Company.

The Hartman Mfg. Company, Vincennes, Ind., through its stockholders, has authorized an increase in its capital stock from $25,000 to $50,000, for the purpose of increasing the capacity of its plant and the extension of its business.

The court has given permission to Ben R. Mowry, receiver for the Public Service Company of Mooresville, Ind., to sell its electric light and power plant to Harry J. Stoops of Chicago for $19,500, the amount of bonds outstanding. The receivership arose from a complaint that the company was running behind in finances.

Plans by Joseph T. Hutton, architect, have been accepted for an industrial high school at Hammond, Ind., to cost $215,000, exclusive of the equipment. There will be a machine shop, forge room, foundry, rooms for the teaching of steam fitting, gas fitting, plumbing and electric wiring, woodworking, cabinet making and printing.

The South

NASHVILLE, TENN., November 28, 1910.

At most Southern points business thus far this month has been reported fairly good, with some orders of considerable size and enough scattered trade to make a satisfactory aggregate. The number of projects involving new construction has diminished somewhat as compared with a few weeks back; but alterations or enlargements involving the purchase of new equipment are steadily going forward in most of the leading industrial centers, including the saw milling, coal, ore and phosphate mining districts.

The Hill Power Company has been formed at Newman, Ga., by H. G. Glover and others to build a hydroelectric plant of considerable size in that vicinity.

The Shreveport Blow Pipe & Sheet Iron Works, Shreveport, La., is making a feature of blow pipe equipment for planing mills and factories, including a new patented type of dust collectors and slow speed suction fans, piping, &c., for the removal and disposition of refuse, which in many instances is fed directly to furnaces.

The authorities at Dublin, Ga., are planning to spend $25,000 on improvements to the city pumping plant and electric power and lighting system.

The Ware County Light & Power Company, Waycross, Ga., in consequence of changes strengthening its organization, will probably increase its equipment materially during the coming year or two.

The Brown Wagon Company, Macon, Ga., is arranging for a thoroughly modern system of electric motor drive and will purchase current from a central power station.

It is proposed at Douglasville, Ga., to build an electric power and lighting plant for operation by the municipality.

The construction of a municipal power and lighting station has been decided upon at Midway, Ky.

The Southern Engine & Boiler Works, Jackson, Tenn., has had a continuously good business this season in the equipment of power plants, particularly for saw mills, the operating machinery of which it also furnishes.

The Electric Power & Mfg. Company, Spartanburg, S. C., is planning a large increase in power equipment and the extension of its service to other communities.

A bond issue to cover the cost of a municipal power plant was defeated at Americus, Ga., but another election will be held on the subject in the near future.

The Richmond Power Corporation, organized at Richmond, Va., proposes to build a large electric plant at the Midlothian coal mines and supply current to that city for lighting and industrial power.

Specifications for machinery to be installed in the proposed electric power and pumping plant for municipal service at Chase City, Va., will be complete and ready for bids about the first of the year.

Considerable new machinery, including a large electric crane, will be installed in the mills now under erection by the Appalachian Marble Company, Knoxville, Tenn., in the suburb of Lonsdale. A part of the equipment, however, will be taken from another plant.

The Consolidation Coal Company, Baltimore, Md., which recently acquired 100,000 acres of coking coal lands in eastern Kentucky, will begin at once the construction of a large coking plant, to be situated on Boone's Fork, in the center of the Elkhorn coal field. The Chesapeake & Ohio and the Louisville & Nashville railroads are building tracks into the property.

Chess Wymond & Co., Louisville, Ky., have leased land in Harrison, Miss., for the term of five years, and are erecting a mill for the manufacture of staves.

Fire at the Jackson Cotton Oil Company's plant, Jackson, Miss., destroyed the hull house, causing a loss of about $15,000.

The Georgia School of Technology, Atlanta, Ga., is preparing to erect an administration building and a foundry and smith shop. The company has machinery enough to equip the addition, but later on will add machine shop and woodworking shops, which will call for the purchase of machinery in that line.

The Northwest

MINNEAPOLIS, MINN., November 28, 1910.

From this time forward until the opening of another season of navigation, there will be considerable activity at the ports on Lake Superior, and all through the iron ranges, in preparing for next year's work; and extensions or improvements are already being blocked out that call for the purchase of a great deal of material, including power, mining and other mechanical and electrical equipment of every description. In the region north of Duluth there will also be numerous installations of municipal plants for water works and lighting service, so that, taken all together, an exceptionally busy period is in prospect for manufacturers and supply houses interested in this trade. Through southern Minnesota and the Dakotas no great degree of activity is promised until the revival of construction work in the spring; but many plans are now being made that will result in much new building at that time. In the mining districts of the Black Hills and west into Montana and Idaho, there will also be need of a great deal of new equipment, a considerable percentage of which will be ordered between January 15 and March 1, so as to insure delivery in time for early installation in the spring.

The Gunther Machinery Company, Minneapolis, among recent contracts, has furnished the complete operating equipment of the new planing mill built in Minneapolis by the H. B. Waite Lumber Company.

An ore concentrating mill and cyanide plant will be built in the spring on People's Creek by the Regal Mountain Coal Mining Company, Great Falls, Mont. Either steam pump

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equipment will be provided or electric current obtained from a water power that has been developed in the vicinity.

The Frick & Browick Granite Company, St. Cloud, Minn., has been organized by O. Frick and others to establish a granite working plant.

An order for three Pelton water turbines, each direct connected to a Westinghouse generator of 2000 kw. motor generator sets, power transformers, &c., has been placed by the Homestake Mining Company, Lead, S. D., for the equipment of its hydroelectric plant. Accessory apparatus will be purchased as the work nears completion.

The Black Hills Development & Financial Corporation will enter upon the construction next spring of a 300-ton ore reduction plant, including smelter, at Carbonate, S. D. The plans also call for the installation of a large electric power plant in the coal fields of Wyoming, which are just across the State border.

The city of Harlowton, Mont., has engaged C. M. Thorp of Bozeman, Mont., to prepare plans for the new water works plant to be constructed there.

The installation of a municipal power and lighting system is under consideration at Eureka, S. D.

John I. Moore, Minot, N. D., has been granted a franchise by the village of Berthold, N. D., for the construction and operation of an electric light plant. It is to be ready for operation by February 7.

The Minneapolis & St. Louis Railroad Company has completed an addition to its roundhouse at Watertown, S. D., in which are installed a drill press, lathe, shaper, blacksmith forge and a boiler for heating the roundhouse and operating power. The addition is 24 x 72 ft.

The Denver, Laramie & Northwestern Railroad Company, Denver, Colo., is constructing a four-stall roundhouse and machine shops 25 x 80 ft. on its terminal grounds, the latter to contain sufficient machinery to handle its motive power and car repair work.

Milwaukee

MILWAUKEE, WIS., November 28, 1910.

While some houses report a marked improvement on sales within the past fortnight, the machinery market here, so far as local or State requirements are concerned, continues generally dull and the bulk of the business obtained by the larger manufacturing plants comes from remote districts of the country. Other orders are mainly of a routine character and cover small equipment or supplies, including repair parts. A great many lists are being figured on and eventually they will nearly all be booked, but intending buyers are putting off the actual closing of contracts just as long as they feel that they can do so without injuring their business.

The above applies to machinery in general. Local builders of shop tools have not had facilities to fully take care of the demand for their products, and until these are provided by the new buildings now under erection there is little that can be said concerning this branch of local manufacturing. Sales of equipment for use in Milwaukee and vicinity are principally in the hands of representatives of outside concerns. Some of these appear to be doing quite well, but the majority find trade slow. Out in the State the situation is rather better.

The boilers now in use in the municipal pumping plant at Stoughton, Wis., are expected to be condemned, and steps will be taken at once to provide a new battery.

A boiler house extension 47 x 64 ft. will be erected at the municipal power and pumping station in Bayfield, Wis., and two new boilers provided. The work, however, is not to be started until spring.

A substation equipped with power transformers and other apparatus will be installed in Bloomer, Wis., by M. Rasmus, proprietor of the local electric plant, to take current from a transformer line connected with the plant of the Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis.

Business interests at Waukesha, Wis., are planning the erection of a gray iron foundry, which, it is stated, will be occupied by the I. B. Powell Company, Menominee Falls, Wis., which is said to have decided upon removing from its present location.

The Heib Mfg. Company, Merrill, Wis., instead of building a new factory to replace the one destroyed by fire, will probably purchase an existing plant in that vicinity and remodel it for the installation of thoroughly modern equipment.

Pumping machinery is to be installed and a complete system of water distribution constructed for the city of Prescott, Wis.

It is probable that a large factory will be built in Sheboygan, Wis., by the Sagerstrom Piano Company, now located at Minneapolis. The Business Men's Association of Sheboygan now has under consideration the securing of a suitable site for the purpose.

A factory, with modern equipment, including boilers, pumps, vacuum pans, power machinery, &c., is to be erected at Clinton, Wis., by the Delavan Condensed Milk Company, Delavan, Wis.

The Berlin Machine Works, Beloit, Wis., furnished the complete operating equipment of the large new planing mill and woodworking plant constructed at Call, Texas, to replace a plant that burned early in the fall. This installation was made in record time, the new mill having been put in operation within 40 days from the time the old one was destroyed.

The Oneco Copper Mining Company, Houghton, Mich., is developing a shaft in which operations had been abandoned for some years past and is replacing the old equipment with heavier machinery secured from another mining company. A considerable line of purchases of new apparatus for the account of this property will need to be made at intervals during the coming year.

A portable rip and swing crosscut sawing rig for construction work and general industrial service is being put on the market by the Oshkosh Logging Tool Company, Oshkosh, Wis. It can be operated either by gasoline engine or electric motor, or belted to an existing source of power.

It is reported from Antigo, Wis., that a manufacturing plant of moderate initial capacity will be built there by the National Hoist Company, which was recently organized by C. F. Dallman and others.

The proposition to issue bonds for $300,000 to cover the cost of a new water works system, with high duty pumping engines, and a municipal electric plant at La Crosse, Wis., was defeated at the recent election, but will be revived.

Forge and machine shops for repair work are to be built in the spring at Whitewater, Wis., according to the present plans of the Badger Railway & Light Company, Milwaukee, which expects to begin construction at that time of a direct line to connect Whitewater and Lake Geneva. It is also proposed to establish an electric generating station at Whitewater sufficient to provide current for local power and lighting service. Machinery requirements, however, will not be figured upon for some time.

The Mosinee Electric Company, Wausau, Wis., whose organization was recently noted, will not only operate a public service plant at Mosinee, Wis., but also deal in electrical machinery and appliances, particularly motors, controllers, switchboards, &c.

The Wilton Light & Power Company, Wilton, Wis., has been granted a franchise to construct a light and power plant.

The Southwest

KANSAS CITY, MO., November 28, 1910.

In comparison with the amount of business entered from day to day the number of inquiries upon which salesmen are working has largely increased, indicating that there are a great many orders to be placed during the winter months. Delay in closing contracts still characterizes the market, and the spurt of buying that occurred immediately following the election has given way to a period of relative quiet.

M. Cook & Co., Joplin, Mo., have been engaged by the city of Granby, Mo., to prepare plans for a municipal water works system which will include high duty pumping units.

Plans and specifications for a municipal pumping plant at Malvern, Ark., are expected to be worked out some time this winter.

The construction of a municipal water works system has been definitely decided upon at Fairfax, Okla.

A boiler, steam pump and hoist have been installed by W. T. Henderson, Neosho, Mo., at a new mining property in Henderson, Mo., and other machinery will be required as soon as the development warrants it.

The Webb City & Carterville Foundry & Machine Works, Webb City, Mo., is featuring in its sales at present an improved ore screen of the Henry type which is notable for the very accurate sizing that it performs, as compared with ordinary machines for the purpose.

A fully equipped machine shop is being erected by the Inspiration Copper Company, Miami, Ariz., adjacent to its main works, to provide for the necessary repairs to the operating machinery.

The machinery equipment of the Arkansas Stone & Iron Company's quarry and crushing plant at Imboden, Ark., which was recently bought by Julius Haugh of Decatur, Ind., will be enlarged and improved.

The Arizona Mine Supply Company, Prescott, Ariz., has been awarded the contract from the Grand Mountain Mining Company for the machinery equipment of a group of mines to be developed at Chaparal, Ariz.

THE MACHINERY MARKETS

The Scott Mfg. Company which is building a modern furniture factory at Helena, Ark., will in future be one of the most important buyers in that section of mechanical equipment and supplies.

The installation of a water works system will probably be undertaken next spring at Braymer, Mo., where the subject is now under consideration by the authorities.

Power machinery, pumping units, piping, &c., will be required by the Alfalfa Irrigation Company, Altus, Okla., which is undertaking an extensive development in that vicinity.

A large band mill with auxiliary equipment is being installed in the plant of the West Lumber Company, Westville, Texas, and other improvements are to be made later on.

H. L. Kramer, Galena, Kan., is removing the machinery from his mill to a new ore concentrating plant in Cave Springs, and will install additional equipment.

Provision will be made in the near future for the purchase of machinery with which to equip a new municipal power and pumping plant at Stafford, Kan., plans and specifications for which were recently completed.

The Taylor Water Company, Taylor, Texas, has under consideration at the request of the city the installation of a larger pumping unit at its San Gabriel River station.

The J. S. Worley Company, Kansas City, is preparing plans for the construction of a pumping plant and system of modern water works at Altoona, Kan.

The business of the Hannibal Wagon Company, Hannibal, Mo., has been incorporated with $55,000 capital stock. The company is contemplating the erection of an addition to its plant in the spring, details of which have not been decided upon.

The Jewel Carriage Company, Carthage, Mo., has increased its capital stock from $250,000 to $400,000. The new issue will be preferred stock and will be used for enlarging the plant and extending the business.

The Osage Welch School Desk & Furniture Company will build a plant at Osage, Okla., which will include a main building, 75 x 125 ft.; warehouse, 60 x 90 ft.; dry kilns, 25 x 90 ft., and an engine and boiler room, 30 x 40 ft. It is expected to have the buildings constructed and equipped by January 15.

Farther Central West

OMAHA, NEB., November 28, 1910.

A feature of the existing situation which causes considerable dissatisfaction among manufacturers, dealers and sales agents who depend upon the regular machinery trade of this section is the frequent change of plan, postponements, &c., on the part of prospective purchasers. Last spring many of them who had decided upon new construction or improvements announced that these would be undertaken before the close of summer. Then they put off doing anything until the trend of fall business could be observed, and now they are talking about what they will do the last of the winter or at the beginning of spring. Meanwhile, large lists of equipment have been quoted upon and the salesmen of various houses are kept guessing as to when their services will be required in closing contracts. They are afraid to devote less attention to prospects than they have been giving them, as competitors may step in and take advantage of the work already done; other business that might be secured with proper effort, but promises less returns, is frequently neglected in consequence. Under the circumstances it is essentially a dealers' market, and the most profitable line of trade is comprised in minor equipment and supplies.

The purchase of machinery and other equipment included in plans for improvements to the local water works and electric lighting system will be made shortly after January 1 at Grand Island, Neb., by the city authorities.

A machine shop for repair work will be installed by the Iowa City Electric Railway, Iowa City, Iowa, in connection with other extensions and improvements.

The contract for the portion of the equipment to be used in the new lighting system at Fremont, Neb., including metal poles, will be furnished by the Fremont Foundry & Machine Company.

The installation of a pumping plant and water distribution system is proposed at York, Neb., and a bond issue for the purpose will be voted upon December 27.

A large fireproof warehouse, with handling equipment, will be built in the spring by the Leighton Supply Company, Fort Dodge, Iowa.

The Katz-Craig Company, Omaha, has the contract for a new water works system for Belle Fourche, S. D.

The Alamo Engine & Supply Company, Omaha, has been awarded the contract for installing an electric power plant for the city of Blue Hill, Neb.

Plans are now under consideration by the authorities at Brigham City, Utah, for the installation of a hydroelectric power unit, consisting of a hydraulic turbine of the reaction type and an alternating current generator.

The construction of an electric plant to be operated by the municipality is under consideration at Franklin, Neb.

The municipal power and lighting plant at Seymour, Iowa, which was destroyed by fire, will be rebuilt for greater capacity. The old equipment included a Westinghouse generator driven by a Murray Corliss engine.

It has been decided that the repair shops of the new electric railway line to be built by the Iowa Traction Company from Oskaloosa to Tama, Iowa, will be located at the former place.

The Fremont Gas & Electric Light Company, Fremont, Neb., has let the contract for a new building, 30 x 80 ft.

The Tungsten Mountain Mines Company, Boulder, Colo., is about to install an air compressor, which will be operated by an electric motor. Additional machinery will be purchased as work progresses on a tunnel which the company is now driving.

It is reported that the Des Moines Electric Light Company, Des Moines, Iowa, is considering improvements to its plant amounting to about $70,000.

The plant of the Ottumwa Supply & Construction Company, Ottumwa, Iowa, was destroyed by fire November 19. The building was owned by the Milwaukee & St. Paul Railroad.

The Gade Company, Iowa Falls, Iowa, is not only erecting its new gate factory building, but is putting up the west half, or 150 ft. of its new gas engine factory. The company will build the east 150 ft. in the spring.

Southern Texas

AUSTIN, TEXAS, November 25, 1910.

The demand for structural steel is keeping up well in Texas and the Southwest generally. In the larger cities plans are being drawn for a number of large office and factory buildings, the erection of which will be carried out during the coming year. The influx of new settlers to south Texas, particularly in the Gulf Coast and lower Rio Grande valley regions, is creating an increased demand for irrigation machinery. It is reported by dealers in pumps and engines and irrigation supplies generally that their trade this fall has been much the largest they have had in the same season. It is usually during the winter that the installation of irrigating plants is carried on most actively.

Instead of removing his canning factory from Madison, Ind., to San Benito, Texas, as was originally proposed, N. J. Hitz will install a new and modern plant at the latter place. It will be one of the largest canneries in the South. The main building will cover an area 300 x 365 ft. Employment will be given at the start to about 150 people.

The Crockett machine shop at Bay City, Texas, has been purchased by Charles Le Sage and Andrew Bentham. The shop is equipped for both iron and woodworking. New machinery will be installed.

The San Antonio Machine & Supply Company, San Antonio, has been awarded the contract by the Brownsville Sewerage Company, Brownsville, Texas, for the machinery for the sewerage disposal plant at that place.

The carriage works of A. Ferrell & Sons, Dallas, recently destroyed by fire, will be rebuilt. The loss was about $25,000, partly insured.

The Mexico Northwestern Railway Company is negotiating for the necessary ground in El Paso upon which to construct an extensive terminal system. The present northern terminal of the road is Juarez, Mexico, opposite El Paso. A large amount of money will be invested in the improvements.

The Ysleta Townsite Company has adopted plans for the establishment of a new town near Ysleta, Texas. The irrigation of a large tract of land is embraced in the proposed enterprise.

The Board of Trustees of Deming, N. M., has ordered an election to be held January 14, for the purpose of voting on the proposition of issuing $38,000 of bonds for the construction of a sanitary sewerage system and sewerage disposal plant. The system will consist of one septic tank, five standard flush tanks and 900 standard manholes. About 37,000 ft. of sewer pipe will be laid.

Domingo G. Aguirre, Sucs., will construct a complete and modern system of water works for the city of Tepic, Mexico. About $200,000 will be invested in the pumping plant and distributing system. The plans for the proposed works are now being drawn.

The Fundicion Hidalgo, Monterey, Mexico, will make important enlargements of its iron works in that city. It

will add a department for the manufacture of chilled car wheels and will also install machinery for manufacturing all kinds of bearings for line shafting. At present all chilled car wheels and bearing boxes come from abroad.

E. L. Kelley, Beeville, Texas, has admitted into partnership A. J. Hays of Papalate, Texas. The new concern will be known as the Beeville Cornice Works. New machinery will be installed and a large stock of material carried in future.

Iron and Industrial Stocks

NEW YORK, November 30, 1910.

The stock market at last yielded to the influence of the continued unsatisfactory reports regarding general trade, doubtless accelerated by the pessimistic utterances of James J. Hill of the Great Northern Railroad. Prices therefore sharply declined until Tuesday afternoon, when a rally occurred after the announcement of the Pennsylvania Railroad's rail orders for 1911. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	8⅞	Railway Spr., pref.	96½- 97¾
Allis-Chalm., pref.	31⅞- 33	Republic, com.	33 - 34⅛
Beth. Steel, com.	30¼- 32⅞	Republic, pref.	96 - 97
Beth. Steel, pref.	59¾- 62⅞	Sloss, com.	49¼- 52
Can, com.	9½- 10⅞	Sloss, pref.	114½
Can, pref.	77 - 82¼	Pipe, com.	17⅜
Car & Fdry., com.	51 - 55	Pipe, pref.	58¼
Car & Fdry, pref.	115	U. S. Steel, com.	76 - 80⅜
Steel Foundries	46 - 47¾	U. S. Steel, pref.	117⅛-118⅜
Colorado Fuel	31⅜- 35¼	Westinghouse Elec.	67 - 73⅛
General Electric	154¾-160	Am. Ship, com.	77¼- 78
Gr. N. ore cert.	57⅜- 59½	Am. Ship, pref.	110½-111
Int. Harv., com.	110 -113	Chi. Pneu. Tool	40 - 42
Int. Harv., pref.	121¼	Cambria Steel	43 - 44½
Int. Pump, com.	42¾- 44¾	Lake Sup. Corp.	26¾- 27¼
Int. Pump, pref.	84½- 86¼	Pa. Steel, pref.	104½
Locomotive, com.	37¾- 40¼	Warwick	10¾
Locomotive, pref.	106⅛	Crucible St., com.	12¾- 13⅝
Pitts. Steel, pref.	100¼-101¼	Crucible St., pref.	78⅛- 79⅞
Pressed St., com.	32½- 33	Harb.-W. Ref., com.	32½- 32¾
Railway Spr., com.	33½- 34	Harb.-W. Ref., pref.	94 - 95

Dividends.—The Ingersoll-Rand Company has declared the regular semiannual dividend of 3 per cent. on the preferred stock, payable January 1.

The Underwood Typewriter Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable January 2.

Notes on Prices

Rope.—Business in cordage is moving along in the same fashion as for some time, the demand being fair, but not up to the wishes of manufacturers. The lower prices quoted last week were about what rope had previously been selling for, as the result of concessions from card prices, but which had not been formally announced. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure manila of the highest grade, 8¾ to 9¼ cents per pound; second grade manila, 7¾ to 8¼ cents per pound; hardware grade, 7¼ to 7¾ cents per pound; pure sisal of the highest grade, 6¾ cents per pound; second grade, 6¼ cents per pound; jute rope, ¼-in. and up, No. 1, 5¾ to 6¼ cents per pound; No. 2, 5¼ to 5¾ cents per pound.

White Lead in Oil.—The demand for white lead in oil has fallen off as usual at this season, but notwithstanding this there was a fair business during November both in jobbing lots and making shipments on contracts. October held its own as the banner month of the fall trade. Prices remain unchanged for the best brands in New York as follows: In lots of 500 lb. and over, 7½c. in 100, 250 and 500 lb. kegs; 7¾c. in 25 and 50 lb. kegs. In lots of less than 500 lb. lots the usual advance of ½c. is charged.

Linseed Oil.—The cause of the reduction in the price of oil last week was because the price of Argentine flax seed laid down at Western points was lower than domestic seed was selling for, and this resulted in the price of domestic seed falling off in price. The seed situation has resulted in some speculative buying of oil, but outside of this, demand is somewhat above the average for the season, as manufacturing consumers have not stocked up as in previous years. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
State, raw	94
City, raw	95

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance over raw.

Spirits Turpentine.—In the local market the demand continues for comparatively small lots, but these aggregate quite a considerable movement. This is accounted for by the fact that paint manufacturers did not supply themselves with turpentine earlier in the season on account of the high price, so that buying is being extended through the usual dull season. Continued buying may result in higher prices as the supply decreases. New York quotations in five-barrel lots are as follows:

	Cents.
In oil barrels	78
In machine barrels	78½

Less than 5-bbl. lots, ½ cent advance per gallon.

The Lehigh Valley Structural Steel Company

The Lehigh Valley Structural Steel Company held a house warming on the evening of November 22 in the new office of its plant at the foot of Allen street, Allentown, Pa. The company started business in May in what was formerly the roll and beam mill of the old Allentown Rolling Mills. The building was in bad condition when occupied, but it has been put in good shape, and the original space intended for the plant is already being doubled. The equipment is provided to handle the heaviest and largest structural steel work, the entire plant being electrically driven. From the time operations were begun until now the company has been extremely fortunate in securing business, and its prospects are reported most excellent for a continuance of trade.

The officers are as follows: President, Dixon C. Williams of Chicago; vice-president and general manager, F. S. Komp; treasurer, Joseph Mack. President Williams is vice-president of the Chicago Building & Mfg. Company, Chicago Nickel Company, Chicago Pump Company, and interested in other Chicago enterprises. Vice-President Komp, who is in direct charge of the plant, has had much Western experience, and for the last few years has occupied a similar position with the Modern Steel Structural Company, Waukesha, Wis. The foreman of the plant is William McGonnigan, who was formerly in charge of the Allentown Rolling Mills plant and has also been connected with the Bethlehem Steel Company and the Guerber Engineering Company.

Scrap Iron Dealers Organize for Protection

The Western Scrap Iron Dealers' Protective Association has been formed, with headquarters in Chicago. The secretary is Isadore Wagner, 745 West Thirty-ninth street. The organization was effected at a meeting held last month, which was attended by 36 dealers from towns in Illinois and Wisconsin. As stated in the constitution, the objects of the association are: "To promote the business of dealing in scrap iron and metals; to secure the co-operation of persons engaged in the scrap iron and metal business for a legal uniform system of transacting business; to protect and preserve the welfare of persons engaged in said lines of business, and to take all legal steps for the mutual protection of the interests of all persons engaged in the scrap iron and metal business and to aid and assist all members in good standing in prosecuting and in defending any unjust claims that may be made against them by any of their customers, and to secure the usage of a reasonable uniform contract to be used in connection with the sales of the merchandise of the members." The membership fee is $25. The plan is meeting with much favor, dealers in that section of the country enrolling their names rapidly.

The Norton Company, Worcester, Mass., announces that Charles Churchill & Co., Ltd., of London, Birmingham, Manchester, Newcastle and Glasgow, have been appointed sole agents for the United Kingdom for Norton grinding wheels made of alundum. It is nearly 20 years since Charles Churchill & Co. entered into business relations with the Norton Company for the sale of its wheels, and it is especially gratifying to the firm that it should now be intrusted with the handling of the whole of the company's business in such an important territory.

The Alice Furnace, at Birmingham, Ala., and No. 4 of the Ensley group of the Tennessee Coal Iron & Railroad Company were blown out November 28. The Southern Iron & Steel Company is expected to blow in its Alabama City furnace this week.

The Steel Corporation's Pension System

Plans have now been consummated to begin on January 1, 1911, to make payments from the United States Steel and Carnegie Pension Fund, which was established last spring by the joint action of the United States Steel Corporation and Andrew Carnegie. From the income of the fund old age pensions will be paid to employees of the United States Steel Corporation and its subsidiary companies. For this purpose the United States Steel Corporation provided $8,000,000 which, with the Carnegie Relief Fund of $4,000,000 created by Andrew Carnegie on March 12, 1901, makes up a joint fund of $12,000,000. The fund is administered by a board of 12 trustees, through a manager appointed by the board, with such powers and duties as the board may give him. The Board of Trustees has adopted pension rules for the administration of this fund to take effect on January 1, 1911, and apply to persons who are in the service of the United States Steel Corporation and its subsidiary companies on and after that date. Three classes of pensions are provided:

1. Pensions by compulsory retirement, granted to employees who have been 20 years or longer in the service and have reached the age of 70 years for men and 60 years for women.

2. Pensions by retirement at request, granted to employees who have been 20 years or longer in the service and have reached the age of 60 years for men and 50 years for women.

3. Pensions for permanent incapacity, granted to employees who have been 20 years or longer in the service and have become permanently totally incapacitated through no fault of their own.

The monthly pensions to be paid from the income of the fund will be made up on the following basis: for each year of service, 1 per cent. of the average regular monthly pay received during the last 10 years of service; provided, however, that no pension shall be more than $100 a month or less than $12 a month. For example, an employee who has been 25 years in the service and has received an average regularly monthly pay of $60 a month, will receive a pension allowance of $15 a month.

This pension fund provides for the support of faithful employees in their old age. It is entirely separate and distinct from the voluntary accident relief plan put into operation by the United States Steel Corporation on May 1, 1910, which provides for employees who may be injured and the families of employees who may be killed while at work in the service of the subsidiary companies of the United States Steel Corporation.

Neither the voluntary accident relief plan nor the United States Steel and Carnegie Pension Fund involves any contribution from the men themselves toward the accident relief or old age pensions.

Republic Improvements.—The Republic Iron & Steel Company, Pittsburgh, is about to let contracts for the immediate building of a 16-in. continuous roughing and a 14-in. finishing mill to be installed in its Brown-Bonnell Works at Youngstown, Ohio. These mills will roll merchant steel bars from 1 to 3 inches in diameter and equivalent shapes. No. 4 blast furnace, under construction by the Republic Company at Haselton, is expected to be ready about April 1, and the new open-hearth plant, which will contain eight 60-ton open-hearth furnaces, about May 1.

The Vanadium-Alloys Steel Company, Latrobe, Pa., manufacturer of high speed, alloy and carbon steels, has recently installed and put in operation a 12-in. rolling mill driven by electric motors. It is stated this mill is the only one of its kind rolling high-speed steel that is driven by electricity.

Labor Notes

At Los Angeles, Cal., it is now stated that all the foundries whose men were on strike this year are supplied with men, and there is some difficulty in placing all the nonunion workmen who desire positions. Pickets are still on duty about some of the shops, but the Supreme Court has decided that the anti-picketing ordinance passed by the City Council of Los Angeles is legal. Some 280 pickets are now awaiting trial under this ordinance, half of them being out under bail.

Efforts are being made to strengthen the International Molders' Union in Portland, Tacoma, Seattle and Spokane, and the Pacific Coast machinists are looking to the molders to help them in their strike.

The semi-annual meeting and banquet of the Washington district of the United Metal Trades Association of the Pacific Coast was held in Seattle November 16. The question of reducing hours under a lessening volume of business was discussed, and it was the general sentiment that shops should not work less than nine hours a day, as any reduction of hours at this time would be considered as yielding to the demand of the union for a shorter workday. It was urged that if work became slack it would be better to lay off men for a day or two than to work all the week on less than a nine-hour basis. An instance was cited in which hours were reduced in a shop due to the falling off of orders, and the unions immediately sent out the report that this particular shop had signed for the eight-hour day.

The West Penn Steel Company, Brackenridge, Pa., maker of open hearth steel and black and galvanized sheets, has decided to add a 32-in. jobbing mill to its equipment, on which heavy sheets and light plates up to 60 in. wide will be rolled. To accommodate this new mill an extension to the present main mill building, 80 x 100 ft., will be added, making this building 80 ft. wide and 600 ft. in length. The contract for the mill will likely be placed within a few days. No additional equipment will be needed, the present power plant being sufficiently large to drive the new mill.

Much interest is manifested at Birmingham, Ala., in the proposition to merge a number of the producers of pig iron into one large corporation. It is admitted that a strong combination could be worked up; but, generally speaking, there is felt but little hope of bringing about such a consolidation. Still, the fact that the high officials of three of the principal concerns involved have been going over the district in private cars the past week, looking carefully over the different properties involved, undoubtedly lends color to the scheme.

The Society of Automobile Engineers will hold its next annual meeting in New York City January 11 and 12, during the Automobile Show. Among the papers to be presented are the following: "Automobile Springs," by E. K. Rowland, of Wm. & Harvey Rowland; "Motor Tests," by Prof. R. C. Carpenter; "Gears with Rolled-in Teeth," by H. N. Anderson.

Mary Furnace of the Ohio Iron & Steel Company at Lowellville, Ohio, which has been closed down since June 1, will not resume blast until market conditions improve, both as regards the demand for pig iron and prices. It is announced on the highest authority that the company will not build an open-hearth steel plant during 1911 as reported.

The Bethlehem Steel Company has removed its Philadelphia offices from the Pennsylvania Building to Suite 1609 Morris Building, 1421 Chestnut street.

Trade Publications

Sloping Drills.—The Denver Rock Drill & Machinery Company, Eighteenth and Blake streets, Denver, Colo. Bulletin No. S-C-2. Illustrated. Concerned with the Waugh stoping drill, in which no air escapes from the front end, thus making it practically dustless. Other special features of construction are a machinery steel valve chest with a hardened steel bushing to form the valve seat, an automatic lubricating device and the use of an improved type of barrel. While practically any shape of steel can be used for drilling, the one recommended is the four-grooved section.

Fine Tools.—The L. S. Starrett Company, Athol, Mass. Catalogue No. 19. Size 5⅛ x 7½ in.; pages, 274. Describes and illustrates a very complete line of fine mechanical tools, which includes a number that have been added since the previous edition was published. Brief specifications are given, and a number of tables of useful information completes the catalogue. The customary system of marginal numbers has been retained and both numerical and alphabetical indices render it a simple matter to locate any tool quickly.

Blowers.—Sterling Blower Company, Hartford, Conn. Catalogue No. 85. Concerned with a number of blowers and blower systems for handling refuse and dirt from various mechanical processes, conveying light material and removing steam and odors. The various parts of these systems are illustrated and described.

Head Gates, Gate Hoists and Valves.—S. Morgan Smith Company, York, Pa. Bulletin. The first part contains photographs of head gates, gate hoists and valves, with a brief description of each, while in the last part are dimensioned drawings of hoists, made so that they can be readily used by engineers and draftsmen. There are also five pages devoted to turbine lay-outs.

Annunciators and Push Buttons.—De Veau Telephone Company, 472 Eighteenth street, Brooklyn, N. Y. Catalogue No. 14 and a pamphlet. The former describes a full line of telephone apparatus and electrical specialties. Separate systems are shown accompanied with installation specifications, suitable for engineers, architects or contractors. Among the specialties is an electric reset annunciator, with the drop operating in any position and remaining where put. Besides this there is a new gravity annunciator, so constructed that it is impossible to shake down the drop. The pamphlet contains short descriptions of annunciators and push buttons.

Outlet Boxes and Covers.—Pratt Chuck Company, Frankfort, N. Y. Booklet. Describes galvanized boxes and covers for electric fixtures of various types. The covers are self-adjustable and can be removed without taking out the screws.

Well Drilling Machinery.—The Cyclone Drill Company, Orrville, Ohio. Catalogue A-50. Size 6½ x 9½ in.; pages, 128. Describes and illustrates the company's complete line of well drilling and prospecting machinery, showing some new type of drills not brought out in former catalogues. Views are also given of the company's plant in 1893 and its present one, showing the growth. Interior views of the various departments of the plant are also shown. Net prices are given on tools and supplies.

Pumping Machinery.—Boggs & Clarke, 535 South Clinton street, Syracuse, N. Y. Pamphlet. Concerned with a line of centrifugal pumps, winches, crushers and general machinery. The pumps include vertical and horizontal types, horizontal suction pumps, horizontal and vertical double suction pumps and steam centrifugal pumps. The different pumps are illustrated and brief tables of specifications are given. Space is also given a number of accessories, such as check and float valves, a foot valve and strainer and pipe and fittings. Other pieces of machinery illustrated include a patent ice crusher and a changeable and adjustable winch, which can be used on legs in the ordinary way, on a post or placed on the body of a wagon or car.

Steam Pumps and Hydraulic Machinery.—The Canton-Hughes Pump Company, Canton, Ohio. Catalogue No. 25. Size 7¼ x 5¼ in.; pages, 120. Lists the duplex and simplex piston and plunger pattern pumps, which are most commonly used. While those illustrated are numerous, there are a large number of other pumps which the company builds and which it is prepared to furnish in response to requests for special designs. Tables of specifications supplement the illustrations and a telegraph code and considerable useful information complete the catalogue.

Cold Tire Setter.—The Brooks Tire Machine Company, Wichita, Kans. Booklet. Deals with the Brooks cold tire setter, which is a hand power machine for upsetting tires cold while on wheels. The special features of this machine are described and the text is supplemented by illustrations of the various parts. Four sizes of machines in all are built, handling tires from ⅝ in. thick x 1¾ in. wide to ¾ in. thick and 4¼ in. wide.

Oil Stones.—The Scranton Whetstone & Abrasive Wheel Company, Scranton, Pa. Loose-leaf catalogue. Pertains to the line of Ideal oil stones, made of an electric abrasive, which is said to be as hard and sharp as a diamond. The different styles illustrated include sharpening and slip stones, combination bench stone, gouge stones with round edge, pocket and axe stones, and oil stones for a number of different purposes. Space is also given to various kinds of emery wheels and cylinders and there are a number of line engravings showing the special wheels supplied for various makes of grinding machinery.

Mechanical Rubber Goods.—The B. F. Goodrich Company, Akron, Ohio. Catalogue. Size 6 x 9 in.; pages, 171. Pertains to the line of mechanical rubber goods manufactured by this company, which includes rubber belting, hose in a number of varieties, gaskets and railroad specialties, packings and an extensive line of molded rubber goods. The various goods are illustrated and brief specifications supplement the printed descriptions.

Air Tools.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, Ill. Catalogue No. 32. Size 6 x 9 in.; pages, 104. Calls attention to pneumatic tools and appliances and a complete line of air compressors and Duntley air-cooled electric tools. The first includes drills, hammers, riveters and rammers operated by compressed air, compression riveters and hoists. These are all illustrated and described and there are a number of engravings showing them in actual use.

Gasoline Engines.—Palmer Brothers, Cos Cob, Conn. Pamphlet. Illustrates and describes a line of two and four cycle gasoline engines, those of the former type ranging from 1½ to 14 hp. and those of the latter from 3 to 30 hp. Both the make-and-break and the jump-spark systems of ignition are employed and the engines are built with both two and three ports and various numbers of cylinders from one to four, inclusive. Accessories such as whistles, magnetos, reversing gears, gasoline tanks and propellers are also covered.

Water Tube Boilers.—The Milne Water Tube Boiler Company, 30 Church street, New York City. Three loose leaf bulletins. No. 2 calls attention to the use of curved tubes in the Milne water tube boiler, while No. 2A points out the fact that all parts of these boilers are readily accessible when in operation. No. 3 shows how the use of vertical tubes increases the evaporation and keeps the tubes clean.

Rail Welding.—Goldschmidt Thermit Company, 90 West street, New York City. Brochure. Devoted to the Thermit process of rail welding, which is accomplished by pouring superheated Thermit steel around the rail ends. The special advantages of this process are an electrical conductivity equal to that of the rail itself, while at the same time its full strength is developed and the regulating of the composition of the steel used in welding to conform to the characteristics of that of the rail, so that the metal of the joint will have the same hardness as the rail, thus preventing any chance of unequal wear. The illustrations show the welding of an entire rail section, a Thermit weld of the rail base and flange, welding a third rail and the formation of Clark and compromise joints. Space is also given to repairs to motor cases and truck frames, which the company is prepared to do by contract.

Roofing Tin.—N. & G. Taylor Company, Philadelphia, Pa. Four issues of a monthly house organ called *The Arrow*. These call attention to the completion of a century of the company's existence and show a number of buildings upon which the Target and Arrow roofing tin has been used, as well as portraits of prominent members of the firm.

Friction Cone Pulleys.—Evans Friction Cone Company, Newton Center, Mass. Catalogue. Deals with a line of friction cone pulleys designed to be hung from the ceiling or supported on legs. The various types of pulleys are illustrated and a brief table of specifications given.

Screw Machines.—The National-Acme Mfg. Company, Cleveland, Ohio. Calendar. Size 12 x 15 in. Each of the 12 leaves in addition to giving the calendar for one month contains an illustration either of a screw machine or some of its products. Among these are the multiple spindle screw machine and some products of the screw machine milling attachment, which were illustrated in *The Iron Age*, June 4, 1908, and April 28, 1910, respectively.

Marine Gasoline Engines.—The Clifton Motor Works, 229 East Clifton avenue, Cincinnati, Ohio. Catalogue. Illustrations and descriptive matter explain the operation of a line of gasoline engines made in nine sizes ranging from 10 to 90 hp. The special features of the engines are described at length and the text is supplemented by illustrations. The special advantages claimed for them are accessibility, perfect water circulation, unobstructed passages for the flow of the inlet and exhaust gases, an automatic governor and positive lubrication.

Well Drilling and Prospecting Machinery.—Armstrong-Quam Mfg. Company, Waterloo, Iowa. Catalogue No. 43. Treats of a line of machinery for drilling oil, gas and water wells. All of the different types of machines are illustrated and their special features described, together with a number of views of these drills at work. Space is also given

to engines and boilers for furnishing power, wire rope and leather belting and a number of drilling and fishing tools.

Washers and Weights.—The King & Andrews Company, Chicago Heights, Ill. Pamphlet. Relates to a number of different types of castings, such as slot and packing washers, separator spools, foundation and box washers, sewer manhole covers and sash and counterweights.

Electric Traction Supplies.—The Eureka Tempered Copper Works, North East, Pa. Catalogue and price-list No. 5. Relates to a portion of the copper and brass products of this company, which includes cast and drop forged commutator bars; copper, bronze and brass castings, commutators, mica, insulation, trolley wheels, bushings, bearings, ears, splice sleeves, controller segments and fingers, brush holders, copper hammers, soldering coppers, wire stretchers, &c. The various supplies are illustrated and complete price lists are given for all of them.

Conveying Machinery.—Link-Belt Company, 299 Broadway, New York City. Book No. 96. Size 6 x 9 in.; pages, 52. Describes a number of different types of conveying machinery for sugar estates and refineries and shows actual installations of some of them. Among the different machines covered are cane unloaders, elevators for cane and bags, screw and belt conveyors and a number of accessories, such as chains, sprocket wheels, collars, bearings, &c.

Trimming Presses.—United Engineering & Foundry Company, Farmers Bank Building, Pittsburgh, Pa. Folder. Shows a trimming press which is built in a number of sizes that handles all kinds of work. The special features of the press are an extra heavy wheel or gearing, side cut-off, a steel jaw clutch of heavy construction, a very deep bed and slide and extra high die space.

Steels.—Philadelphia Steel and Forge Company, 50 Church street, New York City. Pamphlet. Describes the line of steels made by this company, which includes automobile, tool and alloy steels and Monel metal. The various automobile steels cover not only the straight carbon steels, but also all the alloy steels called for by the Association of Licensed Automobile Manufacturers. Space is also given to a new natural alloy steel, which is made in four grades, and is claimed to be freer from seams and pipes than any of the other alloys, forges easily and machines like screw stock.

Electric and Refrigerating Machinery.—The Triumph Electric Company, Cincinnati, Ohio. Pamphlet. Size 7 x 10 in.; pages 24. This is an illustrated souvenir of the opening of the company's new plant at Oakley, a suburb of Cincinnati, on April 30, 1910, which was described in *The Iron Age* May 5, 1910.

Machine Molded Gearing.—National Gear Wheel Foundry, South avenue and Walker street, Pittsburgh, N. S., Pa. Catalogue. Illustrates and describes the various kinds of machine molded gearing made by this firm, which includes spur gears, miter and bevel gears, hunting tooth, mortise gears, worm wheels and internal gears and pinions.

Conveyors for Freight and Packages.—Link-Belt Company, Nicetown, Philadelphia, Pa. Book No. 83. Size 6 x 9 in. Illustrated. Calls attention to a number of installations of conveying machinery for handling freight and packages which are typical of the progress in the design of this line of machinery. Space is also given to tray elevators for handling newspapers and stereotype plates in newspaper offices and printing plants.

Leather Belting.—The American Laminated Belting Company, 113 Hudson street, New York City. Booklet entitled "The Difference Between Albeco Laminated and Multi-lap Leather Belting." Gives comparisons of the operating principles, power transmitting qualities and the ultimate economy of both types of belting and shows the ability of laminated belting to handle heavy loads. *The Iron Age*, February 3, 1910, contained an illustrated description of an installation of a 28-in. laminated belt in the Eagle refinery of the Standard Oil Company, Jersey City.

Special Machinery.—Novelty Iron Works, Dubuque, Iowa. Circulars. Call attention to a number of special machines for cutting keyseats, making, pressing and bunching shingles, a belt driven power hammer, a well driller and a cushioned drive trip hammer for blacksmiths' use.

Pipe Sleeves and Plates.—The Beaton & Cobin Mfg. Company, Southington, Conn. Folder. Calls attention to the Adjusto sleeve, which is made of galvanized iron and can be adjusted to any depth between the floor and ceiling from 10 to 16 in. and a line of ceiling and floor plates which are made of gray iron in 15 sizes.

Well Drilling Machines.—Leidecker Tool Company, Marietta, Ohio. Catalogue H. Illustrated. Treats of the Marietta portable drilling machines for oil, gas and artesian wells. Space is also given to a number of special drilling and fishing tools and well supplies.

Pumps and Pumping Machinery.—The John H. McGowan Company, Cincinnati, Ohio. Five booklets. Nos. 30 and 31 treat of single cylinder and duplex pumps, respectively, for various purposes, and practically a full line of both styles of pumps is shown. No. 34 relates to deep well pumping machinery and tube well supplies. In addition to two styles of pumps, space is given to well strainers, barrels, packing and packing tools. No. 35 deals with feed water heaters and purifiers of the open and the pressure patterns. Both styles are illustrated and described and a table of fuel saving is included. No. 36 describes and illustrates the McGowan duplex pump for boiler feed and tank purposes.

Lighting Transformers.—Allis-Chalmers Company, Milwaukee, Wis. Booklet No. 4024. Sets forth some of the features of the Allis-Chalmers lighting transformers, such as safety, ruggedness, weight, regulation and cost, and points out their adaptability for use in either lighting or power service. The special features of these transformers are additional leads for use where the voltage is 5 and 10 per cent. below that of the station, which enables the same voltage lamp to be used throughout the entire lighting system, and the ability to connect the transformers so that the secondary voltage will be either 110, 220 or 440 volts.

Air Brakes.—The New York Air Brake Company, 165 Broadway, New York City. Loose leaf catalogue. Size 8 x 10¾ in. This is the company's 1910 catalogue, describing and illustrating a complete line of air brakes for all classes of railroad service, air pumps and governors, pressure controllers and accessories. The complete index of catalogue plates and the equipment schedules render the finding of any piece of apparatus simple and in addition a table of plate number symbols is given.

Steel Car Paint.—Joseph Dixon Crucible Company, Jersey City, N. J. Booklet. Calls attention to the use of Dixon's silica-graphite steel car paint, which has a natural mixture of silica and graphite for its base. This pigment is inert and practically indestructible, as it is unaffected by heat or cold and unchanged by the action of acids and alkalies. A number of views or cars protected with this paint are included.

Pipe Joint Cement.—H. W. Johns-Manville Company, 100 William street, New York City. Mailing card. Treats of H-O pipe joint cement, which can be used in all kinds of joints. It is claimed for this cement that while it hardens it does not solidify like red or white lead, and joints made with it can be easily uncoupled without breaking the fittings.

Air Compressors.—Sullivan Machinery Company, 150 Michigan avenue, Chicago, Ill. Three bulletins. Nos. 58D, 58F and 58G call attention to the Sullivan line of air compressors, which includes tandem Corliss air compressors, small power driven air compressors and power and steam driven duplex air compressors.

Boiler Settings.—Baltimore Retort & Fire Brick Company, Hull and Nicholson streets, Baltimore, Md. Bulletin No. 2. Illustrated. Calls attention to a number of firebrick special boiler settings which are made of materials least affected by the chemical activity of heat and the combustion gases. Tables give the dimensions of the various shapes as well as the number of common brick used in building settings.

Tank Hoop Lugs.—Racine Tank Lug Company, Racine, Wis. Circular. Treats of malleable iron lugs for tank and silo hoops. In these lugs the hoop end is inserted under cast fingers and the studs on the lug take the place of rivets or bolts in the perforations of the band, which is kept in place by the fingers. Three different styles of lugs are made, all of which are illustrated.

Electric Lighting.—General Electric Company, Schenectady, N. Y. Three bulletins. No. 4777 is devoted to building lighting and contains many illustrations of exteriors and interiors of buildings lighted by G. E. Mazda and Tantalum lamps. Data relative to the subject are included, and the complete lines of both types of lamps are shown. No. 4780, superseding Nos. 4453, 4494 and 4506, illustrates and describes the Gem, or metallized filament incandescent lamp, which has a higher economy and greater illuminating power than the carbon lamp. No. 4781, superseding No. 4647, illustrates the series Mazda lamp for street lighting and contains considerable data showing the advantages possessed by this lamp over other types used for this purpose.

Wire.—A. Leschen & Sons Rope Company, 920 North First street, St. Louis, Mo. Folder. Devoted to the Hercules wire rope, which is made in a dozen styles, divided and classified under the general types of patented flattened strand and round strand. The wire of which this rope is made is drawn and tempered by a secret process which is claimed to have perfected wire rope manufacture and for purposes of identification one strand of the rope is painted.

Recording Instruments.—The Bristol Company, Waterbury, Conn. Seven bulletins. Nos. 126 and 128 give general descriptions and specifications for two types of recording thermometers, No. 129 is devoted to thermometer thermostats, No. 135 calls attention to recording shunt ammeters for all ranges of direct current, No. 141 illustrates and describes round form recording pressure gauges, while Nos. 145 and 146 refer to indicating thermometers and a long distance recording tachometer, respectively. No. 147 relates to the Bristol-Durand radii averaging instrument for circular chart records, which was illustrated in *The Iron Age* June 30, 1910.

Obituary

W. H. Woodward died November 27 at his summer home in Weld, Maine, aged 70 years. He was associated with his brother, J. H. Woodward, and others in the earlier operations of the Woodward Iron Company in the Birmingham district. He was the first president of the company. The first furnace was built in 1882, and was blown in in 1883. W. H. Woodward later retired from the presidency of the company and engaged actively in other business enterprises in Birmingham, his brother, who had been secretary and treasurer of the Woodward Iron Company, being then elected president.

Henry Grant Thompson, secretary and treasurer of the H. G. Thompson & Sons Company, New Haven, Conn., is dead at Paris, France, aged 57 years.

Frank W. Whitaker, Hamilton, Ohio, president of the Black & Clawson Company, Hamilton, a director in the Sidney Steel Scraper Company, Sidney, Ohio, and a prominent banker, died at his residence in Hamilton, November 24, aged 60 years.

David Hunt, Jr., general manager of manufacturing for the E. M. F. Company, Detroit, Mich., was killed in an automobile accident near Yale, Mich., November 26. After leaving Harvard University, Mr. Hunt became connected with the Boston office of Manning, Maxwell & Moore, and later entered the New York office of that firm. About 10 years ago he was made treasurer of the Bausch Machine Tool Company, Springfield, Mass., and was with that company two years, resigning to become general sales manager of Warner & Swasey, Cleveland, Ohio. He was connected with this firm about six years, or until February, 1910, when he went to Detroit. He was about 36 years old. His advancement in machinery selling and manufacture was rapid, and he had a wide acquaintance throughout the trade

E. J. Nichols, secretary of the T. H. Symington Company, Baltimore, Md., died November 25, aged 41 years. He had been in poor health for over a year, his death following shortly after an operation at the Maryland University Hospital. He was born in Delmar, Del., had been connected with the Symington interests for some 16 years, and had been secretary of the company since its formation. He leaves a widow and a daughter.

Abel Charles Whittier, Medford, Mass., is dead at the age of 82 years. He was for 15 years treasurer of the Whittier Machine Company, Boston.

Edward B. Leaf, president of the E. B. Leaf Company, iron and steel merchant, Philadelphia, Pa., and also president of the Spring City Bloom Works, Spring City, Pa., died at his residence in Philadelphia, November 23, from acute Bright's disease. He was born at Pottstown in 1866, and started in the iron business in 1892 as a co-partner in the firm of Potts & Leaf. In 1900 he withdrew from that firm and began business under the name of E. B. Leaf & Co., and on the incorporation of the E. B. Leaf Company, in 1909, he became its president. He leaves a widow and two daughters.

Octave Chanute, an eminent civil engineer, died in Chicago November 23, aged 78 years. He was born in Paris, was brought to America by his parents in 1838, and became prominent in railroad engineering. At one time he was chief engineer of the Erie Railroad. He was the builder of the Kansas Pacific Railroad, the Union Stock Yards of Chicago, and several important railroad bridges. His scientific researches into methods for improving railroad service made him one of the most distinguished engineers of his day. In recent years he paid much attention to flying machines and is familiarly known as "the father of the aeroplane." His ideas were recognized as scientifically correct after the Wrights had made their first successful flights and had acknowledged that it was Chanute's book, "Progress in Flying Machines," published in 1894, which had turned their attention to the heavier-than-air experiments.

Personal

A. E. Hughes, who has been general manager of the Texas Rolling Mill Company, Fort Worth, Texas, for some time, has severed that connection and will take a brief vacation in the mountains of Mexico. His plans are not yet ready for announcement.

S. A. Benner has resigned as general manager of sales of the Carnegie Steel Company, and will become general sales manager of the Pittsburgh Steel Company, the change taking place January 1.

Alfred H. Schutte, of the German machinery selling house of that name, who has been visiting machine tool builders in this country, sailed November 29 for Germany.

C. W. Lang, construction superintendent of the Dominion Coal Company, is leaving that position to engage in the service of the Brown Machine Company, New Glasgow, Nova Scotia, in which he has purchased an interest.

W. A. Green, district manager and treasurer of the Republic Iron & Steel Company at Birmingham, Ala., severed his connection with the company December 1 to become associated with the John W. Gates oil interests in Texas.

J. A. Farrell, president of the United States Steel Products Company, is in Europe for a few weeks.

A box party was given by the heads of departments of Milliken Brothers, Inc., in honor of Francis Dykes, general manager of the company, at Weber's Theatre, New York, on the evening of November 26. After the theatre a supper was served at the Breslin Grille. Besides Mr. Dykes there were present E. C. Wallace, president of the company; John M. Ellis, James M. Ryan, Charles W. Eckhardt, F. H. Boyle, J. E. Jennings, H. M. Ward, S. J. Reeves, John Cargill, W. R. Waterbury, Richard Harragan, W. T. Voege, D. H. Roney, L. B. Loomis, C. R. MacCarey, J. P. Pittinger, George Wambold, C. E. Buckton, McClellan Reeves, Nelson Place, Wm. J. Sage, E. H. Frisell, J. C. English and H. K. Ryerson.

Edgar Allen & Co., Ltd., Sheffield, England, announce that Schrock & Squires, 291 Pearl street, New York City, have been appointed Eastern agents for the sale of their tool steels. Large stocks of all the company's products will be carried by the Eastern agents in order to promptly meet the requirements of customers. This agency arrangement will be supplemented by co-operation on the part of the Chicago office, which is the American headquarters of the company, and also by J. C. Ward, the director and general manager in the United States.

The Pawling & Harnischfeger Company, Milwaukee, Wis., in order to care for the great increase in its business on the Pacific Coast, has opened a branch office in the Washington Building, Portland, Ore., in charge of R. K. Morse, who for some years has been a member of the company's engineering staff at Milwaukee. In addition to the engineering problems to be taken care of, Mr. Morse will also act as sales representative for a complete line of cranes, hoists and lumber handling apparatus.

The new open hearth furnace of the New York State Steel Company, Buffalo, N. Y., is nearly ready for operation, and the company expects to begin making steel in it December 10.

The Tariff Question

An Early Revision Not Expected

WASHINGTON, D. C., November 29, 1910.—The results of the recent Congressional elections, which have changed the Republican majority of 56 in the House of Representatives to a Democratic majority of more than 60, have brought the tariff question again to the front at an unexpected early date, and, judging by the many communications received here from business men in all parts of the country, much concern appears to be felt lest the Payne-Aldrich tariff act shall be taken up for amendment in the near future. While any attempt at tariff legislation must necessarily be more or less demoralizing to the business of the country, the anxiety now felt is premature, if not wholly unnecessary.

The Old and New Congress

The coming session, opening December 5, which is the last of the Sixty-first Congress, expires by constitutional limitation March 4, and so far as actual tariff legislation is concerned will be devoid of interest, although it is to be expected that a foretaste of the battle that will be waged in the Sixty-second Congress will be given by individual Democratic members, who will hasten to place their views before the country in the form of bills for the amendment or repeal of the Payne-Aldrich law.

With the meeting of the Sixty-second Congress in December, 1911, the country will find the House, including the Ways and Means Committee, in control of the Democrats, but the Senate, including the Finance Committee, and the Presidency in the hands of the Republicans. This will mean that, while the Democrats may initiate more or less comprehensive legislation, no measure can reach the President without the consent of the Republican Senate and may be vetoed by him even in the event that a combination of Democrats and Republican insurgents in the upper House should reach an agreement with their Democratic colleagues in the lower body upon special or general tariff measures. No possible combination could be effected to pass a tariff bill over the President's veto.

The President's Influential Position

The exact significance of this situation should be understood by all who are interested in prospective tariff legislation. As the Republican majority in the Senate in the Sixty-second Congress will be much smaller than at present, it is quite possible that the Democrats and insurgent Republicans may be able to poll a majority vote on the tariff and other important commercial propositions. It is, therefore, evident that the President will occupy a position of enormous influence respecting tariff legslation, for, should he desire any downward revision of the Payne-Aldrich act, the Democratic leaders of the House would be only too willing to pass a measure to his liking, even if it did not entirely meet with their views, and such a bill would probably be approved by the Democrats and Republican insurgents of the Senate.

The Democratic programme with respect to the tariff has not yet been outlined in detail, but the main points are now being considered by the Democratic leaders, who have for their guidance the history of the two Congresses in which Representatives Roger Q. Mills of Texas and William M. Springer of Illinois, two lifelong Democrats, occupied the post of chairman of the Ways and Means Committee, backed by a Democratic House, opposed by a Republican Senate.

Chairman Mills adopted a comprehensive programme, intended to be declaratory of his party's principles, for he knew that the enactment of a Democratic tariff law at the time was out of the question. He caused to be prepared and passed by the House a complete revision of the tariff law, and although this bill was smothered by the Senate, it caused no little anxiety to business interests, and especially to importers and manufacturers, who were not thoroughly familiar with the parliamentary situation at Washington. Chairman Springer, on the other hand, adopted what was known as the "pop gun" policy, which consisted in reporting and passing a number of independent measures reducing and repealing the tariff on certain commodities of general use. Mr. Springer styled this method of legislation "punching holes in the tariff," and argued that the popularity of certain of the propositions among the people at large would be sufficient to force the Senate into taking favorable action. None of these bills passed the Senate.

Organization of the New Congress

All indications now point to the election of Champ Clark of Missouri, the present minority leader and ranking Democratic member of the Ways and Means Committee, as Speaker of the Sixty-second Congress. One of his most important duties will be to reorganize the Ways and Means Committee. Should he follow the principle of seniority, which is rarely departed from, he will appoint Oscar W. Underwood of Alabama chairman of the Ways and Means Committee. Mr. Underwood has seen long service in the House and his face is familiar to iron and steel producers who have come to Washington on tariff errands during the past decade. While he is a conscientious low tariff advocate, he is by no means a radical theorist.

A reorganization of the Senate Committee on Finance will also take place at the beginning of the Sixty-second Congress for the reason that the veteran chairman, Senator Nelson W. Aldrich of Rhode Island, will retire from the Senate March 4, in order that he may recuperate his health, which has suffered severely because of the heavy strain to which he has been subjected during recent years. Senator Penrose of Pennsylvania is the ranking Republican member of the Finance Committee and is likely to succeed to the chairmanship. Of course, the committee will be strongly Republican and will be likely to make short work of any tariff measure that may be passed by the Democratic House. The programme will probably be to pigeon-hole all House bills on the tariff and, if any legislation is forced through a combination of Republican insurgents and Democrats to pass a House bill, it will be necessary to discharge the Finance Committee from its consideration by a direct vote on the floor.

Work of the Tariff Board

In this connection the work of the Tariff Board, organized under the provisions of the Payne-Aldrich act, must not be overlooked, for President Taft is giving renewed evidence of his intention to utilize this board for more or less comprehensive tariff revision in the not far distant future. Since the election he has held several conferences with the majority leaders of both Houses, his purpose being to ascertain the practicability of securing legislation at the coming session that will render the board permanent in its tenure and as independent as possible of Congress hereafter. The President wishes to divorce the tariff from politics and secure the means of effecting an intelligent if not a thoroughly scientific revision of customs duties when next the subject is taken up, but he realizes that there is an element in the present Congress, which will probably also be found in the Sixty-second Congress, opposed to the board and anxious to starve it out by refusing appropriations. The President would like to have a provision enacted at the coming session that would take care of the board for a series of years, but this is contrary to congressional precedents, and it is probable that nothing more will be accomplished than the appropriation of a generous sum for the

work of the board during the fiscal year beginning July 1 next.

The Tariff Board has laid a broad foundation for a more extended investigation of the tariff question in all its phases than has ever before been attempted in this or any other country, with the possible exception of Germany, where scientific methods have characterized tariff legislation for more than a decade. The immediate objects of the board have been quite generally misunderstood and misstated in the daily press, which has given business men the impression that the board contemplated making recommendations for changes in the present law at a comparatively early date. As a matter of fact, the board is confining its activities at present to a far-reaching inquiry concerning the relative cost of production in this country and abroad of the leading articles of importation and especially those as to which there has been the greatest amount of controversy in the Congressional tariff debates. The board has no plans for the utilization of the information thus to be obtained, but will hold it for the guidance of the President and of Congress, should an attempt be made at any time to overhaul any portion of the Payne-Aldrich law. W. L. C.

Youngstown Iron & Steel Company Extensions

The Youngstown Iron & Steel Company, Youngstown, Ohio, for many years known as the Youngstown Iron & Steel Roofing Company, has recently made some large additions to its plant, which will about double its capacity in the manufacture of black and galvanized iron and steel sheets and other finished products. The total number of mills it now operates comprise eight hot sheet mills, one jobbing mill, one plate mill, three roughing mills and three cold mills. Their combined capacity is about 100,000 tons of plates and sheets per year.

The newest additions to the plant include a 30 x 72 in., three-high mill, served by two 35-ft. Laughlin continuous heating furnaces, and a 30 x 60 in., two-high jobbing mill to roll light plates and sheets up to 56 in. wide. The first named mill is equipped with electrically driven roller tables and conveyors, and will roll plates from No. 12 gauge to ¼ in. in thickness, up to 68 in. wide, and to a maximum length of 32 ft. The mill tables, conveyors and shears were furnished by the Lloyd-Booth Works of the United Engineering & Foundry Company at Youngstown, Ohio. The roller levelers and roll lathes were built by the American Roll & Foundry Company, Canton, Ohio, while the circular shears and slow speed device for turning rolls and housings were built by the A. Garrison Foundry Company, Pittsburgh. On the second mill light plates and sheets will be rolled up to 54 in. wide. The product of this mill will be furnished in red steel, blue annealed or box annealed in Bessemer or open hearth stock for deep stamping and drawing purposes. This mill was also built by the United Engineering & Foundry Company.

The eight hot sheet mills consist of one 28 x 48 in., one 28 x 42 in., one 28 x 38 in., three 28 x 36 in. and two 28 x 32 in., together with their complement of roughing mills and cold roll mills for finishing the product. The sheets from these mills are finished in one, two and three pass, and full cold-rolled finish, pickled, box annealed, patent leveled and resquared in Bessemer, open hearth and special deep stamping quality. The galvanizing department contains three pots, and is equipped to galvanize sheets from No. 10 gauge up to 54 in. wide and as light as No. 31 gauge.

These sheet mills are contained in a steel building, 130 x 714 ft., in length, an addition, 135 x 350 ft., having been designed and erected by the Hunter Construction Company, Youngstown, Ohio. The building is commanded by two Niles and one Shaw 35-ton cranes, with 70-ft. span and two 10-ton gantries. The mills are driven by a 48 x 60 in. Corliss engine built by the C. & G. Cooper Company, Mt. Vernon, Ohio.

The company has also recently built a new power house of steel skeleton construction, 50 x 150 ft., with brick walls and covered by a concrete roof, reinforced with Duplex metal lath. In this building, in addition to the former equipment (which consisted of one 200-kw. and one 100-kw. Bullock generator, driven by one Buckeye and one Erie steam engines) has been installed, a 500-kw. Crocker-Wheeler generator direct connected to a 20 and 40 x 42 in. C. & G. Cooper cross compound engine. The steam for driving these engines will be furnished by a battery of 1600-hp. Stirling water tube boilers, built by the Babcock & Wilcox Company, Barberton, Ohio.

A slab storage building, 75 x 200 ft., and a sheet bar storage building, 75 x 275 ft., have also been erected. These buildings are steel structures, covered with corrugated sheet iron. The slab storage building is equipped with a Shaw 20-ton electric crane of 75-ft. span, equipped with Cutler-Hammer lifting magnet, while the sheet bar building is equipped with a Shaw especially wide spread bridge 15-ton crane of 75-ft. span. A new building for the pressed steel department, 100 x 300 ft., of steel skeleton construction, with brick walls, concrete roofing and cement floor, has also lately been finished and occupied. It is equipped with a 5-ton Shaw electric crane, with 50-ft. span.

Quite a large part of the output of this company in black and galvanized sheets is used in its own finishing departments for the manufacture of Mahoning and Youngstown expanded metal lath, Youngstown and Mahoning expanded metal for reinforced concrete, metal studding, a full line of different forms of metal roofing, T and C sheet lath and also Duplex lath. The last named is a new lath recently put on the market which, when used for reinforcing concrete roofs, requires no centering, the top side of the lath being finished in the same way that ordinary cement sidewalks are laid, the under side being plastered. In its pressed steel department the company uses steel sheets in the manufacture of shapes for the agricultural implement trade, including the Danielson metal single tree for which it is having a very active demand. The officers of the company are as follows: L. E. Cochran, president; John O. Pew, vice-president and general manager; C. A. Cochran, secretary; Mason Evans, treasurer; C. B. Cushwa, general superintendent; G. F. Danielson, superintendent pressed steel department.

The Foreign Trade Balance for 10 Months.—In the first 10 months of 1910 the total imports to the United States of both free and dutiable merchandise amounted to $1,296,226,777, as compared with $1,196,267,707 in the first 10 months of 1909, an increase of $99,959,070. In the first 10 months of 1910 our total exports of domestic merchandise amounted to $1,398,624,710, as compared with $1,339,327,473 in the same period of 1909, an increase of $59,297,237. The value of exports in the first 10 months of 1910 exceeded that of imports by $102,397,933, a decrease of $40,661,833 from the first 10 months of 1909 and of $379,449,983 from the first 10 months of 1908. October exports showed an increase in manufactures and a decline in foodstuffs. Imports of manufacturers' materials fell off. As was expected, the fall movement of grain abroad is changing an adverse balance of trade to a favorable one.

The population of the city of Seattle, Wash., is 237,194, an increase of 156,523, or 194 per cent. The population of Portland, Ore., is 207,214, an increase of 116,788, or 129.2 per cent.

The New Gould & Eberhardt Vertical Continuous Miller

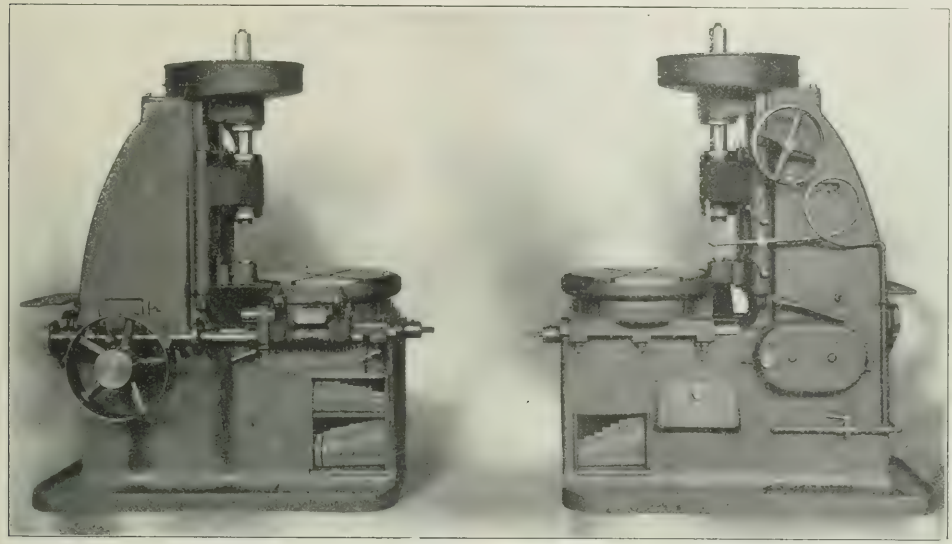
For turning out duplicate work rapidly and reducing the time lost in setting work, Gould & Eberhardt, Newark, N. J., have designed a continuous vertical milling machine. This tool employs high speed steel milling cutters and is offered as a simple machine with a powerful drive in both the spindle and the table, which revolves continuously. It is claimed that the miller is one that a boy can keep running and working throughout an entire day, his duty being merely to replace finished pieces with new ones.

The main frame is of box section and is cast in one piece, making it strong and rigid. Like the gear hobber of this company, which was illustrated in *The Iron Age*, November 3, 1910, the face plate or revolving work table is made in one piece, with the worm wheel below it, so that the torsional stresses are minimized. A coarse pitch hardened steel worm meshes with this worm wheel and can be quickly disengaged and the table revolved by hand if desired. This is an advantage, as it enables the operator to see if the work runs true when the periphery of a part is being milled. Means are provided for taking up wear between the worm and the worm wheel.

A direct gear drive is supplied for the table and circumferential feed changes ranging from 4 to 14 in. per minute are available through change gears. The table revolves on a large floating washer within the work slide. This washer can be adjusted longitudinally by a dial graduated in thousandths of an inch and the slide has a guard inclosing the table. This guard prevents the chips from scattering over the floor and the machine and at the same time a small scoop attached to the revolving table automatically carries the chips away from the work and drops them into the base of the machine.

The large diameter chrome-nickel steel spindle runs in bronze bearings and has hardened and ground steel washers to take the thrust. Any wear that occurs in the main spindle bearing can be compensated for. The end of the spindle is threaded to receive end or face milling cutters and there is also a slot or keyway for driving them. Taper shank cutters of the ordinary type can be used and pulled into place by a draw bar extending through the center of the spindle. The main spindle slide is integral with its bearing and has vertical adjustment. At the extreme lower end is an outer spindle support capable of vertical adjustment independently of the main slide.

If desired a pump can be furnished with the miller and when forming a part of its equipment is located in the base of the machine. A pan cast around the edge of the bed serves to catch any oil that might drop around the machine. The total net weight of the milling machine is 3000 lb.



Driving Side. Operating Side.

Two Views of a Continuous Milling Machine Built by Gould & Eberhardt, Newark, N. J.

The Increase in Consumption of Copper.—It is pointed out, says the *Wall Street Journal*, that, based upon the increase in gross business of the large electrical companies, copper consumption this year will show an unparalleled increase, whereas there has been a moderate increase only in copper production. The General Electric Company, Western Electric & Mfg. Company, Western Electric Company and Allis-Chalmers Company, four of the largest consumers of copper in the world, show an increase in gross sales averaging more than 20 per cent. The General Electric Company this year will do a business of close to $70,000,000, comparing with $51,565,000 for the 11 months ended December 31, 1909, and $44,540,000 for the full year ended January 31, 1909. The Westinghouse Electric & Mfg. Company will show a gross business of $40,000,000, comparing with $29,248,000 last year. The Western Electric Company's gross for the current year will reach over $60,000,000, comparing with $46,000,000 in 1909.

The Waterbury Crucible Company, Waterbury, Conn., is selling its building, machinery and stock, and will discontinue business in that city. It has been manufacturing crucibles in Waterbury for the past five years. For some time the company has been negotiating with the Chamber of Commerce of Detroit, and arrangements have been made for the establishment of the company in that city and the erection of a larger plant than that in Waterbury. E. B. Seidel is president and general manager of the company; L. G. Tenney, treasurer, and A. W. Force, secretary.

The Gyroscope and Its Useful Possibilities—I

Explanation of Its Phenomenon—Precession

BY ELMER A. SPERRY, NEW YORK.

Old as the gyroscope is and familiar as its action it has remained for the present generation to solve its mystery and discover its commercial utility. It is a privilege at this stage in the transition of the gyroscope from a scientists' and children's toy to an important engineering mechanism to present this series by one of the world's greatest authorities on the subject. Mr. Sperry took up the study of the gyroscope fascinated by its mystery and convinced of its value as the producer of an important mechanical force. To him belongs the credit of discovering a new principle of applying it whereby its effectiveness as a stabilizer for ships, monorail cars and aeroplanes may be enormously increased, and the same results secured with one-tenth the weight required in former applications. In the next three issues will be reviewed the work of other experimenters and the author's own developments along these lines.

The gyroscopic phenomenon, precession, is not generally understood and it is to be regretted that this reaction has not been adequately explained. A popular explanation is seldom attempted, and in some mathematical works so much mystery is thrown about it that it seems impossible of comprehension. Even in some colleges the explanation of the gyroscope is not undertaken. It is not a paradox, as one of the great English mathematicians has been wont to call it for the last 40 years, but is really extremely simple and natural. By a few simple experiments, in connection with which there need be no mathematics, it can be shown why the phenomenon takes place.

Nothing but angular motion operates with the gyroscope, that is, if linear motion is impressed upon it, even of large magnitude, no gyroscopic reaction results, but when angular motion is impressed around an axis which is either within the disk or which is outside, or even remote from the disk, so long as it moves around a center, a certain phenomenon takes place. It is simply this: When there is impressed upon a rapidly rotating disk, an angular motion, it is seen suddenly to take upon itself another angular motion in a plane normal to or at right angles to that of the original impressed force or motion. Precession, or the motion that the wheel or disk takes upon itself, depends upon the direction of the rotation, and the direction of the impressed forces, as will gradually be made clear by several experiments referred to later.

Popular Misconceptions

A year ago last summer the author took occasion to investigate the gyroscope, especially as to its various practical applications, and to this end, interviewed many in Europe that have written on the subject, or have become prominent in its applications. He found people of large attainment who had abandoned the gyroscope, as had some of the English experimenters, who characterized it in rather interesting ways. One had worked out this synopsis of the trouble and had abandoned all hope of understanding the gyroscope. He said, "A gyroscope is positively a net work of negations of the natural." Another found fault with the gyroscope because it was "A phenomenon of indirection." It is a sort of indirection, a motion to the side. Another man said it always worked "at cross purposes." All these statements contain some truth, as is appreciated when the gyroscopic phenomena are investigated.

The gyroscope has always been a fascinating subject to mathematicians. Newton spent years studying it and impressed his name on one of the motions of the gyroscope, the "Newtonial motion." By certain experiments it is possible to show the causes of precession, to "manufacture precession," so to speak, and see develop this sudden and unexpected automatic tilt of a rotating disk, showing that as soon as you impress one force upon it, another force instantly manifests itself.

As to some familiar applications, Dr. Schlick believed the front wheel of the bicycle to be gyroscopic, but it cannot be to any great extent. The directive feature of the bicycle is present whether the machine is moving or standing, a tip to one side or the other



Fig. 1. Fig. 2.

Apparatus to Illustrate That Speed of Rotation for a Given Force Varies with Extension of Mass.

will cause a change in direction of the front wheel which, therefore, cannot be gyroscopic. More gyroscopic effect is present in railroad trains. Owing to the rapid rotation of the wheels the outer rail, on curves, should be considerably elevated, in addition to that required by centrifugal force alone. Some believe, and with good cause, that the accident to a surburban train just out of New York two or three years ago, when electrical motors were first used in this service, was due in large measure to the gyroscopic action of the masses in rotation which were much larger than had theretofore been present on steam locomotives.

A familiar phenomenon that some have wrongly considered gyroscopic is the turning over of a cat when it falls down. In reality the phenomenon depends upon the differing radius of action of a mass. Imagine one rotating slowly sitting upon a pivoted stool with his arms extended, as in Fig. 1. When the arms are drawn down close to the body, as in Fig. 2, the velocity of spin is greatly increased, and as they are again extended the spin will slow down. The cat is able to utilize this principle, with the difference that it has four extendable appendages instead of two. If a person should try to rotate himself on a stool he would

find it very difficult. The cat, however, has more facilities; with its hind legs extended and its front legs drawn close to its body, it twists its body one way and then extending its front legs and retracting its hind legs it twists the other way, thus turning in space.

How the Gyroscope's Power Was Discovered

It is more than probable that the true engineering significance and the enormous power of the gyroscope were first discerned in this country. In the early history of our navy, a torpedo was used known as the Howell torpedo, which depended for its action upon the rapid rotation of a flywheel. The torpedo was cigar shaped, and amidships had a steel wheel some 16 in. in diameter that was rotated up to about 16,000 rev. per min. The rotation was so rapid that the 1-64 in. clearance left around the periphery was taken up by the centrifugal stresses acting upon the elasticity of the steel wheel, which was thus utilized as an automatic brake. This wheel was coupled to and served to

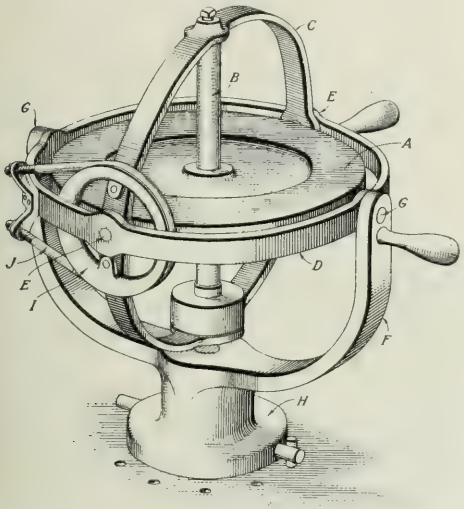


Fig. 3.—A Typical Gyroscope.

drive the propeller when spun up. A Dow steam turbine, the forerunner in America at this early time of the present steam turbine, was directly connected to spin the heavy wheel up to speed.

Lewis Nixon, then of the navy, had charge of some attempts at markmanship with the Howell torpedo. The ship was anchored a certain distance from the target, and after some difficulty in starting the steam turbine, they finally, after quite a lapse of time, succeeded in getting the turbine and wheel up to speed. Meanwhile the tide had turned, and the torpedo was found pointed considerably to one side of the target. Some of the members of the crew were ordered to change the torpedo and point it toward the target, but they found it very difficult indeed. They had no trouble lifting it, but could not budge it laterally; it would not change its direction. The lieutenant called for more men, and finally it started slowly and, as the men trod the deck, he saw they changed the torpedo's relative position upon the boat considerably, so he stepped back and took a sight at the target, but, to his great surprise, found the target was still in the same quarter. In their efforts they had moved the ship around under the torpedo, which contained the spinning wheel and which had refused to move.

This was one of the first times that the real power of the gyroscope had manifested itself; and being noted in engineering circles, it set many to thinking that in this revolving mass was a force much more powerful than had heretofore been thought possible, and investigations were set on foot to find out something more about the power of the gyroscope.

The Gyroscopic Phenomenon

Now as to the phenomenon itself, and what constitutes precession. When a force is impressed upon a revolving wheel to turn it out of its plane of rotation,

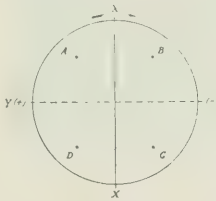


Fig. 4.

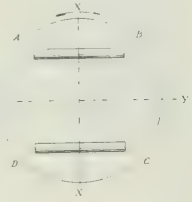


Fig. 5.

Diagrams for Analyzing Gyroscopic Action.

why should it suddenly and unexpectedly spring out of this plane at an entirely different angle? Suppose Fig. 3 to represent a typical gyroscope consisting of a spinning wheel A upon a vertical axis B in a gimbal mounting consisting of an inner or precessional ring C and an outer or base ring D, these rings being pivoted together at E and E, and the outer ring being again pivoted to the fork F at points G and G, the whole mounted upon the base or standard H. When there is no rotation of the disk or wheel, then as the outer ring D is swung upon its pivot G G all parts supported by the ring D move with it and partake of the same motion about an imaginary line drawn from G to G. When, however, the disk A is set spinning and forces are applied to the outer ring D, causing it to swing upon the axis G G, something new happens, and the inner ring C and wheel A are seen to instantly respond by swinging vigorously upon pivots E E. Upon ceasing to move the base ring D, the tilting motion on the part of ring C and disk A instantly and abruptly ceases.

It is found that the direction of the tilting of ring C depends upon the direction of the impressed forces upon base ring D. It will also be noticed that pivots E E lie about at right angles to the pivots G G. When

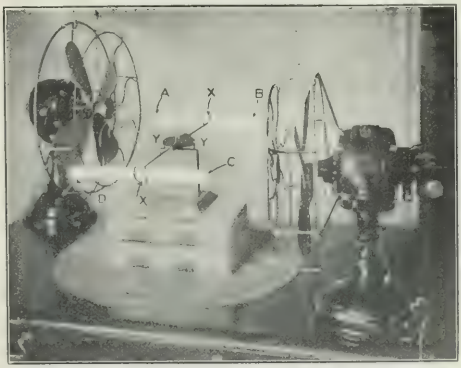


Fig. 6.—Apparatus to Illustrate Gyroscopic Action.

the rotation of disk A is stopped and the same motions are impressed upon ring D, ring C is found to be wholly inactive and simply swings about an imaginary line drawn from G to G just as it should on account of being supported from the ring D. Upon again starting the wheel A spinning in the opposite direction, it is observed that upon attempting to move the base ring

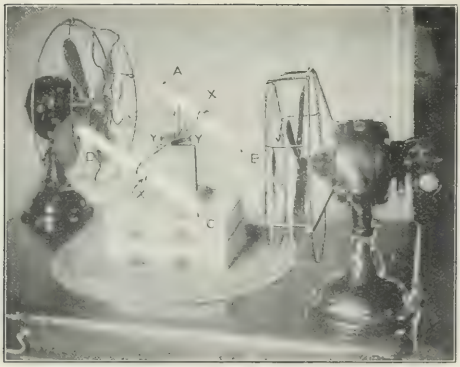


Fig. 7. Typifying a Force Impressed on One Side.

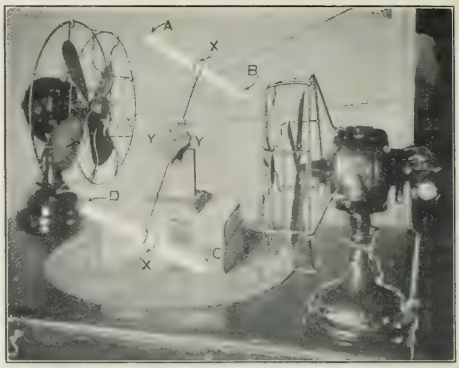


Fig. 8.—Result of the Force Impressed in Fig. 7.

D the ring C and the disk A again become instantly responsive and swing vigorously about the pivots E E, but that now the direction of motion of the ring C is opposite, inasmuch as the wheel is spinning in the opposite direction as stated. These vigorous to and fro motions of the revolving mass A and its supporting ring C on the line E E result from forces or motions impressed upon ring D swinging on a wholly different line, that of G G, at right angles to E E.

How the Phenomenon May Be Studied

A circle may be represented as a polygon with an infinite number of sides; likewise circular motion may also be similarly considered. For convenience the number of sides may be reduced to four. The analogy still holds good, and it will be noted that a particle which was at one instant located at A upon Fig. 4 is presently at B, then at C, then at D, and back again to A. This is simply polygonal motion reduced to a figure of four sides, and it will at once be seen that although it is true that the particle has traversed a circular path between the points, these deviations from straight lines upon one side of the center are opposite and equal to those upon the opposite side of the center. It is immaterial how the particle traveled between the points so long as these forces are all balanced within the mass of the wheel itself, so it is allowable to think of the particles as passing in straight lines between the points, and it is necessary to follow them through all the peregrinations of actual motion, because all these actual deviations from straight lines are balanced within themselves as stated.

Now suppose these particles formed a part of the wheel or disk rapidly revolving clockwise, and a motion is impressed about axis X X, shown upon the disk in Fig. 4. Suppose this motion depresses the right side, marked (—) and raises the left side, marked (+). The gyroscope law states that the disk will now be seen to automatically take upon itself a motion, and the bottom edge of the disk will be depressed or recede and the top will move outwardly toward the observer, the disk taking on a movement about a new axis, Y Y, shown in dotted lines. Studying this diagram reveals the fact that there is a marked difference in the effect of the tilting motion on the various pairs of positions; for instance, when the rotating disk is swinging upon its vertical axis.

The particles in travelling these two paths, B C and D A, are not asked to change their general direction of motion, nor are any particles while they are passing in a line generally parallel with line X X, or vertically up or down on the two sides of the disk. There is a very different state of affairs in the pairs when they are considered horizontally or when the particles cross from A to B and C to D. It must be remembered, however, that as the disk spins, it is being tilted upon the axis X X, and therefore the ends of the line A B are moving in opposite directions, A coming forward and B receding. The particles are, therefore, asked to flow or precipitate themselves downwardly in their passage from A to B and are deflected out of the constant plane in which they were operating between the points D and A; where both of these points were travelling in the same direction, now they are asked to pass between points travelling in opposite directions, or, as stated, to flow down hill.

Now imagine a myriad of particles passing constantly between A and D, each possessed of the familiar quantity known as inertia; in other words, they are "strong-headed" and refuse to go down hill, preferring rather to raise the hill up to meet their needs

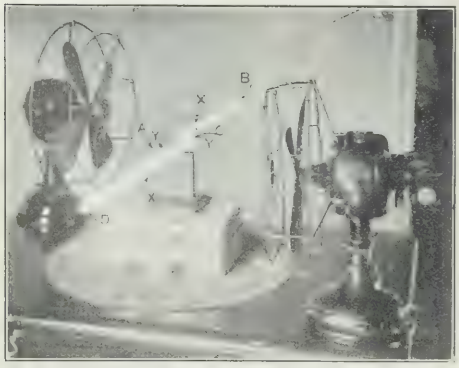


Fig. 9.—Typifying a Force Impressed on the Other Side.

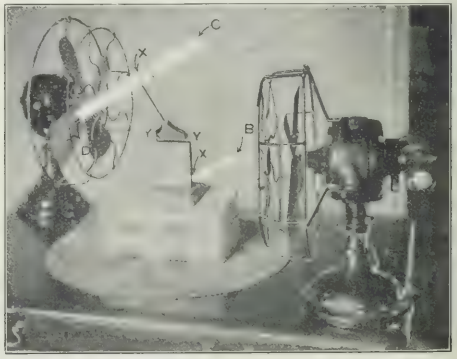


Fig. 10.—Result of the Force Impressed in Fig. 9.

as to constant plane of rotation. The particles all being below the surface of the wheel and within the mass itself, all this becomes very easy, and the top of the wheel is therefore given a definite tendency to move outward and away from the plane of the diagram. The particles that are passing horizontally from C to D in the lower half of the disk, since the left side of the disk is now being depressed, are asked to ascend a hill, D being higher than C to the same extent to which B was lower than A. Again these particles refuse to have their plane of rotation changed and set about their task of pushing the hill itself down, which causes a second strong and definite tendency on the part of the disk to have its bottom or lower half depressed or moved away from the observer and below the plane of the diagram.

Therefore a new couple is set up tending to rotate the disk about on the horizontal line Y Y, inasmuch as the particles passing from A to B are all trying to raise the upper half of the disk, and those passing from C to D are constantly trying to depress the lower half of the disk. This new angular motion which the disk manifests, and which has been described as the couple tending to rotate it about the new axis Y Y, is known as gyroscopic precession.

It will be further seen that as soon as the original effort to tilt the disk upon its vertical axis, X X, ceases, all the four paths between the lettered points remain in the same plane and there being no hills to be climbed or depressed by the myriads of particles passing horizontally, there could be no farther tendency to turn the disk upon the horizontal axis Y Y. This actually conforms to one of the gyroscopic laws which states that the precession ceases instantly upon the cessation of the impressed forces, upon the primary axis of tilt. Thus the phenomenon is entirely one of inertia of the rapidly revolving masses and is due wholly to Newton's first law that all matter resists being deflected from its path when once it has assumed a line of motion.

A Simple Analogy

The explanation which to the author is simplest consists in supposing that normally to the vertical axis X X there are mounted at equal distances from the center, two parallel gun barrels open at either end which persist in their location with reference to the axis X X, while the particles of the rapidly revolving disk flow through them. These are shown in Fig. 5, and the upper gun barrel may be marked A B and the lower one C D. The particles are assumed to be moving in the same direction as they did in Fig. 4—namely, with a clockwise rotation. Suppose now that the particles passing through these rifle barrels are rifle balls. If a rifle ball were fired through a second rifle barrel, open at both ends, placed immediately in front of and exactly in the same axial alignment, the ball would pass on through the second barrel almost as though it were not there.

If the second rifle barrel is hung by some elastic support so that it is free to move laterally in any direction and the axial alignment is changed so that one gun barrel is at a small angle to the other, but pointing directly into the adjacent end of the freely suspended second barrel, and a bullet is fired from one barrel through the other, the bullet will have to be turned aside from its original path in passing through the second barrel. It would resist this, and as it progressed farther and farther through the second barrel would constantly impinge upon the side of the bore during its progress, so the second barrel being perfectly free to move, would be pressed bodily in the direction of the original course of the bullet and would move as a whole. For purposes of additional illustration of gyroscope precession, this may be considered to be just what happens to the particles which have received a definite directive force in their travel when they arrive at points A and C, and are now asked to deflect such course upon entering the rifle barrel C D and A B.

Suppose now that this pair of rifle barrels be lifted out of the disk and mounted, as represented by paper tubes in Fig. 6, and suppose the myriad of particles passing through them are air particles directed by the two electric fans. The little wire representing the axis X X which holds the two barrels is pivoted in the diamond-shaped central piece and by means of the small cord can be given a tilt in either direction as is plainly to be seen. This diamond-shaped support at the same time is pivoted crosswise or upon the line Y Y of Fig. 5, so that if the barrel A B be elevated and the barrel C D be depressed, a motion about axis, Y Y, will be developed and gyroscopic precession will be seen in the act of being developed, the phenomenon being adequately and beautifully illustrated.

By starting the fans and manipulating the cords, the two gun barrels A B and C D may be tilted so that

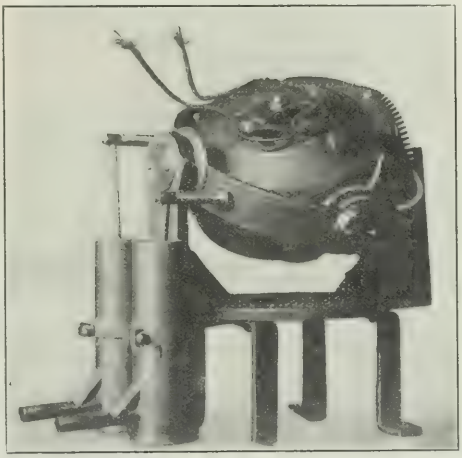


Fig. 11.—The Sperry Gyroscopic Coupling Which Increases the Precessional Velocities.

their ends B and C are depressed and their ends A and D, are elevated, as shown in Fig. 7, whereupon the tube A B instantly swings upward and the tube C D swings downwardly around the axis Y Y, as shown in Fig. 8. Upon reversing the impressed forces and depressing the ends A and D of the tubes, as in Fig. 9, a reverse motion takes place, the tube C D instantly swings up and the tube A B swings down around the axis Y Y, as shown in Fig. 10, thus showing the reversal of the gyroscope precession incidental to the reversal of the impressed forces about axis X X. Through the operations of this simple experiment the precessional forces are seen in the act of being developed, and the resulting motions start and proceed from their inception. The causes of the motion in this instance are perfectly apparent and of such a nature as to be unmistakable as to origin.

The Force of the Gyroscope

Now to consider the magnitude of these forces, having measured the velocity of the air and found it to be only 52 ft. per sec. In a steel wheel about 12 times this velocity is allowable and 6,000 times the weight of every particle traveling here; even with the air particles the reaction is clear cut and the resulting motions strong and positive. Think what they would be were the particles 6,000 times heavier and operating at 12 times the velocity, making 72,000 times the force here present in this pair of tubes, and again consider the number of rifle barrels or paths are multiplied almost indefinitely in the case of the wheel.

Some time ago the author enunciated one principle of the gyroscope which he has since been able to demonstrate and which should be almost axiomatic; that is, if 100 lb. is impressed upon the base ring D in Fig. 3 to swing it, 100 lb. can be taken from the precessional ring C to the normal. The amount of stress that is impressed in this one plane can actually be recovered in the other plane up to the breaking down point of the couple. This principle the author has applied in a more or less novel gyroscopic coupling which, it may be said, brings about a rather paradoxical reaction. This was exhibited in Europe last year, it having been pronounced new by those who have seen it in operation; it seems to multiply the precessional velocities by the $\sqrt{2}$ or 1.41 of the impressed velocities of the base ring. One form of application of this principle is shown in Fig. 11.

(To be continued.)

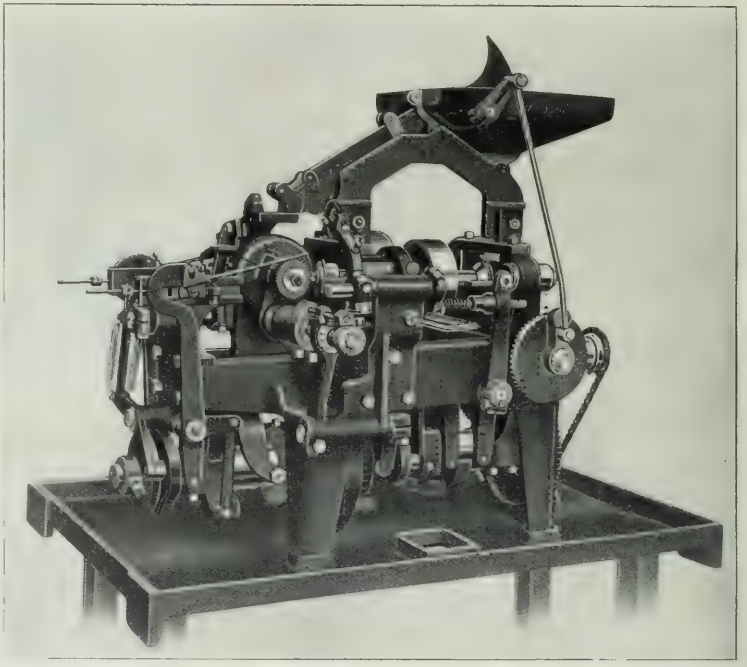
The New Manville Screw Shaver and Slotter

A recent product of the E. J. Manville Machine Company, Waterbury, Conn., is a combination machine for shaving and slotting the heads of machine and wood screws. It can also be used for either plain shaving or slotting, if desired, and has been developed as an accessory to the wood screw threading machine illustrated in *The Iron Age*, July 7, 1910, the two being intended to overcome the objections to older types of screw manufacturing equipment.

This new machine is claimed to form a head of the correct diameter, perfectly round and concentric with the body of the screw, and with the slot exactly in the center of the head. All screws up to 4 in. long, which is the maximum handled, are pushed into the spindle clear up to the head, and no back rest is used to throw out imperfect blanks. This feature of holding the screw in the spindle, while it is being turned and having the spindles rigidly mounted is claimed to insure every head being absolutely round and very smoothly finished. It is also said to increase the life of the tools and insure a greatly increased production, as no time is lost in turning the spindle over. A split chuck, very much like that used on an automatic screw machine, is employed to hold the blank, and the saws are mounted on a rigid bracket, which can be instantly adjusted to bring the slot in the center of the head.

The screws handled by this machine range from a No. 0, ¼ in. long, to a No. 20, 4 in. long. Two sizes of hoppers are furnished, which are interchangeable on this machine and also with the wood screw threading machine. Practically all parts of the machine are in full view and almost every adjustment can be made while the machine is running. The manner of mounting the shaving tool is such that the tool can always be brought to the head of the screw at any angle, thus insuring a head with the correct angle even though the tool itself may not be correctly formed.

It is practically impossible to break any of the parts of this machine, as almost all the movements are yielding and some of them will give in both directions. Positive stops govern the action of all these movements instead of having cam faces bring the tools to their working points alone. It is said that any operator who is at all familiar with the older type of machine can easily run this new tool, as the action of the tools is practically the same in both, the only radical point of difference being that both spindles are mounted rigidly in the frame and each spindle has an individual set of tools. This is said to give extreme accuracy to the product, while the amount is increased, as no time is consumed in moving the spindles over from side to side.



A New Wood Screw Shaving and Slotting Machine Made by the E. J. Manville Machine Company, Waterbury, Conn.

The Budapest Exhibition.—Joseph Baneth, Budapest, Hungary, is now in New York, and until December 20 will make his headquarters at the Herald Square Hotel. He has come to this country to interest manufacturers in the International Exhibition "of novelties and patents of the iron and engineering industries," which will be held in the Industrial Palace at Budapest in May and June, 1911. The principal articles to be exhibited, as stated in the preliminary circular of the exhibition, are "iron ware, machines and apparatus for domestic use, industrial and agricultural plants; also motor engines. Construction and technical devices for manufacturers, inventions and novelties for shipping and in the military art will be admitted; models or designs or new heavy machines can also be exhibited." The exhibition will have the aid of the Royal Board of Trade of Hungary and the National Association of Hungarian Ironmongers.

The Brown Radiation Pyrometer

A Fixed Focus Instrument with High Temperature Range

A new type of radiation pyrometer has been designed by Richard P. Brown, which is claimed to embrace several new features and to be an accurate and simple instrument for measuring temperatures beyond the range of the electric pyrometer employing a platinum thermo-couple. This new pyrometer, which is being marketed by the Brown Instrument Company, 311 Walnut street, Philadelphia, Pa., is particularly adapted for measuring the temperatures in blast furnaces, open hearth steel furnaces, boiler furnaces, brick kilns and rotary cement kilns, where the temperature is about 3000 degrees F., and must be measured 20 ft. inside the wall. It is also valuable in research work and wherever high temperatures must be measured. Fig. 1 is a view of the instrument packed in a case for transportation, while Figs. 2 and 3 show it in use taking the temperatures of furnaces. In Fig. 2 the pyrometer is held in the hand, as only instantaneous readings of the different units making up a battery

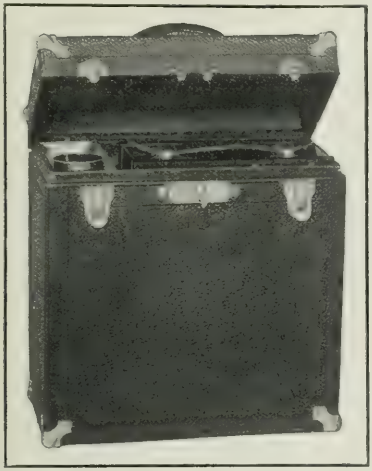


Fig. 1.—The New Radiation Pyrometer Made by the Brown Instrument Company, Philadelphia, Pa.

are desired, and in Fig. 3 it is mounted on a tripod in front of one particular furnace.

In general the electric instrument will measure temperatures under 2500 degrees F. efficiency, but above that point the life of the thermo-couple is declared to be very short and the accuracy of the pyrometer impaired. The thermo-couple in a radiation pyrometer is located at the rear of the tube, and a concave mirror focuses the heat rays entering the tube upon the couple, which is connected to a milli-voltmeter with its scale graduated in degrees. No part of the instrument is exposed to the excessive heat which it measures and consequently the furnace gases or the heat cannot destroy its usefulness.

Two styles of radiation pyrometers are in general use—the adjustable and the fixed focus types. Those of the former type are said to possess the objection of being complicated, and former instruments of the fixed focus type had no means of indicating to the operator that he was not too far from the furnace, the proper distance being 10 times the diameter of the opening in the furnace wall. In the Brown instrument a finder similar to that of a camera is used. The tube can thus be pointed directly at the furnace, and the finder acts

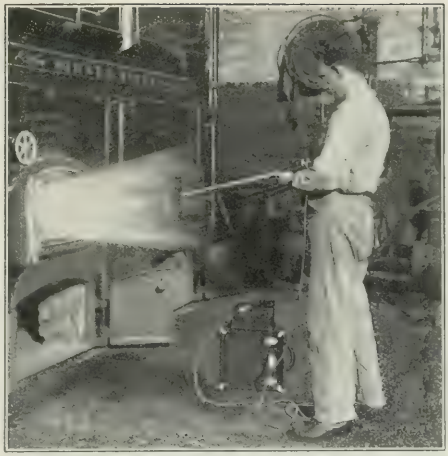


Fig. 2.—Taking the Temperature of a Battery of Furnaces with the Brown Pyrometer.

as a measure of the distance, for when the red reflection of the opening fills the entire field of the finder the pyrometer is at the proper distance.

The instrument has been calibrated for measuring the temperature of a black body or the temperature of walls and inside parts of furnaces that are practically black, and it is said that the graduations are accurate within 1 per cent. at 3000 degrees F. In measuring the temperature of molten metal or highly polished surfaces that reflect a correction has to be made for this reflection. A special feature of the pyrometer is the use of a collapsible tube, which enables the pyrometer tube, the indicator, the tripod and the wiring to be folded into a small leather carrying case that weighs about 15 lb. and is shown in Fig. 1. This makes the pyrometer especially adapted for being moved from place to place for testing.

It is frequently inconvenient, if long tests of a brick kiln or furnace are made with a radiation pyrometer, to leave the door open. For this purpose a firebrick tube

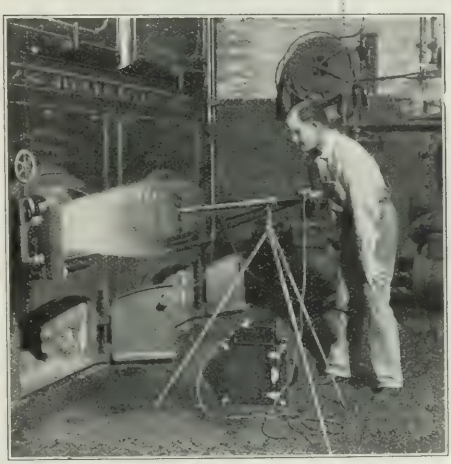


Fig. 3.—The Instrument Mounted on a Tripod for Prolonged Use in One Location.

is inserted in the opening in the furnace wall and projects into it, the inner end being closed. The pyrometer is then focused on the inner end of this tube and a bracket bolted to the wall is used to support it, instead of the tripod shown in Fig. 3.

The British Steel Maker's Ore Supplies*

Spanish, Swedish and North American Iron Deposits—Sources of Manganese Ores—The Place of Alloy Steels

BY W. H. HERDSMAN, GLASGOW.

I am not unmindful of the fact that our Institute was addressed some seven years ago by so eminent an authority as the late Bennett Brough on "The World's Iron Ore Supplies," when interesting facts and figures were put before you. A discussion followed, showing a general concurrence of opinion that, while the ever-increasing drain on the known and available deposits of Bessemer ores is a matter for some anxiety to acid steel makers, there need be none regarding the supply of the various grades of phosphoric ores suitable for foundry, forge and basic iron and steel purposes. From neither of these conclusions do I propose to dissent, though the world's production of iron has in the interim increased by 50 per cent. to some 65,000,000 of tons annually. Avoiding, as far as possible, figures and statistics which are available to all, I shall base my remarks rather on my personal views and experience as an analyst, metallurgist and mineral expert, closely associated with the development of the iron, steel and ore industries during the past 35 years. In addition to the ores of iron, I propose to include in my survey the other ores required by the steel maker to-day, especially those of manganese.

Three Classes of Iron Ores

My experience has led me to place all iron ores in three classes:

1. Those formed by chemical action by replacement or precipitation from ferruginous solutions derived from primary rocks or pre-existing deposits, the iron being deposited as nonhydrated oxide (red hematite) or as protocarbonate (Spathic ore), the latter generally more or less oxidized by weathering subsequently to hydrated brown hematite (limonite, &c.). Our West Coast hematites belong to the first division; the Bilbao deposits are the best known examples of the second. The nonphosphoric magnetites are also of this class, subsequently metamorphosed by thermal action. All the low phosphorus ores (other than those of Class 3) are included in this class, but it also includes numberless minor deposits of varying phosphorus contents outside the Bessemer limits (that is, above 0.06 phosphorus), but generally much lower than the phosphoric ores proper.

All ores of this class containing phosphorus are of (geologically) recent formation or exposure, and are found at or near the surface, the phosphorus contents being accidental. The class itself is essentially nonphosphoric. They are from the nature and circumstances of their genesis of most varied and irregular form and size; often they are extremely deceptive in their surface indications to those unacquainted with their character—this fact having led in the past to enormous sums of money being wasted on the acquisition of ore properties which have proved on working to be little more than surface crusts and knobs.

2. The second class of iron ore deposits are those which are found regularly stratified in sedimentary rocks. These ores are phosphoric without exception and will be dealt with later when I come to speak of the phosphoric ores.

3. The third class includes all those of direct volcanic or Plutonic origin, and all are essentially nonphosphoric ores. Representatives of this class within the range of my review are the aluminous-titaniferous ores of Antrim and the chromiferous iron ores, containing some nickel, occurring in Greece and in Cuba. The titaniferous magnetites of Norway, though not at present regarded as ores of iron, belong also to this class.

Low Phosphorus Ores

Of the Bessemer or acid process ores we now import some 8,000,000 tons annually to supplement the 1,750,000 tons raised in this country, to supply the acid steel maker. Our imports are derived principally from Spain, both north and south, the iron ore exports of which country we share with Germany, Belgium, France and, to an increasing extent, with the United States. Algeria, Greece, Norway and Sweden furnish the greater part of the balance of our wants, and Tunis is expected, in the near future, to become an important contributor, while in times of high prices and (or) low freights, ore flows to us in a not inconsiderable stream from the distant South Russian mines of the Krivoi Rog district via the Black Sea port of Nicolaieff. Of the Spanish mines, those of the Bilbao district have furnished our main supplies for fully 30 years, and continue still to do so, though both quantity and quality steadily decline. They were long ago considered to be approaching exhaustion, and their life has been fixed periodically since 1882 at "another 10 years." Now Don Joaquin Arisqueta and Don Julio de Lazurtegui, than whom there can be no better authorities, estimate the remaining ore at 70,000,000 tons, and their life, with a continually decreasing output, at 25 to 30 years. Of the other mines in the north of Spain supplying this class of ore, the district of Santander produces 1,500,000 tons annually, and by those on the spot is expected to continue that output for fully 20 years.

In the south of Spain the districts served by the ports of Almeria, Aguilas, Seville, Carthagena, Garrucha, Malaga and Marbella, in the order of importance given, yield an annual supply of about 3,000,000 tons, while on the east coast the mines in the province of Teruel, shipping at Sagunto Port, yield a further 500,000 tons annually.

All these districts, with the exception, possibly, of Seville, may be expected to continue their present output, and in several instances to considerably increase it, for periods of not less than 25 years; and I think we may safely assume that the increasing supplies from the south of Spain, together with the expected large increase from Tunis, will more than compensate for the dwindling Bilbao yield, and maintain the supplies likely to be required for the acid process for the next 25 years or more. The time will be influenced by the development of the Tunis deposits and by any discoveries which may be made along the Mediterranean seaboard, including the long coast line of Asia Minor, which, under the new Turkish régime, may now be expected to become more accessible to mining enterprise. My own opinion is that while these shores will contribute in the future a considerable aggregate to the world's ore requirements, the phosphorus contents will generally be found to be above Bessemer limits.

THE ACID PROCESS DOOMED TO EXTINCTION.

Another factor which may appreciably prolong the life of the acid process is found in the siliceous hematites and magnetites of Norway. If these can be successfully and economically separated from the gangue,

* A paper read before the West of Scotland Iron and Steel Institute at Glasgow, October 21, 1910.

and the concentrates shipped to this country, they would furnish, when briquetted with the soft ores of the south of Spain and of Teruel, a high grade smelting ore, without which the acid process cannot continue to exist. Unfortunately, the first attempt in Norway under British auspices to solve this problem has not met with conspicuous success, and the outlook in this direction is not promising. There can, I think, be no doubt that the acid process has maintained its existence so far since the genius of Sydney Thomas showed us the way to use phosphoric ores for steel making, because of the large quantities of rich ores which have hitherto been available, and the blast furnace economy attending their treatment. Now, however, acid ores are steadily falling off in their iron contents, while, since the supplies from Narvik and Wabana became available, the supply of basic ores is increasing, so that unless some important new discoveries are made within the radius available for our markets, the acid process is doomed to extinction or to share with the puddling furnaces in quiet retirement the memories of past glories.

I introduce these considerations here to maintain my contention that there need be no apprehension felt on account of approaching scarcity of low phosphorus ore, while, as I hope to show, the reserves of all other classes of iron ore yielding the necessary metal are practically inexhaustible.

Seeing that the two processes now march side by side, there is no reason to anticipate any disturbance of the economic situation by the eventual disappearance of the acid process. Before leaving the subject of acid ores, I should, perhaps, say that being personally acquainted with both districts, I do not regard the south Russian ores as permanent reserves available for our use, though they may continue to be shipped to us for some time longer; nor do I look on the Brazilian iron ores as within our zone of supply, though, possibly, under the conditions which influence the Russian supplies, cargoes of the best class of the Minas ores may find their way here eventually.

Phosphoric Iron Ores

These, the world's primary ores of iron, have been formed by separation of the metal from solutions derived from the primary rocks of the earth's crust, through the agency of animalculæ, bacteria, or other micro-organisms which have so continued active in our service, from the first dawn of life on our globe, through all the long geological ages to the present day; a period of time so vast as to rank with astronomical distances in one's inability to grasp it, yet the iron ore now being formed in some of our bogs to-day is of similar origin to that coming to us from remote Cambrian or Silurian times. These deposits, found in their original stratified form, constitute our great store of the metal for future use, and will be found to be practically inexhaustible.

The phosphoric ores constitute the greater proportion of our own native ores, as is the case in Germany, France, Luxemburg, Spain, and, indeed, in every country retaining its original sedimentary strata.

We have iron ore beds in North Wales, now being worked, which were laid down for our use in Cambro-Silurian times, and others in Wiltshire and at Dover which have existed only from the Cretaceous period, but the conditions most favorable to iron ore deposition in this part of the world appear to have occurred during intermediate geological times, so that we find our main deposits of this class of ore in Cleveland, Lincolnshire, and Northamptonshire, in the Lias and Oolites of the Jurassic group.

The Minette ores of Germany, Luxemburg and Northern France, which together are estimated to contain not less than 10,000,000,000 tons of workable ore, thus furnishing a supply to their respective countries, at the present rate of consumption, for fully 300 years, belong also to the Jurassic age; while the bedded phosphoric ores of Spain in the stratified measures of the northern provinces, of greater geological age, amount, according to Mr. Lazurtegui, to hundreds of billions of tons.

Going somewhat further afield, but still within the zone from which we at present draw our supplies, we find, in Tertiary measures outcropping on the shores of the Black Sea, bedded ores of the same class, 30 to 50 ft. thick, and estimated to contain at least 1,000,000,000 tons. These were recognized by the late Professor Le Neve Foster as probably of more importance to Russia than the rich deposits of Krivoi Rog. An attempt was made a few years ago to utilize these ores, and blast furnaces and basic Bessemer plant were erected near Kertch. The ore was mined by continuous bucket dredges, loaded direct into wagons and briquetted by simple pressure, dried and conveyed to the blast furnace (fuel being obtained from the Donetz district, shipped by the Sea of Azov), making an excellent basic pig. The works, however, at the time of my visit had stopped for want of capital, and much of the pig iron then made eventually found its way to this country.

NEWFOUNDLAND AND NOVA SCOTIA DEPOSITS.

Crossing the North Atlantic to our own colony of Newfoundland, we find at Bell Island, in Conception Bay, numerous beds of phosphoric iron ore outcropping on the island and dipping at a low angle to the north—the small segment of a trough of ore deposition, the limits of which have not yet been determined, but which already proved and worked more than a mile from the shore, shows it to be one of the most extensive and valuable deposits of phosphoric ore within our sphere of interest. The quantity of ore recoverable within submarine working limits must amount to hundreds of millions of tons, and may reach thousands of millions.

A boring made last year, at the time of my visit, from the farthest point of the submarine area reached, showed five workable seams of ore, totaling some 35 ft. in a depth tested of 370 ft., the beds being separated by partings ranging from 12 to 200 ft., thus showing a frequent recurrence of the conditions favorable to iron ore deposition over an extended period of time, with very irregular intervals, and suggesting the probably great lateral extent of some, at least, of these ore beds, making the further development of this mine of extreme interest.

The geological horizon in which these ore beds are found appears to be near the base of the Silurian measures, which with their Cambrian complements outcrop on Bell Island and the southern shores of Conception Bay.

The iron contents of these beds is high and remarkably uniform, varying only from 47 to 53 per cent. in the several beds in the above-mentioned boring, while the shipments over many millions of tons have averaged over 50 per cent. with great regularity, with 1 per cent. phosphorous and low silica. The ore of the surface beds possesses the remarkable property of natural rectangular cleavage, so that the quarries in which it is mined appear to be full of bricks; this property disappears largely in the submarine workings, though traces of it are occasionally met with even at considerable distances from the shore. The ore from the quarries, together with that drawn by inclined planes from the submarine workings, is carried across the island, some two or three miles, by several endless rope railways, to the two shipping piers on the south and sheltered side of the island, where it is tipped into large bunkers and loaded from there by an endless chain of buckets at the rate of about 1500 tons per hour.

Another of these bedded phosphoric ores has recently been shipped to this country from the Annapolis

district of Nova Scotia. It is higher in phosphorus than the Wabana ore—the cargo under my notice having given 1.5 per cent. It is, however, higher in silica, and is practically identical in composition with the Careg Fawr ore of North Wales previously mentioned. Two beds, at least, of this ore appear to exist in Nova Scotia, apparently of upper Silurian or Devonian age, but, unfortunately, the beds have suffered, in parts at least, considerable disturbance by earth movements and igneous extrusions, which have broken their continuity. There is, however, every probability of undisturbed areas of these beds being found to exist in the province, in which case they must become a source of wealth to the Colony, and an available supply of high phosphorus ores to ourselves of considerable importance, being very conveniently placed for shipment.

SWEDISH DEPOSITS.

Of other present sources of phosphoric iron ore available for our use the only remaining deposits of importance are those of Northern Sweden, *i. e.*, Kiruna, Luossavaara, and Gellivara, which are already proved to contain many hundreds of millions of tons, without the limits of the ore having been reached. The ore is now well known to all of us, and is found in the bunkers of every iron and steel works. It is an ore differing widely in its appearance and iron contents from the Wabana ore, but is, in my opinion, of precisely similar origin, though it has since been completely metamorphosed by igneous action, which has brought the ore into a state of fusion and "slagged off" the greater part of the silicious contents into the surrounding crystalline rocks, retaining, however, the whole or greater part of its phosphorus contents. It is a rich ore, cheaply mined, but handicapped by a long railroad transport to the shipping port; however, large steel hopper wagons, a heavy rail bed, powerful locomotives, and the most modern shipping arrangements, enable large quantities to be dealt with in the most economical manner, so that when this country has definitely accepted the basic process, it is to Narvik and to Wabana and Nova Scotia that it must look for its main outside sources of supply. The west coast ports of this district are most favorably situated for Wabana and Nova Scotia, and Grangemouth equally so for Swedish deliveries.

This concludes my review of the phosphoric ores at present available to the British steel makers, though other Wabanas will, and other Kirunas may, be found within the radius of transport to our shores economically possible, there being much of Newfoundland but imperfectly explored, while the whole coast line of Labrador and of the great Hudson Bay is still *terra incognita* beyond the narrowest fringe of shore.

In the accompanying table are analyses of phosphoric iron ores, as well as of chromiferous ores referred to in this paper:

Bedded Phosphoric Ores.

	Of Cambro-Silurian age.				Of more recent geological age.	
	North Wales.	Nova Scotia.	North Spain.	Wabana.	Dover (Cretaceous).	Kertch (Tertiary)
Iron	45	48	49	50	30 to 40	30 to 45
Silica	18	15	20	9	10 to 15	12 to 18
Phosphorus	1.6	1.5	1.5	1	0.4 to 0.6	1 to 2
Lime	4	4	2	3	3 to 10	2 to 6
Alumina	6	6	3	4	5 to 8	4 to 6
Manganese	low	low	low	low	low	0.5 to 5.5
Sulphur	generally low in all				low	low
Moisture	generally low in all				variable, but much higher	

Iron Ores Containing Chromium and Nickel.

	Greece.	Cuba.
Iron	47	46
Chromium	2.5	1.7
Nickel	0.6	0.5
Silica	10	6
Phosphorus	0.025	0.015
Lime	1	low
Combined water	5	13
The above are in the dry ore.		
Moisture, per cent. as mined	3	30

I may mention here that the Clinton and Flax Seed ores of the United States, which must form the main future iron ore reserves of that country, are of the same regularly stratified type of primary phosphoric ore as the Wabana and others elsewhere, which I have mentioned.

Manganese Ores

Turning now to the ores of manganese, increasingly necessary to the steelmaker, I propose to confine my remarks to the present chief sources of the ores of that metal supplying this country.

Though manganese is one of the most widely disseminated of the metals, the important concentrations of it, forming high grade ores, are rare, and we have to go far afield for any considerable supply of such mineral. As is well known, Russia, India and Brazil practically supply not only our own needs, but those of the whole metallurgical world, minor supplies being furnished by Spain, Greece, Turkey, Cuba, Chili, &c. The demand for this ore for a number of years, while continually growing, has been somewhat erratic, and prices have fluctuated greatly in consequence, the supply, however, being now in excess of the demand, since the Indian deposits were exploited. It may be expected that more settled conditions will prevail.

Of high grade ores, those of the Russian Caucasus, though confined to one district at present, hold probably the greatest reserves of the mineral, this being due to their definite bedded character. The ore bed, it is said, can be traced for 75 miles. It retains its horizontal position to a great extent undisturbed, and at the present rate of production will not be exhausted for several centuries. The average quality exported of recent years has contained 47 to 50 per cent. manganese, 10 to 12 per cent. silica and 0.14 to 0.18 per cent. phosphorus.

Next in point of importance to the Russian are the Indian deposits, which are found widely disseminated over that great peninsula. The Madras deposits, the first sample parcels of which passed through my hands, were first worked in 1892, and have continued to yield increasing supplies annually since that time. This ore, however, is somewhat phosphoric and ferruginous and mostly unsuitable for making 80 per cent. ferromanganese. It was not until the numerous and important deposits of higher class mineral in the central provinces began to be mined and exported, at the beginning of this century, that the Indian supplies of this ore became of real importance, and other workable deposits, being subsequently found in Central India, Bombay and elsewhere, the annual production rose to over 500,000 tons, which amount can be doubled or quadrupled if necessary, when the various fields have been supplied with adequate rail transport and the shipping facilities have been organized on modern lines.

I do not propose to attempt any description of the several fields and the numerous individual deposits, as all this can be found by any one interested in the remarkable and monumental monograph on the Indian manganese ores prepared by the able assistant superintendent of the Geological Survey of India, L. L. Fermor. The reserves of manganese ore available for the future in India are naturally at present practically impossible to forecast, even if all the existing deposits were known, which is improbable.

Mr. Fermor has estimated that the known deposits at the then rate of production may be expected to be exhausted in 30 to 50 years. Without the advantage of the intimate acquaintance with the deposits which Mr. Fermor must have, I have yet had opportunity of inspecting typical deposits of almost every district in India, and differing as I do from him as to their genesis in certain cases, I am of opinion that their extent and importance have been very greatly underrated.

The Brazilian deposits have for many years yielded us a supply of the purest manganese ores, rich in metal,

and extremely low in silica, iron and phosphorus, from the mines of Miguel Burnier, which were the first to be worked in that country. The ore, however, from the bed furnishing these supplies has proved with the deeper working of the mine to contain an excessive proportion of small and to be unusually hygrometric, cargoes of the ore having yielded over 20 per cent. of moisture. Since I last visited this mine I understand a briquetting and calcining plant has been erected to enable the mineral to be shipped in a dry condition; but I have, at the time of writing, no information as to what measure of success has attended its installation. This Miguel Burnier ore is unique in its character and quality, the deposit in no way resembling those of Russia or India.

Other Brazilian manganese ore deposits of ordinary type occur, and have been extensively worked, in the State of Minas, and also in Bahia, while important deposits of this mineral are said to occur in Matto Grosso, but the ore has not, I think, as yet found its way into the market. The known ore deposits, together with fresh discoveries which may be expected to be made in the vast territories and littoral of that great country, will undoubtedly enable Brazil to maintain if not improve its position as a manganese producer for a long series of years to come.

Of other of our sources of manganese ore, the picturesque mine of Covadonga in Northern Spain alone rivals the Brazilian ore of Burnier in its richness and freedom from phosphorus, while Turkey, Greece and South Russia all produce ore of a lower grade, much of which can only find a market in times of great demand.

Ores of Nickel, Chromium, Tungsten and Vanadium

I need only briefly refer to the other metalliferous ores required by the steel maker, which include nickel, chromium, tungsten, vanadium and molybdenum. Those of chromium and molybdenum alone have come under my personal notice professionally abroad. For our nickel supplies we depend, as you know, chiefly on that coming to us in the form of the silicate "garnierite" from New Caledonia, and that found as nickeliferous pyrrhotite at Sudbury, Canada, while minor supplies come from numerous sources elsewhere abroad. In considering the future of nickel steel, it must not be forgotten that the supplies are limited and that the steel maker must compete with the nickel plater and many other of our craftsmen for their possession.

Of chrome ores, in their mineral origin very closely related to the ores of nickel, there is a much greater but still limited supply, and for those of high grade (35 per cent. chromium and upward) the chemical manufacturer is a formidable competitor. Turkey, New Caledonia, Australia, India, Canada, Rhodesia and many other places yield supplies of this ore, the mineral being more widely distributed in appreciable quantities than nickel. In the event of chromium being required by the steelmaker in greater quantity, there are large reserves still available, but the cost of transport will always maintain the price of these ores at a high level.

A much cheaper source for the steelmaker, when the problem of their reduction has been solved, lies at hand in the iron-chrome-nickel ores which, as already mentioned, are found by hundreds of millions of tons in Greece and Cuba, and other chromiferous iron ores in Tasmania and elsewhere.

Tungsten, vanadium and molybdenum are all of rare occurrence in nature, and we have no reason to believe that they will ever be otherwise, so that their use must be confined as at present to limited amounts in special steels. Tungsten is one of the heavy metals, representing nature's final efforts when fashioning the elements, and when alloyed with steel in small quantities imparts remarkable hardness and magnetic qualities. Its chief ores, wolfram and scheelite, are found in veins and pockets in the primary rocks, and its supply will depend on the extent to which general mining operations are carried on in such rocks, but it can never be plentiful. The same remarks apply to the mineral molybdenite, the chief source of molybdenum, our supply of which is derived principally from workings in the granites and gneisses of Norway.

Vanadium is a scarce metal of quite another kind, which owes its present distribution on the earth's surface, like iron and manganese, to its solubility in ordinary waters. Traces of it are comparatively widely distributed. It is found in our Jurassic iron ores, having been noticed in those of Cleveland and Wiltshire. Its ores are, however, of somewhat rare occurrence, and the steelmaker is at present dependent mainly on supplies from distant Peru, where veins of a rather uncommon mineral, "asphaltite," appear to have captured and fixed a considerable quantity of this too soluble and elusive metal. It is interesting to note that these deposits occur also in sedimentary rocks of Jurassic age.

Higher Grade Steels to Come Into Use

This concludes my review of the ore supplies, to which I now propose to add a few remarks and reflections on the future of the steel industry as suggested by the above consideration of our supplies of the raw materials. Without trespassing on the province of Messrs. Wells and Kipling, I think I may venture to say that the age of steel, that is, carbon steel, has reached its zenith, and that progress, in the guise of our leading engineers, calls urgently for a new or improved metal for many industrial purposes. I do not suggest that we are on the eve of any sudden or great metallurgical revolution; the change will be gradual and unnoticed, as is the steady replacement of acid steel by that of basic manufacture now going on, for iron must, I think, remain the base of the coming alloys within that period of the future with which we have any present concern.

These premises and others which I shall shortly enumerate must all influence our calculations when we attempt to estimate the rate at which our ore supplies may be expected to be drawn on in future, and the probable direction in which our steel industry may be expected to expand. The other considerations I have in mind are the effect which will be produced on our trade by the development of the iron and steel works already established in Canada and India, and those which will follow in the near future in Australia, New Zealand and others of our colonies possessing the necessary mineral supplies.

China, possessing these supplies in unusual abundance, may also soon be expected, either alone or under Japanese tuition, to establish her own steel industry and become an active competitor in the Eastern markets.

The rapid extension of the use of ferro-concrete must also make its effect felt in reducing the demand for much structural metal which it replaces.

Then there is the ever-increasing amount of scrap metal returning to be used again. This in railroad metal alone must already be a considerable item—though I know of no statistics available on the subject—and in the future, with the spread of railroads and of steel works over the earth's surface, must become still more so. The extent to which the present drain on the iron ore resources may be relieved in being shared by other metalliferous minerals, depends evidently on the course of invention and discovery, which cannot be foretold. We have practically reached the limit of usefulness to which steel and our other present constructive metals can be applied, and we await the advent of the man who will lead us on our way to the next stage in the world's advancement.

MANGANESE AND NICKEL-CHROME STEELS.

It is very evident that any metal which is to share the future burden with iron, must itself be available

in sufficient quantity. I have endeavored to show that the ores fulfilling this condition are comparatively few, and that manganese easily stands first, with its very large supplies of manganese and manganiferous iron ores of every possible grade, since the available supply of the manganiferous iron ores immeasurably exceeds those I have reviewed of the richer class of ores of this metal. Hadfield, more than 20 years ago, surprised the metallurgical world with the announcement of the wonderful properties of steel when alloyed with 10 to 15 per cent. of manganese, but this manganese steel, acclaimed by Pourcel as the "King of Metals," has remained in comparative obscurity, and of greatly restricted use, because of certain difficulties of manufacture and treatment, which no one seems to have made any serious effort to overcome.

It remains a costly metal for special uses only, made from the most expensive of manganese ores and alloys, because no one apparently can yet be found with the genius necessary to control the carbon contents of the various manganese-iron alloys. Is it not time that some voice more influential than mine should again be raised to cry "Wake up, Britain!" if we are to maintain our position as leaders and pioneers in the metal world? Steel alloyed with chromium and nickel, either together or separately, has proved to have valuable qualities, and if by direct reduction the great stores of the three metals present in the ores of Greece and Cuba, already referred to, can be utilized, such steels can be provided in considerable quantities and at much cheaper rates than at present.

The success said to have attended recent experiments in alloying steel with Monel metal (a nickel-copper alloy), suggests that the division set up between iron and the non-ferrous metals may shortly have to be removed, and copper may be called to our aid to provide the necessary ferrous alloys of the future. As copper is a metal very widely distributed in nature, and is becoming more plentiful every year, with fresh discoveries constantly made, there may be found much useful work for it among the ferrous alloys.

There remains only aluminium among the commercially available metals to be considered. This metal, the ores of which are provided by nature in the greatest abundance, seems destined in the future to play a more important part in the metallurgical world, and we frequently hear of alloys of aluminum which are to "replace steel," the latest, announced quite recently, being "Duralumin," which, however, has yet to make good its claim.

The true significance of the magnetic qualities possessed by Heusler's alloy of manganese, aluminum and copper may not yet be apparent, but it at least suggests that these metals, together with iron and nickel, form a quintet meriting the very careful attention of our experimental metallurgists.

To those of our younger members furnished with a modern technical training and imbued, as they must be, with ambition and enthusiasm for their work, I commend these several problems, the material prizes for the solution of which are of no mean value, while the names of those who succeed will go down to posterity with those of Bessemer, Siemens, Thomas and others, as men who have shown themselves leaders in the march of progress, worthily upholding their country's fame.

The Woodward Governor Company's New Quarterly.—The Woodward Governor Company, 201 Mill street, Rockford, Ill., has commenced to issue a new quarterly house organ, entitled *Power Control*. The first number has 16 pages and contains matter of considerable interest to electric plants, cotton, paper and textile mills and all users of water power in general. A brief historical account of the organization of the company is given and attention is called to the necessity of using water wheel governors. There is a brief description of the plant of the Park Rapids Mill & Elevator Company, Park Rapids, Minn., where a type C Woodward compensating governor is installed. A new type of relief valve for pipe lines is described and completes the quarterly.

The Stana R Adjustable Reamer

The Standard Tool Company, Cleveland, Ohio, has recently added to its line a new adjustable reamer, known as the Stana R. This tool is said to have been brought out in response to a growing demand for an adjustable reamer that is simple in construction, readily adjusted to compensate for wear and at the same time solid enough to stand the most severe service. These features are claimed to be developed to the highest degree in this reamer, which is made in both the hand and the shell types with either carbon or high speed steel blades. Fig. 1 shows the shell type of reamer, while Fig. 2 is a view of the hand type.

The body of the reamer is made of hard, tough machinery steel, and the blades are unequally spaced around its circumference which prevents chatter and

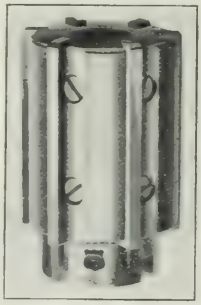


Fig. 1.



Fig. 2.

New Stana R Shell and Hand Reamers Made by the Standard Tool Company, Cleveland, Ohio.

insures a smooth hole. Each blade is held rigidly in place by heavy screws, having specially shaped heads that are countersunk into the body of the reamer deeply enough to prevent them from being loosened or damaged by accidents. The screw heads engage in V-shaped slots that are milled into the face of each blade. This construction not only seats and holds the blades rigidly against the bottom and back of the slot in the body, thus eliminating any tendency to spring, but it is claimed prevents absolutely any endwise motion.

After the blades are worn and need to be reground or when it is desired to increase the cutting diameter the blades can be taken out by removing the screws, and the diameter increased by placing a liner of some suitable material and the desired thickness, preferably tin foil, evenly in the slots under the blades, after which the reamer is ground to size in the usual way. The blades can also be ground with end clearance for chucking or machine reaming, as they extend a sufficient distance beyond the body to permit this being done. As will be seen, the blades can be adjusted many times. When completely used up the substitution of a new set of blades makes a new reamer to all intents and purposes.

Nutter & Barnes Metal Cutting-Off Machines

Rapid and Economical Production Characterizes the New Types

Two new machines for cutting metal have been developed by the Nutter & Barnes Company, 326 A street, Boston, Mass., and are illustrated herewith. Fig. 1 is an 8-in. metal saw cutting-off machine and Fig. 2 shows an elastic wheel metal cutting machine.

The special advantages claimed for the former machine are a large drip pan surrounding the base and an oil reservoir of ample size inside. The drive is of the central spur gear type throughout and all the driving gears and shafts, with the exception of the main driving gear wheel and the back gears, are of forged crucible carbon machinery steel. The main driving gear is 18 in. in diameter and has a 2½-in. face. The gears connecting with the saw spindle are of 5 pitch, have a 4-in. face and run in phosphor bronze bushings. The saw spindle is 3 in. in diameter and 16 in. long. Its nose measures 1⅜ in. and there are four ½-in. driving pins.

The feed drive is of the combination sprocket chain and gear type with four changes, ranging from ½ to 2 in. per minute. The gears furnishing the changes are contained in a gear box that is mounted on the feed brackets at the rear of the machine. The sprocket on the feed driving shaft is located between two friction disks, which normally hold it in place, but will allow it to slip if too great a load is applied to the feed or the stop is not set to trip at the right time. A foot lever at the front of the machine, which is not shown, engages the feed, and the treadle rod connected to the lever extends through to the rear of the machine near the oil supply tube and operates on the worm shaft meshing with the feed worm wheel.

The maximum capacity of the work shoe, which is 30 in. from the floor, is 8-in. round stock, but by removing this shoe, a bevel gauge can be used on the plain table for cutting flats, squares and structural shapes at an angle.

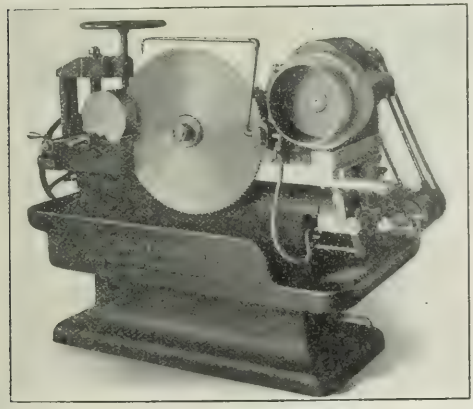


Fig. 1.—An 8-In. Metal Saw Cutting-off Machine Made by the Nutter & Barnes Company, Boston, Mass.

The principal dimensions and specifications of the machine are given in the following table:

Face width of saw spindle gears, inches	4
Pitch of saw spindle gears	5
Diameter of saw spindle, inches	3
Length of saw spindle, inches	16
Diameter of main driving gear, inches	18
Face of main driving gear, inches	2½
Ratio of back gearing	43 to 1
Length of carriage, inches	22

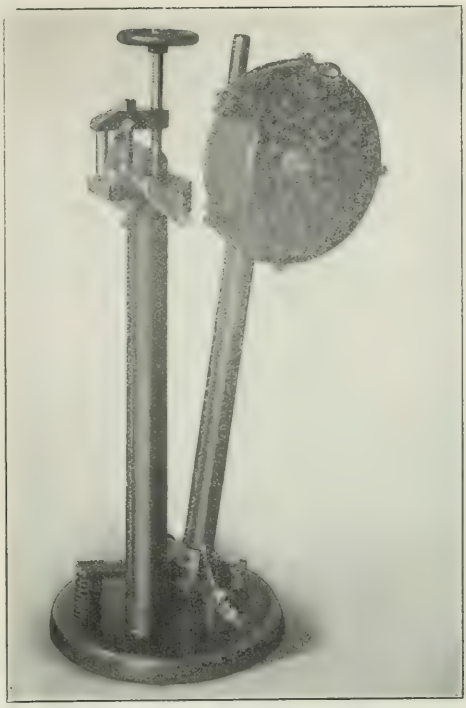


Fig. 2.—The Nutter & Barnes Elastic Wheel Metal Cutting Machine.

Width of carriage, inches	17
Movement of carriage, inches	9
Hight of work shoe from floor, inches	30
Diameter of saw, inches	22
Thickness of saw, inch	3/16
Depth of cut, inches	8
Number of speeds	2
Size of plain table, inches	18½ x 13
Diameter of countershaft pulley, inches	14
Face width of countershaft pulley, inches	4½
Floor space, inches	30 x 56
Net weight, pounds	2,500
Shipping weight, pounds	3,000

Two saw speeds are available from the two-step cone pulley, and if this is not used, the back gears provide the same number. The diameters of the cone pulley steps are 10 and 12 in. respectively and the face width of both is 3½ in. The regular equipment of the machine includes one 22-in. saw, an oil pump for supplying lubricant to the saw and a stock support with an adjustable screw elevation, as well as the tools usually supplied.

The metal-cutting machine shown in Fig. 2 is designed to cut off pipe and tubing 3 in. or less in diameter and solid pieces up to a maximum diameter of ¾ in. It is said that the material can be either hard or soft steel, and that the harder it is the better. The cutting is done by an elastic wheel, 12 in. in diameter and 3-32 in. thick, which runs at a speed of 3,000 rev. per min., bearing against the material which is held stationary in the V work shoe. This is claimed to be a decided advantage, especially on long pieces.

It is stated that this wheel does not require any sharpening and is swung forward for cutting by either the right or left hand or foot, as both a handle and a treadle are provided. The spring attached to the treadle returns the wheel to its idle position when the cut is completed.

Furnace A of the Tonawanda Iron & Steel Company, Tonawanda, N. Y., went out of blast November 19 for relining.

Heat Changes in Structural Materials

Relation of Temperature to Tensile and Compressive Strength

James E. Howard, engineer physicist, Bureau of Standards, Washington, D. C., read a paper before the National Association of Mutual Insurance Companies at Peoria, Ill., September 28, 1910, which was part of a general discussion on "Fire Waste and Its Prevention." In introducing the subject, Mr. Howard said that to obtain exact knowledge on the action of heat on building materials as a basis for judging of the

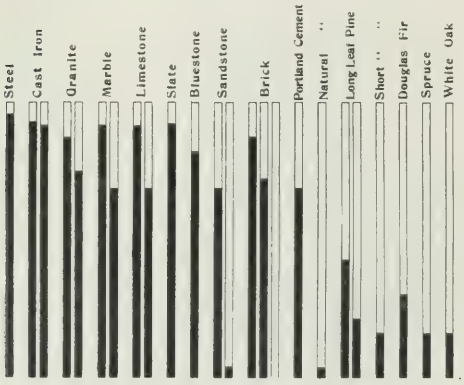


Fig. 1. The Relative Rigidity of Structural Materials.

manner in which losses or injury may be averted, involves a large amount of laboratory work and the collection of data through the careful observations of insurance authorities. From the portion of the paper in which comparisons are made between steel and cast iron on the one hand, and other building materials, we make the extracts below. Mr. Howard also gives diagrams and comment bearing on the relative permanent expansion of different building stones after heating to a temperature of 400 to 440 degrees F.; the loss in water and carbon dioxide, of ground hydrated cements when heated to different temperatures, and the heat conductivity of Douglas fir:

Progressive Effects of Heat on Strength

It is recognized that heat is capable of destroying the integrity of any and all structures, but that each of the materials of construction is capable of enduring in some degree exposure to high temperatures, and that a study of their physical properties under conditions which may be encountered is essentially the foundation on which intelligent efforts for the prevention of fire losses must rest. The first manifestation which is noticed when a rise of temperature occurs is the expansion or increase in volume of the material. Simultaneously therewith the strength and certain other properties may undergo a modification, at first apparent only through critical examination, but eventually as higher temperatures are reached the effects become menacing and finally destructive. Chemical changes occur in some of the materials of construction as well as physical.

Not only is a high temperature menacing, but the rate of change is also detrimental to some classes of materials. Not so, perhaps, if the temperature of the entire mass changed rapidly, but with low conductivity and a friable nature injury may result from internal strains. Furthermore, the proper distribution of stresses in a structure may be so disturbed by reason of parts thereof being heated that cases of overloading may occur, even to the limit of failure. In any change toward high temperatures there is, in fact, a tendency in the direction of ultimate injury, although a moderate change is of no particular account. But what constitutes a moderate change is nevertheless different in different classes of structures. Changes in temperature unnoticed in a building must be provided for in a bridge, therefore an unqualified statement on the subject is difficult to make.

A property of materials similar to that of expansion or contraction by changes in temperature is that of extension or compression by reason of changes in load. This rate of change, or, in other words, the modulus of elasticity, presents a wider range in values in different structural materials than the co-efficients of expansion by heat. So far as known, however, these two values bear no relation in common to each other.

As temperatures increase the metal portions might at times be the first to undergo a change in strength and rigidity, assuming those portions were accessible to the flames. But again the rate of change may be the controlling factor, and it becomes necessary to assume that slow heating occurred, a condition not often realized in a conflagration.

Before the ultimate strength of any part of a structure is reached there may have been so decided a modification in the distribution of the loads by reason of the successive changes which have prevailed, that the final appearance is not necessarily indexical of the primary cause of failure. So many reservations are necessary in any general statement that further remarks of this kind will be suspended and a number of diagrams presented on which are shown features of the physical properties of structural materials which have a bearing upon the subject.

Relative Rigidity of Materials of Construction

Diagram No. 1 shows the relative rigidity of structural materials. Steel has the highest modulus of elasticity of any of the materials used, and its relative rigidity is indicated in the open space above the full line at the left-hand side of the diagram. The several open lines above each of the solid ones represent in turn the relative extensibility or compressibility of the materials named on the diagram, based upon their respective moduli of elasticity. Three values pertain to

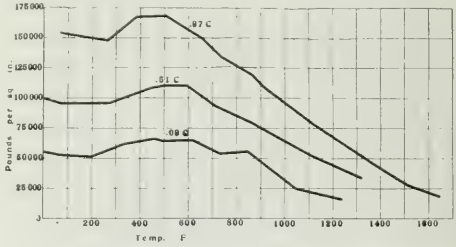


Fig. 2.—Tensile Strength of Steel at Different Temperatures

the materials when stressed by comparatively low loads, or within their elastic limits. Two values are given for cast iron, and two for each of several other kinds of material, while for brick three are shown, representing hard, light hard and salmon brick. In the case of long leaf pine the difference usually found between the tops and the butts of the trees is indicated by the two open lines of the diagram.

The significance of the lines on the diagram is this: If each of the materials represented thereon were loaded by compression with the same load per square inch of sectional area, then their shortening in hight would take place relatively as here indicated for columns originally all of the same hight. That is, a load applied to a steel column of such a hight that its total

compression would amount to 1 in., and such a column of steel need only be 80 to 90 ft. high, then the same load applied to a cast iron column would shorten it from 1⅝ to 2 in. To carry this comparison to the other materials a lower stress per square inch would need to be considered than contemplated in the case of steel and cast iron.

But on a suitable basis of comparison the load which would shorten a steel column a given amount would shorten a monolithic column of hard brick three times as much, and if made of salmon brick 60 times as much Neat Portland cement is seven and one-half times as compressible as steel. Sandstone from 7½ to 25 times as compressible, and so on for the other materials as indicated on the diagram.

It must not be forgotten, however, that the results on the diagram refer to the compression of the materials within their elastic limits. It is quite a different matter when considering overloads which cause permanent sets.

Tensile Strength of Steel at Different Temperatures

Diagram No. 2 shows the curves of tensile strength of three grades of steel when at different temperatures. Over the range of atmospheric temperatures steels are strongest when cold at zero F. At lower artificial temperatures the strength is greater still. At about the temperature of boiling water the strength reaches a first minimum, after which it increases to the crest at a zone in the vicinity of 400 to 600 degrees F., after which there is a steady drop until the metal becomes plastic, at a bright red or yellow heat.

It appears from the best evidence available that the curves of elastic limits would not follow those of tensile strength, but show a gradual drop throughout as the temperature rises.

Expansion of Confined Materials

Diagram No. 3 shows the predicted expansive force which would be developed by confined materials when the temperature is raised. The figures on the diagram are based on the moduli of elasticity and the co-efficients of expansion of the materials. A range in temperature of 160 degrees F. was used, since this change in temperature will cause an expansion in a steel bar equal in amount to the extension which it will display under a stress of 30,000 lb. per square inch—that is, equal to the extension of a piece of mild steel at its

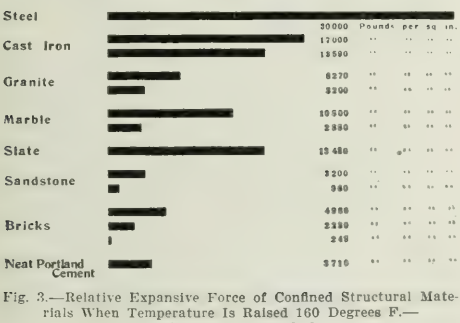


Fig. 3.—Relative Expansive Force of Confined Structural Materials When Temperature Is Raised 160 Degrees F.—Approximate, Predicted Values.

elastic limit. Steel pre-eminently leads in many of the physical constants, and as here compared has a value quite beyond the other materials of construction.

The harder varieties of stone appear capable of developing an expansive force considerably above the softer stones of the same kind, which is due chiefly to the differences in their rates of compressibility under stresses.

Three predicted values are given for brick, to represent the behavior of hard, light hard and salmon brick. The very low value for salmon brick is significant. No results are presented on firebrick, but their properties resemble the under burnt building brick in this that firebrick are quite compressible. They successfully resist the effects of heat, in part because of the readiness with which they are compressed. Conversely, firebrick would not be expected to display a high expansive force when confined.

Lime mortar is very compressible, and makes a good cushion in a wall for the stronger brick to act upon when heated. These expansive forces must be guarded against or may be neglected according to the kind of material or its position in the structure. It will be noted that the range in temperature here considered, only 160 degrees F., is an exceedingly limited one; if, however, these predicted values are approximately

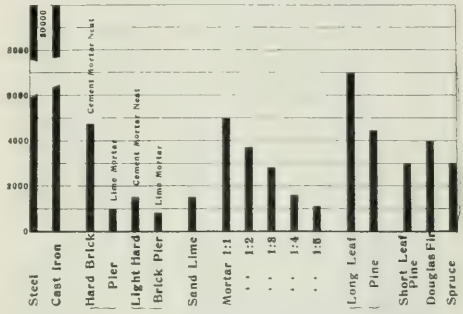


Fig. 4.—Compressive Strength of Columns of Different Structural Materials.—Steel and Cast Iron at 30,000 Lb.

reached the gravity of thermal changes in causing disrupturing forces may be realized.

Compressive Strength of Columns

Diagram No. 4 shows the compressive strength of a group of columns of different kinds of structural materials. The compressive strength of steel columns is given at 30,000 lb. per square inch, an ordinary strength for structural steel. It may vary from this according to the grade of steel used, lower or higher according to the elastic limit of the metal, and modified by the workmanship. The compressive strength of cast iron columns has been found in the vicinity of 30,000 lb. per square inch also. This metal occasionally gives higher results, and at times lower. The uncertainty of having an unsound casting is a source of trouble and detracts from the reliability of cast iron.

The strength of individual brick greatly exceeds that of brick when laid in piers. This is due largely to the grade of mortar employed. Hard burnt brick frequently range in strength from 15,000 to 20,000 lb. per square inch when tested singly and an exceptional shale brick was found to possess the phenomenal strength of 38,000 lb. per square inch.

In piers, however, a compressive strength of 3000 lb. is a very good one, although when a hard brick is laid in neat cement a resistance between 4000 and 5000 lb. may be displayed. The same grade of brick in lime mortar will develop only about 1500 lb. per square inch ultimate strength. Light hard brick show less difference in strength whether laid in neat cement or in lime mortar. They develop lower strength than the harder brick, and being nearer the strength of the lime mortar the cushioning of the mortar is more favorable relatively. Provided the stronger brick could be laid in mortar having nearer the characteristics of the brick than a much higher strength might reasonably be expected. Sand lime brick range in strength from 1500 to 3000 or 4000 lb.

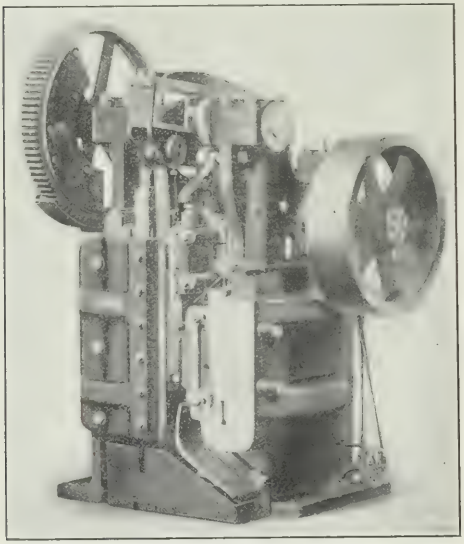
The strength of mortar composed of Portland cement depends upon the richness of the mixture. The diagram illustrates the range which may be expected in mortars from a one and one mixture to a mixture

containing 1 part Portland cement to 5 parts of sand. The rigidity of these mortars is approximately in proportion to their strengths. The strengths of concretes follow about the same as that of the cement mortars. The addition of the stone has been found not to modify the ultimate strength over wide ranges. Some examples have shown a slight loss in strength of the concrete over that of the mortar used without the stone, and illustrations of the opposite kind may also be found.

Occasional sticks of long leaf pine are found which develop the maximum strength plotted on the diagram, but a common strength is in the vicinity of 4000 lb. per square inch, while 3000 lb. is an ordinary value for short leaf pine. Douglas fir has generally a compressive strength of about 4000 lb. per square inch. These values are such as may be found, but the wide range in ultimate strength which is displayed by structural materials makes it necessary to consider specifically the properties of those materials which are actually to be used when judging of the strength of any particular structure.

New National Vertical Roll Thread Machine

Among the machines demonstrated at the recent exposition of bolt, nut and forging machinery at the



The Vertical Roll Thread Machine Built by the National Machinery Company, Tiffin, Ohio.

plant of the National Machinery Company, Tiffin, Ohio, August 19 to 23, 1910, referred to in *The Iron Age*, August 4 and September 1, was a vertical roll thread machine. The machine is built in three sizes, with maximum capacities for rolling threads 1 in. in diameter by 3 in. long, ½ x 4 in. and 2 x 4 in., although intermediate diameters to 6-in. lengths can also be rolled. The special feature of this machine is that the blanks are fed into the dies horizontally, so that work of any length can be handled.

In this machine long rods can be threaded as well as bolts. The present day practice in cutting threads on the ends of rods is either to upset the ends of the rod or else use one having a larger diameter in order to secure the necessary strength in the threaded portion. Thread rolling possesses the advantages of great savings in labor and material since stock smaller in diameter can be used without impairing the strength of the thread, as recent tests made by the Franklin Institute demonstrated that the strength of a thread formed by rolling is equal to that of the shank of the bolt or rod itself.

In addition to enabling all lengths of work to be handled, the feature of feeding the stock to the dies horizontally gives a frame that is very rigid and occupies a minimum amount of floor space, while the ability to flood the dies which have their grooves in a vertical plane with lubricant insures thorough cleansing of the thread and increases the life of the die. A Scotch yoke gives a slow downward stroke and a quick return to the reciprocating die slide, which is backed by a train of hardened steel rollers actuated by a series of racks and pinions. This type of bearing reduces the friction to a minimum, as well as the wear of the moving parts and the power required to operate the slide. The die box is stationary, and has wedge adjustments that are easily accessible from the front of the machine and permit very minute adjustments to be secured.

The friction slip flywheel which was a feature of the improved forging machine that was illustrated in *The Iron Age*, November 3, 1910, is employed on this machine also. The flywheel acts as a relief to the machine, and if the dies loosen through neglect on the part of the operator or any other accident should occur to prevent a full stroke from being made, it slips between the friction disks. In this way the momentum of the flywheel is dissipated, and the strains and damage attendant on a rigid flywheel eliminated.

In operation a single blank lies upon a rest or feed bar, and the starter which is actuated by a cam on the main shaft inserts the blank into the gap between the dies at the proper time and presses it against a gauge. The feed bar then automatically backs out of the dies and returns to its original position where it picks up another blank. The movement of this bar is always parallel to the face of the dies, and the starter aids to insure the blank being correctly inserted. Both the rest and the starter are capable of adjustment for handling various diameters of blank within the capacity of the machine.

The lubricating system is of the force feed type, and keeps the dies continually flooded with lubricant. This keeps the dies free from scale and dirt, which increases the life of the dies and insures a better finished output. After cleansing the dies the lubricant returns to the reservoir to be used over and over again.

The Cote Steel Tie.—George M. Cote, 714-15 Curry Building, Pittsburgh, Pa., has perfected a new form of steel tie, on which he has been working for over three years. The tie is pressed from a cold plate by hydraulic machinery, making the process of manufacture ideally cheap. Adjustable fasteners clamp the rail in place. The design of the tie has been shown to a number of leading railroad representatives, who have expressed themselves in a manner very satisfactory to the inventor. He is arranging to form a company to erect a plant for the manufacture of the tie and its appliances. Mr. Cote has been in the lumber business 27 years, furnishing railroad companies with ties, and not only understands railroad requirements in this respect, but also fully appreciates the scarcity of lumber and the desirability of furnishing railroads with a satisfactory substitute for the wooden tie.

The Carnegie Steel Company, Pittsburgh, has recently shipped the material for a new steel frame saw mill to be built by W. T. Carter & Bro. at Camden, Tex., which will be the first of this new type of construction in the Southwest. The incident is notable for the reason that it illustrates the opening up of a large new field for structural steel and the apparatus used for its erection in one of the country's most important industries.

The Schuchardt & Schütte Thread Miller

An Automatic Machine for Rapidly Producing Large Screws and Spur Gears

The practice of cutting screw threads on the engine lathe while it is the commonly accepted standard is said to be open to the objection that the work turned out is not absolutely accurate. The advancements and improvements made in the construction of modern machine tools by which it is possible to mill the threads so that they are correct within the smallest allowable amount of error has led Schuchardt & Schütte, West Street Building, New York City, to design a thread milling machine. Fig. 1 is a front view of the machine showing a thread being cut and Fig. 2 shows the drive and the change gear box. In both engravings the same reference letters have been used to indicate the same part with a view to making their location easier.

The special advantages claimed for these machines are that they will cut a thread within the closest limit of error at a fraction of the cost of doing this work in an engine lathe and a capacity of from two to eight times that of a lathe. This latter feature is most noticeable when cutting multiple threads with high leads. Although designed for milling threads, the machine can also be used for cutting spiral gears with extreme angle of teeth up to a maximum diameter of 10 in. For the regular work of thread milling, the range of work handled includes both right and left hand threads with angles up to 45 deg. and leads up to 20 in.

The machine is entirely automatic in operation. The drive is from a countershaft to the cone pulley shown in Fig. 2. From this point the rotation of the cutter H and the blank G are accomplished by differ-

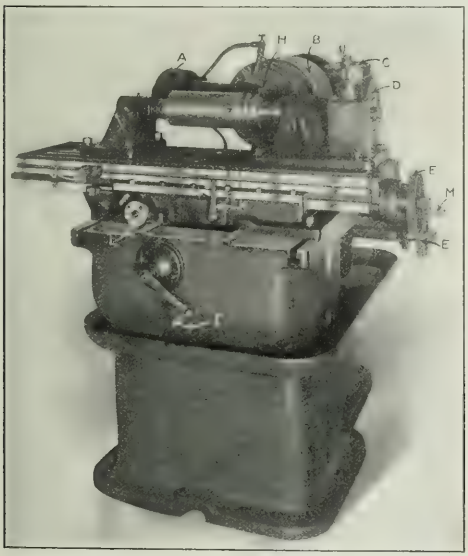


Fig. 1.—Front View of a Large Automatic Thread Miller Built by Schuchardt & Schütte, New York City.

ent means. The cone pulley shaft drives the cutter spindle through two sets of bevel gears, one in the front part of the case B and the other at the point A, Fig. 1. This spindle is set at a fixed angle of 12½ deg. to the axis of the work and it is stated that this angularity permits a greater driving gear ratio, brings the work closer to the cutters and enables smaller cutters to be employed. A vernier which is not clearly shown in the engravings is used to set the cutter at the proper angle in the vertical plane for the various angles of threads.

The rotation of the blank and the table feed are accomplished through the chain running over the two sprockets at the rear of the machine, Fig. 2, and the gear box N. The upper of these sprockets is driven through spur gearing from the cone pulley shaft and the lower one drives the gear box. This is of the

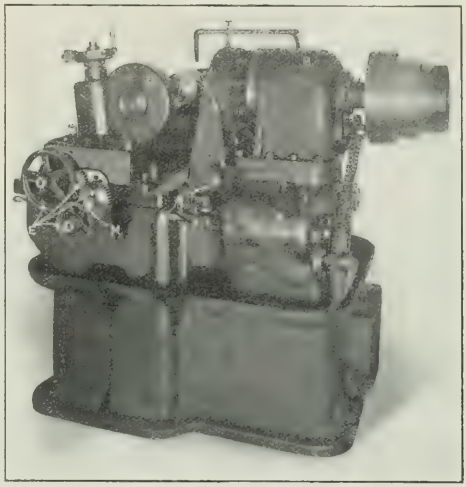


Fig. 2.—End View Showing the Drive and the Change Gear Box.

three-shaft type with sliding gears which have their movements regulated by the two cranks O and P. Twenty feed changes in all are available through the movement of these two cranks in combination. From this gear box, motion is transmitted through bevel and worm gears to the table lead screw. The spindle drives the indexing head C through a set of worm gears in the case D, having a ratio of 40 to 1. The change gears E provide for the various threads to be milled. The movement of the table toward and away from the cutter is controlled by the crank I and the longitudinal movement is regulated by the position of the dog J which strikes against the lever K and trips the feed. In conjunction with the change gears the number of threads milled per inch is regulated by the number of turns given to the indexing head, while for special threads recourse is had to an independent adjustment, L, which meshes with the worm on the spindle. The quick return crank fitted to the square nut M on the end of the lead screw enables the table to be rapidly shifted by hand.

Two sizes of machine are built, the smaller being the one illustrated, and the accompanying table gives the principal dimensions and specifications of both:

	No. 1.	No. 2.
Maximum diameter of blank, inches	9	12
Maximum length of thread, inches	16	20
Minimum lead, inches	1/4	1/4
Maximum lead, inches	20	20
Divisions up to, inches	1 15/16	2 3/4
Maximum angle of thread, degrees	45	45
Diameter of hole through spindle, inches	1 5/16	1 3/4
Minimum distance between cutter and work arbor, inches	2 1/4	2 3/4
Diameter of hole in cutters, inches	1 1/16	1 1/16
Minimum feed per revolution of cutter, inches	0.01299	0.01299
Maximum feed per revolution of cutter, inches	0.05236	0.05236
Diameter of countershaft pulleys, inches	12 and 8	18 and 10
Belt width, inches	3	3 1/2
Net weight, pounds	3,000	4,700

The equipment regularly furnished with the machine includes a countershaft, one work arbor 1¼ in.

in diameter, the pump and fittings for an automatic water supply, a complete set of wrenches and the other accessories necessary to operate the miller. A special head spindle having a hole with a maximum diameter of 3¼ in. to accomodate shafts passing through can be furnished as an extra.

The Taylor Gravity Underfeed Stoker

An Improved Boiler Firing Device for High Combustion Rates

The American Ship Windlass Company, Providence, R. I., has developed the Taylor stoker to dispose of ashes and other refuse rapidly. This makes it possible to burn the large quantities of coal which are required when boilers are operated at double their rated capacities, and by maintaining intense fires and rapid circulation to concentrate the load on a few units with the resultant minimizing of loss, a condition which undoubtedly conforms to what may reasonably be expected to be the boiler practice of the future. The disposal of the great amount of ashes which results from high combustion rates is generally difficult, but has been made somewhat simple in the Taylor stoker by feeding the coal beneath the surface of the burning fuel. This feeding is done at an angle to the surface of the fire with the result that gravity carries the consumed coal to the dumping plates at the rear of the stoker and also aids in distributing the fresh fuel, these features giving the stoker the name gravity underfeed.

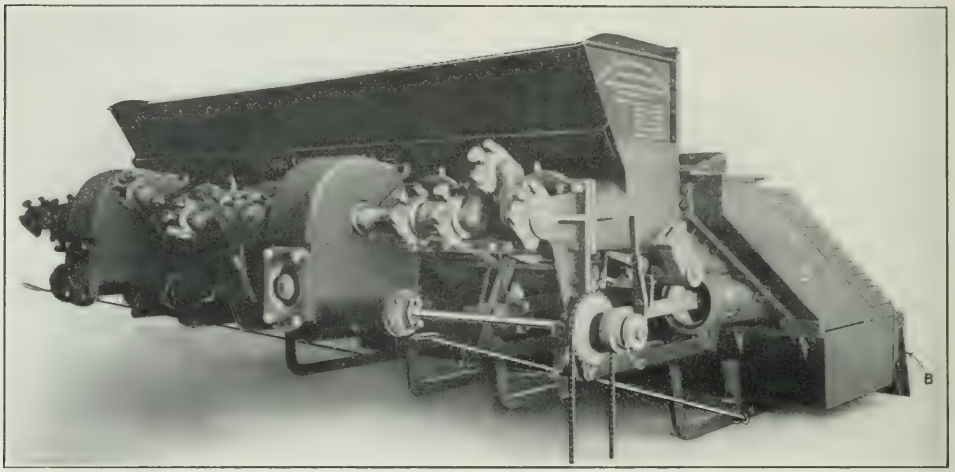


Fig. 1.—Front View of the Taylor Stoker Made by the American Ship Windlass Company, Providence, R. I.

The fundamental features of the design of this stoker have remained unchanged since its inception, because the importance of removing the combustion wastes rapidly was recognized when the first stoker was placed on the market. It is claimed for this stoker that it will burn more coal than any other, because of the great refuse handling capacity of the device. Fig. 1 is a front view of the stoker, with the principal parts indicated by reference letters, and Fig. 2 is a longitudinal section through the fire, showing the mechanism by which the fuel feeding and removal of the ashes is accomplished. It is in the construction and operation of this mechanism that the principal changes made necessary by the demand for stokers of increased capacity have been made.

As the stokers were originally built, each of the series of lower rams, A, was directly connected to the bell crank operating the upper plunger, and the stroke of these lower plungers had to be adjusted for each separate retort. In the new type, while the travel of the upper row of rams that assist gravity by pushing the coal into the fire is constant, the length of stroke of the lower set can be simultaneously increased or diminished at will. When the dumping plates B have been dropped it is frequently desirable to push the refuse out more rapidly than usual, and at other times when it becomes necessary to get rid of the refuse that has collected in the lower part of the furnace, the travel of the plungers is increased temporarily and subsequently restored to its original length.

A type of pantograph lever connection having a cam and balance weight on the upper member, as shown in Fig. 2, controls this variation in the travel of the lower plungers. The cams are pivoted to the connecting rods and are connected by chains, lever arms and a shaft to the operating handle at the center of the stoker. When the stroke is to be altered, the adjusting lever is dropped. This releases the cams and allows them to assume a horizontal position, thus lengthening the stroke of the plunger. If the vertical connection of the bell crank lever is in a position that prevents the cam from dropping, the latter remains at rest until the connection has moved backward. Then

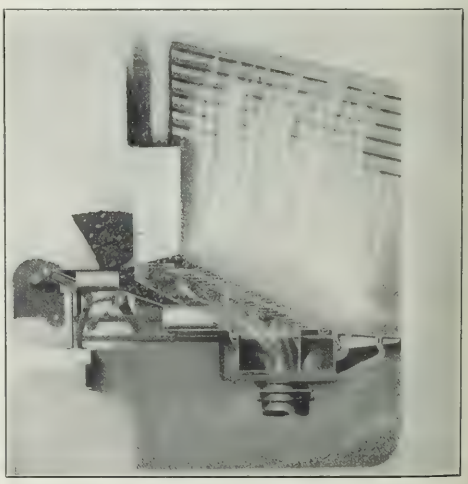


Fig. 2.—Longitudinal Section of the Stoker Through the Fire.

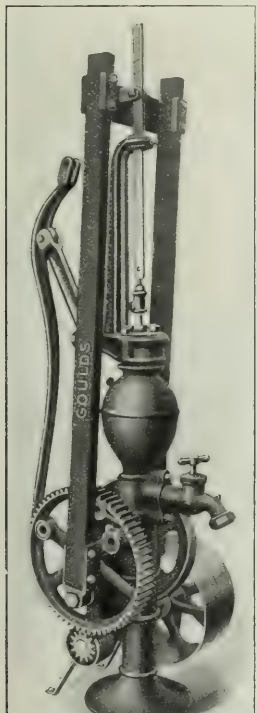
the counterweight falls, and the cam is carried into position.

Two other improvements are the relocation of the speed shaft sprocket and the alteration of the dumping plates. The speed shaft sprocket is now placed at the right end of the stoker together with the clutch C, Fig. 1, and the face plates which hold the shearing pin on the outside. This change is said to facilitate replacing shearing pins when necessary, and the throwing of the stoker on or off the line, while at the same time the connection to the fan shaft is improved. The dumping plates in the earlier types were cast in one piece, but now they are made in independently renewable sections which facilitate the making of repairs and lessen their cost.

Other minor improvements which tend toward simplicity, more certain operation and a reduction in the expense of making repairs are the use of lock nuts in all places where the jar might cause fastenings of the ordinary type to work loose, an increase in the size of the gears in the gear boxes and the shafts and bearings and the employment of body bound bolts to connect the crank shaft brackets to the ram boxes. The cast iron ram boxes and the tuyere boxes D are now carefully doweled together to insure a better connection.

A New Goulds Pumping Jack

A new geared power attachment for operating any windmill pump standard by belt drive from a gas or gasoline engine, electric motor, water wheel, &c., was recently placed on the market by the Goulds Mfg. Company, Seneca Falls, N. Y.



A New Pumping Jack Made by the Goulds Mfg. Company, Seneca Falls, N. Y.

This pumping jack is so arranged that it can be attached to any pump by clamping it to the standard near the base, disconnecting the pump lever and bolting the pitman on the windmill rod. With this arrangement the pump can be operated by the windmill, by hand, or by the engine by changing one bolt and adjusting either the pitman or the lever on the pump rod. Three ranges of stroke are available by changing the wrist pin from one to another of the driving wheel spokes.

The position of the gears and plunger rod is such that the pitman moves vertically on the upstroke, so that there is no considerable side thrust on the plunger rod. The pinion is protected by a guard. The pitman is made of wood, and the shaft is 1¼-in. polished steel. The tight and loose pulleys are 12 in. in diameter with 2½-in. face.

The Production of Plates and Sheets in 1909

The production of plates and sheets in the United States in 1909, as shown by statistics just published by the American Iron and Steel Association, was 4,234,346 gross tons, or about 12,000 tons short of the record production, that of 1907. The following table gives the output by States since 1907, in gross tons:

States—Gross tons.	1907.	1908.	1909.
New England, New York and New Jersey	126,403	58,567	119,642
Pennsylvania	2,651,166	1,531,066	2,384,185
Delaware, Maryland and Virginia	28,420	25,000	29,038
West Virginia	153,599	159,714	211,012
Kentucky and Alabama	54,631	45,473	70,639
Ohio	851,987	603,213	938,185
Indiana, Illinois, Wisconsin, Missouri, Wyoming and California	382,626	226,660	481,646
Totals	4,248,832	2,649,693	4,234,346

In 1909 there were 141 works in 17 States which rolled plates or sheets, against 117 in 15 States in 1908 and 134 in 17 States in 1907.

In the following tables the production of plates is separated from that of sheets, the product of No. 12 gauge and thicker being classified as plates and that of No. 13 gauge and thinner as sheets. Black plates, or sheets, for tinning are included, but nail plate and skelp are excluded. The figures represent gross tons:

Plates.—No. 12 and Thicker.

	Iron.	Steel.	Total.
1905	10,022	2,031,184	2,041,206
1906	23,333	2,508,219	2,531,552
1907	30,277	2,629,783	2,660,060
1908	31,679	1,239,342	1,271,021
1909	32,332	2,346,766	2,379,098

Sheets.—No. 13 and Thinner.

	Iron.	Steel.	Total.
1905	62,134	1,428,890	1,491,024
1906	51,040	1,599,564	1,650,604
1907	43,761	1,545,011	1,588,772
1908	22,354	1,356,318	1,378,672
1909	43,870	1,811,378	1,855,248

It will be seen that the production of plates last year fell off 280,000 tons from the record of 2,660,000 tons in 1907, while that of sheets was 268,000 tons more than in 1907, making a new record. The States which rolled iron or steel plates in 1909 in the order of their prominence were Pennsylvania, Ohio, Illinois, New York, Wisconsin, Indiana, Alabama, West Virginia, Massachusetts, Wyoming, New Jersey, Delaware and Kentucky. The States which rolled iron or steel sheets in 1909 in the order of their prominence were Pennsylvania, Ohio, West Virginia, Indiana, Illinois, Kentucky, New York, Delaware, Maryland, Missouri, Massachusetts, Connecticut and California. Of the total production of iron and steel plates in 1909 Pennsylvania rolled 1,631,271 tons, or over 68.5 per cent., against 980,025 tons, or over 77.1 per cent., in 1908, and of the total production of iron and steel sheets in 1909 Pennsylvania rolled 752,914 tons, or 40.5 per cent., against 551,041 tons, or almost 40 per cent., in 1908. Ohio rolled 353,177 tons, or over 14.8 per cent., of the total production of plates in 1909, and 585,008 tons, or over 31.5 per cent., of the total production of sheets.

Operation of trains and public use of the whole of the new Pennsylvania station, New York, began at two minutes past midnight of Saturday, November 26. The full schedule of trains at present consists of 61 trains westbound and 55 trains eastbound every 24 hours. These do not include the 88 eastbound and 85 westbound trains of the Long Island Railroad. Work on the tunnels was begun June 10, 1903, and the station was begun May 1, 1904, so that more than seven years have been consumed in construction. Preliminary surveys and soundings were made for two years previously.

Cutler-Hammer Alternating-Current Motor Starters

In line with the increasing use of alternating-current motors, especially in industrial plants, the Cutler-Hammer Mfg. Company, Milwaukee, Wis., has duplicated much of its direct-current controlling apparatus in alternating-current type. For single-phase motors, standard starting rheostats similar in appearance and operation to the familiar direct-current motor starting box are now on the market in sizes up to 35 hp.

For polyphase motors the three types of starters illustrated represent the latest developments. The face plate type, Fig. 1, is adapted for use with motors of moderate capacity, the standard sizes ranging from 5 to 50 hp. It is inexpensive, compact and easily operated, and can be mounted on the wall or other convenient location. The resistance is mounted on the rear and no extra wiring is needed, as where the resistance is mounted separately. The only wiring required is to connect the slip rings of the motor to the three terminals on the face plate. The contact segments are of hard drawn copper and can be easily replaced or interchanged without interfering with any interior connection.

The brushes consist of a pair of contacts at each end of the lever. The leading contact of each pair is carbon and the other copper. This is claimed to result in long wear, as the carbon takes the arc, while the copper, which has a low contact resistance, carries the current.

A latch is provided for holding the lever in the running position, but this can be replaced if desired by a no-voltage release. If the current fails the primary circuit is automatically opened and the rotor resistance re-inserted. An overload attachment can

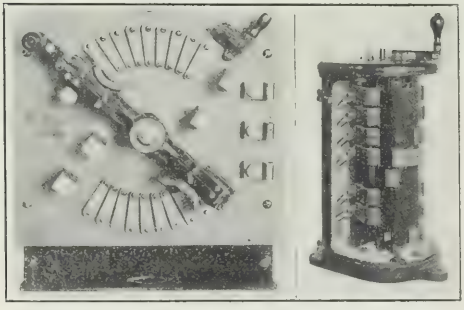


Fig. 1.—Face Plate Starter. Fig. 2.—Drum Starter.
Two New Polyphase Motor Starters Made by the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

also be provided to open the primary circuit and cut in the resistance in the secondary when the motor is overloaded.

For larger motors and in locations where dust, lint, &c., are present the drum type of starter is preferred. This, shown in Fig. 2, is made in standard sizes, ranging from 10 to 200 hp. The drums are tightly fitted and constructed to withstand severe service. The contacts and brushes are hard drawn copper and can be renewed at slight expense. The cylinder on which the contacts are mounted is built to remain perfectly true under all conditions. The terminals are arranged on the side and are readily accessible. This type of controller can be handled by any workman without danger of accidental contact with current-carrying parts. The cutting out of the resistance and the acceleration can be easily controlled.

In starting very large motors and those operating under especially heavy starting conditions the heavy currents resulting cannot be handled in the best manner by apparatus having sliding contacts. The arcing and wearing of the contacts would be excessive. For such use a device is necessary which will stand the severe service with minimum chance for wear. The multiple switch starter, Fig. 3, has the qualities of design and construction which make it especially adapted for starting large or heavily loaded two or three phase slip ring motors. The standard sizes made range from 50 to 600 hp.

Many features of the Cutler-Hammer direct-current multiple switch starter have been embodied in this

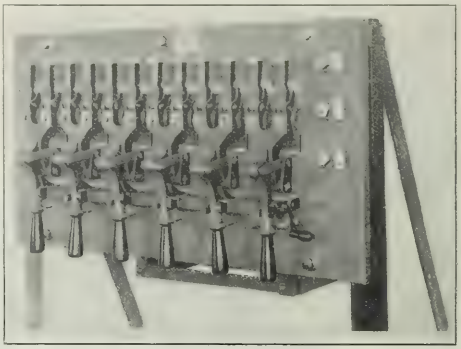


Fig. 3.—The Multiple Switch Type Starter for Polyphase Slip Ring Induction Motors.

alternating-current device. It is claimed no sparking at the switch can occur in starting, whether under load or not. The switches are not like ordinary knife switches, but are of circuit-breaker construction, making full contact instantly. Besides doing away with sliding contacts, the multiple switch starter prevents the hasty cutting out of resistance, as each switch must be closed separately, beginning at the left. The time taken insures a smooth acceleration of the motor and prevents injury due to large current inrush.

The contacts of the switches are so connected that the resistance is cut out of the phases of the secondary at the same time. The currents in the legs are therefore approximately equal and an electrical balance is maintained. The motor is started under the best conditions, each phase producing its share of the torque. This type of starter is claimed to be the most serviceable for use with large motors such as are used to a great extent in steel mills and other plants. Automatic no-voltage and overload release can be provided for opening the primary circuit and re-inserting the secondary resistance in case of failure of current or overloading of motor.

Railroad Equipment Orders.—Among recent car orders are 1000 50-ton steel hopper cars for the Carolina, Clinchfield & Ohio. The Boston Elevated is having 50 cars built by the Laconia Car Company. The New York Central is inquiring for 1000 box cars and 110 refrigerator cars. The New York Despatch Refrigerator Line has ordered 300 30-ton refrigerator cars from the Whipple Car Company, and the Pennsylvania Lines West 150 cars from the Pressed Steel Car Company. The Baldwin Locomotive Works has an order for 10 consolidation locomotives for the Seaboard Air Line. The New York Central has brought its locomotive orders for 1910 up to 323, of which 203 were for replacements. The last order was for 120 locomotives, and was placed with the American Locomotive Company. Of these 60 will be for the New York Central Main Line, and the remainder for the Michigan Central and the Big Four. The Cincinnati, New Orleans & Texas Pacific is in the market for five passenger locomotives and 10 110-ton consolidation locomotives.

New Triumph Alternating Current Generators

Special features of a new line of alternating current generators built by the Triumph Electric Company, Cincinnati, Ohio, are the thorough ventilation of all parts, and the ability to operate in parallel with machines of other make. These machines are of the stationary armature and revolving field type and are

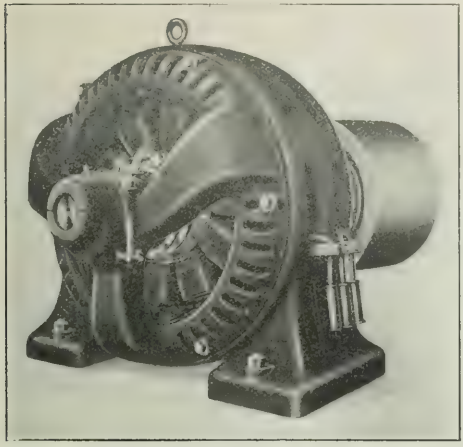


Fig. 1.—An Example of the New Revolving Field Type Alternators Built by the Triumph Electric Company, Cincinnati, Ohio.

built for either direct connection, for coupling to an engine, or may be belt driven as desired. The sizes range from 50 kw. upward and may be obtained for single, two or three phase circuits and for 240, 480, 600, 1200 or 2400 volts. The design and construction are claimed to make them very strong and serviceable.

The usual standard ratings of 35 degrees and 40 degrees C. temperature rise have been adopted, and any machine can be furnished for either of these ratings according to the duty it has to perform. Generally speaking, a 40 degree C. temperature rise will be ad-

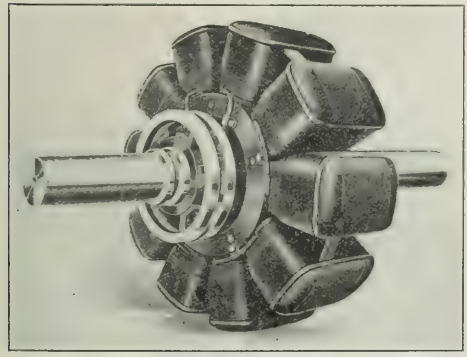


Fig. 2.—The Revolving Field of One of the New Triumph Alternators.

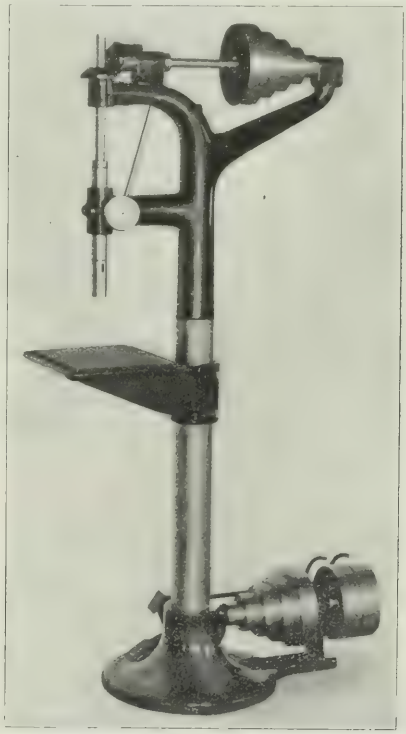
vocated for machines which have to carry a non-inductive load, while a machine which has to carry an inductive load, such as arc lamps or induction motors, will be rated on the 35 degree C. basis. The regulation of these new alternators is declared to be in accordance with the best engineering practice and to vary from 6 per cent. on a machine with a 35 degree C. rise to 8 per cent. wtih a machine rated at 40 degrees C. temperature rise.

The use of a relatively large amount of copper in both the rotor and stator windings has reduced the copper loss to a minimum. In addition due to the design of the stator the core losses are comparatively low, so that these machines have high efficiencies. Fig. 1 shows one of these alternators and gives a good idea of the compact and pleasing design, and Fig. 2 shows the revolving field removed.

A New Sibley Sensitive Drill Press

The 16-in. sensitive drill recently brought out by the Sibley Machine Tool Company, South Bend, Ind., in a general way follows the standard practice. While its construction is of the same type as the standard light drill press, it nevertheless possesses the distinctive feature of being self-oiling throughout.

The lubricating system consists of oil chambers filled with lambs' wool, saturated with oil, which are located beneath each of the four horizontal bearings. From these chambers the oil is fed through a slot in



A New 16-In. Sensitive Drill Press Built by the Sibley Machine Tool Company, South Bend, Ind.

the bottom of the bearing by capillary action to the shaft. The bearing for the crown gear is oiled in a special way as well as the loose pulley shaft. For the former the lubricant is drawn from a chamber situated just back of the wick, while for the pulley shaft a tube screws into the pulley hub. This tube contains a lubricating candle which is kept against the shaft by the pressure of a light spring.

Five spindle speeds, ranging from 150 to 1700 rev. per min. are available when the countershaft is running at 500 rev. per min. A special feature of the spindle is that it is not counterbalanced but is kept rigidly in any position by a brass friction. Miter gears are used throughout and are said to insure quiet running at high speeds. The base, which is of ample proportions, gives the tool the required stability. The drill press with the regular equipment weighs 300 lb.

Muskegon's New 6,000,000-Gal. Pumping Engine

A Huge Steam Driven Pumping Set Built by the Platt Iron Works Company

The city of Muskegon, Mich., has installed a 6,000,000-gal. high-duty pumping engine, which is supplying water to a direct-pressure municipal distribution system. The provisions of the specifications covering this engine called for an engine having a capacity of 6,000,000 gal. per 24-hour day and a duty of not less than 135,000,000 ft.-lb. per 1000 lb. of steam at a pressure of 125 lb., capable of supplying water at a domestic pressure of 70 lb. and a fire pressure of 125 lb. per square inch. The Platt Iron Works Company, Dayton, Ohio, secured the contract and supplied an engine of the triple-expansion straight flow, single-acting plunger type with attached air pump, feed pump and compressor. Fig. 1 is a view of the steam end of the engine and Fig. 2 shows the water end. The engine is entirely self-contained. Its total hight is about 45 ft. and its weight, exclusive of piping for the suction and the discharge, is 225 tons.

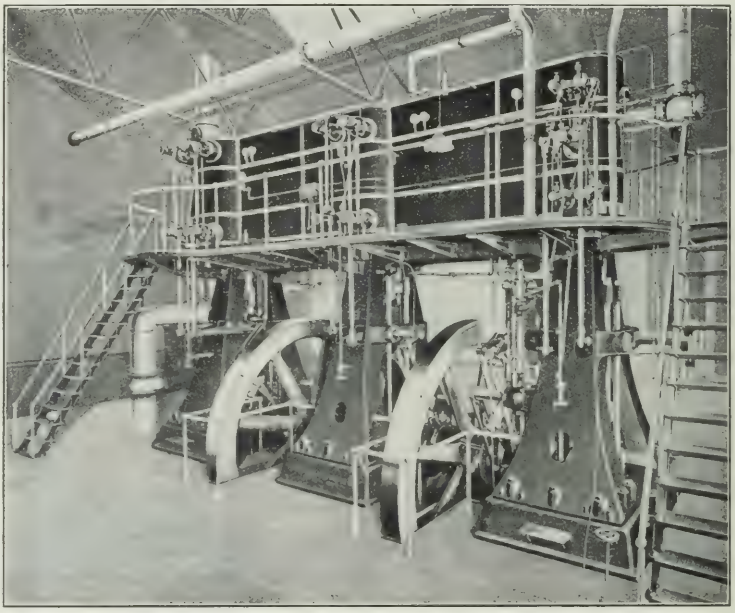


Fig. 1.—The Steam End of the 6,000,000-Gal. Pumping Engine Built by the Platt Iron Works Company, Dayton, Ohio, for the City of Muskegon, Mich.

The cast-steel valve decks are of the double-bottom type placed in a vertical position between the plunger and the suction and discharge chambers. The water valves are contained in cages, which are secured to the valve deck by bronze bolts. As will be noticed from Fig. 1, the steam end is of the A frame type with bored guides. Corliss type valve gear driven by eccentrics and rocker arms directly from the main shaft is employed and the speed and water pressure are controlled by two automatic governors, and changes from high to low speed or from the domestic to the fire pressure, or *vice versa,* have been made while the engine is in operation in from 15 to 20 seconds.

The surface condenser is placed in the suction line of the pump. The air pump, which is of the single-acting attached type, is directly connected to the low-pressure plunger head, together with the feed pump and the compressor supplying air to the air chambers.

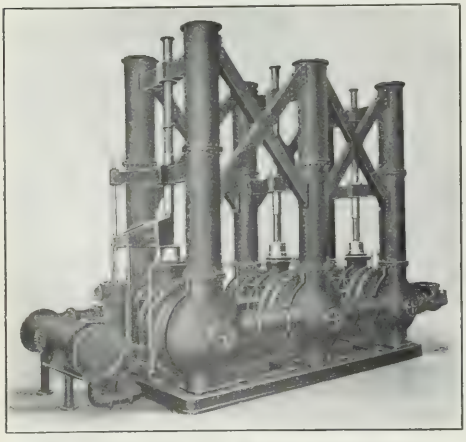


Fig. 2.—Water End of the Muskegon Pumping Engine.

The water of condensation is delivered to a hot-well, where it is freed from oil, the latter being returned to the lubricating system, which is of the continuous automatic type.

In the recent test of the engine made for the city by Henry A. Allen & Co., Chicago, with a steam pressure of 90 lb., the capacity of the engine was 6,589,200 gal. per 24 hours and the duty per 1000 lb. of dry steam was 141,536,000 ft.-lb. The contract requirements called for a pressure of 125 lb. of steam at the throttle, but on account of unsatisfactory boiler equipment and the uncertain condition of the city water mains it was impossible to conduct the test under regular service conditions. The leakage tests of the pump valves and the plungers gave a result of 0.219 per cent., which is so small as to be negligible, and consequently the quantity of water pumped was determined by plunger displacement. The steam passing through the cylinders was determined by weighing and the percentage of moisture ascertained with a throttling calorimeter. All the test instruments were read every ten minutes and indicator cards were taken every hour. The duty per 1000 lb. of dry steam at a pressure of 90 lb. was figured at 141,536,000 ft.-lb., or 6,536,000 ft.-lb. in excess of the contract requirements at a pressure of 35 lb. greater. When this duty was corrected for the difference existing between the actual and the contract steam pressures, the figure was increased to 151,695,000 ft.-lb., and it is claimed that even this will be exceeded in regular service.

The Grand Rapids Plain Milling Machine

While the new plain miller recently brought out by the Grand Rapids Machine Tool Company, Canal and Newberry streets, Grand Rapids, Mich., conforms generally to the standard design of the column milling machines now on the market, it possesses a number of special features of its own. All of these tend toward greater rigidity and strength and easy operation, thus making the machine one that is well adapted for high-

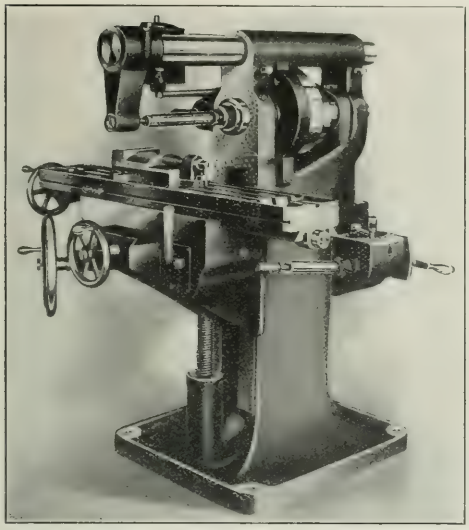


Fig. 1.—General View of a New Plain Miller Built by the Grand Rapids Machine Tool Company, Grand Rapids, Mich.

speed service. Fig. 1 is a general view of the miller, while Figs. 2 and 3 show the two feed changing gear boxes.

The column is cast in one piece, but the base is much wider than usual to resist the weight of the table when at either limit of its motion, and is surrounded by an ample oil retaining rim. The knee is of the customary box type and has an extended top and an extra long bearing on the column. Raising and lowering the table is accomplished by a telescoping screw. The

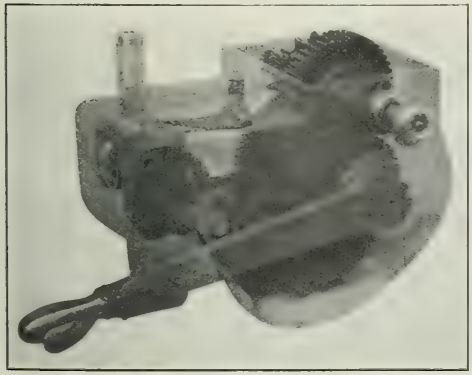


Fig. 2.—The Rear Feed Changing Gear Box.

saddle is very deep and 22 in. long and is fitted with a compensating stationary nut.

The table has a working surface of 32 x 8 in. and three 5/8-in. T slots provide plenty of space for clamping the various fixtures used in place. Although the width of the table is 8 in., it is possible to clamp a 10-in. indexing outfit in position and cut work within the full range of the machine. The crucible steel spin-

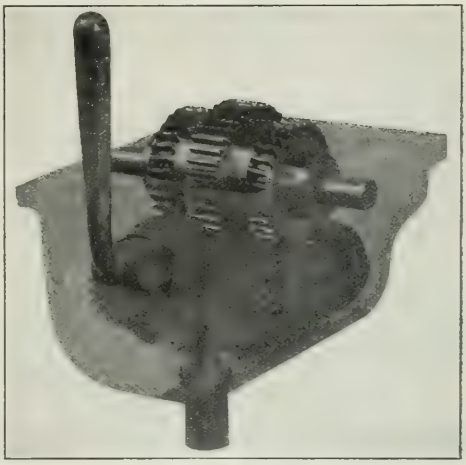


Fig. 3.—The Second Feed Change Gear Box.

dle is bored to conform to the No. 10 Brown & Sharpe standard taper.

The drive is from a countershaft to a three-step cone pulley, with 6, 9 and 12 in. diameters for a 3-in. belt, when equipped with back gears having a ratio of 6½ to 1. When the back gears are not furnished a four-step cone pulley is employed, having 6, 8, 10 and 12 in. diameters. From this shaft a nickel steel chain runs to the gear box for the feed changes at the rear of the machine shown in Fig. 2. The gears in this box as well as those in the second feed changing gear box, Fig. 3, with which it is connected by a universal joint telescoping shaft, are of coarse pitch of the selective sliding type and both in combination render 12 rates of feed available. Throwing the lever of the second gear box to one side engages the feed, which causes the table to move until the feed is disengaged by pulling the lever forward.

Following are the principal dimensions and specifications of the machine:

Length of saddle, inches	22
Working surface of table, inches	32 x 8
Taper of spindle, B. & S.	10
Ratio of back gears	6½ to 1
Width of belt, inches	3
Number of feed changes	12
Table travel, inches	24
Saddle travel, inches	8
Knee travel, inches	18
Net weight, pounds	2,020

The regular equipment of the machine includes a countershaft with friction clutches and ring oiling bearings, a complete set of wrenches, a large vise and an oil reservoir of liberal capacity.

The National Implement and Vehicle Association.—Several associations identified with the agricultural implement and vehicle industries have entered into a merger, which was completed November 18 under the title of the National Implement and Vehicle Association. It succeeds to the following organizations: National Association of Agricultural and Vehicle Manufacturers, National Plow Association and National Wagon Manufacturers' Association. E. D. Metcalf of the International Harvester Company, Auburn, N. Y., is president of the new association. The secretary and general manager is E. W. McCullough, Chicago, formerly secretary of the National Wagon Manufacturers' Association and an expert on factory costs and cost accounting. The new organization will take over the business of its predecessors on January 1, 1911.

CURRENT METAL PRICES.

The following quotations are for small lots. New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square ..... ¢ lb 1.90¢
1 to 1in x ⅜ to 1 in ..... "
1¼ to 4 in x ⅛ to ½ in ..... ¢ lb 2.10¢
Rods—⅜ and 11-16 round and square ..... ¢ lb 2.10¢

Angles:	Cts ¢ lb
3 in. x 3 in. and larger	2.00¢
3 in. x 2½ in. and less	2.05¢
1" to 2 in. x ¼ in.	2.00¢
1" to 2½ in. x ⅜ in. and 1¼ in. x ¼ in.	2.10¢
1 to 3½ in. x ⅜ in.	2.20¢
1 to 6 in. x ½ in.	2.20¢
5 in. x 3½ in.	2.20¢
6 in. x 4 in.	2.30¢
8 in. x 4 in.	3.50¢
½ x ⅛ in.	1.75¢

Tees:	
1 in.	2.15¢
1¼ in.	2.15¢
1½ to 2 in. x ¼ in.	2.15¢
1½ to 2 in. x ⅜ in.	2.35¢
3 in. and larger	2.10¢
Beams	3.10¢
Channels, 3 in. and larger	2.10¢
Bands—1 in. to 6 in. x 16 to No. 8	2.10¢
"Burden's Best" Iron, base price	3.75¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	4.00¢

Merchant Steel from Store—

per ¢ lb

Passenger Machinery ..... 1.90¢
Tire Talk, Fire and Sleigh Shoe ..... 2.50¢ 3.00¢
Best Cast Steel, base price in small lots ..... 7¢

Sheets from Store—

Black	One Pass, C R Soft Steel	R. G. Cleaned.
No. 8	¢ lb 2.50	2.80¢
Nos. 18 to 20	¢ lb 2.70	2.90¢
Nos. 22 and 24	¢ lb 2.75	3.00¢
No. 26	¢ lb 2.80	3.10¢
No. 28	¢ lb 2.90	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ¢ lb 12 to 14½¢
Patent Planished, W. Dewees' List ..... ¢ lb A, 10¢; B, 9¢ net

Galvanized.

Nos. 12 and 14 ..... ¢ lb 2.95¢
Nos. 22 to 24 ..... ¢ lb 3.30¢
No. 26 ..... ¢ lb 3.50¢
No. 28 ..... ¢ lb 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ..... ¢ lb 3.75¢
No. 26 ..... ¢ lb 3.85¢
No. 28 ..... ¢ lb 3.95¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galv'd
No. 24	$ per sq. 3.85	4.80
No. 26	3.00	4.00
No. 28	2.80	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IC, 14 x 20 ..... $5.25
IX, 14 x 20 ..... 6.00
A A Charcoal:
IC, 14 x 20 ..... $5.00
IX, 14 x 20 ..... 6.50

American Coke Plates—Bessemer—

IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40

American Terne Plates—

IC, 24 x 28 with an 8 lb coating $8.50
IX, 24 x 28 with an 8 lb coating 10.50

Seamless Brass Tubes—

List November 13, 1908 Base price ¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 Base price 15¢

Copper Tubes—

List November 13 1908 Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 19½¢ ¢ lb

High Brass Rods—

List August 1, 1908 14½¢ ¢ lb

Roll and Sheet Brass—

List August 1 1908 14½¢ ¢ lb

Brass Wire—

List August 1, 1908 14½¢ ¢ lb

Copper Wire—

Base Price. Carload lots, min. 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) ¢ lb 18¢
Sheet Copper Cold Rolled, 1¢ ¢ lb advance over Hot Rolled
Sheet Copper Polished 2 in. wide and under, 2¢ ¢ sq. in. 60in.
Sheet Copper Polished over 20 in. wide, 2¢ ¢ square foot
Planished Copper, 1¢ ¢ square foot more than Polished

METALS—

Tin—

Straits Pig ..... ¢ lb .39 @39½¢

Copper—

Lake Ingot ..... ¢ lb 14¼ @15 ¢
Electrolytic ..... ¢ lb 14¼ @14½¢
Casting ..... ¢ lb 14¼ @14½¢

Spelter—

Western ..... ¢ lb 6¼ @6½¢

Zinc.

No. 9, base, casks ..... ¢ lb 5¼¢ Open ..... ¢ lb 5¾¢

Lead.

American Pig ..... ¢ lb 5 @5¼¢
Bar ..... ¢ lb 6¾ @6¾¢

Solder.

½ x ½, guaranteed ..... ¢ lb 22½ @23 ¢
No. 1 ..... ¢ lb 20¢ @21 ¢
Refined ..... ¢ lb 18½ @18¾¢

Prices of solder fluctuate by private brand vary according to composition.

Antimony—

Cookson ..... ¢ lb 10¢
Hallett's ..... 10¢
Other Brands ..... ¢ 9½¢

Bismuth—

Per. lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 34¢
Rods & Wire ..... Base Price 41¢
Sheets ..... Base Price 53¢

Old Metals.

Dealers Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	¢ lb 10.00@11.25
Copper, Heavy and Wire	¢ lb 10.75@11.00
Copper, Light and Bottoms	¢ lb 9.75@10.00
Brass, Heavy	¢ lb 7.25@7.50
Brass, Light	¢ lb 5.75@6.00
Heavy Machine Composition	¢ lb 9.75@10.00
Clean Brass Turnings	¢ lb 7.25@7.50
Composition Turnings	¢ lb 8.25@8.50
Lead, Heavy	¢ lb 6 @6.25
Lead, Tea	¢ lb 6 @6.50
Zinc Scrap	¢ lb @4.00

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THE IRON AGE

Established 1855 | New York, December 8, 1910 | Vol. 86: No. 23

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-18 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

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Cutting Down Pig Iron Output

Further Restriction Promised This Month

More Rolling Mills on a 50 Per Cent. Basis—Record Lake Ore Shipments

November pig iron production was 1,909,780 tons for coke and anthracite iron—the smallest month's output since May, 1909. No other month since June of last year has fallen below the 2,000,000 ton mark. The daily average last month was 63,659 tons, against 67,520 tons in October. The shrinkage in steel works furnace output is responsible for all the falling off; merchant furnaces, under the alternation of slower and faster driving which has prevailed for some weeks, making slightly more iron per day in November than in October.

The net decrease in active blast furnaces in November was 13. Other furnaces will give up the struggle before the end of the year. Even with the more rapid curtailment of the past month, stocks continue to increase. The United States Steel Corporation is now operating 54 per cent. of its blast furnace capacity, against 55 per cent. one week ago.

Pig iron production December 1 was at the rate of about 22,750,000 tons a year, or 1,600,000 tons less than on November 1. An output of 27,200,000 to 27,300,000 tons is now indicated for 1910, or 1,400,000 to 1,500,000 tons more than the record made in 1909. Of this increase fully half has been added to stocks. Pig iron producers have followed to a most undesirable extent the policy so long an incubus on the copper industry.

The pig iron market is settling further into dullness. Buying has not stopped, but consumers are less inclined to contract, while sellers must offer special inducements to get business. Foundry operations are slowing down, and while here and there iron is being bought for the first half, such transactions are the exception, while inquiry for the second half is much rarer. Southern iron is sold at $11 for first quarter and first half, and $10.75, Birmingham, is reported to have been touched for spot iron.

One sale of 5000 tons of basic iron from the Valleys has been made to a Chicago district steel works, and low prices are reported on sales of Valley basic to Western steel foundries. At St. Louis a 10,000-ton sale of Southern basic was made to a steel foundry.

Further slackening of steel works and rolling mill operations has resulted from a falling off both in specifications and new orders, and an increasing number of mills are working at 50 per cent. of capacity.

Structural steel is just now the most promising line. At Chicago, with the adoption of the new building code, work will soon be begun calling for 50,000 tons

of steel, including 10,000 to 12,000 tons for the Insurance Exchange Building. At Two Harbors, Minn., the new Duluth & Iron Range Railroad dock will require 9500 tons. In New York the extension of the Second and Third Avenue Elevated lines will call for 15,000 tons of rails and a large amount of structural steel.

The outlook for lake shipyards this winter has improved with the placing of three ore boats, one for the Jones & Laughlin Steel Company and two for the United States Steel Corporation. A Pittsburgh ore interest is negotiating for two vessels 615 ft. long, which will be the largest on the lakes. About 30,000 tons of plates and shapes will be needed for the five boats. The Standard Oil Company has also placed vessel contracts which will require a considerable tonnage of plates. For the new battleship, which will be built at Newport News, 12,700 tons of plates will be required, including 2200 tons of protective deck plates.

New rail orders include one of 5000 tons, taken at Chicago, and 10,500 tons for the Nashville, Chattanooga & St. Louis, to be rolled at Ensley, while the division of 20,000 tons for the Reading Railroad between the Pennsylvania Steel and Bethlehem companies is practically assured. The West Chester Railroad is in the market for 5300 tons.

Sheet prices have been yielding under closer competition. A meeting of sheet manufacturers will be held at Pittsburgh December 8.

Lake Superior iron ore shipments made a new record in the season just closed, at 42,620,000 tons, an increase of 936,000 tons over the shipments of 1909 down the lakes.

High Quality Steel and Iron Ore Exhaustion

In all recent discussions of the question of iron ore supply the disposition has been to combat the idea that an ore famine is impending, or is even a probability one or two or three generations later. In a general way Prof. Henry M. Howe, in an article reviewed in these columns some months ago, indicated that even on the more obvious considerations which are usually given prominence, and the fact that only a small part of the earth's crust has been explored for ore, the expected life of our iron deposits has been increased from decades to centuries. He pointed out, also, what has never been given consideration in ore articles, that an incalculable amount of material which is not ore to-day will have become ore by the time the need appears.

Following closely on Professor Howe's signal contribution came the elaborate volume prepared by the Executive Committee of the Eleventh International Geological Congress, held at Stockholm, Sweden, in August. Its estimates for all the iron ore producing countries of the world, or countries in which ore is known to exist in quantity, were based on data furnished by geological surveys and by experts in mining geology. These gave a total of 22,408,000,000 tons of "actual reserves" and 123,377,000,000 tons of "potential reserves," the last item being reinforced by an estimated addition of "many thousands of millions." The impression given by this volume was that an incalculable abundance of iron ore may be counted upon, in spite of the counter effect of the editors' observation that "the supply hitherto known of actual (iron ore) resources would not be sufficient for 200 years on the supposition that the production of pig iron remained stationary"—or at about 60,000,000 tons a year for the world.

An interesting contribution to the discussion is the paper by W. H. Herdsman, of Glasgow, read recently before the West of Scotland Iron and Steel Institute, as given in *The Iron Age* of December 1. The writer considers primarily the sources of ore supply that will be open to the British steel maker in the nearer decades, but makes some suggestive comment that is of equal application to the United States and other countries. In connection with the commonly accepted exhaustion of low phosphorus iron ore deposits and the declining iron content of such ores, Mr. Herdsman points out that the drain on the acid ore resources will be relieved by the use of other metalliferous minerals. He refers to the iron-chrome-nickel ores found by hundreds of millions of tons in Greece and Cuba as likely to furnish the steel maker in part with the higher grade product which will be increasingly demanded in the near future. How far alloy steels will be a factor in modifying the rate at which iron ores are being used is a question on which definite statement is impossible. But Mr. Herdsman's suggestion is directly pertinent to the situation in the United States, in view of the use of iron-chrome-nickel ores by two Eastern steel companies, and of the tests of open hearth rails made from such ores, showing four times the life of Bessemer steel rails.

It need not be expected that progress in the use of higher grade steel for structural and railroad service will be rapid or revolutionary. But developments such as the coming in of the nickel-chrome iron ores of Cuba is bringing, and that signalized recently by the acquisition by one interest of the Heroult electric furnace rights for the United States, point to an increasing emphasis upon quality rather than quantity in the production of steel. The bearing this will have upon the problem of iron ore supply is well worthy of being taken into account along with the kindred considerations of rapidly growing use of ferro-concrete and the yearly increasing amount of scrap metal returning to the melting furnaces. All will have their part in modifying the geometric ratio which has been so freely used in computing the exhaustion of our stores of iron ore.

Joint Debates at Salesmen's Meetings

The New England selling forces of the several constituent companies of the United States Steel Corporation have inaugurated a series of monthly conferences, which have proved highly beneficial to those in attendance, notably because of a system of debates dealing with trade topics of live importance. Two men are designated to present papers, taking opposite sides of such questions as that of the last meeting, "Shall a Contract Be a Contract?" Each prepares the best brief of which he is capable, drawing upon his own experiences and those of others. The result has been that, while the first of a pair of papers has seemed so convincing that no adequate reply appeared possible, at the end of the answering discourse the opinion as to the merits of the question has veered with some of the listeners. General discussion follows sharp upon the closing words of the second paper. Debate, some-

times heated, brings out the strong points and the fallacies of the arguments. A well-grounded basis of practice is established, and men are strengthened in their ability to handle their customers and thus made more valuable. Many organizations of office men, superintendents and foremen are fostered by American manufacturing companies. The formal paper or joint debate might be adopted by many of them to great advantage.

The President and the Anti-Trust Law

A strong sentiment exists in favor of amending or repealing the Sherman anti-trust act, as in its present form it is regarded as a serious check to legitimate business. Representations to this effect have undoubtedly been made to President Taft, and his message to Congress was therefore awaited with much interest to learn what he might have to say on this subject. He has not avoided it, but discusses it as follows:

> I do not now recommend any amendment to the anti-trust law. In other words, it seems to me that the existing legislation with reference to the regulation of corporations and the restraint of their business has reached a point where we can stop for a while and witness the effect of the vigorous execution of the laws on the statute books in restraining the abuses which certainly did exist and which roused the public to demand reform. If this test develops a need for further legislation, well and good, but until then let us execute what we have. Due to the reform movements of the present decade, there has undoubtedly been a great improvement in business methods and standards. These will doubtless be made clearer by the decisions of the Supreme Court in cases pending before it.
>
> The great body of business men of this country, those who are responsible for its commercial development, now have an earnest desire to obey the law and to square their conduct of business to its requirements and limitations.
>
> I believe it to be in the interest of all the people of the country that for the time being the activities of government, in addition to enforcing the existing law, be directed toward the economy of administration and the enlargement of opportunities for foreign trade, the conservation and improvement of our agricultural lands, the building up of home industries, and the strengthening of confidence of capital in domestic investment.

This view of the situation commends itself to thoughtful men. It may not please those who were anxious to see a recommendation that the law be swept from the statute books nor those who would enjoy a fierce declaration that the law will not only be enforced to its full extent but that it ought to be made even more drastic. The President has taken what seems to be a proper position under the circumstances. The construction of the act is now before the Supreme Court and at no distant day the country will know precisely what bearing it has on important interests and how far it goes in affecting a much wider range of business activity. Meanwhile, it is well to wait. The language used by the President in reference to this matter is temperate, judicial and calculated to promote confidence in his wisdom.

Canadian Tariff Agitation

The agitation for lower duties in Canada is becoming more pronounced. A representative body of farmers in the vicinity of Goderich, Ontario, met in that town some days ago and passed a resolution in favor of tariff reduction, naming farm implements, cement, harness, wire, cotton, woolens and clothing in general. On December 16 a Western farmers' deputation, 1000 strong, will visit Ottawa to petition for a lowering of the duties on agricultural implements and other articles. The Canadian agriculturists appear to be especially insistent on the reduction of prices on the manufactured articles which they consume. They have not abated from the position they took in the summer when Premier Laurier made his tour through Northwest Canada.

Courtesy in Correspondence

Recently a large foreign dealer, requiring what would ordinarily be designated as a "big lot of machinery," wrote for prices to various manufacturers. A reply from an American firm read about as follows: "Yours at hand. State exactly what you want and we will see if we can meet your requirements. Yours, &c." This letter was merely glanced at and then thrown aside. Another letter, received from a French maker, was a lengthy communication, with the customary complimentary introduction and expressions of appreciation for having been called upon for goods by the honored correspondent. The letter went quite fully into the details and merits of various products and closed with assurances of the highest consideration. The dealer read this letter twice and then issued the order, "Buy all our machinery of that firm." No investigation was entered into as to the comparative merits of the products of the two manufacturers. One letter had produced a favorable impression and the resulting conclusion that the firm could not act otherwise than honorable, while the other letter provoked the feeling that the writer's firm was composed of barbarians, who did not even know how to write politely.

American correspondence is becoming more and more condensed. Brevity in business letter writing is constantly aimed at, and so well is this understood in our own country that those handling large correspondence favor letters written in the fewest lines. It saves the time of the recipient in reading as well as the time of the sender. Foreigners, however, are accustomed to indulge in much polite verbiage in business letters, and an American in corresponding with foreign buyers will find, as in the case cited, that a few introductory and closing courteous lines are not a profitless waste of good English but are often potent in conjuring up profitable business. As Lucullus had it, "a kind word is better than a fat pie," and an introduction creating a favorable impression at the onset is one of the best foundations for future agreeable business relations.

October a Good Month for Exports

Our foreign trade in October was very heavy. The total exports attained a value of $207,713,086, while the imports aggregated $124,046,150. The exports were larger than in October of last year, and the imports were smaller. The gain in exports was largely due to a heavier outward movement of manufactured goods. This is gratifying, in view of the rather caustic criticisms which are so frequently made of our faulty methods in cultivating the export trade in manufactured products. When such exports reach a total of $45,748,873 in one month, as they did in October, there would seem to be some energy and intelligence applied to the cultivation of foreign markets by American manufacturers. Another feature of the October movement was the heavy balance in favor of this country, the excess of exports over imports amounting to $83,-

666,936. Thus has the unsatisfactory condition of our foreign trade, as shown in the summer months, corrected itself. It is to be hoped that this condition of affairs will continue. The business and financial interests of this country have enough adverse influences to contend with at this time without the additional unpleasant experience of piling up indebtedness abroad. Financial ease is much more certain if the international trade balance is in our favor.

A Blow at Usurious Loans to Workmen

The Supreme Court of Massachusetts has handed down a decision declaring constitutional the law which requires that a license be secured from the local authorities if a person is to engage in the business of making loans of $200 or less at a rate of more than 12 per cent. per annum interest. Every employer of labor must welcome governmental control of a form of usury which has many annoyances for those who disburse wages. The act in question has been bitterly fought by the makers of such loans, for it is a serious blow to the practice. Local governments are given the right to regulate the maximum interest which can be collected, and the penalty of the violation of these regulations is the loss of the license. Any regulation of a practice which has compelled many manufacturers to post notices making an assignment of wages sufficient cause for immediate dismissal should be copied generally by other States. The constitutions and statutes of the several commonwealths are sufficiently similar to make the Massachusetts decision applicable to the country as a whole, where like statutes are in force.

Correspondence

How Business Depression Should Be Met

To the Editor: Events which have since occurred indicate to me a gradually increasing acceptance by the financial, mercantile and manufacturing public of J. J. Hill's opinion that we are in for a prolonged period of diminished business activity, and what such experiences have in the past entailed in the way of enforced economies most of us know, though it is possible that some of us who went through the 1893 depression have forgotten. Long before the end of the impending period of diminished business activity is reached the significance of the concluding paragraph of your financial review in your issue of November 24 will be realized by all hands; at present, however, quite a number of business men recognize the potentialities inherent in the situation pointed out by President Hepburn; but they delude themselves, in my opinion, with the idea that "this storm won't last long."

THE CAUSE OF DIMINISHING ACTIVITY.

Men of this class seem to me to shut their eyes to the fact so often pointed out by J. J. Hill during the last several years, and emphasized in his utterances of November 27—*i. e.*, that the cause of the impending readjustment of prices, values, &c., is our persistence in flying in the face of nature's laws for a long time. He has repeatedly warned us that the loss of efficiency evidenced by our decreased output per capita, accompanied by steadily rising prices and entailing an ever increasing cost of living, could not go on forever, and that it would automatically bring about a cure.

Under the old dispensation—that is, during the era of the unrestrained and in effect ignorant application of the individualistic principle—the first remedy to be resorted to would have been a reduction in the wage rate; indeed, the financial writer for the *Sun* seems to think that this remedy should be applied now; that it should precede all others. But this remedy is not of such easy application as was formerly the case. The labor unions are a fact to be taken into consideration. They uniformly evince a decided distaste to this particular form of remedy for the ills of the body politic. In view of their attitude, the fact must be faced that reduction of the wage rate as a cure will be the last remedy, not the first, to be applied.

OTHER REMEDIES THAN WAGE CUTTING.

Luckily we are not without other remedies applicable as "first aid to the injured," as I shall attempt to show further on. The world has progressed since 1893 in respect of its knowledge of the evil effects of the unrestrained application of the individualistic principle. The word "progressive" does not necessarily mean a socialist at that; it may mean a paternalist in the sense that it is the Christian duty of the intelligent man to educate or protect his less fortunate brother; and nowhere are real education and sympathy more needed than with labor unions. Nowhere are larger dividends obtainable by the application of these two remedies in the shape of increased output and industrial peace than from labor unions. Labor unions have come to stay, and should be cultivated (educated).

But if there be any of your readers who believe that they are the root of all industrial evil; that they should be smitten hip and thigh, and that consequently cutting the wage rate should be the first remedy to be applied in order to restore the patient to a normal condition, I would ask them to pause and consider some facts which they may not be aware of; or, if aware of them, which they may not understand the logical effect of, but with which, however, every broad-gauge employer of labor is conversant. One of these facts is that the most fallacious principle which labor unions attempt to apply has been, in effect, taught them by their employers; by the very people to whose care they were in natural order of things entitled to look.

A FLAT RATE OF WAGES AN ERROR.

I refer to their refusal to "grade" their men; which takes the form of a flat rate for all their members in total disregard of the fact that all men are not equal; to their thus premiumizing inefficiency. And this is about as serious a charge as can be laid against any one, but especially against organizations whose "*leitmotif*" is supposed to be the "elevation of labor." In your issue of October 13, 1910, you commented upon and reproved the practice of employers who cut price rates so soon as a man's efficiency has resulted in his earning more than the "flat rate" which they thought ought to be the limit of a man's wages. This practice is the father of the labor unions' idea of not grading their members.

The first employer who started this vicious practice and all employers who have copied him have thereby penalized efficiency; have shown their men that it did not pay to be efficient—at least, not with a boss who practiced an ignorant trick like this. Now if the employer, who is supposedly the most intelligent man around a factory, is ignorant enough to fly in the face of nature by penalizing efficiency, is he at least not debarred from inveighing against the man or organization ignorant enough to fly in the face of nature by premiumizing efficiency? And there you have the case in a nutshell of the average employer versus the average labor union. There are exceptions in both classes, but, by and large, the majority in each class comes under that heading. And it is these ignoramuses who are responsible for most of the trouble. As above said, I hold the employing class as most responsible, because they should know better.

In expressing the foregoing opinions I am not ignorant of the many injustices practiced by labor unions against employers, and quite often to their own detriment. Perhaps if the new methods had not placed such a wide gulf between employer and employed, or perhaps if those over the men more often had a disposition and ability to talk to their men in explanation of what is to the latter incomprehensible with their limited knowledge, strikes would be less frequent. I know that has been my experience, and I have been an employer of labor in a modest

way practically all my life; and never had a suspicion of the shadow of a strike.

GRADING OF MEN CAN BE DONE.

But if labor unions do refuse to grade their men that constitutes no reason why intelligent employers should not grade them. It has been done in many shops—union shops, I mean. It can be done in almost any shop in which the employer is intelligent enough to apply efficiency methods, or even thoroughly intelligent piece work methods; but the confidence of the men in the boss not being afflicted with the flat rate microbe is a *sine qua non*. The locomotive engineers' union is a standing monument to the fact that not all labor unions are ignorant enough to attempt to set nature's laws at defiance. Locomotive engineers are graded, in effect, and by their union at that. This is the kind of union welcomed by intelligent employers. I am told that the railroads would fight for it any time, and that they bonus efficiency besides—that is, they regrade their engineers and no objection by the union.

I think that too little thought is given to the influence of example in some of the things our large corporations do, and especially is this the case in respect to some of our so-called legislation in favor of labor. Take, for instance, the laws which make the eight-hour day obligatory on all contractors on public work in this State; how any real friend of labor, or how any real friend of the class upon whom labor depends for employment could help such legislation along is more than I can understand. Of course, this law adds 25 per cent., or, at least, 15 per cent., to the cost of all contracts at once; what this means on only three contracts is readily decipherable. I refer to the $50,000,000 worth of good road contracts, the $100,000,000 Erie Canal contracts and the New York subway contracts now about to be placed.

Outside of this is the effect of such legislation upon the efficiency shown in private contracts. Theoretically a man when working for a contractor on private work will increase his output at least pro rata as the increased hours on such work are to the hours on public works; as a matter of fact, he does nothing of the kind. The effect of such legislation is practically to establish an eight-hour day all around. And that I am not alone in this view is evidenced by the attitude taken by the German Government when a petition was presented to it to shorten hours on some public work; the answer was, in effect, that it would be both economically unwise as well as morally unjust for the Government to use general assets to demoralize private activities.

LABOR PAYS FOR RESTRICTIVE LEGISLATION.

Of course, labor pays for this sort of thing, even if it doesn't know it; it shows up in rent and other items going to make up the increased cost of living. And if any one should set the public, its citizens, a good example, surely it is their government, and next in order of importance its largest business interests—the railroads. Cooperation with business, by repealing some of this indefensible legislation, would be a boon just now. To-day's *Times* says the eight-hour law is affecting the battleship contractors. When coddling labor unions results in affecting the nation's safety it is nearly time to throw in the reversing lever. The socialist, Briand, who heads the French Cabinet, refused to stand for that sort of thing, and he was upheld. Have we no Briand anywhere in authority? Surely a better time than right now in which to get matters back upon a sound, economic basis could not be expected. Very truly yours,

MAX H. C. BROMBACHER.

NEW YORK, December 5, 1910.

Possibilities in Railroad Economies

To the Editor: I notice with interest what you say in the current issue of your paper in relation to economy on railroads. While I have made no calculations and gathered no data, I think the statement as to the amount of savings which could be made is not at all exaggerated. I have had a rather large experience in the designing and making of parts for cars, and numberless instances could be given in which a saving could be made. And these points of saving as a rule are cumulative. I have no hesitancy in saying that there are thousands of instances in which differences of design are absolute foolishness. Any one conversant with car construction could point this out on every hand.

We have heard a good deal about standardizing among the railroad people, but let me say that this is practically all nonsense. I could almost number on my fingers the articles in freight car construction which are standard. And this applies not only as between different roads, but to the equipment on single railroads. I have in mind one road which is overcoming this trouble so far as it is concerned, but taken in general the thing is simply ridiculous, and no well-conducted individual business establishment would ever think of such a conglomeration of tweedledee and tweedledum as exists on our steam railroads. And the possibility for savings here is only one among many. JAS. H. BAKER.

PITTSBURGH, PA., December 2, 1910.

Coal Washing and Drying at Sydney, Nova Scotia.—Several English companies and two American companies have made offers to the Dominion Steel Corporation, Sydney, Nova Scotia, for the installing of the plant to wash the entire slack coal output of the corporation's mines. The coal washing plant which the corporation now has at work was built by Heyl & Patterson, Pittsburgh. The now projected plant will cost about $200,000. The corporation will not award the contract until it has concluded some experiments it is now conducting at Sydney with a coal drier. If the experimental plant works out as it is expected to do the water contents in the washed coal will be reduced to 5 per cent. or less, and certain impurities will be eliminated to the great improvement of the coal for the purpose of coking.

Pennsylvania Corporation Figures.—The close of the fiscal year of the State of Pennsylvania shows an interesting condition in the incorporation of new companies. Several hundred were chartered and over 250 companies increased their capital. The receipts from bonus on charter capital and subsequent increases aggregated $1,151,092.15, which is one-third of one per cent. of the capital authorized. This item of revenue was $634,826.60 greater than the same source of income in 1909 and means that over $200,000,000 more was invested in new corporations in Pennsylvania in 1910 than in the year before. The increase of capital was general, although a number of iron and steel concerns were heavy contributors to the total.

The Foreign Rail Trade.—An increase in rail inquiries is noted by the London *Ironmonger* which says that the business in prospect includes 11,000 tons for the East Indian Railway, 6500 tons for the Bombay & Baroda Railway and 4500 tons for the Bengal & North Western Railway. There are some vague inquiries about also, one being for 10,000 tons for Servia, but this is hardly likely to come to British works. The Belgian State Railways have placed orders for 30,000 tons of rails and accessories with Belgian works. A New South Wales inquiry amounts to 8000 tons and a like tonnage is asked for by the Great Indian Peninsula Railway.

Birmingham, Ala., advices state that Douglas H. Gordon of the Baltimore Trust Company, and Joshua Levering, also of Baltimore, have been elected directors of the Alabama Consolidated Coal & Iron Company for the ensuing year. This company was at one time controlled by Baltimore interests, and the election of these directors tends to the belief that Baltimore people are again becoming largely interested in it.

Pig Iron Production

The Decline Proceeding More Rapidly

The November Rate Nearly 4000 Tons a Day Less Than That of October

The statistics of pig iron production show an accelerating rate of decrease. In November (30 days) the output of coke and anthracite iron was 1,909,780 gross tons, or 63,659 tons a day, against 2,093,121 tons in October (31 days), or 67,520 tons a day. Steel works furnaces made all the curtailment of last month. In fact, the merchant furnaces showed about 500 tons a day increase over their October rate, and this with a decreasing number of furnaces. In recent months there have been unusual fluctuations of output in the same furnace due to the alterations of slower and faster driving and to occasional bankings. The net loss in the number of active furnaces between November 1 and December 1 was 13, to which the steel works furnaces contributed 7 and the merchant furnaces 6, though, as is well known, the capacity represented by the 7 is much greater than that of the 6.

The daily capacity of the 217 coke and anthracite furnaces active December 1 was 61,279 tons, which compares with 65,826 tons a day for 230 furnaces on November 1. Estimating charcoal iron, the production of pig iron at the beginning of December was at the rate of about 22,750,000 tons a year, or 1,600,000 tons a year less than on November 1.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
November, 1909	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,876	27,740	85,616
March	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,962
September	47,007	21,536	68,542
October	45,794	21,726	67,520
November	41,427	22,232	63,659

November Output by Districts

The table below gives the production of all coke and anthracite furnaces in November and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	July. (31 days)	August. (31 days)	Sept. (30 days)	Oct. (31 days)	Nov. (30 days)
New York	162,901	158,666	148,999	147,894	142,610
New Jersey	18,962	19,177	18,773	19,115	18,284
Lehigh Valley	61,014	63,878	63,919	69,327	62,161
Schuylkill Val.	61,340	64,926	60,689	61,673	54,642
Lower Susquehanna and Lebanon Val.	60,043	54,442	53,750	54,072	50,370
Pittsburgh dis.	502,711	510,352	505,342	507,508	445,083
Shenango Val.	113,280	113,500	108,114	112,026	82,904
West. Penn.	129,786	116,117	115,622	126,098	87,568
Md., W. Va. and Kentucky	75,051	76,477	68,398	67,926	58,772
Wheeling dis.	73,164	68,341	74,143	76,581	84,290
Mahoning Val.	215,282	211,575	201,986	202,667	180,717
Ohio, except S. W. and North. Ohio.	139,627	122,960	111,958	117,902	108,599
Hocking Valley, Hanging Rock and S. W. Ohio.	30,163	32,490	27,657	24,029	25,008
Mich., Minn., Mo., Wis., Col., Wash.	65,863	66,096	63,935	72,825	78,927
Chicago dis.	264,136	258,145	259,672	246,504	239,469
Alabama	143,313	140,015	148,755	160,077	165,512
Tenn., Georgia and Texas	31,806	29,690	24,563	26,897	24,764
Totals	2,148,442	2,106,847	2,056,275	2,093,121	1,909,780

The net decrease in the number of active furnaces between November 1 and December 1 was 13. The list of furnaces blown out includes one Niagara in the Buffalo district, Musconetcong in New Jersey, one Saucon in the Lehigh Valley, one Swede in the Schuylkill Valley, one Duquesne, two Edgar Thomson and one Isabella in the Pittsburgh district, New Castle No. 4 in the Shenango Valley, one Cambria and Josephine in western Pennsylvania, Princess in Virginia, one Bellaire in the Wheeling district, two Ohio in the Mahoning Valley, one Joliet in Illinois, Alice and one Ensley in Alabama, Napier and Silver Creek in Georgia.

Among furnaces blown in last month were one Paxton in the Lower Susquehanna Valley, Martin's Ferry in the Wheeling district, Hamilton in the Hanging Rock district, one Gary in Indiana, one Colorado and Citico in Tennessee.

Capacity in Blast December 1 and November 1

The following table shows the daily capacity of furnaces in blast December 1 and November 1. These figures are based largely on the performance of the furnaces in the past two months:

Coke and Anthracite Furnaces in Blast and Capacity.—Gross Tons.

Location of furnaces.	Total number of stacks.	December 1. Number in blast.	December 1. Capacity per day.	November 1. Number in blast.	November 1. Capacity per day.
New York:					
Buffalo	17	12	4,067	13	4,135
Other New York	7	3	565	3	550
New Jersey	7	2	568	2	432
Spiegel	2	..	....	..	....
Pennsylvania:					
Lehigh Valley	23	11	1,942	12	2,076
Spiegel	3	1	81	1	90
Schuylkill Valley	16	6	1,762	7	2,010
Low. Susquehanna	7	5	861	4	802
Lebanon Valley	10	6	820	8	847
Pittsburgh district	50	34	13,686	38	15,483
Spiegel	3	1	120	1	114
Shenango Valley	20	9	2,623	10	3,226
Western Penn.	27	12	2,769	14	3,295
Maryland	4	3	710	3	805
Wheeling district	14	7	2,675	7	2,420
Ohio:					
Mahoning Valley	23	16	5,705	18	6,837
Central and North.	22	10	3,620	10	3,803
Hocking Val., Hanging Rock and S. W. Ohio.	15	8	984	7	775
Illinois and Indiana	31	19	7,705	20	8,050
Spiegel	3	1	100	0	0
Michigan, Wisconsin and Minnesota	10	7	1,476	7	1,340
Colorado, Missouri and Washington	7	5	1,285	4	1,100
The South:					
Virginia	23	8	879	9	1,140
Kentucky	5	2	344	2	348
Alabama	46	21	5,096	23	5,274
Tenn. and Georgia	20	8	896	9	874
Totals	415	217	61,279	230	65,826

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.— 1908.	1909.	1910.	Spiegeleisen and ferromanganese. 1909.	1910.
January	894,415	1,117,823	1,773,201	12,325	19,538
February	745,302	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,558	1,739,212	23,743	25,591
April	725,548	1,093,092	1,669,898	22,478	22,304
May	759,674	1,256,448	1,619,283	20,834	26,529
June	717,689	1,365,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,591	1,442,572	22,313	25,776
September	933,514	1,660,859	1,419,221	25,148	15,151
October	996,481	1,769,094	1,419,624	25,384	8,500
November	981,167	1,689,994	1,242,804	23,376	9,032
December	1,090,339	1,768,799	.....	20,791	.....

Graphic Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:



Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to December 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron Delivered at Chicago.

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	39,619	59,232	84,459
April	73,885	38,289	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	36,444	64,656	75,516
July	72,763	39,287	67,793	69,305
August	72,594	43,851	72,546	67,963
September	72,783	47,300	79,507	68,476
October	75,386	50,554	83,856	67,520
November	60,937	52,595	84,917	63,659
December	39,815	56,158	85,022	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	15.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	14.25	16.40
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	14.25	16.06
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	14.25	16.00
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,250,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	2,056,275
October	2,336,972	1,567,198	2,599,541	2,093,121
November	1,823,125	1,577,854	2,547,508	1,909,780
December	1,234,279	1,740,912	2,635,680	.....

A Structural Fabricating Plant at Denver.—The Lowith Brothers Iron Works Company, Denver, Colo., has plans prepared for the erection of shops for the fabrication of structural iron and steel. The company has heretofore purchased its material from Eastern interests already fabricated, but owing to the increased demand for steel construction in Denver and surrounding territory, it is the belief of the company that the city will finally be an important center for the manufacture of this material. A complaint is now pending before the Interstate Commerce Commission to bring about a reduction in freight rates into Denver from the East on plain material. At present the rate on plain material is the same as that on fabricated steel, and as a result the material has been purchased in the East already fabricated and shipped ready for erection.

The Joliet Rolling Mill Company, recently incorporated with $150,000 capital, takes over the Joliet Iron Products Company. Among the Incorporators are Israel Joseph, Adam S. Clow, Adam Groth, A. B. Scully and C. E. Woodruff. Mr. Joseph has been elected president and Mr. Groth, who had been president of the Joliet Iron Products Company, is treasurer. The product is bar iron and small shapes, the capacity being about 25,000 tons a year.

The application to the United States Court, Philadelphia, Pa., for the appointment of a receiver to secure creditors of L. & R. Wister & Co., iron merchants, pending the adjudicating of bankruptcy proceedings, reported in *The Iron Age*, of November 24, was refused by the court. No further progress is reported in the bankruptcy matters at this time.

Opening of the Mechanical Engineers' Convention

The attendance at the annual meeting of the American Society of Mechanical Engineers, now in progress, promises to be the largest in the history of the society. At the time of going to press the registration, including members and guests, had reached 660.

An unusually large number assembled for the opening function Tuesday evening, in the Engineering Societies Building, New York, when George Westinghouse presented his presidential address. In it he alluded to the principal events in the society's year—the joint meetings with engineers of all professions at Boston in March and with the Institution of Mechanical Engineers in England last summer, as well as the important local meetings of the society in Boston, St. Louis and San Francisco. Reverting to his paper presented at the English meeting on the necessity of standardization of electric railroad equipment, he corrected the misunderstanding of some of the discussers by declaring that he had not recommended the adoption of one particular system, and repeated his specific recommendations. The remainder of the address was a very interesting historical account of the conception and development of the air brake.

For the committee on election of officers, George A. Orrok announced the result of the balloting and the president declared the following elected for the ensuing year: Col. E. D. Meier, president; H. H. Vaughan, E. M. Herr and George M. Brill, vice-presidents; D. F. Crawford, E. B. Katte and Stanley G. Flagg, Jr., managers, and Wm. H. Wiley, treasurer.

The new president was escorted to the platform and briefly acknowledged his appreciation of the honor conferred upon him, following which a reception by the retiring and newly elected president to the members and guests was held in the society's rooms.

Wednesday morning the usual matters of business were dispensed with. Secretary Rice announced the election during the year of 135 members, 15 associate members and 126 junior members, and 28 promotions to member's grade. A report for the committee having in charge the raising of funds to meet the society's share in the purchase of the land occupied by the Engineering Societies Building was presented by Worcester R. Warner. There remains less than $90,000 to be subscribed.

Reports on the meeting in England were presented by Honorary Secretary F. R. Hutton and Secretary Calvin W. Rice and the first professional paper "The Transmission of Heat in Surface Condensation" was presented in abstract by the author, George A. Orrok. A report of the discussion of the paper will be included in the main report of the meeting in our next issue.

The Connecticut Valley Metal Trades Association.—At the recent annual meeting of the Connecticut Valley Metal Trades Association, held at Springfield, Mass., these officers were elected: President, F. C. Breakspear, A. G. Spalding & Bros. Mfg. Company, Chicopee, Mass.; vice-president, C. P. Fay, J. Stevens Arms & Tool Company, Chicopee Falls, Mass.; secretary, A. E. Smith, Knox Automobile Company, Springfield, Mass.; treasurer, Springfield National Bank. Executive Committee: R. D. Reed, H. B. Smith Company, Westfield, Mass.; F. C. Feiker, Northampton Cutlery Company, Northampton, Mass.; A. J. Tucker, Cheney Bigelow Wire Works, Springfield, Mass.; George Braithwaite, Stevens-Duryea Company, Chicopee Falls, Mass.; T. J. Rider, Rider-Bagg Company, Springfield, Mass.

The Gyro Motor Company, recently incorporated with a capital stock of $100,000, is building a factory at Washington, D. C., for the manufacture of high-grade revolving cylinder motors for aeronautical machines. The president of the company, Emile Berliner, 1438 Columbia road, Washington, was the first man to build such motors for aeronautical experiments five years ago. At that time he made the statement that this type of motor would be very well adapted for aeronautical work, as it required no fly wheels and was self cooling, a prediction which has been verified by the success of the Gnome motor. The general manager of the company is Spencer Heath, the well-known specialist and maker of the Paragon aerial propellers.

Geo. B. McCormack and Erskine Ramsay of Birmingham, Ala., have closed a deal whereby the charcoal furnace and brown ore properties of the Georgia-Alabama Iron Company at and near Cedartown, Ga., come under their control. These properties have been heretofore operated as a Rogers-Brown interest. The furnace is now idle. Brown ore is being mined in large quantities and sold on the market to coke iron makers. Whether the furnace will be rehabilitated and put in operation has not yet been announced.

President Taft, in an address at Richmond, Va., November 23, aroused great enthusiasm by his prediction that the Panama Canal would be open to the world well in advance of the official date of opening, January 1, 1915. He declared that if necessity demanded he believed American battleships could be sent through the waterway by January 1, 1913.

The erection of the two large additions to the forge shop and foundry buildings of the Champion Division of the International Harvester Company, Springfield, Ohio, is going forward rapidly. The foundation for the foundry is almost completed, while the superstructure of the forge plant is now being erected.

The business men of Middletown, Ind., have organized the Middletown Commercial Club, the principal object of which will be to induce factories to locate in that city. B. R. Inman is president; F. H. Hagenbuch, vice president; C. C. Druly, secretary and Adolph Cooper, treasurer.

The Laramie Rolling Mill of the Union Pacific Railroad at Laramie, Wyoming, which was seriously damaged by fire, may not be rebuilt. It has not been profitable. There were five heating furnaces, one puddling furnace, a 10-in. and a 19-in. train and machines for manufacturing spikes, rivets and bolts, the capacity being 20,000 tons a year.

The George B. Lessig Company, Pottstown, Pa., has resumed operations in its puddle mills, plate mill and nail factory, with every prospect of continuing during the first half of 1911. The puddle mill has been operated about one month since July 1, while the other departments have been operating about two-thirds of the time.

It is stated by the Struthers-Wells Company, Warren, Pa., whose Pittsburgh branch office is located in the House Building, that it has put in successful, continuous operation upward of 75,000 hp. in gas engines, both horizontal and vertical types, of its manufacture. A specialty is also made of suction gas producers.

The fortnightly bulletin of the American Railway Association shows that on November 23 the net surplus of idle cars on the lines of the United States and Canada was 28,393, compared with 13,581 two weeks earlier.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Dec. 7, 1910.	Nov. 30, 1910.	Nov. 9, 1910.	Dec. 8, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	14.75	14.75	14.75	18.75
Basic, Valley furnace	13.50	13.50	13.25	17.00
Bessemer, Pittsburgh	15.90	15.90	15.50	19.90
Gray forge, Pittsburgh	13.90	13.90	14.15	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.50	27.50
Forging billets, Pittsburgh	....	28.50	28.50	32.00
Open hearth billets, Philadelphia	25.50	25.50	26.00	30.60
Wire rods, Pittsburgh	28.00	28.00	28.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	16.00	16.00	16.00	20.00
Iron rails, Philadelphia	18.00	18.00	18.00	20.50
Car wheels, Chicago	13.50	13.50	13.50	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	*13.75*	14.25	14.25	18.00
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*12.75*	13.00	13.50	17.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.35	1.35	1.37	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.60
Common iron bars, Pittsburgh	1.40	1.40	1.45	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.60
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.35	1.65
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.60	1.60	1.60	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.00	13.00	13.00	13.75
Electrolytic copper, New York	12.87½	12.87½	12.87½	13.37½
Spelter, New York	**6.00**	5.95	5.95	6.37½
Spelter, St. Louis	5.85	5.80	5.80	6.20
Lead, New York	4.50	4.50	4.40	4.40
Lead, St. Louis	4.40	4.40	4.30	4.30
Tin, New York	37.95	37.35	36.25	32.25
Antimony, Hallett, New York	7.75	7.75	7.75	8.12½
Tin plate, 100 lb. box, New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams, over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.60c.; Nos. 11 and 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.80c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.80c.; Nos. 12 to 14, 1.85c.; Nos. 15, 16 and 17, 1.90c.; Nos. 18 to 21, 1.95c.; Nos. 22, 23 and 24, 2c.; Nos. 25 and 26, 2.10c.; Nos. 27 and 28, 2.15c.; No. 29, 2.20c.; No. 30, 2.30c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2c.; Nos. 17 to 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.15c.; No. 27, 2.20c.; No. 28, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.15c.; Nos. 12, 13 and 14, 2.25c.; Nos. 15, 16 and 17, 2.40c.; Nos. 18, 19, 20 and 21, 2.55c.; No. 22, 2.60c.; Nos. 23 and 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3c.; No. 28, 3.15c.; No. 29, 3.25c.; No. 30, 3.45c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

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Plugged and Reamed.		
1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
3½ to 13 in.	61	43

6 to 13 in. 2½ in. and smaller, over 18 ft., 10 per cent. net extra. 2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, December 7, 1910.—(*By Telegraph.*)

Pig Iron.—The pig iron market is practically lifeless, there being no inquiries of moment. The Valley furnaces continue to quote $15, at furnace, on standard Bessemer. The average price of Bessemer iron for November by one authority is given as $14.94 and basic $13.36, both at Valley furnace. Foundry iron is weaker and has sold below $13.75, at furnace. We quote standard Bessemer iron, $15; basic, $13.50; No. 2 foundry, $13.75; malleable Bessemer, $13.75, and gray forge, $13, all at Valley furnace, with a freight rate of 90c. a ton for delivery in Pittsburgh district.

Steel.—There is little new inquiry and prices are weak. Small independent steel plants are offering billets and sheet bars at considerably less than the larger mills are naming. Reports are that one or two odd lots of open hearth sheet bars have been sold for prompt delivery by dealers at close to $23, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24.50, f.o.b. Pittsburgh, full freight to destination added.

(*By Mail.*)

Conditions in the iron trade to-day are far from being satisfactory; in fact, are worse than at any time this year as regards both new orders and specifications. Since about November 1 there has been a steady decline in orders, while specifications against contracts have also shown a decided falling off. Confidence in the immediate future seems to be lacking, and consumers are placing orders with great caution. The feeling is pretty general in the trade that the present basis of prices cannot be maintained. Operations among the large steel companies are now down to about 50 per cent., and in some cases less. So far prices have held fairly well, but there is no doubt that here and there concessions are being quietly made, yet these have not had the effect of bringing out any considerable volume of business. The nominal price of Bessemer pig iron remains at $15. Valley furnace, but not enough new business is being offered to test the market. Basic iron is only fairly strong at $13.50, at Valley furnace, with reports that $13.25 was done on a recent sale involving 7000 to 8000 tons to a local open hearth steel plant, for delivery in first half of the year. There is not much inquiry for foundry iron, but prices are weak, and $13.75, at Valley furnace, for No. 2 is reported to have been shaded. Regular prices of Bessemer and open hearth billets, 4 x 4 in., remain at $23, and sheet and tin bars at $24.50, Pittsburgh, freight to destination added, but these prices are being shaded by small outside steel mills. The coke trade is also in very unsatisfactory shape with prices weak, and in many cases coke has sold at prices below the actual cost of making it.

Ferromanganese.—A local consumer is reported to have bought 600 tons of foreign 80 per cent., deliveries 100 tons a month for first half, on the basis of $38.50, Baltimore. The demand has quieted down, as most consumers are well covered through the first half. Several large users are covered for all of 1911. We quote 80 per cent. foreign, for delivery through the first half, at $38.50, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—No sales of moment have recently been made and new inquiries are light. We quote 50 per cent. for delivery over the first six months of next year at $55 to $55.50, and for prompt delivery at $56 to $56.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—A local consumer has bought 1500 tons of sheared iron plates on the basis of about 1.70c., delivered at mill. New inquiry is dull, most consumers being covered, while their requirements are lighter than usual, owing to the slowing down of operations. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—New inquiry is light and specifications against contracts are not coming in well. We quote Bessemer rods at $28 to $28.50 and open hearth and chain rods at about $28.50, Pittsburgh.

Muck Bar.—The demand is small, owing to the slowing down of operations among the bar iron mills, and prices are weaker. We quote best grades of muck bar, made from all pig iron at $29 to $29.50, delivered at buyer's mill in the Pittsburgh district.

Steel Rails.—New orders and specifications for light rails are fairly active, last week being quite a good one in this respect with the Carnegie Steel Company. The Edgar Thomson rail mills of this company at Bessemer are now being operated to 50 per cent. or less of capacity. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—The Baltimore & Ohio Railroad has ordered 30 all steel passenger cars from the American Car & Foundry Company and 20 from the Pullman Company. The Pressed Steel Car Company has received orders for 50 new steel trolley cars for the Pittsburgh Railways Company and 25 50-ton tank cars for the Solvay Process Company, Syracuse, N. Y. The Pittsburgh Steamship Company has given orders for the building of two new ore boats to be ready for the opening of navigation next year; the Jones & Laughlin Steel Company has placed an order with the American Shipbuilding Company for a new ore boat to duplicate the W. C. Moreland, which was totally wrecked on her second trip down the lakes; the Shenango Furnace Company, of which W. P. Snyder is president, will probably invite bids in the near future for the building of two ore boats, and which will likely be the largest ever built, 615 ft. over all, and built on the new longitudinal system. In addition to these boats, which will require upward of 30,000 tons of plates, the Standard Oil Company has placed contracts for two boats, while other interests have placed contracts for the building of two steel passenger boats, three bulk freighters and two car ferries, so that the lake shipbuilding concerns have quite a good amount of work already on their books and in prospect. The outlook as regards orders for steel cars is not good. The Woods Run plant of the Pressed Steel Car Company is practically shut down, while its McKees Rocks works has enough orders booked to run fairly full until about February 1, but with little beyond that date. The general demand for plates is quiet, and the leading mills are operating to only about 60 per cent. of capacity. We continue to quote ¼ in. and heavier plates in the wider sizes at 1.40c., Pittsburgh, while on the narrow sizes, 1.35c., Pittsburgh, is still being named. There are reports of lower prices than 1.40c. on wide plates being named by one or two mills, but these are not confirmed.

Structural Material.—No orders of moment have been placed in this district in the past week. A fair amount of bridge work from the railroads is coming up, but it is slow in being placed. While local mills continue to quote beams and channels up to 15-in. on the basis of 1.40c., f.o.b. Pittsburgh, there are persistent reports that these prices are not the bottom of the market, but are being shaded by outside

THE IRON AND METAL MARKETS

mills, that are using less than 1.40c., Pittsburgh, as a basing price, for delivery at certain points.

Sheets.—The sheet trade continues in unsatisfactory condition, with no prospects of betterment in the near future. Distributers and consumers of sheets are purchasing only such quantities as are actually required to meet current needs. Prices are being modified to suit conditions, and in some cases contracts have been canceled. Very little new tonnage has been sold to large consumers on the 2.20c. basis for No. 28 gauge one-pass cold rolled sheets, but this price is being obtained for small lots. None of the sheet mills is operating to full capacity, the American Sheet & Tin Plate Company running at present to only about 50 per cent. Consumers who have been holding off will probably be compelled to come in the market early next year to replenish stocks. The general market on sheets is on the basis of about 2.15c. for No. 28 gauge one-pass black, and 3.15c. for No. 28 galvanized, in carload and larger lots, with $1 a ton higher prices charged for small lots. We give the full schedule of prices now in effect on black and galvanized and on roofing sheets on a previous page.

Tin Plate.—A material restriction in operations has occurred recently on account of the slowing down in demand and falling off in specifications against contracts. The American Sheet & Tin Plate Company is operating to about 55 per cent. of capacity. Some heavy contracts for bright plate have been placed in the past three or four weeks from the salmon packers, the meat packers and also from the makers of tin cans, but deliveries on these contracts which run through first quarter and first half of next year will not start for some time. We continue to quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Bars.—The railroads are specifying a little more freely against their contracts for iron bars, and it is also stated that specifications against contracts for steel bars are coming in at a fairly satisfactory rate. New orders for both iron and steel bars are light. We quote steel bars and common iron bars at 1.40c., f.o.b. Pittsburgh.

Hoops and Bands.—Several large consumers of both hoops and bands have recently placed contracts covering their requirements through the first quarter, but new demand is confined mostly to small lots to cover actual needs. Specifications against contracts are coming in at only a fairly satisfactory rate. In the Chicago district some cutting has been done recently on bands using the 1.40c. price, Pittsburgh, as a basis. We quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—Deliveries on contracts made early in the year have been pretty well cleaned up, and only small scattering specifications are being placed, for which 78c. per bundle is being charged for December shipment.

Spikes.—Reports are that several of the large Western railroads will soon be in the market with inquiries for a considerable tonnage. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Spelter.—The market is dull and prices are slightly lower. We quote prime grades of Western spelter at 5.80c., East St. Louis, equal to 5.92½c., Pittsburgh.

Merchant Steel.—New orders are only for small lots, but specifications against contracts are being received by the mills at a fairly satisfactory rate. It is probable that mill shipments in December will show a falling off as compared with November. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base, under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—The demand is dull, being only for small lots to cover actual needs. Specifications against contracts have not been coming in well for some time. Regular discounts are being fairly well maintained, and are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Jobbers and consumers of wire and wire nails continue to place orders only for small lots. Specifications against contracts are not satisfactory. It is stated that prices, which were being slightly shaded several weeks ago, are firmer now and are being maintained. Mill shipments of wire and wire nails in December will probably show a falling off as compared with November, but an improvement is looked for early in the new year. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—It is stated that a local mill has taken a contract for three miles of 6 to 10 in. steel line pipe, and another contract for 25 to 30 miles is reported to have been placed. General business is quiet, several of the mills are going after business quite agressively, and it is stated that regular discounts on both iron and steel pipe are not being strictly held in all cases. Discounts in effect on both iron and steel pipe are printed on a previous page.

Boiler Tubes.—The new demand for both merchant and locomotive tubes is light, and prices are more or less demoralized.

Iron and Steel Scrap.—The scrap list of the Pennsylvania Railroad was issued last week and included nearly 20,000 tons of rails and other scrap material, the largest tonnage offered by this road for some time. The scrap trade continues very dull, consumers being covered for several months ahead, and are not taking in material very freely on account of slowing down in operations. The present quiet condition in the scrap trade is expected to continue for some time. We note a sale of about 2000 tons of heavy steel melting scrap at $14, delivered. Dealers quote about as follows, per gross ton, f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.75 to $14.00
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	9.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.50 to 25.00
No. 1 bushelling scrap	12.25 to 12.50
No. 2 bushelling scrap	8.75 to 9.00
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.75 to 9.00
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	11.50 to 11.75
Heavy steel axle turnings	10.25 to 10.50

Coke.—Several large contracts for furnace coke for shipment to the valleys and one contract for Eastern delivery are being figured on, but have not yet been closed. A number of the leading independent producers are still actively at work on a plan to place the coke business on a better basis. Last week the Upper and Lower Connellsville regions turned out 285,049 tons of coke, a falling off over the previous week of 41,000 tons. This is by far the lightest output of coke in the district in any one week so far this year. We quote standard makes of furnace coke for prompt shipment at $1.45 to $1.50 per net ton, at oven, while for delivery over first half $1.75 to $1.80 is quoted. Best makes of 72-hour foundry coke for prompt shipment are held at about $2 per net ton, at oven, and for first half from $2.10 up to $2.50.

The corporation of Trimble, Mudge & Co. has been organized under a Pennsylvania charter with a capital of $250,000, and will take over the business of Hazard, Mudge & Co., dealers in iron and steel scrap, Buffalo, N. Y., and also the scrap business of Edmund W. Mudge & Co., Frick Building, Pittsburgh. The general offices will be located in the Frick Building, Pittsburgh, with a branch office in Ellicott Square Building, Buffalo, N. Y. Scrap yards will be maintained on the South Buffalo Railway at Lackawanna, N. Y. This new arrangement becomes effective January 1. While officers have not yet been elected, the personnel of the new company is the same as that in the two firms that have been absorbed.

Chicago

FISHER BUILDING, December 7, 1910.—(*By Telegraph.*)

Trade is very quiet in all lines of finished materials. There is a fair run of orders for small lots from store of sheets, plates and structural material, but buyers from mills are generally reducing their stocks for inventory and are postponing orders wherever possible until after the first of the year. A large number of plants will be closed for the last week or two weeks of the month for repairs usually made at the time of taking inventory, including many industries which formerly closed at other seasons of the year. This general cessation of industrial operations is made necessary by the corporation tax, which requires inventories to be taken at the end of the year. A bright spot in a dull market is in the field of fabricated material. In Chicago

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the City Council has finally adopted the new building code, which has been pending for nearly a year. As it reduces the cost of erecting steel buildings, many large projects for office buildings have been held in abeyance waiting its adoption. The money market has also grown more favorable for financing large buildings, and it is expected that work will commence this winter on buildings requiring 50,000 tons of steel. In the Duluth district about 25,000 tons of steel will be required for work now under way, including an ore dock for the Great Northern Railway, a similar dock for the Duluth & Iron Range and construction work on the plant of the Minnesota Steel Company. At Kansas City preliminary work has begun on the long talked of Union Terminal, and contracts amounting to 35,000 tons are expected to be let soon. In other Western cities, especially on the coast, there are tangible prospects representing a large aggregate tonnage, as much of which has been held back by financial conditions the past year. Concessions are reported from Eastern mills on plates and also on light sections of structural shapes. The weakness in sheets is confined principally to tin mill sizes of black sheets. The only car order reported from Western railroads is one from the Great Northern for about 1000 steel cars. The equipment industries expect developments early in the year in the way of railroad buying. The scrap market is weaker, with the most pronounced decline in rerolling rails.

Pig Iron.—The Inland Steel Company has made an additional purchase of 5000 tons of basic from a Valley furnace for immediate shipment. Repairs on this company's furnace will not be completed until about January 1, making necessary an additional purchase for current requirements. The leading steel foundry interest has also been making purchases of basic for first quarter and first half shipment. In foundry grades the market is quiet. November sales were considerably in excess of the average sales of previous months, but foundries in this territory are generally covered for their requirements for first quarter at the present rate of consumption, and will use their inquiries for any additional tonnage for first quarter as an inducement to obtain prices on second quarter iron. The Southern furnaces are not maintaining as firm a front in holding for $11.50, Birmingham, for first quarter, as it is growing difficult to interest buyers in any price higher than $11, and in one or two cases this price has been shaded by Tennessee furnaces. Buyers are generally waiting for a more definite turn in the business situation, and are becoming skeptical regarding reports of a railroad buying movement which is expected by the equipment industries in the near future. Valley furnaces have been making low prices for Western delivery, apparently with a view to reducing their stocks before the opening of navigation and a probable reduction in ore prices. Local furnaces have good shipping orders, but have trouble in getting cars. The following quotations are for December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	18.40 to 18.90
Jackson Co. and Kentucky silvery, 8%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 10%	20.40 to 20.90

(*By Mail.*)

Billets.—The market is quiet, with only an occasional inquiry for small lots of forging billets. Chicago mills quote $28 base, Chicago, for carload lots, but this price can be shaded on any desirable tonnage.

Rails and Track Supplies.—Western railroads have not yet submitted definite inquiries for their rail requirements for 1911. A preliminary inquiry for 10,000 tons from one road has been pending for some time, but has not been closed. The current demand for track supplies is light. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.20c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—The Duluth & Iron Range Railroad has let to the American Bridge Company a contract for a new ore dock at Duluth which will require 9500 tons. The Great Northern, which let a contract last summer for the construction of an ore dock at Allouez Bay, near Duluth, has requested that the work be rushed this winter so as to have it ready for spring shipments of ore. The Minneapolis Steel & Machinery Company has booked 346 tons for a sampler building at the Washoe smelter of the Anaconda Copper Company. The fabricating interests are quite optimistic regarding the amount of business pending. More building contracts are expected to be let in Chicago this winter than for some years past, as many of the pending projects have been delayed a long time awaiting a new building ordinance. There is also a large amount of work pending throughout the West on which definite announcements are expected in the near future. The market for plain material from mill is quiet and concessions are reported again on light sections. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The mills report a very quiet week in specifications, and do not expect much activity until large orders are placed for freight cars. There has been a fair amount of business this fall in material for steel passenger cars, but the largest tonnage of the plate mills goes into freight equipment. The Great Northern is in the market for 975 steel cars and is expected to close this week. This inquiry includes 500 ore cars, 400 hoppers and 75 tank cars. Ohio mills are again reported making concessions on narrow plates, but the market is firmer than last fall. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The only weakness reported in prices is in tin mill sizes of black sheets. Owing to the fact that deliveries from the mills are so prompt, specifications from jobbers have fallen off somewhat the past week. This will keep stocks down until after inventories are taken to comply with the corporation tax law. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Specifications for soft steel bars came in better during the month of November than in October, but are still somewhat below expectations. Buyers who hold yearly contracts are gaining more confidence, however, as one implement manufacturer who had given specifications for 2000 tons last fall and then recalled them has reinstated this tonnage for December shipment. New buying is light in both soft steel and hard steel bars. The railroads are slowly increasing their specifications for bar iron. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Jobbers are beginning to order barb wire quite freely for spring trade, but specifications generally provide that shipments be held back so as to arrive after January 1. This is in line with the general tendency in the trade to reduce stocks before taking inventories, as required by the corporation tax law. The bolt, nut and screw manufacturers are not specifying so actively as a year ago, and the automobile trade is considerably short of last year. The manufacturers of poultry netting, wire cloth and screen doors recently announced their prices to the jobbing trade for spring shipment. In each case prices were readjusted on a lower basis than last year. Where custom requires it, the wire mills make contracts covering the first half. Some of the manufacturing consumers of wire insist on such contracts to protect them, but the wire cloth people discontinued that plan of purchasing two years ago, and now buy their wire from month to month at the market price. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—The specifications of the agricultural implement manufacturers this year are running ahead of any former year, and the gain in this trade will help to offset the lighter demand from the automobile industry. Store demand is good in all lines excepting plain bars.

Cast Iron Pipe.—No lettings of any moment are reported in this territory the past week. Harbor Springs, Mich., recently advertised for bids for 900 tons of water pipe, but bought only 200 tons. The gas companies are getting prices from the foundries for their requirements for spring shipment, and it is expected that a considerable tonnage of gas pipe will be bought this month. The money market is becoming a little more favorable for the pipe foundries, as municipal purchases were restricted to a considerable extent the past year by the inability of cities to sell bonds. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

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Old Material.—Rerolling rails have declined about $1 in the past week, one sale of 1000 tons having been made to a local mill at $14 per gross ton delivered. Melting steel has held firm, but other important lines of scrap have declined 25c. to 50c. per ton. Dealers are generally disappointed at the lack of improvement in business and are disposed to take losses now rather than carry their stocks until later. The rolling mills for several months have been running at considerably less than half their capacity in this territory and the steel mills are down to about 50 per cent. of the capacity of this district. The large malleable foundries which specialize on railroad work are not running over 50 per cent. The agricultural foundries are running full, but represent a smaller production of malleable tonnage. The gray iron foundries will generally close down for the holidays. All along the line more than the usual interruption to business is expected this year on account of the corporation tax requiring inventories December 31. Many factories which formerly ended their fiscal year and closed for repairs at some other season will now adopt the general custom of closing at the end of the year. This has a marked effect in reducing the consumption of scrap, and the inclination to reduce stocks of materials before taking inventory also checks the purchase of spot material. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	13.25 to 13.75
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	18.50 to 19.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	10.75 to 11.25
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.00 to 8.50
Machine shop turnings	6.75 to 7.25
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	9.75 to 10.25
No. 2 busheling	7.75 to 8.25
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.25 to 12.75
Stove plate and light cast scrap	10.50 to 11.00
Railroad malleable	11.25 to 11.75
Agricultural malleable	10.50 to 11.00
Pipes and flues	8.75 to 9.25

M. M. Broad & Co., scrap merchants, have dissolved. M. M. Broad has become a member of the American Iron & Supply Company, doing a scrap iron brokerage business in the First National Bank Building, Chicago, and L. J. Newman, his former partner, has accepted a position with the Ohio Iron & Metal Company of the same city.

Philadelphia

PHILADELPHIA, PA., December 6, 1910.

Buying in both crude and finished materials has been very light and little betterment in the general demand is anticipated until after the turn of the year. The volume of old orders on steel mill books is gradually becoming smaller. Prices are firm, there being no disposition to make any concession at this time, as it is not believed that, under existing general conditions, any pronounced betterment in buying would result. Sheets have been in less active demand and mills are catching up on orders. Bars continue dull. The old material market is quiet, with lower prices noted for heavy melting steel, borings and turnings, owing to the greater anxiety of sellers to dispose of holdings.

Iron Ore.—Consumers show no interest in the market except for low phosphorus ore, for which they are looking around for supplies for next year. No sales have been announced. Importations at this port during November totaled 103,126 tons, valued at $360,923, while arrivals during the week ending December 3 aggregated 11,695 tons, valued at $22,418. The classification of importations at this port in October was as follows: Spanish, 18,580 tons; Swedish, 29,483 tons; Newfoundland, 17,550 tons, and Cuban, 23,230 tons. At Baltimore the total receipts of Cuban ore in October aggregated 112,600 tons.

Pig Iron.—The market shows little indication of improvement. The larger buyers are pretty well taken care of as far as near future needs are concerned, and current business is confined closely to the smaller consumers, who are taking about the usual quantities, covering month to month requirements. The absence of further weak sellers, who have either blown out their furnaces or retired from the market, gives prices an appearance of greater firmness. While there have been no further curtailments of production in this territory, it is announced that Punxsutawney and Adrian furnaces, in the central part of the State, are to go out about the first of the year. As the average selling price decreases at other furnaces, due to the cleaning up of old high price orders, more consideration is given to curtailment, and it is likely, unless a sharp betterment in the demand sets in, that the early portion of the year will see a further blowing out of furnaces. Transactions in the higher grades of foundry iron have been confined to small lots, with a fair proportion extending over the next three months, at prices ranging from $15.50 to $15.75 for standard brands of No. 2 X foundry, delivered in this vicinity. There has been some buying of low grade irons by the cast iron pipe foundries, who in several instances cleaned up pending business for first quarter delivery. Virginia foundry grades have about settled on a basis of $13, furnace, for either No. 2 X or No. 2 plain. In some instances this figure, which is equal to $15.80 to $16, delivered in this territory, can be done for first half, but the majority of sellers are not disposed to accept orders for shipment beyond the first quarter. Small sales of forge iron are reported at both $14.25 and $14.50, delivered in this vicinity. Basic iron is uncalled for, and prices are entirely nominal. A few sales of low phosphorus have been made, standard analysis being firm at $22.50, delivered here. A moderate tonnage of misfit low phosphorus has been sold at a concession from that price. One melter who was in the market for a large block of standard iron, for first half delivery, has withdrawn from the market. While the general range of quotations is unchanged, more extended deliveries are available. For deliveries in buyers' yards, eastern Pennsylvania and nearby points, the following range of prices is named:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—The local demand is still very quiet and sellers report the heavy Western movement about at an end. While $38.50 to $39, Baltimore, is nominally quoted, speculative offerings, usually at a low figure, control the price situation to a considerable extent.

Billets.—A somewhat better volume of small lots in prompt rolling billets is reported, but the aggregate amount coming to the mills shows no material increase. Forging billets have been in less active demand. While there has been some indefinite inquiry for early 1911 requirements, no business is reported. Ordinary open hearth rolling billets for either prompt or first quarter shipment are quoted at $25.50 to $26, delivered in buyers' yards in this vicinity, with forging billets firm at $28, Eastern mill, the usual extras for high carbons and special sizes being added.

Plates.—Orders taken by Eastern mills recently show no material increase in tonnage. While some mills gain a few hundred tons, others fall behind a trifle, so that the volume of business coming in is practically unchanged. While there is considerable unfilled business on some makers' books, a good share is for forward shipment, and the amount on hand for delivery this year is growing considerably smaller. Prices are being firmly held, 1.55c., delivered in this territory, representing the minimum for ordinary carload business.

Structural Material.—Some little bridge business has come out, 1700 tons being reported placed by the Philadelphia & Reading Railroad, while several other orders for small bridges are pending. While fabricators are figuring on building work in nearby districts there is little new business of any importance that has developed in this immediate vicinity. Some fabricators have considerable work on hand, sufficient to keep them well engaged for some months; mills, however, are catching up on orders in hand for plain shapes. Prices are unchanged, 1.55c. to 1.60c., delivered here, representing quotations for plain shapes.

Sheets.—There has been less business offered and mills in this district are rapidly catching up with orders. Unless there is an improvement in buying some will close mills for the holidays somewhat earlier than usual. There is still an absence of any forward buying, consumers purchasing generally for near future requirements. Prices are well maintained, the following range being quoted by Eastern mills for reasonably early delivery: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand appears to be less active. Hardly

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enough business has been done to establish a market. While quotations for refined iron bars in small lots range from 1.35c. to 1.45c., delivered in this territory, the inside price can easily be done for moderate quantities and would probably be shaded a few hundredths, if the business offered were considered especially desirable. Steel bars continue moderately active at 1.55c., delivered in this district.

Coke.—While there have been some negotiations for furnace coke for 1911 delivery, there has been little business consummated in this territory, although consumers would no doubt place orders if their ideas as to prices were met. Foundry coke transactions have been small, at unchanged prices, and largely for early delivery. Prices show little change, the following range, per net ton, about representing the market for deliveries in this territory:

Connellsville furnace coke	$3.85 to $4.05
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.50 to 3.90
Foundry coke	3.85 to 4.05

Old Material.—Business is largely of a hand to mouth character. Mills show little interest in the market generally, and, as a rule, take in only bargain lots. Anxious sellers have in some instances taken lower prices for No. 1 heavy melting steel, $13, delivered, being done in small lots. Several of the leading mills, however, are not inclined to pay more than $12.75 for this grade, and are not particularly anxious to take it in at that figure. Borings and turnings also show a decline on lighter buying and heavier offerings. In the principal rolling mill grades very little business has been done and prices are to a large extent nominal. The following range about represents sellers' ideas of the market for delivery in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia, ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$12.75 to $13.25
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 18.50
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.50 to 18.00*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.50 to 13.00
No. 1 forge fire	11.00 to 11.50
No. 2 light iron	7.00 to 7.50
Wrought turnings	8.25 to 8.75
Cast borings	8.25 to 8.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cleveland

CLEVELAND, OHIO, December 6, 1910.

Iron Ore.—Taking into consideration the large amount of ore on the docks and in the furnace yards, and the expected limited purchasing next season by some consumers that overbought this year, it is doubtful if the new record of lake ore shipments established in 1910 will be broken during 1911. There has been a little spurt of shipping orders during the past few days from consumers that want to get some of their tonnage from the docks on furnace yards before severe winter weather sets in. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—Following a moderate buying in small lots of foundry iron during the past few weeks, the market has again quieted down. A few new small inquiries are pending and not much business is expected to come out during the remainder of the year. A leading electrical interest has an inquiry out for 1000 tons of low phosphorus iron for delivery to an Eastern plant in the first half. The market is not firm, and while $14 at furnace is the usual asking price for No. 2 foundry for first quarter and first half delivery, this price is being shaded somewhat, and reports are quite general, but are unconfirmed, that No. 2 foundry can be bought at $13.50 in the Valley for next year's delivery. For Cleveland delivery, local furnaces are adhering to their recent quotations of $14.25 to $14.50, delivered, for the first half. For December delivery we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.50 to 14.75
Northern foundry, No. 2	14.25
Northern foundry, No. 2	14.00
Gray forge	13.90
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—A local interest is understood to have purchased about 60,000 tons of furnace coke, representing its requirements for one stack for six months. Another local interest that had an inquiry out last week has decided to buy only odd lots for spot shipment. There is little demand for foundry grades. One local consumer is asking for prices for 1500 tons for delivery through the entire year. We quote standard Connellsville furnace coke at $1.45 to $1.55 per net ton, at oven, for spot shipment, and $1.75 to $1.80 for delivery through the first half. Connellsville 72-hour foundry coke is held at $2 to $2.10 for spot shipment and $2.25 to $2.50 for the first half.

Finished Iron and Steel.—Business in finished lines is light. Some mill agencies are getting as good a volume of orders as in immediately previous weeks, but others notice some falling off. Consumers are allowing their stocks to run low, and there is little expectation of an improvement in the demand until after the first of the year. Shafting is in more active demand than any other finished lines. There is some inquiry for steel bar and small shape contracts for first half delivery. Steel bar specifications are only fair, with prices firm at 1.40c., Pittsburgh. The American Shipbuilding Company has received a contract from the Jones & Laughlin Steel Company for a 12,000-ton lake boat to replace the W. C. Moreland, which was wrecked a few weeks ago. Its construction will require about 4500 tons of plates and shapes. The Pittsburgh Steamship Company is asking for proposals for two large lake freighters for 1911 delivery. Much of the pending structural work has been held up until after the first of the year, and the structural demand is limited mostly to small lots. One order, however, is for 1500 to 2000 tons of structural material for a bridge, which was taken by an independent interest. The Commissioners of Cuyahoga County have rejected all bids for the Dunham road grade crossing elimination work near Cleveland, requiring 400 tons, and will readvertise. Bids have also been rejected for the foundation for the city hall in Cleveland, requiring 500 tons of reinforcing bars, and the work will be readvertised. The demand for sheets is only moderate and prices are not firm, some of the mills shading as much as $2.50 per ton on black sheets for prompt shipment. Some of the sheet mills are seeking first quarter business at 2.15c. for No. 28 black and 3.20c. for galvanized. Rivet prices are being fairly well adhered to for future delivery, but concessions of $2 a ton are being made for spot shipment. The demand for iron bars continues light, with prices stationary at 1.30c. to 1.35c., at mill.

Old Material.—Three local mills are so well filled up with scrap that during the past few days they have placed an embargo on shipments. This has made the market practically lifeless. Dealers look for only a limited amount of business during the remainder of the year. Prices to a certain extent are nominal, there not being sufficient business during the week to establish any clearly defined basis. The Big Four Railroad has a list out of somewhat more than its usual tonnage. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	13.25 to 13.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, December 7, 1910.—(*By Telegraph.*)

Pig Iron.—Up to the present time curtailment intentions with the producers have been largely a matter of talk with no definite results. The furnace interests now seem to realize that it will be necessary to cut down the output, and rumors are out that several Northern furnaces will go out of blast this month. Practically all of them have been waiting on the other furnace to make the move, and as a consequence production has been outrunning consumption. Agricultural implement manufacturers and stove makers have been steady customers, and the jobbing foundries have also been fairly good melters, but this trade is not now good, and it is estimated that the foundries in this vicinity have enough iron on hand to operate at least four months without adding to present stocks. About 8000 tons of No. 2 foundry and analysis iron was contracted for by Illinois agricultural implement manufacturers last week, most of which business went to Southern furnaces. A local melter bought 500 tons of foundry iron for first half, about equally divided between Northern and Southern iron. Other sales reported are only small lots. A satisfactory feature of the present situation

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is the free movement of contract iron. It is stated that some Southern spot iron has been offered as low as $10.75, Birmingham basis. The first quarter price is $11, delivered, with a strong probability that orders would be accepted for first half at this same figure. Northern No. 2 foundry remains at $14, and malleable around $14.25 to $14.50, Ironton. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 15.75
Southern coke, No. 2 roundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(By Mail.)

Coke.—Furnace and foundry coke move rather slowly. No change is anticipated for the immediate future, and there is likely to be a falling off in furnace coke shipments, as several blast furnace owners have signified an intention of blowing out in the near future. In the Connellsville field spot furnace coke is offered as low as $1.45, but the Wise County and Pocahontas operations appear to be getting from 5c. to 20c. above this figure. Contract prices in all three fields range from $1.65 to $1.85. Foundry coke is quoted at $2 for spot shipment and around $2.25 for contracts, and only small tonnages are being sold. All the above prices are per net ton at oven.

Finished Iron and Steel.—The market is just about holding its own. Prices are unchanged, 1.40c. representing mill quotations on steel bars and structural material, with warehouse prices around 1.75c. to 1.85c. There is a fair demand for hoops and bands from the brewing and distilling interests.

Old Material.—A local dealer sold a medium sized lot of wrought scrap last week, but transactions in both wrought and cast scrap are mostly limited to sale of carload lots for immediate requirements. As nearly all dealers are stocked up, they are not making prices attractive enough to bring in any large quantities of scrap. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Buffalo

BUFFALO, N. Y., December 6, 1910.

Pig Iron.—The market has been extremely quiet, with a perceptible falling off both in inquiry and in new business placed. Such orders as have been received are small, and the largest inquiry coming in was for 1000 tons of foundry iron from a central New York concern. The slackening of demand is especially noticeable from cast iron pipe foundries and those supplying the automobile trade. Some foundries in general trade, although fairly well filled with work, have stopped coming into the market for the present. Radiator and stove foundries are busy, but as a rule have their wants covered for some time ahead. The price situation is not particularly cheering from the furnacemen's point of view. Five furnaces are out of blast in the Buffalo district; the Punxy Furnace at Punxsutawney, Pa., will be blown out January 1, for an indefinite period, and the Adrian Furnace at Dubois, Pa., will go out of blast about the same time. This may be cited as an example of the disposition on the part of pig iron makers to meet the situation, which has reached an unprofitable basis, by further curtailment of production. There is so little business going for the past week that prices have not been tested, and we, therefore, quote the same as for the previous week, f.o.b. Buffalo, as follows:

No. 1 X foundry	$15.00 to $15.50
No 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—The market has been without activity in any line, so far as new business is concerned, current sales and specifications on contracts both showing a reduction in volume. Mills supplying this district report that the output has overtaken specifications in nearly every line of finished materials, and production is being curtailed somewhat to meet these conditions, even in bar products. The agency of the principal interest states that Canadian export business continues to lead over domestic sales. In structural lines business for the week has been light, only one or two projects developing to the stage where figures are being asked. Plans for new factory buildings to be erected by the Crouse-Hinds Electrical Company at Syracuse have been completed and bids are being received; a considerable tonnage of steel roof trusses will be required, probably about 300 tons in all. Contract for steel for the H. D. Taylor Company's warehouse, Buffalo, about 100 tons, has been awarded to the George Kellogg Structural Company.

Old Material.—The market continues exceedingly dull, with practically no demand from steel mills. Foundries are taking a moderate amount of cast scrap. The principal lines manifesting any degree of strength are machinery cast scrap and railroad wrought. Prices are largely nominal and unchanged from last week, with the exception of heavy melting steel and cast borings, which are slightly weaker. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$11.75 to $12.25
Los phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	9.75 to 10.25
Locomotive grate bars	10.75 to 11.25
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.50 to 6.75

The Grade Crossing Commission, Buffalo, has decided to build two additional viaducts over the Erie Railroad, one at Genesee street and the other at Doat street.

Joint contract is soon to be let by the city of Niagara Falls and the New York Central Railroad for the construction of a steel viaduct over the New York Central tracks at Eleventh street, Niagara Falls.

The Groton Bridge Company, Groton, N. Y., has received contract from the State of New York for the construction of the steel superstructure of a highway bridge over the Erie Canal at Rochester, at its bid of $28,841.

The American Pipe & Construction Company, Philadelphia, has received contract from the State of New York for dredging the Oswego Canal, between Oswego and Fulton, for $2,323,998.

St. Louis

ST. LOUIS, December 5, 1910.

Pig Iron.—With some of the leading offices a quite satisfactory business was done the past week. One seller reports sales of upward of 10,000 tons. These transactions represent sales in various quantities and shipment (mostly Southern No. 2 foundry and analysis iron, and for shipment over the last half) with some 18 consumers, partly local and partly in St. Louis territory. Another house sold upward of 3000 tons, while the leading interest secured a contract from a local steel foundry for 10,000 tons of Southern basic, for shipment over the first half. The sale of 1200 tons of Southern 2 to 2½ silicon for shipment over the first half, was also reported. Conditions as to prices continue unchanged. Business is pretty much confined to forward delivery and prices for Southern No. 2 foundry range from $11 to $12, Birmingham, with doubtless the major portion of the sales being made at the inside figure.

Coke.—Business is wholly confined to a jobbing basis, there being no round lot inquiries. Specifications on contracts are coming in freely, however, and shipments are proceeding satisfactorily. The tone of the market is weak. We quote for best Connellsville 72-hour foundry $2 to $2.25 per net ton; second quality, $1.85 to $2, f.o.b. oven.

Finished Iron and Steel.—The leading interest reports an improvement in the inquiry for standard rails and mentions sale of approximately 5000 tons to the Cotton Belt Railroad. For light rails there is a fairly brisk inquiry from coal interests. In structural material the demand is mainly confined to specific work. There is a moderate inquiry for bars from jobbers and agricultural implement manufacturers. In track material business is light.

Old Material.—The demand for relaying rails is gaining in volume and urgency, with the result that prices have advanced. While the bulk of the inquiry is for standard sections, there is also a good demand for light sections. For scrap iron and steel new business is still of small proportions, but the leading dealers are busy in filling prior contracts and trading with each other. The following offerings

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by the railroads are reported for the week: Missouri Pacific, 1000 tons; St. Louis & San Francisco, 750 tons; Wabash, 550 tons. Prices are nominally unchanged. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$11.50 to $12.00
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.75 to 12.25
Frogs, switches and guards, cut apart	11.75 to 12.25

The following quotations are per net ton:

Iron fish plates	$11.50 to $12.00
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad tank and sheet scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.50 to 8.00

The Railroad Committee of the House of Delegates has reported a bill requiring the Missouri Pacific Railway to abolish the Chouteau avenue grade crossing by constructing a viaduct. The bill requires the railroad to bear the expense, estimated at $200,000.

The East Side Levee & Sanitary District has announced that bids will be opened January 9 for four highway bridges over the division channel, which is now being dug to divert the waters of Cahokia Creek into the Mississippi River. Each span of the bridges will be 270 ft. long. The estimated cost of the four bridges, which will be of steel, is $45,000.

San Francisco

SAN FRANCISCO, November 30, 1910.

Conditions are still unsatisfactory, the movement being confined almost entirely to jobbing sales and small orders for stock, but the undertone of the market is felt to be more favorable. This is partially due to the expectation of the Panama-Pacific Exposition, which if held here would cause a material increase in the requirements of San Francisco and of California as a whole between now and 1915. It is also believed that the agricultural prosperity of the country will bring a strong reaction from recent conditions by next spring. While little new business is expected before the end of the month orders are to be placed early in December for a substantial tonnage in several lines. The fact that merchants are beginning to order for stock, even in small quantities, is taken as a favorable indication.

Bars.—Little new business is being booked by mill interests, and in view of the increasing production on the Pacific Coast the outlook for the future is rather uncertain. Manufacturing interests are still proceeding with caution, but the jobbing trade shows a little more life, and preparations for development work in a number of lines should bring out more inquiry in the near future. With the stock taking period approaching, however, no heavy movement is likely before the close of the year. Merchants are well supplied with a heavy tonnage of foreign steel under contract, and no extensive purchases are expected from this quarter. Reinforcing bars are in fair demand for this time of year, but the prices are comparatively low. Prices on soft steel are steadily held, no further reduction being anticipated. Bars from store, San Francisco, are quoted at 2.20c. for iron and 2.40c. for steel.

Structural Material.—Local building business has recently fallen far below normal, the valuation of contracts let last week being the lowest of any week in several years. The city seems to be well provided for in all classes of buildings, though architects have several large projects in hand which will soon be heard from. Local steel contractors have very little unfinished work on hand, but are counting on a number of schools for the early part of next year. The Cortez Hotel will probably be let by the end of the week, and an apartment house will require about 200 tons, but otherwise there is nothing in sight before the end of the month. Several jobs are scheduled to come out early in December, among them being the Lowell High School, the Sacramento court house and the Masonic Temple. Figures will probably be taken on the Oakland city hall next month. The American Bridge Company has taken a fair order for a railroad bridge in Oregon, and a contract is expected on the court house at Portland, Ore. A fabricating order for the Hogue Building, Seattle, is due in a few days. The Bon Marche department store in that city may be withheld for some time. Plans are being drawn for a six-story department store for Hale Bros. in this city, which will require a substantial tonnage, but it will not be ready for figuring for several months. Beams and channels, from store, 3 to 15 in., San Francisco, are quoted at 2.60c.

Rails.—Standard sections continue moderately active, and the total tonnage booked so far this month is considered very encouraging. Plans for extensions and new work on a number of small lines in various parts of the State are reaching a stage at which buying may be expected, and the larger roads show a disposition to proceed with branch lines and improvements more actively than for some time past.

Plates and Sheets.—New business in tank plates is rather slow, though fabricators have a good volume of work, and the outlook is favorable for next year. A fair tonnage of marine plates will be required for repair work, but the movement in this line is not heavy. Black and galvanized sheets have been very dull, but some improvement is noted in the distributive trade, and orders for stock are larger than for several months. Several new inquiries are coming up for riveted pipe and tank work. It is reported that a gas plant is to be installed at Willows, Cal. The city of Los Angeles has taken bids on about 1100 ft. of 12-in., 14-gauge riveted pipe, and will let a contract about the end of the year for 1409 ft. of riveted steel siphon, 9 ft. 6 in. in diameter.

Merchant Pipe.—The current movement is by no means satisfactory, but is apparently on the increase. Some mill representatives report an improvement in the oil fields, which is not noticed by others. The oil industry is rapidly getting into better shape, and with increasing consumption the surplus output is gradually moving off. All newly projected pipe lines, however, have been dropped for the present, and those who are boring wells have considerable unused stock on hand. The distributive trade is inactive, but jobbing stocks show considerable reduction and small orders of a sorting-up nature are coming out freely. If this business continues on the present scale, November will be the best month since last June.

Cast Iron Pipe.—The first large pipe contract of the Bay Cities Water Company, Oakland, Cal., has been let to the Crane Company, and calls for approximately 30 miles of pipe, varying in size from 4 to 12 in. Shipment is to commence at once. The tonnage moving on small purchases is satisfactory, and a material increase in demand is expected during the next few months. Fire hydrants and water works supplies are in good demand, Los Angeles being in the market for a lot of fittings, &c., and Portland, Ore., for 200 hydrants, with smaller inquiries from other places. Reports on recent investigations by insurance interests in many coast towns are causing a general agitation for water works improvements. The town of Ashland, Ore., is preparing to issue $170,000 bonds for extending the water system.

Pig Iron.—Business is even quieter than before, as none of the local foundries have much work on hand, and operations in other parts of the State have been greatly curtailed. Occasional small lots are sold, but the tonnage is below normal, and with more or less imported material accumulating prices are weak and irregular. English, Chinese and continental iron can hardly be sold above $22, and there is scarcely any movement at that figure. The Noble Electric Steel Company expects to resume the production of pig iron as soon as the Northern California Power Company completes its plant.

Old Material.—There is little feature to the market at the moment, except for the increasing scarcity of cast scrap. Immediate requirements in this line are small, but offerings have been diminishing for some time and no large lots of good material are coming on the market. Some melters have accordingly shown a disposition to buy for future requirements, and dealers are very firm as to values. There is little new business in steel scrap, but with a good demand in prospect dealers are endeavoring to accumulate a supply. Cast scrap is quoted at $18 per net ton, but good heavy material would probably bring a better figure. Other quotations are: Steel melting scrap, per gross ton, $12.50; wrought scrap, per net ton, $13.50; rerolling rails, per net ton, $15.

Birmingham

BIRMINGHAM, ALA., December 5, 1910.

Pig Iron.—The buying the past week in this market has continued at a greater rate than would generally be supposed, the greater portion by far having been for forward delivery. In some cases purchases have been made on the $11, Birmingham, basis, for sufficient iron to run the con-

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sumer through the first half, which is equivalent to a certain extent to making the $11 price good for the first half of 1911. Still, no one can be found openly quoting such figure. One large interest that took a considerable tonnage of $11 iron announces its withdrawal from the market. Another states that in view of the likelihood of one of its furnaces soon going out, and considering the tonnage on its books unfilled, it will take no more business for the present. Were it not for the fact that stocks on the yards here showed a material increase in November, and there is no iron of consequence selling for December delivery, the market would have really a strengthening tendency. Spot iron is admittedly the weak feature, and if it should be held firm through December the producers will have a good deal over which to congratulate themselves. The recent buying of Southern iron has been from all sections of the country and for all grades, indicating that consumers of all kinds of iron realize that prices are low. As a matter of fact, if a break below the $11 figure should be made, and such a price become general, more than one furnace now running would be forced to suspend operations.

Cast Iron Pipe.—The makers of water pipe are simply "resting on their oars," so far as new business is concerned. They are still fairly busy on orders and just now are cleaning up their stocks of raw material as far as possible and arranging for the inventories which will occupy the last two weeks of the year. The only large contracts of importance now pending are those in Chicago and Portland, Ore. The latter has been up for consideration for some time, but the greater portion of the tonnage is yet to be placed. The makers of sanitary pipe find jobbers with rather scant stocks, but disinclined to take anything until after inventories. Prices in this line are lower than they have been for years. On water pipe we revise quotations, f.o.b. cars, Birmingham, per net ton, as follows: 4 to 6 in., $20 to $20.50; 8 to 12 in., $19.50 to $20; over 12-in., $18.50 to $19. Gas pipe continues its differential of $1 per ton over this schedule.

Old Material.—There is nothing new to be said of the scrap iron market and we continue to quote nominally, per gross ton, f.o.b. cars here:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

The German Iron Market Quieter

BERLIN, November 24, 1910.

The market situation has grown rather quieter. Buyers are holding back, but in most lines this is due to the fact that they have provided for their wants for a considerable period ahead. In view of the advanced season it is not expected that the market will show any improvement till toward the end of the March quarter, when the spring business will be coming in. In structural shapes, for example, it is expected that the demand will then be considerably heavier than for several years. Building operations have been at a low ebb for a long period, and labor questions will probably not arise to trouble builders as they have done for a year or two.

It is no little encouragement to the German trade that the downward movement of prices in Belgium has apparently come to a standstill, and that even an improvement is mentioned in some cases. This week a Brussels dispatch states that the price of semifinished steel for export to England has risen 1 shilling, and that the home price for bar iron has been advanced from 132.50 to 135 francs. Another encouraging event for the German trade is a slight reduction of coal prices. The Coal Syndicate has just given out its list for 1911, with prices about 6c. a ton lower, while the reductions made by the Prussian Government's mines in the Saar district range as high as 24c.

Dealers Create a Flurry in the Bar Trade

The event of the week in the trade has been the public bidding for large contracts in bars for the railroad authorities at Berlin, which brought out bids considerably below the convention price. One firm of dealers bid as low as 103 marks on basic steel bars and 104 on open hearth, delivered at Oberhausen, near the lower Rhine, whereas the convention's price at that point is 110 marks. Other bids were a little higher. The publication of this news created quite a stir among the members of the convention, since it was assumed that one or more of the big mills, members of the combination, must be behind those low offers. Accordingly a meeting of the latter was hastily got together at Dortmund yesterday to take action against the offending member or members. It transpired, however, that the dealers made their bids without any arrangement whatever; but it is not stated whether they have on hand stocks sufficient to fill the orders in question, or whether they are speculating upon getting bars from manufacturers later on at prices low enough to allow them a profit on the transaction. This meeting apparently brought out evidence, nevertheless, that the convention is on a rather weak footing; hence a further meeting was appointed for the middle of January to deliberate upon the future of the combination.

The ore market has continued active and strong, and in some qualities complaints of scarcity are heard. The arrivals of Spanish ores are still insufficient, and, as prices are now 60c. to 72c. per ton higher than at the beginning of the year, German furnaces are substituting other ores as far as possible. English competition has also driven the price of a new form of Swedish ores—so-called concentrates of low phosphorus contents—so high that German buyers have declined to follow. German companies, however, have long contracts for ordinary Swedish ores, and these are being filled regularly. Ores from Normandy have been coming into Germany in growing quantities, and Russian ores have also gone into the Silesian district in considerably larger amounts.

In semimanufactured steel the business situation has scarcely changed, though it is mentioned that the competition of the outside open hearth works with the Steel Works Union has latterly grown sharper. The export in this specialty is pretty active, but American competition has affected the price situation unfavorably. The demand for structural shapes has slackened as the winter begins and building operations are curtailed. The Steel Works Union to-day announced the opening of business for the first quarter of 1911 at unchanged prices—namely, 115 to 117.50 marks per ton. Owing to the excellent foreign demand the business in rails and other track supplies continues good. The Union has just given out a statement showing that of its production of rails and such supplies during the half year ended with September 30 not less than 45 2-3 per cent. was exported. At the same time nearly one-third of the production of semimanufactured steel was exported, and somewhat more than one-fourth of the structural shapes.

Metal Market

NEW YORK, December 7, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Dec.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
1	13.00	12.87½	37.85	4.50	4.40	5.95	5.80
2	13.00	12.87½	37.85	4.50	4.40	5.95	5.80
3	13.00	12.87½	....	4.50	4.40	6.00	5.85
5	13.00	12.87½	37.50	4.50	4.40	6.00	5.85
6	13.00	12.87½	37.85	4.50	4.40	6.00	5.85
7	13.00	12.87½	37.95	4.50	4.40	6.00	5.85

Pig tin is higher than it has been at any time this year. Copper is listless, at unchanged prices. Spelter has advanced to 6c., New York. Lead is firm, but quiet.

Copper.—The copper market has been very quiet, awaiting the announcement of the producers' statistics, which will be out to-morrow. Electrolytic copper has softened somewhat in tone, but there is very little trading, and it is thought that if any demand develops the price will improve. Lake copper is very firm at 13c.; electrolytic is held at 12.87½c., but there are reports of offerings at slightly under that price. The English market continues firm, but manufacturers have adopted a waiting attitude, although there are reports of great activity in all consuming centers. Favorable statistics, it is stated, will bring about a good demand in the London market. The London market closed to-day with spot copper selling at £56 16s. 3d. and futures at £57 12s. 6d. Sales amounted to 300 tons of spot and 500 tons of futures. The market closed quiet.

November Copper Averages.—The Waterbury average for November was 13c. The average price for lake copper in New York for November was 12.97½c., and the average price of electrolytic was 12.85c.

Pig Tin.—The pig tin market is quiet, but tin for immediate delivery is now selling higher than at any previous time this year. The market went up to 37.85c. yesterday, with little trading. Some consumers whose stocks have run down have come into the market for small quantities, but purchasers generally show a great deal of caution about placing orders. It appears that pig tin stocks are pretty well concentrated, but it is very probable that the high price of the metal in this market at present is largely due to the operations of the London syndicate. In New York to-day pig tin was sold for 37.95c. The London market closed with spot tin selling at £172 5s. and futures at £172

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5s. The sales amounted to 140 tons of spot and 150 tons of futures. The market closed firm.

Tin Plates.—The market is dull. A number of independent mills are reported to have taken steps toward further reducing production. The price for 100-lb. coke plates remains at $3.84.

Lead.—The recently advanced prices are being well maintained, but the market is very quiet. Outside sellers are keeping their quotations above that of the leading interest in New York, but they are meeting the price made by it in the West. The metal is now very firm at 4.50c., New York, and 4.40c. in St. Louis.

Spelter.—The spelter market continues in the control of the manufacturers and a few large sellers, and they have succeeded in advancing the price to 6c., New York. There is very little call for spelter, as the sheet zinc business and galvanized iron industry are both very quiet. Quotations are 5.85c., St. Louis, and 6c., New York.

Antimony.—The antimony market has weakened perceptibly, and there are offerings of one of the better known grades at greatly reduced prices. It appears that a number of sellers are overstocked. Hallett's is selling at 7.75c.; Cookson's can be had at around 8c.; Chinese grades, 99 per cent. guaranteed, are costing about 7¼c., and Hungarian grades are selling at from 7c. to 7.12½c.

Old Metals.—The market shows no improvement in the demand. Dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, December 6.—A fair amount of copper is being sold for January and February shipment, as well as for prompt delivery. Some of the larger buyers have inquiries in the market for March and April. Consumers of tin are restricting their purchases to urgent requirements. Lead prices are being shaded at St. Louis, and the spelter interests are also disposed to make concessions. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 38¼c.; small lots, 40c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.90c. to 4.95c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 12c.; red brass, 11c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 24½c.; tin foil, 36c.; block tin pipe, 33c.

Metals, St. Louis, December 5.—Lead is quoted at 4.40c. and quiet, spelter is easier at 5.80c. and slower, both at East St. Louis. Zinc ore remains at $45 per ton, Joplin; first grades are still in best demand. Tin is sharply higher and held at 38.60c. per pound; antimony (Cookson's) is easier at 8.10c.; lake copper is quoted at 13.35c.; electrolytic, 13.20c., all at St. Louis. The demand for finished metals the past week was much improved.

New York

NEW YORK, December 7, 1910.

Pig Iron.—Inquiry has fallen off very considerably in the past week, and an inactive market is looked for until January. Foundry operations have been on a more contracted scale, and melters appear to be well supplied with iron for the immediate future. More effort is being made by some sellers to market their product, and buyers seem to be waiting for further concessions. There is a growing opinion that an even more stringent reduction of output must be enforced before the market will show any stiffening of prices. In the past week sales of 100-ton to 500-ton lots, with two or three contracts for larger amounts, have been made to New York State and New Jersey foundries. The low phosphorus portion of an inquiry for 7000 tons from an electrical company is reported to have been closed, but 5000 tons of foundry iron is yet to be bought. We quote as follows, for tidewater delivery: Northern No. 1 foundry, $15.50 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Steel Rails.—The West Chester Railroad, West Chester County, N. Y., is in the market for 5300 tons of rails. For the extensions of the New York City elevated lines on Third and Second avenues about 15,000 tons of rails will be required. The Reading order has not been officially announced, but it is understood that the Pennsylvania Steel Company and the Bethlehem Steel Company will receive 10,000 tons each. The Illinois Steel Company booked 13,000 tons last week, including 5000 tons for a Southwestern line. The Tennessee Company has taken an order for 10,500 tons for the Nashville, Chattanooga & St. Louis and 500 tons for the Vicksburg, Shreveport & Pacific Railroad.

Finished Iron and Steel.—No improvement is to be noted in general conditions. The mills generally are not working at more than 60 per cent. of their capacity and new business is not being taken in sufficient amount to prevent a still further reduction of 10 per cent. in the near future unless a decided and unexpected turn ensues for the better. This condition is very largely due to the extent to which the mills increased their producing capacity in the last three years. Under the old order of things the present volume of business would give the mills all they could do. A period of readjustment confronts us and it remains for the country's natural growth to restore the proper balance between supply and demand. The contracts for structural material closed last week and the new business which came into the market total up rather better than for the previous week. The lowest bid for the general contract for the post-office at the Pennsylvania terminal in this city was submitted by R. E. Henningham. The Geo. A. Fuller Company was the next lowest bidder and guaranteed the construction in a materially shorter time. No decision has been reached, but it appears to be between these two bidders. The American Bridge Company was awarded the 4300 tons of steel for the East Cambridge extension of the Boston Elevated Railway, 9500 tons for an ore dock at Duluth for the Duluth & Iron Range Railroad, 700 tons for the Queen & Crescent, and 2300 tons for a loft building at Fifth avenue and Thirty-eighth street, New York, for Bonwit, Teller & Co. The Taft Hotel at New Haven, requiring 2000 tons, has gone to the Lackawanna Steel Company. The Thompson-Starrett Company of this city has been awarded the contract for the new Insurance Exchange Building, Chicago, 22 stories, which it is claimed will be the largest office building under one roof in this country or perhaps in the world. The National Bridge Works has 800 tons for an office building on Church street, New York; the Western Iron Works, 750 tons for the Cortez Hotel, San Francisco, originally reported to have gone to Milliken Bros.; the Louisville Bridge Company, 400 tons for the Louisville & Nashville; the Hinkle Iron Company, 500 tons for a theatre on First street, near Second avenue, New York; the New England Structural Company, 400 tons for the alterations to the elevated structure of the Boston Elevated Railway at Sullivan square, and George W. Jackson, Inc., 400 tons for the changes to the Chicago Elevated loop. The 800 tons for the factory building of the Pingree Company, Detroit, has also been placed, and it has been confirmed that the Eastern Steel Company, through the Hay Foundry & Iron Works, will furnish the 3000 to 3500 tons of plain material for the Corn Building on Madison square, New York. Bids go in December 15 on the Harlem prison to be built at Wingdale, N. Y., which will probably require 3000 to 4000 tons. The Pennsylvania Railroad received bids last Saturday on 1500 tons of bridge material for its New York division, but no decision has been reached, and also has in the market a small bridge in New Jersey requiring about 300 tons. Still in the market are 12,000 tons for the Norfolk & Western, 2500 tons for the Virginian Railway, and 6000 to 8000 tons for the Sloane Building. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Cast Iron Pipe.—The local market has developed no features of special interest. Contracting for delivery next year continues, and some of the business thus closed up has been of some little importance. No public lettings of consequence are in sight outside of that by the city of New Bedford, Mass., which will be made December 8. The demand for early delivery has naturally subsided to very small proportions. Carload lots of 6 in. are quoted at $22 per net ton, tidewater.

Old Material.—It is a rather striking comment on the dullness in the scrap trade to remark that stove plate has been in better demand from consumers than any other class of old material. All other grades are almost completely neglected. Some little interest, however, attaches to the fact that a few of the dealers appear to be picking up such lots of wrought scrap as they can secure from other dealers

THE IRON AND METAL MARKETS

at attractive prices. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling Rails	$10.50 to $11.00
Old girder and T rails for melting	10.00 to 10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.50 to 11.00
Light iron	5.00 to 5.50
Cast borings	5.50 to 6.00
Wrought turnings	5.50 to 6.00
Wrought pipe	9.50 to 10.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	12.00 to 12.50

Iron and Industrial Stocks

NEW YORK, December 7, 1910.

The period since last week's report has been one of almost continuous liquidation. Too many discouraging influences have recently developed to enable the stock market to maintain the position of strength which it assumed the greater part of last month. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chalm., com..	8⅛ - 8¾	Pressed St., pref..	94 - 96
Allis-Chalm., pref..	27½ - 31	Railway Spr., com.	30½ - 33½
Beth. Steel, com..	28¾ - 31½	Railway Spr., pref.	95⅜ - 96
Beth. Steel, pref..	57¼ - 61¼	Republic, com.....	30⅜ - 33¼
Can, com.....	9 - 9¾	Republic, pref.....	93½ - 96½
Can, pref.....	75½ - 79	Sloss, com.....	49 - 50½
Car & Fdry, com..	48 - 52¼	Pipe, com.....	15⅞ - 16¼
Car & Fdry, pref....	.114	Pipe, pref.....	55½
Steel Foundries..	40¾ - 45¼	U. S. Steel, com..	74½ - 77⅛
Colorado Fuel.....	29⅞ - 32⅞	U. S. Steel, pref...	115 - 117¾
General Electric..	149½-152¾*	Westinghouse Elec.	65½ - 69⅜
Gr. N. ore cert....	54½ - 58⅜	Am. Ship, com.....	78
Int. Harv., com...	108¼-111	Chi. Pneu. Tool...	40½ - 41¼
Int. Harv., pref...	121¼-121¾	Cambria Steel.....	42½ - 43½
Int. Pump, com...	39½ - 43⅜	Lake Sup. Corp....	26½ - 27¾
Int. Pump, pref...	82½ - 85	Pa. Steel, pref.....	103
Locomotive, com..	35½ - 38¾	Warwick	10½ - 10½
Locomotive, pref..	105 -105⅞	Crucible St., com..	12 - 12⅝
Nat. En. & St., com....	17¾	Crucible St., pref..	76⅝ - 78½
Pitts. Steel, pref..	100 -101	Harb.-W. Ref., com.	32½ - 32¾
Pressed St., com..	29 - 31¾	Harb.-W. Ref., pref.....	95

* Ex dividend.

Dividends.—The Crucible Steel Company of America has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable December 24.

The American Can Company has declared the regular quarterly dividend of 1¼ per cent. on its preferred stock, payable January 2.

Notes on Prices

Rope.—Thus far during the month the demand has shown no increase over November. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure manila of the highest grade, 8¾c. to 9¼c. per pound; second grade manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 5¾c. to 6¼c. per pound; No. 2, 5¼c. to 5¾c. per pound.

Linseed Oil.—A new feature has been introduced into the linseed oil situation since prices have been so high; that of the importation of European oil and Argentine flax seed in sufficient quantities to affect the domestic oil market. Seed is arriving at Northwestern points in comparatively small quantities, much of which has been contracted for. The future of the American oil market is regarded as dependent largely upon the outcome of the Argentine crop now growing. It is thought possible that oil may temporarily drop to near the 90c. mark and that under adverse conditions it may reach $1.25 before September, 1911. Argentine seed is being depended upon for the May deliveries in this country. Lack of demand will probably continue until February, which is the usual normal condition during this period. The oil market is not strong under present conditions. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
State, raw	95
City, raw	95

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance over raw.

Spirits Turpentine.—The market has fluctuated during the week. Large buyers were not in evidence to any extent, evidently expecting lower prices. Consuming manufacturers who use turpentine in their product are preparing for their annual inventory and repair. Comparatively little turpentine is being used for painting, so that business is quiet. The present crop of turpentine has nearly all reached market and some look for a stronger market after the turn of the year. New York quotations in 5-barrel lots are as follows:

	Cents.
In oil barrels	78
In machine barrels	78½

Less than 5-bbl. lots, ½ cent advance per gallon.

New Tools and Appliances

Universal Angle Gauge.—The E. G. Smith Company, Columbia, Pa., is bringing out a new universal angle gauge which is simple in construction and free from parts likely to become disarranged. There are only four parts to the gauge, two straight edges and the two curved links that connect them. All three joints between the straight edges and the links are pivots, so that the former may be placed at any angle relative to each other. Thus the gauge may be used as a protractor, hight, gauge, square and in various other ways.

New Monarch Engine Lathe.—A 16-in. engine lathe has recently been added to its line by the Monarch Machine Company, Sidney, Ohio, which is equipped with double back gears having ratios of 5 to 1 and 9 to 1, that are operated by a conveniently located lever. The headstock is reinforced by ribbing and has a three-step cone pulley. The range of feeds, which can be either of the belt or the positive geared type, is sufficient to cover all the requirements met with in practice. High carbon hammered crucible steel is used for the spindle, which runs in bronze bearings. An offset tailstock is employed which enables the compound rest to be swung parallel with the bed. The bed is extra heavy and deep and is reinforced by webs spaced 19 in. apart. The carriage and apron are of the customary type and the compound rest has ample bearing surfaces and taper gibs for taking up wear. The steel rack is made in one section and the pinion meshing with it can be disengaged when cutting screws. The swing over the bed is 16 in. and over the compound rest 10 in. The maximum distance between centers is 34 in. with a 6-ft. bed. A taper attachment can be furnished as an extra, as the lathes are drilled to receive it.

A Universal Graduating Machine.—A graduating machine in which the work is placed in position, the machine started and automatically stopped when the piece is completed is the latest product of the Modern Tool Company, Erie, Pa. Two sizes of machine are built; one for small work such as straight and curved scales, surveying instruments, gun sights, &c., and the other with the work end of the base arranged to rotate fixtures or brackets for holding heavy milling machine saddles, curved scale work, faces or edges of disks and taper dial or drum work. Accurate adjustments can be made in all parts and any desired width of spacing or length of line can be secured.

Automobile Street Sweeper.—An automobile street sweeper has been brought out by the Monette Street Cleaning Machinery Company, Inc., 320 Broadway, New York City, which travels on four wheels, the brush being located between the two axles, while an apron picks up the dirt delivered to it by the brush and carries it to a number of cans in front, which are removed when filled. Only one man located at the rear of the machine is needed to drive the sweeper and control all the appliances. The special feature of the machine is a combination of vibratory and rotary motions which makes the action of the brush very similar to that of a hand broom. Rotary motion alone, it is claimed, will cause the dirt when damp to cling to the bristles of the brush and clog them, but the vibratory motion picks up the dirt and tosses it upon a belt which carries it away, thus keeping the broom clean. The power for operating the sweeper is furnished by an 18-hp. engine,

and it is claimed that the sweeper will do the work of three two-horse sweepers, a sprinkling cart and a dozen men.

Gas Brazing Forge.—A new brazing forge which differs from those now on the market principally in the construction of the operating treadle. has been designed by J. L. Lucas & Son, Bridgeport, Conn. The treadle is hinged from the rear of the forge and has two connecting rods extending to the gas and air valves. Normally the treadle is raised by a spring connected to the under side of the table, and in this position the air and gas valves are open to the extent of their adjustment, but when pressure is applied to the treadle the gas is reduced to a pilot light. A latch near the bottom of the leg adjacent to the treadle serves to hold the latter down when the operator desires to leave the machine. This arrangement makes it possible to leave the gas turned on during the intervals between jobs, when adjusting and changing work or performing other work, but the gas need not be left burning. This feature has given the forge its name of the Gas Saver forge Both single and double torch styles are made.

Small Saw Sharpener.—A smaller size of grinder for sharpening the saws used in its cutting-off machine is being made by the Cochrane-Bly Company, Rochester, N. Y., which is practically the same in its construction as the company's regular grinder. The demand on the part of users of small cutting-off machines for a moderate priced grinder capable of sharpening their saws led to the design of this new type.

Variable Speed Planer.—To enable different rates of speed to be employed for working various metals and also for the cutting and return strokes in the same metal, the Hamilton Machine Tool Company, Hamilton, Ohio, has developed a very simple and compact planer drive. Any one of four cutting speeds is available while the return is at a constant speed, the variation being secured through four pairs of gears controlled by one lever, which enables the change from one speed to another to be made quickly and prevents conflicting gears from being thrown in at the same time. Power is transmitted from the pulley shaft to the first speed changing shaft by a rawhide gear and the speed changing gears run at comparatively slow speed, thus preventing unnecessary wear and producing smooth running. The drive is located on the bed instead of the housings, which protects the gears but at the same time renders them readily accessible. Each machine has an index plate, showing the different speeds provided and the proper location of the levers for each, attached.

Portable Grinding Pan.—A 42-in. pan which is similar in design to the large stationary pan made by the same company has been placed on the market by the Thomas Carlin's Sons Company, 1918 Henry W. Oliver Building, Pittsburgh. Pa., to meet the demands for a small grinding and mixing pan in chemical works, laboratories. iron foundries, &c. The frame, bottom and the gears are of iron, while the roll tires and bottom plates are of hard white iron to resist wear, and the large diameter vertical shaft is of cast steel and runs on bronze and steel washers. In ordinary service from 5 to 7 hp. is required to drive the pan, which weighs 3800 lb.

A New 32-In. Upright Drill.—A drill press especially designed for handling automobile parts and for use in railroad shops has been brought out by the Superior Machine Tool Company, Kokomo, Ind. This tool has a compound table with both cross and longitudinal adjustments, and the feed screws for these have dials graduated in thousandths of an inch. The working surface of the table is 18 x 36 in., the overall dimensions being 20 x 40 in. It is supported by an adjustable screw that rests on the base. The arm is of heavy design and has a very large bore for the table.

Roll-Over Molding Machine.—There has been developed by the Detroit Foundry Supply Company, Detroit, Mich.. a new roll-over molding machine known as the Grimes' machine. This is a simple standard machine, requiring only a little floor space and is perfectly balanced, as the center of gravity is the center of rotation. It is claimed that with the small handwheel used it is possible for one man to turn the largest flask smoothly and without jerk, as the pattern is drawn by an absolutely straight gravity drop. The maximum size flask handled by this machine is 24 x 36 x 12 in., the last being the depth.

The Pittsburgh Steel Company's New Blast Furnaces.—The Pittsburgh Steel Company, Frick Building, Pittsburgh, with rod, wire and wire nail mills at Monessen, Pa., has definitely decided to build two blast furnaces at Monessen to supply the company with basic pig iron for its open hearth department, which contains 12 60-ton furnaces. It is the intention to use direct metal, which will effect quite a saving over the present practice that involves remelting pig iron largely purchased from the Shenango Furnace Company of Pittsburgh and M. A. Hanna & Co., of Cleveland, Ohio. It is understood that Julian Kennedy, Bessemer Building, Pittsburgh, will be consulting engineer for the erection of these two furnaces.

The Republic Iron & Steel Company, Pittsburgh, Pa., has contracted with the Westinghouse Electric & Mfg. Company for 79 crane and mill motors, aggregating about 5000 hp., to be used in mills at Youngstown, Ohio. The contract also includes magnetic controllers for the larger motors and manually operated controllers for the smaller motors.

The report that the Westinghouse Electric & Mfg. Company would erect a five-story building at East Pittsburgh for the manufacture of automobile equipment is untrue. The company at present has no extensions to its plant under way or contemplated.

By a sweeping majority, San Francisco has authorized the $5,000,000 city bonds for the Panama-Pacific International Exposition, thus making a total of $17,500,000 which has been raised in San Francisco and California for this fair in 1915.

Sand-chilled and semi-steel rolls for use in various industries have formed a very important item this season in the sales of the Youngstown Foundry and Machine Company, Youngstown, Ohio, which is gradually extending this branch of its trade.

The American Automobile Mfg. Company, whose head office is in the Lincoln Bank Building, Louisville, Ky., has purchased a large plant at New Albany, Ind., and will begin to build automobiles there about January 1.

The Nickelized Casting Company, Pittsburgh, now has its nickelized chilled wheels in service on several of the leading railroads of the country, with very satisfactory results.

The Pressed Steel Mfg. Company has removed its offices from the Bourse to suite 504 Land Title Building, Chestnut and Broad streets, Philadelphia.

The Bethlehem Steel Company put its C furnace at South Bethlehem, Pa., in blast December 2, making five furnaces now active.

The Jackson Iron & Steel Company, Jackson, Ohio, will blow out its furnace some time next week.

The population of Duluth, Minn., is 78,466, an increase of 60 per cent.

The Machinery Markets

Inquiries that give promise of good business are coming into the machinery trade in good volume, but there is very little doing in the way of actual orders. In Pittsburgh there is considerable purchasing of a miscellaneous character, and in Cleveland dealers note a better volume of business. In the Farther Central West a great deal of construction work is going on and the demand for outdoor equipment is good in that territory. On the North Pacific Coast and in the Southwest the call for equipment is good and a better business is looked for at the beginning of the year. In other territories business is marking time and no actual rush of trade is looked for until after the first of the year.

New York

NEW YORK, December 6, 1910.

There is very little doing in the New York machinery market. Dealers are busy in filling orders placed within the last few weeks, but new orders are few. Inquiries are coming into the market in small volume and there seems to be an absence of new enterprises. All things considered, the machinery trade is not in a very encouraging condition, but it is thought that after the first of the year, when many of the smaller manufacturers get their inventories made up, business from that source will begin to improve. During the last week machinery houses have been doing more or less of a pick-up business, selling a machine here and there, but there is nothing in the shape of a list of tools before the trade at this time.

Writing under date of November 24, our Berlin correspondent makes the following report of trade conditions in Germany: "A meeting of the Society of German Machine Tool Builders was held in Berlin recently, and a statement was issued indicating that shops are pretty well employed. It is added that there is a heavy demand for machine tools, both from the home market and from abroad, and that stocks on hand have been materially reduced. The belief was expressed that it would soon be possible to bring prices more into harmony with the cost of production, but it was admitted that American competition, particularly in machines of medium sizes, was making itself keenly felt in Germany and was unusually sharp in neutral markets. In order to meet this competition it was recommended that the shops devote their attention to a few standard sizes, like the American system, rather than try to produce all sizes and styles of machines under one roof."

The McKinnon Chain Company, Buffalo, N. Y., is erecting a new plant at St. Catharines, Ont., which will be 80 x 300 ft. and one story. The building will be equipped largely with special chain making machinery.

The Curtiss Aeroplane Company has been incorporated, with headquarters at Hammondsport, N. Y. The company has a capital stock of $20,000 and it intends to build aeroplanes and similar apparatus.

The Philadelphia Quartz Company, Chester, Pa., will build an extensive branch plant at Buffalo, N. Y., for the manufacture of silica of soda. The new plant with equipment will cost about $100,000 and will be located on a 5-acre site at the crossing of the Pennsylvania Railroad and the Buffalo Terminal Railroad, just east of the city line, adjoining the transformer station of the Niagara Falls, Lockport & Ontario Power Company. Considerable crushing and grinding machinery will be required for the equipment of the new plant. The present Massillon, Ohio, branch of the company will be abandoned upon the completion of the Buffalo plant.

The Defiance Paper Company, Niagara Falls, N. Y., is receiving bids for construction of its new plant on Second street, which will include considerable steel work.

The Crouse-Hinds Electric Company, Syracuse, N. Y., has completed plans for a new manufacturing plant, comprising six buildings, one and three stories, brick and structural steel construction, which it will erect on Wolf street at an estimated cost of $200,000.

The Larkin Company, soap manufacturer, Seneca, Larkin and Van Rensselaer streets and Erie Railroad, Buffalo, N. Y., Jno. D. Larkin, president, 663 Seneca street, is receiving bids for a 2000-hp. plant elevator, equipment and steam heating plant. Alternating motors from 5 to 50 hp., transformers, ammeters and switchboard will be required.

Plans for the new power house for the State Capitol at Albany have been completed and have been approved by the Trustees of Public Buildings. The new building will be of face brick and terra cotta on stone base, with tile and copper roof, and will cost approximately $500,000. It will be located on North Hawk street and will supply heat, power and light to the Capitol Building and also to the new Educational Building, through concrete conduits 8 ft. in diameter. The boiler room will be of sufficient capacity for 10 380-hp. boilers, a total of 3800 hp., and the engine room of size to contain five engines and dynamos of 1700-kw. capacity. The initial installment is to be eight boilers and four engines and dynamos. An overhead coal pocket of 1000 tons capacity will also be installed. Bids for equipment will be advertised for after January 1. Franklin B. Ware is State Architect, Albany, N. Y.

The H. D. Taylor Company, Buffalo, N. Y., is building a three-story brick addition, 66 x 75 ft., to its factory and warehouse for saddlery goods at 105-111 Oak street.

Murphy & Ronan, carriage builders, Albany, N. Y., will erect a new factory building on North Broadway.

A gravity system of water works is to be built at Oriskany Falls, N. Y., including a 13,000,000-gal. reservoir with concrete dam. The work will call for approximately 25,000 ft. of 12, 10, 8 and 6 in. cast iron pipe, 37 hydrants and 36 valves. Bids will be considered for the entire work only and will be received by the Board of Village Trustees, G. J. Pollard, clerk, until 2 p.m. December 22. A. M. Scripture, New Hartford, N. Y., is engineer.

The Aluminum Specialties Mfg. Company has been incorporated at Fulton, N. Y., to manufacture aluminum specialties. The incorporators are T. S. Jackson, G. H. Spitzle of Utica, N. Y., and Jno. R. Sullivan of Fulton.

The Ingle Machine Company, St. Paul street, Rochester, N. Y., has increased its capital stock from $10,000 to $70,000.

The Contractors Casting & Machine Company, Buffalo, N. Y., is adding to its foundry plant at Hertel avenue and the Erie Railroad a building 140 x 140 x 30 ft. in hight, with wings 40 x 50 x 15 ft. and 15 x 50 x 15 ft. in hight, a portion of the increased space to be used for chipping room purposes.

The Electrode Company, Niagara Falls, N. Y., has construction well under way on its new plant on Buffalo avenue.

The Spinella Corset Company, Niagara Falls, N. Y., has purchased a large tract of land at the north end of the city and will early in the spring commence the erection of a large manufacturing plant.

Chicago

CHICAGO, ILL., December 6, 1910.

Machinery dealers in Chicago are encouraged by a larger volume of inquiries, and while a great deal of the business pending will not be closed until after the first of the year the waiting period is growing shorter. The demand is well distributed and general in character, coming from small as well as large shops, and if dealers had the volume of automobile business that was being done a year ago things would be really above the average. On figuring up their returns for the year most of the dealers find that they have made a fair showing as compared with former years, and in some cases they have exceeded recent years in the amount of their sales. Since July the trade has been quiet and has run below the average, but the figures for the year will not look so bad when they are footed up. Slow collections have had a depressing effect on the atmosphere in the machinery district, as the dealer does business on a small margin of profit and his capital is soon tied up when many of his customers take longer than the usual time to pay for their goods, especially when they do not give notes or paper that can be discounted.

The railroads are due to place large orders in the near future for cars and miscellaneous equipment. Their purchases of cars the past year have been less than the number required for replacements, and they have not bought any for six months. Their general buying of miscellaneous equipment has also been very light in the last six months. The equipment manufacturers are good buyers of tools, especially forge shop equipment, and when their business picks up they will undoubtedly appear in the machine tool market as liberal buyers.

The Lincoln Ice Company, Chicago, has leased for a period of 99 years the property at the southeast corner of Carroll avenue and Elizabeth street, on which it will begin at once the erection of a plant for the manufacture of artificial ice.

The Western Steel Car & Foundry Company, Old Colony

THE MACHINERY MARKETS

Building, Chicago, has under consideration extensive improvements to its plant at Hegewisch, Ill., which will include the erection of a number of additions to its present plant.

The J. L. Clark Mfg. Company, Rockford, Ill., tin boxes and cans and metal specialties, is erecting a new factory building, 181 x 198 ft., one story, of brick, concrete and steel construction, with saw-tooth roof. The equipment of the building will be modern in every detail, and the building is arranged with a view to giving the best possible light. Contracts for practically all of the equipment required have been let.

The Meadows Mfg. Company, Meadows, Ill., is preparing to move to Pontiac, Ill., where it will occupy a large factory building which has just been completed. In its new location the company will have better shipping facilities.

The Dickerson Mfg. & Supply Company, Clinton, Ill., has been incorporated with $200,000 capital stock, fully paid. The company will manufacture a water gauge for steam boilers of all kinds, locomotives, marine and stationary, invented by Charles L. Dickerson, president of the company. A location for a manufacturing plant has not been decided upon as yet, as the company intends to contract for the manufacture of the gauge for some time.

The Bartholomew Company, Peoria, Ill., automobiles, is erecting an addition to its factory, 60 x 100 ft., of fireproof construction. The company has also about completed a 20 x 90 ft. steam heated garage, with sliding doors on the front side which permits the machines to enter at any place. A number of new machine tools have recently been installed by the company.

The W. R. Howell Company, Geneva, Ill., has decided to rebuild its plant there, which was recently destroyed by fire. The contract for the erection of the new plant has been let and operations will be started at once. Details of equipment to be purchased have not been decided upon.

Philadelphia

PHILADELPHIA, PA., December 6, 1910.

Business still drags. There has been no demand for machine tools from the railroads. While car and locomotive orders have been somewhat better, there is still an absence of any tool lists for 1911 from the railroads in this district. Builders of tools, both of the standard and special types, report the demand as quite irregular. A few sizable orders are in sight. The demand for second-hand machinery, tools, engines, &c., has been less active. Very little new business for export shipment has come out; what little there is has been largely confined to special equipment.

Estimates on revised plans are being asked for the erection of the seven-story garage and service building, 71 x 164 ft., of steel, concrete and brick, which the Packard Motor Car Company proposes to erect at Broad and Wood streets.

Fire partially destroyed the foundry of the Macungie Stove Foundry, Macungie, Pa., November 23. Particulars as to the loss entailed and plans for rebuilding the plant are not available.

The Reading Iron Company is installing a small gas producer at its Scott Foundry for use in connection with experimental work. This company has just shipped a large sugar mill to Porto Rico, which is the largest it has ever built; it is 18 ft. high and 130 ft. long, and weighs complete about 700 tons.

Frank Toomey, Inc., has purchased the property of the Mora Car Company, Newark, N. Y., from the receiver, the sale being approved by the courts. Possession has been taken and the plant will be maintained in operation to complete the manufacture of automobiles, for which materials and parts are on hand. It is the intention of the purchaser to resell the plant.

The Baldwin Locomotive Works has received orders for 15 locomotives from the Cincinnati, Southern & Texas Railroad Company, as well as scattered business from other railroads and industrial concerns. Several large contracts are under negotiation. This company is now fairly busy, carrying a total of 16,000 employees on the rolls at its local and Eddystone plants. The outlook for business is considered fair, but it is thought likely that the bulk of the contracts placed will be for moderate numbers of locomotives.

The Salisbury Marine Construction Company, Salisbury, Md., has taken over the Marine Railway, formerly operated at that place by Lloyd & Williams, and is engaged in rebuilding and modernizing the plant so as to enable it to build pleasure and commercial craft up to 150 ft. The buildings being erected include a boat shop, 70 x 120 ft.; joiner shop, 45 x 50 ft., two stories; machine shop, 20 x 25 ft.; store house, power house and office building. While a large part of the power and machine shop equipment is provided for, the company is still in the market for wood working machinery. R. D. Grier is president; Otis Lloyd, vice-president; R. H. Grier, secretary, and Lewis Morgan, treasurer. Catalogues referring to shipbuilding materials, supplies and furnishings are requested.

Alexander Brothers, manufacturers of leather belting, are having plans prepared by Bergdoll & Pawling for a six-story brick, steel and concrete factory building at 414 and 416 Third street, extending through and including four building fronts on Orianna street. These properties adjoin the firm's present plant. General information as to the requirements in connection with the proposed new factory are not yet available, but additional power equipment is to be provided.

New England

BOSTON, MASS., December 6, 1910.

November was a disappointing month in the machinery trade, both with the manufacturers and the dealers. The totals of orders booked were less than those of October. In fact, the month fell well behind the average of the year. The situation is not without encouragement, however. Indications are that a satisfactory amount of industrial expansion, entailing the purchase of large amounts of new machinery, will have been completed before next summer. Announcements already made and plans still kept private indicate this condition. A considerable number of orders have been booked with the understanding that they will not be entered until January. With some of the manufacturers a noticeable increase in business has come during the last few days. One machine tool builder reports having received more business yesterday and to-day than during the whole month of November. Buyers are always slow to place business in December, because of the effect upon the inventory showing. In numerous cases the expression of opinion is that the low level of the depression has been reached and that improvement is to be looked for with the new year.

The United Shoe Machinery Company, Beverly, Mass., will continue the expansion of its great works. Factory B will be extended 200 ft., constituting a building 60 ft. wide and five stories high. A similar extension of factory A is nearing completion, together with an ell 80 ft. wide, which will connect with the proposed addition to factory B. Work on the foundations of the new building will begin this winter, and the structure will be made ready for its equipment in the spring. A large drop forge shop will also be built, but details are not yet completed. Tentative plans call for a building 300 ft. in length. The enlargements mean the purchase of large amounts of machine tools, forging and other equipment.

A transaction of large importance is the purchase of the property of the George Lawley & Sons Corporation at South Boston by the Boston Elevated Railway Company. The Lawley Corporation has purchased the idle plant of the Atlantic Nail Company, Neponset, Mass., and will convert the premises into a ship yard and marine construction and repair shops. The Elevated will create a great power plant at South Boston, where conditions are exceptionally favorable for the purpose, including harbor frontage for coaling sheds and docks. The power unit will be a very large one. The demands of the increasing electric lines, including the subways, elevated and surface systems, has outgrown power facilities, and the approaching completion of the Cambridge subway makes it imperative that immediate relief be afforded. The understanding is that the new plant will not only greatly increase the present power, but will replace certain existing units in order to secure greater economies.

The Trumbull Electric Mfg. Company, Plainville, Conn., manufacturer of electrical supplies, intends to make extensive additions to its works in the spring, but no details are at present available.

The H. B. Smith Company, Westfield, Mass., manufacturer of heating boilers, radiators and other heating specialties, has let the contract for several new buildings, which will largely increase the manufacturing capacity of the works. They will constitute parts of the South Side plant. A machine shop will be 100 ft. square and two stories, and a foundry building will be 100x245 ft., connecting with the present foundry. Both buildings will be of steel and brick. A wooden storehouse will be replaced by a steel frame building. A concrete core building, 80x100 ft., two stories, is nearing completion.

Additions to general manufacturing works in New England include the following: National Seat Novelty Company, New York, new factory at Hop River, Columbia, Conn., to manufacture chair seats from leather and paper pulp and other specialties; Rockfall Woolen Company, Rockfall, Conn., addition 48x80 ft., two stories; Robert D. Mason Company, Pawtucket, R. I., dyer and bleacher, addition 66x127 ft.

The new demurrage rules for New England have gone

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into effect, some important changes having been made in the original schedule. The time limit is decreased from that of the local rules, of 96 hours, to 48 hours, excepting lumber products, coal, grain and grain products, the time for which is extended to 72 hours. Certain other minor exceptions are made, under the usual practice, and, generally speaking, the new routine is that in vogue in other parts of the country.

The Standard Machinery Company, Providence, R. I., is putting out an extensive new line of reducing presses, some of them equipped with dial feed and capable of feeding two holes to each revolution of the press. A cam knockout is furnished for shell work. The smallest machine weighs 4300 lb. and the stroke varies from 6 to 12 in. It is also built back geared, with balance wheel drive. The next size weighs 6400 lb., with stroke to 16 in. It is back geared, with single train of gears and balance wheel. The third size weighs 10,000 lb. and has double train, cut gearing and friction clutch, together with balance wheel. The gearing gives a ram speed of 8 to 10 strokes a minute, while in the smaller sizes the ram speed is 28 to 40 per minute.

Cleveland

CLEVELAND, OHIO, December 6, 1910.

Local machine tool dealers are getting a somewhat better volume of inquiries than a few weeks ago, but orders are coming out rather slowly. Dealers are encouraged in the fact that there is more business in prospect than for some time. In many cases, however, recent inquiries are from concerns that are figuring on installing some additional equipment, but will not place their orders until after their annual meetings shortly after the first of the year. Pending inquiries are mostly from larger concerns in various metal working industries. Sales reported during the week are mostly single tools in medium sizes. Railroad business is still limited almost wholly to an occasional single tool order. The demand for second-hand machinery shows some improvement, but is not very active. The general manufacturing situation remains about stationary. Most plants are running full time, but many have reduced their working forces somewhat. The feeling prevails that, while December will be a rather quiet month, business will open up in good shape after the first of the year.

The Damascus Brake Beam Company, which recently purchased the plant of the Cowing Engineering Company in Cleveland, is making quite extensive changes to the plant and some additions, making it adapted to the needs of the new owner. The company has moved its offices from the Citizens' Building to the plant, and it is expected that the latter will be ready for operation about January 1.

W. H. Knight, president of the Cleveland Gas Meter Company, has awarded a contract for the erection of a new plant, 40 x 51 ft., three stories. The plant will be equipped with stamping and other machinery.

It is reported that the Baltimore & Ohio Railroad Company will erect large repair shops at some point in Ohio, the location not yet having been decided upon. A number of cities will make efforts to secure the shops.

The Ford Plate Glass Company, Rossford, Ohio, will build extensive additions to its plant that will triple its present capacity. Fourteen new buildings of reinforced concrete, brick and steel will be erected at a cost of more than $1,000,000. Among the new buildings will be a machinery room, 190 x 1055 ft.; a power house, 70 x 160 ft.; boiler house, 60 x 192 ft.; machine and blacksmith shop, 60 x 200 ft.

The Northern Ohio Traction & Light Company, operator of an extensive traction system throughout northern Ohio, which for some time has had under consideration the erection of a large central power station to supply power for the entire system, has decided to build a $1,000,000 power plant in Cuyahoga Falls. It is stated that construction work will be started early in the spring. The company's offices are located in Akron, Ohio.

The One Minute Washer Company, Sandusky, Ohio, maker of washing machines, will begin the erection of a new brick and steel plant early next month, that will give the company considerably more capacity than the present plant. A site has been secured at Market and Warren streets.

The Bunting Brass & Bronze Company, Alliance, Ohio, is now in the market for foundry equipment, motors and generators, milling machines, air compressors, 5-ton crane and other small equipment for the new plant that it has under erection in Toledo, Ohio.

The American Tire & Rubber Company, Akron, Ohio, has commenced the erection of a new three-story plant. The company will make carriage and vehicle tires and mechanical goods and specialties. A 300-hp. engine will be installed.

Cincinnati

CINCINNATI, OHIO, December 6, 1910.

The machine tool business is in better shape this week, and some firms who went over their records for November were surprised to learn that they had actually made a fairly good showing during that month. A few single tools have been bought by the railroads lately, but no purchases have been made on large lists known to be in the hands of executive officers. Included in recent orders are several for the larger sized lathes. Export business prospects are brighter, and it is hoped that the demand from this source will be sufficient to help out local manufacturers in bridging over the usual dull holiday season.

Manufacturers of valves and other engineering specialties report no let up with them, and they are looking forward to a very heavy business in 1911.

Joseph G. Steinkamp & Bro., architects, Mercantile Library Building, Cincinnati, are taking bids for the construction of a three-story brick and concrete building, to be erected at 120-122 East Eighth street for Thomas E. Kennedy. This building will be leased for light manufacturing purposes, but names of prospective tenants are not yet available.

Smith & Mills, machine tool manufacturers, are making a one-story addition to their plant on Spring Grove avenue, Cincinnati. This building will be 30x50 ft., and will be used to house a 100-hp. Miller gas engine to drive a generator for supplying light and current for the machine shop.

The R. A. Becker Varnish Company, Cincinnati, is contemplating an addition to its plant on Harrison avenue.

The Standard Oil Company has completed plans for some large additions to its plant and warehouses on State avenue, Cincinnati.

The R. K. LeBlond Machine Tool Company, Cincinnati, tendered its foremen a dinner on the evening of December 1. J. M. Manley, secretary of the Cincinnati Metal Trades Association, J. H. Renshaw of the Continuation School, and Superintendent J. A. LeBlond made addresses to the gathering, which were responded to by different foremen.

It is rumored that the Avondale Ice Company, Cincinnati, is having plans prepared for a $50,000 ice plant to be erected in Evanston suburb.

The Triumph Electric & Ice Machine Company, whose plant is in Oakley, has opened a Cincinnati office in the Fourth National Bank Building.

Sechler & Co., Cincinnati, contemplate making an addition to their carriage factory on Plum street.

Steinman & Meyer, Cincinnati, furniture manufacturers, will make a five-story addition to their plant on York street. Architect Martin Fisher has the plans in charge.

Alfred Hill, of Cincinnati, who is secretary of the Casey & Hedges Company, Chattanooga, Tenn., states that the press reports of his company's fire damage last week are very much exaggerated. Only a part of the old foundry building was destroyed and the fire will in no way hold up deliveries.

The Baldwin Forge & Tool Company, Columbus, Ohio, expects to have its new plant, now in course of construction at Parkersburg, W. Va., all ready for occupation by January 1.

The plants of the West Mfg. Company and the Ohio Metallic Specialty Company have been moved from Columbus to London, Ohio. Both of these companies manufacture hardware and metal specialties.

Indianapolis

INDIANAPOLIS, IND., December 6, 1910.

The American Good Roads Congress is meeting at Indianapolis this week. One of the interesting features is the exhibit of road machinery and material, which is the largest yet shown at a national convention. There will be a large number of papers read on road construction and the progress of good roads legislation in the various States.

E. L. Anderson & Son of Union City, Ind., who bought the Anderson Carriage Mfg. Company's factory at Anderson, Ind., at receiver's sale, have organized and incorporated it under the old name, adding the prefix "the." The capital stock is $30,000. The directors are E. L. Anderson, T. B. Anderson, A. L. Colvin, C. E. Horn and William Gimbel.

The Terre Haute Malleable & Mfg. Company, Terre Haute, Ind., has increased its capital stock from $75,000 to $100,000. A. W. Wagner is president of the company.

The Calumet Car Company, which recently completed a new plant at Calumet, Ind., has as its first work the wrecking of 3600 box cars of the Chicago Great Western Railroad.

The S. G. Taylor Chain Company of Maxwell, Ind., will

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move its plant to Hammond. W. J. S. Woodall is superintendent.

The Kibbe-Workinger Foundry Company, Elkhart, Ind., has been incorporated with $25,000 capital stock to do a general foundry and machine business. The directors are O. E. Kibbe, Z. G. Kibbe and E. M. Workinger.

The Oolitic Operative Quarries Company, Clear Creek, Ind., has been incorporated with $25,000 capital stock to quarry stone. The directors are William Chambers, William Graham and Nat U. Hill, Jr.

The Roth Mfg. Company, Columbus, Ind., has changed its name to the Indiana Deep Well Pump Company. It manufactures a pitless pump, the invention of J. G. Roth.

Milwaukee

MILWAUKEE, WIS., December 5, 1910.

Conditions affecting the local machinery market having shown considerable improvement within the past week or ten days, some of the manufacturers and dealers here are hopeful that there will be a gradual upward trend from now on, broken only by the holiday season. The course of buying is, however, so erratic that predictions on that point cannot be made with any degree of certainty. Season contracts continue difficult to close, even when substantial inducements are offered, and nearly all buying is done just prior to the time when material is required.

Rudolph Mueller, Milwaukee, is preparing to build a garage, with machine shop, 25 x 120 ft., on Fourth street, near Cedar.

It is reported from Two Rivers, Wis., that the Coneaut Mfg. Company, now of South Milwaukee, has purchased the factory of the Two Rivers Woodenware Company, and will remove to that place.

The Weber Mfg. Company may build a wood working plant in West Allis, Wis., but will not do so before spring.

A site has been purchased in West Allis., Wis., by the Standard Separator Company, Milwaukee, and plans decided upon for a manufacturing plant, 250 x 550 ft., one story. An electric power plant is also to be installed and the machinery in the works driven by means of motors. The company is now operating in leased quarters near the Reliance works of the Allis-Chalmers Company.

A notable installation of machinery was recently made in the Canadian Northwest by the Allis-Chalmers Company of this city for the Swanson Bay Forests, Wood Pulp & Lumber Mills, Ltd., at Swanson Bay, near Vancouver, B. C., where upward of $1,000,000 has been expended for a new timber cutting plant, pulp mill and forest holdings.

The Reliance Engineering & Equipment Company, Milwaukee, is looking for a new location for one of its clients, now manufacturing a heavy motor truck, 5 to 15 tons capacity, in a Western city. One of the requirements of the owners of the company is that a certain amount of local capital be invested in the enterprise as an evidence of the support of the community in which its plant is built.

C. W. Doubler, whose present address is given as Madison, Wis., has organized a company to acquire the Red Rock quarries in the vicinity of Darlington, Wis., and install improved machinery, including a crushing plant.

The People's Water, Light & Power Company has been organized at Mellen, Wis., to operate a public service plant.

The Rhinelander Iron Company, Rhinelander, Wis., has done a good business this year in the sale of both new and second-hand machinery. The market in the Northern districts of Wisconsin and Michigan is steadily broadening.

The Wisconsin Zinc Company will install a power plant and concentrating mill at its Winskill Mine, near Benton, Wis.

Preparations will be made at Menasha, Wis., shortly for the installation of additional power machinery at the city lighting and pumping plant.

A machine shop is to be built in Waupun, Wis., by Edward Van Loo in connection with a garage.

W. T. Bradley, Tomahawk, Wis., is organizing a company to erect a soap factory there. Electric power will be used.

A brewery, equipped with its own power plant, will be built in North Milwaukee, Wis., by the Home Brewing Company.

The Northwestern Steel & Iron Works, Eau Claire, Wis., states that during the past year it has added to its plant a large foundry and three new shop buildings, at the same time extensively increasing its equipment. Besides the Northwestern line of concrete machinery, it manufactures the complete output of several other large concrete machinery concerns, and states that it is in the market for manufacturing propositions of this kind at any time, having a floor molding capacity in the foundry of 15 tons per day, with pattern makers, molders and machinists especially skilled in this line.

The Mandt Wagon Company, Stoughton, Wis., has plans prepared which call for the remodeling of the entire plant, the demolition of the old frame structures erected by the late T. G. Mandt and the erection in their place of modern two, three and four story brick and steel buildings. It is expected that the rebuilding of the plant will be extended over a period of several years, as it is the intention of the company to keep the plant in continuous effective operation.

Pittsburgh

PITTSBURGH, PA., December 6, 1910.

Considerable purchasing of a miscellaneous character has developed lately in consequence of building operations in this district, but there are few contracts of any size now being let, and the market is sustained principally by orders from other sections of the country. For the coming spring, however, an unusually large number of projects are already being mapped out, and for these the requirements in the way of machinery, both mechanical and electrical, will be quite heavy. A fair percentage of orders is likely to be placed soon after the holidays, but most of the buying will be done rather late.

The Holbeck Riverside Gas Power Company has been incorporated at Oil City, Pa., by John D. Smithman, H. H. Smithman, Joseph M. Jenckes, with $1,000,000 capital stock, to establish a plant for the manufacture of engines, compressors, boilers and tanks. Further details will be made public later.

A new high service pumping plant is to be installed by the Donora Water Works Company, Donora, Pa. The plans are in charge of Chester & Fleming, Pittsburgh.

The Oil City Boiler Works, Oil City, Pa., has been awarded the contract for two boilers of 300 hp. each, feed water heater, pump, &c., for installation in the power and pumping plant at Sharpsburg, Pa.

W. E. Hildebrand, Pittsburgh, heads the newly organized Pittsburgh, Steubenville & Wheeling Railway Company, which is preparing to build an electric traction line from Carnegie, Pa., to Chester, W. Va. The plans contemplate a large central generating plant located where fuel can be had at low cost, but the details have not thus far been worked out.

The city engineer of Youngstown, Ohio, will shortly submit plans for the proposed municipal power and electric lighting plant, and the matter is expected to be definitely acted upon this winter.

The Pittsburgh & Lake Erie Railroad Company has bought about 50 acres at Adelaide, Pa., between Pittsburgh and Connellsville, and will erect a modern timber preserving plant, which is to be operated by a company under the management of an engineer who has designed quite a number of such plants, and is an expert in that line of work.

The Industrial Engineering Company is a new Pittsburgh corporation.

The Four States Coal & Coke Company, Worthington, W. Va., is installing a heavy duty air compressor and will make other additions to its equipment before spring.

Considerably enlarged manufacturing facilities for the coming year are to be provided by the Penn Motor Company, Pittsburgh, which is now incorporated. The plans for the projected improvement have not yet been fully determined upon.

The Ligonier Stone & Ballast Company has been organized by A. K. Keltz and others of Ligonier, Pa., to operate quarries in that vicinity on an extensive scale, land for that purpose having been leased from the Cramer Coal, Coke & Stone Company, Cramer, Pa.

Detroit

DETROIT, MICH., December 6, 1910.

During the past week there were a good many important developments, announcement having been made of various new enterprises which call for large expenditures for buildings and equipment, as well as material used purely for construction purposes. Bookings on this account will be made gradually within the next few months, as there is no longer the hurry which characterized previous operations. Few of the new companies recently organized expect to start manufacturing before April or May, and only additions to established plants, which are needed in fulfilment of present or expected demands on the business, will be rushed to completion.

The Cartercar Auto Company, Pontiac, Mich., will complete arrangements shortly for another machine shop building, 150 x 160 ft., which is needed in the extension of its plant.

The Muskegon Paper Box Company has been incorpor-

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ated to establish a manufacturing plant in Muskegon, Mich. F. A. and G. E. Scruby are interested in this enterprise, their present address being given as Grand Rapids, Mich.

It is stated locally that C. D. Widman, Detroit, has sold his furniture manufacturing business to the Voss Mfg. Company, Louisville, and that the plants will be consolidated in that city.

Three new shop buildings, each 40 x 80 ft., are to be erected at Elkhart, Ind., by the Crow Motor Car Company of that place.

It is reported from Niles, Mich., that the National Wire Cloth Company's plant will be enlarged to provide facilities for the consolidation with it of an Eastern plant manufacturing approximately the same line of goods. A merger of several such companies is also talked of.

A timber cutting plant, planing mill, shingle mill, &c., will be built at Tula, Mich., by the Tula Lumber Company.

Plans for a large quarrying, crushing and manufacturing plant, to be erected by the Michigan Limestone & Chemical Company at Calsite, Mich., are nearing completion. All of the contracts for material and equipment will be placed through J. G. White & Co., New York City.

Work is about to begin in Detroit on the erection of a new factory building for the Hale Motor & Machine Company.

A four-story factory building, approximately 60 x 260 ft., is to be erected by the Universal Motor Truck Company, Detroit, in accordance with contracts recently awarded. The details of equipment are now being worked out.

Construction contracts are about to be let at Muskegon, Mich., for an electric plant to be operated by the municipality, and the purchase of equipment will also be determined upon in the near future.

Reichel Bros., Marquette, Mich., are building a new saw mill there, and will be in the market for equipment at intervals between now and spring, although the principal details have been provided for.

Wm. Horner, Reed City, Mich., is arranging for the construction of a new factory building, 80 x 120 ft. The Hauser, Owens & Ames Engineering Company, Grand Rapids, Mich., is reported to be in charge of the plans.

The Packard Motor Car Company, Detroit, is putting on more men in its pattern making and foundry department.

A two-story factory building, 70 x 70 ft., equipped with new machinery, will be erected in Kalamazoo, Mich., by the Kalamazoo Sheet Metal Works.

E. M. Arnos, Olivet, Mich., who is connected with the college there, has organized a company to build a power plant by remodeling the local flour mill and equipping it with electrical machinery, water wheel driven. Bids on the apparatus needed will be taken up to December 20.

The Manistee County Electric Company, Manistee, Mich., is arranging for the construction of a large hydraulic power plant. The preparation of plans has been intrusted to D. J. Albertson, Kalamazoo, Mich.

Toronto

TORONTO, December 3, 1910.

The features of the week's trade are pretty much those of the whole autumn season. Nearly all factories are working up to their full labor capacity. New business to keep plants going in future months may not be coming in in quite as strong volume as it was, but so far the outlook is encouraging. There is still a large amount of new capital to be used in constructive work, and there seems to be no hesitation on the part of British investors to buy new Canadian issues, so that, apart from the proceeds of the crops and the profits of business, there is money to spend on equipment.

The ratepayers of Gleichen, Alberta, have voted in favor of spending $30,000 on water works and sewerage improvements.

Tenders, to be in by January 3, are being called for by A. Johnston, Deputy Minister of Marine and Fisheries, Ottawa, for the construction of a buoy depot, including the erection of a reinforced concrete wharf, power house, the installation of drainage and water systems, &c.

Up to February 1 tenders will be received by J. W. Breakey, secretary-treasurer of the town of Souris, Man., for the delivery next spring and summer of water pipes, hydrants, gate valves, valve boxes, pig lead, oakum, standard vitrified sewer pipe, &c., for the municipal water works and sewage system.

In January a by-law will be submitted to the ratepayers of Vancouver, B. C., to raise $200,000 on existing water works account. This is over and above the $690,000 estimate as required for the extension of the water works extension on the north. An agreement is practically arranged for the expending of $2,000,000 in South Vancouver by the joint municipalities. Of this sum $1,000,000 is to be on new water works account.

The City Council of Calgary, Alberta, is considering an expenditure of $50,000 upon a new incineration.

The R. McDougall Company, Galt, Ont., manufacturer of machine tools and pumps, is enlarging its works.

The Maximilian Pneumatic Tool Company has practically all the stock subscribed for its Woodstock, Ont., works. Orders for $5000 worth of machinery are being placed.

Canadian Explosives, Ltd., headquarters Montreal, has been incorporated by the Dominion Government with a capital stock of $15,000,000.

The Mexican Northwest Equipment Company, with a capital stock of $200,000, has received a charter of incorporation from the Dominion Government. The purpose of the company is to manufacture and deal in locomotives, cars and machinery and equipment of all kinds used in connection with railroads. The headquarters of the company are to be in Toronto.

The Ottawa Furnace Mfg. Company has decided to erect a factory in Calgary, Alberta.

A $500,000 water power development and pulp industry are to be undertaken on the Malbaie River, above Murray Bay, Que. A large force of men is at work upon the excavation of the ground that is to be the site of the buildings. The work is being done for the Canadian Power & Pulp Company, and the equipment is being attended to by the Bishop Construction Company, Montreal.

It is stated that the Dominion Steel Corporation's expenditure on new construction at Sydney, N. S., will amount to $1,500,000 in 1911.

The Canada Keg & Barrel Company proposes to locate in Orillia, Ont. Its works there would, it is said, employ from 80 to 100 hands at the outset.

The Canadian Carbon Company, Toronto, is arranging to start a branch factory in Winnipeg, Man., to cost $15,000.

The Canadian Pacific Railway Company has ordered five more 130-ton locomotives, to be built at its Angus shops in Montreal. They are to be used as pushers on the Rocky Mountain section.

The City Council of Chatham, Ont., has passed a by-law to provide the Western Bridge & Equipment Company with a site of 7 acres at a price of not more than $1500, and to give the company a fixed low assessment for 10 years. On its part the company is to build works at an outlay of $10-000 and spend at least an equal sum on its equipment. The ratepayers will vote on the by-law on January 2.

The Hydro-Electric Power Commission is now on the point of delivering power to London, Ont., where the city plant has been put in readiness to receive it. But manufacturers who have been using electricity there as supplied by the local company find they must change their motors. These are nearly all direct current motors, whereas alternating current is being supplied by the city. Upward of 300 motors of varying power will be taken out and new ones put in their place.

St. Louis

ST. LOUIS, December 5, 1910.

Business is still quiet, although some of the dealers say they did fairly well on the whole for November. There are no specially good inquiries in the market, but there is a straggling demand from new manufacturing enterprises, which are starting up in considerable numbers.

The Commonwealth Steel Company continues making extensions, as required by its rapidly growing business on cast steel passenger car specialties.

The Duplex Adding Machine Company, St. Louis, has leased the three-story building at 1900-02 Morgan street, containing about 21,000 sq. ft. of floor space. The company will employ several hundred skilled mechanics for the manufacture of a simplified adding machine.

The Rogers-Conklin Mfg. Company, Joplin, Mo., announces that on November 14 the name of the company was changed to the Rogers Foundry & Mfg. Company.

The plant of the Roberts Cotton Oil Company at Jonesboro, Ark., was destroyed be fire November 28. The loss is estimated at $100,000.

The National Gas Machine Company, St. Louis, Mo., has been incorporated with $100,000 capital stock to engage in the manufacture of equalizing gas machines. The company will establish a factory at St. Louis. It has a full equipment of machinery and tools for the present, acquired from another concern, but will be in the market for new machinery and tools after the first of the year.

The Bayer Steam Soot Blower Company, St. Louis, Mo., is erecting a new factory building, 42 x 100 ft., of brick and concrete construction, for which all necessary equipment has been purchased.

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San Francisco

SAN FRANCISCO, November 30, 1910.

The labor agreement recommended by the Arbitration Committee has not yet been adopted by the San Francisco metal working shops. No further attention is paid to labor troubles at outside points, and there seems to be a better undertone to the market. A few scattering sales have recently been made of large tools, and there is some further business in prospect, while the movement of small lathes, shapers, &c., is gradually improving. No large business with private firms is expected, however, during December, and there is little prospect of a general demand during the rainy season, though a little railroad business is coming out. Government inquiries are limited to a steam drop hammer and a wood planing machine for the Mare Island Navy Yard.

There is little new inquiry for wood working machines, and some of the sales which materialize are of less importance than was anticipated. Numerous lumber interests along the coast are making plans, however, for extensive improvements to be carried out next spring, and considerable activity is expected at that time. General factory equipment is in fairly active demand. Most of the salmon canning interests are planning improvements, and rumors have been started of a number of new canneries to be operated next year, which will require considerable new machinery.

Road machinery is regarded by local merchants as one of the most important and promising departments, as the State and many municipalities are working on large projects, and interest in this class of improvements is still increasing. Notwithstanding the beginning of the rainy season, numerous inquiries are still coming in for rollers, graders, &c.

In view of the large prospective requirements of Alaska and California gold fields, increased attention is given to dredging machinery, and considerable business is also coming up in dredges for general reclamation purposes. The Bucyrus Company has taken the contract for heavy machinery for the Feather River No. 4 dredge, being built at Marysville, Cal., for the Natomas Consolidated, and anticipates a number of other large orders in this territory within the next few months. Mr. Eels, president, and Messrs. Sweigert and Coleman, vice-presidents, of this company, have been visiting the San Francisco office for the past ten days.

A large electric motor has just been shipped to Honolulu for the Hawaiian Dredging Company.

Insurance interests have been making a careful investigation of fire protection equipment in California, and have recommended many improvements which are in most cases being provided for. Inquiries are coming out for fire engines, pumps and general water works machinery for all parts of the State.

The town of Palo Alto is figuring on an auxiliary water pumping plant and an automobile fire engine, and the town of Redlands is having estimates made on a high pressure water system in the business district. Los Angeles is in the market for a number of motor-propelled fire engines, &c. The city of Sacramento is figuring on two fire engines and an additional pumping unit for the water works, and the town of Holtville has taken bids on a new pumping station.

Henshaw, Bulkeley & Co., San Francisco, agents for Underwriter pumps, report a large demand for these machines recently, especially from factories and planing mills, many of which are figuring on additional installations next spring.

A number of large sales of electric and hydro-electric machinery have been closed during November, one of the largest being a 10,000 hp. plant for the Homestake Mining Company, Lead, S. D., which has ordered three Pelton impulse wheels, to be operated under a 660-ft. head, with Pelton governors, connected to Westinghouse generators. Another important order is that of the San Diego, Cal., Railway for a 3000-hp. steam turbine plant in two units.

The Edison Company, Los Angeles, has let contracts for a large power plant at Long Beach, Cal.

A Westinghouse generator and an 850-hp. Pelton-Francis turbine, to operate under a 1280-ft. head, have been ordered for the municipal plant of Brigham City, Utah.

The General Electric Company has taken a contract to supply transformers for the municipal plant at Palo Alto, Cal.

Plans have been accepted for a new municipal power plant at Lodi, Cal.

George Wingfield has secured extensive water rights on the Humboldt River in Nevada, and is preparing to install a large power plant to supply his Buckhorn mines.

The Hydro-Electric Company of California has ordered a 2500-hp. Pelton impulse wheel and Pelton governor to operate on a 680-ft. head and an Allis-Chalmers generator for its plant at Bodie, Cal.

Louis G. Henes, coast representative of Manning, Maxwell & Moore, reports the sale of a 15-ton crane for the Southern Pacific substation at Berkeley, Cal. A crane for the Oakland station has already been delivered.

The Llewellyn Iron Works, Los Angeles, has a contract for six freight elevators for the W. H. Perry Estate Building in that city.

W. T. Garratt & Co., pioneer brass founders of San Francisco, have leased a two-story and basement building to be erected at Fremont and Folsom streets.

The Richmond Light & Power Company, Richmond, Cal., is preparing for the complete reconstruction of its electric lighting plant.

L. R. Cady, who operates an electric light plant at Susanville, Cal., has placed orders with the Pelton Water Wheel Company and the General Electric Company for an additional unit.

The Honolulu Iron Works Company, Honolulu, T. H., is making a specialty of sugar mill machinery and is getting considerable foreign business in this line. Orders were taken recently for two large mills in Formosa, to duplicate others already installed by the company in Japan. It is reported that a great deal of development is projected for the Japanese sugar industry.

A. C. Stanley, San Jose, has purchased the Roseberry mining property near San Bernardino, Cal., and expects to place orders shortly for a 10-stamp mill and other machinery.

The Columbia Marble Company of this city is considering the installation of a Fort Wayne electric drill at its quarry.

F. S. Chapman and C. Chapman of Portland, Ore., are figuring on establishing a large saw mill in the vicinity of Klamath Falls, Ore.

A lively demand for small pumping plants for irrigation is reported in the agricultural district between Klamath Falls, Ore., and the California line.

A lot of new machinery is to be installed by the Globe Grain & Milling Company at Los Angeles.

Porterville, Cal., is having plans prepared for a water works system to be constructed at an estimated cost of $75,000.

The Southwest

KANSAS CITY, MO., December 5, 1910.

The sale of machinery for a diversity of purposes, including mining and ore reduction, has recently been more active, and the outlook for the new year is most encouraging.

It is reported from Coffeyville, Kan., that the Coffeyville Foundry & Machine Company will enter extensively into the manufacture of gasoline engines. Considerable new equipment is to be provided for the purpose.

Bids are to be taken by Capt. D. L. Stone, Fort Sill, Okla., for installing a refrigerating plant in the army post there.

Improvements to be made by the Atchison, Topeka & Santa Fé Railway Company in this section include a welding plant at Shopton, Kan., and the installation of heavier tools at other points to take care of locomotive repairs.

A new manufacturing plant is to be built at Little Rock, Ark., by the Diamond Basket Company.

The Alamogordo Improvement Company, Alamogordo, N. M., which is constructing a hydroelectric power station in that vicinity, is planning the installation of a number of such plants to provide current for industrial purposes, thereby creating a market for motors in the communities which it serves.

It is reported from Silver City, N. M., that Boulware & Johnson of that place are in charge of plans for the installation of a hydroelectric plant of 3000 kw. on the upper reaches of the Gila River. Construction work will begin in the near future.

The L. J. Smith Locomotive & Equipment Company has recently been organized at Kansas City and acquired a plant on Fourth and Central streets. In addition to general repair work on locomotives, steam shovels and contractors' equipment of various kinds, the company will deal in such machinery, utilizing its facilities, when necessary, to put apparatus in good condition for resale.

Cleveland & Weatherhead, Silver City, N. M., are installing new machinery at the Deadwood mines, which are under their control, and will be in the market later on for additional equipment as development work progresses.

From Waco, Texas, it is reported that the Citizens' Railway Company will install a 1500-kw. steam turbine unit and has intrusted its selection to the National Light & Improvement Company, whose headquarters are in the Pierce Building, St. Louis, Mo.

The installation of a municipal water works system was recently decided upon at Coldwater, Kan., and the preparation of plans has been intrusted to an engineering firm in Kansas City. Machinery will not be purchased until after January 1.

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A substation, with equipment for the transmission and distribution of power, is being erected in Joplin, Mo., by the Southwest Missouri Electric Railway Company of Webb City, Mo.

The construction of an ore concentrating plant will be undertaken in the immediate future at Carl Junction, Mo., by the Homestake Mining Company, which has entered upon extensive development work there.

A bond issue of $20,000 for water works construction will soon be available at Miles City, Texas.

Ekman & Tolbert, Ada, Okla., have been engaged to construct water works at Allen, Okla., where a bond issue of $25,000 for the purpose was recently voted. The machinery equipment is reported to have not yet been purchased.

Following the installation of a pumping engine of 20,000,000 gal. capacity in the White Rock pumping station at Dallas, Texas, another of the same size will be purchased, although no definite time for doing so has as yet been set.

Improvements are to be made in the water works system at Okmulgee, Okla.

The Northwest

ST. PAUL, MINN., December 5, 1910.

Among manufacturers and dealers in machinery all eyes are now turned toward the possibilities of the coming year, which promises exceptionally well for the sale of construction material, contractors' outfits, power equipment and industrial machinery, including foundry appliances, machine shop, boiler and tank making and fabricators' tools.

In the mining districts of South Dakota, Montana and Idaho there is also much figuring on new equipment, a considerable part of which is to be installed within the next two or three months. Development work everywhere is being more vigorously prosecuted than has been the case for a good many years, with the result that the houses supplying the trade have a great deal of business in prospect.

The Sioux Falls Light & Power Company, Sioux Falls, S. D., is adding largely to the capacity of its auxiliary steam power plant, and other improvements are to follow.

Material and equipment will be purchased at some time during the present winter for a water works plant at Townsend, Mont., the plans of which are now being prepared.

The project for a municipal pumping station and system of water distribution at Wayzata, Minn., which has been under consideration for some time past, will probably reach a favorable conclusion in the near future.

A new concentrating plant will be completed soon after the first of the year by the Hymalulu Mining Company, Mystic, S. D., which will henceforth be among the best buyers in that district of equipment and supplies.

Improvements which will probably involve the purchase of some new equipment will be made in the water works system at Tracy, Minn.

The electric light plant at Casselton, N. D., which was owned by B. A. Tenny, has been sold to Lloyd Lynch and Chester Hallet, who will remodel and operate it, with the probable purchase of some new equipment a little later on.

The authorities at Manhattan, Mont., are planning the construction of a water works system.

The Corbin Metal Mining Company, Corbin, Mont., is considering the erection of a concentrating plant and the extension of its operating machinery at the mine.

The Western Supply Company, Butte, Mont., has furnished a new air compressor and drilling outfit for the Black Friday Mining Company's operations at Radersburg, Mont., where electric motors will be used in place of direct steam drive, as at present, as soon as the necessary arrangements can be made.

A bond issue of $10,000 to cover the cost of a municipal pumping plant and water distribution system has been authorized at Morristown, S. D.

The Snowshoe Mining Company, Mullan, Idaho, will install an air compressor, motor driven, which has already been purchased. Other improvements are to be effected later.

Plans for a smelter will shortly be carried into effect by the Gilt Edge Maid Gold Mining Company, which controls a good producing property in Turner, near Deadwood, S. D.

A steam turbine set of 20,000 kw., new steel stacks, improved furnace equipment, &c., are being added to the main generating station of the Twin City Rapid Transit Company, Minneapolis, and other additions are expected to be made before spring.

The Crown Iron Works Company, Minneapolis, Minn., whose structural iron shop was recently destroyed by fire, will build a new fireproof building of brick and steel construction, 74 x 152 ft. The new shops will be equipped with a 10-ton electric crane, punches, shears and other necessary machinery and tools.

Lewiston, Mont., has estimates completed for rebuilding its water works system. The improvements contemplated will cost about $80,000.

North Pacific Coast

PORTLAND, ORE., December 3, 1910.

Current trade in all lines is fair, with occasional spurts of buying that bring the aggregate volume of business up to a very satisfactory figure, all factors considered.

It is reported from Bellingham, Wash., that the Nooksack Valley Traction Company will soon begin the construction of an electric line north of that city, necessitating the purchase of considerable equipment and supplies.

The National Power Company, recently organized at Spokane, Wash., with headquarters in the Columbia Building, will undertake an extensive hydroelectric power development on the site of a small plant now in operation.

The Valparaiso Mining Company, Ketchikan, Alaska, is planning the installation of an ore crushing plant, with 10 stamps, early in the coming spring.

The gear cutting shop of the Portland Iron Works, which has been equipped with a gear planer, stated to be the only machine of its kind in the Pacific Northwest, is taking care of a heavy run of business, turning out mortise gears, bevel, spur or miter, of any description required.

The plant of the Oregon Door Company, Sellwood, Ore., is to be enlarged in the near future and some new machinery added.

The Lidgerwood Mfg. Company, whose sales offices for the north Pacific Coast are in the Alaska Building, Seattle, Wash., is placing its hoists, loaders, &c., very extensively through this section, and the prospects for the immediate future are most favorable.

The Hoquiam Machine Works, Hoquiam, Wash., is making a specialty this season of the Ideal logging tools which it manufactures. In these a large and growing trade has been developed.

Considerable equipment will be required by or before spring, and an ore reduction plant erected by the Dixie Meadows Mining Company, Prairie City, Ore., which was recently organized to take over the property of that name in the vicinity.

The planing mill of Savidge Bros. at Klamath Falls, Ore., is being enlarged and new machinery installed.

The City Council at Centralia, Wash., has decided upon plans for the installation of a complete electric power and lighting plant.

The authorities at Hermiston, Ore., have granted a franchise to B. A. & G. A. Chisholm to install an electric power and lighting plant.

The Bellingham Mfg. Company is planning an addition to the plant of the Western Sash & Door Factory, Bellingham, Wash., which it recently acquired. New machinery for making boxes, crates, &c., is to be installed.

The Hercules Steel & Iron Works has been organized in Portland, Ore., by E. W. Doane, L. G. Carpenter and G. H. Nicholai to operate a machinery building plant and do jobbing and repair work.

The authorities at Olympia, Wash., are preparing to start a vigorous campaign for the location of new industries, and as fast as the tide lands are filled in they will be utilized for free sites to be offered to manufacturers. Harbor improvements are also under way which will enable concerns building along the water front to have good shipping facilities by vessel.

The Washington Iron Works, Portland, Ore., recently made a large shipment of machinery to Manila for use in the Philippine Islands.

The plant of the International Lime Company, now under erection near Seattle, Wash., will be put in operation shortly after the first of the year. Electric drive is being installed throughout. This company will be a fairly constant buyer of equipment and supplies, with a large yearly aggregate of purchases.

The main offices of the Pacific Tank & Pipe Company have been removed to a new structure recently completed for the purpose at its factory near Kenton Station, Portland, Ore.

It is reported to be the intention of the Knob Hill Mining Company, Republic, Wash., to install an air compressor plant and add other equipment by or before spring.

The Washington Pipe & Foundry Company, manufacturer of metal and machine banded wooden stave pipe, which is stated to have the largest plant of its kind in the world, has had a liberal amount of business this season for the account of water works systems, power plants, fire service systems, hydraulic mining and general industrial purposes. The

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works of the company, with its principal offices, are in Tacoma.

A plant for the manufacture of sheet metal productions will be built in Spokane, Wash., by the Spokane Corrugated Culvert & Tank Company, recently organized there by H. G. Harrison of that place, in association with John S. Beall and C. A. Foster of Portland, Ore.

The preliminary work is now in progress on a new system of water supply for the city of Ellensburg, Wash.

The Riverside Portland Cement Company, Riverside, Cal., has plans prepared for the enlargement of its plant at Crestmore, which include the installation of two new kilns, three ball mills and two tube mills. Later on these improvements may be doubled. The company is also considering the erection of several buildings for handling and storing cement, and advises that it is particularly interested in reinforcing systems for concrete structures. Considerable new equipment will be installed.

The Lewiston-Clarkson Improvement Company, Clarkson, Wash., has completed plans for the improvement of its light and power system, to cost approximately $100,000. E. H. Libby is president.

Farther Central West

OMAHA, NEB., December 5, 1910.

Despite the lateness of the season a great deal of construction work is still in progress, for nearly all of which buying of material and equipment has been prolonged beyond the usual period and will, in some cases, be carried through the winter. Thus the lack of business during the early fall is being somewhat compensated for at this time. From the general industrial field machinery and supply houses are also deriving a fair run of orders, mostly for prompt delivery. Few new projects have, however, been heard from lately, except as prospects for next spring, and the main support of the market must come from enterprises already established.

Preliminary preparations, involving arrangements for more power, are being made by the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, for a 20-mile extension of its lines.

The city of Stuart, Iowa, has ordered from the Des Moines Bridge & Iron Company, Des Moines, Iowa, a steel tower and tank of 80,000 gal. capacity. Further purchases by the municipality will need to be made by or before spring, but their nature and extent have not been definitely decided upon.

The installation of a municipal pumping plant is proposed at Logan, Iowa, and will probably be undertaken in the spring.

The plant of the Des Moines Clay Mfg. Company, Des Moines, Iowa, will be largely extended and equipped with additional machinery.

It is reported from Bonaparte, Iowa, that S. E. Irish and others are organizing a company to build a hydro-electric plant. A concrete dam will be built and water turbines, electric generators, exciter units, transformers and power transmission apparatus installed.

The E. L. Watrous Mfg. Company, Des Moines, Iowa, has been very successful with its new process of hot galvanizing and tinning, known as the Watrous method, and an increase in its facilities will probably be called for in the near future.

Following development work now being prosecuted by the Clear Grit Mining Company, Leadville, Colo., under the management of C. J. Moore, considerable additional equipment will be required. A pumping unit has been installed at the 185 ft. level and adequate drilling machinery provided.

The South Omaha Stone Mfg. Company has been organized at Omaha, Neb., by Joseph H. Saunders and N. E. Carter to operate a stone finishing plant.

Jacob W. Young, J. M. Buckle and others have organized the Utah Plaster Company, Richfield, Utah, with a capital stock of $500,000, to establish a large plant for the manufacture of cement, plaster and similar products. Homer C. Bloom of Pittsburgh, Pa., is also reported to be interested.

The Horn Silver Mining Company, of which M. C. Morris, Salt Lake City is manager, will build a 75-ton ore reduction mill at Frisco, Utah.

Webster City, Iowa, is negotiating for a site on which it will erect a new power plant at a cost of $50,000, for which none of the equipment has been purchased.

The City Council of Olathe, Colo., is preparing to establish a water works system at a cost of $65,000.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, is erecting an addition to its plant on Miles street, 52 x 300 ft. The company has recently installed two cupolas, one of which is constructed of reinforced concrete and was erected at a cost of $3000. Each of the cupolas has a capacity of 35 tons a day. The company has recently purchased a large tract of land across the street from its foundry, upon which it expects to erect a large building in the spring at a cost of $30,000.

The Johnson Biscuit Company, Sioux City, Iowa, has plans prepared for the erection of a five-story building, 100 x 150 ft., work upon which will be started early in the spring. The new building will be of brick and mill construction and will contain all modern improvements, including an air purifier, laundry, electric lighting plant, telephone system, fire sprinkler system, icing trolleys, sanitary ovens, cracker conveyors, cracker ovens and candy mixing and making machines. A considerable amount of the equipment has already been contracted for, but the engines, boilers and additional machinery to be installed have not been fully decided upon.

The Hastings Foundry & Iron Works, Hastings, Neb., is building a new plant composed of four buildings of steel construction. Upon its completion the company will move from its present location. The plant will be modernly equipped throughout and will be one of the most complete of its kind in the West.

The Peterson-Rerum Battery Company, Charles City, Iowa, has been incorporated, with a capital stock of $50,000. The company manufactures electric batteries and expects to build a large factory in the spring.

The W. T. Wood Company, Waterloo, Iowa, has been incorporated. The company will engage in the manufacture of wagons, farm trucks, tool grinders, gasoline engines, &c. W. T. Wood is president of the company.

Texas

AUSTIN, TEXAS, December 3, 1910.

Industrial conditions in Mexico and along the Rio Grande border of Texas have not been disturbed by the recent sporadic revolutionary uprisings. American interests in Mexico are fully protected, and it is not feared that, even should the seditious movement against the existing government of that country become serious, which is very improbable, there would be any overt act committed upon American or other foreign holdings. The home seekers' movement to South Texas is growing in volume with the advance of cold weather in other portions of the country. Many of these newcomers invest considerable money in irrigating and other machinery, the demand from this source being unusually large.

Owing to the continued dry weather which has prevailed in Texas and almost the entire Southwest for the past two years, dealers report a large demand for well boring machinery. Numerous cities are short of water, and instead of depending on the surface supplies, have resorted to the digging of artesian wells. Fine water and in large quantities can be obtained at depths varying from 500 to 2500 ft., and well drillers and dealers in machinery of this character are being kept very busy.

The city of Dallas recently sold an issue of $650,000 worth of public improvement bonds. The bonds are divided for the purpose of making improvements to the water works system, for street improvement and for other public work.

The International & Great Northern Railroad is erecting reinforced concrete buildings at Taylor, Texas, for its car repairing shops, blacksmith shop, round house, store house and power house. It will also install air compressing machinery. The new shops will give employment to about 160 men.

The St. Stephen Land Company will construct a water storage reservoir and install a large amount of irrigation pumping machinery upon its property near Marfa, Texas.

S. M. Beverly and associates will erect a large plant at Pecos, Texas, for the manufacture of plaster cement and plaster of paris.

A cargo of 3500 tons of scrap iron was recently shipped from Galveston on the steamship Dora Baltea, destined for Italy.

D. D. Fairchild, Jr., of San Antonio and associates have applied to the City Council of Victoria, Texas, for a franchise to construct a street railway system there.

E. M. Ford will install an irrigating pumping plant near Leasburg, N. M. He will irrigate about 300 acres of land.

The Western Construction Company of Wichita, Kan., has submitted a proposition to the Chamber of Commerce of Douglas, Ariz., looking to the irrigation of about 10,000 acres in that section. The company purposes to install pumping plants and furnish water to the land owners.

The Sinaloa Land Company of Los Angeles, Cal., recently finished the construction of a system of irrigation upon its lands in the valley of the Culiacan River, State of Sonora, Mexico, at a cost of $250,000, gold. The company owns 3,000,000 acres. Interests identified with this com-

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pany will soon begin the construction of another irrigation system in the same section by which 75,000 acres will be watered. Large pumping plants will be installed.

Rafael Zepeda of Guanacevi, State of Durango, Mexico, and other mine owners of that district will install a reduction mill for the treatment of their ores at a cost of about $300,000, Mexican money.

J. P. Warr, Hedley Ludlow and G. Gonzalez, all of Pachuca, Mexico, have formed a company for the purpose of installing an ore reduction mill of 100 tons daily capacity at Atotonilco, State of Hidalgo. The company has a capital stock of $400,000, Mexican money.

C. A. Bentley of Zacatecas, Mexico, and associates will install an ore concentrating plant in that district.

The Cajones Mining Company will soon have plans drawn for a stamp mill of 200 tons daily capacity, which it will install at Villa Alta, State of Oaxaca, Mexico. The company will also install a 300-hp. hydro-electric plant.

The Bryan Cotton Oil & Fertilizer Company, Bryan, Texas, has let the contract for the erection of a large seed house, which will be supplied with cleaning machinery.

The South

CHATTANOOGA, TENN., December 5, 1910.

F. M. Welch, Chas. Maurin and others of Donaldsonville, La., have organized the Lafourche Valley & Gulf Railway Company, to build an electric traction line between that city and Lockport. None of the equipment details will be taken up before spring.

The electric power and pumping plant operated by the city of Cairo, Ga., the equipment of which includes a Crocker-Wheeler generator driven from a Harrisburg engine, will probably be enlarged in capacity. The boilers at present installed were furnished by the J. S. Schofield's Sons Company, Macon, Ga., and will need to be added to.

A new engine and other machinery will be provided for the plant of the McInnis Lumber Company, Hattiesburg, Miss., which recently sustained considerable damage from the bursting of a flywheel.

A bond issue of $25,000 for the construction of water works and a sewage plant is to be voted at Sarasota, Fla.

The Greenville Chair Company is planning the erection of a factory building at Greenville, Tenn.

An appropriation of $50,000 for water works construction has been decided upon at Russell, Ky.

The Marion Electric Company has been organized to take over and improve the plant and system of the Marion Light & Power Company, Marion, Ala., which has a present capacity of 125 kw.

One of the most complete crushing plants in the South is being erected by the North Carolina Granite Corporation at Mt. Airy, N. C., for handling granite. Power will be supplied from a steam plant equipped with two boilers of 300 hp. capacity, and a Hamilton Corliss engine unit.

T. W. Jay, Leesburg, Fla., will establish a wagon factory and repair plant, 30 x 100 ft.

The Richmond Iron Works Corporation, Richmond, Va., is erecting a new building to accommodate the manufacture of a line of automobiles to be known as the Virginian. Details as to the equipment are not available.

Government Purchases

WASHINGTON, D. C., December 5, 1910.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids December 27, under schedule 3099, for one motor driven power pump to be delivered at Navy Yard, Mare Island, Cal.

The Paymaster-General, Navy Department, Washington, will open bids December 13, under schedule 3052, class 1, for one double service planing machine, and on December 20, under schedule 3092, class 1, for one steam drop hammer.

The office of the Constructing Quartermaster, Fort Bayard, N. M., will open bids December 24 for furnishing and installing complete two compound duplex steam pumps.

The Isthmian Canal Commission, purchasing department, Washington, will open bids under canal circular Z 4879A for one power hack saw, 24-in. blade.

The Isthmian Canal Commission, Washington, opened bids November 18, for furnishing one wood boring machine, as follows: Chicago Pneumatic Tool Company, New York, $70; Independent Pneumatic Tool Company, Chicago, Ill., $70; Ingersoll-Rand Company, New York, $64.80.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids November 22, as follows:

Schedule 3013, class 1, for two electric driven compound geared deck winches and controllers—Bidder 70, Hyde Windlass Company, Bath, Maine, $2450; 173, Williamson Brothers Company, Philadelphia, Pa., $2600.

The Secretary of the Department of the Interior, Washington, opened bids November 17 for furnishing engine, generators and switchboard for the central power plant at the Freeman's Hospital and Howard University, Washington. The bids for the completed work are as follows: Blackall & Baldwin Company, New York, $15,803; Allis-Chalmers Company, Milwaukee, Wis., $14,450; Lord Electric Company, New York, $14,982; General Electric Company, Schenectady, N. Y., $16,090; National Electrical Supply Company, Washington, D. C., $13,455; Harrisburg Foundry & Machine Works, Harrisburg, Pa., $13,850; Westinghouse Electric & Mfg. Company, Baltimore, Md., $14,447; McCay Engineering Company, Baltimore, Md., $14,295; A. D. Granger Company, New York, $17,443.

Returning Goods to Manufacturers.—The Walworth Mfg. Company, 128 to 136 Federal street, Boston, Mass., has issued a circular from which the following extracts are taken: "The practice of returning goods without notification, where no fault exists on our part, has become a very serious evil, and we have decided in future not to accept material of any kind or description unless we have been notified of the return and our permission for such return given. Where the fault does not lie with us, we shall make a charge for clerical labor and incidental expenses of 10 per cent., and such other expenses which we may have been put to in the way of freight or expressage. If, however, the fault is with us, we expect to stand the cost. We think the trade will agree with us that the charge as proposed is not a heavy one, in view of the expense to which we are put in examining the goods and passing the credit through our books."

To Push Pittsburgh's Industrial Growth.—The Trade and Commerce Committee of the Chamber of Commerce, Pittsburgh, has sent requests to every member for suggestions on the subject of diversified industries for the Pittsburgh district. Inquiry blanks giving space for various forms of suggestions relating to transportation, taxation, fuel, advertising and the like accompanied the requests. The letter says in part: "You are invited to submit to the committee any ideas or suggestions which you may have regarding the methods which have been pursued in other localities, or which your experience leads you to believe would be most useful in Pittsburgh; also at any and all times to lay before the committee any information which you may have regarding new industrial establishments which might be induced to locate here, and, in general, any data or information which would aid in prosecuting this important work."

Eclipse Concrete Mixers at New York Cement Show.—The Standard Scale & Supply Company, Pittsburgh, will have on exhibition at the New York Cement Show a display of Eclipse concrete mixers, including one of the new special rear discharge machines, which has an engine set at the side of the drum, and has been built especially for street paving and other work, where it is desirable to move the mixer forward as the work progresses. The company will also have in operation a motor driven mixer mounted on skids, showing the advantages of low charging and open drum; when this machine is seen in operation, it demonstrates fully that the concrete obtained from it is thoroughly mixed.

The Pennsylvania Railroad Company is erecting at Altoona, Pa., an addition to its steel car shops. It is a steel building, 90 x 450 ft., and will be equipped with machinery for the manufacture of steel cars.

Obituary

GEORGE H. ROGERS, Hartford, Conn., of the Simeon L. & George H. Rogers Mfg. Company of that city, died November 29, aged 62 years. He was born in Hartford. For some years he was engaged in farming near Meriden, but returned to Hartford to take an active part in the management of the business, serving part of the time as the secretary of the company. He leaves a widow and two sons.

CHARLES JOSEPH DE BERARD, secretary and treasurer of the Felt & Tarrant Mfg. Company, Chicago, died November 28. He was born at Racine, Wis., August 7, 1849, removing to Chicago in 1866. For 25 years he was associated with Robert Tarrant in the machine shop business, and continued until his death as a stockholder and director in the Tarrant Foundry Company. In recent years, however, he was actively identified with the Felt & Tarrant Mfg. Company. He leaves a widow, three daughters and two sons.

HENRY FAIRCHILD DE BARDELEBEN died at Birmingham, Ala., December 6, aged 71 years. He was a pioneer in the development of the iron industry in the Birmingham district, in which he began operations in 1872. At the time of his death he was actively engaged in opening up a coal property.

JOHN H. BARKER, president of the Haskell & Barker Car Company, Michigan City, Ind., died December 3, of pneumonia, aged 66 years. He was born in Michigan City, his father being one of the founders of the company. He was a shipping clerk in a Chicago wholesale sugar house and later a grocer at Springfield, Ill., before taking a minor place at the car works, at the age of 25. He became general manager two years later and continued in that position until 1883, when he was elected president. He contributed much to the progress and prosperity of the city in which he lived, leaving as monuments to his liberality the Y. M. C. A. building, public library, a hospital, park buildings, &c. He served one term as mayor. He leaves a daughter.

WILLIAM P. LETCHWORTH died at Buffalo, December 1, aged 87 years. He was one of the founders of the Pratt & Letchworth Company, being associated in its beginnings in 1848 with P. P. and S. F. Pratt. He retired from active participation in the business more than 30 years ago.

JULIUS E. FRENCH, chairman of the Board of Directors of the Railway Steel Spring Company, and prominently identified with a number of other large corporations, died at the home of his daughter, Mrs. Harry K. Devereux, Cleveland, Ohio, December 2, aged 73 years. A month ago he underwent an operation for an affliction of the stomach. He was born in Perry, Ohio. About 1875 he purchased the Winslow Car Roofing Company in Cleveland, and up to a year ago he was president of its successor, the Chicago-Cleveland Car Roofing Company. He was president of the Page Car Wheel Company, and became president of the Steel Tire Wheel Company when the former was consolidated with the latter in 1898. As the general offices were located in New York, he moved to that city from Cleveland in that year. Later the Railway Steel Spring Company was formed by the consolidation of the Steel Tire Wheel Company and other companies and Mr. French was elected president of the enlarged corporation, which office he held until two years ago. At the time of his death he was a director of the American Locomotive Company, the Standard Sewing Machine Company and several other companies.

WILLIS H. ESTERLY, secretary and treasurer of the Mannen & Esterly Company, Cleveland, Ohio, maker of sheet metal goods, died December 2 of pneumonia, aged 43 years.

Personal

William L. Neilson, assistant sales manager of the Norton Company, Worcester, Mass., has sailed for Germany, to take charge of the company's works at Wesseling.

George C. Gordon of Worcester, Mass., for four years superintendent of the Wyman & Gordon Company, manufacturer of automobile crank shafts and high grade drop forgings, has joined the forces of the Park Drop Forge Company, Cleveland, Ohio, as works manager. He is a graduate of the Worcester Polytechnic Institute, and has been master mechanic of both the Carpenter Steel Company and the American Steel & Wire Company. The addition of Mr. Gordon anticipated an increase in the forging equipment of the Park Drop Forge Company to enable it to care for the heavier class of forgings that the development of the commercial automobile has made necessary. Heavier hammers and a hydraulic outfit are being considered.

A dinner was given by Waddill Catchings, receiver of the Central Foundry Company, to the New York office force, at Reisenweber's, New York, on the evening of November 26. In addition to the executive and official staff of the New York office, there were present C. C. Todd, the Western representative; A. T. Drysdale and F. T. Suehle, of the Baltimore plant; J. Miller and H. Johnson, of the Newark plant, and C. J. Conley, of the Medina plant. The participants numbered about 60.

Wm. Van C. Brandt, who had been connected with the testing department of the Pennsylvania Steel Company, Steelton, Pa., recently accepted a position as salesman with the Colonial Steel Company, Pittsburgh, with headquarters at Springfield, Mass. Previous to entering the steel business he was a midshipman in the United States Navy.

The ninth annual dinner of the Carnegie Veterans' Association was given at the residence of Andrew Carnegie, at Fifth Avenue and Ninety-first street, New York, Friday evening, December 2, and was attended by 36 of Mr. Carnegie's partners and other associates in the Carnegie Steel Company. Mr. Carnegie was re-elected president, Charles M. Schwab vice-president and Charles L. Taylor secretary. Remarks were made by Mr. Carnegie, W. E. Corey, W. B. Dickson, H. P. Bope, John C. Fleming, W. P. Palmer, L. C. Phipps, C. M. Schwab, R. A. Franks and Ambassador J. G. A. Leishman.

E. C. Felton, president of the Pennsylvania Steel Company; C. F. Rand, president of the Spanish American Iron Company, and Quincy Bent, assistant to the president of the Maryland Steel Company, are in Cuba visiting the iron ore properties of Pennsylvania Steel Company interests.

A. A. Fowler, of Rogers, Brown & Co., who is recovering from a severe illness, has gone South for a short stay.

Abbott A. Thayer, of the Cincinnati Milling Machine Company, Cincinnati, Ohio, sailed for Europe last week, where he will establish several branch offices for his company.

Richard Tuffli, vice president of the Tuffli Bros. Pig Iron & Coke Company, St. Louis, sailed November 29 on the steamship Siberia for Honolulu and will spend the winter there.

Frank Salomon, formerly chief engineer for Alfred H. Schutte, the German machinery exporter, has resigned to take charge of the Otto Gas Engine Works, Philadelphia, Pa.

Under date of Thursday, December 1, Wallace H. Rowe, president of the Pittsburgh Steel Company, Frick Building, Pittsburgh, Pa., issued the following announcement: "Effective January 1, 1911, Samuel A. Benner, formerly general manager of sales of the Carnegie Steel Company, will assume the position of

assistant to the president of this company, with headquarters in Pittsburgh, performing such duties as may be assigned to him by the president. F. H. Forman, general manager of sales of this company since its incorporation, will continue in that capacity as heretofore."

Exports Under the Drawback Law

Decrease in Such Exports in the Fiscal Year 1910

WASHINGTON, D. C., December 6, 1910.—The export movement of manufactures with benefit of drawback of the duty paid on imported materials used in their production suffered a decline during the fiscal year ending June 30, 1910, of more than 6 per cent. This was notwithstanding the fact of a gain of more than 14 per cent. in the exports of manufactured products of all kinds, according to advance figures furnished the correspondent of THE IRON AGE by the Bureau of Statistics of the Department of Commerce and Labor. The decline is rendered additionally significant because of the fact that during 11 months of the fiscal year 1910 the new tariff law was in force with its slightly enlarged provision covering dutiable materials imported for use in the construction of vessels for foreign account.

In view of the wide discussion of the drawback question, while the Payne-Aldrich bill was pending in Congress, the strenuous efforts made by manufacturers and exporters to secure amendments liberalizing section 30 of the Dingley act and the refusal of the Conference Committee to materially enlarge the scope of the law, the statistics for 1910 are highly suggestive and indicate that until important amendments are made in the present law no great increase in exports with the benefit of drawback may be expected.

Drawbacks Compared with Exports

The following table, showing the drawbacks paid and the exports of manufactures of all classes during the past six years, is of interest:

Fiscal year.	Drawbacks paid.	Exports of manufactures.
1905	$5,896,475	$611,425,574
1906	5,831,124	686,023,169
1907	5,445,150	740,314,557
1908	6,637,602	742,575,841
1909	6,604,432	671,416,014
1910	6,182,375	768,309,063

The shipments of goods made in part with foreign materials eligible to drawback duties reached high-water mark in 1908, when the increase over the preceding year was proportionately large when compared with the slight gain in the exports of manufactures. The increased utilization of the drawback law in 1908 was very largely due to the movement to secure a more liberal statute, which brought to many manufacturers their first knowledge of existing opportunities to extend their foreign trade. The Treasury Department during 1908 promulgated an unusually large number of drawback regulations, under which many manufacturers operated for a year or more, only to abandon them after the cost of complying with the stringent requirements of the Department became clearly apparent. The year 1909 witnessed a material decline in the number of regulations in force, but certain large producers increased their output of export goods, which enabled the year to show a record almost equal to 1908.

Drawbacks on Metal Products

The statistics covering the exports of manufactures of iron and steel and other metals with benefits of drawback during 1910 show a decline corresponding closely to the decrease in the total shipments of all classes of drawback goods. But for the substantial increase made in the exports of tin cans, chiefly employed as containers for petroleum, the metal schedule would have reflected a much heavier loss. The following table shows the refund on each class of metal products in the fiscal year 1910 as compared with 1909:

	Drawbacks paid.	
Articles exported.	1909.	1910.
Agricultural implements and parts	$80,184	$15,948
Aluminum and manufactures	52,675	189,633
Automobiles	6,182	4,905
Cars, railroad	1,287	43
Cars, railroad, parts of	280	....
Cars, all others	266	6
Cable, electric	29,721	47,693
All other electrical appliances	5,669	3,410
Bar iron	5,507	9,468
Billets, ingots and blooms	12,937	....
Sheets and plates, steel	5,003	25,981
Structural iron and steel	59,873	1,455
Wire and manufactures of	21,708	38,867
Castings	4,422	6,133
Hardware	132	115
Saws	4,577	6,834
Tools, all other	430	239
Pumps and pumping machinery	3,508	112
Steam and other engines and parts	99,659	7,785
Boilers	5,247	
All other machinery	2,363	2,417
Nails and spikes	2,669	2,299
Pipes and fittings	2,638	1,148
Pulley blocks and chains	935	690
Railroad fish plates and splice bars	11,560	7,522
Steel rails	25,033	22,424
Shade rollers	4,299	2,380
Spoons, tinned	1,245	411
All other manufactures of iron and steel	2,918	4,146
Babbitt and magnolia metal	13,856	6,725
Pig and bar lead	24,414	88,883
Lead pipe and fittings	3,578	2,140
Sheet lead and shot	11,872	5,143
Lead seals	5,335	3,510
Type metal	8,118	1,029
Other lead manufactures	640	1,080
Tin cans	1,754,176	1,916,977
Tin, crystallized and embossed	3,994	4,262
Tin plates, lithographed	3,048	4,461
Tin foil	24,184	18,951
All other tin manufactures	660	676
Metals not elsewhere specified	368	....
Totals	$2,307,170	$2,185,891

A Precarious Business

The above table reflects clearly the precarious character of the export trade with the benefit of drawback as it is able to exist under the present law. Except in the items of tin cans and steel rails, heavy fluctuations are noted in all important classes of goods, showing clearly that refunds are obtainable only on occasional orders and that it is difficult, if not impossible, to build up a steady trade under the regulations which the Treasury Department now feels justified in promulgating.

In considering the overshadowing importance of the item of tin cans in the above table, the fact should be borne in mind that it represents only the Welsh plate brought to this country for the manufacture of containers for oil, &c., and is in addition to the domestic plate exported with benefit of the unofficial drawback, although, as pointed out in *The Iron Age* last week, there has been less of this domestic drawback business during the past three years than during the five years following the arrangement effected in 1902 between the manufacturers and their workmen to accept wage reductions on export orders.

Movement to Liberalize the Law

One of the most energetic campaigns conducted in the interest of exporting manufacturers while the Payne-Aldrich bill was under consideration was directed to securing the liberalization of the drawback law. The House passed a comprehensive provision for the allowance of drawback claims in cases where the technical requirements of the term "manufacture," as construed by the United States Supreme Court, could not fully be met, allowing claims on the substitution principle, where the foreign material in the finished product is not capable of identification, but where evidence is adduced that at least an equal quantity has

actually been imported and traced to the manufacturer's plant; permitting goods to be consumed on shipboard with benefit of drawback; allowing rebate of internal revenue tax on goods withdrawn from bonded warehouses and used on shipboard, and permitting drawbacks to be paid on imported coverings used on exported American goods.

This provision was stricken out by the Finance Committee when the bill was reported to the Senate, but the statement was made that a new section would be adopted in conference that would prove satisfactory to those who were interested in enlarging the scope of the drawback statute. When the bill reached conference, however, the House conferees appeared to have lost interest in the provision framed by the Ways and Means Committee, and the result was the adoption and final re-enactment of the drawback section of the Dingley law with the addition of a provision allowing rebates of internal revenue tax on domestic alcohol used in the production of articles for export and the following amendment covering materials imported for use in the construction of vessels for foreign account:

That the provisions of this section shall apply to materials used in the construction and equipment of vessels built for foreign account and ownership, and for the government of any foreign country, notwithstanding that said vessels may not within the strict meaning of the term be articles exported.

It will be seen, therefore, that in spite of the long continued efforts to enlarge the drawback law the statute to-day is substantially what it has been for a century, except that specific provision is made for materials used in the construction and equipment of vessels built for foreign account. It is unquestioned that such materials were intended by the framers of the earlier drawback laws to be eligible to refund of duties paid thereon, but the United States Supreme Court defeated this purpose by holding that a vessel built in an American shipyard for foreign account could not be said to be "exported" within the technical meaning of the term when she raised a flag and sailed for a foreign port.

The movement to further amend the drawback law with a view to reducing the cost to the manufacturers of the country of operating thereunder has not been abandoned, and it is the hope of those who have conducted the campaign in the past that an independent statute will be passed by Congress in the not far distant future covering the entire subject in a comprehensive, nonpartisan and thoroughly practical manner. At present the cost of operating under the existing law and regulations is prohibitive in many trades, and the only manufacturers who have met with much success in building up a foreign market for their products, exported with the benefit of drawback, have been those who have been able to set aside plants devoted exclusively to the filling of export orders. W. L. C.

A New Metal Tempering Process.—P. J. A. Douglass, Dartmouth, Nova Scotia, has discovered a process for tempering nonferrous metals. Among the special advantages claimed for metals treated in this way are noncorrosiveness, flexibility and a uniform temper. Metals treated by this process are capable of taking a keen edge, which renders them available for cutlery and all kinds of tools. It is possible to use castings of these metals which are cheaper than forged steel. E. E. Cleaveland, Chester, Nova Scotia, was associated with Mr. Douglass in the development of the process.

The Pressed Steel Car Company, Pittsburgh, has received an order for 1200 steel underframes for 600 box and 600 steel gondola cars to be built by the Louisville & Nashville Railroad at its shops at Louisville, Ky.; also an order for 30 steel tank cars for the Spokane, Portland & Seattle Railroad.

Customs Decisions

Corrugated Galvanized Sheets

The United States Court of Customs Appeals has handed down an important decision in the case of J. J. Moore & Co. *vs.* United States with regard to the dutiable classification of corrugated iron sheets, under paragraph 193 of the tariff act of 1897. The special significance of the decision is due to the fact that large importations of such sheets were made at various ports prior to the passage of the new tariff act and the liquidation of the entries thereof has since been suspended.

Duty was assessed upon the sheets at 45 per cent. ad valorem, with two-tenths of 1 cent per pound additional under paragraph 132, because they were galvanized. The importers contended that if the sheets were dutiable under paragraph 193, which is the basket clause of the metal schedule, paragraph 132 could not properly be applied thereto, for the reason that it relates to articles described in paragraph 131. The Board of General Appraisers overruled the importers' protest, whereupon an appeal was taken to the United States Circuit Court and the case subsequently transferred to the Court of Customs Appeals. After an exhaustive review of the law and facts, the court sustains the contention of the importers, including the additional duty, thereby reversing the board and the collector, in a decision in part as follows:

The further contention is made that, if paragraph 193 applies, then by its very terms paragraph 132 cannot. There is much force in this contention. Paragraph 132 follows paragraph 131, in which a specific, definite finding as to the rate of duty which iron or steel sheets would bear is ascertainable, and the purpose of paragraph 132 was to add two-tenths of one cent per pound when galvanized, and this two-tenths of one cent per pound was said to be more duty than if the same was not galvanized or coated. This would be easy of ascertainment in a case coming within the provisions directly imposing a duty upon the sheets of iron or steel specifically. But it will be noted that the catch-all clause, paragraph 193, relates to all classes of importations not specifically provided for, including articles composed wholly or in part of iron, steel, lead, or other metal, which would include of necessity the metal employed in galvanizing, and upon articles of this class a duty of 45 percentum ad valorem is fixed. We think this contention should be allowed, and that the provisions of paragraph 132 can only be applied in cases where specific duty is in terms imposed upon the sheet of steel or iron, &c.

We do not overlook the cases, T. D. 26,152, G. A. 5967 and T. D. 26,866. It is true that in these cases the board took a different view of these paragraphs. What considerations were brought to the attention of the board does not appear. The language of the board was, "Being, however, galvanized, they are covered by the express terms of paragraph 132, and are subject to the additional duty of two-tenths of one cent per pound therein provided for galvanized iron sheets." We do not agree with this interpretation of the statute. Under paragraph 193 there is no means of ascertaining authoritatively what the duty on this importation would have been had it not been galvanized. The appraisal is of the goods as imported, and necessarily so, and we cannot accept the view that in addition to the full duty of 45 percentum ad valorem upon the article, which perhaps for the very reason that it is galvanized is brought within the provisions of section 193, and is placed there for the purpose of fixing the appraisal, that the additional duty should be imposed of two-tenths of one cent per pound because of a condition which resulted in bringing it within that paragraph. It does not and cannot be made to appear that this importation would be dutiable at all under paragraph 193 had it not been galvanized. It is a fair inference in the present case that it would not have been, as the value of the goods as found by the collector was only 3.68 cents per pound, and it may well be inferred that the 0.68 cent would no more than cover the cost of galvanizing. But be that as it may, there is certainly no provision for any authoritative ascertainment of what would have been the dutiable value or the duty upon this importation had it not been galvanized.

The decision of the Board of General Appraisers is modified to the extent of directing a reliquidation, excluding the two-tenths of one cent per pound additional duty.

Princess Furnace of the Princess Iron Company, Glen Wilton, Va., was blown out November 29, and will remain out indefinitely.

Trade Publications

Castings.—Light Mfg. & Foundry Company, Huntstown, Pa. Four pamphlets. The first is a general one dealing with the various kinds of aluminum and bronze castings made by this company, while the other three are concerned with white brass and babbitt, plastic bronze and manganese bronze castings, respectively.

Power Transmission Machinery.—The Hill Clutch Company, Cleveland, Ohio. Catalogue No. 9. Size 6 x 9 in.; pages 194. Describes and illustrates with numerous half-tones and sectional views the complete line of the company's products, which includes the Smith type of Hill friction clutch, mentioned under New Tools and Appliances in *The Iron Age* September 8, 1910; the Hill collar oiling and other bearings, gears, pulleys, hangers, &c. The catalogue is intended for the engineering and construction departments of companies interested in transmission machinery as well as for the purchasing department, and in addition to the prices it contains much information valuable to the former departments. This includes a table of the horsepower transmitted by double leather belting on plain or friction clutch pulleys, a table for laying out shafting, standard sizes of keyseats for friction clutches, horsepower and speed of gears and rules for calculating the speed of gears and pulleys. The American and English rope transmission systems are described at length with capacity tables and formulæ, and illustrated instructions regarding rope splicing are also given.

Water Tube Boilers.—The Milne Water Tube Boiler Company, 30 Church street, New York City. Pamphlet. Points out the advantages of the Milne water tube boiler, some of which are uniform strength, reduced cost of maintenance, accessibility, dry steam, steady water level and durability. These boilers are constructed of wrought steel throughout and each is a complete unit composed of three members only, the drums, the tubes and the economizers. The construction of these parts is illustrated and described and there are a number of views showing the installation of the boiler.

Marine Gasoline Engines.—The Mianus Motor Works, Mianus, Conn. Catalogue. Size 6 x 9 in.; pages 32. Refers to a line of marine gasoline engines which are claimed to be easy to start, readily reversible, simple to operate and capable of having the speed varied at will. Six sizes of engine in all are built, ranging from a 3-hp. single cylinder motor to a double cylinder type capable of developing 15 hp. The special features of these engines are illustrated and described and space is given to accessories, such as propeller wheels, stuffing boxes, ignition supplies, gasoline tanks and piping, &c.

Water-Jet Eductors.—Schutte & Koerting Company, Twelfth and Thompson streets, Philadelphia, Pa. Catalogue 2, Section M. Contains a number of illustrations of the Koerting water-jet eductors, which are extensively used for draining cellars and pits, washing filter sand, discharging ashes from a boiler room and sinking mine shafts, the actuating fluid being taken either from a local source or supplied by pressure pumps. These eductors are made with screwed or flanged ends and the water supply and discharge pipes can be connected either to the ends or to the top.

Automatic Screw Machinery.—The National-Acme Mfg. Company, Cleveland, Ohio. Folder. Calls attention to the special features of the Acme automatic multiple spindle screw machine for the manufacture of bolts, nuts, screws and all duplicate parts from metal bars, which are power, speed, control, convenience, economy and safety. An illustrated description of this machine was printed in *The Iron Age*, June 4, 1908. Of special interest in the folder is a list of records established in various railroad repair shops throughout the country for manufacturing various parts with the machine.

Bolt Pointing, Threading and Special Tapping Machines.—The Webster & Perks Tool Company, Springfield, Ohio. Brochure. Refers to the improvements made in the company's horizontal threading and special tapping machines. The different machines which include single spindle bolt pointing machines, one and two spindle automatic threading machines and several special types of threading and tapping machines are illustrated and brief specifications are given on the facing pages.

Turbine Water Wheels.—Norrish Burnham & Co., Glen Rock, Pa. Catalogue. Shows an improved type of turbine water wheel. Space is given to a historical account of turbine water wheel manufacture. Illustrations show the different types of wheels, both vertical and horizontal, and a number of suggested installation schemes are given.

Pumping Machinery.—The Weinman Pump Mfg. Company, Columbus, Ohio. Catalogue No. 11. Covers a line of steam and belt and electric driven pumps for all purposes. The general construction of the company's horizontal and vertical pumps is explained, followed by illustrations and brief specifications of the different types going to make up the complete line, with lists of repair parts, tables of dimensions, &c.

Presses.—Albright Company, Goshen, Ind. Catalogue. Size 6 x 9 in.; pages 73. Concerned with presses for a number of different purposes, such as pressing scrap of all kinds, baling waste, making leather belting, crimping and embossing all kinds of leather or sheet metal goods, &c. The different types are illustrated and brief specifications are given on the facing pages

Valves.—Glenn Valve Mfg. Company, 1906 North Halsted street, Chicago, Ill. Catalogue. Describes and illustrates the Glenn patent balanced valves, which are especially adapted to working under high pressures of steam, water or other media and are made in both the three and the four way styles. A special extra heavy globe valve is built in sizes ranging from ½ to 4 in., inclusive.

Portable Crane and Hoist.—Franklin Portable Crane & Hoist Company, Franklin, Pa. Brochure. Describes and illustrates a portable crane and hoist, built in 12 sizes, and designed for use in shops, factories and wherever it is necessary to lift heavy bodies or transfer them from place to place with safety and the minimum of time and labor.

Pumps.—The Humphryes Mfg. Company, Mansfield, Ohio. Vol. 1, No. 2, of the *Water Lifter*. Refers to the Blazer patent spiral pump, rotary pumps, hydraulic rams, a vertical centrifugal pump and a rotary pump especially designed for use in garages. An illustrated description of the Blazer pump appeared in *The Iron Age* March 31, 1910.

Pneumatic Riveters.—Hanna Engineering Works, 2059 Elston avenue, Chicago, Ill. Card. Gives instructions to operators of the Hanna type pneumatic riveters for adjusting the dies so as to secure the maximum output of the machine with the minimum consumption of air.

Quick Threading Attachment.—The Hendey Machine Company, Torrington, Conn. Pamphlet. Points out the advantages of the attachment recently brought out by the company for returning the carriage at high speed to the start of the cut. Only seven parts are employed, and when the attachment is not in use it can be easily disconnected and moved down to the foot of the lathe bed, where it is out of the way. The engravings show the attachment in its several parts and also when applied to the lathe, both in and out of use, and complete instructions for applying and using the device are included. *The Iron Age*, November 10, 1910, contained an illustrated description of this attachment.

Vacuum Cleaner.—Keller Mfg. Company, Twenty-first street and Allegheny avenue, Philadelphia, Pa. Pamphlet. Contains instructions for unpacking and installing the Keller duplex vacuum cleaner, which was illustrated in *The Iron Age* November 10, 1910.

Underground Conduits.—W. N. Matthews & Brother, 219 North Second street, St. Louis, Mo. Pamphlet. Size 4 x 6 in.; pages 92. Contains specifications on underground conduit construction for all forms of work, which are supplemented by illustrations of manhole and conduit systems and figures showing the cost of constructing conduit systems in various kinds of streets. Space is also given to guy anchors and a number of accessories for both overhead and underground construction work.

Electric Steel Sheets.—Follansbee Brothers Company, Pittsburgh, Pa. Blue print. Gives information on the results obtained from tests of steel sheets for armatures. The special advantages claimed for these sheets are a very low core loss and an exceedingly high permeability.

Stencil Machine.—The Bradley Stencil Machine Company, St. Louis, Mo. Circular. Devoted to a circular stencil machine in which the dial is mounted on a wheel which revolves the disk, thus eliminating the danger to the operator's hands said to be present in all other machines, due to having to take hold of the disk to revolve it.

Switchboards.—Walker Electric Company, Philadelphia, Pa. Cloth bound book. Size 5¼ x 7¼ in.; pages 212. A treatise, illustrated, on the past, present and future of switchboards, showing the difference between the early types of boards built of wood covered with asbestos and the present marble ones. There are chapters on measuring instruments, circuit breakers and Walker switchboards, and some 50 pages are devoted to wiring diagrams, tables of knife switches and other data.

Pumps.—Dean Brothers Steam Pump Works, Indianapolis, Ind. Pony catalogue No. 82. Describes briefly pumps for mining, boiler feed and condensing purposes. A patent twin cylinder air pump, designed for surface and jet condensers, is shown which is claimed to be the only twin cylinder air pump that can be converted into separate pumps. In the large sizes of combined air pumps and jet condensers, the tail rod projects from the air piston and is carried on a bronze adjustable bearing. This relieves the bore of the air cylinder from the weight of the piston, while an extension casting, bolted to the cylinder head, covers the tail rod, so there can be no air leakage.

Pumps.—The Hazen Mfg. Company, Hudson, Mich. Catalogue No. 2. Gives general description and specifications for a number of double acting force and lift pumps which can be used on wells ranging from 25 to 200 ft. in depth. Instructions are given for the setting and the operation of these pumps, and a number of supplies and accessories such as well valves, well cylinders and points, check valves, packing box heads, pump rods, fittings and tanks are covered.

Scandinavian Progress in Electrometallurgy

Dr. Joseph W. Richards, Professor of Metallurgy at Lehigh University, Bethlehem, Pa., delivered an interesting lecture at a section meeting of the Franklin Institute, Philadelphia, on the evening of December 1, on "A Vacation Trip in Scandinavia, with some Observations on the Electrometallurgy of Iron and Steel." Dr. Richards took his hearers on a most instructive tour through Denmark, Sweden and Norway, illustrating his travels by blackboard sketches and lantern slides. Particular attention was called to the rapid advance of electrochemical and electrometallurgical development in Sweden and Norway. The progress of electric power plants, using the numerous natural water falls was especially dwelt upon.

The use of electric furnaces for the manufacture of pig iron is claiming, he stated, much attention on the part of the Swedish ironmasters, and experimental shaft furnaces have been erected and operated for development work along that line. The high cost of charcoal and coke, the latter imported from England, necessitates the development of the electric shaft furnace for pig iron making and it has already shown its economy, when used in connection with power cheaply supplied from the use of natural water falls, which are most abundant and can be depended upon for steady supplies. In 10 years, he believes, the manufacture of pig iron in those countries will be almost exclusively by electrical methods. The manufacture of chemicals by the application of electrochemical methods is already large in Norway and was being steadily expanded. The manufacture of steel by the use of the electric induction furnace has been successful in a moderate way, and is now about to be largely increased. Dr. Richards stated that he believed that Sweden and Norway would shortly become important factors in the manufacture of steel by electrical methods, and that the cost would be low, as power, and transportation are cheap, the plants being located on deep water, close to the natural sources of power.

The Williamson Free School of Mechanical Trades.—Bulletin No. 6, recently issued by the Williamson Free School of Mechanical Trades, Williamson School Post Office, Pa., answers the question, "Can Trades be Taught in a School?" in the affirmative and presents statistics of the class which was graduated March 26, 1910, to support its contention. At the present time 50 of the 51 members of the class are working at the trade which they learned at school and all but one of them say that they are well suited. The various trades represented include 12 bricklayers, 13 carpenters, 4 operating engineers, 11 machinists and 10 pattern makers. The average number of hours employed per week varies with each trade from 51 for the bricklayers to 61.7 for the operating engineers, the general average of all being 53.79 hours. The average rate of wages received per hour was a maximum for the bricklayers and a minimum for the engineers, the general average being 30.8 cents per hour.

A New Crucible Steel Casting Plant.—The Seitz Automobile & Transmission Company, Detroit, Mich., has purchased and is equipping a large plant at Monroe, Mich., for making crucible steel castings. This plant will be known as the Seitz Crucible Steel Foundry. There are two main buildings, each 50 x 140 ft. having steel frame, brick walls and slate roof. On each side is a wing 26 x 140 ft.; an office in the front portion is 61 x 126 ft. The foundry will make both crucible and converter steel, and its capacity will be sufficient to allow it to handle considerable outside business, in addition to making all of the castings required by the Seitz Automobile & Transmission Company. The complete equipment for making crucible steel is now installed, but converter equipment and a cupola will be added as soon as possible. None of this latter equipment has been purchased as yet. The foundry will be under the management of Malcolm MacLeod, who has been identified with the production of crucible steel in Western plants since 1873.

The Royersford Foundry & Machine Company's European Branch.—John D. Sells, general manager of the Royersford Foundry & Machine Company, Royersford, Pa., has just returned from a three months' business trip to Europe, where he went to extend the company's connections for the sale of its Sells roller bearing and its general line of power transmission machinery. A branch has been opened at 149 Queen Victoria street, London, E. C., in charge of Theodore Butler, where will be carried the largest stock of power transmission machinery to be found in Great Britain or on the Continent. Mr. Sells reports business at home and abroad as exceptionally good. Although the company has erected an additional building, 50 x 150 ft., it is compelled to run the plant 20 hours a day in order to meet the demand for its products.

The Chemists' Club Building.—The Chemists' Building Company, organized by members of the Chemists' Club, New York, is stated by the *Electrical World* to have erected a ten-story fire-proof building on a lot 56 x 100 ft. at 50-54 East Forty-first street, New York City. The lower half of the building is leased to the club and contains all the conveniences for a social club, together with a large auditorium for scientific meetings and ample space for a complete chemical library and museum. The five upper stories have been specially constructed for laboratory purposes and will be rented either as entire floors or in suitable subdivisions to analytical, commercial or research chemists, physicists, electrochemists, bacteriologists, etc., but not as manufacturing laboratories.

The Buhl Malleable Company, Detroit, Mich., has awarded a contract for the construction of an open hearth steel foundry, 65 x 300 ft., to be of steel construction with cement foundation. The company expects to have the foundry ready for occupancy by March 1. The arrangement of the buildings enables the company to handle its different lines under one management and control. The new plant will be equipped with two ten ton cranes and all modern machinery for the production of steel castings, ranging in weight from 300 pounds down.

The Drake-Williams-Mount Company, Omaha, Neb., has just completed at the plant of the American Smelting & Refining Company in that city a smokestack which is claimed to be the largest and highest self-supported steel smokestack on earth. It is 28 ft. in diameter at the base, narrowing to a point 50 ft. from the ground, and thence to the top it is 12 ft. in diameter. The total height is 300 ft. The quantity of steel used in its construction was 170 tons. This stack is for the purpose of dissipating the arsenical fumes from the plant of the smelting works.

A plant for the recovery of iron ore from flue dust is being installed at the furnaces of the Warwick Iron & Steel Company, Pottstown, Pa., by the Ore Recovery Company. An improved nodulizing furnace is to be used in connection with the installation. The plant is expected to be ready for operation in the near future.

Tate, Jones & Co., Inc., Pittsburgh, have just received an order for their fuel oil burning equipment for open hearth furnaces, to be used as an auxiliary in case of natural gas shortage, to be installed in the plant of Mackintosh, Hemphill & Co., Pittsburgh.

A New Manville Power Press

A Single Acting Open Back Press with a New Automatic Releasing Friction

The Manville Brothers Company, 27 Benedict street, Waterbury, Conn., has brought out a new line of single acting open back presses. The press, shown in Fig. 1, is typical of the entire line which is said to be a very good form for general use. Its construction is such that the advantages of ample room for hand feeding single pieces of work, handling large sheets of metal and feeding strip metal in from the front or back or from side to side are combined. Other special features of the press are strength, convenience in operation and an automatic releasing friction, the details of which are shown in Fig. 2.

As will be apparent from an examination of the table of dimensions and the engraving of the press, the frame is stiff and well reinforced where it is necessary, which has resulted in the production of a machine that is claimed to be the heaviest and strongest of its kind on the market. In addition to its ample proportions the frame is designed for convenience in operation, and there is a large planed surface at the front and the sides of the bed for attaching feeds and fixtures. The lower connection pin can be removed if desired without taking out the slide, as the frame has overhanging bearings. The bed is deep and the size of the opening in it can be made to any dimensions specified by the purchaser. The hammered steel shaft

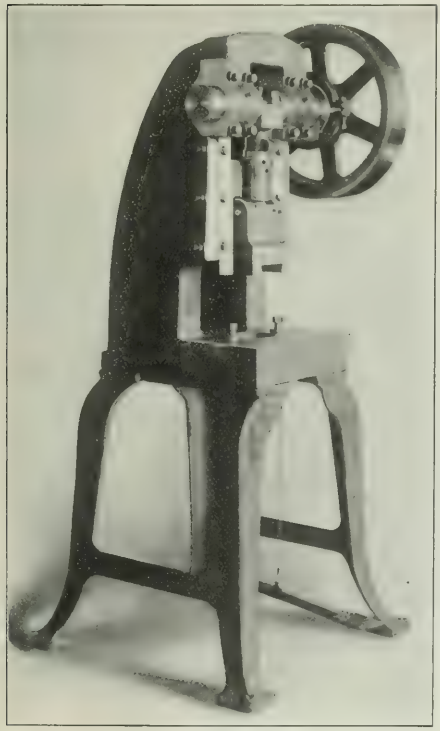


Fig. 1.—The No. 30 Single Acting Open Back Press Built by the Manville Brothers Company, Waterbury, Conn.

is very large, and the slide is strong and well braced at the back. An exceptionally long slide and ways are employed, thus giving an excellent guiding effect as well as wearing surfaces.

The friction illustrated in Fig. 2 is of the maker's automatic releasing type upon which patents have been

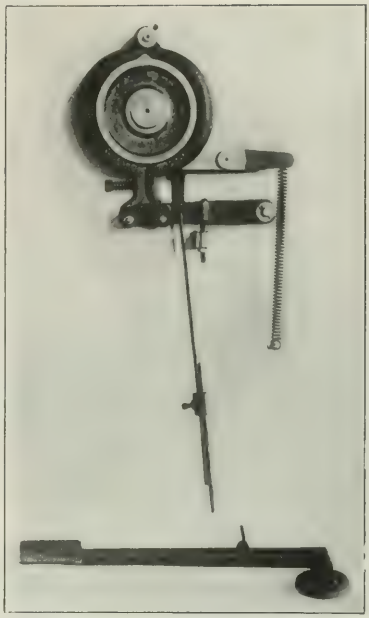


Fig. 2.—Automatic Releasing Friction Used on the Press.

applied for, and is controlled by the foot treadle. Depressing the treadle releases the friction, while as soon as the pressure is removed the treadle ascends and applies the friction with full force. This is a valuable feature on this company's presses and results in a great saving of power, repairs and attendance, particularly in a large press room.

The connection is of the sleeve type and is so arranged that when an adjustment is made the parts are securely locked by the binding screw at the front, thus giving a very strong, solid connection. In common with the four-slide wire forming machine, illustrated in *The Iron Age*, November 6, 1910, and the other machines of this company, the clutch is of the Johnson type. It is regularly arranged to run the press continuously as long as the treadle is depressed, but in special cases such as protecting the operator against accident in hand feeding it can automatically be thrown out of engagement at each revolution of the press shaft.

The following table gives the principal dimensions and specifications of the four presses which go to make up the complete line, the one illustrated being the No. 30 press.

	No. 10	No. 20	No. 30	No. 40
Weight, complete, pounds	500	700	1,250	1,900
Weight of balance wheel, pounds	60	100	150	325
Diameter of balance wheel, inches	14	18	24	30
Face width of balance wheel, inches	2¾	3¼	3¾	4¼
Standard length of slide stroke, inches	1	1¼	1½	1¾
Maximum length of slide stroke, inches	1½	2	2½	3
Distance from bed to center of shaft, inches	17¾	20¾	24	27
Distance between bed and bottom of slide when down, inches	5	5½	6	6½
Throat depth, inches	3	3½	4	4½
Width between uprights, inches	5¼	6½	8	9
Center distance of die bed bolts, inches	5¾	6½	7½	8
Diameter of bed opening, inches	2¾	3½	4½	5
Depth of bed, inches	6¾	8½	10¼	12
Width of bed, inches	11⅝	13½	15⅞	18¼
Speed for average blanking, revolutions per minute	200	160	140	120

Regularly the slides are left plain on the bottom, but if information as to the dovetail required for the punch block is furnished the builder will plane this without charge and will furnish a punch block. All of the patterns are subject to certain modifications regarding width and hight, and when required, special facings will be added for attachments. If desired this line of presses can be supplied fitted with side or throat roll feed, friction dial or ratchet dial feed or any other special

See Ba[illegible]s.

The Gyroscope and Its Useful Possibilities—II

Directing Torpedoes and Steadying Ships

BY ELMER A. SPERRY, NEW YORK.

It is interesting to trace the discovery of the real engineering features of the gyroscope. Apparently the principle was first enunciated by a great mathematician in England, John MacFarlane Gray, in the early seventies. He exhibited before one of the learned societies an apparatus which was somewhat similar to Fig. 3

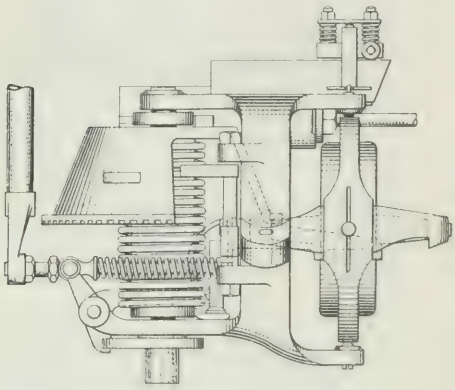


Fig. 12.—The Obry Gyroscope for Guiding Torpedoes.

(see page 1265), and he showed them this peculiar fact, that when for any reason precession cannot take place as when the brake band J is tightened upon the brake wheel I so that the inner ring C is locked with the outer ring D, if force is impressed on the base ring D to tilt it, it acts no differently when the wheel is spinning than when it is idle; it is perfectly free to tilt in either direction and no reactive forces are generated which noticeably oppose its motion.

Now comes the point that was first enunciated by this noted engineer. He said that to get the engineering benefits from the gyroscope, to obtain a reaction or opposition to the impressed forces, the wheel must be allowed to tilt in the second plane, it must be afforded facility for turning in two planes. In other words, to secure reaction precession must be allowed. The brake J must be off the wheel and the ring C must be free to tilt to the normal, the freer the better. When the precession takes place and the ring C tilts freely there is a strong resistance that tends to oppose the motions impressed upon the base ring D. Gray first called attention to that fact. He said the engineering significance of the gyroscope is due entirely to preces[illegible]4 quite contrary to the ordinary conception of engineers, that a wheel tends to resist motion which is designed to carry it out of its plane of action. The wheel must be mounted or pivoted so that it can precess to the normal or in a plane to the improved forces, and when it can so operate then powerful resistance is developed opposing the impressed forces; these forces can be figured in thousands of foot pounds even in a comparatively small machine.

The author spent about two years trying to locate this original model of the late MacFarlane Gray, and in August, 1909, finally succeeded in finding it. It was his intention to bring it to New York and with proper inscription place it in the Engineering Societies Building. It was given him as a matter of fact, but Mr. Maw, editor of *Engineering*, London, and who gave him valuable assistance in finally locating this model, thought at the last moment that it should be retained in England and made a request in writing to this effect the day before the author sailed, suggesting that he dictate a short inscription to be engraved upon it and accept some photographs of it. This model is now in the South Kensington Museum. It is very appropriate that such recognition should be given this piece of historic apparatus and due honor done MacFarlane Gray, especially considering the coming importance and wide engineering possibilities of the gyroscope and the large field of usefulness that is rapidly opening up for the employment of its enormous powers.

Other Uses of the Gyroscope

The most extensive use to-day is probably the automatic steering gear in Whitehead torpedoes. This gear is simply used for the purpose of lateral guiding of the torpedo and holding it to an absolutely straight course. This little gyroscope has a secondary ring which may precess,—it offers positive resistance to any effort to turn it from its course, and this resistance is used to operate valves and through a secondary motor, the rudders. This use originated by Obry, an Austrian naval officer. See Fig. 12. F. M. Leavitt, engineer of the E. W. Bliss Company, Brooklyn, and inventor of the

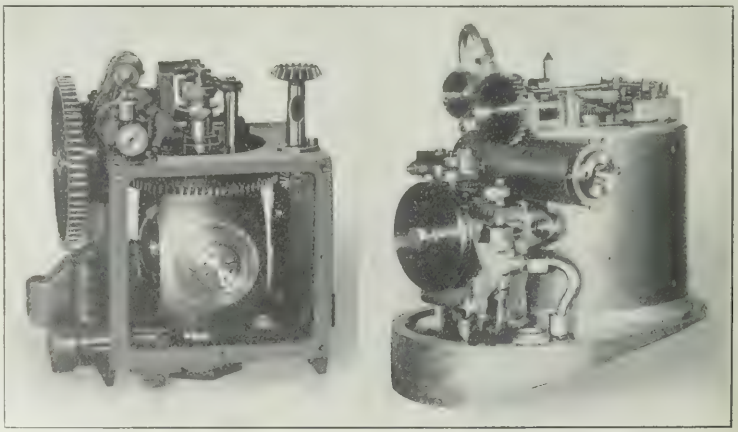


Fig. 13.—Two Types of Leavitt Gyroscope Used in the Bliss-Leavitt Torpedoes.

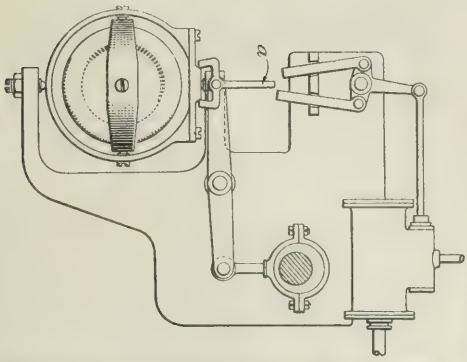


Fig. 14. Details of the Leavitt Torpedo Directing Gyroscope.

Bliss-Leavitt torpedo, has greatly increased the efficiency of the gyro gear of torpedoes, as he has greatly improved the torpedo itself. Figuring from the increased speed and radius of action, he has increased the power factor of the old Whitehead torpedo twenty times and without materially increasing the air pressure carried. He has accomplished this by a wonderfully bold piece of engineering; that is, by automatically burning a fuel directly in the pressure air current, thus greatly increasing its temperature. The reciprocating engine of the Whitehead is replaced by a pair of little Curtiss turbines. It should be remembered that every doubling of the absolute temperature doubles the volume, and starting with a small amount of air, an immense quantity reaches the turbine, under the requisite pressure, enormously increasing the power generated; an exceptionally interesting piece of engineering!

Fig. 13 shows two types of the Leavitt directing gyroscope. This is small and he has increased its accuracy by unloading the base ring; instead of requiring the base ring to do the work of moving a valve, its duty has been reduced to about 1-100 of that required in the Obry gear and consisting simply of giving a directive factor to an extremely small pivoted pawl at the instant the pawl is otherwise perfectly idle. Fig. 14 shows this vibrating pawl at *a*.

Dr. Schlick's Work

Dr. Schlick, an engineer of Hamburg, Germany, to whom is due the vibrationless reciprocating marine engine, has gone further in the installation of large gyroscopes for steadying ships than any other. He has been well supported by his friends of the Hamburg-American Line, and much credit belongs to this company for its courage in financing schemes that seemed to many so impossible of practical results. Fig. 15 shows the first steamship to be equipped with the gyroscope, the See Bar.

Dr. Schlick, in studying the behavior of a side-wheeler, observed that whenever the ship rolled, and in perfect synchronism with the roll, its bow would be thrown around to the port or starboard, but with an opposite effect to that familiarly known as "yawing." As it rolled to the starboard the prow would go around to the starboard or in the same direction, and as it rolled to port the prow would pull around to port. This he described in a lecture before the British Institute of Naval Architects and Engineers, and when he was through several took issue with his assumption that this was a gyroscopic effect. They were very positive and said that Dr. Schlick was probably not aware that every boat pulled around as it rolled, and that his observation was incorrect. He insisted, however, that he saw it.



Fig. 16. Fig. 17. Fig. 18. Fig. 19. Fig. 20.

Apparatus Illustrating the Turning Moment Produced by an Inclined Revolving Wheel Analogous to the Effect Observed on a Rolling Side Wheel Steamboat.



Fig. 15.—The See Bar, the First Steamship Equipped with a Gyroscope.

The author, to witness it for himself, took passage on the worst old side-wheeler that has been allowed to persist on the course between Ostend and Dover and found that the phenomenon actually existed. By

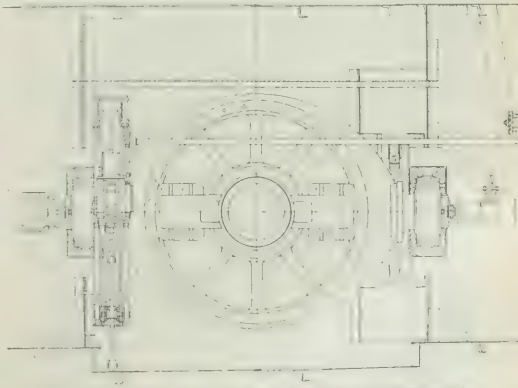


Fig. 21.—Plan View of the Stabilizing Gyroscope Placed on the See Bar.

sighting from the flag pole on the stern to objects on the receding shore, it could be seen that every time the boat listed one way or the other the stern went way over in the opposite direction, so much so that in heavy rolling it required a correction of its heading and its

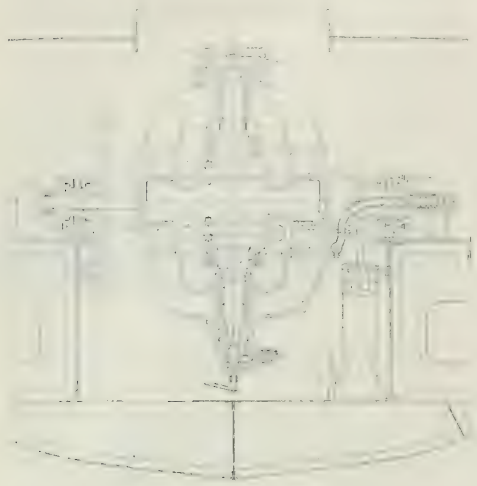


Fig. 22.—Forward Elevation.

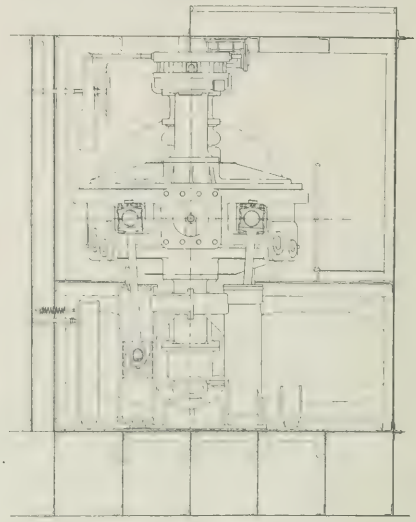


Fig. 23.—Side Elevation.

Details of the Stabilizing Gyroscope Placed on the See Bar.

old rudder chains clanked along the sides, absolutely synchronous with the roll over one way and the other.

A counterpart of this effect can be had with the apparatus illustrated in Figs. 16 to 20. This consists of the same pivoted stool shown in Figs. 1 and 2 (page 1264) with a bicycle wheel with a lead tire attached, so that its plane may be inclined to either side of the vertical. When the wheel is tipped but does not revolve, nothing takes place, but when the wheel is rotated and then inclined one way the stool revolves in that direction (see Figs. 17 and 16) and when the wheel is tipped the other way the stool turns around in the opposite direction (see Figs. 19 and 20). Just the motion that Dr. Schlick described takes place.

While Dr. Schlick did not at once build a machine, he accumulated data, and undertook to find through mathematics and by the aid of other mathematicians the size of a gyroscope wheel he would require for a given stabilizing effect and also just what would happen to the ship. He wrote to Sir William H. White in England: "If I can hold a ship from rolling, will she ship seas? Will her decks be dry or will she ship more seas?" The great naval architect replied very promptly: "If a ship can be held from rolling, she will not ship seas; her decks will remain dry." Observation very fully bears out this verdict, because since that time Dr. Schlick has put a gyroscope on the Hamburg-American steamship Silvanna, loaned by the company for the purpose, and the author has been on board himself and knows just what happens in a rough sea.

While Dr. Schlick was pondering over the problem and before he made experiments, an American by the name of Forbes, in Minneapolis, where there is little water, except a small lake, decided that a gyroscope properly put in a ship should keep it from rolling. After some preliminary bathtub experiments he determined to try out a practical application, so with a fishing boat propelled by oars and equipped with a powerful gyroscope, he waited for a storm. When one came he went out to the middle of the lake, around in and out of the trough of the sea and back, and this first boat to be actually equipped with a gyroscope steadying plant behaved "as though it were in a vise." He had provided reactive force sufficient to actually hold the boat. Later he applied for a patent, quite considerably before Dr. Schlick even applied for his first German patent. These applications went through the office, an interference was declared, the dates were taken and the usual procedure gone through, and the patent office decided in favor of the American, and the broad and underlying patent was issued to Forbes. So, as sometimes transpires, when people are thinking others are acting, but Dr. Schlick is entitled to much credit.

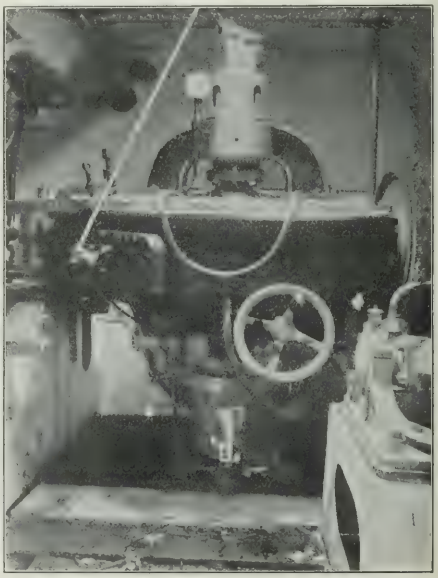


Fig. 24.—View of the Machine as Installed on the See Bar.

He was the first to apply the gyroscope on a large scale.

Being anxious to see what could be done on board ship, and being a practical engineer, Dr. Schlick called to his assistance a number of other engineering

mathematicians and designed the first machine. The working drawings are of interest and are reproduced herewith. Fig. 21 is a plan, Fig. 22 a forward elevation and Fig. 23 a side elevation. Fig. 24 shows the complete machine as it was later installed on board the See Bar.

The above deserves place with what is probably the greatest single discovery the world has ever known in practical engineering—the magneto induction. It is this principle that permits of the production of electricity direct from mechanical energy or conversely to develop mechanical power from electricity. Faraday discovered this at the end of a direct search for it, as Columbus found land when he set forth on a voyage of discovery, and at the same time Professor Henry in this country was engaged upon the same search, and made the discovery and published the results, these two workers knowing nothing of each other's efforts. Had one failed, the other would have brought it to light. It would seem that when the world is ripe for an advance usually more than one is ready to make it.

Forbes later did considerable work on the Pacific Coast with larger machines, all of which bear out what will be discussed later.

(*To be continued.*)

Steel Manufacturers Confer on Trade Conditions

The conference of iron and steel manufacturers held at the Railroad Club, Hudson Terminal Building, New York, Wednesday, November 30, following a meeting of the directors of the American Iron and Steel Institute, was attended by the officers of about 30 important companies, representing more than 90 per cent. of the output of rolled steel products in the country. The situation relative to demand for iron and steel and current production and prices was discussed and views exchanged as to the business outlook. The following statement was given out for publication by Judge Gary, chairman of the United States Steel Corporation:

"Representatives of about 95 per cent. of the manufacturers of steel in America met at luncheon to-day and the two hours following were occupied in ascertaining the condition of business in this particular line and in the expression of opinions concerning current prices. It was stated that on the average of all branches the bookings are about 50 per cent. of capacity and the shipments somewhat in excess. There has been a slight though marked increase of daily bookings month by month since the first of August to the present time. Prices as a rule are well maintained, though in some lines as usual there is some cutting on the part of small producers who were not represented. Without exception the views expressed by those present regarding the future were favorable. Also each one voiced the opinion that present prices are fair and reasonable and should not be changed.

"For some time past purchasing by railroad companies has been very much below normal; but it is the consensus of opinion that there will be an increase in the near future. The amount of daily bookings at the present time is about equal to the capacity of the mills 10 years ago. The disposition of the manufacturers of steel to co-operate, so far as it is proper, remains unchanged."

The L. J. Smith Construction Company, Kansas City, Mo., has purchased the property of the Riverside Iron Works, Kansas City, Kans., which was in the hands of a receiver for several months. The Smith Company will use the plant for the repair of its locomotives used in railroad construction work. In addition to doing its own repair work the company will also do a general repair business for railroad companies and contractors.

Lake Superior Iron Ore Shipments

A New Record Made in the Season of 1910

Returns have been received by *The Iron Age* from the nine docks on Lake Superior and Lake Michigan from which shipments of iron ore were made in the season of navigation which closed November 30. They show that the shipments of iron ore by water in the past season were 42,620,206 gross tons, against 41,683,599 tons in 1909. The November movement was 2,641,898 tons. The past season was exceptional in that no ore was shipped after the end of November. In other years upward of 500,000 tons of ore has been moved in December. The table below gives the shipments from the various ports for 1910 and the three preceding years. It will be seen that the previous record, which was made in 1909, was exceeded this year by 936,607 tons:

Iron Ore Shipments from Upper Lake Ports.—Gross Tons.

	1910.	1909.	1908.	1907.
Escanaba	4,959,869	5,747,801	3,351,502	5,761,988
Marquette	3,248,930	2,969,451	1,487,487	3,013,826
Ashland	4,093,822	3,834,207	2,513,670	3,437,672
Two Harbors	8,271,169	9,181,132	5,702,237	8,188,906
Superior	8,437,261	6,540,505	3,564,030	7,440,386
Duluth	13,609,155	13,470,503	8,808,168	13,445,977
Totals by lake	42,620,206	41,683,599	25,427,094	41,288,755
Totals by rail		903,270	587,893	975,959
Total shipments	42,586,869	26,014,987		42,266,668

The all rail shipments of Lake Superior ore, which should be added to the above total of 42,620,206 tons to give the total shipments from Lake Superior mines for 1910 will not be known until after January 1, as these are reckoned for the calendar year. In each of the five years preceding 1910, with the exception of 1908, these all rail shipments have exceeded 900,000 tons. If we use that figure for 1910 the total ore movement for this year would exceed 43,500,000 tons. This is somewhat more than recent estimates have allowed for, but at the beginning of the year it was expected that 1910, if the prosperous conditions then apparent in the iron industry were maintained, would show shipments of 49,000,000 to 50,000,000 tons of Lake Superior ore.

The United States Steel Corporation's water shipments, which were above 22,550,000 tons in 1907, 14,250,000 tons in 1908 and about 21,500,000 tons in 1909, have been above 22,000,000 tons this year. The Mesaba range, which shipped 28,176,281 tons in 1909, has made a new record this year, exceeding its previous high figure as above by nearly 1,000,000 tons with a total of over 29,150,000 tons.

The Lebanon Valley Furnace Sold.—J. M. Shenk and George E. Meily, representing the bondholders of the Edgewater Iron Company, Lebanon, Pa., purchased November 30 the Lebanon Valley Furnace at Lebanon, Pa., long operated by J. & R. Meily, and one share in the Cornwall Ore Hill Company, Lebanon, Pa., under foreclosure proceedings, for $100,000. Bonds on the property, held by the purchasers, amount to $135,000, while the share in the ore banks is subject to a mortgage of $70,000. It is stated by the new owners that no plans have yet been formulated, but that the furnace will hardly be put in operation under present market conditions.

In a recent announcement the Zug Iron & Steel Company, Pittsburgh, manufacturer of stay bolt and other forging irons, makes this comment on the outlook: "Our conviction is that 1911 will redeem the expectations advanced for the present year, with the volume increased by the longer wait. As stocks have not been accumulated, and low figures have been so long continued, it can be expected that values will promptly respond to increased demand, and that the era of low prices will end."

United States Navy Motor and Controller Specifications

The United States Navy Department has recently adopted a very progressive policy in the standardization of its specifications for electric motors and their controlling appliances for use on shipboard, and also at the various yards and stations on shore. Prior to the adoption of the present standard specifications, the different technical bureaus of the Navy Department, of which there were formerly five, each purchased motors under specifications of its own choosing, which specifications differed sufficiently from another to make apparatus for the same purpose materially at variance, depending upon the bureau by which it was ordered. The result of this must necessarily have been to depreciate the desirability of navy business from the standpoint of the manufacturers and increase the cost of this material to the government.

The Bureau of Construction and Repair of the Navy Department was active in this work of standardization, having promoted the adoption of uniform specifications by means of representative conferences. The specifications were prepared for the consideration of the conferences by the expert electrical aide of the Bureau of Construction and Repair, M. W. Buchanan. In addition to officers and engineers from the different bureaus of the Navy Department, the conferences included representatives from a large number of the principal American motor manufacturers and from the American Association of Electric Motor Manufacturers. The specifications as determined by the conferences are broad in their scope and as liberal as is consistent with the best American practice. They should prove equally satisfactory to customers and manufacturers.

The following specifications have been standardized in the manner above outlined, and have been issued by the Navy Department for the use of all bureaus of the department:

Specifications 17-M-1: Direct current motors for operating navy yard machinery, issued September 3, 1909; specifications 17-M-2: Induction motors for operating navy yard machinery, issued September 3, 1909, and Specifications 17-A-3: Auxiliary electrical appliances on shipboard, issued October 26, 1910.

Specifications 17-M-1 and 17-M-2 are intended to cover first-class commercial motors for general power purposes on shore. Specifications 17-A-3 are intended to cover the highest grade of motors obtainable, in which special features of construction and materials are required, having in mind the more severe nature of marine service and insurance for military preparedness.

This standardization of motor specifications is a movement in the direction of uniformity and economy in the purchase of material for the Navy Department, which was the subject of comment in an article in *The Iron Age* of April 15, 1909, entitled "Government Standards for Machinery."

Mining Extension Work by the School of Mines of Pennsylvania State College.—The School of Mines of the Pennsylvania State College, co-operating with the Mining Branch of the State Y. M. C. A., has undertaken an important line of mining extension work among the coal mining men of Pennsylvania and adjoining regions. Lectures on important mining topics are prepared by the School of Mines, which are printed in pamphlet form by the Y. M. C. A., and distributed, free of charge, to the miners. The Y. M. C. A. has organized a number of mining institutes, which hold regular monthly meetings. The lectures are first distributed, which allows the miner to be prepared on their subject matter and leaves the entire time at the meeting for discussion. It is the intention to follow up these written lectures by a lecture given by an instructor sent from the School of Mines, who will review the substance of the series just studied, answer questions from members of the institutes, and deliver other lectures on mining topics. Great interest has been manifested in the work already given, and there is much demand for the printed lectures. It is believed that more than 10,000 coal miners were reached during the past year.

Awards of the Elliott Cresson Gold Medal

The Franklin Institute, Philadelphia, acting through its Committee on Science and Arts, recently awarded the Elliott Cresson gold medal, the highest in the gift of the Institute, to a number of engineers and scientists. The names are given below with a statement in each case of the particular line in which the recipient has done "distinguished leading and directive work":

Edward Weston, Newark, N. J., for work "in electrical discovery and in the advancement of electrical application."

Ernest Rutherford, professor of physics, Owens College, Victoria University, Manchester, England, for work "in the advancement of our knowledge of electrical theory."

Sir Joseph John Thomson, Cavendish professor of experimental physics, Cambridge University, England, for work "in the advancement of our knowledge of the physical sciences."

Sir Robert A. Hadfield, Sheffield, England, for work "in the advancement of our knowledge of metallurgical science."

Harvey W. Wiley, chief chemist of the Department of Agriculture, Washington, D. C., for work "in the fields of agricultural and physiological chemistry."

John Fritz, South Bethlehem, Pa., for work "in the development of the iron and steel industries."

Prof. John A. Brashear, Pittsburgh, Pa., for work "in the production and perfection of instruments for astronomical research."

The National Gas and Gasoline Engine Trades Association will hold its annual meeting in Racine, Wis., December 12 to 15. An exhibition of gas appliances will be held in the meeting room of the Association in Dania Hall. The programme includes, among others, the presentation of the following papers: "The Installation of a Mechanical Ignition System Complete," by H. F. Apple, Apple Electric Company, Dayton, Ohio; "Does the Efficiency of a Gas Engine Depend on the Equipment?" by Chas. F. Kratsch, Colborne Mfg. Company, Chicago; "The Gasoline Engine in the Agricultural Field, at Home and Abroad" by Geo. Cormack, Jr., Independent Harvester Company, Plano, Ill.; "Gas Producers" by H. F. Smith, Smith Gas Power Company, Lexington, Ohio; "Gas Engine Ignition" by Otto Heins, Bosch Magneto Company, New York; "Comparisons of Various Methods of Testing Engines" by Joseph Tracy, New York; "Gasoline Engine on the Farm" by J. G. Finkbeiner, Field-Brundage Company, Jackson, Mich.; "Guaranteeing Gas Engine Power" by C. O. Hamilton, Elyria Gas Power Company, Elyria, Ohio.

The Employers' Liability Commission of the National Association of Manufacturers met in Dayton, Ohio, last week for the purpose of outlining the policy which will be pursued by the members of the association with relation to the subject of employers' liability and workmen's compensation for industrial accidents. A special committee, consisting of James A. Emery, general attorney for the association, and F. C. Schweltman, of St. Louis, spent four months abroad studying the various compensation acts adopted by foreign countries, and made an exhaustive report of its investigation. This report will be published in book form some time during January.

The Industrial Training of Boys—I

Education and the Development of the Apprentice*

BY J. J. FLATHER,† MINNEAPOLIS.

It must be accepted as a self-evident truth that in order to maintain industrial supremacy there must be thorough co-operation between capital and labor to the end that the skill of the latter may be utilized to develop and increase the organized enterprise of the former.

Without going into the question of causes at the present time, it is generally understood that the present methods of keeping up the supply of skilled labor are inadequate, and some modification of these methods must be employed if we would have skilled and experienced workmen.

The Supply of Molders a Special Need

This problem is being met in various ways, all of which exert a helpful influence toward its solution, but it is to be noted that employers in foundry work have not given this matter the attention which has been exercised by employers in other trades, nor which the importance of the subject merits. This is to be regretted, for no class of labor offers better opportunity for such effort, and in none is the promise of results greater.

In other lines of activity we find that manufacturers have established schools in connection with their work in which each boy is expected to spend a portion of his time in study closely related to the practical work which he is accomplishing in the shop. Other employers have combined and established night schools and continuation schools in which the employees are given an opportunity to broaden their technical knowledge. Then there are the city evening schools, available alike to the apprentice and the older men who want to learn more of their various trades and the studies which are related to them; such schools have been established all over the country, and every large city has its evening classes in drawing, carpentry, plumbing, machine work, pattern making and various other lines. Again we find the purely trade schools and so-called short-time trade schools in which a boy is supposed to be taught the essentials of his trade. Unfortunately some of these latter are most unsatisfactory in that they attempt to teach a boy in three months what ought to take two years. In addition to these, there have been established various correspondence schools which are doing excellent work in their respective lines, but all of these methods have their limitations, however satisfactory they may prove in special cases and under favorable environment. It is, moreover, questionable whether any of the present methods would be productive of the best results, in the solution of the larger problems of training the masses from the raw material into skilled tradesmen.

Co-operation Between Public Schools and Employers

In its larger sense the problem involves infinitely more than the training of artisans; for its solution demands intelligent co-operation between the public schools and the employers of labor, and it is this phase of the subject which I wish to present to you, not as offering definite solution, but as a suggestion which might lead to the desired co-operation and discussion, to the end that something definite may result which will not only help solve the educational problem but which will provide and maintain an abundant supply of intelligent labor, ready to be molded by the various manufacturers and other employers, to meet their respective requirements.

There is a general feeling in many quarters, especially among those who have not studied the situation thoroughly, that the general introduction of manual training in our public schools will meet all requirements. They argue that the training received in this line of work in the schools will fit a boy for his future vocation because it teaches him the use of tools and educates the eye and hand as well as the mind; but the manual training of the schools is not sufficiently intensive to be vocational.

I would advocate the teaching of manual training subjects in all our public schools, but not as industrial training. It is a developmental subject through which the pupil's intelligence is increased and his interest in his studies maintained; but manual training, as ordinarily taught in school shops by the average teacher, can in no wise be regarded as vocational. With few exceptions the time devoted to any one subject does not exceed 250 actual hours and often it is not half this number. When one considers that it requires from 8000 to 11,000 hours for a boy to learn a trade, and that he may put in 250 hours in four or five weeks, it can be readily seen that the manual training of our schools can have little weight as a preparation for vocational work.

It has, however, one marked advantage in addition to those mentioned, and this is the opportunity afforded teachers and parents, as well as the boy, in helping to determine whether or not an industrial career should be followed.

The Present Educational System Inadequate

It requires no argument to demonstrate that, under the social and industrial conditions which exist to-day, our present educational system is inadequate to meet the demands made upon it. The Bureau of Education is about to publish a bulletin prepared by Dr. Strayer, in which it will be shown that about 25 per cent. of the pupils who enter school drop out before the end of the sixth grade; 48 per cent. do not complete the eighth grade and only 10 per cent. graduate from the high school.

Moreover, those who do continue in school are poorly prepared for any form of industrial work. The curriculum even in the elementary schools has been overloaded and unbalanced. Revision and differentiation are both imperative.

Undue loyalty to democratic ideals has prevented our school boards from differentiating their courses to any marked degree, and the attempt is made to put all pupils through the same general studies. In the commercial and business world we soon discover that all men are not equal and we must also recognize the same condition in the status of our school children and make provision accordingly. Here in the city of Chicago to-day nearly 50,000 children are "repeaters" who are spending the second or third or fourth year in the same grade and at a cost in actual outlay of over $2,000,000 per year. Special provision should be made for the education of backward and defective children, and strong industrial courses should be established for those who are not attracted by the purely academic studies, but who do evince an interest in manual work.

The Success of Industrial Schools

The eagerness with which pupils have entered manual training courses and the interest displayed in all

* Read before the National Founders' Association, Chicago, November 16, 1910.

† Professor of Mechanical Engineering, University of Minnesota.

forms of practical work by boys formerly listless and without ambition have led in a few cases to the introduction of more practical subjects and the elimination of certain academic studies to a still greater degree than is found in the manual training schools. The success of these industrial schools has been marked, but where there is one such school there should be a hundred. This would materially aid in solving the problems before us, namely, what to do with the boy from 12 to 16 years of age and how to furnish an adequate supply of intelligent labor and skilled tradesmen.

No manufacturer or other employer wants a boy 12 or 14 years of age. Such a boy is too immature, both physically and mentally; his principal use for the first few years of employment is in the capacity of a non-producer, as a doer of odd jobs, and when he is old enough to learn a trade he finds there is little or no opportunity because he lacks the educational qualifications. He may get a job as helper in a factory and work up into the position of machine tender or some similar situation in which he absorbs a certain amount of one-sided knowledge, but this is not learning a trade.

The progress of industrialism has led to similar specialization in many lines of production, and keen competition, acting in combination with other causes, has fostered the one-machine man to the gradual exclusion of the apprentice. Economical production demands expert machine hands, but we must not lose sight of the fact that this process results in a rapidly diminishing supply of the all round tradesman and a consequent scarcity of well-trained, capable men.

The Apprentice System Favored

While the day when a boy was bound out to his master to learn a trade is now past and gone, a well-planned apprentice system has so much in its favor that it behooves us to consider seriously the re-introduction of such a system, suitably modified to meet the present demands and conditions. Some of the larger employers of labor, recognizing that they must individually make provision to obtain and maintain a supply of skilled all round workmen, reverted to the modified apprentice system a number of years ago and now have no difficulty in filling any position from their own trained apprentices.

These systems differ materially in detail, but the general principle is the same, namely, the placing of the apprentice under some one in authority whose duty it is to see that each boy is given the proper instruction, that he is advanced from one kind of work to another, and that his mental development keeps pace with his acquisition of skill; to this end each boy must spend a certain portion of his time in studies correlated to the trade which he is attempting to learn. Usually upon the completion of the apprenticeship a bonus is given.

Such a system as this has been in operation at the Baldwin Locomotive Works for almost 10 years, and here the apprentices are indentured to serve three years or four years, depending upon their previous education. The boys, except in the first year, must attend the public night schools, as the firm does not maintain any school for its apprentices. However, those who do attend leave the shops an hour earlier and are paid for this time.

"Each subforeman or contractor has a number of boys and is held responsible for their vocational training while under his supervision. The disciplining, however, remains with the foreman of the department, subject to the head of the apprentices' department, whose duty it is to see that all obligations are strictly observed; that changes in occupation and transfers from one department to another are made; that the apprentice attends school regularly and is given abundant opportunity to acquire a thorough knowledge of his trade."—The Apprenticeship System at the Baldwin Locomotive Works, by N. A. Sample. (Annals of the American Academy of Political and Social Science, 1909.)

A modification of this plan was introduced into the Twin City Iron Works by your president, O. P. Briggs, a number of years ago. In this case one man of wide experience and infinite patience had direct charge of a group of selected boys who were responsible to the instructor alone. Work was given by the foreman to the instructor who re-assigned it to the several apprentices, at the same time showing how it could be done in the best manner. The shops draughtsman met the boys once a week and gave them instruction in mechanical drafting and the interpretation of drawings. This plan works well in a small shop and could be followed in any number of cases to good advantage.

The Instructional Apprentice System

It is generally recognized that very few boys are sufficiently well developed, either physically or mentally, to be benefited to the fullest extent in night schools, after working at a trade all day, and for this reason we find that a number of shops are maintaining day classes for their apprentices. Some of the building trades are accomplishing the desired end by requiring attendance in the public day schools for a part of each year.

This instructional apprentice system has more recently been introduced into the shops of the New York Central lines, where a school is maintained during working hours in which the apprentices are taught mechanical drawing and certain phases of shop practice.

"At each of the larger shops are two instructors—a drawing instructor, who in most cases is the shop draftsman, and a shop instructor who gives his entire time to instructing the apprentices in their shop work and to seeing that they receive the proper shop experience."— The Apprentice System on the New York Central Lines, by C. W. Cross. (Annals of the American Academy of Political and Social Science, 1909.)

The amount of instruction journeymen give to apprentices when working with them is, of course, variable, due to the personality of both the journeyman and apprentice. The company has no means of compelling a journeyman to give an apprentice any instruction, but in the majority of cases they do so if he is an agreeable boy. It is not expected that the shop instructor will give all the instruction, but the company does expect and require the sub-foreman to give instruction as opportunity offers.

The boys work the regular hours of the shop, which is usually nine per day, and are in the class room two hours of the morning of each second day, for which they receive regularly hourly pay.

Mr. Cross, who is in charge of the apprentice system, states that the men in the shops, both foremen and workmen, have evinced considerable interest in the apprentice school, and there has been a demand for evening schools to give them the same advantages. In response to this desire evening schools have been started at a number of places.

The system is working out very satisfactorily, and on account of the opportunity offered there is now no trouble in obtaining a sufficient number of intelligent boys to enter the several trades. Not only does the system give assurance of an ample supply of skilled workmen, but in the making there is found an economic advantage, for less spoiled work is produced, and the output is actually increased.

The General Electric's System at Lynn

Perhaps the most notable example of the instructional apprentice system is that employed by the General Electric Company at Lynn, Mass., under the direction of M. W. Alexander.*

This was started about 10 years ago as a special department which has been modified and developed from time to time, and now gives instructions to about 350 apprentices. Class rooms were established in the factory, training rooms were fitted up with especial reference to the work of instruction, and an arrangement was made whereby instructive commercial work could be transferred from the factory to the training rooms.

* See the American Society of Mechanical Engineers' *Bulletin*, January, 1910.

Here we find a grade school within a factory. The training rooms are in charge of skilled workmen who act as assistants to the superintendent of apprentices. One man is required for every 25 to 40 apprentices. A very successful feature of the training room is the employment of the apprentices themselves to act as instructors to those less advanced. This gives self-confidence and affords an opportunity to discover and develop executive ability in the apprentice.

In the development of the system the work has been extended so that it now provides for the boy with a grammar school, a high school or a technical college education. One of the recent features has been the training of machine specialists in which unskilled workmen of from 20 to 35 years of age are given instruction for a few months in lathe work, others again in boring machine work and still others in planer and milling machine work.

In the regular apprentice training, boys 15 years of age who have completed grammar school and are physically capable are taken on as apprentices. The courses in machine work and pattern making require four years, while those in brass, iron and steel molding and steam fitting require two years. For these courses the boys must be 16 years of age. All apprentices are required to spend from one and one half to two hours per day in the class room on studies correlated to their work. Full pay is received whether in the class room or shop.

Every boy, except the foundry apprentices, starts his career in the training room, where he is under the direct supervision of the superintendent. From the very outset the apprentice is required to do commercial work, which teaches the boy the value of time and money and stimulates him by making him feel his place in real industrial life.

How Apprentices Are Transferred at Lynn

In due time the apprentices are transferred into the factory and assigned to various departments for the remainder of their apprenticeship. These apprentices are under the discipline of the shop foreman and subject to the rules of the department, yet they still belong to the superintendent of apprentices and look to him for transfer to the various classes of work and for general guidance.

At first the apprentices were transferred to the factory after a year or so, but the present tendency is to extend the period in the training rooms to three years. Mr. Alexander states that "the advantages of this system lies not only in the extended systematic training of the apprentices but also in their better general supervision during the most impressionable period of their lives."

Courses for draftsmen, tester and erector apprentices now require a high school education for entrance and continue for three years. Studies equal to those of college grade are pursued for one and one-half to two hours a day in conjunction with the practical work. Draftsman apprentices spend about one and one-half years in machine shop training and the rest in drafting. This course, as well as the tester apprentice course, requires in addition a good deal of home study, and only young men of pronounced ability will be able to complete them satisfactorily.

In addition to these courses, business apprentices are given training in shop business, with especial reference to stock keeping and factory accounting. This course is two years in length. Other courses relate to shop training for college men.

At the Lynn factory this work is under the control of a Supervisory Committee through whose efforts many improvements have been effected. In these courses for college graduates special training is given in preparation for the sales organizations to those who elect the commercial field. For those who are to become designing, manufacturing or administrative engineers a more comprehensive course is followed.

The results bear evidence that the possibilities of apprentices under proper guidance and instruction are remarkable if their ambition and interest in the work are aroused. This good and intelligent work, Mr. Alexander states, could not be accomplished if the class-room instruction, which is correlated with the practical training, did not make the apprentices mentally alert and place them in a position to read working drawings without difficulty, to compute every-day arithmetical factory problems and, in general, to understand the reason for every stroke of work which they perform.

The apprentice system at Lynn is a most interesting economic experiment, broadly conceived and well carried out, the results of which have more than justified the outlay. It would seem that such a system could well be adapted to any manufacturing plant of considerable size operating under conditions somewhat similar to those existing at Lynn; but it is hardly applicable to the smaller shops in its present form, although it might readily be modified, as it is quite possible for manufacturers in a given locality to join issues regarding class instruction, and this is the only serious difficulty. One of the principal reasons why these manufacturers and others have to establish schools in connection with their work is the inability to obtain a sufficient number of boys who have been properly prepared in the public schools for the work required in industrial activities.

(*To be continued.*)

Detroit-Fenestra Exhibit at the Cement Show.—The Detroit Steel Products Company, Detroit, Mich., manufacturer of Detroit-Fenestra solid steel window sash, will have an interesting exhibit at the Cement Show, to be held December 14 to 20, in New York City. Such windows are particularly adapted for use in connection with concrete construction, as the sash can be adapted for any sized window opening or any style or thickness of glass. It is used extensively in factories and industrial buildings where maximum light and ventilation are required, as it does away with the use of obectionable frames and heavy mullions, and is fireproof. Recent installations have been made in the new Chicago & North Western Terminal at Chicago, New York Central shops at West Albany, Ford Motor Company's factory, Detroit; United States navy yards at Boston and Portsmouth; United States Steel Corporation's great plant at Gary, Ind.; Solvay Process Company's plant, Detroit; Michigan Alkali Company's plant, Wyandotte, Mich.

Ingram-Richardson Enameled Signs.—The Ingram-Richardson Mfg. Company, Beaver Falls, Pa., manufacturer of porcelain enameled iron signs, is furnishing a large number to the subsidiaries of the United States Steel Corporation, covering special notices to prevent accidents. These signs run from 3 x 6 in. to 18 x 36 in., and are in different colors and designs. Many are made up in six or seven different languages, giving such cautions as "Don't Touch, Live Wire," also "Dangerous, Man Working Above." A general sign used is 10 x 12 in., bearing a skull and crossbones on, with the word "Electrika," the sign being finished in red, black and white, and used in mills and factories in dangerous places. In addition to the above, the company is selling many factory display signs to go on roofs of buildings. In making these signs the company uses mineral colors. At the heat at which the colors are fused the signs are more brilliant and more durable than the usual painted ones.

The furnace of the Mitchell-Diggins Iron Company, Cadillac, Mich., making charcoal pig iron, was blown in November 26, after having been out for a considerable length of time for relining.

Iron Ore and Flue Dust Briquetting

The Schumacher and Ronay Processes—The Latter Is Used Also in Making Briquettes from Borings and Turnings

Pig iron producers have given much attention in the past decade to the problem of briquetting dust ore. The difficulties attending the use of fine ores are naturally greater with the increase in dimensions of blast furnaces. These increased dimensions and proportionately increased blast, as is well known, have added greatly to the accumulation of flue dust. This iron. Their value differs according to the value of rock ore delivered at the various blast furnaces. It has been clearly shown, however, that the briquetting of the flue dust is of considerable economical value in connection with pig iron production. The use of flue dust is of far greater importance in this country, since it is estimated that over 2,500,000 tons, containing a

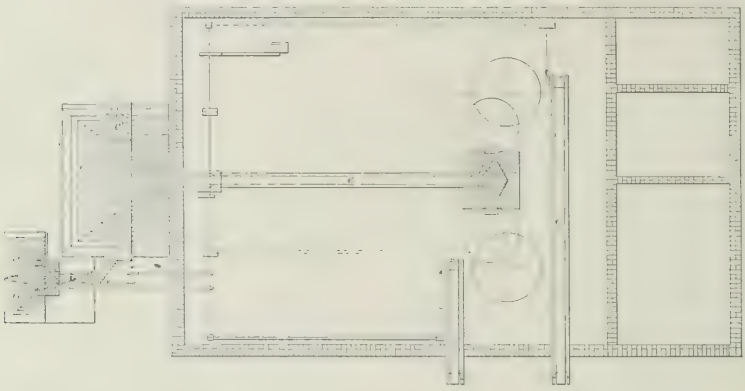


Fig. 1.—Plan of a Ronay Plant for the Briquetting of Dust Ores and Flue Dust.

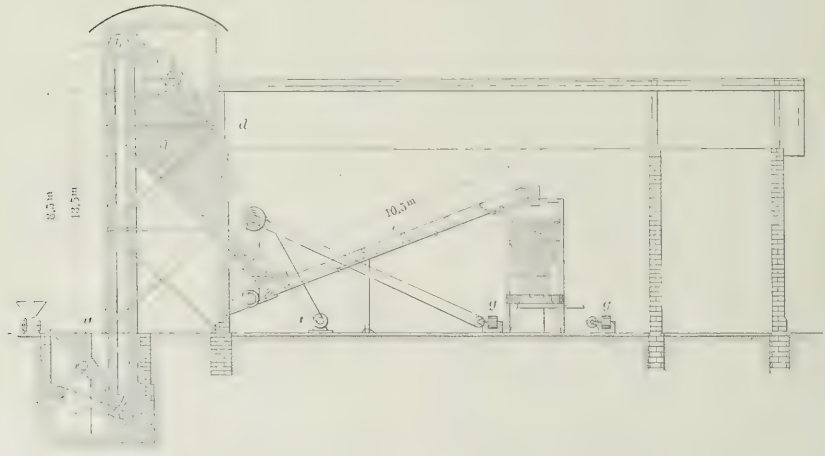


Fig. 2.—Sectional Elevation of a Ronay Plant for the Briquetting of Dust Ores and Flue Dust.

is valuable, not only owing to its high percentage of iron, but also because of the coke and lime contained in it. Many processes for solving the problem of briquetting fine ores and flue dust have been tried, and a number of these have been described in *The Iron Age*.

The German blast furnaces have made a practical success of briquetting fine ores, owing to the fact that they have been compelled to utilize waste products to a greater extent than American pig iron producers. Of the 1,500,000 tons of fine dust, which, according to Prof. G. Franke, of the Mining Academy of Berlin, constitutes the annual waste product of blast furnaces, 250,000 tons is briquetted and used as raw material. These briquettes contain an average of 35 per cent. of high percentage of iron, is added each year to the accumulated dust piles at blast furnaces.

Briquetting installations have been made at many of the German blast furnaces. Some of these are of local origin and their success is dependent on local conditions. Two processes which are of established efficiency have already become well known, namely, the Schumacher and the Ronay. The former was particularly referred to in the paper of C. de Schwartz, Liege, Belgium, on "The Briquetting of Iron Ores," read at the Buxton, England, meeting of the Iron and Steel Institute, a synopsis of which was given in *The Iron Age* of October 6, 1910, page 776. Installations of the Schumacher system have been in operation in Ger-

many for some time at Königshütte in Upper Silesia; Rombacher Hüttenwerke, Rombach; Eisenhütten Aktienverein Düdelingen, Düdelingen, Luxemburg; Dortmunder Union in Dortmund; and Hasper Eisen & Stahlwerke at Haspe, Westphalia. There is also an installation at the Cockerill Works in Belgium. The Ronay system is installed and is working satisfactorily at the following plants: Oberschlesische Eisenbahnbedarfs Aktiengesellschaft, Friedenshütte, Upper Silesia; Lothringer Hüttenverein Aumetz-Friede in Kneuttingen, Lorraine, and Gutehoffnungshütte in Oberhausen. It is being used, too, at a large number of works for the briquetting of iron and other metal turnings and borings. Both systems are operated



Fig. 3. Dust Iron Ore Briquettes Made by the Roney Process.

at low cost. According to German conditions, this would amount to 25 to 30 cents per gross ton.

Figs. 1 and 2 show the general arrangement of a Ronay briquetting installation. The dust ore or flue dust arrives at the storage bin *a* and is lifted by elevator *b*, and after passing through a screen *c*, in order to eliminate all the larger pieces of ore, coke or stone, it drops into the bin *d*. The screened material is transported by belt conveyor *e* to the small hopper *f*, from which it passes into the press. The finished briquettes, Fig. 3, are taken from the press by belt conveyor *g* and loaded into small cars, which run to the blast furnace.

For the handling of the installation there is needed a machinist, a man at each press and two men at each belt conveyor to discharge the briquettes. The capacity of each press is, according to the weight of the dust ore or flue dust, from five to eight tons per hour. The power necessary for the press and all auxiliary apparatus for the Schumacher process is 60 hp. For the Ronay process, it is somewhat more. The cost of the waste chemical product required with the Schumacher process—it is used rather for its catalytic action than as a binder—is put at 2½ to 5 cents per ton.

The difference in the two processes may be referred to: The Schumacher process is solely intended for the briquetting of flue dust and requires from 0.5 to 1 per cent. of the above mentioned chemical. The briquette is formed by comparatively low pressure and can be immediately loaded on cars ready for use in the blast furnace. In the Ronay system no added material is required, and the dust ore or flue dust is simply subjected to a specially applied pressure, which also gives the briquette such mechanical strength that it can be immediately loaded on blast furnace cars. In both cases, the dust ore passes directly from the receiving bin to the press without any previous modification. Their simplicity makes these two processes especially advantageous, inasmuch as the economical utilization of waste products demands as a first consideration a minimum manipulation. No binding material has to be used in either process.

The mechanical strength of these briquettes, it is claimed, is such as to permit of their use in the largest blast furnaces. It is sufficient to allow a considerable proportion of coke dust to be mixed with the flue dust, thereby adding to the quality of the waste product. The value of these processes is indicated by the fact that even at points where ore as taken from the ground is as cheap as 40 cents per ton, as in the Minette district, briquetting plants of the types referred to are now in operation.

The low operating cost of the Schumacher and Ronay systems is responsible for their use in Germany rather than the cintering method. One disadvantage of the latter is that the high temperatures cause some smelting of the material and thus hinder the reducing process in the blast furnace.

The Westinghouse Air Brake Company has decided to install at Wilmerding, Pa., a Ronay briquetting plant for the briquetting of metal turnings and borings, the order having been placed through the American representative, G. Leve, 30 Church street, New York. In Germany and elsewhere the two processes referred to have been introduced for the briquetting of ores by the Allgemeine Brikettierungs Gesellschaft. A subsidiary company, in which the important locomotive firm of A. Borsig is interested, handles the Ronay process of briquetting borings and turnings in all countries except the United States. It is known as the Hochdruck Brikettierungs Gesellschaft.

The Pittsburgh Foundrymen's Association.—The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel on the evening of December 5, preceded by a dinner. The meeting was addressed by Robert B. Thomson, president of the Associated Foundry Foremen of Buffalo, N. Y. A large number of foremen from the foundries in the Pittsburgh district were present at this meeting upon invitation from their employers.

The Southern Iron & Steel Company's Deficit.—The Southern Iron & Steel Company has issued its report for six months ended June 30, 1910. The income account is as follows:

Gross income	$[illegible]
Inventory reductions, cost adjustment, expenses, interest and taxes	92,281
Operating profit	$8484
Deductions from income, less other income	202,554
Deficit for six months	$202,070

United States Steel and Carnegie Pension Fund

Regulations Governing Its Administration

In *The Iron Age* of December 1, 1910, a general statement was given concerning the United States Steel and Carnegie Pension Fund established this year by the joint action of the United States Steel Corporation and Andrew Carnegie. It amounts to $12,000,000 and will be administered by 12 trustees, through J. B. Erskine as manager, his headquarters being in the Oliver Building, Pittsburgh. In view of the large number of employees who are actually or prospectively eligible to receive pensions from this fund, the exceptional amount to be administered, and the great care and time given to the development of the system, we give below the rules and regulations in full, effective January 1, 1911, even though a synopsis of their main provisions has already been printed:

Who May Obtain Pensions

1. Employees of the United States Steel Corporation or of any other corporation a majority of whose capital stock is owned or controlled by the United States Steel Corporation, or of the Board of Trustees of this Pension Fund, may obtain pensions under the following conditions:

First.—Pensions by Compulsory Retirement.

2. All men who have been 20 years or longer in the service and have reached the age of 70 years shall be retired and pensioned.

3. All women who have been 20 years or longer in the service and have reached the age of 60 years shall be retired and pensioned.

4. At the request of their employing officers persons employed in executive or administrative positions may be allowed to continue in active service after reaching the ages mentioned above.

Second.—Pensions by Retirement at Request.

5. Any man who has been 20 years or longer in the service and has reached the age of 60 years may be retired and pensioned either at his own request or at the request of his employing officer.

6. Any woman who has been 20 years or longer in the service and has reached the age of 50 years may be retired and pensioned either at her own request or at the request of her employing officer.

Third.—Pensions for Permanent Incapacity.

7. Any employee who has been 20 years or longer in the service and has become permanently totally incapacitated through no fault of his or her own as a result of sickness, or injuries received while not on duty, may be pensioned at the discretion of the Board of Trustees.

Amount of Pensions

8. The monthly pensions to be paid will be made up on the following basis, subject to the provisions of section 27: For each year of service 1 per cent. of the average regular monthly pay received during the last 10 years of service.

Illustration.—An employee who has been 25 years in the service and has received an average regular monthly pay of $60 a month will receive a pension allowance of 25 per cent. of $60, or $15 a month.

9. No pension granted shall be more than $100 a month, or less than $12 a month.

How to Obtain Pensions

PENSION BY COMPULSORY RETIREMENT.

10. Employing officers will report to the manager of the fund the name of every man who has been 20 years or longer in the service and has reached the age of 70 years, and of every woman who has been 20 years or longer in the service and has reached the age of 60 years. These reports will be sent to the president of the company concerned for his approval.

PENSIONS BY RETIREMENT AT REQUEST.

11. Any man who has been 20 years or longer in the service and has reached the age of 60 years, and any woman who has been 20 years or longer in the service and has reached the age of 50 years, who wishes to be retired and pensioned, should notify his or her employing officer.

12. Any employing officer who wishes to retire an employee who has reached the age and has had the length of service fixed for retirement by request, must notify such employee and report to the manager of the fund the request that such employee be retired and pensioned. These requests whether from an employee or an employing officer will be sent to the president of the company concerned for his approval.

PENSIONS FOR PERMANENT INCAPACITY.

13. Any employee who has served 20 years and who is permanently totally incapacitated through no fault of his or her own as a result of sickness, or injuries received while not on duty, may notify his or her employing officer and apply for a pension. Every such application will be sent by the employing officer to the president of the company concerned for his approval. In every such case it must be shown to the satisfaction of the Board of Trustees by physical examination that the employee applying for a pension is permanently totally incapacitated to earn a livelihood.

General Regulations

14. Pensions from the fund will be paid only to those employees who have given their entire time to the service of corporations included under the provisions of the fund.

15. The acceptance of a pension from the fund shall not bar any former employee from engaging in other business so long as such other business is not of the same character as the former employment. No employee receiving a pension may re-enter the service.

16. Length of service shall be reckoned from the date since which the employee has been continuously in the service to the date when retired, and a part of a year if less than a half shall not be counted; if more than a half it shall be counted as a full year.

17. Leave of absence, suspension, temporary lay-off on account of reduction in force, or disability shall not be considered as breaks in the continuity of service, and time thus lost shall not be deducted in reckoning the length of service.

18. Dismissal or voluntarily leaving the service followed by reinstatement within two years shall not be considered as breaks in the continuity of service, but the time thus lost shall be deducted in reckoning the length of service.

19. The Board of Trustees shall fix the date in each case, upon which the pensions shall begin.

20. Pensions shall be paid monthly at the close of each month, unless revoked by the board, and shall terminate with payment for the month succeeding that in which the death of the employee occurs.

21. Whenever the terms "service" and "in the service" are used in these rules they mean employment by the United States Steel Corporation, by one or more corporations a majority of whose stock is owned or controlled by the United States Steel Corporation, by their predecessors, or by the Board of Trustees of this fund.

22. Pensions may be withheld or terminated in case of misconduct on the part of the beneficiaries or for other cause sufficient in the judgment of the Board of Trustees to warrant such action.

23. In order that direct personal relations with retired employees may be preserved and that such employees may continue to enjoy the benefits of pensions granted them, no assignment of pensions will be permitted or recognized under any circumstances; neither shall pensions be subject to attachment or other legal process for debts of the beneficiaries.

24. This pension plan is a purely voluntary provision for the benefit of employees superannuated or totally incapacitated after long and faithful service, and constitutes no contract and confers no legal rights upon any employee.

25. The manager of the fund shall decide all questions arising out of the administration of the fund and relating to employees, subject to a right of appeal to the Board of Trustees within 30 days after notice to the persons interested of the manager's decision. The action of the Board of Trustees or of any committee designated by the board to hear such appeals shall be final and conclusive.

26. Neither the creation of this fund nor any other action at any time taken by any corporation included under the provisions of the fund or by the Board of Trustees shall give to any employee a right to be retained in the service, and all employees remain subject to discharge to the same extent as if this Pension Fund had never been created.

27. Whenever it may be found that the basis named for pensions shall create total demands in excess of the annual income increased by any surplus deemed applicable by the Board of Trustees, a new basis may be adopted reducing the pensions theretofore or thereafter granted so as to bring the total expenditures within the limitations fixed by the Board of Trustees. Notice of such new basis shall be given before the beginning of the year in which it may be decided to put the same into effect. These pension rules may be changed by the Board of Trustees at its discretion.

28. An annual report giving an account of the fund and its administration will be made as soon after the first of each year as practicable, and copies of such report will be posted at all mills, mines, railroads, shops and other works and published in such newspapers as may be designated by the Board of Trustees.

By order of the Board of Trustees these rules for the administration of this fund shall take effect on January 1, 1911, and shall apply to those who are in the service on and after that date.

The Battleship and Collier Bids

The Eight-Hour Provision Prevents Competition

WASHINGTON, December 6, 1910.—The ill effect of incorporating in the last annual naval appropriation bill a provision that the construction of the 27,000 ton battleship, two 12,500 ton fleet colliers and machinery for a second battleship authorized thereby should be carried on under the eight-hour labor law has been demonstrated more speedily than was anticipated. When bids for these four important items were opened at the Navy Department December 1, it was discovered there was absolutely no competition for either vessels or machinery. But a single bid was received for each item, and in the case of the two colliers these bids were defective and cannot be considered. The Newport News Shipbuilding & Dry Dock Company, which submitted the only bid for the new battleship, will probably be awarded the contract, and the General Electric Company may be permitted to build the machinery for the second battleship, the hull of which is required by law to be constructed in a Government navy yard.

The Eight-Hour Provision

The provision in the naval appropriation bill requiring the work to be done "under the eight-hour labor law" is so vague and indefinite, especially in view of the scope of that statute as construed by the courts in numerous cases, that the Navy Department has been flooded with requests from shipbuilders and other manufacturers doing contract work for the Government to give it an official construction. The law officers of the Department, however, have been unable to determine the question to their own satisfaction and, therefore, have refrained from any attempt at interpretation. Inquirers have been advised that the statute "speaks for itself" and it seems probable that its force and effect will ultimately have to be determined by the courts.

Under the circumstances, all but a single shipbuilding firm decided that it was not practicable to attempt to build the 27,000 ton battleship under the law as passed by Congress. The Newport News Shipbuilding & Dry Dock Company has long followed the eight-hour legislation with close attention, having been well advised for many years by the late Judge L. E. Payson, resident counsel for the company in this city. The company's plant being exceptionally well located with reference to labor and other facilities, it did not hesitate to undertake the contract, presenting four proposals ranging from $5,760,000 to $5,830,000, the difference being based upon special specifications for machinery. All the bids are well within the $6,000,000 limit set by Congress.

Appropriations Probably Inadequate

For the machinery of the second battleship, the hull of which is to be constructed at a Government navy yard, the General Electric Company submitted a proposal for machinery, including turbines guaranteed to develop a speed of not less than 21 knots, at $352,500. While this bid will probably be accepted, it is believed that the sum appropriated by Congress for the hull of the vessel will be insufficient to build it under the eight-hour law. In fact, the New York Navy Yard, where the battleship Florida is now in course of construction, has advised the Navy Department that the vessel cannot be built for the amount appropriated, and it is likely that at the coming session the Secretary of the Navy will ask for an additional sum to cover the anticipated deficit in the appropriations for the two vessels. It will be remembered that the cost of the construction of the battleship Connecticut, which was built at the New York Navy Yard in a contest with a private shipyard which constructed her sister ship, proved to be prohibitively high, considered from any rational business standpoint, but the experiments are being continued partly in deference to the so-called "labor" sentiment in Congress and partly because certain congressional naval experts believe that at least one navy yard should at all times be kept in readiness to build warships.

It is probable that the Navy Department will readvertise the two colliers. The proposal of the Union Iron Works, San Francisco, to build one vessel was $1,595,500, cannot be considered because it exceeds the appropriation. The Moran Company, Seattle, Wash., submitted an informal proposal to build one of the colliers for $987,000, but the bid not being accompanied by either certified check or bond cannot be accepted. It is possible that some attempt may be made by the Navy Department to construe the eight-hour provision of the naval appropriation act before re-advertising these colliers, as it is evident that the uncertainty as to the scope of the law will operate either to prevent competition or impel manufacturers to submit bids at prohibitive figures.

Bids for Armor

The Secretary of the Navy opened bids the same day for armor for the two battleships authorized by the new law. As the provisions of the eight-hour statute were not extended to this item, the three companies which for several years have shared these contracts—the Carnegie, Bethlehem and Midvale—again submitted substantially identical bids, namely, $480 per ton for turret armor and $420 per ton for side armor. The contracts will probably distribute the armor among the three plants in accordance with their special facilities and present engagements. W. L. C.

A Leading German Steel Manufacturer on the American Steel Industry

Major Fritz von Stumm, general staff officer of cavalry, military expert and one of the leading steel manufacturers of Germany, has made a tour of the principal iron and steel plants of the United States. At the Hotel Astor, New York, before sailing for home last week, he expressed himself as much impressed by the high degree of organization of the steel industry in the United States and the fine condition of all the plants he inspected. He said:

"The American iron and steel industry is organized and conducted on a truly colossal scale. The degree to which thorough organization and the use of the most perfect labor saving machinery has been carried stamps the United States as being in the very forefront of the world's progress in this industry. Your steel manufacturers are without exception, so far as my observation extends, broadly progressive men. Nothing has impressed me more in the course of my visit than the courtesy of the officials of all the various establishments that I have visited. In every case they have given me every facility for informing myself regarding conditions and methods obtaining here. No better equipment for the economical and efficient production of iron and steel is to be found anywhere than exists in your great plants, and I have visited both those of the United States Steel Corporation and of the leading independents."

The plant of Stumm Bros. is one of the oldest and best known in Germany. It is located at Neuenkirchen, in Rhenish Prussia, and has been operated by the same family for more than 200 years.

The Swedish Crucible Steel Company, recently incorporated, will, it is reported, erect a plant at Hamtramck, Detroit, Mich., where the office will be located upon completion of the factory. The company will succeed to the business of the Olson Adjustable Plow Point Company, Milwaukee, Wis.

The Hilliard & Richards Friction Clutch

Ability to Control Application of Power and Freedom from Wear Are Two Features

A new type of friction clutch and cut-off coupling has been brought out by the Hilliard Clutch & Machinery Company, Elmira, N. Y. This clutch is a decided departure from all the types now on the market, most of which depend upon toggle joints and levers to produce the pressure on the friction surfaces. These joints and levers must be thrown past a center to lock the mechanism in working position, which not only means a straining of these levers but necessitates a readjustment of the clutch after slight wear. In the Hilliard & Richards clutch the two friction plates are drawn against the friction ring which contains a number of hardwood inserts by screws that are operated by spiral gears and turned by spiral racks attached to the sliding collar. This feature is clearly shown in Fig. 1, which is a view of the clutch, while Fig. 2 illustrates the application of the clutch to a turret lathe.

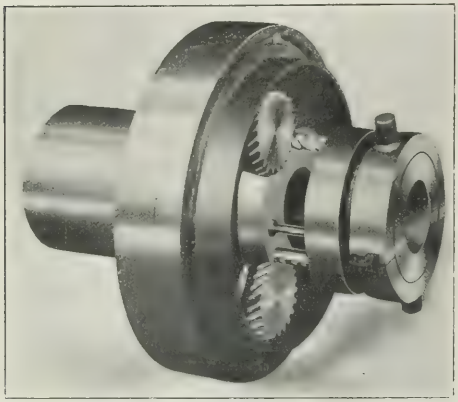


Fig. 1.—A New Type of Friction Clutch Made by the Hilliard & Richards Clutch & Machinery Company, Elmira, N. Y.

Some of the special advantages claimed for this clutch are, the screws can be turned very slowly, the tightening or loosening of the operating mechanism is not controlled by the centrifugal force, adjustments are easily made, and the interior is kept free from dust. By being able to turn the screws very slowly when desired the friction is gradually applied and the load picked up smoothly and without any sudden jerk. On this account the clutch is particularly valuable for controlling delicate machinery especially in textile mills where a sudden shock in starting might cause much damage and annoyance. Although the clutch can be used on delicate machinery it is also possible to use it on large machine tools as illustrated in Fig. 2, where a turret lathe equipped with one of these clutches is taking a very heavy cut. This clutch is particularly adapted, it is claimed, for use on high speed line and countershafts, especially as no parts of the operating mechanism have any tendency to tighten or loosen under the influence of centrifugal force.

When adjustment becomes necessary due to the wood inserts wearing, this is easily accomplished by removing the nut which locks the sliding collar in position. When this has been done the sliding collar can be drawn out and the spiral racks taken out of mesh with the gears. Turning each gear the same number of teeth to the right draws up the friction plates the same amount on all sides, and the racks can again be placed in mesh with the gears which gives a perfect adjustment and a uniform pressure throughout the friction surfaces. On account of the absence of any openings at the center through which air can be drawn the interior is kept free from dust and grit which might interfere with the efficiency of the clutch.

The various sizes of the clutch made, together with the maximum shaft bore and the horsepower transmitted are given in the following table:

Size of clutch. Inches.	Maximum shaft bore. Inches.	Horsepower transmitted at 100 rev. per min.
8	1 7/16	4
10	1 15/16	7
10	2 3/16	10
11	2 5/16	14
12	3 7/16	18
14	3 5/16	25
16	4 5/16	40
18	4 5/16	50
20	5 5/16	65

Ball thrust bearings are provided for the spiral gears to reduce the effort necessary to engage the clutch. These clutch sleeves are furnished bored and reamed and babbitted or bronzed bushed. In all the different styles there is an oil reservoir bored out of the center having suitable grooves for distributing the oil. For filling this reservoir oil holes with covers are provided, and the clutch is enabled to run for a long time with no other attention except proper lubrication as the hardwood inserts wear excellently. As there is

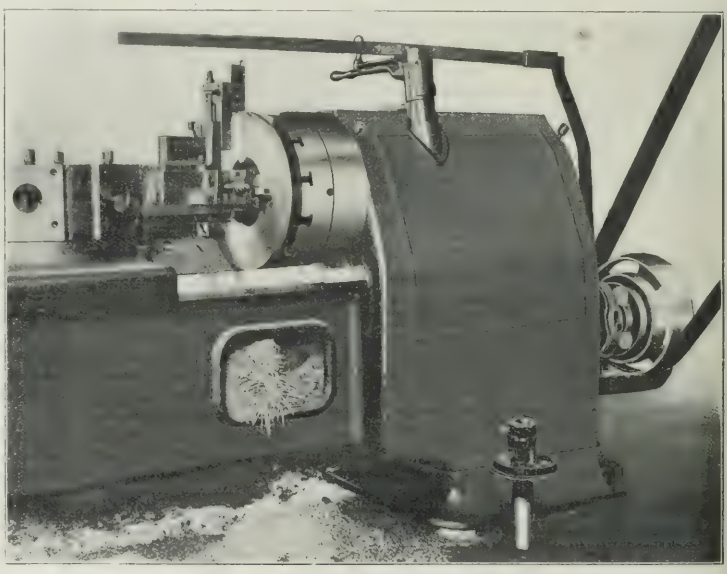


Fig. 2.—A Turret Lathe Equipped with the New Clutch.

no space between the hub or body of the clutch and the sliding collar the clutch can always be thrown in tighter, and no readjustment is required until these two parts come together when it may be easily made as described above.

The Baird Sheet Metal and Wire Reels

For conveniently handling the wire and sheet metal used in standard and automatic wire forming machines and presses, the Baird Machine Company, Oakville, Conn., has developed a number of new types of reels. A little smaller type of reel is furnished for use with the maker's wire forming machines of various kinds which were illustrated in *The Iron Age*, January 6, February 3, and March 3, 1910, and with the open back press, an illustrated description of which appeared in *The Iron Age*, September 15, 1910.

The pins in the sheet metal and scrap reels, Figs. 1 and 2, which receive the coil of metal are easily and quickly adjusted to accommodate coils of different inside diameters. The outer flange is held in place by a thumb screw and can be easily adjusted for different strip widths. Another especially important feature of the reels is that they are interchangeable on the stud or shaft so that if the metal has to be run through the press again the reel from the scrap reel shaft with the metal on it can be put on the metal reel stud while the empty metal reel is placed on the scrap reel shaft, thus saving considerable time and labor. The flanges which are made in various diameters to suit the requirements of different classes of work have two radial slots extending through them which permits the binding wire to be cut away from the new coil after it has been placed in position on the reel and also enables the operator to bind a coil of scrap metal before removing it from the reel. This feature does away with the awkward handling caused by a loose coil and at the same time avoids the necessity of opening up the coil of metal about the room.

The drum reel, Fig. 3, is made with a floor base which is the type illustrated for use with the smaller types of standard automatic machines such as small four-slide wire forming machines, those for making garment hooks and others of that nature. If desired, these reels can be mounted on benches for machines making small springs, garment eyes, &c. The adjustable arm reels cover a wide range of coil diameters and in addition possess the advantage of having the ends of the fingers turned inward to catch the loose inner coils of wire and force them into place when the coil of wire is dropped on the reel, which does away with the loss of time said to have been caused by the use of the old type of finger reel where the fingers caught in all these loose coils. This reel is made with a universal arm and can be used in a horizontal position, Fig. 4, or turned at right angles so that the reel is vertical, Fig. 5.

In all the types of reels illustrated the shaft bracket can be adjusted on the stand to give a variety of hights, while the base is made very heavy. This gives a rigid reel and one that does not require fastening to the floor.

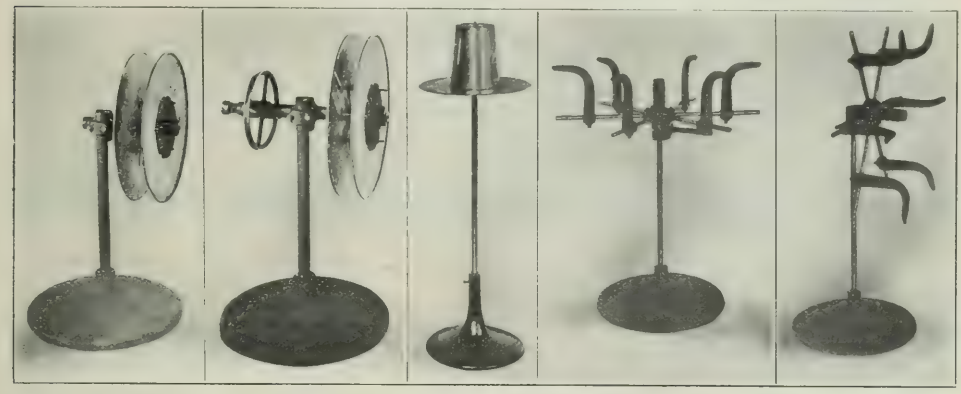


Fig. 1.—Sheet Metal Reel. Fig. 2.—Metal Scrap Reel. Fig. 3.—Drum Reel. Fig. 4.—Horizontal Universal Wire Reel. Fig. 5.—Vertical Wire Reel.

Several Types of Sheet Metal and Wire Reels Made by the Baird Machine Company, Oakville, Conn.

Westinghouse Machine Company Financing

Holders of three-year collateral notes of the Westinghouse Machine Company, of which $6,473,000 are outstanding and which fall due about January 1, are in receipt of a letter from the Creditors' Committee which says:

"Your committee has agreed to advise noteholders that the debt of the machine company must be extended so that all noteholders may be secured. It has been determined to have the machine company authorize and issue a mortgage under the following conditions: The machine company is holder of stock of the Westinghouse Foundry Company and is a guarantor on an outstanding issue of bonds amounting to $800,000. The machine company also has outstanding debenture bonds aggregating $825,000, issued prior to those securing your notes. It has also outstanding $140,000 first mortgage serial bonds.

"A consolidation or merger will be effected whereby all properties of the Westinghouse Foundry Company shall be conveyed to the Westinghouse Machine Company and a 30-year 6 per cent. mortgage and refunding bond placed on the consolidated companies, bonds under this mortgage to be disposed of as follows: $140,000 to be held by the trustees under the mortgage to retire $140,000 serial first mortgage bonds; $800,000 to be held to retire $8,000,000 Westinghouse Foundry bonds; $825,000 to be held to retire outstanding prior debenture bonds of the Westinghouse Machine Company.

"Sufficient of these 30-year refunding bonds are to be placed with the Colonial Trust Company of Pittsburgh at 90 per cent. of par value as collateral to secure the present outstanding notes, which are to be extended for three years with interest at 6 per cent."

The H. W. Johns-Manville Company announces that, owing to greatly increased business, it has removed its offices now located at 85 Sheldon street, Houghton, Mich., to more commodious and convenient quarters at 96 Sheldon street. S. T. Harris, who has been associated with the company for a number of years, will continue in charge of the Houghton branch.

A New Electric Welding Process

An Advance in the Art Made by the Hub Machine, Welding & Contracting Company

A new system of electrical welding has been developed by the Hub Machine, Welding & Contracting Company, 621 Cherry street, Philadelphia, Pa., by which cast iron, cast steel, wrought iron and tool and machinery steel have been successfully welded. The welding of a break in a steel bar measuring 12 x 4 in. in section and welding two oval 12 x 4 in. spokes in a 15-ft. cast iron fly wheel, which was very difficult. In a recent series of tests made at the New York office of the company, 117 West Fifty-first street, a 4 x 4 in. steel bar was welded in 20 min. with a maximum voltage of 75 volts and a current consumption of 300 amperes, the total amount used being 20 kw.hr. In making this weld the average length of arc used was from 4 to 5 in. In making welds by this process a

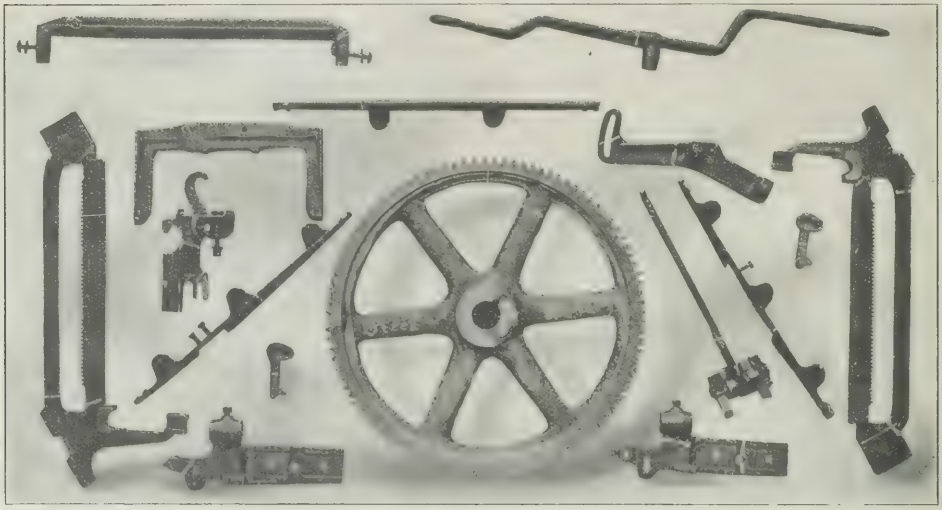


Fig. 1.—Specimen Pieces Welded by the New Electric Process Employed by the Hub Machine, Welding & Contracting Company, Philadelphia, Pa.

special feature of this system is that the heat employed can be regulated so as to secure the melting heat of the metal being welded and thus prevent burning. It is possible with this system to duplicate parts of machinery that have been broken, a feature which, where the machine is of foreign make is especially valuable as regards the saving of both expense and time. Fig. 1 shows a number of sample pieces which have been welded by this process and Fig. 2 shows a job of cutting which can also be done.

In welding broken parts together the pieces are clamped on a metal table which is made of one of the electrodes by connecting through a weight and cable similar to that shown in Fig. 2 to one side of the circuit. The other electrode is a carbon pencil which is connected to the opposite side. In making the weld the current passes through a flexible cable to the copper rod in the interior of the tool and from there to the carbon pencil, thence to the work and back through the cable, the current being so regulated as to produce just enough heat to melt the metal that is being welded. Where it is desired to repair a casting or forging where a lug has been broken off or lost it is desired to lengthen one which has been worn, a mold is built of a special carbon composition in the shape of the lug around the parts where the weld is to be made. The part is then brought to the melting point and metal added to fill the mold, that which is added being of the same composition as the original part.

As will be noticed from Fig. 1, the possibilities of this system are numerous. In one case where the bearings on large 10 in. rolls were worn down to 8 in. the company had welded on an 1¼ in. of metal all around the worn jounal and then turned it down to the regular size as well as straightening out the surface of the roll where it had become worn. Other special work executed by this company has included the repairing of pin valves for automobiles, the successful short arc is first employed to bring the metal up to the melting point, after which the length of arc is increased to cause the metal to flow, this length being



Fig. 2.—Cutting Metal by the Electric Arc Used in the New Welding Process.

directly controlled by the operator through the variation of resistance in the circuit.

In Fig. 2 it shows a recently finished order for

some new lugs on steam hammers in process of completion. At the time the photograph was taken the old lugs which were too short were being removed by heating them until they were soft enough to be cut away with a hammer. After this was done the new lugs were welded on in the customary way.

The Waltham Bench Thread Miller

A machine that is designed to do work of smaller size and of greater precision than that handled by the larger machines now on the market has been brought out by the Waltham Machine Works, Newton and Cutter streets, Waltham, Mass. Its construction is claimed to include several features of design ordinarily not found in machines of this type that enable it to handle a larger variety of work. The special fields for which it is particularly adapted are tap making including the smallest sizes, the production of micrometer screws and other similar work. Fig. 1 is a front view of the machine, and Fig. 2 is a rear view showing details of the drive.

The cutter, which is 1½ in. in diameter, is mounted on a hardened spindle driven through a train of spur and bevel gears. The movement of the spindle is transmitted to the lead screw through a train of gears which with the change gears regularly furnished give a range of threads of from 10 to 80 per in. Special sets of change gears which increase this range from 4 to 100 threads can be furnished if desired. The cutter head can be swiveled in a vertical plane around the center line of the cutter and horizontally from a point near the spindle, while the tailstock and its spindles are milled away close to the center so that the cutter can be brought clear to the center line. The graduations for the vertical swivel are on a segment, 4 in. in diameter, and are in plain sight on the top

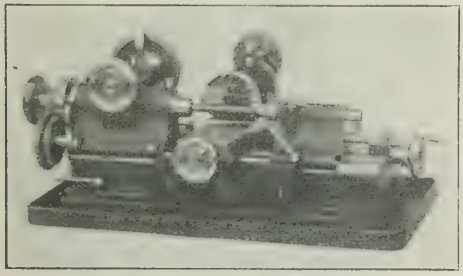


Fig. 1.—Front View of a Bench Thread Milling Machine Made by the Waltham Machine Works, Waltham, Mass.

of the head. By using the horizontal swivel and a cutter of the proper angle, a buttress thread which is perfectly square on one side can be cut, and by reversing the work and taking a second cut a square thread is obtained.

The bearing for the cross slide is 10 in. long, and the friction index for the feed screw is graduated in divisions of 0.0005 in. The feed screw nut is in a block that can be fastened either to a part of the carriage or to the sliding bar of a taper attachment, the latter providing sufficient taper for pipe taps and similar work. To guard against setting the cutter too deeply on duplicate work a stop screw is provided.

The carriage has two bearings, a V bearing 12 in. long close behind the bed and a flat one at the front of the bed. The lead screw is in the center of the former, and its center is only 3½ in. from the center line of the cutter. The nut for the lead screw is fixed as regards longitudinal movement but can be rotated slightly. Fastened to this nut is an arm the outer end of which is held against a swivel bar by a spring. Setting this bar at an angle increases or diminishes the feed of the carriage, thus giving a larger or smaller amount of lead to the work. The feed is engaged and disengaged by a hand operated clutch at the left end of the lead screw. When the cut is completed the clutch is released and the carriage returned to its starting point by the hand wheel at the right end, which has a friction index attached thereto.

The headstock spindle takes a regular lathe chuck with a capacity of ⅝ in. and is driven by a worm and

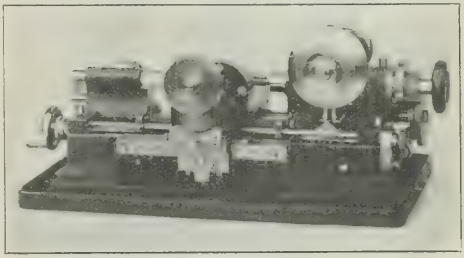


Fig. 2.—Rear View of the Miller Showing the Drive.

worm gear. The driving pulley is connected to the worm shaft by a toothed clutch, which is automatically disengaged when the cut is completed. A hand wheel serves to turn the worm spindle by hand when setting the cutters, and there is an indexing device attached to the work spindle by which double, triple or quadruple threads can be cut.

The four-step cone pulley on the worm shaft is interchangeable with the driving pulley on the countershaft. The round belt can be run to the step on either side of the one in line, which gives at least 16 feed changes.

A thread 6 in. long and not exceeding 2 in. in diameter can be cut, and if that portion of the work which is not threaded is not greater than the capacity of the chuck, ⅝ in. at one end or the diameter of the tailstock spindle, 13-16 in. at the other, its total length can be indefinite. Two tailstock spindles are furnished, one with a point and the other with a hole extending entirely through it.

This machine is what the maker terms his universal machine, but if desired a plain machine for manufacturing purposes can be supplied. In the latter machine the horizontal swivel for the cutter head, the taper turning attachment, the screw compensating bar, the extra tailstock spindle and the change gears are omitted. The machine is regularly fitted with a pan base measuring 14½ x 26½ in., and an individual oil pump can be provided if desired. The weight of the universal machine without the pump is 190 lb.

The Hanna Engineering Works, 2059 to 2113 Elston avenue, Chicago, has just obtained an order from the American Bridge Company for equipping its new plant at Gary, Ind., with 24 Hanna type compression yoke riveters, ranging in size from 4 to 60 in. reach and from 40 to 64 tons pressure on the die. With this installation the American Bridge Company will have in the neighborhood of 75 Hanna riveters in use. Recently the following concerns have also adopted the Hanna type of riveter: Walsh Boiler & Iron Works, Springfield, Mass.; National Tube Company, Pittsburgh, Pa.; Lukens Iron & Steel Company, Coatesville, Pa.; J. I. Case Threshing Machine Company, Racine, Wis.; Reeves & Co., Columbus, Ind.; S. G. Martin & Co., St. Petersburg, Russia; Canadian Pacific Railway Company, Montreal, Canada; Canada Foundry Company, Davenport, Ont., Canada.

The Long Lake Iron & Steel Company, Duluth, Minn., has been incorporated with $250,000 capital stock. H. H. Longly is president of the company.

The Vulcan and Hercules Hand Power Shears

Two tools that are offered as time and money savers for machine, blacksmith, ornamental iron, automobile, light structural and sheet iron shops are the Vulcan

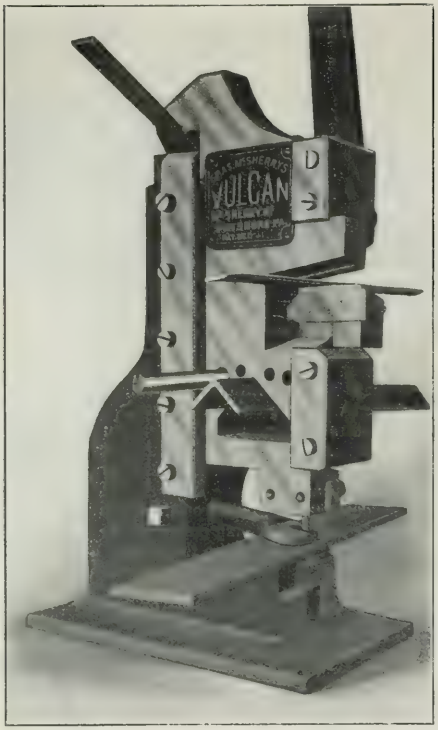


Fig. 1.—The Vulcan Combination Shear, Punch and Bending Machine, Made by the McSherry Mfg. Company, Pittsburgh, Pa.

combination shear, punch and bending machine and the Hercules shear. Both are products of the McSherry Mfg. Company, 122 Ninth street, Pittsburgh, Pa.

The Vulcan machine is shown in Fig. 1 and is adapted for cutting, punching and bending rounds, squares, flats or angles. It will punch a 5-16 in. hole through ¼-in. steel, shear ¼ x 2 in. steel, ½-in. rounds and 1½ x 1½ x ⅜ in. angle iron, and bend ¼ x 2 in. steel.. Interchangeable punches and dies are furnished with which it is possible to do a great variety of work. The regular equipment includes five sizes of punches and dies, one die and two punches of each size from 3-16 to 7-16 in. Two die blocks are furnished to facilitate the punching of small angles. The machine is made entirely of steel, weighs 100 lb., is 6 x 11 in. at the base and 17½ in. high.

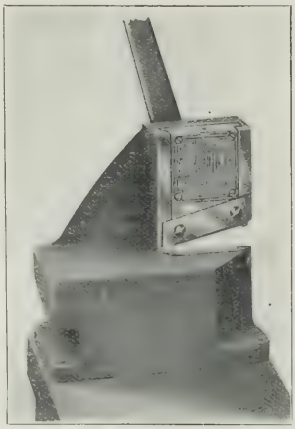
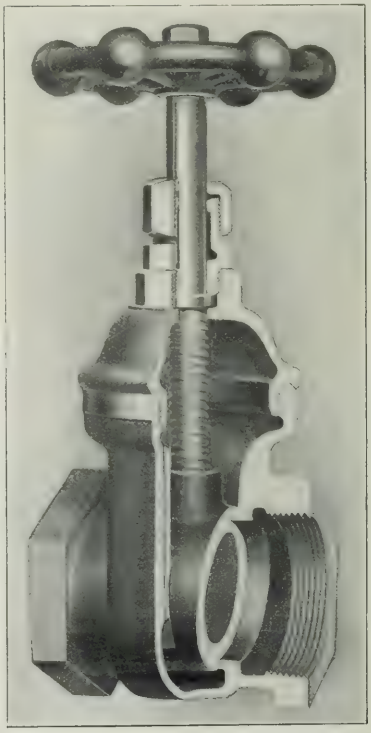


Fig. 2.—The Hercules Hand Power Shear.

The Hercules shear, Fig. 2, cuts sheet and plate steel and angles and bars at any angle. Sheet metal can be cut straight or curved, so that it is useful in making elbows, tees, &c., and miters and notches can be cut in angle iron. Two sizes are built, the smaller one cutting steel as heavy as ⅛ in., and the larger up to ¼-in. steel. The smaller machine weighs 40 lb., has 4-in. blades and occupies a space of 6 x 10 x 8 in. Its lever is 30 in. long. The larger machine weighs 190 lb., has 6-in. blades and occupies a space of 8 x 15 x 13½ in. and has a lever 72 in. long. Both machines are arranged to be secured to a bench with four bolts.

The Gaco Brass Gate Valve

A rather interesting test was recently made upon a Gaco brass gate valve made by the Pittsburgh Gage & Supply Company, Thirtieth street and Liberty avenue, Pittsburgh, Pa. An ordinary valve which is guaranteed to withstand in service pressures not in excess of 200 lb. per square inch was subjected to double that amount of hydrostatic pressure without any flaws or leaks showing. The pressure was subsequently raised to 800 lb. without any stretch developing and was reduced to 400 lb. without any leaks becoming apparent.



Sectional View of the Gaco Gate Valve Made by the Pittsburgh Gage & Supply Company, Pittsburgh, Pa.

Some of the special features of this valve, which is made in 10 sizes, ranging from ¼ to 3 in. in diameter, are that they have nonrising stems, which enables them to be conveniently operated in a limited space, and that they will always operate successfully if placed upside down, horizontally or in other positions, as the wedge disk is of one piece, and guides on either side serve to hold it in position, thus preventing rubbing of the disk against the seat. In this valve the openings

are far in excess of the pipe area, which gives a greater thickness of metal at the parts subject to greater pressure and prevents any tendency of the valve to spring out of alignment. The body of the valve is reinforced between the hexagon and the bonnet connection with two ribs and also by the addition of 1-32 in. of metal to prevent the valve from springing longitudinally. The disk and the valve stem connection provide for the engagement of a large number of threads which insures long life to the working parts. The construction of the bonnet, stuffing box and packing rod is of the pyramid type, which permits any part to be removed without injury to the others.

The best quality of metal available is used in the construction of these valves, and the hexagon ends are tapped to the Briggs standard gauges used in all the United States standard fittings, and all parts are interchangeable through the use of special gauges and templets. The hand wheel is of the ball rim pattern and is securely fastened by a square and nut.

The Triumph Three-Wire Generator

A new design of three-wire generator has been placed on the market by the Triumph Electric Company, Cincinnati, Ohio. The general appearance of this line of generating units is shown in Fig. 1, while Fig. 2 gives an idea of the construction of the armature. In designing and building these units the Triumph Electric Company claims to have entirely eliminated the principal objection existing heretofore to the use of three-wire machines, namely, poor commutation on unbalanced loads. The new generator is said to be absolutely sparkless on an unbalanced load.

These units are built for either belt or direct connection and in the latter case they form an exceedingly compact unit. They can be used for light and power distribution systems in areas not exceeding one or two sq. miles, but are especially adapted for furnishing light and power to large stores, office buildings and for general use in manufacturing establishments. The two-voltage feature of a three-wire distribution system is especially advantageous in the last class of service, as adjustable speed motors are being used more extensively in connection with manufacturing operations. By controlling the amount of current passing through the fields of these motors it is possible to obtain a wide range of speed because of the flexibility of the system, while at the same time a considerable saving in the amount of copper employed is effected. If desired,

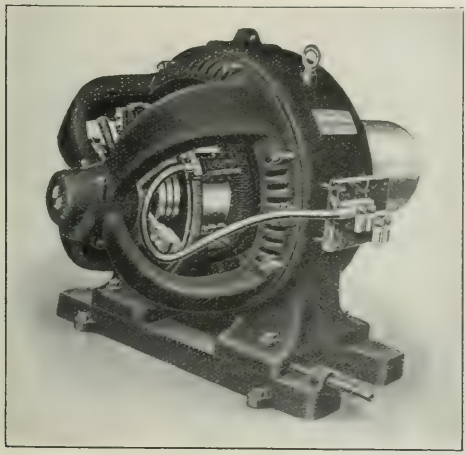


Fig. 1.—One of the New Three-Wire Generators Built by the Triumph Electric Company, Cincinnati, Ohio.

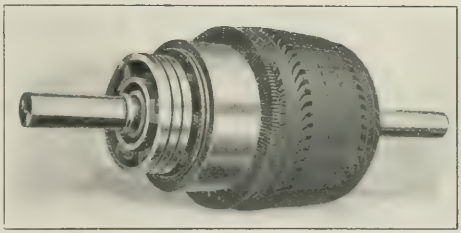


Fig. 2.—The Armature of the New Generator.

these generators can be operated in parallel with either two or three wire machines.

All the standard sizes of machines from 25 kw. up are built and the armatures of all are wound for 250 volts, which enables 125 volts to be obtained from either side of the system. The standard machines are designed to care for an unbalanced load of 25 per cent., but it is also possible to obtain other capacities. The balancing coils or transformer employed with this generator consists of three interconnected windings around laminated iron cores and are mounted in a cast iron case.

The Petroleum Iron Works Company

The Petroleum Iron Works Company, Sharon, Pa., is fabricating two of the highest self-supporting steel stacks used at any steel mills in the United States. These stacks are provided with steel breechings and are intended for the new plant of the Republic Iron & Steel Company at Haselton, Ohio. The hight of each stack will be 250 ft. above the foundation. The shells are 11 ft. 2 in. in diameter and are flared at the base to 20 ft. diameter. Steel flues connect the boilers directly to the steel stacks. The work will be completed early next year. This company is also to build a heavy steel standpipe, 16 ft. diameter by 120 ft. high, at the same plant. It will be of the most modern construction. The company has just completed for another customer two calcining cupolas, with blast pipes, platforms and charging buckets.

Work is well on the way with the fuel oil and gasoline storage tanks for the various United States Government battleship fuel stations. Large tonnage contracts are progressing for oil tanks for California, Texas, Louisiana, Mexico and eastern United States. Among other noteworthy jobs a large penstock was recently completed at Au Train, Mich., and a 96-in. diameter penstock is just being installed at Ephratah, N. Y. A large number of orders for water storage tanks, gas separators, oil condensers, steel ladles and miscellaneous steel construction will keep the plant busy some time. R. T. McCormick, formerly Pittsburgh manager of this company, is now established at the main office at Sharon, Pa., with the title of manager of sales. W. B. Rose, formerly with the W. B. Rose Supply Company, St. Louis, is now the St. Louis sales representative, having offices in the Title Guaranty Building, while J. H. Houze has been transferred from Tulsa, Okla., to Houston, Texas. G. P. Bard of the Bard-Cate Construction Company, Boonton, N. J., has charge of the Petroleum Iron Works Company's Eastern office, 50 Church street, New York City.

The regular meeting of the mechanical section of the Engineers' Society of Western Pennsylvania was held in the society rooms in the Oliver Building, Pittsburgh, on the evening of December 6. A paper entitled "Two-Cycle vs. Four-Cycle Gas Engines" was read by E. J. Fithian, manager of the Bessemer Gas Engine Company, Grove City, Pa. The author presented his paper under the headings of construction, reliability, economy and attendance.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:
1 to 1½ in. roundan dsquare ..... ₡ lb 1.90¢
1 2/10 to 6 in. X ⅜ to 1 in. ..... 2¢
1 2/10 to 6 in. X ¼ to ⅜ in. ..... ₡ lb 2.10¢
Rods ⅜ in. and 11-16 round and square ..... ₡ lb 2.00¢

Angles—
6 in. X ½ in. and larger ..... 2.00¢
3 in. X ⅜ in. and ½ in. ..... 2.05¢
1½ to 2 in. X ¼ in. ..... 2.10¢
1 2/10 to 2 in. X 5-16 in. and ⅜ in. ..... 2.10¢
1 to 1¼ in. X 5-16 in. ..... 2.15¢
1 to 1¼ in. X ¼ in. ..... 2.20¢
⅞ in. X ⅜ in. ..... 2.10¢
¾ in. X ⅜ in. ..... 2.15¢
¾ in. X ¼ in. ..... 2.25¢
⅝ in. X ⅜ in. ..... 2.35¢
½ in. X ⅜ in. ..... 2.45¢

Tees:
1 in. ..... 2.05¢
1¼ in. ..... 2.05¢
1½ to 2 in. X ¼ in. ..... 2.15¢
1½ to 2 in. X ⅜ in. ..... 2.25¢
3 in. and larger ..... 2.15¢

Beams ..... 2.10¢
Channels, 3 in. and larger ..... 2.20¢
Bands—1½ to 6 in. 5-16 to No. 8 ..... 2.50¢
"Burden's Best" Iron, base price ..... 2.75¢
"Burden's Best" Iron, base price ..... 2.95¢
Norway Bars ..... 3.00¢

Merchant Steel from Store—

per lb.
Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.20@3.00¢
Best Cast Steel, base price in small lots ..... 7¢

Sheets from Store,—

Black	One Pass, C. R. Soft Steel	R. G. Cleaned
No. 16	₡ lb 2.55¢	2.80¢
Nos. 18 to 20	₡ lb 2.75¢	2.90¢
Nos. 22 and 24	₡ lb 2.85¢	3.10¢
No. 26	₡ lb 2.90¢	3.30¢
No 28		

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₡ lb 12 @14½
Parent Planished, W. Dewees Wood ..... ₡ lb A. 11¢; B. 9¢ net

Galvanized.

Nos 12 and 14 ..... ₡ lb 2.95¢
Nos. 22 to 24 ..... ₡ lb 3.25¢
No 26 ..... ₡ lb 3.50¢
No 28 ..... ₡ lb 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ..... ₡ lb 3.75¢
No. 26 ..... ₡ lb 3.75¢
No. 28 ..... ₡ lb 4.00¢

Corrugated Roofing—

2½ in. corrugation.	Painted	Galvd
No. 24 ..... per 100 sq. ft.	3.85	4.80
No. 26 ..... per 100 sq. ft.	4.20	4.40
No. 28 ..... per 100 sq. ft.	4.30	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A" Charcoal:
IC, 14 X 20 ..... $6.25
IX, 14 X 20 ..... 7.50
A. Charcoal:
IC, 14 X 20 ..... $5.00
IX, 14 X 20 ..... 6.50

American Coke Plates—Bessemer—

IC, 14 X 20 ..... $4.40
IX, 14 X 20 ..... 5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating $8.50
IX, 20 x 28 with an 8 lb. coating 10.50

Seamless Brass Tubes—

List November 13, 1908 ..... Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 ..... Base price 18¢

Copper Tubes—

List November 13, 1908 ..... Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 ..... 19½¢ ₡ lb

High Brass Rods—

List August 1, 1908 ..... 14½¢ ₡ lb

Roll and Sheet Brass—

List August 1, 1908 ..... 14½¢ ₡ lb

Brass Wire—

List August 1, 1908 ..... 14½¢ ₡ lb

Copper Wire—

Base Price, ... Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. quantity lots ₡ lb 18 ¢
Sheet Copper Cold Rolled, 1¢ ₡ lb advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 1¢ ₡ square foot
Sheet Copper Polished over 20 in. wide, 2¢ ₡ square foot
Planished Copper, 1¢ ₡ square foot more than Polished

METALS—

Tin—

Straits Pig ..... ₡ lb 39 @39½¢

Copper—

Lake Ingot ..... ₡ lb 14½@15 ¢
Electrolytic ..... ₡ lb 13½@14¢
Casting ..... ₡ lb 13½@14¢

Spelter—

Western ..... ₡ lb 6¼@6½¢

Zinc.

No. 9, base, casks ..... ₡ lb 5¼¢ Open ..... ₡ lb 5¾¢

Lead.

American Pig ..... ₡ lb 5 @5¼¢
Bar ..... ₡ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed ..... ₡ lb 28½@29¼ ¢
No. 1 ..... ₡ lb 21½@22 ¢
Refined ..... ₡ lb 19 @19½¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₡ lb ..@10¢
Hallett ..... @10¢
Other Brands ..... @9½¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

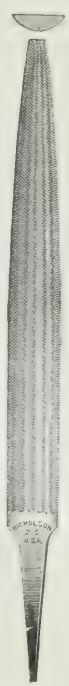
No 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₡ lb 11.00@11.25
Copper, Heavy and Wire	₡ lb 10.75@11.00
Copper, Light and Bottoms	₡ lb 9.75@10.00
Brass, Heavy	₡ lb 7.25@ 7.50
Brass, Light	₡ lb 5.75@ 6.00
Heavy Machine Composition	₡ lb 9.75@10.00
Clean Brass Turnings	₡ lb 7.25@ 7.50
Composition Turnings	₡ lb 8.25@ 8.50
Lead, Heavy	₡ lb ..@ 3.25
Lead, Tea	₡ lb ..@ 3.50
Zinc Scrap	₡ lb ..@ 4.00

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THE IRON AGE

Established 1855 — New York, December 15, 1910 — Vol. 86: No. 24

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-18 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.00 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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A Drifting Market

Some December Rollings on Rails for 1911

Unprecedented Stocks of Lake Ore—A Foreign Pool in Ferrosilicon

The iron trade is resigning itself to a period of drifting, with little expectation of early developments affecting either prices or orders. It is evident from the character of some recent new business that consumers of finished steel are running on scant stocks, and that mill operations now more closely measure the country's consumption.

The attitude of producers on prices was illustrated by the action of the sheet manufacturers at their Pittsburgh meeting December 8, which was the largest ever held. They decided that conditions do not call for any change, and that in the immediate future what has been the nominal basis should be made the actual basis of sales. It is familiar history that price maintenance is less difficult after a period of cutting in which buyers have generally supplied their wants for a period.

Rail contracts have been so much threshed over in anticipation that their value as a factor of encouragement is already discounted. The Pennsylvania order, with its condition of heavy discards from the rail bloom, has not yet been accepted. The New York Central tonnage, which is likely to be 125,000 to 130,000 tons, or more than has been counted on, likewise involves some questions of specifications. In two or three cases rail mills which would have been idle most of this month, have been given preliminary orders for early rolling, but appiying on next year's contracts. The Ontario & Western has made some purchases, and has other orders pending. The Delaware & Hudson is in the market for 10,000 tons, most of which is expected to go to the Bethlehem Steel Company.

Car inquiries include 1500 to 2000 for the Buffalo, Rochester & Pittsburgh and 1000 for the Kanawha & Michigan. The Harriman lines is figuring on 153 locomotives, and the Boston & Maine is about to buy a considerable number.

There is still a good volume of structural work, but fabricating prices are so low that only the best equipped works can make a profit. The new Bureau of Engraving and Printing at Washington will require 4000 tons. The Pennsylvania Terminal Post Office in New York, 6200 tons, on which bids exceeded the appropriation, will be readvertised.

Three caissons for Government dry docks, one in Cuba, one in New York harbor and one on the Pacific Coast, will furnish much needed plate mill tonnage.

Prices on steel bars have not been strictly maintained at 1.40c., Pittsburgh, but the activity in this direction has not affected the large tonnage of contract business now on the books. A conference of bar manufacturers will be held in Pittsburgh, December 15. Plate manufacturers held a meeting there on Wednesday, December 14.

Tin plate manufacturers at a Pittsburgh meeting

December 14 declared for the continuance of present prices. Some irregularity in black plates has been a disturbing factor in the sheet market.

Low prices were brought out by two cast iron pipe lettings of the week—$24.35 per net ton for 3500 tons at Cleveland, and $21.38 for 1500 tons at New Bedford, Mass.

In pig iron the only question of moment is how soon the merchant furnaces will blow out enough capacity to put production below consumption. The idle list is growing more rapidly. The Steel Corporation blew out another Gary furnace this week. Northern foundry iron has been dull and drooping, but Southern producers are rather less inclined to take $11 business for the second quarter of next year.

The shipments of Southern pig iron abroad can scarcely be dignified as a movement. A recent sale of 300 tons for Italy was made by the Tennessee Company and for some time occasional small lots have been taken by Italian foundries.

Makers of 50 per cent. ferrosilicon in Europe have formed a pool and arranged for a 50 per cent. reduction in output, a capacity of 30,000 tons being included.

Iron ore stocks on Lake Erie merchant docks December 1 were 9,414,000 tons. It is probable that Lake ore in furnace yards, including those in the Chicago district, is more than double this amount, making a total close to 30,000,000 tons. This is probably the largest amount of ore that has ever been piled up ahead of the industry, and means that many consumers have all the ore they will need until late in 1911.

Pig tin reached a new high point for the year this week, at 38.55c.

A Time for Finding Economies

The amount of prominence lately given to efficiency as a measure of successful industrial management is entirely in line with another development of the present slackening in business—the increasing application of the same test to the rank and file of workmen. In the news dispatches of the past week, it has been stated, that a large locomotive company will gradually reduce working forces unless locomotive bookings are soon increased. An officer of the company, referring to the labor situation at its works, said: "We are taking on and we are dropping a number of men. We have to hire about 500 men to get 100 good employees." The remark is an index to the sifting that is going on in many industries now that the supply of men is noticeably greater than the supply of jobs.

In 1908 the decline in business enabled many manufacturers to set up new standards of performance in the shop. It proved a good time for the introduction of premium and bonus systems and for the appraisal of the value of individual workmen. In the past two years, apart from the few lines directly affected last year by the excesses of the automobile industry, the pressure has not been such as to break down the new shop standards. And now, whether in partial response to an overwhelming demand at the polls last month for a reduction in the cost of living, or because forces which have been for some time at work for a readjustment are acting more directly than before, manufacturers are facing a time when labor union and other uneconomic restrictions will count less and less.

The railroads have been accused of many offenses against efficiency, but in 1908 they were credited with some very able contriving, after they had been debarred from reducing expenses by cutting wages. They found ways of doing more work with fewer men. Much of the advantage then gained was swallowed up in the wage advances of this year; but had it not been for the economies they were forced to learn in 1908 their net earnings in 1910 would have told much more heavily against the shippers' case.

Such savings in operating costs, as the railroads and the manufacturing industries must enforce in times like the present and those just ahead, are the natural remedy for what was becoming a serious vice—loading every waste and every deficiency of manager and workman upon the ultimate consumer.

Two Routes to Lower Prices

When a certain billion-dollar Congress was attacked for extravagance, the answer was made that this is a billion-dollar country. The call for lower prices that has been gathering force will likewise encounter the argument that this is a high standard and therefore a high cost country. It will be found that some who are now most insistent for a lower level really want what they buy to come down, so that they can either buy more than at present or have a larger surplus income, or both. They are not advocating reductions in what they have to sell, whether labor or manufactured product.

The history of low-price periods in this country has been one of industrial depression and distress. Workmen have not complained in such times of the level of commodity prices, but of the difficulty of getting money with which to buy. The trouble has been that in getting low-priced food and clothing, which they wanted, they also had to take shortened hours and a small wage per hour, which they did not want. The present demand for more economy and more efficiency is not a call for low wages. But the question comes up whether a country used to the American scale of living can change in any orderly way and by the application of more "scientific" methods of manufacture and transportation to a basis which will be more generally popular. If we look to the conditions in other times of low prices for answer, we shall find testimony differing both as to the facts and their meaning. For example, the New York *Evening Post* makes this comment on the position of the steel industry as the result of the depression of the eighteen nineties:

> Prior to 1893 the country was proud enough of its steel producing industry. It doubted if any plants, more serviceable and efficient, could be found on any other continent. When the prolonged depression of the nineties came, we made some very unpalatable discoveries, both as to existing methods of production and methods of financing. Some people in the industry hinted that the Government ought to help them. Others sat down and wrung their hands, announcing that the country was going to the dogs. There were, however, others of that sturdy American type which is keen for innovation, which believes that industrial obstacles were made to be surmounted by enterprise and invention, and which assailed the problem with a comprehensive vigor which let no consideration of the smallest sort escape it. The result we know. That was in 1894 and 1896, and by 1899 we were driving England and Germany from the neutral export fields, and European public men were warning the world against the American invasion.

There is another view to be taken of the low prices which marked the years 1896 to 1898 in the American iron trade, and that is that the difference between that level and the level of to-day is almost wholly a matter of raw materials and labor. Mesaba ore at $1.80 to

$2 a ton, Connellsville coke at 90 cents to $1.10 a ton and common labor at $1 a day—which altogether would represent $7 to $8 less on a ton of iron than is paid for these three items to-day—measure the unparalleled distress accompanying that invasion of European markets by American steel. American engineering skill certainly was busy in that dark period, and the results have been of continuing value to the industry, albeit the investments demanded by the present engineering régime are enormous. But it was the sacrifice of ore and coal resources and the poverty of labor that chiefly advertised themselves in the American invasion of 1896 to 1898. With the latter-day basis of ore and fuel values and the present scale of iron and steel works wages, invention and scientific management will find it difficult to make reductions in cost that will at all compare with what are pointed to above as the achievements of 15 years ago. A clear distinction must be made between saving of waste and increase in efficiency as a way to lower prices, and the route which means a calamitous slaughter of labor and waste of unparalleled mineral resources. And this is by no means saying that a moderate middle ground for ore and coke values would be incompatible with prosperous conditions in iron and steel.

Concerted Action on Workmen's Compensation

At a meeting of the Boston Branch, National Metal Trades Association, last week, prominent speakers dwelt earnestly upon the necessity of more general consideration being given by manufacturers to legislative matters. They urged particularly that the problem of workmen's compensation be taken up at this time, individually and collectively, by employers of labor, so that the strong impulse toward the general adoption of the principle in this country may be kept within safe limits. It is surprising how few business men have any real understanding of this great subject, yet, unless signs fail, most of them will taste the fruits of its growth in the near future. Some of the great associations of manufacturers, however, are giving it most earnest attention and have experts engaged in investigations, in the hope of arriving at conclusions which, embodied in statutes, will be equitable as between employers and employees.

The need of a change from the present unsystematic method of determining recompense to workmen who are victims of accident during their employment is advocated by many owners of industrial establishments. They hold that the liability of employers for accidents to workmen should be based on a system of universal compensation, regulated so as not to increase manufacturing costs inordinately. Such workmen's compensation laws as those of Great Britain work much injustice to the owners. Liability is altogether too general under the present interpretation of the British statute. The complications in connection with accidents of contributory partial disability of the employee, resulting from disease or previous injury, play too important a part in the cost of manufacturing. This is only one of the fallacies of the act. The British law compels no insurance of the workman against injury. Germany, whose system is held up by many as a model, requires contributions to the accident insurance fund from the State, the employer and the workman. The degree of paternalism is a question of no small importance; strong argument exists for minimizing this factor, that the independence of the American workman may not be disturbed. The compensation laws already enacted by some of the States leave much to be desired, as shown by the dissatisfaction concerning them. It is not proposed to discuss the merits of such laws at this time, but to emphasize the demand for greater active interest in the subject. The views of practical men are needed in the work. They are leaving too much to the theorists, whose ideas should be modified or corrected by the investigations of practical yet sympathetic business men.

Keeping Labor in the Suburbs

Manufacturers whose works are in suburban neighborhoods, especially in sections that are growing rapidly because they are sought by industries requiring the same general class of labor, are troubled continually by the inability of their workmen to find satisfactory homes for their families or boarding places for themselves. To add hundreds of workmen each year to the population of such a place requires a much more rapid growth in the number of dwellings than is usually the case. Raising the standard of employment, by increasing the percentage of more highly skilled labor, creates another demand—that for better places in which to live. Various remedies have been tried, including houses built by the manufacturer for rental to his people and restaurants where they can secure their noon meals at low cost.

The Taft-Pierce Company, Woonsocket, R. I., which does contract work in metal and machinery, went at the solution of such a problem some months ago with much vigor. When running full, about 200 expert toolmakers are employed, which is a very great percentage of the total force. Much difficulty was experienced in keeping this highly paid labor, in spite of a liberal wage scale, because the men could find no satisfactory boarding places in the city, which is built about the textile industry. The company decided to establish a boarding house of its own, where men could get their meals at the current rate and rooms if they wished them. The result is an establishment which may be considered as a club rather than a boarding house. Situated in the industrial heart of the city, the building may be compared favorably with the average country club in the details of construction, furnishings and appointments, as well as in its cuisine. The rooms are occupied constantly by the men and the demand is for more of them. A great many of the employees, as well as the managing officers, use the dining room freely. When the conditions are compared with those of the boarding house of a mill town, they live in luxury. They are satisfied, and no doubt the experience of the first few months (the place was opened for business in July) will be accentuated as time goes on, especially when industry is rushing and the demand for high class machinists is constantly attempting to draw men away from such a force as that at Woonsocket.

Modern civilization has raised the general standard of living in this country and employers must take that fact into consideration if they are to maintain their working forces against the blandishments of competitors needing labor. If works are located where living conditions are unattractive, the manufacturer

must be the sufferer as well as his workmen. If he has to take steps which require the expenditure of money in order to keep his men, the investment is a good one, if the undertaking is worked out intelligently, having due regard to the kind of people which the effort is intended to affect. If the end is secured, the expense and trouble are made up many times over in the industrial results.

Correspondence

Efficiency and Lower Prices

To the Editor: Louis D. Brandeis of Boston, a man of much public work and public spirit, has recently laid us under obligations by formulating a plan for meeting a crying need of the hour. In addressing the Interstate Commerce Commission in Washington he struck the keynote as follows: "As an alternative to the practice of combining to raise rates, and hence to increase prices, we offer co-operation to reduce costs and hence to lower prices." Mr. Brandeis' topic on that occasion was railroad freight rates, but his proposal is of much wider applicability.

It has always been plain, and recently has often been stated, that the process of jacking up in rotation the various elements of the cost of living, which has been in progress for some years, could not go on forever. It was felt in a general way that "what goes up must come down," but Mr. Brandeis is the first, so far as I have observed, to propose a wide co-operation to that end. His aim, as I understand it, is to establish some measure of equilibrium between income and outgo by reducing expense instead of keeping to the heretofore popular policy of crowding up prices—a policy which he indicated in referring to the "vicious circle of ever increasing freight rates and ever increasing cost of living." Co-operation is the essence of Mr. Brandeis' suggestion, for it is clear that no one institution or class of institutions in commerce, industry or transportation can effect anything adequate in price reduction. All will have to work together But it is necessary to begin somewhere, and as labor is the foundation of nearly all costs it furnishes the logical starting point.

LACK OF LABOR EFFICIENCY.

Wages are assumed to be the chief factor in labor costs, but within pretty wide limits efficiency is of equal importance. Lack of labor efficiency is recognized as one of the serious economic problems of the time and as a terrible price hoister. Labor inefficiency is of two sorts. On the one hand, that for which the employers are accountable, like defective shop equipment, methods of supervision and failure to maintain the best relations with workmen which can be established; and, on the other, that which must be laid at the door of the men themselves or of the unions. To prepare for effective co-operation, the employers might well subject their plants and systems to renewed and rigid scrutiny and clear them of all faults which contribute to inefficiency of labor, as indicated in two recent and very interesting letters from Max H. C. Brombacher in *The Iron Age*, while the men might advantageously seek to gain the broadest view of their work and its results.

As a motive for this broader view, it is not needful to invoke altruistic sentiment on the part of the operatives. Enlightened selfishness should prompt them to their best effort. No class of our people complains more bitterly of the high cost of living than the working forces of industry and transportation, and none perhaps has contributed more to raise prices. They have pressed for a shorter and shorter day and have fought for, and usually won, higher and higher wages. They have also in numerous cases added to the burden of cost imposed by their victories, by allowing their efficiency to run down along with their decreasing hours of labor, or in inverse proportion to their increased pay. This latter factor of high prices the men ought to proceed to eliminate at once in their own interest, just as the employers should eliminate their promotion of inefficiency through reduction of piece work prices, as indicated by Mr. Brombacher.

LABOR LEADERS SHOULD MODIFY THEIR ATTITUDE.

John Mitchell does not favor too much efficiency, according to newspaper reports. He objects to the specialization of labor beyond a certain point, and says: "Organized labor is against the premium or bonus system of payment for workmen because that is designed to speed up the workman beyond the safety line. That is bad economy." "It is sometimes charged," says he, "that labor unions tend to level down workmen. This is not true. Labor unions do not say that employers shall not pay a perfectly competent and efficient workman something in addition to what he pays the others." These quotations from one of the most respected leaders of organized labor indicate an attitude which will have to be modified if there is to be co-operation for lower prices. Such co-operation does not necessarily call for any general reduction in the amount of money received by workmen. Most people indeed would be glad to see this amount increased. But it does call for the removal by labor itself of all the props which support laziness and inefficiency. Mr. Mitchell's real contention seems to be that the employer should pay the many-times-raised schedule to the veriest dub in the shop, and that whenever an operative shows symptoms of a willingness to do a fair day's work he should immediately be rewarded by extra pay. Even then Mr. Mitchell objects to bonuses on the ostensible ground that it speeds the willing workman up too much for his health, but one involuntarily suspects that the real reason is because such speeding up throws the inefficiency of the scale-paid dub into too sharp relief and may even result in his discharge. Specialization and unrestricted earnings at a fair rate would seem fair to everybody.

THE EIGHT-HOUR WORK DAY TOO SHORT.

But there is another way in which labor can co operate for lower prices, not only without loss but with decided gain. One of labor's victories above referred to has been the progressive shortening of the work day in many lines to eight hours. I question the advantage of this victory to those who won it, but there is no question of its disadvantage to the employers, and to the nation viewed as an economic unit. There must be no such thing as a procrustean work day to which all trade should conform. Some occupations are less and some more exhausting, and the hours of labor must be governed to some extent by these characteristics; but in the majority of trades a nine-hour day is not too much for the health. I think experience has proved that in a large majority of cases the extra hour which the workmen have deducted from their productive period is not so used as to increase but rather to decrease their working efficiency. A return to the nine-hour day in many occupations without any reduction in the present hour or piece wage would have a salutary effect from several standpoints.

It is obvious that every extra piece turned out during a day pulls down the cost of the day's product by reducing the overhead charge on each item. Therefore, if the individual workman were allowed to earn more money and at the same time reduce the total per piece cost of his product, it would push down the cost of living and help the nation in its efforts for more business in competition with other countries. That competition is going to become more keen seems quite certain. The high tariff is now in its last period. Even the strongest of the stand-patters are becoming convinced that tariff revision cannot be long postponed and that it will not be upward this time. It behooves us to set our house in order and to get the prices of that which we have to sell on a level where we will be able to meet Europe in the markets of the world, and to reduce the cost of living to our own people. To accomplish this without forcing down the rewards of labor requires co-operation for lower prices by the removal, on the one hand, by the employers of bad equipment, bad management or restriction of earnings, and on the other hand, by the aban-

donment of premiums on inefficiency, or insistence upon an uneconomically short work day on the part of the associations of labor. CHARLES T. ROOT.

The Education of Labor

To the Editor: Permit me to trespass upon your space in order to explain and to amplify the remark I made in my letter of December 5, anent the possibility, desirability and necessity of our educating our labor (unions). As the cost of living impresses itself upon their minds automatically, it follows that the first thing which an employer should take the trouble to make clear to his men is that, in the long run, to shorten hours is to raise the cost of living. That cutting down production is bound to raise prices is understood by very many; that shortening hours is only another form of decreasing production is not understood by so many. Having made these facts clear to his men, it is not so difficult to make clear to them that, in the long run, the way for them to attain their desired goal of decreasing the cost of living is to increase their efficiency, *i. e.*, their output.

EFFECT OF SHORT HOURS AND CLOSED SHOP IN THE BUILDING TRADES.

How shortening the hours of labor results in increasing rents has lately been pointed out by a report in regard to the effect of short hours and the closed shop in the building trades. Obviously, a house built upon the basis of the eight-hour day, with a wage rate based upon equalizing the loss of time entailed by the closed season (winter), as well as by inclement weather in the open season, is bound to cost much more than a house built upon a schedule of longer hours. The increased cost of building the house is taken into account by the assessors for taxing purposes, of course. The net result is an increased rent which labor pays. That "labor pays" is what very few of the men understand. But for that matter, and as indicative of relative intelligence, the number of house owners who understand that the occupier (renter) pays is not exactly legion either.

To any one who, from the beginning, has been taught that nature, in the last solution, invariably premiumizes efficiency and penalizes inefficiency, that it knows nothing about "getting something for nothing," and that it knows nothing about equality anywhere, there is nothing mysterious about the fact that cutting down efficiency—*i. e.*, output per capita or per machine or per acre—invariably results in increasing the cost of living; and that wage increases seldom square the increased cost of living produced by these attempts to, so to speak, "stand nature on her head."

People grounded in these elementals understand, further, that commerce—*i. e.*, labor— is the basis of national life and growth; hence, that the nation which starts out to shorten hours of labor, without the concurrence of its principal competitors among commercial nations, is bound to lose out in the race for the world's business; it finds its commerce diminishing, hence its means of employment for its artisans diminishing. The end is that an unavoidable necessity arises for reducing the wage rate. This process is inevitable; so inevitable that one wonders at the blindness of the labor unions in agitating continually for shorter hours.

NATURE'S LAWS RELATIVE TO ECONOMICS ARE GENERAL.

It is known of all men that Germany and America are outstripping England gradually but surely in the race for the world's business. It is also well known that England is that nation in which the peculiar principles advocated by labor unions have had fullest sway. Cause and effect, from the standpoint of economics, never had a plainer illustration; a blind man can see the end if that policy be persisted in. And let no one delude himself with the idea, some years ago advanced with regard to bimetalism, that there is an American system of finance, therefore an American law of economics. There may be an American misapplication of nature's laws relative to finance and to economics.

This latter possibility is indicated by the case recently pointed out by the *Sun*, where a Congressional bill carried a clause forbidding the use of power presses already purchased and paid for. The object of this "rider" was to necessitate hand labor; the result was a loss of over $750,000. It seems to me that the most benighted unionist ought to see that this loss was out of all proportion to any possible benefit to the employees affected; that if it was desirable or necessary to coddle that particular form of labor, it would have been both cheaper, as well as more defensible from an economic standpoint, to pension the whole outfit. This would at least eliminate the stigma of this country prohibiting the use of machinery. That a country like ours, which has built itself up and prides itself on the advantages of using machinery, should thus ignorantly legislate against the use of machinery beggars belief.

That an appropriation bill carrying such a rider should pass both Congressional houses is an instance of coddling inefficiency, which one would not expect even from an economic or sociological mollycoddle. He would see that justice would require the extension of this discrimination against the use of machinery to all departments, and legislators ought to see that either such extension of discriminations against the use of machiery should be enacted or the ban should be lifted in this case. Incidentally, we are in no sort of shape to throw away the amount of money involved; and if there ever was a time in which our Government needs to set its people an example of sound economics and economical government, now is the time.

LABOR PAYS FOR ALL ATTEMPTS TO DEFY ECONOMICS.

Were our labor instructed in the principles of sound economics, it would not stand for this sort of thing; would recognize that labor itself pays for all such attempts to "get something for nothing" and to discriminate against the general application of sound economic principles. It would, of course, be far better, as a matter of fact, were these elemental truths drummed into our children in our schools, instead of being fed upon a curriculum based upon the fallacy that "all men are equal"; hence, that one (educational) bill of fare is applicable to all children of a given age. Absorbing food without digesting it results in dyspepsia, and stuffing into a child education (knowledge) which his powers of digestion are not equal to assimilating results in mental dyspepsia. Of the two, physical dyspepsia is the least harmful by far, and mental dyspepsia is sometimes known as "half-bakedness." Our system of education is an immense success as a producer of mental dyspepsia; it is responsible for much of the foggishness in regard to what liberties we take with the laws of nature.

Woodrow Wilson has lately given expression to the view that, as a nation, we are too prone to legislate for evils instead of educating for their elimination; the shortening of the hours of labor employed by the Government is one instance of this tendency. Why should a Government employee be better paid for lesser output than the employee of private activities? Why should Government demoralize private activities by premiumizing inefficiency? And last, why should a government set its people the example of setting the laws of sound economics at defiance? Admitting, for the sake of argument, what I do not believe, that we should strive to instal the universal eight-hour day, why do we legislate instead of educating for this ideal? Will education perhaps show the fallacy of the ideal?

HOW AN EMPLOYER SHOULD HANDLE HIS MEN.

Experience and observation have convinced me that it is possible to teach labor sound economics. But there are two conditions precedent. One is that labor must feel that the employer means fair; the other is that labor must know that the employer knows what he is talking about, that he knows a day's work when he sees it, that he knows his fellow man, &c. Experience and observation have also convinced me that it pays the employer, in concrete shape, to play fair with his men and to take the trouble to make plain to the men one's *leitmotif*.

I have seen a superintendent cut a piece work rate in half without eliciting a murmur of dissent from the employee affected. The superintendent was a man who had that innate broadness of heart which impels a man to act as wisely from feeling as does the man with the

broad mind who is impelled to act wisely from real intelligence. He was a thorough judge of men, and he would not know what the word "psychologist" meant at that. He had established a piece work schedule based upon a fair, not high, day rate per hour and a difference of about 1.3 (66 2-3 per cent.) between the day rate and the piece work rate; that is, a man could earn on piece work about one-third more than the day work rate per hour.

He had proved to the men that he was satisfied with getting his work done at this rate; that the more the men earned the better he was pleased. His men earned as high as 39.2 cents per hour on piece work; a man who could not or would not get on piece work labeled himself and punished his own pocket. In the case I saw he had caused to be made devices to increase the man's output. He approached the man with this statement: "Bill, I've spent some money on these jigs and I think they'll double your output; now, of course, the company expects me to get the cost of these jigs back. I want you to cut the rate in half, but, understand, you shall have as much money as you got last month at the old rate. But I expect you to play fair; give me all that there is in you; you know you need not fear a cut. I'm satisfied with getting my rate on this job cut in half; you are more than welcome to all you can earn."

I saw this employee a week or so after this, and he told me he was doing about 10 per cent. better per hour on the new rate than he had done without the jigs on the old rate. That is the kind of man to have at the head of a shop. He will get the confidence of his men and will hold it. He has educated his men and always explains to them just what he is getting at and "the why." He bases his piece work rate on the average man being only two-thirds of a first-class man—*i. e.*, the 66 2-3 per cent. efficiency proposition is the average man, and he can evolute up to the efficiency of a 100 per cent. man—if it is in him. The superintendent is there to help him, that the man knows; hence, he strives for a goal which he knows is potentially attainable.

The path of peace and of profit in matters industrial lies along lines which are truly educational and which are based upon the firm conviction that the "square deal" is the Indian sign of "real intelligence."

MAX H. C. BROMBACHER.

NEW YORK, December 12, 1910.

Efficiency in American Shipyards

W. L. Capps, chief constructor of the United States Navy, chief of the Bureau of Construction and Repair, makes some interesting statements in his annual report to the Secretary of the Navy for the fiscal year 1910. He calls attention to the increasing rapidity of construction of naval vessels in the United States during the past few years. "This increase in rapidity," he says, "is due in part to greater familiarity with Government work on the part of contractors and in part to a more complete preparation of plans than was hitherto practicable; also to the efforts made to restrict changes in contract plans to the lowest number compatible with the interests of the Government. As a matter of fact, the rapidity of warship construction in the United States compares most favorably at the present time with the rate of such construction in those foreign countries which have established a reputation for rapidity in such work." He further states that the "decreased time of construction has been obtained concurrently with a decrease in the unit cost of construction; in fact, the total cost per ton of displacement of battleships built by contract for the United States Navy within the past few years has been less than the total cost per ton of displacement of similar vessels built in foreign countries, and this in spite of the higher rates of wages paid to workmen in United States shipyards."

The population of the city of Spokane, Wash., is 104,402, an increase of 67,554, or 183.3 per cent.

The Proposed Increase in Railroad Efficiency

Commenting on the claims made at the recent rate hearing at Washington of possible savings that could be pointed out to railroad managers, the *Railway Age Gazette* says:

"We are not optimistic as to Mr. Brandeis' chances of success in his role of instructor in a course on practical railroading before a classroom full of railroad presidents. But we can hope for some indirect results of the publicity given to his claims. It will do good to air the whole subject of scientific management, betterment work, efficiency or whatever one calls it. Some operating officers and many boards of directors need to know what efficiency means. Ordering a subordinate to cut his expenses in two is not what it means. A superintendent of motive power has gone through a hard winter with his power in bad shape. He is told to get it in good shape for the next winter, perhaps with the intimation that his position depends on his success. He builds up a well organized, smooth working shop force, improves his repair shop facilities and gathers the right men at his coaling stations. Along in June an order comes down from above telling him to cut expenses in two. What can he do? His motive power starts the next winter in worse shape than ever. One cannot get a high unit of efficiency without holding trained employees during slack periods so as to be ready when the rush comes. It takes an expensive plant to do a wide variety of work cheaply."

Iron Ore on Lake Erie Docks December 1

It has been the custom of Cleveland iron ore interests for many years to collect figures showing iron ore on railroad docks at Lake Erie ports at the close of navigation, December 1 being the usual date. Reports which have been made to *The Iron Age* from the various merchant docks, leaving out blast furnace docks on the lake front or on rivers at the various ports, show total stocks on December 1, 1910, of 9,414,670 gross tons. This compares with 8,965,789 tons December 1, 1909. The increase is 448,881 tons, whereas it had been estimated that about 1,000,000 tons more ore would be on dock this year than one year previous. The returns by ports are as follows:

Iron Ore on Lake Erie Docks, December 1, 1910.—Gross Tons.

Ashtabula	3,318,051	Huron	375,118
Buffalo	452,795	Lorain	259,448
Cleveland	1,599,046	Toledo	440,053
Conneaut	1,329,997	Sandusky	17,728
Erie	782,464		
Fairport	839,970	Total	9,414,670

Stocks in furnace yards, which are doubtless more than double the stocks on docks, need to be known to make any correct analysis of the situation. It is safe to reckon, however, that Central Western furnaces have available in their yards and on docks enough ore, if it could be apportioned to all users—as it cannot be—to supply the needs of all far into the fall of 1911.

The Lewis Institute, Chicago, announces that the winter quarter will open in all departments January 3. An evening course in gas engines is announced. The present quarter shows the largest number in attendance in the history of the institute, 2700 being registered, counting both day and evening students. On December 16 the first class to complete the two-year co-operative course for machine shop apprentices will leave the institute. There are 20 of these boys, and they are making plans to enter the evening classes in January, in order to continue their studies. Candidates are now being registered for the entering class in the co-operative course. They will begin work January 3. These boys pass their time alternately between the institute and the machine shops, changing about every week.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Dec. 14, 1910.	Dec. 7, 1910.	Nov. 16, 1910.	Dec. 15, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.25
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	14.75	14.75	14.75	18.75
Basic, Valley furnace	13.50	13.50	13.25	17.00
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	13.90	13.90	14.15	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.50	27.50
Forging billets, Pittsburgh	....	....	28.50	31.00
Open hearth billets, Philadelphia	25.50	25.50	25.50	30.60
Wire rods, Pittsburgh	28.00	28.00	28.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	*15.50*	16.00	16.00	20.00
Iron rails, Philadelphia	*17.00*	18.00	18.00	20.50
Car wheels, Chicago	13.50	13.50	13.50	18.50
Car wheels, Philadelphia	*13.25*	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	13.75	13.75	14.25	18.25
Heavy steel scrap, Chicago	*12.00*	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*12.50*	12.75	13.50	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.35	1.35	1.37	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.60
Common iron bars, Pittsburgh	1.40	1.40	1.45	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.60
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.35	1.65
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	**2.20**	2.15	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.85
Cut nails, Pittsburgh	1.60	1.60	1.60	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.00	13.00	13.00	13.75
Electrolytic copper, New York	*12.75*	12.87½	12.87½	13.50
Spelter, New York	*5.85*	6.00	5.95	6.40
Spelter, St. Louis	*5.75*	5.85	5.80	6.25
Lead, New York	4.50	4.50	4.40	4.60
Lead, St. Louis	*4.35*	4.40	4.30	4.52½
Tin, New York	**38.55**	37.95	36.50	32.80
Antimony, Hallett, New York	7.75	7.75	7.75	8.25
Tin plate, 100 lb., box, New York	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net.; tees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net, hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼ in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; Nos. 27 and 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.65c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

Butt Weld.

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
⅝ to 1¼ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	78	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	71	68	70	64
⅝ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
⅝ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	60	62	56	56
7 to 8 in.	59	49	55	45

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1 to 1½, 2 to 3 in.	Butt Weld	Plugged and Reamed. Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.
2, 2¼ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43
2¼ in. and smaller, over 18 ft., 10 per cent. net extra.		
2¾ in. and larger, over 22 ft., 10 per cent. net extra		

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, December 14, 1910.—(*By Telegraph.*)

Pig Iron.—The market is neglected, there being no new inquiries of moment. Stocks of pig iron are still increasing, and no permanent improvement in the market can be expected until the output is materially diminished. Prices are largely nominal. We quote standard Bessemer iron, $15; basic, $13.50; malleable Bessemer, $13.75; No. 2 foundry, $13.75, and gray forge, $13, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—There is very little new inquiry, and only occasional sales of small lots of billets, sheet and tin bars are being made. Small lots of open hearth sheet bars are still being offered by outside mills below $24, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh, full freight to destination added.

(*By Mail.*)

Reports this week are somewhat conflicting, two of the larger steel interests stating that both specifications and orders in the past week have shown improvement, while others say that conditions are quieter than they have been at any time during this year. The trade is still apprehensive that a revision in prices on finished iron and steel, to be followed by lower values on pig iron, billets and bars, may come shortly after the first of the year, and for this reason distributers and consumers are placing orders with a good deal of caution and only to cover actual needs. The sheet market is reported to be on a better basis as a result of the meeting held here last week.

Ferromanganese.—The demand is light. A local consumer has bought a carload for prompt shipment at $38.50, Baltimore. We quote 80 per cent. foreign, for delivery through the first half, at $38.25 to $38.50, Baltimore, the rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—There is practically no new inquiry. We quote 50 per cent. for delivery over first half at $54 to $55, and for prompt delivery at $55 to $55.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—A sale of 500 tons of grooved steel skelp at about 1.25c., delivered at buyer's mill, Pittsburgh district, is reported. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—Some small inquiry is being received for both Bessemer and open hearth rods, and a sale of 200 tons of Bessemer rods for January delivery is reported at $28, Pittsburgh. Specifications against contracts, especially from the chain manufacturers, are not coming in at a satisfactory rate, and in some cases have been held up entirely. We quote Bessemer rods at $28 and open hearth about $28.50, f.o.b. Pittsburgh, but it is stated that on Bessemer rods the price has recently been shaded.

Muck Bar.—The market is very dull and prices are weak. We quote best grades of muck bar, made from all pig iron, at about $29, Pittsburgh.

Steel Rails.—The demand for light rails is not quite so active. The Carnegie Steel Company received new orders and specifications in the past week for about 2000 tons. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—Three or four projects that will take large tonnages are being figured on by the plate mills, but are not in position to be given out. No new contracts have been placed for cars in the past week, but it is understood that the courts have granted permission to the Wabash-Pittsburgh Terminal to place orders for 2000 steel coal cars, and this inquiry is likely to come out in a few days. The Pittsburgh, Shawmut & Northern Railroad is figuring on the purchase of some cars, but nothing has been done. The general demand from boiler shops and other consumers is reported as slightly better. We continue to quote ¼-in. and heavier plates in the wider sizes at 1.40c., Pittsburgh, while on the narrow sizes 1.35c., Pittsburgh, is still being named. There are reports of lower prices than 1.40c. on wide plates being named by one or two mills, but these are not confirmed.

Structural Material.—Local structural interests report that little new business has been placed. Work coming up in this vicinity includes about 500 tons for the extension to the Hotel Schenley, and about 1000 tons for the new additions to the Carnegie Technical Schools. The Fort Pitt Bridge Works is completing shipments on the structural steel for the new open hearth plant of the Jones & Laughlin Steel Company at Aliquippa, Pa., for which it has furnished upward of 10,000 tons. We continue to quote beams and channels up to 15 in. on the basis of 1.40c., Pittsburgh, but there are still persistent reports that this price is shaded by some mills as a basing price for delivery at certain points.

Sheets.—A well attended meeting of the independent sheet mills was held in the Fort Pitt Hotel in this city last Thursday, at which J. A. Campbell, president of the Youngstown Sheet & Tube Company, presided. The unsatisfactory conditions existing in the trade were thoroughly discussed, and it was the opinion that to make any official reduction in prices of sheets would not help the market but make it worse. It was decided to make a strong effort to maintain prices on the basis of 2.20c. for one pass No. 28 black, and 3.20c. for No. 28 galvanized. We are advised that all the mills are now quoting on this basis, with the usual differentials for the lighter and heavier gauges. The full schedule of prices on black and galvanized and on roofing sheets as affirmed at the meeting is printed on a previous page.

Tin Plate.—The new demand is dull, and the mills are operating mostly on contracts from the meat packers and can makers, on which deliveries will probably not start for several months. The American Sheet & Tin Plate Company is operating to slightly less than 60 per cent. of capacity, and some of the independent mills are running at about the same rate. Reports that prices of tin plate have been shaded recently are officially denied, and the market is reported firm on the basis of $3.60 per base box for 100-lb. cokes, f.o.b. Pittsburgh.

Bars.—Specifications for both iron and steel bars show a falling off, as compared with November, but this is due to the fact that inventory period is close at hand and consumers are taking in as little as possible. Shortly after January 1 conditions are expected to be materially better. We continue to quote soft steel bars and common iron bars at 1.40c., Pittsburgh, but at certain points of delivery this price is sometimes shaded a basing price.

Hoops and Bands.—The demand continues light and specifications against contracts have fallen off. We quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—The season is pretty well over, and on the small belated shipments against contracts that are being made this month, 78c. per bundle is being charged.

Spikes.—Orders received are only for small lots. Expected inquiries from several Eastern roads have failed to develop. There are reports that prices are being shaded to some extent. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c., for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Spelter.—The market continues dull, and prices have shown a further decline. We quote prime grades of West-

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ern spelter at 5.70c., East St. Louis, equal to 5.82½c., Pittsburgh.

Merchant Steel.—Specifications from agricultural implement makers are coming in at a fairly satisfactory rate, but from other consumers are light, especially from the automobile industry. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—The demand is only for small lots to cover actual needs, while specifications against contracts from the agricultural implement makers and automobile builders have shown a heavy falling off. Regular discounts are being fairly well maintained, and are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Orders for wire nails and wire continue to be confined to small lots, while specifications against contracts are coming in at only a fairly satisfactory rate. A material betterment in the demand is looked for after the first of the year. Prices are fairly strong, it being stated that the slight cutting in wire nails has almost entirely disappeared. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—A local mill took a contract last week for 6 miles of 4-in. and 15 miles of 3 and 6 in. pipe. General trade is dull, and all the mills could handle a good deal more business if they had it. Some large gas and oil lines are still under way, but are progressing slowly, and may not be given out before spring. It is stated that discounts on both iron and steel pipe, printed on a previous page, are not being absolutely maintained.

Boiler Tubes.—The new demand is quiet, both for locomotive and merchant tubes, and discounts are still being very materially shaded.

Coke.—Several inquiries for furnace coke are in the market, and are expected to be closed before the month is out. The new demand for foundry coke is quiet, most customers being covered through the first quarter and first half. Slow progress is being made on the plan now under way by some of the leading independent coke furnaces to put the market on a better basis, and it now seems doubtful whether anything definite will be accomplished. The output in the Upper and Lower Connellsville regions last week was 289,668 tons, an increase of about 600 tons over the previous week. We quote standard makes of furnace coke for prompt shipment at $1.45 to $1.50 per net ton, at oven, while for delivery over first half $1.75 to $1.80 is quoted. Best make of 72-hour foundry coke for prompt shipment are held at about $2 per net ton, at oven, and for first half from $2.10 up to $2.50.

Iron and Steel Scrap.—Little is being sold, as inventory period is close at hand. The scrap list of the Baltimore & Ohio Railroad closed December 6, the Pennsylvania Railroad scrap list December 7 and its rail list December 8, and the prices obtained were lower than for some months. There has been a material decline in prices of old rails, while heavy steel scrap is weak and borings and turnings are lower. A sale of 1500 tons of heavy steel scrap has been made at $14, delivered, which is top of the market; also 500 tons of rerolling rails at $15.75, delivered, and 500 tons at $15.25, delivered, but these prices are higher than the market to-day; also a sale of 500 tons of bundled sheet scrap at $10.25, delivered, making it about $9.25 at shipping point. Dealers quote about as follows, per gross ton, f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.75 to $14.00
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	9.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.00 to 15.25
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	7.90 to 8.00
Machine shop turnings	8.60 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	14.50 to 14.75
Heavy steel axle turnings	10.25 to 10.50

Chicago

FISHER BUILDING, December 14, 1910.—(*By Telegraph.*)

Prices of finished materials are firmer this week. This is especially true of sheets, on which concessions had been quite general a week ago. Structural shapes and plates are holding firmly and there is less suspicion regarding the maintenance of the 1.40c., Pittsburgh, price on steel bars. The volume of new business is very light, and in plates and structural material the mills are nearing the end of their specifications without having taken new business to keep going. In other products the mills which hold yearly contracts for large tonnages are doing better. The leading local soft steel bar mill which sells to the general trade will shut down the end of this week, and the hard steel bar mills are running at about half their capacity. There is less new buying of sheets, and the Inland Steel Company expects to close down some of its mills before the end of the year. At Gary a blast furnace went out December 12, leaving three of the eight furnaces in blast. The wire mills are making a better showing, as their business is on a normal basis. Jobbers are buying freely for January and February shipment, and expect a good movement of wire products for spring trade. Railroad contracts for fence are also for normal requirements. Railroad purchases of bar iron are increasing steadily, taking the form of orders for 500-ton lots for short delivery periods. No new orders or inquiries for freight cars are reported from Western roads, and the Great Northern inquiry for 1000 steel cars has not been closed. The car builders have contracts for steel passenger cars which will fill their capacity for six months in this line, but many of the leading Western roads have not bought any freight cars for more than a year. Some of the equipment industries expect to be running full by February 1. Railroad traffic is falling off and there is less complaint of car shortage. The slowing down of industries for the inventory season will enable the railroads to keep up with traffic until January, but the condition of their equipment is growing steadily worse and will make operating expenses high and earnings less during the winter. The scrap market has reached the lowest level of prices for the year, and the decline in the last two weeks is not a favorable indication for the immediate future of scrap using industries.

Pig Iron.—The market has settled down to another waiting period. A majority of the foundries in this territory have sufficient stocks on hand or iron purchased to carry them through the first quarter at the present rate of consumption, and those which are not covered are only picking up small lots from time to time. Many of the implement manufacturers have covered for the full first half, but as a rule the furnace interests have not sold much for deliveries extending into the second quarter. Alabama furnace interests continue in some cases to decline firm offers for first half at $11, Birmingham, but cannot obtain any better price now for the first quarter. The Northern furnace interests are doing what might be called a retail business, selling small lots up to 500 tons for prompt shipment or for short delivery periods. The current demand for all grades is checked by the inventory season, which is now at hand, and the furnace interests do not expect any general buying movement until the equipment industries and malleable foundries get back to a normal basis on railroad business. In many important lines the foundries are running at normal capacity. This is true of all the agricultural implement manufacturers, and the stove foundries have also had a good year. The chief depressing influence is the decreased melt in the malleable foundries which use a large portion of the Northern iron made in this district. The following quotations are for December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	18.40 to 18.90
Jackson Co. and Kentucky silvery, 8%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 10%	20.40 to 20.90

(*By Mail.*)

Billets.—The market is dull, with only an occasional inquiry, and the price of forging billets is nominal at $28, base, Chicago.

Rails and Track Supplies.—Only a few small orders were closed in Chicago last week. The Harriman lines are reported to be negotiating for their requirements for next

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year. Other large Western systems have all prepared estimates of their requirements, but are holding back their orders awaiting advices from Washington regarding the advance in rates and other political matters. The market for track supplies is very dull. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.20c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—While the general contract for the Insurance Exchange Building in Chicago has been let to the Thompson-Starrett Company, the steel work will not be let for two or three weeks, until certain details of the new building code are finally settled. The general contract for the McNeil office building has been let to the George A. Fuller Company, but the steel specifications have not been completed. There is a possibility that the Council may make changes in the building code on questions involving the permissible hight of buildings. The Insurance Exchange Building will require about 12,000 tons and the McNeil Building, 900 tons. George W. Jackson, Inc., has taken a contract amounting to about 450 tons for changes in the elevated loop in Chicago, principally in moving columns at corners to permit changing the routes of street car lines. Besides the new building projects which are pending in Chicago, a large tonnage is involved in new bridges, including both municipal and railroad bridges, which are on the slate to be erected the coming year. Prices are firmer on plain material. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The market is very dull, but prices are firmer, and the few orders that are going are distributed among the different mills selling in this market. Some of the railroads have asked for prices on contracts for a full year for boiler and tank plates for repair work, but the tonnage inquired for is disappointing. Steel passenger car orders have brought the mills quite a number of small orders for plates in the last two or three months, but no developments are reported in large orders for freight cars. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—Prices have stiffened in the past week and are now held firmly by the mills on both black and galvanized sheets. The volume of business is disappointing, however, and the Inland Steel Company expects to shut down some of its mills before the end of the year. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The only encouraging feature is that the railroads are quietly increasing their specifications for bar iron. Orders for 500-ton lots are becoming common and are frequently renewed as they are soon covered by specifications. The railroads are using twice as much iron as they did a couple of months ago, and fair specifications are also coming in from the wagon trade. In soft steel bars there is very little new business. The rerolling mills are not running more than half capacity. The price is firm on soft steel bars, but the break in the price of old rails has lowered the quotation for hard steel bars. Bar iron is quoted nominally at 1.35c., but round lots for prompt shipment have sold as low as 1.30c. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.40c. to 1.45c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Jobbers are furnishing good specifications for nails and barb wire for January and February shipment and advise the mills that they expect a good spring trade. Buyers of wire for manufacturing are also specifying at a satisfactory rate. The railroads are not curtailing their purchase of fence, and the Southern roads are placing contracts for their requirements for the full year 1911, these contracts calling for a normal tonnage. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—The agricultural implement people have shown no hesitation this fall in their specifications for special grades of steel used in their product, this indicating that the check some time ago in specifying for bars was due entirely to fears of a decline in price. In merchant steel lines the mills are well supplied with business and are not affected by the dullness in heavy rolled products.

Cast Iron Pipe.—The only water pipe letting among Northern cities that is reported pending this week is one for 3500 tons at Cleveland, Ohio. The gas companies are beginning to negotiate for their requirements for next year and it is expected that contracts will be let during the next two months by most of the Northern gas companies. It is estimated that this business in Northern and Western territory amounts to about 100,000 tons a year. The gas companies are apparently satisfied that prices are as low as they can except. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—Dealers are generally taking losses on the material which they bought from the railroads in October and November. The slowing down among mills and foundries and unwillingness among buyers to increase their stocks before taking inventory has made the lowest prices of the year in some lines of scrap. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$15.50 to $16.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50
Shoveling steel	11.50 to 12.00

The following quotations are per net ton:

Iron angles and splice bars	$13.50 to $14.00
Iron car axles	18.50 to 19.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.00 to 10.50
Steel axle turnings	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast and mixed borings	4.00 to 5.50
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	12.25 to 12.75
Stove plate and light cast scrap	10.50 to 11.00
Railroad malleable	11.25 to 11.75
Agricultural malleable	10.50 to 11.00
Pipes and flues	8.75 to 9.25

Philadelphia

PHILADELPHIA, PA., December 13, 1910.

The movement in pig iron has been light. In some classes of finished materials specifications have been coming out a trifle more freely, but the current demand shows no marked improvement. An increased volume of business in certain grades of old material is reported, but sales are largely of the bargain lot class, and lower prices have in some instances been established.

Iron Ore.—Arrivals of foreign ore at this port during the week ending December 10 aggregated 11,400 tons, valued at $22,600. From now on not much ore will be brought down from Canada, owing to the closing of navigation. Little interest is being taken in the market, the trade awaiting developments.

Pig Iron.—The bulk of the small business going has been confined to foundry irons. The principal sales have been to the cast iron pipe foundries, one Delaware River interest taking 5000 tons of Northern low grade iron at $14.25, delivered, shipment covering December and the first quarter of next year. Several small lot sales of pipe iron have also been reported. In the higher grades, sales range from carloads for spot shipment to several hundred tons for delivery over three or four months. Standard brands of eastern Pennsylvania No. 2 X foundry, for such delivery, are moving at $15.50 to $15.75, delivered. Some producers are holding at 25 cents higher, but are above the market and make few sales. In a few instances, less desirable brands are to be had at figures a shade under those quoted above, but are not considered as having any bearing on the market. A somewhat better movement is to be noted in Virginia foundry irons, several 500-ton sales of No. 2 X, together with a larger number of smaller sales, both for prompt, first quarter and first half delivery have been made, for which prices for both No. 2 X and No. 2 plain are comparatively firm at $13, furnace, equal to $15.80 to $16, delivered in buyers' yards in this vicinity. The Virginia Pig Iron Association, which met in this city last week, reported an increase in unfilled orders on Virginia makers' books, while stocks showed a negligible increase. No further reduction in output beyond that recently announced was reported. Very little interest is shown in forge iron, owing principally to the inactivity of the rolling mills. One of the smaller consumers of basic iron would probably place orders for a few thousand tons at a favorable price. Low phosphorus iron has been sold in small lots at unchanged prices, $22.50, delivered here, for standard analysis iron. While nothing has been heard regarding further curtailment of production, there will, no doubt, be another movement in that direction after the turn

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of the year, when deliveries on higher priced contracts, still unfilled, will have been completed. Consumers seem disinclined to buy beyond their near future needs, and sellers are not forcing business at the present range of prices, which for standard brands, delivered in buyers' yards, eastern Pennsylvania and nearby points, range about as follows:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—The market is bare of any important demand, and prices show continued weakness. While $38.50, Baltimore, for 80 per cent, is nominally quoted, it is not understood to be a firm price for first half delivery.

Billets.—There has been some inquiry for both rolling and forging billets for early 1911 delivery, but buyers are in no haste to place orders and continue to make their purchases on a hand to mouth basis. Mills are operating at about half capacity. Ordinary rolling billets, for either prompt or first quarter shipment, are quoted at $25.50 to $26, delivered. Forging billets are firm at $28, Eastern mill, the usual extras for high carbons and special sizes being added.

Plates.—A better volume of specifications has been coming to the mills from locomotive, boiler and bridge builders, but there is little improvement in the general run of new business. Mills are figuring on a fair tonnage of ship plates, both with one of the local yards as well as the Government, and a better volume of business is expected. Leading producers are firmly maintaining prices. For ordinary plates, 1.55c. to 1.60c., delivered in this territory, is named.

Structural Material.—A smaller volume of miscellaneous business is reported, due to unfavorable weather for outdoor work. Little has developed in the way of larger contracts. The Packard Motor Company has, it is stated, let the general contract for its new building, requiring about 900 tons, but the steel work has not yet been placed. Several other moderate building propositions are pending. Some mills are less actively engaged, as they have been rapidly catching up on old orders. Prices are unchanged, 1.55c. to 1.60c. being named for plain shapes, delivered in this vicinity.

Sheets.—The volume of new business offered is gradually falling off. Mills have little ahead and are largely dependent on day to day orders to maintain even the present productive rate. Prices are well maintained, the following range being quoted by Eastern mills for reasonably early shipment: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand has been almost of a retail character, business offered hardly being sufficient to induce competition. Under the circumstances it is difficult to say what prices could be had were a desirable order to come before the trade. For moderate lots 1.35c. to 1.45c. is quoted for refined iron bars, delivered in this vicinity. Steel bars have not been particularly active, and quotations are unchanged at 1.55c. to 1.60c.

Coke.—At least one fair sized contract for furnace coke for 1911 delivery has been closed, while a number of others are pending, but furnaces are in no haste to place orders, being still somewhat uncertain of policies for next year. A small volume of business has been done in foundry coke, principally for early delivery. Quotations show little change, the following range per net ton, delivered in this territory, about representing the market:

Connellsville furnace coke	$3.85 to $4.05
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.50 to 3.90
Foundry coke	3.85 to 4.05

Old Material.—The bulk of the buying recently has been of the bargain lot order. Consumers are not in particular need of material, but are taking in stock on old orders somewhat more freely, particularly heavy melting steel scrap. Small, prompt lots of this grade have been purchased at prices ranging from $12.50 to $12.75, delivered, although for forward shipment $13 is named. In nearly all grades of material in which business has been done prices are lower, except No. 1 railroad wrought, which is comparatively firm at recently quoted prices. A local merchant was awarded the Government turnings at Washington, on which bids were recently taken, aggregating about 1000 tons, at a higher price than represented by current quotations, which are for small transactions. The following range about represents sellers' ideas of the market for delivery in buyers' yards, eastern Pennsylvania and nearby points carrying a freight rate from Philadelphia, ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$12.50 to $13.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 18.50
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.00 to 17.50*
Old car wheels	13.25 to 13.75
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.25 to 12.75
No. 1 forge fire	11.00 to 11.50
No. 2 light iron	7.00 to 7.50
Wrought turnings	8.00 to 8.50
Cast borings	8.00 to 8.50
Machinery cast	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Grate bars	11.00 to 11.50
Stove plate	10.00 to 10.50

* Nominal.

Pilling & Crane, Philadelphia and New York, have been appointed exclusive sales agents, effective January 2, for the entire pig iron product of the Wharton Steel Company, from the Wharton and Andover furnaces, comprising basic, forge and foundry grades.

Cleveland

CLEVELAND, OHIO, December 13, 1910.

Iron Ore.—Shipments from docks, which picked up somewhat late in November, have again fallen off as a result of the severe winter weather, the ore being frozen and hard to handle. Some shipments have been ordered resumed as soon as the weather becomes milder. Although some consumers bought more ore during the past season than they will need, ore firms claim that there is no resale ore being offered at price concessions. We quote as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The aggregate tonnage sold during the week was extremely small. One local agency reports sales of chacoal iron totaling 2200 tons. The only new inquiries of any size are one for 3000 to 6000 tons of foundry iron and one from a western New York implement manufacturer for 1000 tons of foundry iron, both for first half. Sellers do not expect more than a very limited amount of business until after the first of the year. While No. 2 foundry is firm at $14, local furnace, for Cleveland delivery for spot shipment and first half, this price is being shaded 25c. or more for outside shipment. The usual Valley quotations are $13.75 to $14 for No. 2 foundry for first half. Southern iron is weaker. While the open quotation for No. 2 foundry for the half is $11.25 to $11.50, Birmingham, several sellers will accept business on the $11 basis for delivery through the first half. We note the sale of 400 tons of No. 2 Southern to a local consumer at $11.50, Birmingham, for the first half, but this iron was high in phosphorus. For December delivery we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.90
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—There is some inquiry for foundry coke for the first half from consumers that have not covered, but nearly all of the foundries in this territory are already under contract. Furnace companies are holding off. Prices remain stationary. We quote standard Connellsville furnace coke at $1.45 to $1.55 per net ton, at oven, for prompt shipment, and $1.75 to $1.80 for the first half. Connellsville 72-hour coke is held at $2 to $2.10 for spot shipment and $2.25 to $2.50 for the first half.

Finished Iron and Steel.—Mill agencies are getting a fair volume of small orders, but the aggregate is light. Many manufacturers have only a limited amount of work ahead and hence are ordering only such material as they actually need. The structural outlook shows an improvement. Plans have been completed for the new Y. M. C. A. building in Cleveland, and bids are expected to be asked about the first of the year. About 1000 tons of structural material will be required. It is announced that an addition will be built to the Hollenden Hotel, that will require about 600 tons. Bethlehem sections will probably be used. Bids have been asked for for additions to the plant of the Ford Plate Glass Company, Toledo, Ohio, that will take 1000 tons, and an additional 1500 tons will be required for further extensions to be built a little later. Bids will be received for two new high school buildings in Toledo that will require 500 tons of structural material and 1500 tons of reinforcing bars. Considerable other structural work is in prospect, both in Toledo and Detroit. Steel bars and structural material are firm at 1.40c., Pittsburgh, and the leading producers are adhering to that price on plates. As a result of the meeting

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of sheet manufacturers in Pittsburgh last week sheets are firmer, 2.20c. for No. 28 black, 3.20c. for No. 28 galvanized being maintained for the present. Billets are weak. Open hearth forging billets are being offered at $28, Cleveland, or on the basis of $26.50, Pittsburgh. Many steel bar consumers will not specify the full tonnage of their contracts that expire January 1, and some of the mills are extending these contracts until April 1. The demand for iron bars is light, with prices unchanged at 1.30c. to 1.35c., Cleveland. Both of the Cleveland rolling mills shut down this week for a few days. A local selling agency has taken an order for 250 tons of standard section rails for frog and crossing work.

Old Material.—The market continues very dull. Outside of an occasional carload, local mills are taking nothing on contracts. Prices on several grades have been reduced. For a few weeks dealers were predicting more activity and somewhat better prices about the first of the year, but this feeling, which for a time kept prices from sagging, appears to have entirely disappeared. The Norfolk & Western Railroad will close December 15 on about its usual tonnage. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	19.50 to 20.00
Heavy melting steel	12.75 to 13.00
Old car wheels	12.50 to 13.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	11.75 to 12.00
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	12.75 to 13.25
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, December 14, 1910.—(*By Telegraph.*)

Pig Iron.—The trade has entered into the usual dull holiday period, and both sales and inquiries are mainly confined to small lots for prompt shipment. Some activity is reported from the St. Louis district, and several round lots of foundry iron are reported as having been sold through branch offices there. Last week a local firm sold a central Ohio melter about 970 tons of various grades of Southern foundry based on a price of $11, Birmingham, for No. 2 foundry, practically all for December shipment. There is yet considerable talk of curtailment in the Northern field, but the furnaces said to be interested are slow in furnishing definite dates for blowing out. Some operators who were said to be willing to book orders at $11, Birmingham basis, for shipment through the first half are now reported as becoming indifferent to taking on business at this figure longer than through the first quarter, and some producers will not accept second quarter orders below $11.50. The Northern price is unchanged, and for prompt or first half shipment $14 to $14.50, Ironton, is quoted, although the first named figure more nearly represents the ruling price. To a small degree the laws in several Western states requiring tax assessments returns to be made January 1 are blamed for causing some consumers to refrain from stocking up until after that date. Malleable is quiet around $14.25 to $14.50, Ironton, for any delivery up to July. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 15.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

Coke.—The market continues featureless. While there are two or three inquiries for furnace coke that have been in the hands of local agencies for some time, these contracts are not expected to be closed until the first quarter of next year, and even then the business will hardly come to a Cincinnati firm, due to the distant location of the prospective customers. There are two small inquiries from the South for furnace coke for spot shipment, and these are expected to be closed, with the orders probably going to Wise County operations. There has been considerable curtailment in all three fields, but prices appear to be lower in the Connellsville district, where some brands of spot furnace coke are offered as low as $1.45 to $1.55; but in both the Wise County and Pocahontas fields a premium over these figures is obtained of 5c. to 15c. Contract figures range from $1.65 to $1.85, all per net ton, at oven, in all three districts. Spot foundry coke is obtainable around $2 and contract foundry coke at $2.25, per net ton, oven.

Finished Iron and Steel.—In some lines the near approach of the holiday season has not had any noticeable effect, and orders for hoops and bands, as well as for some kinds of structural material, are holding up fairly well. The mill price of 1.40c. is generally considered as unshadable, except for some few sizes from independent mills. The warehouse prices on structural material are from 1.75c. to 1.85c.

Old Material.—No large tonnages of scrap are being moved, and no improvement is anticipated until well along into next year. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

St. Louis

ST. LOUIS, December 12, 1910.

Pig Iron.—Some of the leading sales agencies report a good measure of activity, while others have found the market very dull, not only as regards sales, but inquiries as well. A canvass of the trade developed that several of the recently reported inquiries are still pending, mostly for special iron. The leading interest reports a sale of 2000 tons of Southern No. 2 foundry, for shipment over the first half. A leading house mentions sales aggregating 3000 tons of Northern and Southern iron, mostly foundry grade, to be shipped into St. Louis territory during the first half. Another house reports sales aggregating 3500 to 3600 tons of Southern foundry, for shipment over the first quarter, and the agent for a leading Birmingham furnace placed 500 tons of No. 2 for shipment over the first quarter. The tone of the market continues weak, and doubtless most of the sales have been made at inside figures. Nominally the market is $11 to $11.50 for quick shipment and $11.50 for first quarter, Birmingham basis, but it is intimated that offers of $11 for first quarter can be worked with some furnaces.

Coke.—Such business as is possible is confined to small lots for prompt shipment, though we note an inquiry for 40 to 50 cars for shipment over first half, also one for five cars per week, delivery over first half. The market is easier, and prices are nominally $2 and $2.25 for best Connellsville 72-hour foundry per net ton, at oven, the first named figure for spot. Specifications on contract are coming in freely.

Old Material.—The only item on the list which is holding steady is relaying rails, while the tone of the market for scrap iron and steel is easier, owing to the light movement, though there is some inquiry. The offerings by the railroads for the past week were as follows: Vandalia, 200 tons; Cotton Belt, 250 tons. Most of the attention of the leading dealers is being given to deliveries on contract. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	12.75 to 13.25
Old steel rails, less than 3 ft.	12.25 to 12.75
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.75 to 12.25
Frogs, switches and guards, cut apart	11.75 to 12.25

The following quotations are per net ton:

Iron fish plates	$11.50 to $12.00
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad tank and sheet scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.50 to 8.00

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New York

NEW YORK, December 14, 1910.

Pig Iron. The limited inquiry that has appeared in the past week mainly calls for pig iron for delivery in the first quarter of 1911. As a rule buyers are supplied with iron for early needs, and it is true also that with few exceptions they are taking their iron according to contract stipulations. Sales have been limited, the largest reported being for 500 tons of foundry iron for shipment into New Jersey. A New Jersey foundry is inquiring for 1500 tons, and a nearby foundry in New York State is in the market for 1500 tons of one grade of iron and 1000 tons of another. The electrical inquiry heretofore reported has not yet resulted in business. Eastern Pennsylvania foundries have been making lower prices to New Jersey consumers, and the competition of Virginia furnaces on low levels continues. Two or three additional Pennsylvania furnaces are expected to blow out before the end of the year. We quote tidewater deliveries as follows: Northern No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $14.75; Southern No. 1 foundry, $15.50 to $15.75; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—A little better feeling seems to exist and prices are a trifle firmer, but no real improvement in business is expected before February. Refusal of railroads to sell their scrap at present prices over any extended period indicates their anticipation of improved conditions. Consumers are coming to the conclusion that further reduction of prices is unlikely, and after the first of the year any that may be holding for lower prices will probably come into the market. The mills apparently attribute lack of orders to lack of needs, and as a rule are reducing output, feeling that price reduction would be fruitless. Plates are very quiet and bar iron also, but it is more or less seasonable, as annual inventory time is near. One of the leading steel bar mills reports a better business so far this month than for the corresponding period last month. The structural business in the week just ended was very light. The lowest bid submitted for the general contract for the post-office at the Pennsylvania terminal in New York exceeded the estimate, and it is possible that the design will be revised and probably that the bids will be readvertised. Plans have been drawn and approved by the supervising architect and bids for the general contract are being asked for a new building for the Bureau of Printing and Engraving at Washington. It may require 4000 to 5000 tons. The Public Service Commission has approved the plans for the extension of the Second and Third avenue lines of the elevated railroad in New York City to White Plains and Woodlawn, and if the franchise is granted by the Board of Aldermen the Interborough Rapid Transit Company will be in the market for about 15,000 tons of structural material and a considerable tonnage of rails. The Virginian Railway bridge work, 2500 tons, has been awarded to the Virginia Bridge & Iron Works. The Pennsylvania Steel Company has the contract for 1700 tons for two bridges for the Pennsylvania Railroad, one at Harrison, N. J., and the other on the New York division. The Washington Irving High School, 2500 tons, has been awarded to the McClintic-Marshall Construction Company. As part of a previous contract, the American Bridge Company will fabricate 7000 tons for a building at Duluth for the Minnesota Steel Company. Levering & Garrigues will get the extensions to the Waterside station of the New York Edison Company, 450 tons, and probably also the Sacramento Court House, 650 tons. Dyer Bros. will probably get the Lowell High School, San Francisco, 950 tons, and the New England Structural Company has the 700 tons for the Bigelow Building, Boston. It is reported that the Public Service Corporation of New Jersey is inquiring for 1000 tons for a power house. Prices remain unchanged. Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Steel Rails.—Some business has been given to a few of the mills for December rolling, but applying on 1911 contracts and to be paid for as though rolled in the new year. This will prevent idleness for most of December, which several mills were facing. The Ontario & Western has placed 1000 tons of its 1911 order and has several inquiries out. The New York Central order is now up for discussion as to certain new points in the specifications. The Carnegie Steel Company has sold 1500 tons to the Clarion & East Brady Electric Railway Company and 500 tons to the Interstate Railroad Company. The Union Pacific has placed 1000 tons with the Illinois Steel Company for early rolling.

Cast Iron Pipe.—Weather conditions are unfavorable for construction work, hence the current demand is exceedingly light. Little is now being done in contracting for spring delivery. The lowest bidder on the 1500 tons for New Bedford, Mass., on which proposals were opened December 8, was a Pennsylvania company which named $21.38 per net ton, delivered. The United States Cast Iron Pipe & Foundry Company was low bidder on 3500 tons of 3 to 24 in. water pipe for the city of Cleveland, Ohio, December 12, its bid being $24.35 per net ton, delivered. Carload lots of 6-in. are quoted at $22 per net ton, tidewater.

Ferroalloys.—Foreign producers of 50 per cent. ferrosilicon, who have been conducting negotiations for several months with a view to effecting a pool, reached an agreement a few days ago, in consequence of which production will be reduced about one-half. Those in the agreement include all the producers of ferrosilicon in France, Austria, Norway and Sweden. They have been making annually about 30,000 tons of 50 per cent. ferrosilicon. The agreement will result in the closing down of some plants, and it is understood that the parties who curtail their production will be reimbursed from the general profits of sales made by the pool. There is a good demand for ferrosilicon here at present, and it is being sold at from $55.50 to $56.50. There are some good inquiries out for ferromanganese, but prices are weak. It is offered in this market at $38.50 for delivery over the first half.

Old Material.—A few sales of heavy melting steel scrap have been made, ranging from 100 tons to 2000 tons. On these sales the prices obtained, delivered at works in eastern Pennsylvania, ran from $12.50 on small lots to $13 on the largest quantities, for delivery over the next three months. A cargo of about 650 tons of Panama scrap was sold at $10.32 per ton, Hoboken, to an eastern Pennsylvania consumer. Almost no transactions are reported in rolling mill stock; as a consequence wrought scrap is weak and prices are wholly nominal. The foundries are this week doing very little in cast scrap, even stove plate being neglected. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$10.50 to $11.00
Old girder and T rails for melting	10.00 to 10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.50 to 11.00
Light iron	5.00 to 5.50
Cast borings	5.50 to 6.00
Wrought turnings	5.50 to 6.00
Wrought pipe	9.50 to 10.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., December 12, 1910.

Pig Iron.—The record of transactions in this market the past week does not show that any decided change has taken place in the views of any parties concerned. The concessions by producing interests have been in the shape of extended deliveries of tonnage required, while the melters have not covered more readily even for their immediate requirements at current quotations. An aggregate tonnage about equal to that reported for the previous week was engaged, but fewer producing interests participated owing to the refusal of some to accept additional business at the prices obtainable. A basis of $11, Birmingham, is still quoted for prompt or comparatively early shipments, with an advance of 50c. per ton over that basis asked for first half or strictly second quarter deliveries. It is true that the leading consumers are not represented in purchases at figures quoted, but recent efforts made by them to shade the $11 basis by offering round tonnage spot shipment at $10.75 were not successful. The sale of a lot of 1000 tons for shipment over the first half was made during the week at $11.25, Birmingham, which represents a concession of 25c. per ton by each party interested. Inquiries for one or more lots of 1000 tons each are now pending, but a disposition to await developments immediately after January 1 is much in evidence. The demand for small lots for prompt shipment is expected to decrease during the coming week by reason of contemplated shutdowns for the holidays, and for that reason the actual movement from furnace yards is now comparatively light. Reports from all sources indicate that smaller stocks will be in the yards of consumers January 1 than on that date for years. It is also no doubt a fact that the trade as a whole is committed for less tonnage for future delivery than has been the case for some time. The present condition of the foundry trade is not considered satisfactory, but the outlook is encouraging and a normal activity early in the new year is anticipated.

Cast Iron Pipe.—No report has been made of additional tonnage to be placed at an early date. Nominal quotations are probably lower than last reported, but no actual test of

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values has been offered for some weeks. All Southern producing capacity continues in operation and stocks have not accumulated to such an extent to become burdensome; however, the tonnage now required for order books is very limited and it is not unlikely that all plants will be closed down for inventory longer than usual. We revise nominal quotations on water pipe, per net ton, f.o.b. cars here, as follows: 4 to 6 in., $19 to $19.50; 8 to 12 in., $18 to $18.50; over 12-in., average $17, with $1 per ton extra for gas pipe. Water pipe fittings and specials are quoted at $50 per net ton.

Old Material.—The condition of the market is practically the same as reported last week, but with a larger tonnage in sight for dealers, owing to the cleaning up of foundry plants at inventory time. The status of prices is quite undetermined, but a revision of $1 per ton on all grades is not unwarranted. We quote as follows, per gross ton, f.o.b. cars here:

Old iron axles	$14.00 to $14.50
Old iron rails	12.00 to 12.50
Old steel axles	13.50 to 14.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	8.00 to 8.50
No. 1 country	7.50 to 8.00
No. 2 country	7.00 to 7.50
No. 1 machinery	9.00 to 9.50
No. 1 steel	10.50 to 11.00
Tram car wheels	9.00 to 9.50
Standard car wheels	10.00 to 10.50
Light cast and stove plate	7.50 to 8.00

Buffalo

BUFFALO, N. Y., December 13, 1910.

Pig Iron.—The aggregate inquiry put on this market the past week would probably not exceed 5000 tons both for current quarter and forward delivery. Ordering has been on a very small scale. There is no quotable change in prices, although the trend might be said to be toward less rigidity on the part of furnaces which have been maintaining the increase made a month ago. The inquiries appearing during the week, however, were not of sufficient tonnage in any instance to induce a lowering of quotations to secure the business. For December and first quarter delivery we quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No. 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—The agency of the leading interest reports a good inquiry for miscellaneous bar products, plates and structural material, and most of the others state that the quiet conditions recently prevalent continue. There appears to be some improvement in demand from the automobile trade; two local manufacturing concerns in that line have recently placed orders for considerable tonnages of bar material, one of them contracting this week for six months' requirements, including 500 tons of cold rolled shafting. Some business in sheet piling was taken during the week. In fabricated structural lines there are prospects for the development of plans during the next month or two for a good deal of work for early spring construction, some of which are now being gotten into shape for bids.

Old Material.—Inquiry is at a low ebb and only a small amount of business has been transacted. Requests for suspension of shipments on contracts until after the first of the year are being made by mills, owing to the nearness of the inventory season. Prices are unchanged, though largely nominal.

San Francisco

SAN FRANCISCO, December 7, 1910.

The close of the year is too near at hand for any marked activity. A few contracts are being placed for future delivery, but transactions of this nature are not large, as prompt delivery of most products can be readily obtained. With increasing activity in the small jobbing trade, a better feeling prevails. Numerous large development plans are reaching a stage where business may be expected; building and other improvement work in the country is active, and conditions in general seem favorable for an enlarged movement during the early part of 1911.

Bars.—In view of foreign and local competition, Eastern mills are getting a comparatively small proportion of the coast trade. A number of orders have been placed with the Western Steel Corporation, Seattle, by local interests, and this concern will probably get a large share of the business, as stocks of foreign material are reduced. There is a very fair jobbing movement of reinforcing bars. Bars from store, San Francisco, are quoted at 2.20c. for iron and 2.40c. for steel.

Structural Material.—Considerable activity is noted all over the coast, and December is expected to bring out a much heavier tonnage than last month. This is due to the letting of a number of jobs which have been pending for some time. The November record in San Francisco was poor, the valuation of permits issued being $1,048,071, compared with $1,425,116 for October, and but little over half the record of November, 1909. Other cities made a good showing, particularly Los Angeles and Portland, Ore., and there is considerable steel construction in the smaller towns. In view of the work expected by local fabricators, mill representatives anticipate an active demand for plain material. Since the first of the month, the Western Iron Works, San Francisco, has taken the Cortez Hotel contract, about 600 tons. Bids have been opened for the Sacramento, Cal., court house, and an award is expected in a day or two. Other contracts likely to come out by the end of the week are the Lowell High School, the Masonic Temple, and the Knights of Columbus building. The Bon Marche department store, Seattle, may also be let shortly. Other old prospects are in about the same position as before, but several new plans are coming out. Figures will be taken early in the year for a large building for the Girls' High School, and contracts will be let within a few months for several large Federal buildings at various points in the interior. The Pacific Rolling Mill Company will furnish about 160 tons for the Perry building in Oakland. The Southern Pacific Railroad has submitted plans for a direct lifting bridge, 80-ft. span, 150 ft. above low water, at San Pedro, Cal. It is reported that the Gilbert Hunt Company will erect a large steel building for a fabricating shop at Walla Walla, Wash. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.60c.

Rails.—The contract for the Geary street municipal road, 2575 tons, has been placed with the Pennsylvania Steel Company, which has also booked an order for about 4000 tons of girder rails and specials for a Los Angeles street line. Greater activity is expected soon after the first of the year, in view of the plans made for street railway development all over the coast, and the increasing requirements of interurban and logging lines. Northern logging interests have depleted the timber supply near tidewater, and many firms are planning long extensions of their lines into the interior next spring. The Southern Pacific has acquired a controlling interest in the principal Los Angeles street and suburban lines, and it is reported that its entire system in that district will be operated by electricity, numerous extensions being added. It is reported that the Monterey electric road will install a double broad-gauge track between Monterey and Salinas, Cal. The Northern Electric Company is planning extensive switching yards at its Sacramento terminal. A new street railway will be built at San Rafael, Cal.

Plates and Sheets.—Tank plates have been rather quiet for some time, but inquiries from the oil interests indicate the prospect of a better movement after the new year opens. The reported failure of a new 1,000,000 bbl. concrete oil reservoir near San Luis Obispo, Cal., may cause a renewal of interest in steel tanks. The Union Oil Company is now operating its own tank shop at Oleo, and has ordered a considerable tonnage of material. The current movement of sheets is better, and in view of numerous inquiries from large consumers an active market is expected after the first of the year. The Lake Hemet Water Company has placed an order in Los Angeles for several thousand feet of 30-in. sheet steel pipe.

Merchant Pipe.—A few small orders are still being placed by jobbers, but they are limiting their purchases, buying little for future delivery, as stocks, though somewhat broken up, are still large, and the mills are able to make prompt deliveries. The distributive movement is quiet here, but fairly active in the interior, much of the small trade going to jobbers at Sacramento, and a better movement from the mills is expected in January and February. There is a better feeling in oil pipe, though the present tonnage is limited. The consuming demand for oil has increased remarkably in the last few months, while the output is decreasing, and work is being resumed on many wells. Considerable inquiry is reported for line pipe. A large distributing system for natural gas in the oil fields has been talked of, and if carried out would require a heavy tonnage of pipe, but plans in that direction are only tentative.

Cast Iron Pipe.—The order placed with the Crane Company by the Bay Cities Water Company included only about 3000 tons of cast iron pipe. This order, however, is only preliminary, as it is reported that about $3,000,000 will be spent for pipe, most of it being cast iron. The United States Pipe Company has taken an order for 2000 tons of 24 to 30 in. for the city of Los Angeles, and the city of San Jose, Cal., will receive bids December 19 for 2500 ft. of 12-in. The Long Beach Water Company, Long Beach, Cal., is preparing to lay a number of new 12-in. mains. The Domestic Gas Company of Los Angeles plans to lay a large amount of pipe within the next few months. Tentative plans have been formed for a network of gas mains connecting all the towns in the vicinity of Los Angeles, by means of which the opera-

THE IRON AND METAL MARKETS

tion of existing plants would be placed on a more economical basis. This work, if carried out, will require an extremely heavy tonnage, but the outcome of the project is by no means assured. Plans are being made for an extension of the water system of Porterville, Cal.

Pig Iron.—Foundry pig iron remains extremely dull, owing to the small amount of work in hand and the uncertain outlook for the local foundries. There is little pressure to sell on the part of importers, however, and while prices are not very well established it is difficult to obtain anything under $22. The principal importations of Chinese iron are now taken up by the Western Steel Corporation. Southern foundry iron is nominally valued at $21. Southern pig iron has not been used to any extent here in the past, but with several new steel plants starting operations the demand is likely to be of some importance. An inquiry for a considerable tonnage of basic iron is now in the market. The new open-hearth casting plant of the Columbia Steel Company is now in operation, with sufficient orders booked to assure steady operation throughout the first half of 1911, and the open-hearth furnace and rolling mill of the Doak interests at South San Francisco will be started within a few months. Both these concerns are expected to be large consumers.

Old Material.—Increasing interest is noted in steel melting scrap, one large contract having been let for first quarter delivery. The outlook is good for a heavy movement in this line next year. Cast scrap is scarce and prices are firm. Rerolling rails and wrought scrap receive little attention, and relaying rails, which are offered freely, are neglected. Quotations are as follows: Cast iron scrap, per net ton, $18; steel melting scrap, per gross ton, $12.50; wrought scrap, per net ton, $13.50; rerolling rails, per net ton, $15.

Metal Market

NEW YORK, December 14, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
		Electro-		New	St.	New	St.
Dec.	Lake.	lytic.	Tin.	York.	Louis.	York.	Louis.
8	13.00	12.87½	38.40	4.50	4.40	6.00	5.85
9	13.00	12.87½	38.35	4.50	4.35	6.00	5.85
10	13.00	12.80	....	4.50	4.35	5.85	5.75
12	13.00	12.75	38.67½	4.50	4.35	5.85	5.75
13	13.00	12.75	38.50	4.50	4.35	5.85	5.75
14	13.00	12.75	38.55	4.50	4.35	5.85	5.75

Pig tin continues high, but is neglected. Lake copper is softer and electrolytic lower. Spelter has receded. Lead is quiet and weak.

Copper.—Not since the Producers' Association has been issuing figures of copper production and consumption has its monthly report had so little effect on the trade as did that issued December 8, covering the November statistics. While the report was generally considered good, consumers took no interest in it and refused to be coaxed into the market. The London market was not affected, and consequently there were no orders for export. Disappointed sellers of copper, who were expecting a buying movement following the report, have been shading prices, but even with the inducements there are no reports of sales of any consequence. While lake is nominally 13c., certain brands can be had at something under that price. Electrolytic copper is weaker than lake and is being freely offered at 12.75c. The London market closed to-day with spot copper selling at £56 12s. 6d. and futures at £57 8s. 9d. Sales amounted to 600 tons of spot and 600 tons of futures. The market closed firm.

Pig Tin.—Pig tin reached a new high point yesterday, when after steady advances all week sales were made in this market at 38.50c. This is an advance of 55 points over last week, when the high price of the year was established. As far as buying is concerned, the market has been stale, as consumers have naturally decided to hold off, and only those actually in need of the metal have been buying and then only in very small quantities. The London syndicate seems to have good control of the situation, as stocks are not over plentiful in this market, and the American consumer is obliged to bow to the will of the London operators. In New York to-day pig tin was sold for 38.55c. The London market closed with spot tin selling at £175 17s. 6d. and futures at £175 17s. 6d. The sales amounted to 170 tons of spot and 340 tons of futures. The market closed steady.

Tin Plates.—The market has very little interest. Buyers are few and far between, and stocks are plentiful. The price for 100-lb. coke plates continues at $3.84.

Lead.—Outside sellers of lead in St. Louis have been offering it freely at 4.35c., and this has tended to weaken the New York market. There is only a light demand, and some outside holders are showing a special anxiety to sell. Outside sellers in this market are now getting the price made by the American Smelting & Refining Company, which is 4.50c.

Spelter.—Conflicting reports are in circulation. It is declared in some quarters that people recently interested in advancing prices have become tired of supporting the market and early in the week were wiring about the country with offers to sell at 15 points less than the price made last week. At any rate, spelter is weaker in St. Louis, and transactions have been made there at prices equal to 5.85c., New York. Even at the reduced price, consumers fail to show any great amount of interest, and some of the larger buyers are determined in their declaration to hold out for lower prices. Taken on the whole there appears to be a deadlock between the sellers and buyers. Some think that offerings are now being made at reduced prices to test consumers and ascertain how much they need the metal. The price to-day is 5.70c. to 5.75c., St. Louis, and 5.85c., New York.

Antimony.—Conditions in the antimony market have not changed during the week. Price cutting continues. Hallett's is selling at 7.75c.; Cookson's at 8c.; Chinese grades, 99 per cent. guaranteed, 7½c.; Hungarian grades, 7c. to 7.12½c.

Old Metals.—Consumers are doing little in the market. Dealers' selling prices are nominally unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, December 13.—There is a fair amount of current business in copper, and occasional orders are taken for March and April shipment, but not much business has been done beyond February. While copper is a shade weaker in the East, the change is not sufficient to affect the Chicago quotation materially. Tin is higher. Lead and spelter are dull and spelter is lower. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 39¼c.; small lots, 41c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.85c. to 5.90c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 12c.; red brass, 11c.; yellow brass, 9c.; lead pipe, 4¼c.; zinc, 4½c.; pewter No. 1, 24½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, December 12.—Lead has ruled quiet the past week and is quoted at 4.40c.; spelter is lower, and held at 5.70c., both at East St. Louis. Zinc ore is meeting with a limited demand, and the market is unsettled at $43 to $45 per ton, Joplin base. Tin is held at 38.75c. per pound; antimony (Cookson's), 8.10c.; lake copper, 13.35c.; electrolytic, 13.20c., all at St. Louis. The leading manufacturer reports a fair demand the past week for finished metals; during the past 11 months its sales of coffin hardware metal west of Pittsburgh footed up a total of 4,700,000 pounds.

Iron and Industrial Stocks

NEW YORK, December 14, 1910.

For an exceedingly dull week in stock transactions, the market has been surprisingly firm. From Wednesday to Saturday a steadily rising tendency occurred, the maximum prices generally for the period under review having been reached on the latter day. On the opening days of the current week a slight reaction took place. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis Chalm., com	8½	Railway Spr., pref.	92½ - 93
Beth. Steel, com.	28½ - 29¾	Republic, com.	29¾ - 31¼
Beth. Steel, pref.	56¾ - 59	Republic, pref.	92½ - 93¼
Can. com.	8¾ - 9½	Sloss, com.	48½ - 50¾
Can. pref.	76¾ - 77½	Pipe, com.	15¾ - 16
Car & Fdry. com.	47¾ - 50¾	Pipe, pref.	54
Car & Fdry. pref.	112 - 115¾	U. S. Steel, com.	70 - 74
Steel Foundries	40¾ - 44	U. S. Steel, pref.	115 - 116¾
Colorado Fuel	29¾ - 32	Westinghouse Elec.	65 - 67
General Electric	149¾-154¾	Am. Ship, com.	59¾
Gr. N. ore cert.	54 - 56	Am. Ship, pref.	111¾
Int. Harv., com.	108¾-111½	Chi. Pneu Tool	105¾ - 108
Int. Harv., pref.	121 -121¾	Cambria Steel	41¾ - 42
Int. Pump, com.	39¾ - 41	Lake Sup. Corp.	26¾ - 27¼
Locomotive, com.	34 - 37	Pa. Steel, pref.	102¾ -103½
Locomotive, pref.	105	Warwick	10¾ - 10¾
Pitts. Steel, pref.	101	Crucible St., com.	12 - 13
Pressed St., com.	28 - 31½	Crucible St., pref.	75¾ - 78
Pressed St., pref.	94	Harb.-W. Ref., pref.	95
Railway Spr., com.	30¼ - 32		

Dividends.—Phelps-Dodge & Co. have declared a regu-

lar quarterly dividend of $2.50 and an extra dividend of $2, payable December 30.

The American Car & Foundry Company has declared the regular quarterly dividends of ½ of 1 per cent. on its common stock and 1¾ per cent. on the preferred stock, payable January 2.

The Torrington Company has declared a regular semi-annual dividend of 3½ per cent. on the preferred stock. The directors have voted to call a stockholders' meeting shortly to authorize an increase in the common stock from $2,000,000 to $2,200,000. This may be preliminary to the declaration of a 10 per cent. stock dividend to holders of the common stock; such action would be taken in time for participation in the regular semiannual cash dividend usually paid February 1.

The American Iron & Steel Mfg. Company has declared the regular quarterly dividends of 1¼ per cent on the common and preferred stock, payable January 2.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has declared a quarterly dividend of 2 per cent.

The International Harvester Company has declared the regular quarterly dividend of 1 per cent. on its common stock, payable January 14.

The Washburn Wire Company has declared the regular quarterly dividend of 1¾ per cent. on its preferred stock, payable January 3.

The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on its preferred stock, payable January 3.

The Empire Steel & Iron Company has declared a dividend of 2 per cent. for the six months ending December 31.

The Yale & Towne Mfg. Company has declared a quarterly dividend of 1½ per cent. and a special dividend of 1 per cent., payable January 3.

Notes on Prices

Rope.—The demand for rope continues in small quantities as it has for some time, the trade in general buying only for immediate necessities. This policy has been pursued for so long a time that stocks in merchants' hands must necessarily be small, and larger orders may naturally be expected by manufacturers when business commences to move in a larger way. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16-in. in diameter and larger, with card advances for smaller sizes: Pure Manila of the highest grade, 8¼c. to 9¼c. per pound; second grade Manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure Sisal of the highest grade, 6¾c. per pound; second grade 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 5¾c. to 6¼c. per pound; No. 2, 5¼c. to 5¾c. per pound.

Linseed Oil.—Eastern crushers have reduced the price of oil two cents per gallon. As Argentine flaxseed can be laid down in the West at a lower price than domestic seed is bringing and foreign oil can be brought into the country at less than domestic oil can be purchased for, the market has weakened. Oil contracts for delivery April to September, 1911, are being placed at much below present prices. Buying for immediate requirements is for small lots. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
State, raw	95
City, raw	95

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance over raw.

Spirits Turpentine.—Buying at this point is moderate, while in the South there is a continued demand for export. New York quotations in five-barrel lots are as follows:

	Cents.
In oil barrels	78
In machine barrels	78½

Less than 5 bbl. lots, 1 cent advance per gallon.

More Steel Trade Meetings.

PITTSBURGH, PA., December 14, 1910.—(*By Telegraph.*)—A largely attended meeting of tin plate manufacturers was held in the Fort Pitt Hotel, Pittsburgh, yesterday. E. T. Weir of the Phillips Sheet & Tin Plate Company, Weirton, W. Va., was chairman. The conditions in the trade were thoroughly discussed, and it was the opinion of those present that, based on present prices of tin bars and pig tin, prices on tin plate were low enough and should be absolutely maintained. There has been some demoralization in the prices of black plates, and as a result of the meeting it is probable that in the future the market on that product will be more regular than it has been in the past. Another meeting will probably be held at an early date.

A meeting of manufacturers of plates has been called to be held in Pittsburgh to-day, and a meeting of steel bar makers is to be held here on Thursday.

American Iron and Steel Institute Committees

At the last meeting of the directors of the American Iron and Steel Institute, held in New York, a Committee on Contract Obligations was appointed, consisting of Willis L. King of the Jones & Laughlin Steel Company, as chairman; E. A. S. Clarke, president of the Lackawanna Steel Company, and Samuel Mather of Pickands, Mather & Co. This committee will consider the suggestions brought out in the paper of Willis L. King before the New York meeting of the institute looking to the better enforcement of contracts for the purchase of iron and steel. The committee will consider what measures should be taken in this direction, such as shortening of the sale period, cancellation of tonnages unspecified within a certain time, and the abolition of guarantees against decline. What is aimed at in part is to prevent the buyer from contracting beyond his requirements and the seller from selling beyond his ability to deliver. William B. Schiller, president of the National Tube Company, was made chairman of the committee heretofore appointed to consider the feasibility of a six-day week in continuous operations at iron and steel works. James A. Campbell, president of the Youngstown Sheet & Tube Company, was elected a director of the institute to succeed W. J. Filbert, comptroller of the United States Steel Corporation. Charles Kirchhoff was chosen as the representative of the institute on the Committee on Nomenclature of Iron and Steel, which was appointed several years ago by the International Association for Testing Materials.

The institute has adopted as its seal the one proposed by T. W. Robinson, first vice-president of the Illinois Steel Company, for the menu card of the dinner given at Chicago when the institute and its foreign guests visited that city in October. It was described on that occasion by Mr. Robinson as an allegory of the principles on which the institute is built. "Right Makes Might" is the chief inscription. Of the symbolism of other features, Mr. Robinson says: "In its detail appear the sword and spear transfused by the Alchemy of Wisdom into the plowshare and the pruning hook. From the crucible, for immemorable time the melting pot of nations, there springs the steel of war and the steel of peace. These, however, but surround the central motif, the spirit of co-operation, symbolized by the Bird of Immortality—the Phoenix—rising from the ashes of discord, enmity and strife, into the rays of enlightened life. In its finality the seal, bound by the sturdy oak and wreath with leaves of olive, is a laurel to the strength of unity and the gospel of co-operation."

The Railway Specialty & Supply Company, Monadnock Block, Chicago, changed its name December 1 to the P. & M. Company. This change was made because of the frequent confusion of its old name with the numerous other supply and equipment companies in the railroad trade. The company was organized in 1906 to manufacture and market the P. & M. boltless anti-rail creeper. This device has met with such success that it was deemed wise in adopting a new name to choose one that would identify the company as its manufacturer.

Tashenberg Bros., proprietors of the Buffalo Boiler Works, Buffalo, N. Y., have purchased the plant of the Frontier Boiler Works adjoining on Illinois street, and will consolidate it with their own business. They will also establish a branch plant at Erie, Pa. No new machinery or equipment will be required at present.

The Machinery Markets

The machinery trade is irregular. A better business is noted in Chicago and there is a good run of inquiries. In that city, as well as in New York, there is an increased miscellaneous business, although inventory work is interfering to an extent with buying. There is a rather heavy demand for machine parts and a good single order business for replacement. Detroit machinery plants are steadily increasing their output and there is a demand in that territory for skilled labor. There are indications of price cutting in some lines in Milwaukee, but the call for heavy machinery there is improving. A good call for general machinery exists in the Northwest and on the North Pacific Coast and business in those sections is well distributed. Things are a little quieter in the South, but the trade there has an optimistic tone. Similar conditions exist in the Southwest. A feature of the trade in the Farther Central West is an excellent call for mining equipment. Extensive developments in that line are under way and good sales are being made of air compressors and power units, both gasoline and electrical. Taken altogether, business in general looks better than it did a week ago.

New York

NEW YORK, December 14, 1910.

The unusual amount of inventory work now going on is interfering to an extent with machinery buying, but nevertheless trade is slightly better than it was a fortnight ago. There is a good call for single tools, and at least two New York representatives of large machine tool manufacturers booked more single orders during the last 10 days than they did during the entire month of November. Some of this business came from the railroads, and it is very apparent that most of the great repair shops in the East are crippled because of inadequate or obsolete working equipment. As is usual during periods of shop economy there is an extraordinary call for repair parts, and this has resulted in increasing the business of some shops at least. Manufacturers of outdoor equipment have fared better of late than business in other branches of the machinery trade. The work on the Panama Canal and extensive operations on the Catskill water works have contributed a great deal of support to that branch of business, and the unusual amount of municipal enterprises in the way of water works, &c., in various parts of the country is creating an especially good demand for hoisting engines, derricks, dredges, steam shovels and similar equipment.

The Simms Magneto Company, 1780 Broadway, New York, is now making inquiries for a line of machine tools to be installed in its new plant in course of construction at Watsessing, N. J. The plant is well under way, but the matter of buying machinery was left in abeyance because of Mr. Simms' absence in Europe. He returned a short time ago and it is expected that active buying will soon begin. The company's plant will be 150 x 300 ft. and two stories. The plant will be fully equipped for the manufacture of magnetos and from all accounts a large line of machine tool equipment will be installed. William Shuler is the purchasing agent.

It is understood that the mechanical engineers of the Pennsylvania Railroad are going over the company's large repair plants at Altoona, Pa., and Olean, N. Y., with a view to making up a list of immediate machinery requirements. There is a great deal of equipment in the Olean plant especially that is antique, according to people familiar with conditions there, and from all accounts the list of machinery requirements for replacement in that shop will be large.

The Transmission Gear Company has been organized, with offices at 96 Broadway, New York, to handle the Harris transmission gear. The company is at present having its equipment made under contract and has not decided as to whether it will build a plant later on or not.

The Gamon Meter Company is preparing to build at 280-294 South street, Newark, N. J., a new plant for the manufacture of water meters. The building will be 30 x 208 ft. and two stories. A steam power plant and two elevators will be installed.

D. B. Dunham, manufacturer of carriage tops, &c., Rahway, N. J., is having plans prepared for a five-story brick building, 100 ft. square, to be built at Central avenue and Fourth street, Newark, N. J. The equipment will include a steam plant, elevators, &c.

The Buffalo Mfg. Company, manufacturer of filters and water coolers, is making additions to its factory at 191 Clinton street, Buffalo, N. Y.

The Cyclone Grate Bar Company, Buffalo, N. Y., has increased its capital stock from $25,000 to $50,000, for the purpose of enlarging its manufacturing facilities. The offices of the company are at 827 White Building.

The Frontier Glove Company, Buffalo, N. Y., T. Nevin, M. H. Dunn and W. F. Strasmer, directors, has been incorporated, with a capital stock of $25,000 and will equip a factory for the manufacture of gloves.

The Syracuse Safe Company, Syracuse, N. Y., will add two stories, 122 x 131 ft., to the building on the Phœnix Foundry Company's property at East Water and Orange streets, which it recently purchased.

The Middletown Chemical Company, recently incorporated at Middletown, N. Y., with a capital stock of $50,000, will equip a plant for the manufacture of chemicals and also for the chemical treatment of silk and other fabrics. The directors are J. S. Mack, Allentown, Pa., and G. Walker.

The Aluminum Company of America is arranging to make extensive additions and improvements to its plant at Massena, N. Y.

The Syracuse Malleable Iron Company, Syracuse, N. Y., has commenced construction of its new foundry building, 150 x 200 ft., on North Geddes street.

The Dyneto Electric Company has been incorporated at Elbridge, Onondaga County, N. Y., with a capital stock of $60,000, to manufacture electrical appliances. A. E. Doman, C. L. Amos and A. A. Costello, Syracuse, are the incorporators.

The works of the John R. Keim Company, Kensington avenue and Erie Railroad, Buffalo, N. Y., which were damaged by fire recently, are to be repaired at once and large additions made. The plant is owned and operated by the Ford Motor Car Company, Detroit, for the manufacture of pressed steel parts for automobiles.

The Buffalo Lounge Company, Exchange street and the Lake Shore Railway, Buffalo, N. Y., has purchased the five-story brick manufacturing building at 588-594 Louisiana street and will equip it, as its factory No. 4, for the manufacture of lounges and furniture.

The W. A. Case & Son Mfg. Company, manufacturer of steam fitters' supplies, has purchased the four-story brick factory of the Wagner Machine Company, at Perry and Mississippi streets, Buffalo, N. Y., and will fit up and use it for the manufacture of refrigerating machinery.

The Wm. Simon Brewing Company, Clinton and Emslie streets and New York Central Railroad, is building an extensive bottling plant and will install complete electrically operated pumping and bottling equipment, with electric motors, &c.

James Shufelt, Oswego, N. Y., has plans completed for a three-story factory and one-story engine and boiler house, to be erected in that city for the manufacture of underwear.

The Marcellus & Otisco Lake Railroad has plans in preparation for a three-story factory and power building, 50 x 150 ft., concrete construction, to be erected at Marcellus, N. Y. John Stewart is manager.

Geo. Schaaf, 547 East Utica street, Buffalo, N. Y., is building a three-story machine shop and factory building at Lansing street and Military road, adjoining his present plant.

The Standard Oil Company is building a brick addition to the power plant at its Atlas Works, Elk and Babcock streets and the Buffalo Creek Railroad, Buffalo, N. Y.

The erection of a fertilizer plant with a capacity of 75,000 tons of fertilizer per year is contemplated at Rochester, N. Y., by Swift & Co., Chicago, Ill. Estimated cost, $500,000.

Catalogues Wanted

The Eccles & Smith Company, San Francisco, Cal., desires catalogues covering general machine shop tools and supplies.

The Fay Machinery Company, 126 Liberty street, New York, desires catalogues of mechanical specialties and supplies, electrical contractors' equipment, &c., with a view to making selling connections.

THE MACHINERY MARKETS

Chicago

CHICAGO, ILL., December 13, 1910.

Business is picking up in Chicago territory and dealers during the past week or ten days have been figuring on a good run of inquiries. There are no large lists reported in the market, and the demand is of a miscellaneous character, but has reached a volume which is quite encouraging after several months of dull business. Some good sales of used tools have been closed, and sales of new equipment have also been made for immediate delivery, but in the natural course of events the greater portion of the inquiries now pending will not grow into actual sales until after the first of the year. A favorable indication is that the supply houses have been doing a good business lately. The corporation tax requires all industries to take inventory at the end of the year, and as this period approaches there is a universal tendency to put off buying until the new year so as to reduce stocks. The supply people, however, are profiting by the fact that people have generally exhausted their stocks, which they had supposed would carry them over into the new year. There is no doubt that the business atmosphere will show a general improvement after inventories have been completed. The results of the year show up better on the books than current conditions would indicate. This will be quite a general condition and will undoubtedly bring the dealers a good deal of inquiry in January, which may or may not grow into an active period in the business, depending upon the growth of strength in other lines. Meantime, however, machinery men are generally feeling better, because it looks as though they have passed a turning point in a period of depression.

The Chicago Machinery Exchange, of which Waldemar Giertsen is proprietor, has under construction a new building at West Washington and Ann streets, Chicago. The building is 100 x 200 ft., three stories, of mill construction, with a floor space of 60,000 sq. ft., and is designed as headquarters for the sale of wood working machinery. The exchange has the agency in Chicago territory for several of the largest manufacturers of wood working machinery, and contemplates renting floor space and desk room to manufacturers of other non-competing lines. The exchange management will take care of machines that are exhibited in this manner and its salesman will give the necessary attention to prospective customers when the representative of the manufacturer is not present.

The Board of Education, Chicago, has plans prepared for a high school building which will be erected at a cost of $600,000, exclusive of the equipment, for which another $100,000 will be expended. The first floor of the building will contain a machine shop, wood working shop, a foundry and a forgeroom.

William G. Krieg, 172 Washington street, Chicago, is preparing plans for a factory to be erected for the Midland Terra Cotta Company. It will comprise four one-story units, 75 x 150 ft., a one to four-story mill and power house, 60 x 152 ft., one-story office building, 36 x 66 ft., one-story barn, 40 x 50 ft., and kilns.

The Leonard Construction Company, Chicago, will begin work shortly on a three-story addition to a factory and warehouse for the Velie Motor Vehicle Company, Moline, Ill.

The Union Iron Works, Decatur, Ill., has purchased additional ground adjoining its plant and contemplates the erection of two new buildings early in the spring. One of the proposed buildings will be used as a machine shop in which machine tools will be driven by individual motors. A new foundry is also under consideration and an addition to the present building used as an office and wood shop. The estimated cost of these improvements is $50,000.

The Illinois Valley Gas & Electric Company, Joliet, Ill., has purchased the plant of the Henry Electric Light & Power Company, Henry, Ill., and the plants at Chillicothe and Lacon, Ill. Extensive improvements will be made to the Lacon plant and new machinery installed.

Grossmann & Proskauer, constructing and consulting engineers, Old Colony Building, Chicago, are in the market for gas producers, suction gas power plants, foundry machinery and equipment, forge machinery and equipment, and steam power plants, in connection with two large manufacturing plants that they are designing.

Philadelphia

PHILADELPHIA, PA., December 12, 1910.

While there has been no change in the character of the demand, merchants have taken a somewhat larger number of orders, mostly for the smaller class of tools. A number of these orders had been pending for some time and the volume of business under negotiation is steadily declining, the trade becoming more dependent on current business. Several inquiries for small tools have come from the local railroads recently, but there is still no indication of more general buying on the part of those interests. Manufacturers of tools, both of the standard and special types, continue to report business as irregular and look for little betterment in the immediate future.

Second-hand machinery merchants report quiet conditions and very little new business in second-hand engines, boilers or electrical equipment is noted.

The S. S. Wentzell Machine Company, manufacturer of bottle washing machinery, is taking bids for a new brick and concrete manufacturing plant, 100 x 150 ft., two stories, to be erected at Fiftieth street and Parkside avenue. The principal equipment will be moved from its present plant, 439 North Twelfth street, although some minor equipment may be required but has not yet been considered.

"P. S. M.," care Philadelphia office of *The Iron Age*, is inquiring for a second-hand 100-kw. 110-volt direct current generator, directly connected to a standard make of steam engine. The equipment must be in first-class condition and the make of both engine and generator should be stated.

The Pooley Furniture Company has, it is reported, awarded contracts for the building of a four-story factory, 50 x 166 ft., of brick and concrete, to replace that portion of its plant recently destroyed by fire.

The Frick Company, Waynesboro, Pa., has under consideration the erection of a new foundry building, but has not decided when it will go ahead with the work.

The Electric Speedometer Company is the name recently adopted by the Electric Speedometer and Dynamometer Mfg. Company, 1420 New York avenue, Washington, D. C., under which it will transact business. The officers of the company and the nature of its business remain unchanged. Earl Wheeler is general manager.

While it has been reported that Rowland Firth & Sons, Phillipsburg, N. J., would build a steel casting plant in connection with their works in that city, no definite plans in connection with the project have so far been decided upon.

The Keeley Stove Company, Columbia, Pa., is having plans prepared for a four-story brick factory addition, 52 x 112 ft., for which it will take bids in the near future.

Weaver & Wittle, Labanon, Pa., are building at Front and Lehman streets, in that city, a concrete manufacturing building, 40 x 110 ft., basement and two stories. This building will be used for the manufacture of gasoline engines and novelties, as well as general machine repair work. A small quantity of machinery will be required. They will also manufacture, under the name of Weaver & Co., a new wheat separator, for which purpose woodworking machinery will be installed. The new plant is expected to be ready for occupancy about January 1.

New England

BOSTON, MASS., December 13, 1910.

The machine tool trade remains quiet. Buyers are frank in their intentions to defer the placing of orders until after January 1, or are stipulating that machinery ordered now shall not be billed this year. Foreign business is improving. For example, the Potter & Johnston Machine Company, Pawtucket, R. I., with its large works running overtime, can quote no deliveries better than May 1, 1911, and a large percentage of the orders are from European customers. Other machine tool people are feeling the same influence in varying degrees. The supply trade is good to an extent all out of proportion to machinery. Probably it is a little under the existing line of normal in the curve of demand. But the fact that one old established, always progressive house finds the supply end of its business for the year to date in excess of previous records, is significant.

The sugar and coffee machinery manufacturers report a satisfactory demand, largely for export. The textile machinery industry is rather dull. So are the foundries. With electrical equipment deliveries are not good. The wire business is active, relatively speaking.

The current opinion is that spring business, asserting itself in January, will show a decided improvement. The deduction is probably arrived at through the process of elimination; substantial reasons why conditions should not improve are not easily found. Many experienced and wise observers agree in this opinion. The general desire to make the best possible showing for the year's business, through the medium of the inventory, is retarding buying at present. The removal of the influence, with the resultant accrued business, should have a stimulating effect.

The aeroplane is beginning to be a factor in New England industry. Several concerns are already established to build flying machines. The latest announcement is that a company is forming in Waltham, Mass., headed by C. H. Metz, manufacturer of motor vehicles, to manufacture aeroplanes and their motors. The purpose is to establish a new factory. Established houses and individual designers are

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paying much attention to motors for heavier than air machines. The supply trade is feeling this influence to quite an appreciable extent.

The Oven Equipment & Mfg. Company, Stamford, Conn., manufacturer of sectional ovens and inclosed flame gas burners, will erect a new factory at New Haven, Conn. The building will be of brick, 60 x 200 ft., and two stories, with concrete roof and floors. It will not be ready for occupancy until late next spring, and the machinery requirements have not been made up. Victor Morris Tyler is the president of the Company; Ronald Crawford, vice-president, and Edgar L. Hartpence, treasurer.

The Brown & Sharpe Mfg. Company, Providence, R. I., has brought out a new plain milling machine known as the No. 2 B No. 13 B., the capacity of which is 34 x 6 x 12 in.

Industrial projects just announced include the following: Woodworking mill for the Benjamin Chase Company, Derby Village, N. H., to replace plant destroyed by fire December 11, with loss of $20,000; Platt Brothers, Oldham, England, reported intention to erect machine shops at Fall River, Mass., to take care of the firm's American trade in cotton mill machinery; Providence Braid Company, Pawtucket, R. I,. two-story brick addition, and projected new mill. The new plant of the National Seat & Novelty Company, Hop River, Conn., will be 40 by 100 ft., one-story. Rawitzer Brothers, Stafford Springs, Conn., textiles, will replace mill recently burned by plant at Greystone, Conn.

The S. A. Woods Machine Company, South Boston, Mass., manufacturer of woodworking machinery, is contemplating important improvements to its works in the spring, which will largely increase its manufacturing capacity.

The National Machine Tool Company, 253 A street, South Boston, is in the market for a second-hand 24 x 24 in. planer with 10-ft. bed.

The Traut & Hine Mfg. Company, New Britain, Conn., manufacturer of metal specialties, has increased its capital stock from $200,000 to $500,000. The new securities will be distributed as a stock dividend of 150 per cent.

The Manchester Supply Company, Manchester, N. H., will occupy the building in that city soon to be vacated by the Leighton Machine Company, which is removing to its new shop at East Manchester.

The B. L. Company, Norwich, Conn., manufacturer of ball bearings, has incorporated with a Connecticut charter and capital stock of $50,000, commencing business with $10,000. The company manufacturers all styles of ball bearings products which have previously been imported from Germany. Otto Bruenauer is the president and B. F. Leavitt treasurer and general manager. The New York office is at 50 Church street.

The Symonds Motor Wagon Works has been organized, with a factory at Hyde Park, Mass., to manufacture motor wagons. The company is closely allied with the Exeter Machine Works, Exeter, N. H., of which Joseph H. Symonds, for whom the new company is named, is the president. The new industry will be located in a large building at Hyde Park, formerly used as a woolen mill. A medium price motor wagon will be constructed. Charles C. Leach is the mechanical engineer. A branch metal working plant is planned, to be located in Boston. The Exeter Machine Works is planning to reopen its iron foundry, which has been shut down for some years, and will modernize the equipment for the purpose. New machinery will be installed, replacing some of the older tools in the works. New lines of curved blade and Exeter many blade fans are being designed.

The National Boat & Engine Company has been incorporated under the laws of Maine to take over the business of nine companies which have been engaged in the manufacture of motor boats and parts. Walter J. Reynolds, Muskegon, Mich., is president; J. M. Truscott, St. Joseph, Mich., vice-president, and C. A. Williams, Bay City, Mich., secretary. The authorized capital stock of the company is $10,000,000. and a bond issue is also contemplated. The plants which are merged into the new company are the following: Racine Boat Mfg. Company, Muskegon, Mich.; Truscott Boat Mfg. Company, St. Joseph, Mich.; Pope Boat Company, Fond du Lac, Wis.; Pierce Motor Boat Company, Racine, Wis.; Shell Lake Boat Company, Shell Lake, Wis.; Western Boat & Engine Works, Michigan City, Ind.; West Mystic Mfg. Company, West Mystic, Conn.; Inland Lakes Boat Company, Lake Geneva, Wis. The new company also contemplates engaging in the manufacture of aeroplanes.

The Miner & Peck Mfg. Company, proprietor of the Peck Drop Press Works, New Haven, Conn., is making extensive alterations to its plant and adding to its manufacturing equipment. The company has booked enough business to keep it going until February and its business is rapidly expanding.

Cleveland

CLEVELAND, OHIO, December 13, 1910.

While not much business is coming out in the shape of actual orders, dealers report a considerably better volume of inquiry than a month ago. Numerous prospective buyers are getting prices on tools that they expect to place orders for soon after the first of the year, so that these inquiries are not stimulating current business very much, but they have made a better feeling among the trade. Business during the week has been largely of a pick-up character, being confined mostly to small and medium sized single tools. Architects and engineers have considerable work on hand in the line of new manufacturing plants and additions, on which construction will be started early in the spring, so that the outlook for a fair demand for machinery equipment from this source is quite promising. The demand for second-hand machinery is fairly good. About a month ago considerable used machinery was thrown on the market, but this supply seems to have been pretty well absorbed and less is being offered at present, the supply not exceeding the demand. Builders of industrial cars and locomotives report that the demand for their products which has been active for some time continues good.

In the foundry trade business continues light, but a few of the foundries report some improvement in inquiries.

For enlarging the municipal water works plant in Canton, Ohio, the Directors of Public Service will receive bids this week for one double acting Triplex power pump with a capacity of 2,000,000 gals. per 24 hours, direct connected to a 150-hp. alternating motor. Bids will also be received for a horizontal centrifugal pump in one or two units for pumping against a head of 250 ft. For power equipment bids will be received for one 250-hp. compound steam engine direct connected to a 150-kva. A. C. generator and exciter with a suitable switchboard, also condenser for engine; also for 325-hp. engine and 200-kva. alternating current generator, and for gas engines and generators of similar capacities. Bids will also be received for a steel storage reservoir of from 1,000,000 to 2,000,000 gal. capacity.

An industrial exposition is being planned in Toledo, Ohio, under the auspices of manufacturers of metal goods. Of the 80 companies in that city engaged in metal working industries 51 have already agreed to take part in the proposed exposition, the date for which has not yet been set. Some of the leading manufacturers in the city are taking an active interest in the project.

The plant of the Gabriel Horn Mfg. Company, East Fortieth street, Cleveland, was totally destroyed by fire December 10, causing a loss of about $50,000. The company manufactures automobile horns. The plant will probably be rebuilt at once.

The Cleveland Engineering Company has completed plans for the new plant to be erected by the Ohio Blower Company, Cleveland, and will receive bids for the buildings December 15. There will be two buildings, one a factory building, 80 x 128 ft. and the other an office building 48 x 51 ft. Both will be two-story structures of steel and mill construction. The plant will be located at Banker avenue and East Sixty-first street. Very little new machinery will be required.

Plans for a new plant to be erected by the Suspension Roller Rearing Company, Sandusky, Ohio, have been completed by the Osborn Engineering Company, Cleveland. The latter company will receive bids for the building December 19. This will be a one-story structure of brick and mill construction, 60 x 320 ft. The roller bearing company will purchase woodworking machinery and brass and iron foundry, forge shop and machine shop equipment.

The Atlas Car & Mfg. Company, Cleveland, reports the receipt recently of a number of good orders for industrial car equipment. Among these orders are the following: Two orders for 50 special 6-yd. cars from Pennsylvania quarries for handling stone direct from steam shovels; two industrial railroads, one for a large manufacturing plant and one for an automobile plant, and two storage battery locomotives for a steel plant.

A deal has been practically concluded in Tiffin, Ohio, for the removal of the plant of the Webster Mfg. Company from Chicago to that city, where it will be united with the plant of the Tiffin Malleable Iron & Chain Company. One of the conditions of the removal, which is understood to have been met, is the sale of $300,000 in bonds. Plans have been made for extensive additions to the Tiffin plant. These additions will provide a floor space of between 110,000 and 120,000 sq. ft. and more than double the capacity of the present plant.

The Wood County Stone Construction Company, Bowling Green, Ohio, has been organized, with a capital stock of $25,000. The company will erect a stone crushing plant.

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John H. Lincoln is president and Dr. F. D. Halleck secretary and treasurer.

The Goodyear Tire & Rubber Company, Akron, Ohio, is completing additions to its plant, which will be ready for occupancy by January 1. These consist of a factory building 400 ft. long, five stories and basement, and a large power house.

The Dover Mfg. Company, Canal Dover, Ohio, has increased its capital stock from $100,000 to $150,000.

The Norwalk Drilling Tool Company, Norwalk, Ohio, incorporated with $10,000 capital stock, will manufacture all kinds of drilling tools, steel forgings, rough or machined, and make a specialty of repair work, of gas and steam engines and pumps. The company has purchased the buildings of another concern, especially adapted for its requirements, and which contains a complete equipment, consisting of hammers and machine tools.

Cincinnati

CINCINNATI, OHIO, December 13, 1910.

The export business is engaging the attention of the machine tool trade here, and quite a number of firms report orders received lately from different parts of the world. While orders from the domestic trade are slow in coming in to some firms, others state that the week opened up very favorably, and show the documents to back up this claim. The South has lately furnished a fair share of orders for machine tools, and some of the railroads in that part of the country are said to have been better customers within the past six weeks than some of the larger systems in the North and West. However, the bulk of business received continues to come from the general trade all over the country.

Second-hand machinery shows some improvement, but this is considered merely a temporary spurt, and no steady gain is anticipated until after the holiday season.

The Industrial Bureau of Cincinnati has under consideration an offer from an automobile manufacturing firm to establish a plant in Cincinnati, and it is expected that a favorable location will be found within the next few days. A shoe manufacturer is also contemplating moving his plant to this city some time during the spring.

The Cincinnati Branch, National Metal Trades Association, gave a banquet at the Business Men's Club December 8, at which were present a large number of manufacturers and railroad men. R. K. LeBlond, president of the R. K. LeBlond Machine Tool Company, was toastmaster. A. H. Lazare, central Western manager of *The Iron Age*, substituting for Wm. H. Taylor, general manager of the David Williams Company, who was absent on account of illness, delivered an interesting address on the subject of "Industrial Peace." William Hodgon, freight traffic manager of the Pennsylvania lines at Pittsburgh, presented an able argument on advancing freight rates and he was well supported later by D. C. Buell of the Union Pacific Railway System. Other railroad speakers included S. C. Matthews, general freight agent of the Pennsylvania lines, and Superintendent R. C. Barnard of the same company. Murray Shipley of the Lodge & Shipley Machine Tool Company, responded with an urgent appeal for a square deal for the railroads, followed by Philip Geier of the Cincinnati Milling Machine Company, J. C. Hobart of the Triumph Electric Company, and W. Copiey of the Lima Locomotive & Machine Company. Prof. Frank H. Ball called attention to the manual training department of the Cincinnati Public Schools. Assistant Secretary Manley of the Metal Trades Association, who arranged the banquet, responded to the addresses and was vigorously applauded.

The J. B. Morris Machine Tool Company, Cincinnati, expects to have its new shops in operation before January 1.

The Bradford Machine Tool Company, Cincinnati, has acquired a tract of land adjoining its plant, which will be used for yard storage purposes.

The Cincinnati Planer Company's Oakley plant is working on full time, and lately orders have been received from Holland, Belgium, Germany, Italy, Japan and Cuba, which goes to show that the export business is improving. The company's domestic orders have also been on the increase lately, and an excellent spring business is anticipated.

The Business Men's Club, Cincinnati, gave a dinner to Charles H. Sherrill, United States Minister to Argentina, who delivered an address on South American trade that was very interesting to the manufacturers, especially the machine tool builders, who were present.

It is stated on good authority that the improvements contemplated to be made at Oakdale, Tenn., by the Queen & Crescent Railroad Company, will be carried out and that considerable shop machinery will be required by that company next year.

The Athens Heat, Light & Power Company has been incorporated at Athens, Ohio, with $25,000 capital stock, by F. T. Lindman, C. S. Blauvert, W. E. Detlor, B. F. Detlor and Peter Kunz.

The Igou Mfg. Company has been incorporated at Springfield, Ohio, with $100,000 capital stock, to manufacture and sell machinery. The incorporators are Dennis T. Igou, P. A. Staley, D. C. Igou, D. E. Jones, R. H. Foos and J. H. Dyer.

To mine coal and manufacture coke, the Orr Coal Mining Company has been incorporated at Grafton, W. Va., by J. M. Orr, C. N. Orr, N. F. Orr and A. W. Burdette, all of Grafton, and C. B. Johnson of Clarksburg, W. Va.

The Hoovan, Owen & Rentschler Company, Hamilton, Ohio, has added to its line of manufacture sugar machinery, and has recently made shipment of two large outfits to Porto Rico and one to a Texas crusher. Its new pattern shop has been completed and other additions are contemplated for the spring.

The four-story addition to the Black & Clawson Company's plant, at Hamilton, Ohio, has been completed, and is now used as a pattern shop and storage department entirely.

The Hamilton Machine Tool Company, Hamilton, Ohio, reports some recent sales of lathes for shipment to Japan, Norway and Holland.

The H. P. Deuscher Company, Hamilton, Ohio, manufacturer of woodworking machinery, whose plant was recently mentioned as being damaged by fire, is adding to its foundry building a one-story, 80 x 140 ft., brick structure, which will give its foundry a total length of 340 ft. The shop building, also under construction, measures 60 x 190 ft. Several outside storage buildings are being erected, and the company expects to have all completed by early spring.

Schenck & Williams, Dayton, Ohio, are drawing up plans for a $100,000 power building, to be erected for F. P. Beaver, Dayton, and work is expected to commence early in the spring.

The Buckeye Stamping Company's factory at Columbus, Ohio, recently mentioned, is nearing completion and will be occupied at an early date.

The Philip Carey Mfg. Company's Lockland plant is running up to capacity, and an especially heavy demand for insulating material is reported at the present time.

The Long & Allstatter Company, Hamilton, Ohio, has recently shipped five of its large punching and notching machines to the Edgar Thomson Works of the Carnegie Steel Company.

The Troy Foundry Company, Troy, Ohio, recently incorporated with $10,000, has secured the building and equipment of the old Troy Foundry & Machine Company. The company will make all kinds of gray iron castings and has a capacity of 20 to 25 tons a day.

Pittsburgh

PITTSBURGH, PA., December 13, 1910.

There is not very much life to the market at present, so far as the immediate requirements of this district are concerned. Local concerns are looking mainly to other parts of the country for orders, the aggregate of which continues fairly large.

The United States Signal Company has been organized at Pittsburgh by Thos. A. McQuaide and others. Its plans include the establishing of a factory for the manufacture of boxes and other apparatus for police and fire alarm systems.

The selection of the site for a refinery to be located near Butler, Pa., is under consideration by officials of the High Grade Oil Refining Company, Pittsburgh. J. A. Schofield is president.

Contracts are to be let shortly for a plant to be built by the Bluefields Gas & Fuel Company, Bluefields, W. Va., which will triple its present generating capacity. The plant will include a steam boiler, two benches and the necessary retorts.

The Penn Central Light & Power Company will begin the erection, by or before spring, of a large electric generating station at Altoona, Pa.

Construction contracts have been awarded for a new electric traction line, to be known as the Allegheny & Northwestern Railway, Butler, Pa., which will build from Evans City to Harmarville. The plans for power equipment have not yet been settled upon.

The sale of machinery in and around Charleroi, Pa., should be influenced considerably by a campaign which has just been inaugurated by the Charleroi Business Men's Association of that place for the location in that district of new industrial plants.

Among the contracts recently booked by the Westinghouse Electric & Mfg. Company, Pittsburgh, is one for steam turbines and generators, comprising three units, for the new central power station of the electrical pumping system at Buffalo, N. Y.

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Very comprehensive plans for a large electric generating plant at Speers, Pa., are reported to have been prepared by the West Penn Railways, Pittsburgh, but for the present the additional power needed will be provided by doubling the capacity of its Connellsville station, where extensive improvements are now in progress.

Electric drive is to be installed throughout in the plant of the Union Clay Mfg. Company, Empire, Ohio.

A steam turbine power plant of 500 kw., with three water tube boilers, condensers, feed water and circulating pumps, &c., as well as auxiliary electrical machinery, will be provided for by the Clarion & East Brady Electric Railway Company, Clarion, Pa.

New machinery is being installed by the Parkersburg Mill Company, Parkersburg, W. Va., which will materially enlarge the capacity of its timber cutting and woodworking plant. All of the equipment is to be electrically operated and controlled.

The Pittsburgh Meter Company, East Pittsburgh, Pa., has plans under way for some large additions to its plant, full details of which have not as yet been worked out.

Milwaukee

MILWAUKEE, WIS., December 12, 1910.

The local machinery trade is irregular, and conditions lately have been far from satisfactory, although in some lines manufacturers are working nearly or quite to capacity. Price cutting has again developed, particularly with reference to electrical machinery, and intending purchasers are playing off one concern against another.

For heavy machinery, such as only a few of the larger plants build, the demand appears to be improving. Some excellent orders have been entered here within the past fortnight, and enough others are practically certain of being closed to insure a good run of work in the shops. Drafting and estimating departments are busy. Within a few weeks, at least, the patternmaking and foundry departments will have considerably more to do than was the rule during the fall, and, from present indications, the machine shops in which work is now slack will be well occupied by the middle of January.

The C. Reiss Coal Company, Sheboygan, Wis., will have plans completed shortly for a new power plant and coal dock at Manitowoc, Wis. Boilers, engine, generator, electric motors and handling machinery will be among the requirements.

The foundry building which was to have been erected this fall by the Porcelain Enameling Association of America, at Sheboygan, Wis., will not be started until spring.

The Smalley Mfg. Company, Manitowoc, Wis., has purchased some of the machinery for the addition to its plant but will require more later on, when the new quarters are occupied.

William Gateman, Manitowoc, Wis., will install a machine shop for repair work in connection with a garage which he is about to build there.

The Westinghouse Electric & Mfg. Company, through its district office in the Majestic Building, Milwaukee, has taken the contract for the electric motors to be installed in the new factory of the S. W. Miller Piano Company, Sheboygan, Wis.

The Standard Zinc Company, Platteville, Wis., will dispose of considerable pumping, hoisting and other machinery which has been displaced by heavier equipment.

The Menominee & Marinette Light & Power Company, Menominee, Mich., is arranging to extend its service to a number of industries in that vicinity, which will put in motor drive, including plants located on the island between the two cities.

The plant of the French Battery Company, at Madison, Wis., recently burned, will be rebuilt.

The city of Stoughton, Wis., has bought the water power of the Stoughton Milling Company, which will be utilized as an auxiliary to the municipal plant now operated, after being improved.

It is reported from Chippewa Falls, Wis., that a new timber cutting plant will be built there, and equipped for electric drive by Johnson & Lee.

The works of the Power & Mining Machinery Company, Cudahy, Wis., are exceptionally active, and every indication points to the fact that they will soon be running practically to capacity. The business shows considerable improvement over last year.

The Milwaukee Bridge Company, Milwaukee, has the contract for the structural work on a new manufacturing plant for the J. W. Wells Company, Menominee, Mich.

The concentrator and power plant of the Minnie Mining Company, Benton, Wis., is to be rebuilt, having been almost completely destroyed by fire.

The Sternberg Mfg. Company, Milwaukee, which recently completed an auto-truck factory in West Allis, will probably enlarge the plant by or before spring, in order to meet the demand for its product.

The Giddings & Lewis Mfg. Company, Fond du Lac, Wis., has taken the contract for the complete equipment of a timber cutting plant, the main building of which will be 65 x 210 ft., that has been designed for erection by the Finger Lumber Company, Ltd., in Saskatchewan. Members of the Menasha Woodenware Company, Menasha, Wis., together with Herman Finger of Port Arthur, Ont., form the new organization.

A car house, which will probably be equipped with tools for repair work, is to be built in Janesville, Wis., by the Janesville Traction Company.

A new boiler plant will need to be erected by the Shawano Lumber Company, Shawano, Wis., to replace the one operated in connection with its mill, which recently burned.

The Battery Light & Power Company, recently organized in Milwaukee, has secured manufacturing facilities and is extending its sales campaign over the State. H. M. Klingenfeld is manager.

The McDonough Mfg. Company, Eau Claire, Wis., recently completed the installation of new machinery in the remodeled mill of the Conway Lumber Company, Conway, N. H., which is a steel frame structure, 75 x 300 ft., of the most modern design and equipment.

The Gardner Machine Company, Beloit, Wis., advises that it will have the machine shop department of its new plant in operation in about three weeks.

Detroit

DETROIT, MICH., December 13, 1910.

The automobile industry exhibits increased strength. Reports received by the leading companies from their agencies in various parts of the United States, as well as some foreign countries, are most encouraging. Great interest is being taken in the new models, and for high grade machines, at least, the demand next year will unquestionably be heavy. This condition has, of course, its due effect upon the purchases made by the motor car builders. They are buying steadily to meet regular operating needs, and, while the tendency still is not to order tools or supplies very far ahead of actual requirements, a favorable price will frequently lead to very satisfactory bookings.

The gasoline engine department of the Port Huron Construction Company, Port Huron, Mich., is crowded with work at present. It has been found necessary to put on more men for assembling and testing.

The plans of the Huron Mfg. Company for a factory in Ann Arbor, Mich., are practically complete, and construction contracts have been let. Some of the details of equipment are, however, still to be worked out.

A branch plant, 30 x 130 ft., is to be built in Detroit by the Dominion Stamping Company, Walkerville, Ont.

The National Cable & Mfg. Company, Niles, Mich., which recently increased its capital stock from $40,000 to $100,000, has bought the factory and other property of the Eager Mfg. Company of that city, which will be used for the extension of its business.

The Gaylord Motor Company at Gaylord, near Boyne, Mich., is preparing to manufacture its own automobile bodies.

The J. E. Bolles Iron Works, Detroit, have been awarded the contract for a three-story addition to the plant of the Detroit Forging Company.

From Eaton Rapids, Mich., it is reported that J. Lamb has organized a company to establish a plant for the manufacture of agricultural machinery.

The Detroit Bridge & Steel Works, Detroit, will erect the new municipal boiler plant, plans for which were recently approved by the Public Lighting Commission of Detroit.

D. W. Moseley, Alba, Mich., will put in a new timber cutting plant near that place.

A new two-story factory building is to be erected by the American Agricultural Chemical Company, Detroit. Plans are now being drawn.

The Consumers Power Company has been organized at Manistee, Mich., to build an electric plant furnishing current for industrial purposes. Its full plans, however, have not been made public.

Advices from Midland, Mich., are to the effect that a planing mill will be completed there this winter by John Nehil & Son.

The Bucyrus Foundry & Machine Company, Bucyrus, Ohio, is preparing to erect a shop building of brick and steel construction, which will be furnished with modern equipment.

Bids for a filtration plant and its complete equipment

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will be taken up to January 19 by the city of Grand Rapids, Mich.

The Inner-Brace Chair Company, Schoolcraft, Mich., recently incorporated with $100,000 capital stock, has acquired about 2 acres of ground improved with a two-story building, 40 x 140 ft., on which it is making extensive repairs preparatory to the manufacture of dining room chairs reinforced by invisible continuous steel bracing. The company has already purchased all necessary equipment, but will be in the market for a considerable amount of hand tools.

Toronto

TORONTO, December 10, 1910.

As the time of year for stock-taking and slowing down for repairs draws near, business begins to fall away somewhat from the high line that marked its movement throughout the autumn. But its energy is not greatly lowered; it is still in a condition that can be described as active. That the accumulation of unfilled orders is being eaten into at a rate more rapid than that of its accretion is, however, probably a fact. It remains to be seen whether steam can be kept up at the present pressure throughout the winter. There is a large amount of capital in hand yet to be expended on new enterprises, expansive and reconstructive—capital brought into the country as the proceeds of securities that have been taken freely abroad, mainly in England, and to a limited extent in France. Other issues whose total amount will be great are expected to be forthcoming. It does not appear that there will be a want of funds for the purchase of plant and equipment on these accounts, whether or not the buying power derived from the last crop will continue to play so large a part as it has done so far.

At a meeting held in Welland, Ont., this week it was decided by the directors of the Niagara Falls, Dunnville, and Welland Electric Railway Company to expend $1,000,000 on railroad construction account. Car barns and machine shops are to be erected in Welland.

The Vancouver Gas Company is preparing to build a new plant on deep water frontage at Vancouver, B. C.

The Canadian Auto Top Company, to manufacture tops, wind shields and other accessories of automobiles, expects to have its plant at Tilbury, Ont., ready for operation by January 1. Among the provisional directors are persons said to be connected with the American Auto Top Company, Jackson, Mich.

M. W. Doherty, recently connected with a machinery company in Galt, Ont., is organizing a company to manufacture machinery in St. John, N. B. Incorporation is being sought, the capital stock to be $99,000, and some Toronto machinery interests are named in connection with the enterprise. Woodworking, sawmill and machineshop supplies will be carried in stock.

It has been announced by the chairman of the Ontario Hydro-Electric Commission that the machine shops of the commission will be located in London, Ont., that being the central point in the transmission system.

A proposal to establish in St. Thomas, Ont., an industry to employ 200 hands is being considered by the City Council. A fixed assessment for a number of years is asked for. Machinery is to be put in on a considerable scale, but no further particulars are given out. Negotiations are on foot for the placing in the city of a branch of an American manufacturing concern. Fifty hands would be employed. Some municipal assistance is asked. Of the nature of the works nothing has yet been made public.

A large American concern is in communication with the president of the Board of Trade in London, Ont., in respect to the establishing of a Canadian manufacturing branch there.

The Doty Engine Works Company, Goderich, Ont., proposes to establish a shipbuilding yard at Port Stanley, Ont. Large tugs will be built. The company has contracts for three large ones at present.

The ratepayers of London, Ont., are about to vote on a by-law for fixing the assessment of the McClary Mfg. Company at $150,000, which is $50,000 higher than the amount at which it was fixed in 1902. It is proposed to make large additions to the works in the next few years.

Winnipeg is making special efforts to secure manufacturing businesses and several manufacturers in eastern Canada are considering the placing of branch works there, where cheap hydro-electric power is now obtainable.

The Paterson Lumber Company proposes to build manufacturing works to cost $250,000 to $300,000 in Vancouver, B. C., in connection with its existing business there.

The Richardson Feldspar Mfg. Company, Kingston, Ont., has entered into a contract to supply two carloads of feldspar per week to a soap-making concern in the United States. This is a consequence of Germany's action to restrict the exportation of potash, the concern in question having discovered a process for profitably extracting potash from the feldspar ore of Kingston vicinity.

The Ontario government has passed an order-in-Council providing for the building of a branch line from its Temiskaming & Northern Ontario Railway into the Porcupine mining district. This 32 miles of road will cost about $400,000 and is to be built without delay. Its construction is certain to cause a large expansion in the demand for machinery for mining operations in that camp, whose properties specially require heavy machinery, which cannot be brought over the sleigh roads except under great difficulty and almost prohibitive cost.

Port Arthur (Ont.) municipal authorities have now under consideration proposals for the establishing of new industries involving a capital outlay of $1,400,000. H. S. Jones of Winnipeg proposes to build and operate car works. The plant is to cost $400,000. A free site of 15 acres is asked. A prominent American manufacturer is asking consideration for a project to put up automobile works there to cost $500,000. A foundry project in connection with the local blast furnace is also the subject of negotiation. Mr. Jones' plant would include in its output and operations machinery, cars, railway equipment and repairs.

The Electric Power Company, Limited, is the name of a corporation that has got control of several operating power companies in the Trent River district, Ont., and is proposing large extensions into the cities and towns of that extensive and busy region.

At a meeting of the shareholders of the Lilliker Car Company, held in Halifax, N. S., on December 6, it was decided to accept the amended offer of F. B. McCurdy to purchase the assets and business. The offer includes an undertaking to put $600,000 new capital in the business. The McCurdy interests will purchase $600,000 of the first preferred 7 per cent. stock.

The Collingwood Shipbuilding Company, Collingwood, Ont., has obtained the contract to build a passenger steamship for the Niagara, St. Catharines & Toronto Steamship Company for $165,000; also one for the Ontario & Quebec Navigation Company to cost $250,000; and will make important alterations in two of the steamships of the Canadian Pacific Railway lake line.

The Humber Lumber and Pulp Company is preparing to add to its works a very large pulp mill at Bay of Islands, Newfoundland.

The Grand Falls Company, Limited, which has been formed with $1,200,000 capital stock to develop power and construct large pulp and paper mills at Grand Falls, N. B., is a corporation of men of financial strength, including as it does Sir William Van Horne, ex-president of the Canadian Pacific Railway Company; W. S. Holt, president of the Royal Bank of Canada; George F. Underwood, vice-president of the International Paper Company.

A branch of the Massey-Morris Company's business is to be established in Edmonton, Alberta.

The Rat Portage Lumber Company's mill on the St. Boniface side of the Red River, opposite Winnipeg, Man., was burned on December 7. Loss estimated at $200,000, of which about 80 per cent. was covered by insurance.

In the spring the Diamond Flint Glass Company will erect a large glass factory on a 10-acre site obtained for it in Hamilton by the Publicity Commissioner there. When the new factory is completed the company will vacate its present premises in the city. It is also announced by the commissioner that the Egg-O Baking Powder Company of Repira, Sask., will establish works in Hamilton, and that the Robinson Box Mfg. Company of Lowell, Mass., will do so as well. He says that new factories of an aggregate value of $4,000,000 have been secured for Hamilton within the last twelvemonth.

The Central Canada Power Company, capital stock $10,000,000, has been incorporated under Dominion laws. It will carry on business from its head office in Toronto.

Incorporation has been granted to the Dominion Carlite Explosive Company with head office at Wallaceburg, Ont., and a capital stock of $100,000.

Texas

AUSTIN, TEXAS, December 9, 1910.

The effect of the severe drouth that has prevailed in some parts of Texas for several months is beginning to be felt by business interests. While there has as yet been no appreciable curtailment of industrial operations and plans in any line, such a result is expected, unless rains come in time to insure good crops for next year. Winter rains are the chief dependence of Texas farmers who are situated out of the irrigated parts of the state. In south Texas, where there has been such wonderful irrigation develop-

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ment during the last few years, the lack of natural rainfall is not of serious moment to the farmers. No diminishing of the flow of water in the different streams or of the artesian supply available for irrigating the lands is imminent. The drouth in other parts of the state is serving to make more apparent the benefits and advantages of growing crops by means of irrigation, and the increased sales of pumping machinery demonstrate the interest that is being taken in that branch of the agricultural industry.

C. B. Atterbury, Hillsboro, Ill., has under consideration the establishment of a factory in Austin for the manufacture of a certain line of farm machinery.

The plant and other holdings of the Taylor Water Company at Taylor, Texas, have been purchased by Andrew J. Zilker of Austin. He will make improvements to the property.

The Houston Land Corporation, which is arranging to lay out a new suburban town on the outskirts of Houston, will equip the place with water mains and a sewer system. The tract that is to be developed embraces 160 acres.

The Southern Marble & Stone Company will install a stone cutting plant at Yoakum, Texas. J. Lyons is president.

The boards of County Commissioners of Coleman and McCulloch counties have agreed to jointly erect two steel bridges across the Colorado River; one at or near Waldrip will cost $15,896, and the other at Stacy, $21,484.

Tennission Brothers have established a factory at Houston for the manufacture of metal shingles, metal feed troughs and water troughs. They have a similar factory at Texarkana, Texas.

The Progressive League of Goliad, Texas, is arranging to offer inducements for the establishment at that place of a canning factory, broom factory and steam laundry.

It is announced by the Hubbard Mfg. Company that its hoop mill at Texarkana, Texas, which was recently destroyed by fire, will be immediately rebuilt.

The City Council of Brownsville, Texas, recently received the proceeds from the sale of $30,000 of bonds to be used in enlarging the electric light plant and water works system.

The Electric Railway Company of El Paso has under consideration the construction of an electric transmission line down the Valley of the Rio Grande to supply power for the operation of irrigation pumping plants of farmers of that section.

The large holdings of S. A. Robertson and Alba Heywood of San Benito, Texas, in the Brownsville Irrigation Company of Brownsville, have been purchased by A. W. Gardner & Co. of Houston. The company, it is reported, will now make extensions and improvements.

The Gulf, Colorado & Santa Fe Railroad will erect a brick machine shop and an addition to the 10-stall roundhouse at Somerville, Texas. New equipment will be installed in the machine shop building when it is finished. The general offices of the railroad are at Galveston.

The city of Pecos, Texas, has voted $25,000 of bonds for the construction of a sewerage system and disposal plant The plans of the O'Neill Engineering Company of Dallas for the proposed improvement have been adopted by the City Council.

At a recent meeting of the city commission and business men of Port Lavaca, Texas, a committee of five men, headed by C. J. Spittal, was appointed to investigate the situation in regard to the construction of a modern and complete system of water works for the town. An effort will be made to enlist private capital in the project.

It is announced that the hydroelectric plant, which the Gila River Power Company will install on the Gila River in Grant county, N. M., will be of 15,000-hp. capacity.

The taxpayers of Menard county, Texas, will vote February 7 on the proposition of issuing $20,000 bonds to erect a steel bridge across the San Sabe River at Menard.

In return for a bonus of $50,000 donated by the people of Beeville, Texas, the Nueces Valley Railroad Company agrees to locate its shops at that place. The contract for the construction of the first 60 miles of road was recently let. The new line will run from Beeville to Eagle Pass or some other point on the Rio Grande.

S. H. Mitchell and associates will construct an interurban electric railway between Phoenix, Ariz., and Glendale. The survey has been made and the right of way obtained.

The Cotton Land & Water Company of Kingman, Ariz., is preparing to enlarge its system of irrigation with the view of bringing under cultivation 50,000 acres of land situated in the valley of the Colorado River.

The installation of a hydroelectric plant, to cost about $326,000 and to be operated in connection with the Elephant Butte government land reclamation project in the upper valley of the Rio Grande, is in contemplation by the Water Users' Association, El Paso, which is composed of the land owners embraced in the irrigation enterprise. This power will be used chiefly to operate the auxiliary pumping plants of the farmers of the valley, it is stated.

A. W. McPherson of Santa Monica, Cal., who was recently appointed receiver of the Bisbee Light & Power Company, Bisbee, Ariz., which operates the gas plant at the latter place, announces that he will lay new mains and extend the system.

L. F. Bennett and George P. Baker of Oklahoma City, Okla., will erect a large factory for the manufacture of crates and boxes at some point in the vegetable and fruit growing region of northeastern Mexico.

J. H. Politzer, special representative of the United States Steel Products Company, who recently made a trip through the west coast region of Mexico, says that he found trade conditions excellent everywhere he visited. The demand for machinery of various kinds is constantly increasing.

The Powell pumping station of the municipal water works system of Fort Worth was completely destroyed by fire December 8. The loss to machinery and building was about $10,000, covered by insurance. The plant will be rebuilt as quickly as possible.

Charles J. Johnson of the Palacios Machine Shops & Garage, Palacios, Texas, is installing equipment in a machine shop at the Markham oil field and desires quotations on the following equipment: One 16-in. by 10-ft. lathe, one 20-in. by 16-ft. lathe with taper attachment, one 20 or 21 in. upright drill press, one sliding head back geared drill press from 26 to 30 in., one 21 or 24 in. geared crank shaper, one pipe threading machine to take work up to 8 in., one bolt and nut drilling machine to handle work up to 1½ in., one grinder, one 100-lb. power hammer, a line of blacksmithing equipment, &c.

The construction of a municipal incineration plant is under consideration at Temple, Texas.

The plant of the Georgetown Water, Electric & Power Company, Georgetown, Texas, will be taken over by the city and its equipment enlarged.

E. M. Paulk and others of Royse, Texas, have organized the City Mill & Light Company. Electrical machinery will be required.

The San Antonio Machine & Supply Company, San Antonio, Texas, has received, among recent orders, the contract for the pumping machinery to be installed in the plant of the Brownsville Sewerage Company, Brownsville, Texas.

The contract for a pumping plant, elevated steel tank and water distribution system will be let in the near future by Rogers, Texas.

It is proposed at Beaumont, Texas, to authorize the expenditure of $300.000 for water works construction, including the installation of modern high duty pumping machinery.

The Lufkin Foundry & Machine Company, Lufkin, Texas, is furnishing a new band mill equipment for the plant of the Palmetto Lumber Company, at Oakhurst, Texas.

The Northwest

MINNEAPOLIS, MINN., December 12, 1910.

Last month was in general a very profitable one for the various engineering and equipment houses of this section, and the opening weeks of December have carried with them a fair run of contracts, many of which are not to be completed until the later part of spring or early summer. The designing and installation of electric power and pumping plants, as well as other works of a public or quasi-public nature, are prominent in recent bookings. In machinery and supplies used for factory, mill, shop or foundry purposes trade remains rather quiet, although reasonably good for the pre-holiday season.

An electric plant to serve the community may be erected at Egan, S. D.

A hydroelectric power plant is being constructed at Pine River, Minn., by Webber & Hill. All of the machinery and other equipment will be furnished by the Power Engineering Company, Minneapolis.

Bids will be taken until December 22 by the city of Calgary, Ont., on a synchronous motor-generator set of 1500 hp., together with exciter unit, switchboard, &c.

Under the terms of a franchise recently granted by Eureka, S. D., a central power and lighting plant will be built here by G. A. McLaughlin, whose address is given as Aberdeen, S. D.

A new company which will enter the machinery field here is stated to be the Northwestern Electric Equipment Company, represented by F. B. Thompson, St. Paul, which was recently incorporated for $600,000.

Work, which includes the building of a dam, will begin in the spring on a hydroelectric plant, to be constructed by

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the city of Thief River Falls, Minn. It will, however, be some time until the machinery needs to be purchased.

A new municipal pumping plant, steel tower, tank and concrete reservoir are to be constructed for water works service at Huron, S. D.

Geo. R. Griffith, Pipestone, Minn., will install several electric power and lighting plants in that vicinity under the terms of franchises recently granted him.

A company has been organized by T. J. Wixon, Highmore, S. D., to install an electric power and lighting plant.

The installation of additional pumping units in the several water works stations at Duluth, Minn., is under consideration there by the Board of Water and Light Commissioners, who have made specific recommendations on the subject to the Common Council. A bond issue of $300,000 will be required to defray the cost.

An addition is to be made to the plant of the National Woodenware Company, Hill City, Minn., and some new machinery provided.

Wm. Dollar, president of the Exchange National Bank, Coeur d'Alene, Idaho, is interested in a company being formed to establish an electric power and lighting plant, utilizing as fuel the refuse from the mill of the Stack-Gibbs Company.

Considerable new woodworking machinery will be provided by the O'Neil Lumber Company for an addition to its plant at Kalispell, Mont., which is now under erection.

A new pumping plant for municipal service was recently put in operation at Eureka, Mont., and other public improvements are to be made in the spring.

Within the next few months additional machinery will be installed in the plant of the Eureka Lumber Company, Eureka, Mont., and other changes effected, making it one of the best equipped of its kind in the Northwest.

It is reported that Mankato, Mich., will expend $20,000 for improvements to its water works system.

The electric light plant at Long Prairie, Minn., recently damaged by an explosion, will probably be replaced by the installation of a new plant.

The Board of Water and Light Commission of Duluth, Minn., has asked for a $300,000 bond issue, with a view to installing pumping equipment, building a new reservoir and replacing some pumping apparatus now in use.

The South

ATLANTA, GA., December 12, 1910.

There does not appear to be much new business in sight at present, except as routine buying for manufacturing industries may require, nor is there likely to be any great degree of activity until the holidays are over. A goodly number of contracts long pending have, however, been closed recently by machinery houses in this section, including the representatives of Northern builders located in the larger trade centers, such as Atlanta, Birmingham and New Orleans, and with reference to the future a decidedly optimistic feeling prevails.

It is probable that a motor driven centrifugal pump will be added to the equipment of the municipal water works station at Troy, Ala., its installation having been recommended by the superintendent in charge. Improvements in the lighting plant are also contemplated.

Plans for the enlargement of its car shops at Gadsden, Ala., and the installation of considerable new machinery are being made by the Alabama Great Southern Railroad Company.

It is probable that the woodworking plant of the Sumter Company, Livingstone, Ala., which was destroyed by fire, will be rebuilt for larger capacity.

Geo. Makely, Swanquarter, N. C., is chairman of a commission which has in charge a large reclamation project in the vicinity of that place. The estimate of the pumping equipment and other machinery required includes three 20-in. centrifugal units, which will probably be steam engine driven.

The Strasburg Light & Mfg. Power Company, Strasburg, Va., will build a large electric plant, taking its power from the Shenandoah River, with the object of furnishing current for lighting and industrial service. The company was recently incorporated.

W. C. Chandler, Coaling, Ala., has organized a company to establish a stave factory at Ashville, Ala.

Through the efforts of the Brunswick Advancement Association a large box factory is to be built at Brunswick, Ga., by the Georgia Veneer & Fruit Packing Box Company.

The Magnolia Furniture Company has been organized at Magnolia, N. C., by J. C. Horne and others, to establish a manufacturing plant.

It is proposed that the electric lighting plant at Bessemer, Ala., be acquired by the city and enlarged, but no definite action to that end has as yet been decided upon.

If a franchise is granted by the local authorities, as expected, W. S. F. Tatum will install an electric power and lighting plant at Hattiesburg, Miss.

The city of Warrenton, N. C., is considering the construction of an electric power and lighting station. An engineer has been retained to prepare plans.

A box factory is to be built shortly at Brunswick, Ga., by R. L. Crandall and C. W. Church.

The plant of the Southern Shovel Mfg. Company, Gadsden, Ala., is being enlarged and improved, with a view to operations on a more extensive scale in future.

Negotiations are now in progress at Vicksburg, Miss., for the purchase by the city of the local water works system. If this is consummated the pumping plant will be enlarged and other improvements made.

One of the most important developments in this section from the standpoint of future requirements of equipment, both for traction and industrial service, is the incorporation of the Georgia & Carolina Railway, to complete an electric line from Augusta, Ga., to Spartanburg, S. C., a distance of nearly 125 miles. A. E. Padgett, Edgefield, S. C., is secretary of the company.

Plans for the building of a factory at Palatka, Fla., which will probably be equipped with electric power, are being carried into effect by the Florida Woodenware Company.

A new plant, in which the machinery will be driven by electric motors, is to be built at Lenoir, N. C., by the Lenoir Chair Company.

The improvement of the water supply system, with consequent need, later on, of new machinery and other equipment, is under consideration at Huntsville, Ala.

A steam power plant of 2000 kw. will be erected by the Augusta-Aiken Railway & Electric Company, Augusta, Ga., as an auxiliary to its present system. The machinery, except for some minor details, is reported to have been already decided upon.

C. B. Rucker, Charlotte, N. C., is in charge of plans for a municipal power plant at Rock Hill, S. C., to supply current to the lighting system.

The Weaks Supply Company, Monroe, La., has taken over the business of J. G. Sanders and assumed possession of the latter's machine shop and foundry. The combined business of the two concerns will be operated under the name of the Weaks Iron Works & Supply Company. The foundry and machine shop will be moved to property heretofore owned by the supply company, and the plant will be enlarged so as to take care of heavy locomotive repair work, &c.

The Georgia Metal Roof Company has been incorporated to manufacture lock metal shingles in a plant at 291 Marietta street, Atlanta, Ga. The company has purchased all the necessary equipment.

A large erecting shed is being built at the Gadsden Car Works, Gadsden, Ala. This plant is owned by the Queen & Crescent Railroad system.

North Pacific Coast

SEATTLE, WASH., December 9, 1910.

The noteworthy feature of the trade of large machinery houses and metal-working plants on the north coast continues to be its diversity. Orders recently taken have been very fairly representative of all industries, and the buying covers a wide range of equipment, material and miscellaneous supplies for manufacturers, mill owners, contractors, mining companies and lumbermen.

Plans have been agreed upon at Harmony, Wash., for a municipal electric plant, work on which will be started this winter.

A new mill equipped with the Casey-Hedges Company's boilers, steam turbine units of the General Electric Company's design, and about 170 motors still to be purchased, together with operating machinery of proven efficiency, will be put in operation before spring by the O'Connell Lumber Company of Winlock and Seattle, Wash.

The Kilbourne & Clark Company, Seattle, Wash., is making a specialty of designing and installing complete power, lighting and pumping plants for service of every description. It has had a particularly good run of business this year from the mining and lumber companies of the interior.

The authorities at Silverton, Ore., are considering plans for the construction of a water supply system, which will, however, be operated partly by gravity.

Theodore B. Wilcox, president of the Oregon Development Company, in an address at Salem, Ore., made a statement which is attracting considerable attention in machinery circles, to the effect that the Hill lines have decided upon extensive railroad building in Oregon during the next five years. If this is correct, it will mean corresponding activity in furnishing equipment, not only for the roads themselves and the contractors engaged in construction

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work, but also because of the communities and industrial operations that will spring up along the new lines.

A new system of pneumatic operation for trimmers, including an air compressor of the Westinghouse Electric & Mfg. Company's design, is being installed by the Yeomans Lumber Company at its mill in Pe Ell, Wash., which was recently rebuilt.

Additional funds for heavy development work are being provided by the Red Boy Mines Company, Sumpter, Ore., which will be in the market during the winter for considerable machinery and other equipment.

A machine shop equipped for the most complete service, including heavy repair work, has just been finished and put in operation by the McCormick Lumber Company at McCormick, near Centralia, Wash.

The large hydro-electric plant of the Hanford Irrigation & Power Company, Priest Rapids, Ida., which is now under the control of the Pacific Light & Power Company, will be furnished with additional equipment and the service system extended.

The Gilbert Hunt Company, Walla Walla, Wash., has taken over the property of the Gilbert Hunt Mfg. Company of that city and will issue $150,000 worth of bonds, the proceeds of which will be used for increasing its manufacturing facilities. Additional land has been purchased in the vicinity of the company's plant and several new buildings will be erected. The company fabricates steel for bridges and builds threshing machinery. Active building operation, however, will not be commenced until spring.

Farther Central West

OMAHA, NEB., December 12, 1910.

The preponderance of buying at present is for the account of power and mining properties in the mountain States, where preparations for extensive development work to be carried on during the late winter and spring, especially when open weather again sets in, are now in progress. Air compressors, drills and hoists, with, in many cases, gasoline engines or electric motors to drive them, are most largely in demand. The heavier equipment for steam or hydroelectric power plants has already been decided upon for the majority of installations, and the orders are being placed through representatives of the large machinery builders east of this section.

It is probable that within the coming year a new municipal electric power plant will be built at Sioux City, Iowa. F. W. Cappelen, general manager of the Decarie Incinerator Company, Hopkins, Minn., who is also a consulting engineer, has been retained to make estimates and recommendations.

A number of important improvements will be made next year in the water works system at Waterloo, Iowa, and some new machinery purchased by the municipality.

Construction work will begin in the spring on an electric traction line, known as the Sioux City & Bijou Hills Railway of Sioux City, Iowa, for which extensive power equipment will be required. This may take the form of a hydroelectric plant, supplemented by steam turbines or engines.

Additional power plant capacity will need to be provided in the near future by the Ft. Dodge, Des Moines & Southern Railway, Ft. Dodge, Iowa, to meet the increased operating demands of the system. A steam road between Lehigh and Webster City, which was recently purchased, will be electrified and an extension built from Lehigh to Gypsum.

Soon after February 1 the Omaha & Western Iowa Traction Company will begin the purchase of material, and later on of equipment, for the 90-mile interurban line which it proposes to build from Sioux City to Council Bluffs, with entry into Omaha. The company's address for the present is 3901 North Eighteenth street, Omaha, Neb.

Improved machinery is to be installed in the cyanide plant of the Isabella Mines Company at Cripple Creek, Colo., which has passed under the control of Seattle parties.

The Maya River Power & Land Company, with headquarters in Denver, Colo., is about to start work on a series of hydroelectric plants in Mexico, for which concessions have been obtained. The aggregate power capable of being developed is 270,000 kw. One of the plants, which is to be built on the Santiago River, will furnish power for the Southern Pacific Railroad of Mexico.

A steam hoisting plant will be installed by the Bear Lodge Gold Mining Company, Sundance, Wyo., to replace the gasoline engine driven outfit now in service, and other machinery, including an air compressor, drills, &c., will be provided in order to sink a deeper shaft on the property.

Equipment for driving an 800-ft. tunnel will be installed by the Lehi-Tintic Mining Company, American Fork, Utah.

A bond issue covering the cost of installing a municipal lighting system, with power plant, has been voted at Ansley, Neb.

The Blue River Power Company, Seward, Neb., has been incorporated for $100,000 and will proceed with the extensive hydroelectric development comprised in its plans.

Active preparations are reported to be now in progress by the Pueblo & Suburban Traction & Lighting Company, Pueblo, Colo., for building a new steam turbine power plant of large capacity.

The W. T. Wood Company, Waterloo, Iowa, recently incorporated, will handle a full line of farming machinery, including vehicles, gasoline engines, &c.

S. E. Irish, Keosauqua, Iowa, has purchased the Meek dam and will organize a company to rebuild it and equip it with hydroelectric generators to develop 1200 hp.

Ansley, Neb., has voted bonds in the sum of $5000 for the installation of an electric light plant.

The Oskaloosa Water Company, Oskaloosa, Iowa, will expend about $25,000 for improvements to its plant. Additional pumps will be purchased.

The city of Gunnison, Colo., is considering the installation of new electric light and water works system on the Gunnison River and has retained the firm of Burns & McDonnell, Kansas City, Mo., consulting engineers, who are now on the ground making preliminary surveys and estimates. For the purpose of making this installation it is proposed to issue bonds in the sum of $100,000.

Work is being rapidly pushed on the new plant of the Nebraska Portland Cement Company at Superior, Neb. The first building to be erected will be a machine shop. Upon its completion several other buildings will be erected, one of which will be 60 x 365 ft.

A bond issue of $50,000 has been voted by Atlantic, Iowa, for the purpose of erecting a new light plant and consolidating it with the municipal water plant.

The city of Omaha, Neb., is preparing to establish a garbage crematory. It is estimated that a plant could be installed for $100,000 which could generate sufficient power to light the streets and furnish heat, light and power to the jail and other public buildings.

The Southwest

KANSAS CITY, MO., December 12, 1910.

Reports from the principal centers of distribution show a quiet condition of trade, but the market is by no means dull. Users of machinery have, as a rule, very clear ideas on the subject of what they need, and the inquiries made some months ago, which were not acted upon at that time, also put them very closely in touch with the relative merits, prices, &c., of the different types of apparatus available for their purpose; hence, as they get to the point where purchases can be made, their minds are quickly made up. This is a feature of the present season's business which eliminates much of the usual fuss and flurry and gives little outward evidence of the actual volume of trade being transacted. The present situation through the Southwest is good and the outlook encouraging.

A dredge of special construction, equipped with its own power plant, and a large motor driven suction pump, will be needed shortly by the city of Wichita, Kan., for work on the Little Arkansas River. The plans for it have been prepared by the city engineer.

P. D. Whatley is about to install machinery for a handle factory at Junction City, Ark., and will increase the capacity later on.

Advices from Bartlesville, Okla., are to the effect that the shops of the new St. Louis, Bartlesville & Pacific Railway are to be located there, together with the general offices of the company.

The electric plant at Tulsa, Okla., is to be enlarged and new machinery provided.

An engineering firm in Kansas City has been engaged to prepare plans and specifications for a pumping plant, water distribution and sewage system at Plattsburg, Mo., the estimated cost of which is within $55,000.

An election will be called shortly at Mound City, Kan., to vote on bonds for constructing a municipal pumping plant.

From Nelagony, Okla., it is reported that the Osago Mfg. Company will install an electric generating plant there to provide current for industrial power and lighting service.

S. A. Lanning, Muskogee, Okla., recently organized a company to install a sash and door factory there.

Upon taking over the local water works, the city of Ft. Smith, Ark., will make extensive improvements and install additional machinery of the most modern type.

Work on a machine and forge shop to be used for repairs and maintenance has been begun at Falls City, Kan., by the Atchison Railway, Light & Power Company, Atchison, Kan. All of the tools will be motor driven.

A new plant is being put in operation at Independence, Kan., by the United Window Glass Company. The equip-

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ment at present installed will be extended as the requirements of the business dictate.

The plant of the Treasure Mining & Reduction Company, Mogollon, N. M., will be remodeled and improved, without, however, the addition of any more machinery at present. A hydroelectric plant was recently installed.

It is reported from Hutchinson, Kan., although without official confirmation, that repair shops and a large roundhouse, as well as a coal handling plant, will be erected there by the Atchison, Topeka & Santa Fe Railway. Other improvements are also to be made. No work is, however, likely to be done before spring.

G. E. Schneider of Chicago, Ill., and N. F. Hancock of Muskogee, Okla., have closed a deal with G. D. Sleeper of Wagoner, Okla., for a tract of land at Falls City, Okla., for $45,000, on which they will erect new buildings for the operation of a packing plant.

The City Council of Durant, Okla., will arrange for installing an electric light plant at a cost of about $12,000, when the plans being discussed are adopted.

St. Louis

ST. LOUIS, December 12, 1910.

The Illinois Traction System is arranging to purchase an electrical equipment to be placed in the new hydroelectric plant of the Northern Illinois Light & Traction Company, which is a part of the McKinley system.

The John Stanard Bronson Machinery Company, St. Louis, has been incorporated with a capital stock of $5500. The incorporators are L. B. Bronson, J. S. Bronson and L. E. Jacques.

The City Council of Pleasant Hill, Mo., is preparing to establish a water works system.

It is reported that St. Joseph, Mo., is considering the expenditure of a large sum of money for the enlargement of its street lighting plant.

Shirley & Co. are installing a large pumping plant on what is known as the Osyka tract, at Midway, near Joplin, Mo., and will provide operating machinery sufficient to handle the ore which it contains, as the pockets are opened up.

Indianapolis

INDIANAPOLIS, IND., December 13, 1910.

The Foederer Foundry Company, Indianapolis, has been incorporated with $10,000 capital stock. The directors are A. Foederer, L. S. Foederer and George S. Foederer.

The Union Trust Company has been appointed receiver of the Parry Auto Mfg. Company, Indianapolis, manufacturer of automobiles. The company has $1,000,000 capital stock, of which $150,000 has been paid into the treasury. It is said that the company has orders for over $3,000,000 of its products, but not sufficient capital to fill the orders. The company was organized in July, 1909, and built 900 machines the first year. The expenses of large advertising to get the new car before the public, the cost of experiments, new machinery, &c., left little profit. The liabilities are estimated at $250,000. The petition for a receiver alleged danger of insolvency. It is hoped to have the plant turned back soon into the company's hands.

The Interstate Car Company's plant at Brightwood, a suburb of Indianapolis, was damaged by fire December 10, the foundry being destroyed. E. H. Darrack is president of the company.

The municipal light and water plant at Montpelier, Ind., in receiver's hands, has been ordered sold by the court. John Boyd is receiver.

The Citizens Heat & Light Company, Elwood, Ind., will build an artificial gas plant, to cost $25,000, and will spend $75,000 for an extension of the mains and improvement of the present plant.

The Springer-Whitaker Foundry Company has been incorporated at Terre Haute, Ind., with $10,000 capital stock, to do a general foundry business. The directors are A. H. Springer, A. C. Whitaker and M. A. Whitaker.

The Cardinal Cabinet Company has been incorporated at Wabash, Ind., with $50,000 capital stock, to manufacture cabinets. The directors are G. A. Osborn, J. H. Stigleman, E. L. Weesner, A. E. Osborn and G. A. Wilkinson.

Government Purchases

WASHINGTON, D. C., December 12, 1910.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids as follows:

December 27, schedule 3051, for furnishing and erecting 15-ton traveling crane; schedule 3153, one tool and cutter grinder and one spindle drill press; January 10, schedule 3170, one electric traveling crane; schedule 3171, one engine lathe.

The Paymaster General, Navy Department, Washington, will open bids December 20 for furnishing one 18-in. lathe, schedule 3127, class 61.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids December 6 as follows:

Class 51.—One locomotive wrecking crane—Bidder 34, Browning Engineering Company, Cleveland, Ohio, $10,900, $12,700 and $14,700; 119, Industrial Iron Works, Bay City, Mich., $10,300, $11,775 and $12,970; 154, McMiller Interstate Company, Bedford, Ohio, $12,437 and $14,157; 163, Manning, Maxwell & Moore, New York, alternate bid, $16,100.

Class 52.—One swing lathe—Bidder 6, Aumen Milling & Supply Company, Baltimore, Md., $2148 and $2038; 20, Bradford Machine Tool Company, Cincinnati, Ohio, $2170; 87, Fairbanks Company, Washington, D. C., $2429.60; 91, George W. Field, Philadelphia, Pa., $2168; 99, Garvin Machine Company, New York, $2160; 122, I. H. Johnson, Jr., Philadelphia, Pa., $2690 and $2590; 127, J. P. Kemp, Baltimore, Md., $2503.50 and $2255; 163, Manning, Maxwell & Moore, New York, $2205, $2300 and $2050; 173, Niles-Bement-Pond Company, New York, $3970, $3570, $3100 and $2650; 205, Springfield Machine Tool Company, Springfield, Ohio, $2258.

Class 53.—Two swing lathes—Bidder 87, Fairbanks Company, Washington, D. C., $849; 99, Garvin Machine Company, New York, $848; 127, J. P. Kemp, Baltimore, Md., $849.50; 163, Manning, Maxwell & Moore, New York, $955; 173, Niles-Bement-Pond Company, New York, $830; 205, Springfield Machine Tool Company, Springfield, Ohio, $624 and $794.

Class 55.—One universal milling machine—Bidder 18, Brown & Sharpe Mfg. Company, Providence, R. I., $1548.55, $1490.50 and $546.25; 87, Fairbanks Company, Washington, D. C., $1530; 163, Manning, Maxwell & Moore, New York, $1545; 173, Niles-Bement-Pond Company, New York, $1534; 190, Prentiss Tool & Supply Company, New York, $1937.

Class 56.—One toolroom engine lathe—Bidder 127, J. P. Kemp, Baltimore, Md., $982.25; 163, Manning, Maxwell & Moore, New York, $1240; 173, Niles-Bement-Pond Company, New York, $992; 190, Prentiss Tool & Supply Company, New York, $1054.

Class 111.—One Scotch boiler—Bidder 54, W. P. Cramp & Son Ship & Engine Building Company, Philadelphia, Pa., $3785 and $3550; 78, P. Dulany & Co., Newburgh, N. Y., $4350; 132, E. Keeler Company, Williamsport, Pa., $3640; 163, Manning, Maxwell & Moore, New York, $4500; 174, New York Ship Building Company, Camden, N. J., $3725; 206, Springfield Boiler Mfg. Company, Springfield, Ill., $3800; 240, Vermilye & Power, New York, $4925.

Class 121.—One plate bending machine—Bidder 52, Cleveland Punch & Shear Works Company, Cleveland, Ohio, $2600; 117, Hilles & Jones, Wilmington, Del., $3868; 127, J. P. Kemp, Baltimore, Md., $3575, $3610, $3065, $3100, $3575, $3685, $3735; 173, Niles-Bement-Pond Company, New York, $3985; 214, William Sellars & Co., Philadelphia, Pa., $5900; 244, Wickes Brothers, Saginaw, Mich., $3271 and $2796; 253, Covington Machinery Company, Covington, Va., $3000.

Chinese Ore and Pig Iron for Japan.—The Hanyang Iron Works, Hankow, China, is reported to have contracted to supply Japan with 100,000 tons of iron ore and 100,000 tons of pig iron a year for 20 years for use at the Japanese Government Steel Works at Yakamatsu. The Hankow company, it will be remembered, also had a contract to supply ore and pig iron to the Western Steel Corporation, Seattle, Washington. If the Japanese contract is an absolute one and the tonnages not merely maximum amounts, which may be scaled down, the Chinese works, it would seem, will have little pig iron to sell in the general export market. A portion of its pig iron now goes into rails and will undoubtedly continue to be so used.

Case Hardened Gears for Railroad Work.—The R. D. Nuttall Company, Pittsburgh, has introduced an innovation into railroad equipment parts by bringing out case hardened gears and pinions. The company has had a good many of these in service for some time, but deferred making any announcement until experience had shown that such gears would perform well under severe conditions. The operation of those experimented with has been so satisfactory that the company has decided to make case hardened gears and pinions a part of its regular lines.

Large contracts for Detroit Fenestra solid steel windows have recently been made for the new buildings of the Solvay Process Company, Detroit; Michigan Alkali Company, Wyandotte, Mich., and also to fill the openings in additional buildings of the Steel Corporation, at Gary, Ind. The Detroit Steel Products Company is developing a very large business in this novel product, which is gaining so much success, particularly among large manufacturing interests.

Obituary

HENRY FAIRCHILD DE BARDELEBEN

Col. Henry Fairchild De Bardeleben, the pioneer iron and coal operator of the Birmingham, Ala., district, whose death at Birmingham December 6, 1910, has already been noted, was born in Autauga County, Alabama, in 1841. His industrial operations began in 1871, when with Daniel Pratt, his father-in-law, he acquired an interest in the Red Mountain Iron & Coal Company. In 1876 Colonel De Bardeleben took charge of the old Oxmoor furnaces as general manager, and the first coke iron was made there. He was associated with T. H. Aldrich in opening up what is now Pratt City and mined the first coal there. Later he disposed of his holdings in the Pratt Coal & Coke Company to Col. Enoch Ensley. The building up of the town of Ensley came soon after. Colonel De Bardeleben formed a partnership with W. T. Underwood and the firm of De Bardeleben & Underwood was connected with a number of enterprises in Alabama. He started



HENRY FAIRCHILD DE BARDELEBEN.

the Mary Pratt furnaces, now abandoned, established the city of Bessemer and built a rolling mill there, besides other plants. His holdings finally went into the Tennessee Coal, Iron & Railroad Company, of which he was at first vice-president, but soon left the company to engage in independent enterprises. He took part in the Civil War as one of the Prattville Dragoons of the Confederate Army, but Governor Shorter put him in charge of some mills at Prattville and he returned to that place about a year after his enlistment. He was regarded as Alabama's most remarkable industrial figure.

WALTER L. PIERCE, secretary and general manager of the Lidgerwood Mfg. Company, 96 Liberty street, New York, died suddenly December 10, aged 55 years, of heart trouble. He was also vice-president and treasurer of the Gorton & Lidgerwood Mfg. Company, maker of heating boilers, and treasurer of the Hayward Company, 50 Church street, New York. He became associated with the Lidgerwood Mfg. Company early in his business career and spent 32 years in its service, during most of which time he was secretary and general manager. He was particularly successful in handling the financial end of business enterprises. He was active in trade associations, having been one of the organizers of the National Metal Trades Association, and acted on the Arbitration Committee when the agreement was made between that association and the International Association of Machinists in 1900, which was abrogated in 1901. He was one of the oldest members of the Engineers' Club, and was the first treasurer of the Machinery Club of the City of New York. He also took an active interest in the affairs of the National Association of Manufacturers and was a member of the American Society of Mechanical Engineers and an associate member of the Society of Naval Architects.

WILLIAM L. CASADAY, plow manufacturer, of South Bend, Ind., died December 10 at his winter home at Ocean Park, near Los Angeles, Cal., aged 66 years. He was president of the South Bend Chilled Plow Company, which he organized 23 years ago. While working as a mechanic, he solved the problem of making chilled plow shares, and this discovery was the foundation of his fortune. He received more than 200 patents on various articles and devices. He was the inventor of the Casaday sulky plow, one of the first riding plows to be generally used in the United States. He was born near New Carlisle, Ind., and followed farming in his younger years. He leaves a widow, two sons and two daughters.

FRANK S. GORTON, Chicago, died December 12 of heart failure, aged 63 years. He was born in Rochester, N. Y., and was graduated from Rochester University. In 1887 he was active in organizing the Chicago Edison Company and was secretary and treasurer of that company until 1902. He was also treasurer of the Standard Pneumatic Tool Company until his retirement from active business.

The Bethlehem Steel Company and Texas Ore Lands

The periodic report of the acquisition of Texas iron ore lands by the Bethlehem Steel Company has been published again in the past week. It is stated that "Charles M. Schwab and associates have acquired practical ownership of 100,000 acres of land in the iron producing fields of eastern Texas, the land being situated in Cass, Morris, Harrison and Gregg counties." Then follows the old report of a contract for 30 miles of railroad from Longview northeast to the ore fields, this line to connect with the Santa Fé and shipments to be made over the Port Bolivar docks of the latter. According to authentic information in the hands of *The Iron Age*, the whole story, so far as it relates to the Bethlehem Steel Company or its officers, is without foundation.

The Philadelphia Associated Foundry Foremen.—The regular monthly meeting of the Associated Foundry Foremen of Philadelphia and Vicinity was held at the Manufacturers' Club, Philadelphia, on the evening of December 13, President Clarence R. Brown in the chair. A committee consisting of George W. Beukert, John Butterworth and John Alexander was appointed to revise and present to the association for action certain changes in the by-laws. The subject for the evening's discussion was "Hand Molding *versus* Machine Molding," which was continued from the last meeting. Messrs. John Foley, John Alexander, J. Butterworth, James Whitehead, George W. Beukert and George W. Moore took part, and the various features of both methods and the class of work for which they were particularly adaptable were discussed at length. The judges of the discussion, Messrs. Thomas Devlin, Josiah Thompson, Howard Evans, J. Howard Sheeler and George C. Davies, will announce their decision as to which side had brought out the most telling points at the next meeting of the association.

The William Cramp & Sons Ship & Engine Building Company, Philadelphia, has been awarded a contract to build two vessels for the Cuban Government. One will be a cruiser of 2000 tons, the other a training ship of 1000 tons displacement.

New Publications

Iron and Steel (A Pocket Encyclopedia), Including Allied Industries and Sciences.—By Hugh P. Tiemann; introduction by Henry Marion Howe. Flexible leather binding; pages, 354; pocket size, 4 x 6½ in.; illustrations, 43. Published by the McGraw-Hill Book Company. For sale by the Book Department of the David Williams Company, New York. Price, $3, postpaid.

There have been books on the metallurgy of steel—quite a number of them in the past few years in the United States and Great Britain—and nearly all have had a place and have filled it. But all the time there has been a want unsupplied, and Mr. Tiemann's book comes to fill it, and does fill it most admirably. One measure of the demand for such a handbook is furnished by the inquiries that in the course of a year find their way to the editorial desks of *The Iron Age*. Their name is legion and their variety scarcely less. There was need that some one with wide experience in iron and steel works and thoroughly acquainted with the language of the mills, the laboratory and the office, should put in pocket handbook compass a thousand and one definitions, explanations of processes, and historical and contemporary references, gathering up in small compass the operations connected with every form of blast furnace, steel works and rolling mill product. Mr. Tiemann has shown rare fitness for the task, and it is safe to predict that his book will soon be one of the staples in the literature of the industry.

The introduction by Professor Howe is a literary nugget. He tells how the author has come to the aid of the millman, the metallographist and the commercial man, each of whom has his own jargon, and has interpreted each to the other. As an example he gives this:

> Foreman: "How does this steel work?"
> Heater: "If you don't wash it, it won't clean."
> This is "shorthand" for: "The iron oxide or 'scale' which forms on the surface of this steel adheres so firmly that, unless it is heated so highly that it melts, some of it will cleave to the metal during the operation of rolling, and hence will deface the finished plates into which the steel is to be rolled." The heater's words are not English; they are jargon, and it is proper that they should be. If he persisted in translating them into English as I have done, and in talking English in general, he would simply justify the dismissal which would surely come.

The author tells in a brief preface what he set out to do, which was to combine in a compact book a dictionary, a cyclopedia and a handbook. His problem was to make more than a mere mention book—to give explanations and at the same time come within pocket size. He might well have called it "The Iron and Steel Handbook," for he has put into it something about practically everything that the millman, the salesman, the buyer, the metallurgist and the student wants to know. He may introduce many of his readers to "coal apples," "Igewsky's reagent," "shudes," "sibbering," "Schreibersite" and "Angus Smith's process." However, these out of the way things are not the measure of the value of the book; rather, its excellent treatment of the ordinary matters that every man connected with the trade needs to know about. There are very good summations, for example, of "Chemistry," "Metallography," "Direct Processes" and "Purification Processes." There are 8 pages on "Pig Iron," 4 pages on "Sheets and Tin Plates," 5 pages on "Protection" (against corrosion), 6 pages on "Mold and Molding," 2½ pages on "Iron Ore," 8 pages on "Blast Furnace," 7 pages on "Casting," 10 pages on "Bessemer Steel," 9 pages on "Open Hearth Process," 6 pages on "Puddling," 17 pages on "Rolling," 5 pages on "Heat Treatment," 4 pages on "Special Steels." The dictionary is exhaustive and the cross references abundant.

Testing the book repeatedly by searching for a word or subject, one finds that the author's quest for material has been most painstaking. Little has escaped him. In the matter of trade names he has had some difficulties. "Siloxicon" is referred to, but not "Monel metal." The Bookwalter converter does not appear in the "baby" Bessemer list, nor does the Jones Step process in the long list of direct processes. The sclerometer is given among devices for testing hardness, but not the scleroscope. "B. W. G." is interpreted, but there is no reference to U. S. Standard Gauge. "Stripping plate" is defined in connection with molding machine description, but not "match plate." "G. M. B.," the "good, merchantable brands" of the British pig iron warrant market, does not appear, nor does the word "warrant." In the reference to the Catalan forge, the primitive trompe which furnished the blast might have been mentioned. But the very conspicuousness of an omission is the best token of the completeness of the book. Its appearance is an event of first-class importance, and Mr. Tiemann is to be thanked for the service he has done the whole industry. So far as material return for such authorship is concerned, it is very apt to be, at best, on the testimony of one who has made a conspicuous contribution to the literature of steel, about on the scale of day laborer's wages.

The Mechanical World Pocket Diary and Year Book for 1911.—Twenty-fourth year of publication. Size, 4 x 6 in.; pages, 423. Bound in cloth. Price, sixpence net. Published by Emmott & Co., Ltd., 65 King street, Manchester, England.

In presenting this yearly revised engineers' pocketbook, some 32 pages have been added, and by carefully revising and condensing, space has been provided for the introduction of a large amount of new matter. Among the special features of this edition are a lengthy section on the shapes, speeds and feeds of cutting tools with supplementary sections dealing with milling cutters and twist drills. The section on standard screw threads is entirely new, and that dealing with screw cutting has been extended considerably. Other new sections deal with high speed steel and the constructive details of gas engines. Several additions have been made to the tables of weights, measures, &c., and a new table of steam fittings and tables and data on marine boilers, riveted joints, &c., are included. The subjects, of course, are treated from the standpoint of British practice, but after all the underlying principles are the same the world over, and the book will undoubtedly be found of value to American engineers who use the English system of weights and measures.

We have received Vol. VI of the *Proceedings* of the National Association of Cement Users, covering the sixth annual convention, which was held at Chicago, February 21 to 25, 1910. It comprises 738 pages, and contains all the papers and discussions. Many of the papers are illustrated. The contents are exceedingly valuable to all interested in cement or concrete work. It is edited by the president, Richard L. Humphrey.

"Business Prospects, 1911," is the title of a book received from the Business Statistics Publishing Company, Ltd., 12 James street, Cardiff, Wales, which presents statistics of coal, iron, copper, tin, wheat, cotton and other commodities and makes forecasts for the coming year. The forecast relative to the iron and steel trade in 1911 is that the demand will show some, but no great advance on that of 1910; the capacity of production will still exceed the demand; employment will be regular with wages at about present rates; prices will average figures slightly below those of 1910. As to copper the prediction is made that the output will be kept below consumption; the average price over the

year will be above that of 1908, 1909 or 1910; copper securities will improve in value. The forecast for tin is that the demand will increase to a greater extent than the supply; tin prices will average higher than in any year since 1907. The book comprises 280 pages, including advertisements. The price is 5 shillings.

Personal

Peter Donaldson, of James Watson & Co., Glasgow, Scotland, who has been in this country for the past two months, sails for home on the Mauretania this week.

H. S. Snyder, vice-president of the Bethlehem Steel Company and of the Juragua Iron Company, is in Cuba visiting the iron mines of the latter company in the Santiago district.

Robert R. Barringer has been appointed assistant superintendent of the Payne & Joubert Machine & Foundry Company, Birmingham, Ala.

Paul Koning, late American representative of Brandeis, Goldschmidt & Co., London, and who recently resigned as president of the New York Metal Exchange, will sail December 17 for Berlin, Germany, where he will represent the American Smelting & Refining Company.

Robert E. Jennings, formerly president of the Taylor Iron & Steel Company, has purchased an interest in the Titan Steel Casting Company, Newark, N. J., and has been elected president of that company.

Charles W. Guttzeit, district manager of the Taylor Iron & Steel Company, with offices at 100 Broadway, New York, has resigned his position to take effect January 1, and will become general manager of the Titan Steel Casting Company, Newark, N. J.

Charles G. Armstrong, consulting engineer, Singer Building, New York, has taken into partnership his son Francis J., under the firm name of Charles G. Armstrong & Son. The senior Armstrong is well known in connection with the planning and construction of important buildings in several of the largest cities, and is also the inventor of many modern office building devices, particularly the elevator signaling system, which is in practically universal use, and which for many years has been manufactured by the Elevator Supply & Repair Company. His son is a graduate of the Manual Training School of the University of Chicago and of the Stevens Institute of Technology, and has been engaged with his father in consulting engineering work for the past year.

Charles M. Ams, president of the Max Ams Machine Company, Mount Vernon, N. Y., has returned from a very successful three months' trip in Europe and the continent, establishing new agencies for the sanitary solderless sealed can and the Ams double seamers, many of which he sold. The new Ams factory at Turin, Italy, is completed, thoroughly equipped, and is one of the largest industries in southern Europe.

S. L. Kamps has been elected secretary of the T. H. Symington Company, manufacturer of Symington journal boxes and Farlow draft gear, with general offices at Baltimore, Md.

W. W. Stephens, president of the Stephens-Adamson Mfg. Company, Aurora, Ill., has returned from Europe. He has been spending some time in the study of the shops and methods of the larger manufacturing establishments of England, France and Germany.

Joseph M. Jenckes, for several years superintendent and chief engineer of the Riverside Engine Company, Oil City, Pa., will sever that connection January 1 to engage with the Nagle Corliss Engine Works, Erie, Pa., as designing engineer. He is patentee of the Jenckes Corliss type of valve used on gas engines.

Frederick R. Simms, president of the Simms Magneto Company, 1780-1782 Broadway, New York, returned from abroad December 3, and is now actively engaged in the organization of the company's new plant at Bloomfield, N. J. The builders of this plant claim that it will be the largest and finest equipped magneto works in this country if not in the world.

F. B. Richards of M. A. Hanna & Co. has been elected president of the Lake Superior Iron Ore Association to succeed William G. Mather of the Cleveland-Cliffs Iron Company, who has been president of the association for a number of years. H. G. Dalton of Pickands, Mather & Co. was elected vice-president, and H. S. Stebbins of Oglebay, Norton & Co., treasurer. W. B. Treat resigned as secretary and is succeeded by W. L. Tinker.

Clarence H. Booth, who has been manager of the No. 3 plant of the E. M. F. Company, Detroit, has been appointed as the company's general manager of manufacturing, to succeed the late David Hunt, Jr. Charles Sweet succeeds Mr. Booth.

Robert Wuest, Cleveland, Ohio, commissioner of the National Metal Trades Association, has gone to the Bermudas for a stay of a few weeks.

William S. Stephenson has resigned his position as secretary and treasurer of the Toledo-Massillon Bridge Company, to take the agency for the Beach-Edison traction car in the States of Ohio, Indiana and Michigan. His headquarters, for the present, will be in Toledo. This car is run by the Edison storage battery, independent of trolleys and overhead wires.

The American Emery Wheel Works, Providence, R. I., was awarded a gold medal at the Brussels Exposition for its exhibit of grinding wheels and abrasive products.

The British Iron Market

The probability of a settlement of the shipyard boiler makers' lockout has created a better feeling in the British iron trade. In general the market there has been halting, and the outlook for the future is not well defined. Prices have changed but little. No. 3 foundry iron has been quoted for some time at close to 49 shillings 9 pence, Middlesbrough, for delivery this year, and at 50 shillings 3 pence to 50 shillings 6 pence for delivery in the first quarter of 1911. Shipments of Cleveland pig iron in November were 106,858 tons. For the 11 months ending with November these shipments were 1,101,359 tons, against 1,099,815 in the first 11 months of 1909, 1,225,857 tons in the same period of 1908, and 1,654,409 tons to November 30, 1907. Pig iron stocks in Connal's stores increased nearly 21,000 tons in November, the total at the beginning of this month being about 510,000 tons.

If work at the shipyards is resumed as expected more activity will result throughout the trade in finished material. Recent rail orders taken by British mills amount to about 20,000 tons, including 6500 tons for the Bombay & Baroda Railway, and 7850 tons for the Great Indian Peninsular Railway. Among pending inquiries is one for 9000 tons for the Pekin-Kalgan Railway. The Burmah Railways are in the market for 4000 tons. The Lithgow Iron Works, New South Wales, has undertaken to supply 10,000 tons of steel rails to the New South Wales Government in 1911 and in following years to supply the requirements of the Government, estimated at 20,000 tons a year.

The London *Ironmonger* says: "It is regarded by some people as of great significance that the United States Steel Corporation, who were ready to sell semi-products for January-June shipment on the basis of about 91 shillings 3 pence, c.i.f. Wales, for sheet bars, are now declining orders for shipment later than June. This seems to indicate a belief that the last half of next year will witness a considerable expansion in the American iron and steel trades."

The Industrial Training of Boys—II

Education and the Development of the Apprentice*

BY J. J. FLATHER,† MINNEAPOLIS.

Half-Time Schools as Proposed by P. Higgins

Eleven years ago P. Higgins presented a paper of remarkable interest before the American Society of Mechanical Engineers in which he advocated the establishment of half-time schools for the "education of machinists, foremen and mechanical engineers."‡

The chief features of the proposed half-time schools as presented by Mr. Higgins are:

1. A school which shall include a first-class commercially successful and productive machine shop, which is a department co-ordinate in importance, influence and educational value with the academic department.
2. A school in which the pupils are to have instruction and practice in this shop during half the working hours in five days of each week for a period of four years.
3. Instruction in the public school during a portion of the other half of the time, equivalent to a high school course, restricted, abridged and improved to meet the needs of the pupils.
4. Special care and method of selection of pupils who have finished the grammar school course and who have special aptness for mechanical work.
5. Management under a corporation whose trustees shall be practical business men.

Mr. Higgins states that the main thing which should determine the point where schooling had better be stopped and the real work begun is the natural endowment of the pupil, so that whenever he stops he has received the best possible course of schooling and training for his particular career, whether it be a machinist, draftsman, foreman or manager. And if he has aspirations and natural ability for some position higher, not within the scope of the half-time school, this course may lead to the technical school. If he is not adequate to undertake such work, it should not be the fault of his school training but due to the limit of his natural capacity.

We are in hearty accord with the object and methods of the proposed half-time school and believe that this would afford an excellent means for developing American "machinists, foremen and mechanical engineers," as stated by Mr. Higgins. But if we are to greatly benefit the large body of workers we must go down the line further and begin the training process in the elementary grades.

The secondary industrial school of Columbus, Ga., follows very closely the lines laid down by Mr. Higgins, except in the educational requirements. Here we find a school in operation 11 months in the year, spending seven and one-half hours per day, including Saturday, of which time from 24 to 30 hours per week are spent in some form of industrial training—carpentry, pattern making, machinists, cotton mill work, and business training. The full time required in each course is three years, which is really equal to four years of the present school systems. The requirements for admission are a common school education through the sixth grade and a minimum age limit of 14 years. The school is under the direction of the city superintendent and trustees, assisted by an advisory board of five experts chosen from the leading industries and commercial interests of the city.

Time does not permit of a discussion of other interesting trade schools which have been established in recent years throughout the country. Suffice it to say that most of the municipal trade schools embody many of the features of the half-time school, including immediate supervision by an Advisory Committee made up of men experienced in the trades to be taught. The aim of the schools is to train boys in the fundamental principles and intelligent practice of a trade so that they will be able to confidently enter the industries and receive a fair wage at the start.

Industrial Schools at Indianapolis and Columbus, Ga.

The National Trade Schools at Indianapolis maintain an excellent course in foundry practice which requires completion of the grades and a minimum age limit of 16 years for entrance. The course covers a period of two years and demands a total of 55 hours per week throughout the entire year; 7 hours per day are devoted to shop practice and the rest of the time is spent in mechanical drawing, foundry chemistry, shop lectures and shop mathematics. A tuition fee of $100 per annum is charged. Commercial work is undertaken to a large extent and for this the boys receive compensation, so that not only are they able to earn an amount equal to the tuition charges but it frequently happens that a boy is able to earn his entire expenses.

The foundry is maintained as a high grade jobbing shop, and each student during the latter part of his course must assume the duties of shop foreman. It has been demonstrated in this school beyond question that skilled molders can be developed in two years by systematic training in which the reason why is dominant; but experience shows that the best results are obtained only with the older boys.

It is significant that in one of these, the Milwaukee School of Trades, the age limit for admission is about to be reduced from 16 to 14 years. This is inevitable, for, if a boy has to wait until he is 16 years before he begins to learn a trade, and if an employer will take him on at this age and pay him wages at the same time he is learning the trade, the boy will take the wage proposition every time and the trade school will not get the student no matter how valuable the courses given.

The Cincinnati Co-operative Plan

A half time school for engineering students has been developed by Professor Schneider of the University of Cincinnati in conjunction with the manufacturers of his locality, which is now known as the co-operative plan. Under this plan the students are paired or divided into sections and alternate between factories and class-room week about during the collegiate year, while full time is worked during the summer. The entire course occupies six years, and the students are paid while working in the shops at such rates that the total earnings during the course amount to about $1800. This makes it possible for a larger number of worthy young men to get an engineering education, strongly reinforced with shop practice and business training.

Under favorable conditions the co-operative plan ought to work out well in the training of boys in the trades or other vocations in any large industrial center, no matter what the principal industries may be; but to be successful two things are essential, namely: 1. A willingness to co-operate on the part of the employer,

* Read before the National Founders' Association, Chicago, November 16, 1910.

† Professor of Mechanical Engineering, University of Minnesota.

‡ American Society of Mechanical Engineers, *Transactions*, Vol. XXI.

2. Suitable physical and mental development on the part of the boy.

In Cincinnati the boys who are selected for this co-operative work must have a preparation equal to that for college entrance, and, in consequence, the boys who are eligible must be drawn from the 10 per cent. of the school population who finish the high school; thus the employers are getting the pick of hundreds of young men from 18 to 20 years of age at the start. It is evident that this education is intended primarily for those who are being trained for the higher positions in the various industries, and it is reasonable to assume that not many who complete the work will continue as skilled tradesmen.

It is safe to say that manufacturers would be loath to enter into an agreement of this sort with immature boys, so that this half-time co-operative plan, if applied to the trades, would require an age limit which employers almost universally state could hardly be earlier than 16. To make such a proposition attractive to employers, the boys must have a certain amount of education and mental development, coupled with a sense of responsibility, in order to make it worth while.

If we adopt completion of the grade schools as the minimum educational requirement, usually 14 or 15 years of age, this means that practically 25 per cent. of these boys who enter our public schools would be deprived of the opportunity of entering the industries or of learning a trade through the half-time co-operative plan, assuming that the various state laws would permit it; and of those who would be eligible very many would have been out of school from one to two years before they reached the age of 16, for 78 per cent. of the pupils drop out of school before reaching the end of the second year in the high school.

Notwithstanding all these agencies for securing intelligent skilled labor, employers, both in business and industrial activities, are constant in their demand for boys better fitted to enter upon their careers. The conclusion is again forced upon us that the schools must modify their courses and give industrial training for those who desire to enter upon an industrial vocation.

How to Use Ordinary Schools for Industrial Training

Following somewhat the recommendations of Dr. J. P. Haney, Director of Manual Training in New York, I would urge that manual training be taught in all our elementary schools, and that at the end of the sixth grade, corresponding to the age of 12 or 13 years, separate elective courses be established—the one, as at present, arranged for professional and commercial training, as well as the higher technical training, leading to and through high school; the other having in view the industrial training of the pupil. Bearing in mind the class of boys it is desired to interest and develop, and the object to be attained, practical work should predominate; but during the seventh and eighth grades—that is, the first two years—the training should be general, with a view to increasing the versatility of the boy, rather than his specific training during these years. In order to keep the boy busy, inasmuch as there would be less preparation of studies, it would seem desirable to require that six or seven hours a day be spent in the school, of which time at least one-half should be devoted to industrial work under skilled workmen; the rest of the time could be divided between such subjects as drawing and the study of industrial geography, some history, English and arithmetic; this latter should contain plenty of practical problems of interest to the pupils. There should also be shop talks relating to the various industries.

Two additional years would follow this industrial preparatory, and these should be trade preparatory, in which the time spent is devoted to some one definite trade, to the end that by judicious and intelligent training the boy may enter some industry where he will be given an opportunity at fair wages, under an apprentice instructor, to finish the trade begun in the trade preparatory school. In this school, which a boy enters at 14 or 15 years of age, the time could well be increased to eight hours a day with four hours on Saturday, and there seems no good reason why the practical work should not be continued for 11 months of the year. The amount of time spent in practice would vary somewhat, but in general in most trades four hours a day could be devoted to shop work and the remaining four hours divided between drawing and other studies more or less related to the specific trade. During the course history and civil government, English, arithmetic, practical geometry and physics should be given some attention. An important feature of this course would be the co-operation of an Advisory Committee suggested by Mr. Higgins. This would materially assist in co-ordinating the work of the school with that of the various industries, and it is not at all improbable that in many localities satisfactory arrangements could be made by which the more advanced pupils might, under proper instruction and suitable wage conditions, be employed on commercial work for local firms. This would greatly increase the interest and would furnish a stimulus for speedy work usually lacking in school shops.

The amount of time required to finish a trade would be reduced very materially under such a plan, and it is safe to say that the hope of early reward would encourage many a boy to hold out and complete the entire high school course instead of quitting as at present. It is not to be expected that all such boys would become skilled tradesmen, but it must be conceded that the training could well be adapted to prepare all boys who might desire to enter industrial pursuits and, by a process of selection and elimination, those best qualified by natural endowment and otherwise could be trained as all round men for the trades, while others who did not give such promise of development would be trained for some special work, as, for instance, machine molding in the foundry or machine hand in other industries.

No System Applicable Everywhere

It is recognized that no universal system of trade education will be generally applicable to every community. Local conditions will suggest and demand modifications, and we should expect in certain localities to find emphasis laid on the teaching of trades required in the industries which predominate in the vicinity. Thus, where cotton spinning and weaving are carried on extensively we should expect that provision would be made for this work in the trade preparatory school of that section; the same can be said of the boot and shoe industry, paper making, dyeing and many others peculiar to a given locality.

In working out the course of study for such industrial education, it should be constantly borne in mind that some of the boys who enter upon industrial training will reach a time in their lives when they will want to keep on with the studies and enter a technical college. Provision for such boys must be made by a modification of the high school courses with this in view, and, if necessary, the college entrance requirements should be changed.

It is admitted that the expense in equipment and maintenance of such departments in our public school system would be considerably greater than that now incurred, but it is submitted that the cost is a matter of lesser import than the results. Attractive industrial departments, manned by enthusiastic, capable, properly paid teachers, would cause a greater number of pupils to remain in the schools for a longer period, and the intellectual development, coupled with the training in discipline received by additional thousands of school children all over the country, would in itself be an economic advantage. Moreover, if the introduction of such departments would afford better preparation for the industries and reduce the idle or waste years of a

boy, the productive gain and increase in wealth in a given community would more than warrant any reasonable additional cost. On the other hand, the expense involved on account of "repeaters" would be greatly diminished and the amount thus saved would materially assist in maintaining industrial schools.

It is also submitted that the hopes and ambitions of a boy, the habits of industry, the definiteness of purpose in life, inspired by contact with real things, all make for a higher uplift which will result in social betterment of the people and its attendant lessening of crime fostered by idleness.

While the problems involved are many and far reaching, it is confidently believed that the interest and co-operation of employers with school officials will bring about a system of education which will not only benefit the boy and make him a more intelligent citizen, better fitted to fill his sphere of usefulness, but at the same time American industries will profit because of the more intelligent and contented body of wage earners which will result from such co-operation.

Costly Shipbuilding in Government Yards

WASHINGTON, D. C., December 13, 1910.—As foreshadowed in this correspondence last week, the Secretary of the Navy has transmitted to the House Committee on Naval Affairs a letter urgently requesting Congress to increase the limit of cost of the battleship Florida, now being built at the Brooklyn Navy Yard, from $6,000,000 to $6,400,000. This increase is made necessary by reason of the fact that the Government is unable to build as cheaply as private shipbuilders, being compelled to operate on the eight-hour basis and under other conditions which make for increased cost. The Secretary states that it will cost $239.24 per ton of normal displacement to build the Florida, as compared with $180.80 for the Utah, which is building in a private yard.

A recommendation is also embraced in the Secretary's letter for an increase in the limit of cost of the battleship New York, appropriated for last winter, from $6,000,000 to $7,500,000. The experience gained in the work thus far done on the Florida has made it clear that the New York cannot be built at the Brooklyn Navy Yard for the sum appropriated, and no steps will be taken to lay the keel of this vessel until Congress has acted.

In this connection, the Secretary of the Navy is in receipt of a proposition from the Newport News Shipbuilding & Dry Dock Company to build the battleship New York at the same figure recently submitted by that company for the New York's sister ship, the Texas—namely, $5,783,000. Under the law as it now stands the Secretary has no power to accept this proposition, but, of course, it is entirely competent for him to submit it to Congress with a recommendation. No decision has yet been reached in the matter, but the tax payers of the country, as well as the shipbuilders, will be interested to learn whether the Secretary regards it as worth $1,717,000 to have the New York built in a Government yard. W. L. C.

The Lathbury-D'Olier Company, Morris Building, Philadelphia, Pa., announces a merger of the interests of B. B. Lathbury, consulting engineer, and of the D'Olier Engineering Company. The new company, with enlarged scope and facilities, will continue the general and special engineering, manufacturing and contracting business heretofore carried on by the respective interests. Mr. Lathbury was formerly president of Lathbury & Spackman, Inc. The new company has established a branch office at 114 Liberty street, New York. With enlarged shop facilities in Philadelphia, it is prepared to carry on more extensive work than formerly.

The Philadelphia Foundrymen's Association

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, on the evening of December 7, Vice-President Elmer E. Brown occupying the chair. An invitation extended to the association by the New England Foundrymen's Association to attend its annual banquet at the Exchange Club, Boston, Mass., January 11, was accepted, and a committee composed of August A. Miller, J. Howard Sheeler, Josiah Thompson, Elmer E. Brown and George C. Davies was appointed to make arrangements to take as large a delegation as possible to Boston on that date. A communication from the National Rivers and Harbors Congress, in session in Washington, D. C., was read, and Thomas Devlin, president of the association, was appointed to represent the organization at the meeting.

A Nominating Committee, consisting of George C. Davies, A. A. Miller and H. C. Matlack, which had been appointed to suggest nominations for officers for the coming year, presented the names of the present officers for re-election, as follows: For president, Thomas Devlin, Thomas Devlin Mfg. Company; vice-president, E. E. Brown, E. E. Brown & Co.; treasurer, Josiah Thompson, J. Thompson & Co.; secretary, Howard Evans, J. W. Paxson Company; Executive Committee—Walter Wood, R. D. Wood & Co., Philadelphia; Thomas M. Eynon, Eynon-Evans Mfg. Company, Philadelphia; H. L. Haldeman, Pulaski Iron Company, Philadelphia; Walter T. MacDonald, Schaum & Uhlinger Company, Philadelphia; Walter S. Bickley, Penn Steel Casting & Machine Company, Chester, Pa.; Trustees—Thomas Devlin, Josiah Thompson, Howard Evans; official chemist, George C. Davies. The election will be held at the January meeting.

A brief discussion on trade conditions followed, and in several instances a somewhat better volume of business was reported, with an encouraging outlook for the future in some directions.

The paper for the evening's discussion was read by James Whitehead of the Abram Cox Stove Company, Philadelphia, describing an automatic flask bar tucker, which he has invented. A practical demonstration of the working of the tool followed the reading of the paper. For this purpose a large flask with a barred hinged cope was used, and the sand tucked under the bars with the tool, showing the ease with which this is accomplished. Repeated operations showed the satisfactory result of the new method. In discussion it was brought out that nailed or partly burnt bars interfered in no way with the operation of the device, and that it had had a long tryout, particularly in stove plate work and in a number of other classes of work where barred flasks have been used. At the conclusion of the demonstration a vote of thanks was extended Mr. Whitehead, after which luncheon was served in the dining room of the club.

An Extensive Railroad Contractors' Plant.—The Twohy Brothers Company, railroad contracting, will make Portland, Ore., the headquarters of its operations in the future. A tract of 17 acres has been purchased near Portland, on the Oregon Railway & Navigation Company's tracks, and a large plant is being erected. The general repair shop will be 80 x 180 ft., with an erecting floor extending the length of the building and machine car and engine shops along the side. The building will have a 20-ton Niles crane of 37-ft. span. Four warehouses are in course of erection—one for commissary goods, one for repairs of machines and equipment, one for iron and steel and one for wood stock. A power house will have two 100-hp. boilers to supply steam for hammers and for heating. Electric power for operating the shops will be purchased from the Portland Railway, Light & Power Company. The equipment for the shop has been purchased.

The Development of the Air Brake*

BY GEORGE WESTINGHOUSE, PITTSBURGH, PA.

A train upon which I was a passenger in 1866 was delayed a couple of hours due to a collision between two freight trains. The loss of time and the inconvenience arising from it suggested that some means of applying brakes to all of the wheels was needed.

The first idea which came into my mind was to connect the brake levers of each car to its draft-gear, so that applying the brakes to the locomotive, which would cause the cars to close up, would apply the brakes to the wheels of each car. Shortly afterward I was invited to inspect a train fitted with the Ambler chain brake, which consisted of a windlass on the locomotive revolved by pressing a grooved wheel against the flange of the driving wheel to wind up a chain attached to the brake levers of each car.

As an improvement on Mr. Ambler's plan, I considered the use of a long cylinder to be placed under the locomotive, the piston to be connected to the chain and driven by steam from the locomotive boiler. A short study of this showed that it would be impracticable for more than four or five cars.

My next thought was to place a steam cylinder under each car with a pipe connection from the locomotive, but a little experimentation disclosed the fact that it would be impossible, even in warm weather, to successfully work the brakes by steam. Shortly after I reached the conclusion that brake apparatus of this kind could be operated by compressed air upon any length of train, and in 1867 I filed a caveat in the United States Patent Office to protect the invention. In the meantime I met Ralph Baggaley, who undertook to defray the cost of constructing the apparatus needed to make a demonstration. The apparatus was completed in the summer or early autumn of 1868 and was applied to a train of a locomotive and four cars.

The First Air Brakes

The essential parts of the air brake as first applied were an air pump steam driven from the locomotive boiler; a main reservoir on the locomotive into which air was compressed to about 60 or 70 lb. pressure; a pipe from the reservoir to a valve mechanism convenient to the engineer; brake cylinders for the tender and each car; a line of pipe from the brake valve under the tender and all of the cars, with a pipe connection to each brake cylinder, and flexible hose connections between the cars with couplings having valves which were automatically opened when the two parts of the couplings were joined and closed when the couplings were separated, so that the valve of the coupling at the end of the train was always closed and prevented the escape of air. The piston of each cylinder was attached to the ordinary hand brake lever, so that by the admission of air, the brakes were applied.

It took considerable time to apply the brakes with full force and longer to release them, and in the event of a break-in-two of a train the rear section would be uncontrolled. To overcome this difficulty a new development (1872-3) was what has since been known as the automatic air brake. The equipment was the same, with the addition of an auxiliary reservoir and a triple valve device between the brake pipe, brake cylinder and auxiliary reservoir. This triple valve, when air was admitted to the train pipe, established an opening between the train pipe and the auxiliary reservoir whereby they were filled with air under pressure. The valve also opened a passage from the brake cylinder to the atmosphere. This was the normal condition of the apparatus when the brakes were off. To apply the brakes, the engineer discharged a portion of the air from the train pipe, whereupon the triple valve closed the connection between the brake pipe and the reservoir and between the brake cylinder and the atmosphere and then opened a passage from the auxiliary reservoir, so as to apply the brakes. The restoration of the pressure within the brake pipe released the brakes and recharged the reservoir. In the event of the escape of air from the train pipe by its rupture or by the separation of the train, the air stored in the auxiliary reservoirs instantly and automatically applied the brakes to all parts of the train.

In 1885 the Master Car Builders appointed a committee to report upon the feasibility of applying brakes to freight trains, and this committee inaugurated what are now known as the Burlington (Iowa) brake trials made in 1886 and 1887. These tests proved the inadequacy of the automatic air brake then presented by the Westinghouse Air Brake Company, as well as the inadequacy of all the other brakes then tested. The lack of success was due to the comparatively slow application of the brakes upon the rear of a long train.

As a part of the automatic air brake passenger equipment, I had developed in the seventies a system of train signaling, using a second train pipe. This signaling apparatus had a sensitive valve device connected to a small reservoir upon the locomotive so arranged that when air was admitted through a small opening into the signaling pipe, both the pipe and reservoir were charged to a low pressure (at the present time 45 lb.). By opening a valve at any point in the train to exhaust a small quantity of air from the signal pipe, the delicate valve referred to was moved so as to admit air from its auxiliary reservoir to blow a whistle in the locomotive cab. It was found that when the valve in any car remote from the engine was quickly opened and closed as many as five times, the whistle would be blown an equal number of times—that is, there were set in motion five distinct waves of air, each capable of doing work. The waves of air within the brake pipe traveled as rapidly as sound [i. e., about 1100 ft. a sec.].

The Quick Action Brake

The idea that if the wave of air utilized for signaling could be made to operate the triple valves upon the cars, there would then be an almost instantaneous application of the brakes upon the front, rear and other portions of the train, led to what is now known as the quick-action automatic brake. The valves as developed were successful, and tests made with them were eminently satisfactory. The wide publicity given to these tests, coupled with a public demand for the adoption of means to prevent accidents, brought about the enactment of a law by Congress obliging the railroads to apply brakes and also automatic couplers to all freight trains in the United States. The quick-action automatic brake was operated like the first automatic brake for ordinary train movements; the quick action being used only for emergency applications.

Steel freight cars carrying enormous loads, had in the meantime been developed and freight locomotives had been increased in capacity, so that trains were often composed of 70 to 80 cars, and more recently some have had as high as 100 cars. This possibility had been foreseen, and experiments carried on to so improve the apparatus, that it could be used to control trains of any practical length. These experiments also had in view the more nearly instantaneous action of the brakes for ordinary service purposes than was possible with the automatic brake or with the quick-action brake. The present improved triple valve has the emergency feature, but also what is known as the quick-service application feature; for ordinary purposes the air is admitted to all of the brake cylinders so quickly that the longest freight train can be handled with almost the precision of a 6 to 12 car passenger train.

The blast furnace of the Clinton Iron & Steel Company, Pittsburgh, was banked December 7. The stoves are to be relined and other repairs made.

* From the presidential address to the American Society of Mechanical Engineers, December 6, 1910.

October Exports and Imports of Iron and Steel

The exports of iron and steel increased and imports diminished in total values in October, according to the report of the Bureau of Statistics of the Department of Commerce and Labor. The value of that month's exports of iron and steel and manufactures thereof, not including iron ore, was $17,452,085, against $16,776,178 in September. The value of similar imports in October was $2,497,754, against $2,680,369 in September.

The exports of commodities for which quantities are given totaled 125,687 gross tons in October, against 106,781 tons in September, 130,877 tons in August, 128,055 tons in July, 120,596 tons in June, 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for October and for the 10 months ending with October are as follows, compared with corresponding periods of the previous year:

Exports of Iron and Steel.

	October,		10 mos. ending October,	
	1910.	1909.	1910.	1909
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	11,229	7,908	95,091	48,745
Scrap	1,687	650	18,554	24,137
Bar iron	1,052	1,938	15,980	10,319
Wire rods	2,544	3,747	19,440	14,418
Steel bars	10,708	8,097	89,642	59,469
Billets, blooms and plates	15,493	3,928	29,655	98,522
Steel rails	19,542	22,036	283,324	211,820
Iron sheets and plates	7,499	7,309	84,508	58,262
Steel sheets and plates	14,068	9,228	141,116	83,099
Tin and terne plates	552	631	8,946	7,456
Structural iron and steel	9,942	6,040	124,494	74,473
Wire	7,038	5,298	74,788	65,344
Barb wire	8,135	9,357	62,770	58,504
Cut nails	1,106	919	6,477	7,799
All other, including tacks	925	416	8,333	6,253
Pipe and fittings	14,167	19,392	132,268	132,346
Totals	125,687	106,894	1,195,386	960,967

The imports of commodities for which quantities are given totaled 31,454 tons in October, against 30,960 tons in September, 36,878 tons in August, 42,326 tons in July, 31,010 tons in June, 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of the imports of such commodities for October and for the 10 months ending with October are as follows, compared with the corresponding periods of the previous year:

Imports of Iron and Steel.

	October,		10 mos. ending October,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	20,280	13,305	196,895	113,128
Scrap	3,393	11,259	68,850	25,522
Bar iron	1,668	2,306	32,879	13,968
Billets, bars and steel forms n.e.s.	3,080	1,517	39,106	13,369
Sheets and plates	203	399	5,668	3,058
Tin and terne plates	1,669	4,963	51,006	49,351
Wire rods	1,161	967	16,940	9,514
Totals	31,454	34,716	411,344	227,910

The imports of iron ore in October were 219,571 gross tons, against 208,892 tons in September, 282,949 tons in August, 248,810 tons in July, 193,415 tons in June, 240,833 tons in May, 206,135 tons in April this year and 178,051 tons in the month of October, 1909. The total importations of iron ore for the 10 months ending with October were 2,219,488 gross tons, against 1,297,382 tons in the corresponding period of last year and 560,824 tons in the corresponding period of 1908. Of the October imports of iron ore 137,250 tons came from Cuba, 36,177 tons from Sweden, 19,729 tons from Canada, 6250 tons from Spain and 20,165 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the 10 months ending with October was $164,376,387, against $128,170,458 in the corresponding period of last year. Similar imports were respectively $32,937,752 and $23,567,183.

The Steel Corporation's Unfilled Orders

The United States Steel Corporation's report of unfilled orders on hand November 30, which was published December 10, showed a total of 2,760,413 tons, representing a falling off of 111,536 tons in November. This is the lowest total in any of the reports of tonnage the corporation has given out in the past eight years, though, as it does not include inter-company business, it is probably not as bad a report as some others in which the figures were larger—that of September 30, 1904, for example. The last statement compares with others as follows:

November 30, 1910	2,760,413
October 31, 1910	2,871,949
September 30, 1910	3,158,106
August 31, 1910	3,537,128
July 31, 1910	3,970,931
June 30, 1910	4,257,794
March 31, 1910	5,402,514
December 31, 1909	5,927,031
September 30, 1909	4,796,833
June 30, 1909	4,057,939
March 31, 1909	3,542,595
December 31, 1908	3,603,527
September 30, 1908	3,421,977
June 30, 1908	3,313,876
March 31, 1908	3,765,343
December 31, 1907	4,624,552
September 30, 1907	6,425,008
June 30, 1907	7,603,878
March 31, 1907	8,043,858
December 31, 1906	8,489,718
September 30, 1906	7,936,884
June 30, 1906	6,809,859
March 31, 1906	7,018,712
December 31, 1905	7,605,086
September 30, 1905	5,865,377
June 30, 1905	4,829,655
March 31, 1905	5,579,560
December 31, 1904	4,696,203
September 30, 1904	3,027,436
June 30, 1904	3,192,277
March 31, 1904	4,136,961
December 31, 1903	3,215,123
September 30, 1903	3,278,742
June 30, 1903	4,666,578
March 31, 1903	5,410,719
December 31, 1902	5,347,523
September 30, 1902	4,843,007

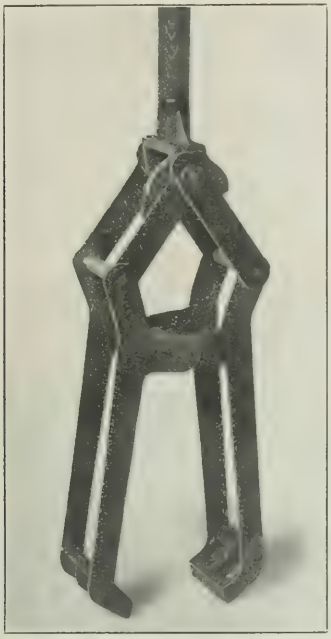
Chairman Gary of the Steel Corporation said recently that the number of men now employed by the subsidiary companies is approximately 180,000. This compares with 225,000 at the high water mark reached in 1909. He intimated that if there is a further reduction in operation the working force would be reduced in consequence, but he considered the outlook better than on August 1 last. In the month of August the daily bookings of new orders were about 20,000 tons; they rose to 21,500 in September; to 22,750 tons in October, and to 24,000 tons in November.

The Empire Steel & Iron Company.—At the monthly meeting of the directors of the Empire Steel & Iron Company, held at 30 Church street, New York, December 13, 1910, a dividend of 2 per cent. was declared out of earnings for the six months ending December 31, 1910, making 5 per cent. for the year. The earnings for the year were more than sufficient to pay the full dividend of 6 per cent., but owing to the depressed condition of the iron trade and the uncertain outlook for the near future it was thought wise to curtail. The company is now running on the basis of about 50 per cent. of its entire capacity, the two furnaces active being its largest, and has accumulated a small stock of pig iron. The ore mines in New Jersey are being run to their full capacity and are reported to be doing well, some sales of ore having been made to other furnace companies.

Recent Changes in Foreign Tariffs.—The initial number of a publication entitled "Foreign Tariff Notes" has just been issued by the Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C. The scope of the new publication is a broad one, embracing changes in rates of import and export duty in all the important countries of the world, notice of proposed or pending revisions of foreign tariffs and amendments of the customs and consular regulations. The first number covers the changes for the last five months. Future issues will be published as often as the number of items requires.

The Whitehead Automatic Flask Bar Tucker

At the meeting of the Philadelphia Foundrymen's Association held on Wednesday evening, December 7, James Whitehead of the Abram Cox Stove Company, Philadelphia, Pa., described an automatic flask bar tucker on which he has applied for a patent. The device was designed to lessen the work of the molder



A New Automatic Flask Bar Tucker Designed by James Whitehead, Philadelphia, Pa.

in tucking the sand underneath and around the cross bars of the molds used in floor work, as the old methods were extremely hard on the molder's fingers, especially if the bars were of iron.

The tool opens and closes itself automatically, and while not heavy, possesses sufficient strength to withstand the ordinary foundry abuse without getting out of order. The wooden handle is 3 ft. 6 in. long and fits into a cast iron socket having a gauge to keep it in an upright position. Steel legs are attached to the socket and at their lower ends are the small castings which do the work of tucking or tamping the sand under the flask bars. The length of the tool from the socket to the ends of these small castings is 16 in., which makes the total overall hight 4 ft. 10 in.

Openings in the tamping castings are provided through which the sand can pass, thus eliminating all danger of a false parting being caused by the sand being pressed too firmly by the tool. A small casting with pins that is attached to the handle socket prevents the jaws from opening too far. The jaws open automatically when the tool is raised, and when pressure is exerted on the handle the legs come together by a toggle lever action and force the sand beneath the bar so that it will be sufficiently firm without being too hard and also much more uniform than when done by hand. In operation the tool permits the molder to stand erect at his work and walk over the bars if desired, thus effecting a considerable saving in time and also performing the work better than was possible by the old methods.

Arrangements have been made with the J. W. Paxson Company, Philadelphia, Pa., to manufacture and market the tool as soon as the patents are granted.

The Goulds Combined Air and Water Cylinder for Pneumatic Pumping

For use in connection with pneumatic water systems the Goulds Mfg. Company, Seneca Falls, N. Y., has recently placed on the market a combined air and water cylinder. This can be used with any well force pump standard or working head where the stroke does not exceed 10 in. for supplying pneumatic pressure tanks from either deep or shallow wells. A sectional view of the cylinder, which shows its construction clearly, is given in Fig. 1, and Fig. 2 shows the cylinder connected to a three-way distributing force pump head.

This cylinder is intended to be attached with the connecting pipe above the water cylinder and the air forced through the same pipe that discharges the water. Its construction is such that the upper or air cylinder takes in a quantity of air equal to the difference in the displacements of the two cylinders at each stroke and at the same time pumps the air which was drawn in on the preceding stroke to the pressure tank through the regular discharge pipe. In this way the necessity of

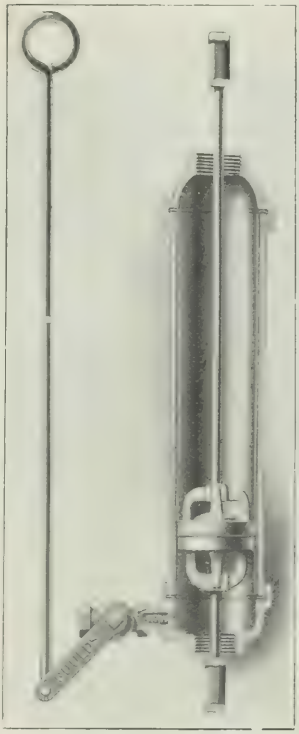


Fig. 1.—Sectional Elevation.

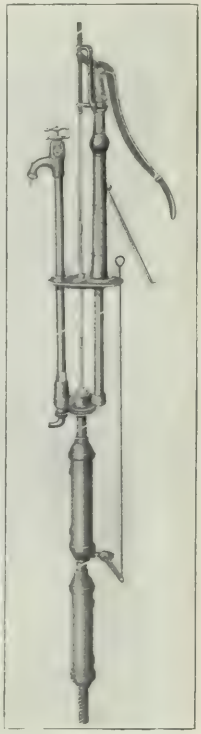


Fig. 2.—On a Pump.

Two Views of the Combined Air and Water Cylinder Made by the Goulds Mfg. Company, Seneca Falls, N. Y.

maintaining a separate air pump to keep the required pressure in the tank is eliminated. These cylinders are made in two sizes, with diameters of 3 and 3½ in., and can be used with pumps where the diameter of the lower cylinder is either 2½ or 3 in., respectively.

The air valve at the lower end of the air cylinder has a lever and rod extending to the base of the pump standard, so that it is possible to shut off the air supply whenever it is desired. In Fig. 2 the pump is shown with the shut-off rod extending to the base of the pump. During the time the air valve is closed the capacity of the pump is equal to that of the upper cylinder.

The Gyroscope and Its Useful Possibilities—III

In Monorail Cars, Automobiles, Aeroplanes and Ships

BY ELMER A. SPERRY, NEW YORK.

Another very popular application of the gyroscope, and one that has been prominent of late is the monorail.

The principle that Mr. Brennan uses is not only extremely ingenious, but very interesting, and can be illustrated by the use of a hairpin and an ordinary little gyroscope top, such as is shown in Fig. 25. It depends upon the fact that if the precession be accelerated or increased it can be made to do work. If a top is spun it will stand on its point and start slowly to turn or wobble generating a cone; gravity presses it down and it is so mounted that it precesses clear around the circle. This motion is sometimes called the Newtonial motion. The top is falling all the time, and in so doing creates precession. The author found some 10 years ago that if he put a wire or rod over a spinning top and turned it as one would a crank, so as to accelerate the precessional or Newtonial motion, he could make the top instantly rise and stand upright; it would come up against gravity doing work, as in Fig. 26 where the top is raising a weight. Brennan uses this principle on his monorail. When the precession is retarded the free side of the top will go down, as in Fig. 27.

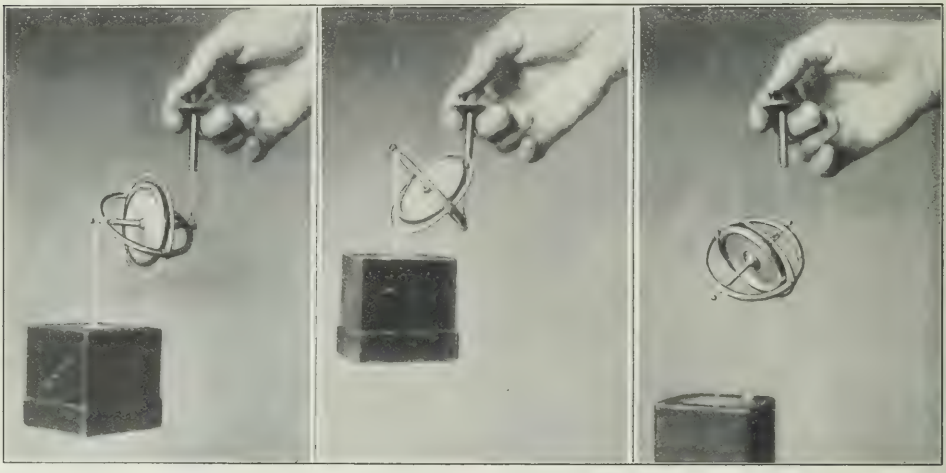


Fig. 25. Fig. 26. Fig. 27.

A Gyroscope Top Used to Demonstrate the Principle of the Brennan Monorail Car.

The Brennan monorail car has a platform mounted upon two wheels in tandem upon a single rail. In a frame erected upon the platform is pivoted upon a vertical axis a spinning mass or disk having a horizontal axis in a frame, which is pivoted upon a vertical axis and may be turned to either side by a horizontal handle. Suppose now the mass to be of considerable weight and spinning rapidly and the car in its upright position and tending to fall either one way or the other, the angular motion thus generated would cause precession, and the handle would start quickly, turning to one side or the other. This would continue until the handle swung through 90 degrees. During this swinging motion the car would have fallen in the direction in which it started only a trifling distance. After the wheel had reached its full sidewise position the car would be no longer retarded by the gyroscope and would fall clear over.

Suppose that an operator was upon this car watching the handle, and as soon as he saw it start in a given direction he would grasp the handle and push it still further in the same direction, thereby accelerating the precession. The car would be found to immediately stop falling and move in the opposite direction. Suppose it moved on in this opposite direction sufficiently to fall across the center line, it would then continue to fall in that direction. The angular motions now impressed upon the gyroscope will cause the handle to move, but the directional motion will be opposite to that first described, and if the operator in detecting this motion should again grasp the handle and push it in the same direction, the car will at once be arrested in its fall and righted until it will start to fall on the opposite side, and this operation is repeated indefinitely; the car always falling one side or the other of the center is constantly corrected and therefore never falls. This act of persisting in accelerating the precession until the car has passed over the gravitational center and starts to fall in the opposite direction is the essence of the whole problem, and Mr. Brennan has devised mechanism to perform the acts of the operator just described.

Mr. Brennan soon found that this car would not pass around curves without the use of two wheels spinning equally in opposite directions with their precessional rings coupled. This eliminated the effect of angles about a vertical axis introduced by curvature of the rails and allowed the gyroscope to respond only to the angles of horizontal axis impressed by the falling car.

The operation of the gyroscope is so powerful and so completely opposes the incipient motions of the car in either direction from the center that it is possible to accomplish the desired result in ways other than suggested by Mr. Brennan. Mr. Froelich accelerates the precession when it has once reached the center by a servo motor shown to the left in Fig. 28. The author has done some work in this field with excellent results. Much credit is due to Mr. Brennan for the thoroughness with which he has been able to carry

out the details of his work. If the disturbance of equilibrium is caused through any other impressed forces, such as weights within the car being shifted or centrifugal action of speed upon a curve, the results in reaction are identical.

The monorail has not been very well received by some engineers, but still there is a great deal to be said in favor of it. If the monorail is to come in it will probably be through the popular demand for very much easier riding at high speeds than is possible with two rails; this difference is very great. When cars become very much larger, several decks possibly, and the easy riding qualities of the monorail are understood, it may become largely used. There is no great saving in rail; the one has to be nearly as heavy as the two; there is little saving in sleepers; they have to be twice as close together; no saving in excavation or tunnels; no saving in the outlay; many of the advantages that have been urged do not seem to exist. Quick laying across the prairie of one rail and the freedom from the necessity of a straight line may render the monorail usable for war purposes.

Other Applications of the Gyroscope

Brief mention should be made of the use of the gyroscope to establish artificial horizon in connection with observations at sea. A French firm has for some years been manufacturing an instrument for this purpose, which has met with considerable success. The spinning wheel weighs but a few ounces, is driven by compressed air, and is hung by a point above its center of gravity. The oscillations of its precession constitute an angle, and by bisecting this angle the artificial horizon is established. The speed indicated by the rapidity of the precessional oscillations is also taken into account in final determinations.

Another use of the gyroscope which promises to be important is in connection with automobiles. The car body of an automobile has two definite series of oscillations; the slower one being longitudinal to the body —*i. e.*, the back end of the body will oscillate about the forward axle as a center or the forward end will oscillate about the rear axle as a center. The body also has a quick sidewise vibration about its own longitudinal axis, which renders long continued riding extremely tiresome, if not injurious, to passengers. These vibrations are set up by one wheel of the rear axle rising over an obstruction or falling into a depression, and it is this vibration that is considerably relieved by pneumatic tires. It has been definitely ascertained that by the use of a comparatively small gyroscope, these sidewise vibrations can be entirely suppressed. Only an occasional very large impulse from one end or the other of the axles reaches the body, the gyroscope suppressing all ordinary vibration in this plane. It is thus seen that the gyroscope in this capacity operates to allow the body only a vibration of long period and about the transverse axis which is very natural and easy on the occupants.

Mr. Churchward, a recognized authority in automobile engineering, has stated that with the suppression of sidewise vibration which the gyroscope is found to accomplish, pneumatic tires become unnecessary. In other words, the particular advantage obtained through the pneumatic tire is thus very largely done away with. The gyroscope makes it practically impossible to quickly upset the vehicle, affording in this way greatly increased security to the occupants. The specification in this attachment of the gyroscope provides simply that it should be mounted under the body and above the spring base of the vehicle. From facts gathered in this connection, it is found that only a very small amount of power is required to spin the gyroscope wheel. Fig. 29 represents such an arrangement, but the gyro wheel in this particular case was found to be many times heavier than necessary.

The use with aeroplanes is of growing importance. It has been shown that even with an extremely small gyroscope a very large balancing factor is introduced on the monorail car. An aeroplane with a very low metacentric hight is the only one that seems practical at present, but such a machine is not stable. One with a low center of gravity is very stable and safe, but owing to the large metacentric hight, will swing vigorously. It absolutely cannot swing, however, if a gyroscope is employed, properly mounted. The experiment with the stool and lead tired bicycle wheel (page 1323, Figs. 16 to 20) showed that a powerful fulcrum can be produced in space by the use of the gyroscope. With a comparatively light gyro the swing will be extremely slow—several seconds possibly being employed in the oscillation—a long time can thus be given the operator to make his correction, thus greatly relieving him of nervous strain. That is one of the points that Mr. Wright makes as a result of his experience. The quickness and unerring adjustments required make the aeroplane problematical in ordinary hands. The public is beginning to recognize that with unaided control, as in the case with the present machines, their successful manipulation classes too much as an acrobatic feat, and many hesitate to trust their proficiency in this field or engage in so nerve racking an occupation. It may be possible that the difficulty can be entirely overcome by the use of a gyroscope.

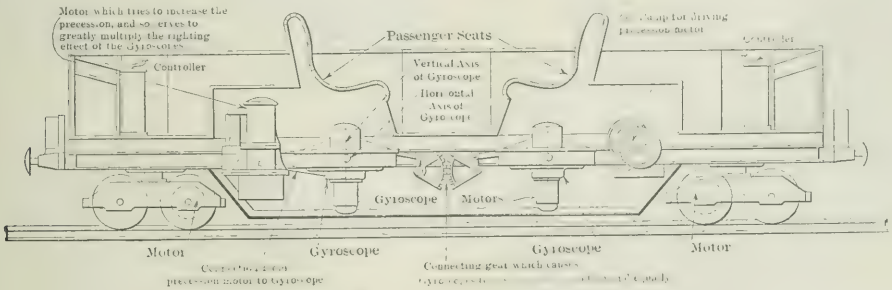


Fig. 28.—The Froelich Monorail Car.

The author has a gyroscope on an aeroplane that has been in the air a number of times, with extremely satisfactory results. A small gyroscope is wonderfully powerful as compared with its size and weight. Ten pounds at the radius of a foot will develop stresses of 1 ton at this radius and may be either directed or projected as required. In Figs. 30 and 31 the gyroscope is shown at G, and is driven from the engine and requires about the same power as two incandescent lamps to drive it and runs nearly two hours after the power is cut off or stops for any reason.

Gravitational Steadying of Ships

Volumes have been written upon the rolling of ships and the problem has been attacked in a great many ways. Frude tried to accomplish it by the use of

water chambers placed athwartship. When the ship rolled the water would rush from one side to the other, in that way extinguishing part of the roll. Those who have experienced heavy rolling know how grateful would be even a small diminution in the roll.

Bilge keels have been introduced, and their characteristics have been quite well understood, being effective only in heaviest rolling, as has been shown by tests made on full sized ships and checked by experimental tank tests. Quite large bilge keels were found to equal about three-fourths of the surface, hull and keel action for all angles of roll. The comparisons between bilge keels and 1 per cent. of water ballast in athwartship tanks is interesting. Very large keels were found to be only one-eighth as effective at 3-degree roll from the vertical, one-fourth as effective at 5-degree roll, only equaling at 12-degree roll, and being three times as effective at 18-degree roll. They are also known to increase materially the resistance (skin friction) and motive power required in all weathers. Bilge keels depend upon the relative movement through the water for their efficiency just as one would expect. Power is required to drag them through the water at all times in calm as well as when needed, whereas with the gyroscope all one has to do is to start it up whenever need exists.

In Germany the author met Dr. Frahm, who has succeeded in overcoming one of the reasons for eliminating the water chambers from the old men-of-war, that was the noise of the hundreds of tons of water rushing from side to side, which is said to have been intolerable, by using the inverted siphon. The trouble with this arrangement is that the central opening has to be of such a character as to cause the movement of the water to be synchronous with the boat's period—that is, if in addition to the simple gravitational factor of the water, the energy of the rushing water is to be utilized. The boat is a pendulum, and in still water conforms to the laws of a pendulum almost perfectly as to uniform period. The movement of the water in the arrangement can be made to conform to some given period. In rough seas, however, the boat is not periodic, varying a great deal. The author has seen autographic records of rolling where the period varied from 7 to 17 seconds. Naturally, when the flow of this great quantity of water gets out of synchronism it becomes a menace, and makes the boat roll more and behave worse.

The great engineer, John I. Thornycroft, of England, tried to overcome the last named difficulty. He placed a great moving weight on a vertical axis in the hold of a ship (by this means the center of gravity of the ship could be changed at will), and also an equipment of hydraulic apparatus for swinging this weight from side to side. The weight was about 5 per cent. of the total displacement of the ship, but it was governed by a controlling apparatus within the ship, in such a way that he succeeded admirably in anticipating all the needs of the ship up to the capacity afforded by this moving weight. The weight had the power of tilting the ship just 2 degrees either side of the vertical when swung to its extreme lateral positions. In sea trials of this arrangement Sir William White states that it reduced 18 degrees of roll to 9 degrees. This was the first attempt to steady a ship by a controlled reactionary force. The difficulties encountered with this, the water tanks and all other gravitational methods is that each pound of weight is enabled to do the work of only 1 lb., and the weights and auxiliary machinery required have been found to be prohibitive; furthermore, the weight when on one side or the other constitutes a persistent unbalancing or listing force whereas the gyroscope delivers stresses pure and simple without disturbing the balance of the boat or introducing any such list whatever. The problem of preventing rolling of ships at sea has been attacked by a great many engineers.

A year ago last summer, while in Hamburg, Germany, the author saw the latest arrangement of Frahm. Three large vessels for the Russian Government are now being built with his arrangement for steadying ships, involving enormous tanks amidships, which will contain from 350 to 400 tons of water through the rushing of which, back and forth, a part of the true periodic roll will be extinguished, but only a part and only when periodic. Dr. Schlick states with reference to this arrangement that it will become a positive menace and cause excessive rolling when the ship's oscillation falls out of period which it invariably does in a storm. This, however, is interesting, as showing the great desire to prevent rolling of ships.



Fig. 30.—An Aeroplane Fitted with a Stabilizing Gyroscope.

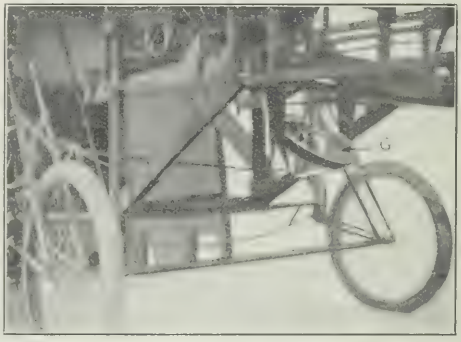


Fig. 31.—Another View of the Gyro Aeroplane.

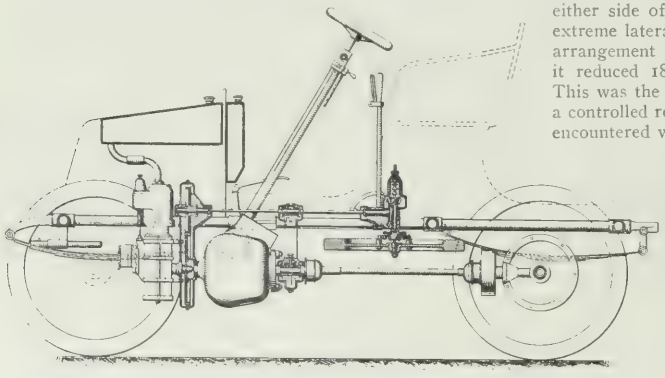


Fig. 29.—A Gyroscope Applied to Suppress Vibration in an Automobile.

Gyroscopic Steadying of Ships

The gyroscope, on the other hand, is not limited to any particular period of the boat; it simply responds to whatever motion the ship has, synchronous or non-synchronous. The question is often asked, Why is the gyroscope better than a moving weight in a ship for roll quenching? The reason is perfectly apparent when you recall the magnitude of stress obtainable from a small machine. Every pound in the rotating mass of the gyroscope can easily be made to do the work of from 150 to 200 lb., and direct in any desired line or plane whereas, when water is used or any other form of moving weight, each pound represents only a pound, and can do the work of only a pound. The small amount of power required for operating a gyroscope is emphasized by the fact that it is small as compared with the extra power required to drive a vessel fitted with bilge keels. One instance has been noted where the power required for operating the gyroscope would be about 5 per cent. of that excess required for bilge keels at normal speed of the boat. Moreover, the keels require power in all weathers, the gyroscope only when needed.

The gyroscope is probably the only device in the world by means of which stresses and also energy may be transferred "around a corner," so to speak. With the gyroscope it is possible to create and maintain a very powerful fulcrum in space effective for the heaviest kind of mechanical duty.

A couple of years ago in the navy yard at Washington the author had some models which were being inspected then and afterward were taken to the Navy Department near the White House. Among the men who came in to pack and take them was an old sailor, who wanted to know what it was. Upon being told that it was a device for preventing the rolling of ships at sea, he said, with a rather decisive wag: "You cannot stop a ship from rolling in the middle of the ocean; why, what are you going to get hold of to steady her?" In a way he was right. A great mass like a ship cannot be prevented from rolling unless it is possible to lay hold of something and something extremely stiff.

On board ship there is one factor that is stiff, and is now available for this purpose, and that is the fore-and-aft stability of the ship. In the gyroscope for the first time the means is at hand of rendering it possible to reach out and transfer this stability around a corner, so to speak, to the athwartships plane and thus hold the ship against rolling. This can be done with a surprisingly small mass, because every pound in that mass can be made to do a very large amount of work, owing to the velocity that may, at low cost, be impressed upon it.

A primary motion on the part of a body, for instance, the slow athwartship or rolling motion of a ship exerts gyroscopic forces upon any vertical spinning shaft and in a fore-and-aft direction. These forces tend to dampen the rolling motion but only feebly, and the fore-and-aft reaction owing to the absence of motion does not at all. It is a part of the general plan to so utilize this force as to make it create extremely large reactions athwartships or in the proper direction to be effective. This is accomplished by the ingenious yet simple expedient of mounting the vertical shaft in a pivoted frame, so that it can tilt and utilize the primary fore-and-aft reaction to cause the axis of the spinning mass to tilt fore and aft. This motion is of much higher velocity than the angular motion of the vessel which produces it. By means of this tilting motion an entirely new gyroscopic force is set up, again at right angles as in the first instance, but now to the plane of tilt (fore and aft) which brings it back to the original athwartship plane just where needed, and what is equally important the reaction is in a direction exactly opposed to the roll of the ship which primarily called it into action; and, in fact, this whole train of phenomena, which has thus been traced through a complete cycle of 180 degrees, produces an enormous augumentation of righting movement and stabilizing power.

(To be continued.)

An Unusual Gas Producer Installation

About a year ago the Fostoria Glass Company, Moundsville, W. Va., installed two Amsler gas producers to furnish gas to its 12-pot furnace. This furnace is a deep-eye construction, being fired with natural gas at the time. The product is table ware. The method of burning the gas is a departure from the usual practice, as the gas and air are not regenerated, but the gas is taken from the producers and fired directly in the furnace, while the air is supplied through passages already in the furnace and proper adjusting doors.

There was some doubt expressed as to the feasibility of the scheme, and it seemed reasonable to expect that there would be some difficulty in securing and maintaining sufficiently high temperatures to properly melt the sand and other material in the batch. When the producers were ready, the gas was turned into the furnace and the natural gas shut off, as there was no change made in the furnace that could not be made from the outside. It took several days for the operatives to get used to the producer gas, and the outcome was rather doubtful for some time. Presently the proper adjustment of the gas and air was found, and there was no further trouble.

In placing an order for five additional producers, the company gives the best recommendation of the plant already installed. The new producers are to operate the 14 and 16-pot furnaces. At the time of placing the order, the company expressed itself as follows: "We are using gas from these producers in an entirely new manner, having connected them with our deep-eye furnace without leaving the furnace out. The results have been fully up to our expectations. The furnace is running on natural draft. We use it in melting Hancock sand in large pots, 46 x 60 x 54. Everybody knows that Hancock sand is hard to melt, but this furnace is melting in from 22 to 24 hours, and we can depend on it the week round melting in 24 hours. We believe that the life of our furnace with producer gas, using it in the manner which we are, will be as long or longer without repairs as with natural gas for fuel."

The Millersburg Glass Company, Millersburg, Ohio, recently contracted for three Amsler producers to operate its pot furnace in the same way as above, and to furnish gas to its tank furnace, lehrs, &c. This was done after a careful investigation of the results attained at Moundsville.

In a recent installation of Amsler gas producers for the Reading Iron Company, Reading, Pa., a two-unit plant is being operated to make gas for a 500-hp. engine. The gas in this case is made of bituminous coal and scrubbed to contain not over 0.015 grain of solids per cubic foot. The scrubbing devices consist of a water sprayed cooling tower and wet scrubber, a rotary or centrifugal scrubber, and a purifier for removing sulphur. A small storage tank is provided for equalizing the gas.

The contract of the American Steel Foundries with its officers, under which they were to receive a share in the profits above a fixed sum, expired July 31, having run for five years. A new contract for two years, beginning August 1, 1910, has been made, which it is stated will be more advantageous to the company and its stockholders than the first one. The company is operating at about 60 per cent. of capacity, and has a month or six weeks' orders on hands.

The Mechanical Engineers' Convention

Thirty-first Annual Meeting, New York, December 6 to 9, 1910

In many respects the annual meeting of the American Society of Mechanical Engineers, just closed, was one of the most successful in its career. The attendance was especially large, the total registration being 1043, of which 633 were members and 410 guests; the papers presented at the professional sessions were well selected in the subjects covered and brought out considerable discussion, and the social features of the programme could hardly have been made more enjoyable. A fact commented on by many was the more than ordinarily cordial atmosphere that existed; even the strangers and those who most seldom attend felt this spirit of hospitality. To a great extent this was due to the efforts of the subcommittees on acquaintanceship, which were a new institution in the provisions for entertaining. The presence also of quite a number of those who attended the meeting in England last summer, and had pleasant experiences to recall in their reunion, contributed to the general feeling of good fellowship which prevailed.

This year the entire day Friday was given up to excursions, and none of the scheduled ones took place either during or on the same day with the professional sessions. There were, however, a number of additional excursions which could be taken on any day by those who cared to omit any of the various professional sessions. Another innovation was having the president's reception on the opening evening, Tuesday, and the dance a separate affair, on Wednesday instead of Thursday evening. This left Thursday evening for a lecture, in which the National Society for the Promotion of Industrial Education, the American Institute of Electrical Engineers and the American Institute of Mining Engineers co-operated. The address by Dr. Georg G. Kerschensteiner, superintendent of schools of Munich, brought out some very interesting features in the conduct of the industrial continuation schools of Munich and was illustrated with lantern slides. All of the social features of the meeting were extremely well handled by the entertaining committees, who deserve the highest credit for the efficient work done in the preparation for them.

The papers which were of the most general interest were the presidential address, referred to in another part of this issue, which gave such an interesting account of the history of the conception and development of the air brake by George Westinghouse; the paper on the "Transmission of Heat in Surface Condensation," by George A. Orrok; the three papers on grinding presented in the session devoted to machine shop matters, and the paper presented before the Gas Power Section describing the gas engine installation in the Lackawanna Steel Works, which was the first large one in this country. A note of sadness, in connection with the latter, was the death of the author only a few days before its presentation.

SECOND SESSION

As usual matters of business were taken up in the fore part of the first professional session. Secretary Calvin W. Rice presented the report of the tellers on the election of new members; in the last year there have been taken in 276 new members and 30 have been promoted. These include 135 full members, 28 associate members promoted to full membership, 15 new associate members, 2 junior members promoted to associate membership and 126 new junior members.

A report of the Committee on the Raising of Funds for the Land Debt was presented by Worcester R. Warner, who stated that there has now been subscribed about $226,000, leaving from $85,000 to $90,000 yet to be raised. A report of the Committee on Constitution and By-Laws was presented by Past President Jesse M. Smith, who briefly described an amendment of the constitution, which will be necessary in order to properly confer the title in the Engineering Societies Building shared by the American Society of Mechanical Engineers. This amendment was put to ballot at this meeting and carried.

Prof. Edwin Robinson of the University of Vermont presented the need in this country for a museum of engineering to correspond to such as now exists in other countries, and urged that the society give attention to the proper way in which such a museum might be established. The subject was discussed by President-elect Colonel Meier, Harrington Emerson, Secretary Rice and Fred R. Low, in the course of which it was brought out that there is now a movement on foot to establish such a museum at Washington.

Colonel Meier, presiding at this session, referred appreciatively to the address of President Westinghouse on the night before and the very desirable addition it makes to the history of engineering, and more particularly the records of the society, in recounting the birth of that important invention, the air brake. A resolution of condolence on the death of William H. Bryan of St. Louis was passed.

Prof. John A. Brashear told a little of the work of the Carnegie Technical Schools and made an appeal for the support of the individual members of the society in the great work this school is doing in the promotion of industrial education.

Reports on the meeting in England last summer were presented by Honorary Secretary Prof. F .R. Hutton and Secretary Calvin W. Rice. The latter's paper, which had been printed and distributed to the membership, contains a very complete record of the events of that meeting, a list of those in attendance and an attractive collection of photographs selected from those taken by various members, making altogether a very splendid souvenir of the meeting for those who did attend and a valuable report for all others of just what transpired. An abstract of this paper follows:

The Joint Meeting in England

BY CALVIN W. RICE, SECRETARY.

The invitation for the joint meeting of the American Society of Mechanical Engineers and the Institution of Mechanical Engineers was received in September, 1909, and on July 16, 1910, the official party of 144 members and guests sailed from New York on the White Star steamer Celtic. There were numerous entertainments on the voyage over and the port of Liverpool was reached on the evening of July 24. Here the party was welcomed by the officials of the Institution of Mechanical Engineers, and the next morning the party disembarked and proceeded by train to Birmingham, where the meeting formally opened on Tuesday, July 26, in the hall of the British and Midland Institute. After the speeches of welcome were made and responded to, professional papers were read and discussed by members of both societies. The mornings of both Tuesday and Wednesday were devoted to professional sessions, while the afternoons and evenings were given over to excursions to points of interest and social functions. Thursday was devoted entirely to sightseeing, and in the evening a *conversazione* was given in the Institute House of the Civil Engineers in London, where the concluding sessions were held on Friday and Saturday. As was the case with the earlier sessions, the afternoon and evening of Friday were left open for excursions and entertainments, while Saturday was devoted to all-day excursions. On Sunday the official party visited Westminster Abbey, and the following day the party disbanded.

James M. Dodge, chairman of the Committee on Public Relations, reported that some progress has been made, although much still remained to be done, and

asked that the membership generally co-operate with the committee in offering suggestions, &c.

Prof. F. R. Hutton extended a cordial invitation to all the members and guests to visit the Museum of Safety, which he felt certain would be of interest to them especially on account of the work that has been done to prevent accidents in mechanical plants.

The Transmission of Heat in Surface Condensation

BY GEORGE A. ORROK, NEW YORK.

The condenser has from the very first been an important part of the machinery designed for utilizing steam, but the advent of the surface condenser has complicated the problem until there are at the present time four opinions as to heat transmission through metallic surfaces. While these differences of opinion were not serious with small condensers, the advent of the steam turbine has developed the necessity for condensers having a capacity of 200,000 lb. of steam at an absolute pressure of 1 lb. To determine the heat transfer through various kinds of tubes and the laws governing its variation under different conditions of temperature, pressure and velocity, a series of tests were made by the author. A small surface condenser was constructed with a relatively small cooling surface and it was operated under conditions as nearly like actual practice as possible, while it was possible to vary existing conditions so that any desired vacuum, velocity of circulating water and mean temperature difference could be maintained and any one of these conditions varied throughout a considerable range independently of the others. The first tests made showed variations of as much as 20 per cent. for the same tube under the same conditions. It was decided that the difficulty must lie with the quality of the steam, velocity of the steam, air leakage or cleanliness of the tubes. These were all remedied and another set of tests made with varying vacua. Tests were next made to determine the variation of heat transfer with temperature difference, the variation with the velocity of the circulating water, the variation with the velocity of steam and the effect of the presence of air in the steam upon the heat transfer. The results of these tests showed that the coefficient of heat transfer is inversely proportional to the eighth root of the mean temperature difference, is approximately proportional to the square root of the velocity of the cooling water and is independent of the vacuum and the velocity of the steam in the condenser tubes. Air has a very pronounced effect upon the heat transfer, especially at high vacua, as has also the material and condition of the tubes.

The author in his opening remarks regretted that he had not been able to determine the law of temperature rise in condensing water, but said that to do this would have necessitated the introduction into the condenser tube of electric couples about every 4 ft. and he did not know of any way to do this. However, he believed that the results would have been the same.

Prof. W. F. M. Goss, in opening the discussion, commended the paper as one of extreme value and said that in his opinion there was no more prolific field for study existing to-day than that of heat transfer. He also thought that the time was at hand for engineers to enlarge their conception of the possibilities of a unit area of heat transmitting surface.

Prof. W. D. Ennis concurred with Professor Goss as to the value of the paper, saying that it was a noteworthy one and was an analysis of an important question. In response to his request as to how the rate of flow compared with condenser practice, Mr. Orrok said that it was within the limits of present day standard condenser practice. Continuing, Professor Ennis said that the value of the coefficient of heat transmission in relation to the mean temperature difference was surprising. He noted that the author had based the rate of transfer on the value of the outside surface of the tube, and said that he would have liked to have had the data on the relation of the thickness of the tube to the rate of heat transfer. The scattering of the points through which the various curves were drawn should not be due to the presence of air in the steam and in his opinion there was evidence of an error between the points and the curves, which was probably due to observation or operation. He was skeptical of the value of water meter readings for this class of work and preferred to weigh the water used.

Prof. Wm. Kent was especially impressed with the method followed by the author in presenting his paper. He was, however, puzzled by the expression "mean temperature difference" and asked if the arithmetical mean temperature difference which is the usual one, was meant or if it was the logarithmic or some other mean. In reply Mr. Orrok said that the mean temperature difference was the mean of the arithmetic and logarithmic means and depended entirely on the conditions that were assumed to exist in each particular case.

H. H. Suplee considered the question of air leakage important, and especially the location of the air. The air in the steam tended to cling to the surface of the tube and as a result the outside of the tube was covered with air bubbles, which formed a nonconducting jacket and retarded condensation.

T. C. McBride said that condensers now form so large a part of central station equipment that the paper was an important one. The conditions encountered in the first series of tests were the same as those met with in low pressure steam turbine practice, and the results of these tests were important. He thought that if the partial air pressure was ¼ in. of mercury the results could hardly be considered as applying to practical conditions in surface condensers. Assuming that ¼ in. was the air pressure, the effective displacement ratio of the air and boiler feed pumps he calculated would vary from 2033 to 5060, which is prohibitive. He was of the opinion that the amount of air present was much less than the author thought. He expressed the hope that the author would make some measurement of the dry pump discharge and present the results at a future meeting, as he does not know of any ever published. In conclusion, he recommended the adoption of a standard code for condenser testing.

In his closing remarks the author said that he did not think that tube thickness was very important. The majority of the tubes used were No. 18 gauge, but some were No. 16 and No. 20, and he could not detect any difference in the transference of heat, a condition which he attributed to the air in the steam. The variation between the points and the curves which Professor Ennis had called attention to was great, but nevertheless was smaller than could be otherwise obtained. The exhaust steam used in making the tests was taken from an exhaust main connected to various pieces of apparatus around the central station where the tests were run and was likely to contain air, and he also thought that some air came in through the pores in the pipes.

THIRD SESSION

The afternoon was devoted to a consideration of five papers dealing with steam engineering topics. The first paper presented was

Combustion and Boiler Efficiency

BY EDW. A. UEHLING, PASSAIC, N. J.

The boiler house possesses more room for economy than any other part of the plant. A properly designed steam engine will give the maximum economy, but this cannot be decreased or increased by the attendant as it depends upon a number of complex conditions. The loss of heat energy in flue gases may vary all the way from 15 to 40 per cent. and is made up of two factors, the heat of the gas itself and the heat of the combustible it contains. The former varies directly as the stack temperature and inversely as the percentage of CO_2, while the latter is independent of the stack temperature and varies inversely as the percentage of CO_2. In fact, the only loss independent of this percentage is that due to the moisture contained in the fuel, but this depends upon the stack temperature, so that this factor and the amount of carbon dioxide present in the flue gas are the two controlling factors. Stack temperature cannot be depended upon alone as an index to the efficiency of operation, and it therefore follows that the other factor must be the true measure of the operation of the plant. As both of these components are easily determined there is no reason why care should not be exercised in the selection and consumption of fuel. A full analysis of the flue gases should be made daily, and once the most economical value of CO_2 has been determined this component of the flue gas will serve as a guide for the fireman. A continuous automatic record is of value to the engineer, and if the stack temperature is indicated and recorded for the benefit of both the maximum efficiency can be secured with little difficulty.

This paper was presented nearly in its entirety by the author, after which the secretary read a written discussion submitted by O. H. Bathgate. In his opinion, although little exception can be taken to any of the author's statements, several important factors necessary for conclusions were either omitted or not given their proper value. Approximate analysis of coal is insufficient, and a separate determination of sulphur is necessary to associate the quality of the coal with efficient steam generation. In daily practice where the carbon dioxide is likely to be below 12 or 13 per cent. the omission of the remaining gas constituents is not serious. In addition to determining the carbon dioxide either manually or automatically means should be also provided for determining the carbon in the ash, as gas and ash analyses are essential to complete knowledge of combustion. Inconsistent results were to be expected as corrections were not made to the basis of standard fuel, temperature, &c., and if fewer results had been used and these few corrected, more reliable conclusions could have been derived. It would be especially interesting to know the ratio of available hydrogen to carbon in the fuel and the conditions for firing from which the results of some of the tables were made. It is extremely probable that the variable conditions affecting the total of the oxygen components have more to do with the inconsistent results than inaccurate analyzing. At present, he declared, there is no practical automatic carbon dioxide recording apparatus available for continuous boiler room operation. In conclusion, he recommended that a single boiler be run on a continuous test under strictly operating conditions, noting the quantities of steam generated and coal consumed, and recording all conditions entering into the operation The use of continuous gas sampling vessels, coal and water meters and steam, water and gas temperature recorders would give numerous records covering any desired period of time, and the results would determine the conditions necessary to secure the highest boiler and furnace efficiency. The carbon dioxide indicator and recorder would be useful then as an index of comparative operations, and of material value only so long as the quality of coal and other controlling factors remain essentially the same.

Prof. W. D. Ennis remarked as one special feature of the paper the complete presentation in the appendix of the modifying factors not usually considered. The whole subject, he declared, is of vital importance to power plants. The percentage of carbon dioxide is a matter of air leakage. The percentage of oxygen is difficult to measure, while stratification in the furnace results in both carbon dioxide and oxygen being present in varying percentages, depending upon where the sample is taken, and might lead to incorrect conclusions. It is not enough to measure the carbon dioxide; both that and the oxygen should be measured. The percentage of carbon dioxide is not necessarily low for maximum economy, but might be very high, although the increase in efficiency from raising the percentage of dioxide from 4 to 5 is six and one-half times that when the change from 11 to 12 is made. In his experience piping has caused trouble with a carbon dioxide recorder due to the formation of iron sulphate in the pipes when the coal contained sulphur, and in a number of cases the time required for the gas to reach the instrument was so long as to constitute a very serious objection. The ideal recorder should indicate as well as record, be cheap and so constructed that its indications cannot be falsified by the fireman.

Prof. Wm. Kent said that while steam and water gauges are essential, addition gauges for measuring the stack and furnace temperatures and the percentage of carbon dioxide are desirable. He recommended the use of a recording instrument for measuring the furnace temperature, preferably a pyrometer in conjunction with a recording thermometer, as that combination furnishes the best indicator of economy. The best economy is obtained with dry coal. He thought that too much stress is laid nowadays on the heat unit question and said that the semibituminous coals of the United States are so uniform that to assume a value of 14,500 B.t.u. per pound is better than having each particular fuel analyzed. The only constituents of anthracite coal that require analysis to determine their percentage are moisture and ash, and these can be determined without such a process, but an analysis must be made for all bituminous coals. In conclusion, he advocated the keeping of continuous records of the percentage of carbon dioxide and the boiler temperature.

Prof. D. S. Jacobus emphasized the fact that the important thing is the proportion of carbon dioxide. He also declared that there are other sources where losses or gains may be made in a boiler room; that in general there are two problems, one in connection with a plant which operates on a practically constant load and the other where the load is fluctuating and it is necessary to have enough boiler power to carry over the peak. Good firing is a very important desideratum in preparing boilers to carry the peak load and is more important than any other factor of economy.

H. C. Abell, New York, declared that in most cases the hydrocarbons are not being properly burned. In 1½ cu. ft. of marsh gas escaping up the flue 10 per cent. of the heat value of the coal can be lost, and he has found that a large percentage of the heat losses are due to escaping hydrocarbons.

J. C. Parker gave it as his experience in going through power plants that carbon dioxide recorders are usually out of order; that as at present built they are more in the nature of laboratory devices than really useful instruments for boiler rooms. High carbon dioxide does not necessarily mean high efficiency, and he maintained that a statement to the contrary in the paper is not proved.

A. W. K. Billings remarked that sight should not be lost of the fact that efficiency of combustion is not the main point, but economy of the plant. It is possible to get a high carbon dioxide record on a recorder without having proper operation. He feels that there is a field for a much more practical test than that for carbon dioxide and that there should be some means of watching how the fireman handles his fuel bed.

Automatic Control of Condensing Water

BY B. VIOLA, BROOKLYN, N. Y.

Condensers for vacuum plants use the cooling water during its progress through the condenser, as the cooling surface and at times the injection of cooling water is unnecessarily increased by incorrect operation of the plant. The finer the division of the cooling water the more the gases pass through it and to a greater extent will the escape of the entrained air be facilitated. This division, however, is never fine enough and a proper utilization of the cooling surface can only be had by allowing sufficient time of contact. Plants constructed strictly in accordance with this plan would, however, be too large, and as water and gases are poor heat conductors when at rest some motion must be provided for the water. Therefore to heat condensed water quickly to the necessary temperature by direct contact with the steam the cooling water surface must be large and change quickly and the time of contact between the steam and the water must be as long as possible. A barometric counter current condenser will fulfill these conditions and a description of a condenser of this type designed for use with two or more vacuum pans is given in the paper. This type of condenser will perform all this work satisfactorily and very economically, particularly if some automatic controlling device operated by the temperature changes of the condensing water is applied to it. While it requires considerable water the use of a controlling device prevents waste, and in many cases where salt water is now used for condensing purposes, because of the great quantity required, the author believes that with a well constructed counter current condenser operated with a temperature controller fresh water could be used with a water purifier to remove matter carried over by the condensed water. This arrangement is a decided advantage where the condensed water can be used for boiler feed.

In presenting the paper in abstract the author used lantern slides reproducing autographic records of temperatures to illustrate his points, and emphasized the

fact that if the water is colder than it ought to be the highest vacuum will not be obtained in the condenser.

George Dinkel criticised the paper as lacking in showing any results and referred to a paper presented by John Webster at an earlier meeting on the same subject as contradicting some of the statements made in the present paper. Results have shown that a surface condenser will require from 12 to 14 lb. of cooling water for a given condensing effect, where a spray condenser will require from 20 to 22 lb. He believed that the author should be asked to append more in the nature of results to his paper.

Written discussion on the paper was presented by Mr. Shellcross, who referred to a controller that he had installed similar to the one described by the author and illustrated in his paper. It worked well and was a big improvement over their former hand control, but they were not satisfied with the wide variations in the temperature chart because the apparatus did not operate quickly enough. They observed that the temperature of air coming from the top of the condenser to the vacuum pump bore a uniform relation to the cooling water in the leg pipe, and that the temperature at the top of the condenser felt much more quickly the opening and shutting of the water valve. They therefore removed the temperature controller from the leg pipe and connected it to the air outlet pipe, with the result that conditions were considerably improved, although there were still variations due to complete opening and closing of the water supply pipe valve. This in turn was overcome by by-passing part of the water around the diaphragm valve, allowing some to enter the condenser all the time and the diaphragm valve to admit just enough to completely condense the steam. These same modifications, he believed, would improve the author's apparatus.

E. D. Dreyfus questioned whether apparatus of the kind referred to in the paper would be sensitive enough for fluctuating loads on turbines. The discussion of the paper was closed briefly by the author.

Tests of a 10,000-Kw. Steam Turbine

BY SAM. L. NAPHTALY, SAN FRANCISCO, CAL.

The results of steam economy tests made on a 10-000-kw. turbo-generator unit under operating loads at the plant of the City Electric Company, San Francisco, Cal., are given in this paper. The object of the tests was to determine the general steam consumption of the turbine under ordinary operating conditions, and also to determine whether the builder's guarantee of economy, generator temperature, &c., had been complied with. The special features of the turbine—which was of the double flow type—the condenser and the generator are given, and this is followed by details of seven tests made on the turbine after its installation and the steam consumption test, together with a description of the apparatus used. As the operating conditions specified in the contract could not be maintained throughout the test, correction factors for superheat, steam pressure and vacuum had to be introduced. The conditions during the test and the results obtained are shown on several diagrams, and a table gives the results on the basis of water rate and the Rankine cycle and thermal efficiencies. Two special features of interest in the turbine are the employment of a new principle in oil relay operation of the main valves and the high speed of rotation—1800 rev. per min.

In the absence of the author this paper was presented by A. W. K. Billings, who added a few remarks on the conditions of the test. For one thing, they were unable to get full loads on the machine except when the fluctuations were very large.

Test of a 9000-Kw. Turbo-Generator Set

BY F. H. VARNEY, SAN FRANCISCO, CAL.

Prior to 1908 the city of Oakland, Cal., was dependent upon water power stations and transmission lines varying from 125 to 150 miles in length for its electrical energy. At that time it became evident that this service must be bettered, not only on account of the capacity but also for the regulation. A turbo-generator set was decided upon as offering the best solution of the problem, and in 171 days from the beginning of the plans for the equipment it was built, erected and placed in successful operation. The turbine is operated in parallel with the hydroelectric system, which consists of 11 water power stations, 3 reciprocating engine stations and 1 gas engine plant. Since its installation it has operated perfectly in every particular, and speedily demonstrated its superiority over reciprocating steam or gas engines, both in regulation or maintenance. The apparatus installed consists of a 9000-kw. vertical Curtis turbo-generator, a Worthington condenser and vacuum pumps, and eight 754-hp. water tube boilers equipped with oil burners of the back-shot type and superheaters for 100 degrees superheat. The guaranteed efficiency at full load and unity power factor, with a steam pressure of 175 lb. gauge and a superheat of 125 degrees F. and a vacuum of not more than 2 in. absolute back pressure in the exhaust chamber, was 16.4 lb. of steam per kilowatt-hour. Because of the urgent need for the plant the efficiency test was postponed until the station had been in operation 14 months. Then the machine was tested on the regular commercial load which it was endeavored to keep as nearly constant as possible throughout two runs of four hours each, with loads approximating 7000 and 9000 kw. respectively. The results showed the steam consumption per kilowatt-hour to be 16.06 and 15.95 lb. without correction, and 15.82 and 15.42 lb. after correcting to make the actual conditions conform with those called for in the specifications. Both tests showed that the builder's guarantee had been exceeded, the figures being approximately 3½ and 6 per cent. in each case.

This paper was presented in abstract for the author by J. T. Whittlesy. The foregoing papers were presented in succession that they might be discussed together.

Written discussion was received from J. H. Lawrence, who found the results in Mr. Naphtaly's paper to vary considerably from those which he had calculated and to give the turbine a much lower heat consumption than he thinks it should be credited with. He has tried methods and used both the old and new steam tables, but has been unable to check the figures given in the table. Where the paper gives a thermal efficiency of 22.65 per cent. he finds that it should be 20.27, and he concludes his discussion with a table showing the revised results as calculated with the Marks and Davis steam tables.

Prof. J. D. Jacobus thought it would be interesting to know what gas engine men have to say about what they could do in comparison with results of these papers as to B.t.u. per kilowatt-hour.

I. E. Moultrop, referring to Mr. Varney's paper, considered it interesting to note that the steam turbine has operated satisfactorily in parallel with a large number of water power stations and given better service in regulation and maintenance than either steam engines or gas engines. He congratulated the engineers of the Pacific Gas & Electric Company on the short time in which they completed the 9000-kw. steam generating station and also on the very low kilowatt cost of this station. He hoped that the author would state briefly how this low cost was obtained. Although the water rate of the turbine was within the manufacturer's guarantee, he did not consider it very creditable for a Curtis turbine of 9000-kw. capacity. Its record with better vacuum and superheat should be improved 1¼ lb. Mr. Naphtaly's paper, he thought, contributed very valuable data on the Westinghouse double flow turbine and showed it very efficient considering the low superheat and vacuum used. He called attention to records made by certain installations, including a 3500-kw. horizontal Curtis turbine which gave a water rate of 13.62 lb. per kilowatt-hour and a 5000-kw. Curtis turbo unit in the Boston Edison Company which has done as good as 12.71 lb. He concluded from comparing results from various turbines that the impulse turbine receives more benefit from an increased pressure than the combined impulse reaction machine, which he thought curious considering that the high pressure elements are of the same type. The benefit from an increase of superheat is marked in both types, with the advantage slightly in favor of the double flow type.

George A. Orrok compared results from tests reported in the paper with other published tests and gave a table recalculating the tests on the same basis, using the new Marks and Davis steam tables. In making up

this table he used the actual test results, pounds of steam per kilowatt-hour, vacuum, superheat and steam pressure not corrected to the contract conditions. He found it simpler to compare the various machines on the basis of the British thermal units in the steam at the throttle valve and to credit the turbine with that portion of the heat turned back into the feed water system at the condenser temperature. This is what power producers are interested in and the heat units so calculated represent what they are paying for in coal.

E. D. Dreyfus discussed particularly Mr. Naphtaly's paper and commended the author for having selected modern working conditions to obtain the highest ultimate economy and for having indorsed an increase in rotative speed which obviously conduces to higher efficiencies. It appeared to him that doubling the rotative speed reduces the steam consumption 4 to 6 per cent., depending upon the size of the unit. It is sometimes indiscriminately stated that the higher the vacuum the better the over-all plant results. This, however, ignores the power consumption of the condenser auxiliaries. There is consequently a point where the improvement in the turbine performance fails to exceed the increased power demanded by the auxiliaries, and it is generally found that the most economical yearly average vacuum varies between 28 and 28.5 in., depending upon the source of water supply. While fuel economy is an important factor of the total cost of power, manifestly investments in operating expenses must also be reckoned with. He continued by analyzing the total money cost of power production in the plant and figured it at about $33.94 per kilowatt, including building, foundation, boilers, piping, conduits, oil storage and burning equipment, auxiliaries and electrical apparatus. The low total cost of a complete expansion turbine, he believes, settles the question definitely as to the advisability of introducing a combined engine-turbine unit in a new station to accomplish a small saving in fuel.

Francis Hodgkinson, who was present when the tests were made, expressed himself as of the opinion that high superheat cost so much money to obtain that it is not altogether an unmixed blessing.

Mr. Pigott criticised the papers as not giving enough data to allow interested readers to confirm the results reported and compared the advantages of engines in combination with exhaust or low pressure steam turbine installations. He considers that the additional investment is not great and is more than offset by the 8½ per cent. gain in economy.

W. H. Emmett made some comparisons between the two papers and commented on the small area of discharge at the low pressure end of the turbine described in Naphtaly's paper. The author's assumption that the engine with a better load would give higher economy he thought fallacious, and believes that the turbine should be rated at about 7500 instead of 10,000 hp. He declared that the Curtis turbine gained 16 per cent. in economy with an increase in vacuum of 1 in. and the other turbine only 3 per cent. Its efficiency, he thought, would decline with higher vacuum and higher load. He referred to records of different turbines abroad which are reputed to be better than ours, and declared that as a matter of fact turbines built by the General Electric Company, including a five-stage, 3000 kw., and a six-stage, 3000 kw., machine, have both done ¼ lb. better than the Curtis turbines built by the German manufacturer, the Actien Gesellschaft. He does not advocate superheat above 200 degrees.

Mr. Walker considered the paper important as showing the development in high speed turbines. Better design and construction, he believes, are necessary. He regarded the turbine described in Naphtaly's paper as one which should go on record as an important advance in this connection. General mechanical design has been thoroughly worked out and this is the forerunner of a large line, he believes, of high speed units.

Notes on the Value of Napier's Coefficient with Superheated Steam

BY ISAAC HARTER, JR., BAYONNE, N. J.

The paper comprises a report of a series of determinations of the value of Napier's coefficient for steam at pressures between 138 and 148 lb. gauge and for various degrees of superheat ranging from 45 to 195 degrees F. In making these tests the boiler used was fired with a chain grate stoker and fitted with a special type of superheater so designed as to secure conveniently various amounts of heating surface with practically constant superheat for each arrangement at a given boiler capacity. Each test lasted five hours and followed a preliminary run of four to five hours. A special feed line was used and care taken to inspect all parts of the boiler before and after each test to eliminate all chance of leakage. The feed water was carefully regulated and was measured in two tanks. The diaphragm containing the orifice was placed a short distance beyond the superheater outlet, and immediately below the diaphragm a thermometer well and connection for a pressure gauge were placed. Both of these instruments were specially calibrated. The outlet beyond the diaphragm consisted of a fixed length of piping, and pressure readings taken just beyond the diaphragm gave pressures which were entirely negligible with respect to those on the high side of the diaphragm as far as any effect they might have upon altering the steam discharged. The orifice used in all the tests was formed in a ½-in. plate with edges rounded to a ¼-in. radius, the contracted diameter being 1.2 in. The results showed that with increased superheat the value of the coefficient and the volume flowing at constant pressure increased, but the weight of steam flowing at constant pressure decreased.

A discussion submitted by H. E. Longwell stated that it would be interesting to learn how the equation

$$W = \frac{Pa}{70}$$

came so universally to be ascribed to Napier, for he believes this equation for the relationship between the weight and pressure of steam escaping from an orifice originated with Professor Rankine. He regretted that the author had not included in his paper the actual logs of the test. That the coefficient for the equation calculated by the author differed from the commonly accepted one, he considered, was probably due to an unhappy selection of the form of orifice employed, for it has been found that any difference from the form of theoretical maximum efficiency can affect the rate of flow as much as 11 per cent. Concluding, he hoped that the author might obtain further data along the same line, using two or more different pressures, and preferably a more improved form of orifice. The data thereby obtained should constitute a substantial foundation on which to build an extension to our present knowledge of action and properties of superheated steam.

Another written discussion read by the secretary was from Prof. R. C. H. Heck, who compared the experimental results given in the paper with the theoretical values of Napier's divisor deduced for the ideal truly adiabatic steam jet. His discussion gave curves graphically comparing these values and his calculations of the points on the curves. The steam quantities in these calculations were taken from an as yet unpublished table of the properties of steam, which differs from the Marks and Davis tables by amounts lying within the region of experimental indeterminateness. The two curves he gave agreed well in form and indicated a coefficient of discharge of 0.97 to 0.98. In this connection he thought it well to show how the coefficient of discharge works out for another set of flow experiments, those of Rateau, which he showed to be 1.02. If this be taken as a normal coefficient and compared with 0.975 in the present experiments, it appears that there is a total contraction effect of about 5 per cent. in the author's orifice.

In his closure the author explained that the readings were taken in connection with another test and that the orifice was accidentally not of a standard form, for which he was sorry. This concluded the Wednesday afternoon session.

REUNION AND BALL

As explained in the introduction to this report, the social reunion, which ordinarily takes place on Tuesday evening, was deferred to Wednesday evening, its place being taken by the president's reception, which ordinarily occurs on Thursday evening, and the dance followed the social reunion Wednesday evening instead of the president's reception, as heretofore. This was held at the Hotel Astor, in the grand ballroom, where those who did not wish to participate in the dancing might visit together and watch those who did. During the evening a collation was served.

FOURTH SESSION

Thursday morning the professional sessions were resumed in the auditorium of the Engineering Societies' Building to consider a group of miscellaneous papers, the first of which was

A New Theory of Belt Driving

BY SELBY HAAR, SCHENECTADY, N. Y.

While investigating the subject of belt efficiency the author deduced a theory for the transmission of power by leather belting very different from the one generally accepted, and the paper presents this theory and a study of the losses occurring in a belt while under load so that its efficiency may be determined. When a belt stretched over a pair of pulleys is at rest the tension on both sides is the same, but when the pulleys are in motion and power is transmitted the tension in the tight side increases while that in the slack side decreases, their difference furnishing a measure of the power transmitted, and this tension is varied by using different kinds of pulleys and by the action of centrifugal force. Some empirical constants published by C. Otto Gehrckens which he derived from experience show that the allowable effective pull increases with the speed and at a constant speed the load increases with the diameter of the pulley. Professor Kammerer of Charlottenberg confirmed this by a series of over 1000 tests on belt transmission and arrived at the following conclusions which form the basis of the new theory: The maximum allowable tension in a belt apparently increases with the speed; the coefficient of friction also increases with the speed and reaches values far above those usually assumed; the maximum efficiency of transmission is not limited by the speed; the coefficient of friction is larger for large pulleys than for small ones and for a wooden one than an iron one when new; more efficient transmission is secured when the small pulley drives, and this can be improved by a properly placed idler. The various apparatus used by different experimenters and the methods of testing employed are described. The author develops a method for calculating the efficiency of a belt and works out an illustrative example. For the purpose of comparison data from several tests are included. In conclusion, the author states that the maximum allowable tension in a belt is not constant and neither is the belt velocity, although the pulleys revolve at a constant speed. Very high belt efficiencies can be secured and, while these are as a high as a good gear transmission, the overall efficiency is considerably reduced by the larger amount of power consumed in overcoming bearing friction, which shows that improvements should be made in the bearings.

George M. Van Buren, looking at the subject from a commercial standpoint, concluded that the best belt drives are those which are best investments. It appears to him that the mean between the German high speeds and our own moderate speeds would represent the best practice. He is in favor of decreasing the slack side tension and increasing the arc of contact, thereby decreasing the total belt tension. The slack side tension, he considers, can be best maintained by idlers. It is perfectly possible to make safe pulleys for high speeds, to substantiate which he cited a 48-in. iron hub and spoke wood rim pulley tested up to nearly 5½ miles per minute peripheral speed without bursting.

R. G. Reist found some conclusions in the paper very interesting. Anything that will lead to the reduction in the size of belts will be welcome. Large belts, he declared, are very unwieldy, and his experience is that low speed belts are in more demand than high. He took issue with one of the previous speakers that the electrical companies are not interested in belting. Carefully designed belt drives are much more important than they were a few years ago.

This paper was discussed in writing by A. F. Nagle. He considered the definite establishment of the relation of the diameter of the pulley to the belt power transmitted to be of great interest and value. Hitherto it has been a matter for the judgment of the engineer to make some allowance for the size of pulley. Accompanying his discussion were diagrams plotted to show various relations between power transmitted, belt pull, speed, &c., as taken from older rules, the study of which show them all to be inapplicable to small pulleys, but that approaching 20 in. in diameter they do not vary much, although from 40 in. to 80 in. and upward deviations become apparent again. It is declared by one engine builder that a single belt will safely transmit power according to the common rule of 600 ft. in. per horsepower-hour, and that a double belt will transmit 50 per cent. more. If the load does not exceed 60 per cent. of the capacities enumerated in a table given, the life of the belt will be greatly prolonged and care required to keep it in good running order reduced to a minimum. It is considered good practice by engineers to keep the service required of belts within the figures in this table, using them as maximum for overloads. The discusser considered that this advice is still well within the results of these new discoveries.

Harrington Emerson dissented with the conclusions in the paper in a number of respects. Slip, he maintained, is what causes wear; the less the slip the greater the power transmitted and the less the wear. He did not favor attempting to transmit as much power as that given by the paper as a minimum.

F. W. Taylor deplored the lack of conclusions or anything to indicate what has been brought out that is new. He told of trouble with belts running at 5000 to 6000 ft. per minute by taking advice given in a paper by Wilfred Lewis on tests he had made. Economy and all around operation, not transmission efficiency, is the important consideration. Practical conditions, and not experimental ones, should govern design. The loss of continuous operation of a shop or the stoppage of manufacture is the chief thing to avoid. He protested emphatically against the suggestion at the end of the paper of using belt speeds of 11,000 ft. per minute, and advised never running over between 4000 and 5000 ft. per minute.

Prof. T. M. Phetteplace was inclined to contradict the disparagement of the value of theoretical investigation, but acknowledged that the greatest convenience at least cost are the important considerations. He would like to see belt experiments carried out for long periods on different kinds of bearings to determine the results. It would seem that speed should not be increased much. The coefficient of friction can be increased by cork inserts and experiments on their effect in the continued operation of belts would be interesting. If a belt when too loose will slip and when too tight will fail, then it appears tension is a ready measure of what should be used. He mentioned a plant which has been running 10 years where they are well pleased with the use of binder pulleys and would like to see results of experiments on the use of such pulleys.

George I. Rockwood commended Mr. Taylor in the criticisms he had made of the paper and his statement on allowable speeds. Large belts, however, he said, can be run at 5000 ft. and have been so running for 30 to 40 years.

William Kent wanted details of the figures given in the paper before it goes into the society's transactions. He stated that 25,000 ft. per minute has been the highest speed on record, and he wants to know how 74,000 to 98,000 ft. could have been attained without bursting the pulleys unless they were made from forged vanadium steel.

In his closure the author admitted that the figures of foreign results which he had mentioned he could not guarantee were correct, but he gave references where they were found in print.

A Graphical Method for Calculating Stresses in a Connecting Rod

BY WINSLOW H. HERSCHEL, NEW YORK.

Connecting rod stresses are usually calculated by empirical formulæ, which, while sufficiently accurate for slow engines where the inertia may be neglected, are of questionable value at high speeds. The majority of the analytical formulæ are also unsatisfactory because they are based upon assumptions which, in the opinion of the author, are incorrect. After a discussion of the usual assumptions made in applying these formulæ with reference to how they may be avoided, three numerical examples of the application of the author's new method are given. This is a graphic one and is applicable for finding the stress at any point in a rod of any shape. The process of determining the inertia forces at any particular point is simplified by using a diagram calculated from exact formulæ. The bending moment due to inertia is calculated from the usual polygon of forces, and there are two additional moments, one equal to the static weight and the other equal to the axial thrust multiplied by the sum of the deflection and assumed eccentricity of loading. Mohr's method is employed for determining the deflection and the amount of eccentricity assumed is in accordance with the conclusions of Moncriess. The results obtained from the numerical examples show that in a simple shaft of uniform stress the maximum bending moment and maximum diameter will be less than 0.6 the length of the rod from the cross head end, and the maximum bending moment at any point will occur at about 38 per cent. stroke. The results show stresses much greater than those given by the usual formulæ, and this is to be accounted for principally because the bending moment due to the axial pressure is considered.

This paper was presented by the author, who stated that he was induced to devise this method because he found no rules for finding the stress at any point in a connecting rod and that he had founded it mainly on Mohr's method for determining deflection.

A written discussion on this paper was read by Secretary Rice from L. L. Willard, who declared the paper interesting for its graphical method of finding stresses in a connecting rod and its reference to many former methods. What is more valuable to engine designers, however, is a method of calculating which can be applied with little labor With keen competition such as has been experienced in the last few years, the engineering departments of manufacturers are seldom given time to investigate many subjects which without doubt are interesting but not considered necessary. Builders of steam or gas engines must standardize their parts as far as possible to reduce the cost of manufacture. They are therefore led to make certain parts stronger and heavier than might be otherwise necessary, so that they can cover a range of sizes. While the methods offered in the paper eliminate some of the usual assumptions in calculations, others are necessary, so that it still requires judgment in the selection of certain values about which no more is known than that covered by the usual factor of safety allowed taking care of inaccuracies and making diagrams, calculations and minor assumptions. The graphical method the author had proposed is much more complicated and the chances of error are thereby increased, requiring much more labor than usual. Therefore the discusser concluded that the results given seem to be no better for practical use than the shorter method.

Prof. Gaetano Lanza took exception to the statement that no analytical method can be used. Locomotive builders will figure stresses in rods if told where to figure them. The graphical method, he said, is interesting, but he failed to see where it is simple and believes it foolish to consider flexure of the rod as a column

In his closure the author stated that he failed to find any simple analytical method. He thinks that the taper of a rod changes the point where the greatest stress comes, and that it may be at other than midway of its length.

Operating Conditions of Passenger Elevators

BY R. P. BOLTON, NEW YORK.

The paper is concerned with the principles that affect and limit the service of passenger elevators. The operation of a passenger elevator is unlike that of reciprocating mechanisms, as the time during which it is in actual motion is only part of the total time of its service. The time of service may be divided into two divisions, passenger movement and machine motion. The first is that which is consumed when the car is not in motion but is awaiting the movement of passengers, and it has a close relation to the number of passengers carried. From observation the author has determined that this average is 15 sec. per passenger per trip. The machine time is divided into three main parts —acceleration, travel and retardation. The first and last are more important than high running speed and the electric traction elevator is superior on these points. The effect of counterbalancing is discussed and it is suggested that observations of passenger traffic be made in order that the proportion may be determined. Records of observations are given showing the flow and distribution of elevator traffic and the effect of excessive traffic upon the traveling powers of the elevator. These test records also serve to bring out the results of an undue proportion of stops and starts, as they are plotted to correspond with the equivalent live load and serve to indicate the excessive cost in power consumption. The tests which formed the basis of these diagrams were made upon elevators of all types under widely diverse conditions, both as to the amount of traffic carried by the elevators and the length of the elevator travel.

This paper was presented in abstract by the author, who gave a number of lantern slides showing the variation in elevator traffic throughout the week day in a number of important office buildings.

Calling attention to one of the tables of the author's paper, Mr. Hollander thought it would be desirable to know the maximum load carried to know whether overbalance of the elevators could be reduced. In his closure the author stated that he would add data to his paper to show the maximum load carried on each trip.

Modern Shoe Manufacture

BY M. B. KAVEN, BEVERLY, MASS., AND J. B. HADAWAY, BEVERLY, MASS.

The earliest forms of footwear were soles of various materials fastened to the feet by thongs. These gave place after a process of evolution to the hand sewed shoes, which require 11 operations to complete them. Fifty years ago a shop making hand sewed shoes on an average employed three persons and all work was done by hand. The first important change was the introduction of the McKay sewing machine. Other developments were pegging, screw and loose nailing machines, but the paramount object, which was to produce machinery for making shoes by the hand sewed method as that gave a smoother inside finish and more flexible soles, was not attained until the Goodyear welter was placed on the market about 20 years ago. In a modern factory the power plant is located outside the main building in a one-story structure and furnishes steam for power and heat, electricity for light and pumps water for the sprinkler system. The various processes and the special machines employed are all described. The welt sewer previously mentioned is the most important of all the machines, although not the most complex, and its construction and operation are given considerable space. Employing the various machines described enables shoes to be produced which retail cheaply and excel in comfort the custom made shoes costing much more.

Mr. Hadaway, one of the authors, presented the paper and showed models of lasts and gave other details and explanations of the points brought out in the paper with regard to the manufacture of shoes.

The paper was discussed by Edwin J. Prindle, who declared that shoe machinery is interesting for its mechanisms aside from whether the engineer is interested in shoe manufacture or not. A Goodyear welt shoe requires 60 machines for its making. Interesting mechanical movements are involved and numerous adjustments for variable nature of material and different shapes of lasts. Attempts are being made to make automatic machinery to take the place of the operator in feeding the shoe to the machine.

Professor Robinson thought that it would add to the value of the paper to include the diagrams which were shown in the presentation of the paper and more concerning just what a shoe factory is and the whole mechanical engineering side of it instead of just the machinery alone.

I. E. Moultrop read a letter from R. H. Long, president of the Long Shoe Factory, a new one near Boston, in which he stated that the paper was very interesting

in describing the making of welt shoes. More attention, he affirmed, is now being paid to patterns and lasts, but he declared that no broad improvements have been made in shoe machinery in the last two years.

In his closure Mr. Hadaway took exception to this last statement, saying that $6000 to $7000 a year is spent by the United Shoe Machinery Company alone on improving machinery, and the company is looking for new ideas to give shoe manufacturers the best possible facilities. An invention is now being developed that will cut the cost of the manufacture of shoes 2 to 3 cents a pair. He submitted as supplementary to his paper, data with regard to the four-story Goodyear shoe factory referred to in his paper, giving the factory space, floor space, output capacity, equipment, layout of departments, power required to drive various machines, all of which are motor driven, number of employees, and further data in detail concerning the output of individual machines in the various departments.

FIFTH SESSION

General Section

The main session, held in the auditorium, considered three papers dealing with machine shop topics. All three papers were presented before the discussion, which was general on all of them. Abstracts of these follow:

The Field for Grinding

BY C. H. NORTON, WORCESTER, MASS.

While grinding in various forms has been known from the beginning of history, at the present day it is looked upon as a slow, expensive, but sure method of obtaining accuracy. The discovery of the polishing wheel enabled work to be done quickly, but as the term was still grinding, the conception that it was a slow process persisted. At the present time the modern grinder and grinding wheel enable all kinds of round work to be sized more cheaply than by turning and filling, and the greatest economy is secured by a combination of grinding and very rough turning, although there are cases where it is cheaper to grind direct. It is not always possible to obtain the rough turning required by true grinding economy, although it is possible to get much more out of present plants by cheaper turning if grinding is utilized. It should no longer be assumed that a grinding wheel cannot remove metal and shape work as quickly as a steel tool, but the latter should be used when it can do the work cheaper and the grinding wheel when it excels. Poor wheels, or good wheels wrongly used, will still remove metal slowly, but a modern grinding wheel used in a modern machine is a milling cutter just as truly as if made of steel and is to be regarded as a cutter with millions of teeth, which, while they may not cut so deeply, can cut more rapidly, as for example at speeds of 6000 or more surface feet per minute. Cams and crank shafts can be produced cheaper by grinding than by turning. With automatic grinders it is possible to turn out work even more rapidly. Where 300 pieces per day were ground by piece work, 2300 are now produced. As the knowledge of grinding becomes more common and the opposition on the part of workmen to increased production is overcome, the field for grinding will be still more extended.

Precision Grinding

BY W. A. VIALL, PROVIDENCE, R. I.

Grinding is an art rather than an exact mechanical operation, and its growth is so recent that relatively little is known about it or its possibilities. The author considers it an art, since it contains elements where the operator's judgment and experience count. The manufacturer can give instructions for running machines, telling the operator to use a certain wheel and speed and still results may vary; the surface of the piece may appear gouged, show wheel marks and have dull finish or be highly finished. There are two important classes of grinding, tool room or shop grinding and manufacturing grinding. The question of accurate fit does not enter into the first class of work, but is important in the second and is coupled with a high rate of production. The machine used must be able both to do the work and be operated conveniently. The latter is important, and the machine must produce true work. The principles underlying grinding are not difficult to grasp, but the work requires enough skill to class it as an art. The first use of the grinding wheel was to correct slight errors that could not be rectified by a file and emery cloth, while to-day it not only does this but also finishes work in a relatively cheap manner. After the machine has been selected, the choice of wheels requires some special knowledge which the makers can furnish. The question of speeds and feeds is the result of experience, and here again the makers will help. The wheels must be true and must not be forced into the work, as this produces a torn finish. The question of limits and sizes is first to be considered, followed by the extent to which rough turning is to be done. The practice at the Brown & Sharpe plant is to allow a variation of 0.008 to 0.012 in. in diameter and by so doing secure a finished product free from tool marks at a minimum cost. If enough pieces of one kind are to be made to make it worth while to specialize to a higher degree than is possible in ordinary work, better results can be secured. The general rule of having one man to two machines is reversed, as the best results are obtained with two men to a machine, one to operate and one to assist in mounting the work.

Modern Grinding Methods

BY B. M. W. HANSON, HARTFORD, CONN.

Grinding is the oldest known means of shaping material. The grinding machine of to-day is of comparatively recent origin. Grinding machines resembling modern types were first made in England but have been most developed in America. The invention of emery wheels made it possible to make fairly rapid progress with grinding processes. At first very little work was ground which could be machined and filed, but after a while it was discovered that unhardened pieces could be machined and finished more accurately and cheaply by grinding than by finished turning and filing. Within the last few years great improvements have been made not only in the cutting quality of the wheels but in the design of the machines themselves. At the present time grinding machinery has become a formidable competitor of the lathe and milling machine and seems to be quite up to the cutting capacity of the wheels. The designers of grinding machinery have had many problems to solve as different materials require different speeds and on the modern machine there must be various speeds for the grinding member as well as for the traverse movement of the work and for the revolution of the work in the case of the cylindrical grinder. Two large groups of grinding machines are now used: those for cylindrical grinding and those for grinding flat surfaces. The former are well known and have been highly developed, while the latter is best known as the planer type of machine with a wheel grinding on its periphery and fed across the surface. Another type is the vertical surface grinder with a cup-shaped wheel working in much the same manner as an end mill on a vertical milling machine. To eliminate the necessity for readjustment due to the wear of the reducing member two devices have been designed to control the size of the work. When the work has reached the desired size, the machine will automatically throw out the feed and new pieces can be put in. It is possible for an operator to manipulate more than one of these machines and less skill is required to get uniformity of size. In this design the size of the work is controlled by contact with the work itself, which is the preferable way. Another recent device is the back rest, which automatically is kept in contact with the work and supports it as rigidly as possible throughout its length. The construction of both of these devices is described at length. For flat grinding the cup-shaped wheel has taken the foremost place although this would not have been possible had it not been for the advancement in wheel making. It is difficult to make an exact rule as to what the feeds for different material should be, but the operator can determine this by running the machine a few minutes, as wheels supposed to be made to the same specifications vary considerably, and consequently the feed has to be regulated not only to suit the material being ground but also the cutting ability of the wheel. The author believes that at the present time grinding machinery is fully developed to the cutting capacity of the wheels, and there will probably not be any essential changes until the grinding wheels have reached a higher development.

This paper was read almost in full by the author. W. L. Bryant, who opened the discussion on all three papers, said that in his opinion they are of great interest and the authors have given information and data of value to manufacturers employing grinding machinery. Grinding is an economical process and the economy is not only in the saving in the labor cost, but also in the saving in the work of assembling ground parts.

A. L. De Leeuw read a written discussion in which he characterized the papers very opportune, since of all machine tools none is less known and understood than the grinder. Literature and pamphlets by makers of grinding wheels and grinding machinery give some definite information on this subject, but from the purely scientific standpoint nothing really good has yet

been written. The main reason for this is that no extensive experiments have been made except by the makers of wheels and grinders, and they regard their results as valuable private property. Present knowledge of all other machine tools has been gradually collected from an immense amount of experience and a few experiments, and the grinder is still so young that little definite knowledge exists with regard to it. The shape and hardness of the steel lathe tool can be determined relatively simply and the way in which it is held is very definite and obvious to the eye. The tool used on the grinder, on the other hand, is very complex, consisting of millions of little grains of various sizes, which are held in a binder of unknown quality, consequently the tool is one of which only the average qualities are known. While all literature upon grinding wheels emphasizes the great care that should be taken in selecting a wheel. While each particular kind of work and finish calls for a different kind of wheel, no final recommendations that a certain wheel is on the average the best for such and such material have been made. Great stress has been laid on the necessity of the proper relation between the speed of the wheel and the speed of the work. The writer's experience has been that every mechanic has his own rule for the speed of the work. It is impossible to run at the proper speed where a machine has only two speeds, and the size of the wheels varies from 18 down to 10 in. Great stress has also been laid on proper relation between the width of wheel and the width of feed, but at present the traverse of the table is not made a function of the number of revolutions of the work. Grinders are one of the greatest factors of economy. The grinder is not taking work away from the lathe, but rather in former years the lathe has done work which the grinder should have done. It is rather remarkable that the vertical surface grinder lagged behind so long and the men who have developed this type to its present efficiency are entitled to much credit. As regards the comparative performances of a vertical grinder and a milling machine for certain classes of work, the writer stated that frail work with relatively little material to remove, and where nothing but a flat surface is to be produced, is an ideal job for the vertical grinder, and, on the other hand, that stocky work with much metal to be removed is better adapted to the milling machine. In the case of flat irons, which Mr. Hanson called attention to as being especially suitable for grinding, Mr. De Leeuw cited an instance where they were turned out at the rate of 150 per hour on the milling machine, with a slightly coarser finish than that obtained on the grinder, and at the rate of 105 per hour with a finish of the same kind as that given by the grinding machine.

The secretary read a written discussion from H. A. Richmond, which gave as the writer's experience that only the builders of grinding machinery well understand the selection of the right kind of wheels, and some of them treat it as of little importance. The sending out of machines equipped with wheels wholly unadapted for the work which they are expected to grind has sometimes resulted in the rejection of the machine, where the builder could have supplied wheels which would have given satisfaction. He cited an instance where a disk wheel surface grinder was unable to grind small high speed steel pieces flat with the wheel that was supplied, but when another was furnished the pieces were ground perfectly flat. It is proper to class grinding as an art. In selecting wheels the abrasive material and its hardness and coarseness are to be considered. Even the experienced wheelmaker can hardly give more than general recommendations in his catalogues, as conditions vary essentially in every plant, but each plant can readily select wheels adapted to its own requirements if the principles of selection are understood and appoint an expert for this work; the question of speeds and feeds can be left to the foreman or operator.

L. C. Higgins read a contributed discussion from G. N. Jeppson, which appreciated the vast amount of useful information given in the papers. They have shown clearly that the modern surface grinder and cylindrical grinding machine must be seriously considered by the production engineer. Great progress has been made in the materials used in grinding wheels until they have become highly developed cutting tools. At present the wheel is not used to its cutting capacity because few grinding machines are correctly and scientifically designed. The conditions under which the work is done also has some influence on the grinding wheels. The problem of the wheel maker is not only to find the proper size of cutting grains and strength with which they must be bonded together for grinding a particular metal, but the additional strength of bond necessary to withstand vibrations brought about by mechanical defects in the design of the machine upon which the wheel is mounted. In reading Mr. Hanson's paper the writer wondered whether he has ever considered the surface grinder of the planer type using wide wheels with rapid speeds and a greater depth of cut. Grinding by the cylinder system will always produce hair-like chips, as the depth of the cut is infinitely small on a broad surface, while grinding on the periphery of a wheel on the same metal will give a larger chip, since it is possible to get a greater depth of cut. A machine of the planer type can be constructed which will consume less power and be more efficient in wheels and do faster work than any surface grinding machine yet devised, and until this has been done the abrasive wheel will not be brought to its full efficiency on this kind of grinding.

Henry Hess took issue with Mr. De Leeuw, saying that he thought the latter did better with the grinding machine than his discussion would indicate. The grinding wheel has advanced farther than any other machine tool, considering the time devoted to its development. Concerning the adaptability of the grinding wheel, he cited instances where the lines of work handled were very diverse, as, for example, mining machinery and agricultural implements, which are satisfactorily handled by the grinding wheel, the finished products being within very narrow limits. At the speaker's plant work is regularly being ground to within a limit of 0.002 in. In his opinion the maximum output of any tool, regardless of what it might be, can be obtained only after some experience has been had in running it, and not from any directions from the manufacturer.

H. M. Leland said that grinding was a very dear subject to him, as he was in charge of the department at the Brown & Sharpe plant, in which the first grinder was used. In his opinion grinding has done more for the industrial development of the country than any other machine tool. While formerly tools after being accurately made would be spoiled by the heat used in tempering, it is now possible to eliminate this trouble by grinding them after they are hardened.

Oberlin Smith, the next speaker, said that the question of avoiding dogging should not be taken into account. As a substitute for dogging and turning the work he recommended the use of a square center at one end. This is not possible in a lathe, but is in a grinder, and when used the grinding can be carried on in one direction instead of from either end and turning the pieces.

J. W. Cole stated that one reason why grinding had not been more generally adopted was because when it was first introduced the mechanics expected too much reduction at one stroke. Heavy cuts heated and sprung the work and the wheels capable of taking heavy cuts were not economical.

C. H. Norton in his closing remarks stated that the object of his paper was not to tell how grinding should be done, but to arouse interest. At present the difficulty is to get people to listen to what the manufacturers of grinding machinery have to say.

Nobody knows all about grinding, and the manufacturers are after the engineer to come along and describe the process, as they themselves have no time. It is a mistake to suppose that a coarse wheel will cut a coarse surface. A coarse wheel with a hard bond will produce a mirror finish on chilled steel rolls. The difficulties mentioned by Mr. Hanson in his paper as to the wearing away of the grinder, making the work difficult, is, in his opinion, only relative. The cup wheel is ideal for certain things where it is difficult to hold the piece in position. The speed of the grinding wheel is not as important as was formerly thought, since certain materials work best with certain speeds, and the only essential is that the speed be kept constant within reasonable limits. An ordinary operator can become sufficiently skilled, in his opinion, in a few days to get the proper speed for rapidly turning out work. A large number of different wheels would have to be carried in stock to meet the whims of certain foremen who would use only that particular grade of wheel, even though some other would do the work just as well. In regard to the use of square centers, mentioned by Mr. Smith, he believes that accurate work could not be produced in this way.

W. A. Viall, in closing, agreed with Mr. Norton as to the reason the papers were gotten out. So little is known regarding grinding that the manufacturer has to work along profiting by experience. Grinding is used chiefly because of its economy. Regarding the limits of accuracy given in his paper, he said that these were for lathe work, and that the limit for grinding varied from 0.001 to 0.00025 in.

Gas Power Section

The Gas Power Section convened on the sixth floor of the Engineering Societies Building in the afternoon, with the chairman, J. R. Bibbins, presiding. In a splendid address he reviewed what has been accomplished by the section in the year just ended and indicated something also of the forces which are at present retarding the development of gas power work. He gave some glimpses of the future in this field and outlined the position which gas power is destined to take in engineering economies. He also brought out the importance of co-operative research, and laid down some lines on which the work at the section might be prosecuted in the future with advantage. Reports of various committees were then presented in abstract by Secretary George A. Orrok, including the Membership Committee, Meetings Committee, Literature Committee and Gas Power Installations Committee. For the Gas Power Operations Committee a brief report was presented verbally by I. E. Moultrop. The report of the Committee on the Election of Officers declared the election of Prof. R. H. Fernald as chairman and George A. Orrok as secretary for the ensuing year. The consideration of the meeting was then given to the papers which had been prepared.

First Large Gas Engine Installation in American Steel Work

BY E. P. COLEMAN, BUFFALO, N. Y.

As is well known, the gas engine installation in the Lackawanna Steel Works, Buffalo, N. Y., was the first of considerable size in this country. It was made at a time when many of the features of design and operation which have now been worked out were not available, and it, therefore, does not represent modern practice. However, when considered from the standpoint of continuity and reliability of service the operation must be considered successful, and the economy of heat consumption is considerably in excess of that usual with compound steam engines. Parts which are now acknowledged to be open to criticism are the gas cleaning and distributing apparatus. The distribution of water in the cooling towers is also admitted to be defective and the flows are counter current only in alternate towers. The gas washing stands are less efficient than cleaners and require a greater amount of power than approved rotary scrubbers of more recent design. The mains of the three pairs of furnaces are not interconnected, and the cleaned gases from the several washeries do not meet in a common mixing main. The normal blast pressure may be taken as 16 pounds gauge. The blowing engine having but one blowing cylinder could not conveniently be equipped with unloading devices, and the powering of the engine is, therefore, necessarily excessive, the units being required to operate against a maximum pressure of 30 pounds. The work required to drive the air and gas pumps amounts to 20 per cent. or more of the indicated power, entailing a net mechanical efficiency which is unsatisfactory. Efficiency trials were made upon a blowing engine already arranged for piping. This engine was equipped with a motor piston having but three instead of five packing rings. The 1000-hp. unit upon which the other trials were made was equipped with five rings at each end of the piston. The compression of the 1000-hp. engine was greater than that of the blowing engine, and the various efficiencies indicated are somewhat higher in the case of the smaller engine. An increase of compression to 180 pounds would possibly produce some increase in efficiency. The lowering of the efficiency is principally due to pump work amounting to 20 per cent. of the motor power or more, and incomplete combustion amounting to 30 per cent. or more of the total heat supplied. In the efficiency trials of the engines the gas was measured by a Venturi meter. The efficiency of the meter was assumed to be unity, and no corrections were made for dirt and moisture undoubtedly present. The heating value of the gas was calculated from volume analysis obtained with Orsat apparatus, the high value being used. In the analysis of the exhaust gases Orsat results were corrected by means of a correction chart plotted from the data of Dennis and Edgar, given in the *Journal of the American Chemical Society.*

The paper was presented for the author by E. E Kiger, who had been associated with him in the making of the tests described. He referred briefly to the manner in which the data was taken and some of the conditions which were not altogether satisfactory.

Written discussion on this paper was submitted by George D. Conlee, who for two years worked under Mr. Coleman. He spoke from knowledge of how carefully the tests were made, and what a great amount of work was represented in the paper, and declared that the tests were possible only because of the experimental work done by Mr. Coleman in the use of Venturi tubes for the measurement of the flow of gases, the theory and results of which work were embodied in a paper presented before the society, entitled "The Flow of Fluids in a Venturi Tube." He further commented on the negative loop shown on the motor cylinder cards in the paper, analyzing its significance and probable cause which he attributed to the layout of the exhaust piping and the introduction of the water for cooling the exhaust. This sort of pressure diagram was obtained from all of the 2000-hp. blowing engines, while the 1000-hp. higher speed engines did not show the negative loop. In conclusion he stated that considering the condition of gas as received by the engines and the requirements of the service it is surprising that the engines have run so well. There have been times when a blowing engine has run as high as 75 days without stop.

Joseph Morgan regarded the paper as most valuable in the facts and experience it related. In his opinion, gas engines are now in fashion, and he believes that if all conditions should be studied it would be found that in many cases gas engine installations have been carried too far. Steel works which are located in regions where coal is cheap, he declared, have no need of gas power. Few plants, he believes, have a power factor of 50, and good steam turbine power plants can be built for about $55 a horsepower, where gas engine installations have cost $96 a horsepower. In the Cambria Steel Company, with which the speaker is connected, the power factor is about 45, so that a gas engine plant as large as would be necessary would be handicapped at the start in fixed charges, more than offsetting the difference in fuel cost with the two types as prime mover. Relative repairs cost more for gas engines and their life cannot be any greater and, perhaps, not as great as that of steam turbines.

Written discussion received from Louis Doelling, vice-president of the De La Vergne Machine Company, declared the paper to be the most comprehensive that has been presented on the subject. Since the plant was not only the first of its size and kind which had

ever been constructed, but was composed of engines which were themselves the first units to be built from an original and untried design, he considers that although the results are not entirely favorable to the engine, there is still reason to be proud of their work, while some of the difficulties he acknowledged were due to errors in design, he feels that a good many are due to the gas not being suitable for gas engine consumption, since it contains from 50 to 80 mg. of dust per cubic meter. The conditions were even worse four years ago, when the dust content often rose to 200 mg. A good modern gas cleaning plant is expected to deliver gas containing not over 20 mg. The early history of this plant was also marked by great instability of the chemical composition of the gas itself; a sudden rise in the hydrogen content was of common occurrence. This was bound to result in frequent pre-ignitions, and a large proportion of excessive wear and short life of the working parts was clearly due to these and the dirty gas. Defects in design have since been corrected and engines of the Koerting type which have been running for five years on clean gas have been found to show wear of less than 0.035 in. The most serious defect referred to in the paper, the high gas consumption, he accredited to the excessive load imposed on the engine by the gas and air pumps and that a very considerable quantity of gas escapes from the cylinder unburned. In later designs the consumption of power by the gas and air pumps has been greatly reduced by using automatic poppet valves, and the lead of the pump crank has also been decreased so the maximum pressure in the pumps is from 10 to 4 lb. He gave further ways in which in the present installation the escape of unburned gases to the exhaust pipe may be avoided. Some of the latest Koerting engines constructed have a heat consumption of not over 10,000 B.t.u. per brake-horsepower-hour. The discussion concluded with further records of improvements which have been made in engines more recently constructed here and abroad and accounts of their performance.

William A. Bole referred to the installation of four gas engines in the Edgar Thompson Steel Works, at Pittsburgh, which is now four years old, and contrasted some of the constructional features of these engines with those described in the paper, particularly that of the cylinder. He declared himself opposed to single piece cylinders, and indorsed the Westinghouse cylinder construction for its provision for expansion. Long pistons, he declared, are bad from lubricating considerations, and criticised the method of lubrication used at the Lackawanna plant. Referring to the general notes relating to operation given in the paper, he was surprised at the extent of the wear on the piston cylinder and piston rod, believing that the lifetime of the rod should be about the same as that for steam engines.

Secretary Orrok thought that the author should have shown more of the plant. He explained that the dust carried over with the gases is very considerable on account of slips in the furnaces, and that under the circumstances the engines have done remarkably well. Nine-tenths of the trouble, he believes, can be laid to the location of the engines.

E. A. Uehling, who has visited the plant, confirmed these observations. He thought another mistake was making such a large installation at once. With boilers it would or should be necessary to clean the gas just as much as it is necessary for the gas engine.

C. W. Baker stated that he knew in a general way that gas engine installation is being carried nearly to the limit in Germany.

E. D. Dreyfus, who has had a chance to compare cost of steam and gas installations, thought that they might be in the ratio of 1¾ to 1, or even 2 to 1, but hardly as high as 4 to 1, as Mr. Morgan had said. He had seen dust plentiful, but doing no harm.

In closing the discussion Mr. Kiger explained that there is lots of dust in the gas, but that conditions are now being improved in this direction; considerable dust goes over from the furnaces, which is not all taken out by the washers. In answer to a request he gave a little sketch of the by-pass governor, which returns part of the gas into the supply pipe of the gas pump.

Notes on a Heavy Duty Gas Producer

BY NISBET LATTA, MILWAUKEE, WIS.

In this paper the author calls attention to the recent development of the heavy duty gas engine and the fact that the gas producer has not been developed of proper size and type to accompany these large units. The paper outlined recent experiments on the use of pulverized coal injected with air in a proportion required to burn the carbon to carbon monoxide. The tests are not yet conclusive in their nature but tend to show the possibilities for the development of a heavy duty gas producer of this type.

W. B. Chapman had seen the producer in operation and was very much impressed with it. It can be built cheaply and generates an immense amount of gas for the space occupied, and generates it very rapidly. Possibly it is the producer of the future. Mechanical stoking must be developed, and then it should be possible to produce a uniform gas. He suggested making the producer in two parts, dividing it horizontally, with the upper part revolving, which will, he believes, prevent blow holes and insure uniform action of the fuel bed. Thus he thinks that large heavy duty producers can be made which will not have to be stoked by hand and will overcome all of the present operating difficulties. The hottest part of the fuel bed will be where the shearing takes place.

W. E. Winship thought that the producer described was of very low efficiency, considering the high thermal value of the fuel and the low thermal value of the gas produced.

The newly elected chairman, Prof. Fernald was then conducted to the chair, and in a few words of appreciation at his election to the office stated that in the next year's work he hoped that good use might be made of the very good ideas left by the retiring chairman in his address.

THURSDAY EVENING LECTURE

This year the customary evening lecture was given under the combined auspices of the National Society for the Promotion of Industrial Education, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers and the American Institute of Mining Engineers. The title of the lecture was "The Industrial Continuation Schools of Munich," and was delivered by Dr. Georg Kerschensteiner, the superintendent of schools, and was illustrated by lantern slides. The need of some school to carry on the educational work where it was left off by the elementary schools was made apparent by the fact that prior to 1877 half a million children left the elementary schools of Germany each year. Although there were continuation schools in Germany prior to this time and the first schools were established in Munich, the development has been the greatest in that city. Two classes of schools were established, the first was a general school, where attendance of 5 to 8 hr. a week was compulsory for all boys between the ages of 13 and 16. In this school no regard was paid to the particular trade which they followed, and the instruction comprised general subjects, such as reading, writing and arithmetic. In the second class of schools, which were designed for the journeymen, the subjects taught included drawing, painting, &c., and no attention was paid to commercial training. In this school the attendance was voluntary.

From this condition of affairs the voluntary continuation schools had pupils, while the compulsory had none. This state of affairs continued until the last decade of the nineteenth century, when the general continuation schools were replaced by trade continuation schools. These gave instructions to apprentices in the evenings, and an effort was made to focus in-

terest on the student's trade. At first the bond of union between the school and the shop was lacking, as the boy was trained in the trade, but no emphasis was laid on practical work. As a first step to connect the so-called craft school with the continuation schools the work was made prominent and the boys soon came to appreciate the other subjects taught. After securing the interest of the students the interest of the employers was next solicited and was obtained as soon as they saw the pupils of the schools taking more interest in their work. These employers inspect the schools, make suggestions as to the selection of teachers and the amount of time to be devoted to the studies, supply models, and cause the apprentices to attend the schools.

The schedule of work done at these schools calls for from 8 to 10 hr. per week, which usually consists of two afternoons of 5 hr. each, or its equivalent, no Sunday or evening work being done. Special classes for further work and for gymnastics also form a part of the school. Other features are short courses for workmen temporarily unemployed, and the dull seasons are also utilized for giving instruction. The organization of the continuation schools is the result of an understanding between representatives of the various trades and the school authorities, and the apprentices must attend during the period of their apprenticeship, or in any event until they have reached their eighteenth birthday. As a result of these schools, individual selfishness is decreasing and the growth of a common interest is noticeable among apprentices and employers. In these schools the teacher is a foreman endeavoring to develop the ability of the students and the customary educational red tape and the visits of the attendance officer have disappeared.

The main object of the school is to teach that the meaning of life is not to rule, but to render service, and the pupils are taught to seek opportunities to do something for fellow students and for the country. At the present time there are 12 local continuation schools for boys, who are either employed in unskilled labor or in special trades, which have not enough apprentices to make it economical to have a special school. These schools are housed in private buildings, not entirely for continuation school purposes, while the trade continuation schools have their own special buildings. During the past year 9400 apprentices between the ages of 14 and 18 and 2700 journeymen were enrolled as pupils in the various continuation schools out of a total population of 600,000.

In addition to the local and trade continuation schools there are special engineering schools which are open to all journeymen in the engineering trades. A course here is four years and instruction is given nine hours a week for 40 weeks throughout the year. Extra work can be taken in optional continuation schools holding their sessions in the evenings. During the past year between 500 and 600 apprentices were enrolled in the 24 classes of day schools. In these schools the course includes practical work in the shops for two or three hours per week, and before this is done the patterns for the work are drawn, and when the work is finished its value is computed. The instructors are either workmen or trained teachers from the public school system, but in the workshop all the instructors are journeymen at the particular trade.

The girls are also taken care of by continuation schools, where they are taught cooking, sewing, &c. In these schools the instruction is given during four hours per week, but after 1912 this will be increased to 12 hours a week. The cost for educating pupils in these various schools of Munich has been calculated to be $24 per year in the primary schools and $18 per year per pupil in the boys' continuation schools. The total cost for the various schools are, primary schools, $1,700,000 for 70,000 pupils, $300,000 for 9400 pupils in the boys' continuation schools, and $70,000 for the girls' continuation schools. Austria, South Germany and German Switzerland have continuation schools which were modeled more or less along the same lines; those of North Germany are slightly different. In conclusion, the speaker laid special emphasis on the fact that a purely theoretical continuation school—that is, one in which little or no attention is given to practical work—would not succeed.

EXCURSIONS

This year a new plan with regard to the excursions was inaugurated, that of devoting an entire day to them instead of having them alternate with the professional sessions throughout the meetings.

The New York Public Library was one of the places visited Friday morning, and was of special interest, as it is the largest library in this country, and was formed by a consolidation of the Astor, Lenox and Tilden libraries. Another one of the excursions was to the Navy Yard in Brooklyn, which has had its equipment increased until now it ranks as one of the largest, if not the largest, yard on the Atlantic Coast.

The Hudson and Manhattan Power House, which is the generating plant for the Hudson River tubes, known as the McAdoo system, was visited through the courtesy of G. McAdoo. The visitors were conducted through the power house, located in Jersey City, N. J., by the chief engineer, G. Sage. This plant contains four Curtis vertical turbines, two of 3000-kw. capacity and two of 6000-kw. capacity. The boiler plant equipment includes eight boilers in two batteries, each boiler having a rating of 900 hp. All stoking is done by hand and forced draft is applied. No. 3 Buckwheat coal is used, and burns from 12 to 17 per cent. ash. The boiler feed pumps are of the reciprocating compound type. The ventilating plant for the tunnel, the oil filtering room, switchboards, signal systems, coal bunkers, &c., were inspected.

About 25 or 30 took part in the excursion to the demonstrating plant of Nelson Goodyear, Inc., on Lorraine street, Brooklyn, N. Y., and the party was conducted by E. H. White, who upon their arrival gave a short account of the development and use of oxy-acetylene welding and cutting apparatus, following which a number of demonstrations were made and the action of the acetylene generator designed by Mr. Goodyear was described. Several novel forms of torches developed by him were also shown. A part in the interesting demonstrations was taken by André Beltzer of the General Welding Company, Hoboken, N. J., who has done signal work in connection with the welding and brazing of aluminum. He showed the use of his special flux for preventing oxidation in these processes.

One of the afternoon excursions was to the Thompson-Lovelace Aeroplane Company, at Fort George, New York City, visited by permission of Frederick Thompson. This factory is claimed to be the first of its kind in this country, and is the shop in which the aeroplanes, recently used at the Aviation Meet in Belmont Park, were rebuilt. The visitors were received by Captain Lovelace, who personally supervises the construction of his aeroplanes. He has had considerable experience as a balloonist, dirigible pilot and aviator. The machines manufactured by this company are all monoplanes, and follow the design and general appearance of the Bleriot, and therefore are known as the American Bleriot. At the present time the company has orders for 50 machines, two of which have been completed and 25 are under course of construction. One of the completed machines is of the racing type, and was made for Mr. Moisant for the trip he will attempt from Key West to Havana. The Bleriot monoplane used by the same aviator in his flight from Paris to London was inspected with considerable interest. The Lovelace aeroplanes are made in racing, flyabout, cross country and passenger carrying types.

Gnome motors and a motor designed by Captain Lovelace are used in the machines.

Among the other places visited in the afternoon was the dry dock of the John N. Robins Company, at Bay Ridge, which contained the latest examples of engineering in this line of work. The machinery of the large capacity pumping plant is all electrically driven, and there are many features of general interest to engineers. Another excursion held Friday afternoon was to the exchange of the New York Telephone Company at 15 Dey street. This exchange handles the local calls originating in the lower part of New York and a force of 210 operators are required to care for them. The toll boards for handling suburban calls and those of the long distance company were also inspected.

One all day excursion was made to the plant of the Pond Machine Tool Company, Plainfield, N. J. The party, which numbered 55, was taken to the works in a special car and after luncheon was served an opportunity was afforded to inspect the recently developed reversing motor planers, thread milling machines and car wheel lathes. The special feature of the reversing motor planers is that the control of the machine as regards the reversing of the table is entirely automatic and is accomplished by having the dogs limiting the table travel, control the direction and speed of the motor driving the planer, through a solenoid controller.

In addition to these excursions which were scheduled for Friday there were a number of others for which parties were not made up. These included the Metropolitan Building, power house of the Interborough Rapid Transit Company, which supplies current for the Subway in New York City; the publishing plant of the Hill Publishing Company, the Waterside station of the New York Edison Company, which was of special interest as being one of the very large plants with both turbine and reciprocating engines; the factory of the Simms Magneto Company, Watsessing, N. J., which is a very good example of modern factory construction; the high pressure pumping station of New York City, and the plant of the National Lead Company at Brooklyn.

November Copper Production and Stocks

The report for November of the Copper Producers' Association shows a reduction in stocks of 8,872,854 pounds during the month. This compares with a reduction of 9,531,800 pounds in October. The report is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States November 1	139,261,914
Production of marketable copper in the United States from all domestic and foreign sources during November	119,353,403
Deliveries of marketable copper during November	
For domestic consumption	60,801,992
For export	67,424,316
Total	128,226,308
Stock of marketable copper of all kinds on hand at all points in the United States December 1	130,389,069

The November production shows a decrease of 7,115,821 pounds on the output for October.

The Jacobson Machine & Mfg. Company, Warren, Pa., builder of gas and gasoline engines for agricultural, lighting and power uses, engine parts, &c., is operating all departments to capacity. The orders booked during November were double those of November, 1909. Some recent contracts include the following: Cornplanter Refining Company, Warren, Pa., one 60-hp. silent automatic engine; J. D. Biggin & Son, Sharon, Pa., one 50-hp. silent automatic; Lynndon Mirror Company, Falconer, N. Y., one 27-hp. automatic, and Goodwin Pottery Company, East Liverpool, Ohio, one 40-hp. automatic.

Steam Turbines in Iron and Steel Works *

The Curtis Type Described and Compared with the Gas Engine

BY R. C. MUIR.†

About 16 months ago, at your Buffalo meeting, we tried to show you that low pressure turbines could be installed wherever reciprocating engines of a fair size were used, at a very low initial cost per kilowatt capacity, and that electrical energy could be produced in a low pressure turbine plant at a figure far below anything attainable in any other type of plant; also that there was a large field for low pressure turbines in iron and steel mills, and that, in fact, in nearly every iron and steel mill low pressure turbines could be advantageously applied. At that time we had in operation or on order comparatively few low pressure turbines. At present we have in operation or under construction 70 low or mixed pressure turbines, aggregating a capacity of approximately 115,000 kw. Of these approximately 30 per cent. in number and capacity are for iron and steel mills. These turbines are operating satisfactorily under nearly every possible condition, and in every case have fulfilled or exceeded our expectations.

A Comparison with Gas Engine Costs

There is not only a large field for low pressure turbines in iron and steel mills, but also for high pressure turbines. Where exhaust steam is not available practically the only competitor of the high pressure steam turbine is the gas engine. The thermo-dynamic efficiency of the gas engine is somewhat higher than that of the steam turbine, although under variable loads this is not so marked as under steady loads. This gain in efficiency, however, is more than counterbalanced by the high first cost and the high cost of operation and maintenance when compared with the steam turbine. Recently we made up a careful estimate of the initial cost of a 15,000-kw. steam turbine plant and a 15,000-kw. gas engine plant. Blast furnace gas or coke oven gas was to be used for fuel. The initial cost of the gas engine plant was 75 per cent. higher than that of the steam turbine plant. Evaluating the gas at the cost of coal having an equivalent heating value, and including all fixed charges and costs of operation for each plant, we found that the cost of power produced in the gas engine plant was 65 per cent. higher at 60 per cent. load factor and 75 per cent. higher at 40 per cent. load factor than power produced in the steam turbine plant.

Advantages of the Steam Turbine

In choosing prime movers two things are always considered—economy and reliability of operation. In iron and steel mills particularly reliability comes first. At present there are several gas engine plants in which the operation is termed satisfactory. Nevertheless, the parallel operation of several large gas engine driven alternators is accompanied by heavy cross currents, "pulses" in voltage and series vibrations, and on the whole the operation is not all that can be expected. Aside from this, the gas engines are subject to serious mechanical difficulties, the mechanism is complicated and high class attendance is required.

On the other hand, the steam turbine is simple, the torque is even, the regulation close, and parallel operation is perfectly satisfactory. We, therefore, consider the steam turbine superior to the gas engine, both as regards reliability of operation and as a means of ob-

* From a paper read at the meeting of the Association of Iron and Steel Electrical Engineers, Pittsburgh, Pa., October 20, 1910.

† General Electric Company, Schenectady, N. Y.

taining electrical power economically. The steam turbine should be installed in iron and steel mills where additional power is required. If gas engines are already installed and additional power is required, steam turbines are especially desirable for the following reasons:

The regulation of gas engines is not good, and the overload capacity is low.

Due to the uniform torque, large flywheel effect and close speed regulation of the steam turbine, sudden changes of load are easily taken care of, and in connection with a gas engine plant a turbine plant would take the sudden fluctuations and greatly improve the regulation of the system. The gas engines would operate on practically steady loads, thereby greatly improving their economy and operation. A steam turbine plant in connection with a gas engine plant would practically insure the owners from expensive shutdowns.

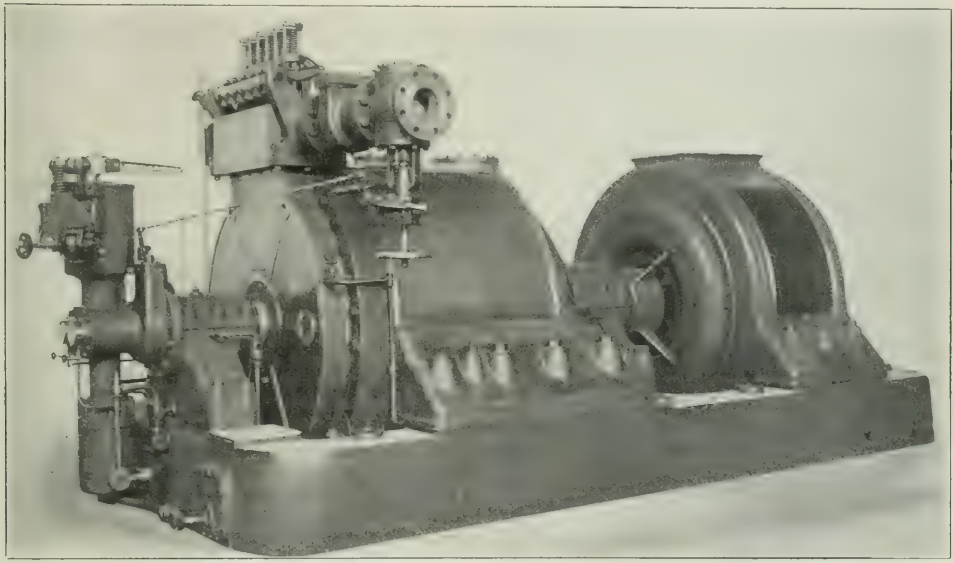
Features of the Curtis Turbine

In the development of the Curtis turbine the General Electric Company has kept three points constantly in view—ruggedness, simplicity and high steam economy. The Curtis type of turbine allows the use of a comparatively small number of rugged parts with large clearance, thereby enabling the turbine to successfully withstand quick starting, shocks caused by water carried over with steam, and long and severe continuous service.

The turbine shaft is short and heavy and is made of nickel steel. The wheels are made of open hearth steel and securely mounted on the shaft. Large heavy buckets of noncorrosive material are dovetailed and accurately spaced in the wheel rims. The wheel rim protects the buckets on the inside, and a substantial shroud ring protects them on the outside. The turbine casing is heavy and well ribbed and carries the stationary buckets. The governing action is positive, and the mechanism exceedingly simple.

The same ruggedness is characteristic of the generator. The revolving field is composed of steel-punchings assembled directly on the shaft. The field coils are strip wound, and are protected and supported on the ends by nickel steel rings. The armature frame is very rigid, and the use of timbers to prevent springing of the frame is unnecessary. The armature coils are laid back at the ends and firmly fastened to insulated rings in the armature frame, thus preventing movement in case of short circuits.

The rotating parts of the turbine and generator are connected by a solid flange coupling, half of the coupling being forged to each shaft. The rotating parts are carried by liberally designed self-aligning bearings, which in turn are supported by low stock standards. All the horizontal units for 500 to 7500 kw. capacity are built upon the same general principles. The illustration shows the appearance of all Curtis horizontal turbine generators.



A Horizontal Five-Stage Curtis Steam Turbine, 1000 Kw., 1800 Rev. per Min., 2300 Volts.

The American Steel Foundries to Make Steel Wheels

The American Steel Foundries, Chicago, is making preparations to engage extensively in the manufacture of Davis cast steel car wheels. These wheels have been tested for the past six years on the leading railroads of the country on passenger and freight cars, as well as locomotives, with very satisfactory results.

The Davis wheel is cast in a sand mold, the molds being dried at even temperature under the regulation of special pyrometers. The tread of the wheel is manganese steel, of a quality corresponding to that used in manganese frogs and crossings, while the plate and hub are soft, low carbon, open hearth steel, the entire wheel being made in one casting.

In pouring a wheel the flask is mounted on a table which revolves while the metal is poured. The first metal to enter the mold is treated with ferromanganese in its passage from the ladle to the mold. The centrifugal action of the revolving table carries this metal out to form the tread of the wheel. When sufficient steel has been poured to form the tread, the ferromanganese treatment is omitted and the remainder of the wheel is cast with soft steel. The tread and flange thus have the composition of a very hard manganese steel, the manganese disappearing from the metal about 3 in. inward from the tread. After the hub is bored the wheel is mounted in a grinder, which grinds the tread and flange to a true circle. By this process of casting the Davis wheel it possesses the strength and safety of a forged wheel, combined with the very hard tread and flange of manganese steel. It is claimed that the flange is seven to eight times as strong as the flange of the average cast iron wheel.

The Garvin No. 2-A Miller

A New Universal Machine Possessing Important and Exclusive Features

In the design of its No. 2-A universal milling machine, the Garvin Machine Company, Spring and Varick streets, New York City, has endeavored to produce a machine capable of handling a wide range of work. Among its special features are a great increase in driving power, the transmission of the feed by the most direct means and the large size of the important parts. This machine is adapted for every class of tool and fixture making, general manufacturing, and as a special tool for the production of certain parts, such as fluted shafts, spiral and bevel gears and twist drills with a constant angle. Fig. 1 is a general view of the miller, Fig. 2 shows how it is possible to swivel

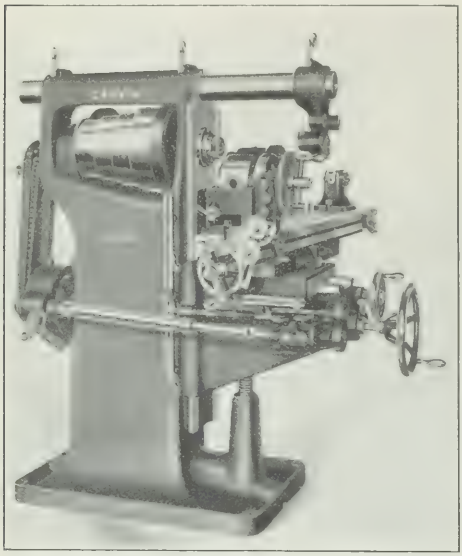


Fig. 1.—General View of the No. 2-A Universal Miller Built by the Garvin Machinery Company, New York City.

the table parallel with the knee and Fig. 3 gives the details of the positive feed change box.

The miller has power feed with automatic trip in all directions, and this is controlled by a single handle in the trip box on the side of the knee in front. In addition to this handle for starting, stopping and reversing the knee, the saddle or the slide, a second one determines which motion is to be active and prevents the knee and the saddle from being both thrown in at the same time.

The knee is closed solid on the sides and the top and the bearing on the column extends upward, thus increasing the holding power on the base. The advantages of this form of construction, which is covered by patents, are solidity and effectiveness and the prevention of spring and vibration under heavy loads. The elevating screw is of the telescoping type and has a ball thrust bearing. In the top of the knee are the square lock ways and the taper gib for the saddle, the guiding surfaces being placed centrally over the in and out screw. This gives a greater proportion of length to width in the guiding fit of the saddle on the knee and secures great accuracy of adjustment without tightness. All the operating handles on the knee are so located that when the latter is in its lowest position they are convenient for the operator to reach without stooping.

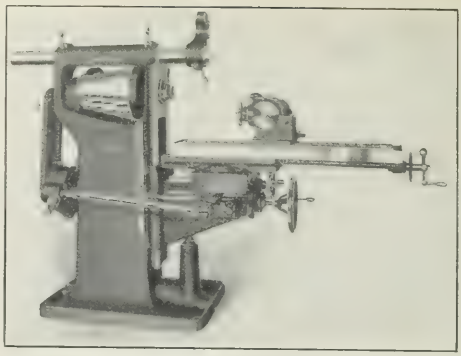


Fig. 2.—The Table Swiveled at Right Angles to Its Customary Position.

The table is wide and proportionately deep, the dimensions inside the oil pockets being 9 x 43½ in. If desired it can be swiveled into line with the spindle, as shown in Fig. 2. The table bearing in the swivel block is long, and has two taper gibs, while the block rests on a large circular base and is held to the saddle by four binder bolts. The feed screw is said to be larger than that ordinarily furnished and the increased torsional strength eliminates all jerky action in driving the dividing head on heavy spiral cutting, while the extra wearing surface afforded gives durability and added capacity for heavy work.

The gears for cutting spirals are arranged for single and double trains and the spirals obtainable include one turn in 1½, 2, 2½, 3 in., &c. When not in use these gears are hung on the inside of the column door. Special provision has been made for jig making and the micrometer adjustments give absolutely correct center distances in any direction between the holes. Holes at an angle are located as readily as any others, as the work can be clamped in the swivel vise and set to any horizontal or vertical angle desired. Thus it is possible to mill off the side of a jig at any predetermined angle, and the jig holes are then bored square to the angular surface at set distances without removing the work from the machine, as when a hole is once located power feed and automatic trip are provided for boring it.

A nickel steel sprocket chain transmits the feed from the end of the spindle to the feed change gear box, Fig. 3. Ten feed changes are available without stopping the machine, and this number is doubled when the back gears are used, thus making it possible for the operator to accelerate the feed of the table when using cutters of large diameter and the spindle is revolving slowly. The gears, which are of hardened steel, are submerged in oil and run on hardened studs, spaced at equal distances around the cylinder. A turn of the crank changes the feed, motion to the right increasing the feed, while a turn to the left decreases

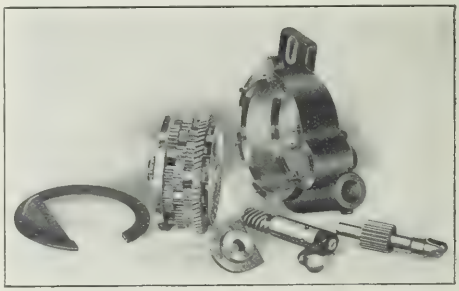


Fig. 3.—Details of the Positive Feed Change Box.

it in approximately geometrical progression. These changes are read from a dial on the edge of the cylinder in either inches or millimeters per revolution, the rate in use appearing at the top.

The principal dimensions and specifications are given in the following table:

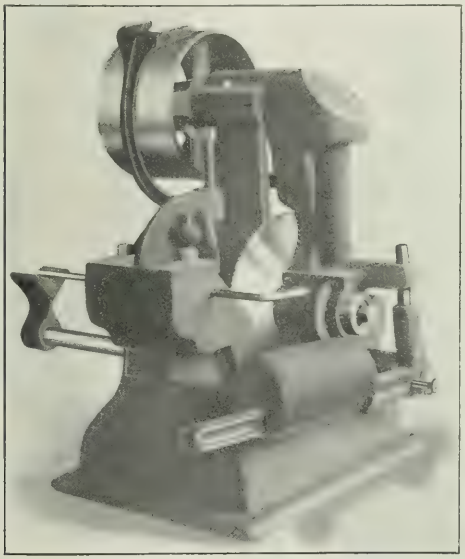
Length of automatic table feed, inches	25
Table adjustment in line with spindle, inches	8
Vertical adjustment of table, inches	18
Overall dimensions of table, inches	12¾ x 48
Size of T slots in table, inches	¾
Maximum capacity between column and arm braces, in.	21½
Swing under arm, inches	12½
Taper in spindle, B. & S., No.	10
Width of belt, inches	3
Number of speed changes	8
Minimum speed, revolutions per minute	10
Maximum speed, revolutions per minute	475
Minimum feed, inch	0.003
Maximum feed, inch	0.5
Swing of centers, inches	12
Distance between centers, inches	23
Diameter of dividing head hole, inches	1 1/16
Diameter of friction countershaft pulleys, inches	14
Width of friction countershaft pulleys, inches	4¼
Minimum speed of friction countershaft pulleys, revolutions per minute	110
Maximum speed of friction countershaft pulleys, revolutions per minute	320
Floor space, inches	74 x 84
Domestic shipping weight, pounds	3,500
Foreign shipping weight, pounds	3,950

The equipment regularly furnished with the miller includes all the accessories ordinarily supplied.

The Improved Taylor-Schantz Metal Sawing Machine

The Taylor-Schantz Company, 230 Mill street, Rochester, N. Y., has improved its No. 2 metal sawing machine. This was done to produce an accurate and rapid cutting-off tool for light work that would be compact and simple in construction and by its economy of time and material displace the power hack saw. The small amount of bench space required, 22 x 22 in., enables it to be used in places where it would be at least inconvenient, if not impossible, to operate a machine that was not so compact.

The machine is designed and built along good mechanical lines and all wearing parts are both large and durable. The drive is through bevel gears of 10 pitch, having a ratio of 1½ to 1, to a large triple thread worm of 3 pitch. This worm has a ball bearing to take the thrust and meshes with a worm wheel, the teeth of which have been carefully hobbed. A gravity feed is used and is controlled by a weight lever. The weight is adjustable on the lever, and its position is varied as the saw dulls or for feeding different kinds of stock.



The No. 2 Metal Sawing Machine Built by the Taylor-Schantz Company, Rochester, N. Y.

The large diameter saw arbor is hardened and ground and is fitted into taper bearings. Minute adjustments are secured by nuts that take up any wear occurring in the bearings. The saw blade is made of a special semi-high speed steel and is 8 in. in diameter by 5-64 in. thick. The surface has constant relief from the center to the rim to give the necessary clearance. An oil bath serves to keep the saw blade cool and remove chips.

The following table gives the principal dimensions and specifications of the machine:

Maximum width of bars handled, inches	4¼
Maximum thickness of bars handled, inches	2
Maximum diameter of rounds handled, inches	2⅝
Dimensions of base, inches	12 x 15
Diameter of saw, inches	8
Thickness of saw, inch	5/64
Diameter of driving pulleys, inches	8
Width of driving pulleys, inches	2½
Speed of driving pulleys, revolutions per minute	200
Net weight, pounds	195
Shipping weight, pounds	240

The vise furnished with this machine is of the V-block pattern and the stock is clamped in place by a hardened screw. For duplicating work an adjustable gauge is provided that insures any desired number of pieces being cut to the same length without having to measure each one to insure uniformity.

The National Machine Tool Builders' Convention Report.—The official report of the ninth annual convention of the National Machine Tool Builders' Association, held in New York, October 25 and 26, has been sent out by Secretary Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass. The volume is an unusual one, exceptionally attractive typographically, and containing a great deal of interesting matter, including the full stenographic details of the convention. The events of the outing given by *Machinery* are set forth with reproductions of snapshot photographs, and a page is given up to an excellent verse set to the song, which made the hit of the *American Machinist's* theatre party. The volume contains 163 pages, a detailed index making its contents easily available. The report is more complete than ever, and its early receipt tells the story of the efficient efforts of Secretary Hildreth.

New Rolling Mill at Ottawa, Ill.—The Central Steel Company, Ottawa, Ill., recently incorporated, is building a rolling mill, which is expected to be ready for operation in January. The mill has four stands of rolls with an 8-in. finishing mill, and will be operated principally in rolling bar iron in small merchant mill sizes, using scrap as the raw material. The power is provided for by a 250-hp. A. C. motor, 2300 volts, using power obtained from a hydro-electric plant at Marseilles, 6 miles distant. This arrangement for power has relieved the company of the expense of installing a steam plant. The officers are: Fred L. Fisher, president and treasurer; L. P. Fisher, secretary; W. D. Wood, vice-president and general manager.

The J. E. Bolles Iron & Wire Works, Detroit, Mich., is working on a large contract for elevator inclosures and metal cars for the double elevators in the new Herpolsheimer Building in Grand Rapids, Mich. This work will be installed the last of December and the building occupied early in January.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square	₰ lb 1.75¢
1½ to 4 in. x ⅜ to 1 in.	₰ lb 1.85¢
1½ to 4 in. x ¼ to 5-16	
Rods—⅜ and 11-16 round and square	₰ lb 1.85¢

Angles:	Cts ₰ lb
3 in. x ¼ in and larger	2.00¢
3 in. x 5-16 in and ⅜ in	2.05¢
1½ to 2½ in. x ¼ in	1.90¢
1 to 2¾ in. x 3-16 in and thicker	2.00¢
1 to 1¾ in. x 3-16 in	2.10¢
1 to 1¾ x ¼ in	2.20¢
⅞ x ⅞ in	2.30¢
⅞ x ¼ in	2.40¢
⅝ x ¼ in	2.45¢
⅝ x ⅛ in	3.15¢
½ x ⅛ in	4.25¢

Tees:	
1 in	2.65¢
1¼ in	2.15¢
1½ to 2½ x ¼ in	2.15¢
1½ to 2½ x 3-16 in	2.35¢
3 in. and larger	2.05¢
Beams	2.40¢
Channels, 3 in. and larger	2.05¢
Bands—1½ to 6 x 3-16 to No 8	2.20¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.50¢

Merchant Steel from Store—

	per ₰
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	

Sheets from Store—

Black	One Pass, C R Soft Steel.	R. G. Cleaned.
No. 16	₰ lb 2.50¢	2.80¢
Nos. 18 to 20	₰ lb 2.60¢	2.90¢
Nos. 22 and 24	₰ lb 2.75¢	3.05¢
No. 26	₰ lb 2.80¢	3.10¢
No 28	₰ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₰ lb 12 @14½¢
Patent Planished, W. Dewees Wood ₰ lb A, 10¢; B, 9¢ net

Galvanized.

Nos. 12 and 14	₰ lb 2.95¢
Nos. 22 to 24	₰ lb 3.30¢
No 26	₰ lb 3.50¢
No 28	₰ lb 3.80¢

No. 29 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₰ lb 5.15¢
No. 26	₰ lb 6.15¢
No 28	₰ lb 7.25¢

Corrugated Roofing—

2½ in. Corrugated.

	Painted	Galv'd
No. 24	₰ 100 sq. ft. $3.85	4.80
No. 26	₰ 100 sq. ft. 2.95	4.00
No. 28	₰ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A A A." Charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.60
A. Charcoal:	
IC. 14 x 20	$5.10
IX. 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb coating	$8.50
IX, 20 x 28 with an 8 lb coating	10.50

Seamless Brass Tubes—

List November 17, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 19½@ ₰ lb

High Brass Rods—

List August 1, 1908 14½@ ₰ lb

Roll and Sheet Brass—

List August 1, 1908 14½@ ₰ lb

Brass Wire—

List August 1, 1908 14½@ ₰ lb

Copper Wire—

Base Price. Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz quantity lots) ₰ lb 18 ¢
Sheet Copper Cold Rolled, 1c ₰ lb advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 1c ₰ square foot
Sheet Copper Polished over 20 in wide, 2c ₰ square foot
Planished Copper, 1c ₰ square foot more than Polished

METALS—

Tin—

Straits Pig ₰ lb 39¼@39¾¢

Copper—

Lake Ingot	₰ lb 14¾@15 ¢
Electrolytic	₰ lb 14½@14¾¢
Casting	₰ lb 14¼@14½¢

Spelter—

Wes'n ₰ lb 6¼@6½¢

Zinc.

No 9, base, casks ₰ lb 5¼¢ Open ₰ lb 5¾¢

Lead.

American Pig	₰ lb 5 @5¼¢
Bar	₰ lb 6¾@6¾¢

Solder.

½ A ½, guaranteed	₰ lb 28½@29¢
No. 1	₰ lb 21½@22 ¢
Refined	₰ lb 19 @19½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₰ lb @10¢
Hallett's	@10¢
Other Brands	@9¢

Bismuth—

Per ₰ $2.00@$2.25

Aluminum—

No 1 Aluminum (guaranteed over 99% pure), in ingots for remelting 24
Rods & Wire Base Price 33¢
Sheets Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₰ lb 11.00@11.25
Copper, Heavy and Wire	₰ lb 10.75@11.00
Copper, Light and Bottoms	₰ lb 9.75@10.00
Brass, Heavy	₰ lb 7.25@7.50
Brass, Light	₰ lb 5.75@6.00
Heavy Machine Composition	₰ lb 9.75@10.00
Clean Brass Turnings	₰ lb 7.25@7.50
Composition Turnings	₰ lb 8.25@8.50
Lead, Heavy	₰ lb @5.75
Lead, Tea	₰ lb @5.50
Zinc Scrap	₰ lb @4.00

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PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 — New York, December 22, 1910 — Vol. 86: No. 25

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-18 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

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Lower Prices Expected

Buying of Steel Products Falls Off Sharply

Bar Iron Lower—Pig Iron Buyers Holding Aloof

The expectation of lower prices is to-day the dominating influence in iron and steel markets. The meetings held last week by the manufacturers in various lines appear to have increased the confidence of buyers that a lower level will soon be reached, either by co-operation or through an open market as in February, 1909. As a result business has fallen off sharply, and the week has brought further restriction in output of blast furnaces, steel works and rolling mills. The industry will go into the new year at a pace much below that at the opening of the month.

The United States Steel Corporation is now operating 50 per cent. of its blast furnace capacity, and will put out other furnaces before the end of the year, including two in Alabama. Other steel companies are also making less pig iron.

The pig iron market, which has been free from any effort by producers to co-operate, is nearer to a standstill than finished materials. Southern iron is freely offered at $11, at furnace, for No. 2 for the first half of 1911, but foundry buyers seem even more disposed to wait than before.

Philadelphia reports a sale of 6000 tons of iron of pipe grades. Eastern pipe makers are still in the market for about 10,000 tons.

In the Chicago district the competition of Mahoning and Shenango Valley irons is more pronounced. A movement has been on foot to combine a number of the merchant Valley furnaces, but with no immediate prospect of success.

The low prices lately made on bar iron, particularly in the Chicago district, have given the iron rolling mills business at the expense of those rolling steel bars. At 1.30c., Pittsburgh, iron bars are $2 a ton below the co-operative price of the steel bar mills, and there has been some shading of 1.30c. Railroads have been larger buyers of bar iron for new car work and repairs.

For the battleship Texas, which is to be built at Newport News, the Carnegie Steel Company will furnish 13,000 tons of plates and shapes; of armor plate, 6000 tons will be required. Worth Brothers were low bidders on the plates for the other battleship, to be built at the Brooklyn Navy Yard, and on which work is held up.

Fabricating companies are making deeper cuts, extraordinary figures being reported on recent lettings of railroad bridge work. It is estimated that 300,000 tons of steel will be required for bridges and buildings now being figured on, 70,000 tons of this amount coming up at Chicago. The record of 1910 in structural steel, with an estimated total of 1,200,000 tons in

lettings of large work, was exceeded both in 1909 and 1906.

Rail orders include 5100 tons for the Mexico Northwestern Railway and 6700 tons for the Pittsburgh & Shawmut. The Chesapeake & Ohio has inquired for 15,000 tons and the Baltimore & Ohio will buy 40,000 tons, as against 80,000 tons for this year. The Lackawanna is in the market for 5000 tons of bars and track supplies and the Chesapeake & Ohio has closed for 3500 tons.

Demand for light rails has fallen off and business has been done at lower prices in the past week.

Cars bought in the past 10 days and those called for in new inquiries represent a total of 10,000 to 12,000, and the outlook for winter work at the car shops is somewhat better.

A Canadian shipyard has taken 2500 tons of plates, and for Canadian car, locomotive and repair work contracts placed at Pittsburgh aggregate 20,000 tons.

While sheet prices are being better maintained since the Pittsburgh meeting, new demand is quite unsatisfactory. The leading producer is running at about 50 per cent. of capacity, and some of the independent companies are doing a little more than that.

The most interesting feature in old material is the development of an export demand. Arrangements are being made for the export of several thousand tons of steel melting scrap to Italy, the price offered being somewhat above that prevailing for domestic business.

A few lots of old range Lake Superior ores have been reserved for next year by furnace companies, the price to be that fixed later on 1911 contracts. General ore buying will be very late next year.

Prices of Steel Products

The question what is the right price for steel products is again being agitated—the price at which there will be the largest buying and the largest employment of producing capacity and consequently of labor, at a profit to the manufacturer. We assume that this last qualification should be made, though in some quarters it has been ignored. The fact that steel manufacturers have lately been holding conferences on one product after another has given keen interest to the discussion, and the situation has been compared with that which existed before the open market declaration of February, 1909. Already advisers have come forward in articles similar to those which were frequent in the period of co-operation in 1908, pointing out that the policy of "reducing output and maintaining prices" results in idleness of many workmen and asserting that if prices were lowered, more steel would be bought and more men would be employed.

The argument seems to be that since the manufacturers of steel have been attempting by co-operation to modify the conditions usually found in times of declining demand, they should be held responsible for all features of a situation like the present. Critics of the price maintenance policy of 1908 often charged upon it the delay of improvement. Curiously enough, too, ever since the turn in February, 1910, from the expansive movement in iron and steel that had lasted just a year, many have risen up to say that the start was made too soon after the panic and must now be atoned for in a real readjustment. Evidently those who would guide the destinies of the steel trade will find it hard to suit the economists.

It is so far the habit to think of the steel trade as determining conditions, that it is often forgotten that it is affected by influences which bear upon all industries. Again, there is a certain popular demand that the steel trade perform the extraordinary. If there is not a boom market, with mills oversold and consumers pushing up prices on each other by buying for the future, there must be the weekly expectation of a "break" in the market, with prices crowded to sensationally low levels to stimulate demand. A waiting market or an orderly adjustment in a time of declining consumption somehow cannot be tolerated.

Looking back upon the course of the steel market in 1908, it now appears that too much stress was laid upon what the manufacturers did. Certain consequences of the panic were there, that could not be cured by any action on steel prices to put them up or down.

The disposition now is to use the experience of 1909 to point the way out of the present situation. Predictions are already made that the new year will only be well entered upon when action similar to that of February, 1909, will be taken; or, if the present status does not give way to a thoroughly competitive market, that the manufacturers will co-operate on a lower level of prices. Leaving out of the account the conditions now affecting railroad demand, the pending prosecutions of large corporations and the expectations of tariff readjustment by the opponents of protection, there are three important differences between early 1909 and now. These relate to the steel trade itself. In the first place the financial position of the steel companies is much stronger than it was at the opening of 1909, and there is not as great anxiety to get business. The second difference is that then the country was bare of steel after 15 months of stock consumption and was ready to stock up again at low prices. To-day, after a year of record shipments of steel from the mills—in the aggregate, though not in each individual line—the country is again falling back on stocks, but is not yet in any such condition of stock liquidation as it was two years ago. In the third place the gap between selling prices of finished material and the cost of raw materials and labor is less now than at the close of 1908. Without discussing now the probable consumption of steel in the first half of 1911, the above conditions account in large part for the apparent unwillingness of manufacturers to cut prices further at this time.

Developments in the next month or two months will have much to do with prices for the first half of 1911. It is obvious that co-operation will be most successfully maintained on a comparatively low level of prices. It is also the fact that a sentiment exists among some manufacturers of steel, favorable to continued co-operation, though at a lower level than to-day's rather than try conclusions in a general scramble for business. There is in this feeling a well-grounded distrust of the ability of the country to repeat the splendid performance following the cuts of last year.

But entirely apart from what manufacturers plan, the final reckoning must be with the buyer, and conditions are admittedly working in his favor. It is apt to be overlooked that even under a 50 per cent. operation of mills as the year closes and the railroads all economizing on steel, the consumption of pig iron is still above a 20,000,000-ton rate. At the same time the outstanding fact to the buyer of steel is that prices

are still some distance above the buying level of 1909, and have responded little as yet to the demand made at the polls last month for a downward revision in all lines.

The Menace of a General Tariff Revision

Extremists favoring very low tariff duties or absolute free trade are, of course, heartily in favor of tariff revision at any time and under any circumstances. They can be expected to be enthusiastic supporters of the announced determination of Democratic leaders in the House of Representatives to begin an investigation as soon as the present Congress adjourns for the purpose of securing information upon which to base a revision of the tariff when the new Congress convenes next December. The announcement of this purpose, however, is most unwelcome, both to stand pat protectionists and to those who would like to see some of the present tariff schedules revised. The country generally has not felt seriously alarmed over the possibility that some of the schedules might be taken up separately and lower duties named on articles therein classified. This is a matter which was not thought to be specially disturbing, although it would, of course, retard trade for a time in the commodities on which new duties were under consideration. The dissatisfaction with the Payne-Aldrich Tariff act is by no means general, but applies simply to a few schedules. It had been expected, however, that the revision of even these schedules would not be attempted until the Tariff Board had had an opportunity to complete its investigations now under way, and report the facts to the President as a basis upon which to make a revision.

The whole situation has been changed by the announcement of the Democratic leaders. It is but a short time since the business of the country was seriously interfered with by a general tariff revision, and now it is confronted with the expectation of another long drawn out period of waiting for the action of the Congress which meets next December, and the result of which will not be known until well along in the summer of 1912. It is a rather unpromising prospect for the next year and a half. It will unquestionably have the effect of further halting new enterprise and perhaps seriously dislocating our industries by retarding their return to at least normal activity which under other circumstances might have been expected some time in the coming year.

Another effect of the suppressed trade caused by such a prolonged tariff agitation would be the inevitable appearance of an abnormally heavy buying movement after the settlement of the matter in 1912. It has always been the experience of this country that after a long period of enforced business quietude our pent-up activities have burst forth in tremendous energy with buyers rushing into the market for the purpose of covering their long needed requirements and thus precipitating a demand beyond the ability of the country to meet immediately and thereby causing prices to rise unnaturally. If there is anything this country imperatively needs, it is to be relieved from the alternation of periods of severe depression with times of feverish activity. Hardly any other country can be found which is subject to such extremes in this respect as the United States. We are now experiencing the evil effect of just such a period of excessive activity. It caused us to overbuild in making additions to our blast furnace and steel works capacity, and the depression through which we are passing is made much more severe by the overshadowing productive capacity now idle. The country imperatively needs a rest from governmental interference with business. No general tariff revision is desired by the great majority of the people. The revision of a very few schedules of the present tariff is all that should be attempted.

Savings in Machine Maintenance

In a paper read at the recent meeting of the National Machine Tool Builders' Association, by C. K. Lassiter, mechanical superintendent of the American Locomotive Company, on "The Design and Construction of Machine Tools From the User's Standpoint," suggestions of live interest were made concerning the maintenance of equipment: In most machine shops no very exact knowledge exists of the condition of machinery. The factory management has a general idea of the equipment, but system is lacking. According to Mr. Lassiter's experience, great economics must follow the consistent carrying out of such a system. For several years he has given specialized attention to the duties of caring for and maintaining equipment in the American Locomotive Company's several plants. Under an organization, which sub-divides the work, enormous and almost inconceivable savings have been achieved in the cost of maintenance. At the same time the productive machine hours which are lost, due to failures, have been reduced from 12 to 1¾ per cent. When the system was first installed about 1000 of the 9000 machines of the company averaged to be out of service. The figure now stands at 100.

As a part of the organized department each plant has an inspector of equipment whose duties are to investigate and report all conditions which might tend to cause machine failures, or which might cause accidents to employees, and to report abuse of equipment by operators, and equipment not kept clean or in order by operators. Weekly reports classify failures of machinery as due to negligence, improper design, accident and ordinary wear. Immediate effort is made to correct the condition which has rendered a machine idle. Where the design is at fault, the weak parts are redesigned and strengthened. As to failures from ordinary wear, investigations are constantly in progress in the effort to simplify the construction of the machine and reduce the number of parts to a minimum. Some of the results cited by Mr. Lassiter illustrate the working of the system:

> In one of our shops, by referring to our reports, we found that 40 per cent. of the failures were due to negligence. We were able to reduce this item to 1¼ per cent. In another case we found that we were purchasing a certain machine from some of the machine tool builders, and there was an error in design which had existed for 10 years on this machine, which was costing us something like $5000 per year. We took the matter up with the machine tool builder and had the design changed. This charge was eliminated, which was like picking up so much money.
>
> We found that the maintenance on some machines which we had in service was so heavy that we could not afford to keep the machine in service, and we replaced them with modern tools. This also showed a decrease in maintenance.

The effect of the system on the design of machine tools used by the company is suggestive:

> Most of the tools which we purchase for our works at present are built to specifications prepared by ourselves, and it is our aim to cut out every gear or moving part on all

machines which is not actually needed for our class of work.

In specifying for planers we require only one speed, as our work is so extensive that we can afford to put a planer on one class of work and never change it.

On vertical milling machines we have specified the design so as to have but one pair of gears between the motor and the cutting tool.

On large vertical boring mills we have cut out gear boxes and equipped the drive with a big plain pulley and placed a variable speed motor on the ceiling, where the countershaft had formerly been put.

On radial drills we have lowered the speed of the driving shafts and increased their diameter, to reduce the maintenance on bearings.

In this connection are the results of tests looking to the economical use of power in operating machines. Here is one example:

In testing out some of our machines we found that there was a considerable amount of power used for removing a certain amount of stock. A good deal of this power we found was absorbed through the friction of unnecessary gears. This is one reason why we have tried to cut out every gear possible on all of the machines which we purchase. It not only saves maintenance, but also cost of power to operate machines.

Few concerns are large enough to maintain a department such as this, but none is so small that the owner cannot work to advantage in careful, individual study of the various units of equipment. The effort must result in appreciable economics in a large majority of cases.

Correspondence

Efficiency the Criterion of a Wage Rate

To the Editor:—In conversation with some large employers of mechanics, I find that they are disposed to question the soundness of my conclusion that "the square deal is the visible sign of real intelligence upon the part of the employer in treatment of his men," and that "real intelligence requires that efficiency, and not the law of supply and demand, should be the criterion by which a wage rate should be determined." Perhaps, therefore, the citation of some instances in support of my conclusion may not be without interest to your readers. The instances I shall cite will all be in the same line of work, though in shops belonging to different owners.

VARIATIONS IN SHOPS DOING IDENTICAL WORK.

I have visited many shops doing identical work and in the line to which the incident I related in my letter to you of December 12 referred, where a superintendent cut a rate in half without remonstrance from the operator. A very suggestive fact which my visits disclosed was that, taking two shops where the equipment was practically identical in respect of the makers of a given tool and in respect of the modernness of the equipment, I found that on a given job there was a vast difference in respect of the piecework prices. In one instance a shop pays 28 cents, another pays 41 cents, and still another pays 70 cents for the same job.

Now, the 70-cent shop foreman claimed, first, that his work was done better—*i.e.*, with more finish; and second, that his men earned more per hour on the job. Conceding for argument's sake that he got a smoother finish, and that it was the result of a finishing cut (three instead of two), this would bring him down about to the 41-cent shop, perhaps. But an even more suggestive fact disclosed was that while the man who got 41 cents and the man who got 70 cents for the job earned more per hour, perhaps, than did the 28-cent man, their average per hour for the month was not quite so great as was that of the 28-cent man. This is, of course, tantamount to saying that the efficiency of the 28-cent man was much greater than that of the other two. But this again is only another way of demonstrating the difference in efficiency of the heads of the different shops.

FOREMEN NOT SO RESPONSIBLE AS HIGHER OFFICIALS.

Going still further back, or "higher up," we find that the credit or the demerit for this difference in results achieved by different shop officials on the same job rests in last solution with the official who has the appointing and removing of the shop officials in question in their respective shops. I have observed the manner in which this difference between "higher-ups" worked out in concrete shape in divers ways; but the ultimate result is almost uniformly the same. In effect the result discloses that, with several shop officials having about an equal knowledge of things mechanical in a given line of work, that shop official having over him the "squarest" (most really intelligent) higher-up will get his work done for the least money, while his men will average more per hour per month at the same time. And this is, of course, what all are striving for—at least the first half of the proposition. Perhaps if more attention was devoted to recognizing the intimate connection between the last half and the first half of the proposition the first half would be attained more often.

My experience has shown me that one reason why the higher piecework price has not increased the rate per hour per month earned by the operator is that, in practice if not in theory, he finds himself up against a gentle admonition from his foreman that he had better go a bit slow—that while the shop superintendent would be willing to have him make all he could he, the superintendent, fears that the boss would not allow the schedule to remain unaltered were he to find that his men averaged more than, say, 35 cents per hour; in other words, it seems to disclose that, *prima facie*, it is another case of Mr. Ignorant Flatrate's shadow hanging over the shop's reaching its best efficiency.

PIECEWORK SCHEDULES SHOULD BE MADE BY QUALIFIED MEN.

While this may be true on the surface, and to some extent in fact, the real explanation, as I have discovered to be the fact in many cases, is that the piecework schedule has been laid down by those who did not know their subject sufficiently to really qualify themselves for that most important duty in a piecework shop—*i.e.*, the preparation of a price schedule calculated to achieve highest efficiency for the shop—*i.e.*, greatest output per capita. A prerequisite to this is stability of the price schedule. And knowledge of what a day's work is, coupled with acknowledgment of the fact that the average man is, in respect of efficiency, only two-thirds of a man, is a condition precedent to a stable piecework schedule.

Naturally, I do not mean that a piecework schedule should be unalterable. Supplying the men with improved tools or appliances, as I showed in a previous letter, affords fair reason for reduction of a given schedule. Barring such changes, a piecework schedule should be stable, if highest efficiency be a desideratum. And it is a desideratum in any line in which raising of prices is the last, instead of the first, resort to be adopted. The sort of thing referred to in the previous paragraph is extremely likely to occur where the people charged with the framing up of a piecework schedule have been technically educated before they received their practical education. I do not see how, in fairness to them, anything else could or should be expected of them under such circumstances.

They obtain their practical education by "trying it on the dog" in such and in other ways—*i.e.*, by framing up piecework schedules. Of course, their owners pay a fearful price for the education of this class of shop officials, when one takes into consideration what a difference the lowering of the efficiency of a shop means in dollars and cents in one year.

PIECEWORK PRICE SHOULD BE BASED ON THE AVERAGE MAN.

In the instance I have cited, where one shop paid 70 cents as against 41 and 28 for the identical job in the other two shops, the head of the first shop had been educated so that his theoretical education had preceded any practical education whatever; and I am satisfied that, not knowing a real day's work, he had been betrayed into basing his price on the output, not of an

average (66 2-3 per cent.) man, but on that of a "soldier in the cause of a minimum day's work for a fair day's pay."

The head of the shop told me that the difference in price was due to a better grade of work and that the man earned 45 cents per hour. The man who did the work told me he did not know as to whether he put up more accurate or more finished work than was done in the other shops, but that he did know that "there was a dead line" of 35 cents per hour per month, which his foreman had tipped him off not to overrun. The foreman gave him the reason that the superintendent's superior would insist upon the superintendent revising the schedule "if anything better than a 35-cent rate per hour per month showed up as a steady diet." This man was corroborated by several others in the same shop; in fact, the existence of "a dead line" in that shop was common knowledge in that city. The reason therefor was no secret either.

I am convinced that the head of that shop meant right, but his blunder was due entirely to his being educated (for that job) "tail end first with care"; his superior, who confirmed that schedule, was educated along the same lines. The head of the shop was not big enough to take the back track, besides which he knew enough to fear the effect of cutting a rate. Perhaps he knows his superior and has reason to fear the effect upon his future of an admission of his error. Hence there seems to exist between them a community of interest in that particular brand of bliss which is often based upon educated ignorance.

TOO LOW A PIECEWORK PRICE.

I have, on the contrary, observed that a shop superintendent educated along deductive lines, where obtainment of practice precedes obtainment of theory, sometimes makes a mistake in the other direction, and makes a price which is too low. The consequences, however, are not nearly so great nor necessarily so enduring; and a man educated that way generally knows that the ability and disposition to take the back-track in such cases are a fair indication of a man's makeup, at least in respect of broadness.

I know of a case where a superintendent happened to make a rate on a given job without considering that the man doing that work was much more than an average 66.2-3 per cent. man; that he was, in fact, pretty close to a 100 per cent. man. Well, the work came along in good shape and the man made very satisfactory money at a rate of 50 cents for the job, and everything was satisfactory all around; but the man got sick and the next man simply couldn't make the same rate per hour, though a very fair mechanic. This set the superintendent to thinking and it didn't take him long to recognize wherein he had blundered. He at once went to "higher-up," said he had made a blunder; that he should have in that case, as was his general practice, based his rate on an average man. He wound up by recommending an increase of one-third in the rate. His "higher-up" was educated along the same lines as the superintendent was, and hence confirmed the increased rate.

Not the least interesting thing about this particular shop is that three days a week the apprentices receive two hours' education theory, and take a four-year course at that. The high boy at the end of the four-year course receives a college education at any technical college he selects. Of course, the shop has the first call upon him when he graduates. Of such are the elect in respect of the Kingdom of Mechanical Engineers; they will "know why they know what they know."

MAX H. C. BROMBACHER.

NEW YORK, December 19, 1910.

The Mesta Machine Company, Pittsburgh, works at West Homestead, Pa., shipped last week an 84 x 48 in. cross compound Corliss engine, with 60-in. stroke to the Republic Iron & Steel Company, at Youngstown, Ohio, and has also ready for shipment a 130-in. Helander barometric condenser to go to the Iroquois Iron Company, at South Chicago, Ill.

An Estimate of Iron Trade Conditions

The circular Market Report of C. S. Trench & Co., New York, for December 16 has the following bearing on conditions and prospects in the iron trade:

"The publicity that has been given to the reaction and falling off in orders and mill operations in the iron and steel trade and the refusal of the railroad interests to make their usual purchases has for the time being overshadowed the really sound condition of the country. The average business man has begun to feel that the unfavorable reports he is reading every day will become a fact later on in his own business, forgetting that the control and conditions under which the iron and steel trade is at present conducted do not make this interest as reliable a barometer as in former years, and that the policy of the railroads in withholding their orders is something that can be changed almost in a day. Our having increased our facilities of producing iron far in excess of our ability to consume does not make the fact of reduced operations necessarily mean that there is a severe recession in business, except as it may be compared with periods of great activity, which from the nature of things are abnormal and of short duration. A population of 92,000,000 of fairly prosperous people, who have just harvested the largest crop on record, are in a position to stand a good deal of the kind of unsettlement that we are now going through. We think 1911 will be an averagely good year; better than that we cannot expect, with the prospects of more or less unsettlement from the approaching tariff revision and other questions that we must expect to be constantly with us during the year. We think we are in a position to endure what is before us without serious difficulty; at the same time any ignoring of these questions, or attempts to imagine they are not real, would be foolish, and, if carried into action, unfortunate."

The Canadian Navy.—The Dominion Government will shortly call for tenders for four cruisers of the Bristol type and six destroyers of the improved river class, in accordance with the naval construction programme decided upon. Three years' time will be given for the delivery of the first ships. It is expected that two Canadian companies, with a British connection, respectively, with Vickers, Sons & Maxim and Harland & Wolff, will tender. There may also be tenders received from other British firms. The specifications require building in Canada, and this involves the establishment of shipbuilding plants on the Atlantic Coast. It is understood that whichever firm gets the contract will be prepared to arrange for construction in Canada. No United States tender will be considered. The total cost of these vessels is estimated at $10,000,000 to $12,000,000; but, in view of the requirement regarding construction in Canada, it may be found that tenders will aggregate considerably in excess of this.

The Cleveland Tool & Supply Company, Cleveland, Ohio, has purchased the stock, fixtures and good will of the Excelsior Supply Company, Detroit, distributer for Shelby seamless mechanical steel tubing in Detroit. The Cleveland Company will maintain the present warehouse and office at 29 East Atwater street, with an increased stock of tubing, as distributer for the National Tube Company, and will handle from Detroit the business formerly carried on by the Excelsior Supply Company in eastern Michigan. The transfer took place December 12. W. M. Roberts, formerly with the Excelsior Supply Company, will continue in charge of the Detroit warehouse and the former staff will be retained.

The Republic Iron & Steel Company has blown out its Hall furnace in the Shenango Valley.

A Steel Manufacturer's Views

The Recent Conferences of Producers and Market Prices

James A. Campbell, president of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has written on present iron market conditions in answer to an editorial in the Youngstown *Telegram,* which criticised the action of the manufacturers. Mr. Campbell says:

There have been no meetings of the manufacturers of steel products, with the exception of the very recent ones, since February 18, 1909, and there has been no effort of any kind to maintain a fixed price on any of the different lines of product, and as a consequence prices have been reduced from $4 to $14 per ton in a natural way by the effort of the manufacturers to secure business.

Pig metal is to-day being sold at from 50 cents to $1 per ton less than it costs the average merchant furnace to produce it, and many of the finished lines are being sold at or near cost. I cite for comparison prices of iron and steel products in 1907, before the financial disturbance, and present prices of the same products to show the reduction that has taken place. You can confirm these figures by referring to *The Iron Age* or the *Iron Trade Review:*

	July 1, 1907.	December 16, 1910.
Bessemer pig iron	$21.25	$15.00
Basic	22.00	13.25
Steel billets	30.00	23.00
Steel sheet bars	31.00	24.00
Rods	36.50	28.00
Steel bars	32.00	28.00
Structural steel	34.00	28.00
Wire nails	40.00	34.00
Steel sheets	52.00	44.00
Merchant steel pipe	53.36	39.00

To make further reductions the prices of ore, coke and limestone, our raw materials, as well as all labor, must be reduced. The iron and steel people, as far as I can learn, do not believe that the conditions at the present time warrant a reduction of labor.

A Lower Basis for Labor

It may be that before the country will again consume the full product of the blast furnaces and steel mills, prices must be lower, as the gentleman to whom you refer states, but if he will go into the subject further he must agree with those actively engaged in the business that before any material reduction can take place the cost of our raw materials and labor must be on a lower basis. If we are to have prices of 1893-1896, we must have like conditions. Many of us in the business think present prices fair, for if they go lower the smaller manufacturers must go out of business. The United States Steel Corporation has the power, due to its cheap raw materials and improved facilities of manufacture, to make it impossible for smaller companies to successfully compete, but it is not its policy to use its power in this way, for it well knows that such a course would mean great loss to itself and bankruptcy to many of the smaller manufacturers. You condemn the American Iron and Steel Institute for using its influence to maintain the present fair schedule of prices. Is not such an effort far preferable to trust methods of cutting prices, forcing the smaller and weaker manufacturers out of business and resulting in great ultimate benefit to the United States Steel Corporation and the stronger independents?

Not only the iron and steel manufacturers, the jobbers and consumers, but the business interests of the country in general owe to Judge Gary and the United States Steel Corporation a debt of gratitude they can never repay for the course pursued by them in the fall of 1907. Any other course would have meant bankruptcy and ruin to many, and the panic of that year was only a gentle zephyr as compared with the whirlwind it would have been had they made prices to secure business without any regard for their competitors.

The Work of the American Iron and Steel Institute

The "principal function" of the American Iron and Steel Institute is not to "maintain trust prices." It is to exchange information, and, as the name implies, be a course of education for all engaged in the iron and steel business. It is an organization similar to the American Institute of Mining Engineers or the Society for the Advancement of Science, and with all due allowance for the difference in the fields embraced, its functions are analogous to those of the above and kindred organizations. It is trying to better the conditions of labor, and already has succeeded in abolishing much Sunday work, and is trying to work out a plan whereby the man employed continuously can have one day each week for rest. In addition, it has had a great influence in preventing a reduction in wages at a time when the high cost of living demands that the workman shall receive every cent it is possible to pay him.

The institute is not doing anything in violation of the Sherman Anti-Trust law and has no agreements as to prices. As a matter of fact, its members are not quoting the same prices, nor have they done so at any time.

You mention the law of supply and demand and note that it is impossible to ignore or control it. You neglect, however, to advise your readers that labor is just as truly an economic commodity as is pig iron, and that its price is controlled by the same economic laws. A reduction in the present scale of prices of finished materials must positively be compensated for in the cost of their manufacture, and this compensation must largely be borne by labor. We note your reason for bringing up the question as you have is your interest in the workmen in the valley, a reason which is most commendable, but if you could hear the discussions in the meetings of the American Iron and Steel Institute you would realize that the steel manufacturers wish to do everything they can for the comfort and happiness of their employees. We certainly would like to give them steady employment, if for no other than the selfish reason that when they, or a portion of them, are idle our profits are correspondingly reduced.

In a later communication Mr. Campbell covers, as follows, two other points made in an editorial in the local journal:

You say: "First, that buying was greatly stimulated by the open market and its reduction in steel prices in 1909."

This statement is true, but only because every jobber, dealer and consumer had disposed of his stocks of materials on hand, and the radical reduction which took place on February 18, 1909, did stimulate buying to again replenish these stocks; also the season of the year when this occurred had considerable influence, as it was the opening of the spring season when the heaviest purchases are made. Because reductions were made then it does not follow that similar or lesser reductions can be made now. We are using ore now that is 50 cents per ton higher than then, which increases our cost of steel about $1.25 per ton. Also, on May 1, 1909, all labor was increased about 7½ per cent. It should be clear with the present low prices ruling and the increased cost, that further reductions at this time would close many of the smaller mills.

You say: "Second, that the market is to-day controlled, and that an artificial dam has been constructed to maintain prices."

This statement is not in accordance with the facts. I have already stated that since February 18, 1909, there have been no meetings and no influence has been exerted to maintain prices, and they have found their present low level in a natural way. At the meetings in the past two weeks no effort has been made to advance these prices.

Gary and Ensley Rail Mills Closed Down.—The heavy rail mill at the Gary, Ind., plant of the Indiana Steel Company was shut down December 14 and will be idle the remainder of the year. The company authorized the statement that the outlook is good for the resumption of operations at the usual time after the holidays. Orders have been issued for the closing down this week of the Ensley steel works and rail mill of the Tennessee Coal, Iron & Railroad Company, and they will be idle for about three weeks.

BIRMINGHAM, ALA., December 20 (*By telegraph*). —George Gordon Crawford, president of the Tennessee Coal, Iron & Railroad Company, officially announces that the Ensley steel plant will shut down December 23 and resume January 15. Blast furnaces Nos. 5 and 6 at Ensley will be blown out. The company will continue furnaces Nos. 2 and 3 at Ensley on basic iron, and furnace No. 4 at Bessemer on foundry iron.

The Jessop Steel Company, Washington, Pa., states that the fire in its rolling mill, December 14, was by no means so serious as reported in local newspapers. All damages have been made good, and the plant is now operating as before.

The new 12,000-ton steel freight boat, the Willis L. King, being built for the Jones & Laughlin Steel Company by the Great Lakes Engineering Works, was launched at the yards of the builder at Ecorse, near Detroit, December 17.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Dec.21, 1910.	Dec.14, 1910.	Nov.23, 1910.	Dec.22, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.25
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	14.75	14.75	14.75	18.75
Basic, Valley furnace	*13.25*	13.50	13.50	17.70
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	13.90	13.90	13.90	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	....	28.50	31.00
Open hearth billets, Philadelphia	25.50	25.50	25.50	30.60
Wire rods, Pittsburgh	28.00	28.00	28.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	15.50	15.50	16.00	20.00
Iron rails, Philadelphia	17.00	17.00	18.00	20.50
Car wheels, Chicago	13.50	13.50	13.50	18.50
Car wheels, Philadelphia	*13.00*	13.25	13.75	17.50
Heavy steel scrap, Pittsburgh	*13.50*	13.75	14.25	18.25
Heavy steel scrap, Chicago	12.00	12.00	12.25	16.00
Heavy steel scrap, Philadelphia	12.50	12.50	13.50	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.35	1.35	1.37	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.60
Common iron bars, Pittsburgh	1.40	1.40	1.40	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.55
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.30	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.85
Cut nails, Pittsburgh	1.60	1.60	1.60	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.00	13.00	13.00	13.75
Electrolytic copper, New York	12.75	12.75	12.87½	13.50
Spelter, New York	5.75	5.85	5.95	6.30
Spelter, St. Louis	*5.65*	5.75	5.80	6.15
Lead, New York	4.50	4.50	4.50	4.70
Lead, St. Louis	4.35	4.35	4.40	4.67½
Tin, New York	*37.90*	38.55	36.90	33.80
Antimony, Hallett, New York	7.75	7.75	7.75	8.25
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; tees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1¼ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
¼, ¾, ⅜ in.	69	59	65	55
½ in.	71	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

THE IRON AND METAL MARKETS

Plugged and Reamed.

1 to 1½, 2 to 3 in...Butt Weld { Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe. Butt or Lap Weld as specified.

2, 2½ to 4 in.....Lap Weld

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, December 21, 1910.—(*By Telegraph.*)

Pig Iron.—The only sale of moment during the week was one of about 2000 tons of standard Bessemer iron for December and January delivery at the reported price of $15, at Valley furnace. There is some inquiry for basic iron, several consumers having offered Valley furnaces a fair tonnage at about $13 at furnace, but they have been turned down. Some of the furnaces hold their basic iron for first quarter at $13.25 at furnace, while others are refusing to shade $13.50. It is possible that on small lots of basic for spot shipment some dealers would sell at $13 at furnace. The outlook for an improvement in prices in the near future is discouraging, stocks being heavy and steadily increasing. The consumption is very much below the output. We quote standard Bessemer iron, $15; basic, $13.25; No. 2 foundry, $13.75; malleable Bessemer, $13.75, and gray forge, $13, all at Valley furnace, with a freight rate of 90c. a ton for delivery in Pittsburgh district.

Steel.—While a good many contracts for sheet and tin bars expire by limitation December 31, nothing has been done as yet regarding renewals, consumers waiting to see whether present prices of steel will be maintained. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24 and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

The iron trade is simply marking time until the year is over, consumers taking in as little as possible. Since the meetings held here last week of the sheet, tin plate, steel bar and plate interests, the market on these products has been fairly well sustained and no radical reductions in prices are expected, for the present at least. The larger producers have found it a note of warning as to what may be expected if prices on the products named are not held better than they have been for some time, and it has had the desired effect. There is practically no new inquiry for pig iron, prices are merely nominal, and iron is piling up very fast in the furnace yards. A move is under way to combine some of the Valley furnaces that sell their pig iron in the open market, but so far it has made little headway. Regular prices on steel billets are $23 and on sheet and tin bars $24, Pittsburgh or Youngstown districts, but these prices are being shaded by some of the smaller mills on open hearth stock. Shipments of finished iron and steel this month by the mills will show a heavy falling off as compared with last month. Stocks held by distributors and consumers are very light, which is shown by the fact that with many of the small orders there are wire requests for prompt shipments. The trade is evidently afraid of a break in prices, and will continue to buy very cautiously until fully assured that they are going to hold. It may take some time to demonstrate this, and should a cut come, it will be a radical one.

Ferromanganese.—Carload lots for prompt shipment are held at about $38.50, Baltimore, but there is little or no new inquiry. We quote 80 per cent. foreign, for delivery through the first half, at $38.25 to $38.50, Baltimore, the rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—The market is bare of new inquiry. We quote 50 per cent. for delivery over first half at $54 to $55, and for prompt delivery at $55 to $55.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—There has been no new buying in this market for several weeks. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—Some unevenness in prices in both Bessemer and open hearth rods has developed and reports are going that sales of Bessemer rods have been made at slightly under $28, Pittsburgh. Specifications against contracts are not satisfactory, and new demand is very dull. We quote Bessemer rods at $28 and open hearth about $28, f.o.b. Pittsburgh, but it is stated that on Bessemer rods the price has recently been shaded.

Muck Bar.—In the absence of any recent sales we continue to quote best grades of muck bar made from all pig iron at about $29, Pittsburgh.

Steel Rails.—There are no new developments regarding the large contracts for standard section rails which the leading roads are ready to place when the mills agree to meet the specifications demanded. It is stated that on 10,000 tons of open hearth rails which the Carnegie Steel Company is to roll to specifications for the New York Central the price will be $30 a ton and perhaps more. New demand and specifications for light rails have fallen off, only about 1500 tons having been booked by the local mill in the past week. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—The steel car interests are now figuring on the inquiry for 2000 steel coal cars which the courts granted permission last week to the Wabash-Pittsburgh Terminal to have built. Several roads are expected to have inquiries out soon after the first of the year. We continue to quote ¼-in. and heavier plates in the wider sizes at 1.40c., Pittsburgh, while on the narrow sizes 1.35c., Pittsburgh, is still being named. There are reports of lower prices than 1.40c. on wide plates being named by one or two mills.

Structural Material.—The McClintic-Marshall Construction Company has taken a contract for about 2200 tons for a public building in an Eastern city, and the American Bridge Company has taken about 1500 tons of bridge work for a Western railroad. The Carnegie Steel Company is now rolling the material on a contract for about 7000 tons of steel for the Minnesota Steel Company at Duluth. We continue to quote beams and channels up to 15 in. on the basis of 1.40c., Pittsburgh, but there are still persistent reports that this price is shaded by some mills as a basing price for delivery at certain points.

Sheets.—While prices are being better maintained as a result of the meeting held here last week, the sheet trade, from the standpoint of new demand, is in unsatisfactory condition, none of the mills running full. The American Sheet & Tin Plate Company is running to about 50 per cent. of its hot mill capacity, but some of the independent mills are doing a little better. The full schedule of prices on black and galvanized and on roofing sheets, affirmed at the meeting held here last week, is printed on a previous page.

Tin Plate.—It developed at the meeting of the tin plate manufacturers held here last week, that most of the large consumers are covered through the first half of next year. Specifications are coming in against these contracts at a fairly satisfactory rate, but there is very little new demand. It is stated that the market is now strong on the basis of $3.60 per base box for 100 lb. cokes, f.o.b. Pittsburgh.

Bars.—Specifications from the railroads against their contracts for iron bars are coming in a little better, but the new demand for both iron and steel bars is quiet. The makers held a meeting in this city last Thursday, and it was decided by those present to try to maintain the market on steel bars on the basis of 1.40c., Pittsburgh. This price was being quietly shaded in some cases, but it is claimed now that this has entirely disappeared. We, therefore, quote both iron and steel bars on the basis of 1.40c., Pittsburgh,

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but for delivery at certain points, notably in the Chicago district, this is shaded as a basing price.

Hoops and Bands.—Specifications against contracts are coming in at only a fairly satisfactory rate, and new demand is very light and only for small lots. It is stated that prices are being fairly well maintained except at one or two competitive points of delivery. We quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—On the small scattered orders being shipped out this month, 78c. per bundle is being charged.

Spikes.—There is no improvement in the demand, which is only for small lots to cover actual needs, while expected large orders from several of the railroads have so far failed to develop. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c., for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Spelter.—The market is much lower. We quote prime grades of Western at 5.40c., East St. Louis, equal to 5.52½c., Pittsburgh. Efforts made by East St. Louis interests to hold prices last week failed completely, and still lower prices are predicted.

Merchant Steel.—Shipments by the mills this month will show a heavy falling off as compared with November, jobbers and consumers taking in as little as possible until after inventory. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—The demand is only for small lots, while specifications from the automobile builders and the implement makers, who are ordinarily the largest consumers of shafting, have been coming in very slowly for some time. Regular discounts are being fairly well maintained, and are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Orders for wire nails and wire are light, while specifications against contracts have not been coming in well for some time. It is stated that regular prices are being quite well maintained. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—No large contracts for line pipe are being placed, as this is the dull season, but new orders in merchant pipe are about as heavy as expected in December. None of the pipe mills is operating to full capacity on account of lack of orders, but it is known that stocks held by dealers are low and a better buying movement is expected after the turn of the year. Discounts on both iron and steel pipe, printed on a previous page, are only being fairly well maintained.

Boiler Tubes.—Some large inquiries for locomotive tubes from two or three of the leading railroads are in the market and may possibly be placed before this year is out. The demand for merchant tubes is very dull and prices are more or less demoralized.

Iron and Steel Scrap.—The scrap trade is almost neglected, consumers not caring to take in material until after the first of the year. Prices are weak. Dealers quote about as follows, per gross ton, f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.50 to $13.75
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	9.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.00 to 15.25
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	7.90 to 8.00
Machine shop turnings	8.60 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	14.50 to 14.75
Heavy steel axle turnings	10.25 to 10.50

Coke.—There is no improvement in demand or prices for either furnace or foundry coke, and the whole coke trade is still in very unsatisfactory condition. The output of coke in the Upper and Lower Connellsville regions last week was 292,435 net tons, an increase over the previous week of about 3000 tons. We quote standard makes of furnace coke for prompt shipment at $1.45 to $1.50 per net ton, at oven, while for delivery over first half $1.75 to $1.80 is quoted. Best makes of 72-hour foundry coke for prompt shipment are held at about $2 per net ton, at oven, and for first half from $2.10 up to $2.50.

The corporation of Trimble, Mudge & Co., recently organized in this city with a capital of $250,000, and which took over the scrap interest of E. W. Mudge & Co., Pittsburgh, and Hazard, Mudge & Co., Buffalo, N. Y., has elected the following officers: H. N. Trimble, president; W. H. Barr, vice-president; W. S. Burchinal, secretary, and E. W. Mudge, treasurer. The new concern will become operative January 1. W. H. Barr, the vice-president, will have charge of the Buffalo interests of the company, with offices in Ellicott Square Building, Buffalo, and a scrap yard on the South Buffalo Railway at Lackawanna, N. Y. The general office will be in the Frick Building, Pittsburgh.

Crerar, Adams & Co. of Chicago, Ill., have been appointed distributers in the Chicago and St. Louis districts for the Shelby seamless cold drawn steel tubing made by the National Tube Company of Pittsburgh, succeeding the Excelsior Supply Company of Chicago, the former distributors.

Chicago

FISHER BUILDING, December 21, 1910.—(*By Telegraph.*)

A comparison with this time a year ago presents a striking contrast. The steel mills were then two to four months behind in deliveries, and buyers were ordering or specifying more than their requirements, which increased the pressure on the steel works, especially the merchant mills. This year the mills have only a small tonnage on their books, and new business is of hand to mouth proportions. Consumption is going on at a normal rate outside of industries affected by the railroad policy, and in some branches of the trade prospects are very favorable. There has never been so much structural steel work on the hands of architects and engineers as at the present time, although last week was the lightest of the year in this territory in contracts actually closed. In Chicago large building projects have been held back since last spring awaiting the new building code. The mills have figured recently on 70,000 tons of material for buildings and bridges in this city alone, and the business pending in the West is estimated at 300,000 tons. This includes only that railroad work for which definite plans have been prepared. Current specifications for structural material are light, as the fabricating shops have but little work left on their books. Stock market talk of lower prices is believed to be the principal cause of delay in placing work under contract outside of Chicago, as financial conditions are now favorable. There is not much new business in steel bars, and the railroads are only ordering bar iron for repair work. The wire mills are running about 70 per cent., a good showing for this season. The sheet business is slowing down, and operations after the turn of the year will depend on the volume of orders held back by jobbers pending their annual inventory. The Great Northern car order excites favorable comment, but large orders from other Western roads are not expected until the rate case at Washington is decided, as the roads will be able to get through the winter now and will not need any material increase in equipment until next fall. The scrap market continues weak and dealers have difficulty in disposing of material in transit. December has recorded the lowest prices of the year for scrap, and many steady buyers are carrying large stocks, which make new offerings unattractive.

Pig Iron.—Trading in pig iron in this territory is limited to small orders. On Southern iron, $11, Birmingham, is now generally recognized as the going price for the first half, and occasional lots for prompt shipment have been sold at concessions from this figure. The furnaces are taking very little business, as buyers have generally covered their requirements for the first quarter and many will wait until they can buy for second and third quarters. Northern iron is weaker under Valley competition, as Valley furnaces are shading $16 for Chicago delivery for first quarter and first half. Local furnaces are now meeting the $16 price for first quarter, for delivery in Chicago. This is equivalent to $15.50, at furnace, for shipment to outside points. Purchases with few exceptions are limited to small lots for short delivery periods. A remarkable feature of the Western market the past year is that the price has shown a weakening tendency after each buying movement. During the moderate movement last month in Southern iron a con-

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siderable tonnage was sold at $11.50 for first quarter and first half. Leading furnace interests are becoming more confident of a turn in conditions before the second quarter of the year. The following quotations are for December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern car foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	18.40 to 18.90
Jackson Co. and Kentucky silvery, 8%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 10%	20.40 to 20.90

(*By Mail.*)

Billets.—The trade is quiet, with the price of forging billets nominal at $28, base, Chicago.

Rails and Track Supplies.—The open hearth rail mill at Gary was closed down last week. The Bessemer mill at the South Works continues in operation. The demand for track supplies is very light. It was confidently expected two months ago that a good tonnage of rails would be booked in Chicago before the end of the year, but railroads continue to hold back all purchases except for repair work, and they may follow this policy until the question of an advance in rates is decided. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.20c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—No important contracts are reported from any Western city for last week. In Chicago the new building code, although it has passed the Council, has not become law, as it requires a formal publication. This has been delayed by one unsettled question, the permissible hight of steel buildings. The old code fixed the limit at 260 ft. The mills have recently figured on 70,000 tons of plain material to go into river bridges and large buildings in Chicago. From Chicago territory to the Pacific Coast it is estimated that pending projects amount to nearly 300,000 tons. In the United States the work in prospect for the fabricating interests, including only railroad work for which actual plans have been prepared, is estimated at over 800,000 tons. For the present the letting of contracts has been checked by the talk of a possible reduction in steel prices. Financial conditions are now more favorable. Prices of plain material continue firm, but current business is light. The fabricators have little business on their books. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The Great Northern Railway has ordered from the American Car & Foundry Company the 500 ore cars on its recent inquiry, and may buy the 75 tank cars this week. The specifications for 400 special hopper cars will be revised. This is the first good steel car order placed for some months by a Western road. The plate mills have but little business. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The Inland Steel Company will close eight of its sheet mills this week, and may shut down the others next week. Current business is light, owing to the general tendency of jobbers to reduce stocks before taking inventory. Prices are firm, but there is not enough desirable business pending to give the market a severe test. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The bar iron business is picking up, especially from the railroads, whose specifications are steadily increasing. The mills are getting orders for quantities as large as 500 to 1000 tons with specifications for prompt shipment. This is the only line in which the railroads are reported buying freely. There is a fair amount of new inquiry for soft steel bars, some from the manufacturing trade and some from contractors for concrete work. The best inquiries at present for concrete bars are from the Southwest. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.40c. to 1.45c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—The wire mills are running better than any other important branch of the steel industry, as they are running about 70 per cent. Jobbers are giving good specifications for January and February shipment, especially in the South and Southwest, where trade conditions are very favorable. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—The agricultural demand has not been affected by the recession in the steel industry, and specifications for special grades of agricultural steel continue very satisfactory. Some of the automobile manufacturers are making 75 per cent. of last year's output, but the majority have curtailed operations 50 per cent.

Cast Iron Pipe.—Business is quiet in this territory and not much is expected until January, when good specifications will be advertised by Northern cities. The gas companies are inquiring for their requirements for next year. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The recent slump in scrap has apparently spent its force and the market is steadier, though weak. Western railroads have not established any minimum selling price on rerolling rails, but the recent decline was at the expense of the dealers, who had bought from the railroads at higher prices, expecting a more active demand this winter. Steel mills are slow in taking open hearth scrap, and the rolling mills are carrying heavy stocks of wrought material. Even foundry scrap has weakened, and No. 1 cast seldom brings a better price than $12.25, delivered. The system which has grown up of selling scrap to consumers while it is in transit, and reconsigning cars to the purchasers, saves expense of unloading and reloading material, but makes the market very sensitive. The check in consumption caused by the inventory season has made it hard for dealers to place shipments which are arriving. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$15.50 to $16.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50
Shoveling steel	11.50 to 12.00

The following quotations are per net ton:

Iron angles and splice bars	$13.50 to $14.00
Iron car axles	18.50 to 19.00
Steel car axles	18.25 to 18.75
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.00 to 10.50
Steel axle turnings	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	12.25 to 12.75
Stove plate and light cast scrap	10.50 to 11.00
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	8.75 to 9.25

Philadelphia

PHILADELPHIA, PA., December 20, 1910.

Characteristic year-end conditions prevail. With the exception of several fair sales of pipe iron, little has been done in pig iron. In some instances deliveries are being curtailed, pending inventory work. The volume of business coming to the finishing mills shows little change. Orders for 4000 tons of rails for prompt delivery have been placed with one of the Eastern mills by the Norfolk & Western Railroad, while an inquiry is out for 15,000 tons of the Chesapeake & Ohio. The Pennsylvania Railroad and the mills are reported as getting closer together on rail specifications, but nothing definite has been done. There has been little movement in old material.

Iron Ore.—The market is at a standstill. Importations at this port during the week ending December 17 aggregated 22,703 tons, valued at $67,130.

Pig Iron.—The principal movement has been in low grade irons, one sale of 6000 tons being reported for delivery during the next few months. Pipe makers are still in the market, with inquiries for about 10,000 tons. In the higher grades of foundry iron several transactions covering quantities up to 300 tons of both No. 2 X and No. 2 plain grades are reported, but the majority of the sales have been in smaller amounts. Standard eastern Pennsylvania brands of No. 2 X foundry are comparatively firm at $15.50 to

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$15.75, delivered in this vicinity, shipment extending over various periods up to the end of the first quarter. There is less disposition on the part of some producers to make the usual 50c. differential between No. 2 X and No. 2 plain grades, and in instances but a 25c. differential is quoted. Sales of Virginia foundry grades have been confined to small lots, the principal sellers firmly maintaining the $13 furnace basis for either No. 2 X or No. 2 plain grades, equivalent to a minimum of $15.80, delivered in this vicinity. Very little movement in forge iron is reported; one inquiry for 600 tons is before the trade, but no sales are reported. Makers hold pretty firmly at $14, Eastern furnace, for this grade, equal to $14.25, delivered, according to destination. In basic iron, one consumer is still feeling around for a moderate lot for early delivery, which would be taken if the price was low enough. Sales of several hundred tons of low phosphorus iron have been made at $22.50, delivered in this vicinity. Inquiries for pig iron generally are falling off, as is customary at this season. While there has been no further curtailment in production announced, it is believed that a further blowing out of furnaces will take place during the early months of next year. Quotations are unchanged, the following range representing the market for standard eastern Pennsylvania brands, delivered in buyers' yards in this vicinity during the first quarter:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—Practically no demand from consumers in this territory is reported. While the leading sellers name $38.50, Baltimore, as a nominal quotation for first half delivery, offerings for prompt shipment are reported at $38.25, seaboard.

Billets.—Business has been very light, principally small lots for early delivery. Eastern mills name $25.50 for ordinary open hearth rolling billets, but would meet Western prices, which would be $25.40, delivered in this vicinity. Forging billets, while not particularly active, are firm at $28, Eastern maker's mill, the usual extras being added for high carbons and special sizes.

Plates.—Individual orders are not large as a rule, and cover the full range of consumers' requirements. There is practically no forward buying being done. Mills are firmly maintaining the minimum quotation of 1.55c. for ordinary plates, delivered in this vicinity, the same price being quoted in instances for either large or small lots. A moderate tonnage of plates for the new Heckscher Furnace is expected out in the near future.

Structural Material.—A fair run of miscellaneous business comes out, but little has developed in propositions requiring any large quantity of shapes. Several moderate building projects are still under negotiation. Mills are operating at an unchanged basis, but the amount of old orders on their books is gradually becoming smaller. Prices are firm, at 1.55c. for plain shapes, delivered in this vicinity.

Sheets.—Mills are catching up with orders on hand and preparations are being made for the usual year-end shutdown. In some instances part of the capacity has already been closed down and, unless there is a rush in the demand, will not start up again until after the first of the year. Eastern mills are holding prices firmly, the following range being quoted for early deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—While the bulk of the business is small, several round lots of refined iron bars for delivery over the first quarter have been placed at prices ranging from 1.25c. to 1.30c., Eastern mill. For the general run of prompt business, 1.35c. to 1.45c., delivered, is quoted. Specifications on steel bars, particularly from agricultural makers, have been heavier. Quotations for steel bars are named at 1.55c., although independent mills are understood to have slightly shaded that quotation.

Coke.—With the exception of an occasional transaction in furnace coke, very little business comes out. Negotiations are still pending for next year's supplies of furnace coke, for which quotations range from $1.65 to $1.75, at oven. The foundry coke market is quiet, with transactions closely confined to small lots for early delivery at unchanged prices. Quotations range about as follows per net ton, delivered in buyers' yards in this vicinity:

Connellsville furnace coke	$3.90 to $4.00
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.50 to 3.60
Foundry coke	3.85 to 4.05

Old Material.—Mills are taking on occasional bargain lots, but are not buying for extended delivery. Odd lots of heavy melting steel have been sold at $12.50, delivered, but some consumers are willing to pay $13 for strictly high grade material. Rolling mill grades have been particularly dull and there is a tendency toward lower prices. While quotations are to a large extent nominal, the following range about represents sellers' ideas of the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$12.50 to $13.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 18.50
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.00 to 17.50*
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.75 to 16.25
Wrought iron pipe	12.25 to 12.75
No. 1 forge fire	11.00 to 11.50
No. 2 light iron	7.00 to 7.50
Wrought turnings	8.00 to 8.50
Cast borings	8.00 to 8.50
Machinery cast	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Grate bars	11.00 to 11.50
Stove plate	10.00 to 10.50

* Nominal.

The Alan Wood Iron & Steel Company has decided to go ahead with the erection of an alternate blast furnace stack at its Heckscher plant. Much of the work of grading and building of foundations will be done at convenient times by the company itself. The stack will have a capacity of 350 to 400 tons a day, and will only be put in commission when one of the other furnaces is out of blast, using the blowing engines of the idle stack. Julian Kennedy, engineer, Pittsburgh, Pa., will have charge of the erection of the furnace and will shortly place contracts for at least a part of the shell plates required.

Sloan, Howell & Co., iron, steel and supply merchants, formerly located at 1625 Real Estate Trust Building, Philadelphia, have changed the title of the firm to Sloan & Co., without any change in the officials of the concern. The offices have been removed to suite 1520, in the same building.

Cincinnati

CINCINNATI, OHIO, December 21, 1910.—(*By Telegraph.*)

Pig Iron.—The week opened up with a scarcity of both inquiries and orders. Contract iron is moving about as usual, but new business is confined to a small tonnage from the jobbing foundries and stove makers to fill out immediate requirements. Local agencies generally believe that soon after the first of the year a turning point for the better will be reached, and that as soon as a buying movement is started prices are expected to recover much faster than they eased off. Southern No. 2 foundry is quotable for either prompt or first quarter shipment at $11, Birmingham, and a firm offer at this figure would probably be accepted by some producers for first half delivery, although several are maintaining $11.50 for the second quarter. Northern No. 2 foundry is unchanged at $14, Ironton, for any delivery until July. Malleable is not in demand, but is quotable around $14.25 to $14.50. For the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 15.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Curtailment of furnace coke production is about keeping pace with that of pig iron, but in the Connellsville field there is still some cheap spot shipment coke. Last week about 8000 tons of furnace coke was sold, for immediate shipment, on a basis of $1.45 per net ton at oven, but $1.50 to $1.60 represents the average prices in all three districts for spot shipment, with $1.65 to $1.85 named for contracts. Foundry coke is only being sold in small quantities and the movement on contracts previously made is reported to be slackening up somewhat. Spot foundry is quoted around $2 and contract foundry at about $2.25 per net ton at oven in the Wise County Pocahontas and Connellsville fields.

Finished Iron and Steel.—Several inquiries are out for splice bars and car material from the railroads, but little actual business is being transacted. The price of 1.35c. is still being made by some of the independent mills for certain widths of plates, but 1.40c., Pittsburgh, is strictly adhered to by the larger interests. Structural material is moving

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slowly, but a good spring business is anticipated. Warehouse prices on structural material remain from 1.75c. to 1.85c.

Old Material.—The market continues very quiet, with prices a little lower than those prevailing for some weeks. Railroad offerings are light. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 6.50
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, December 20, 1910.

Iron Ore.—A few reservations of Old Range Bessemer ore for the coming season have been made in the past few days, the purchasers agreeing to pay the market price as determined later. It is not expected that the ore firms will take up the question of prices until well along in the spring, as the general buying movement next year will be very late. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The market has settled down to a spell of almost complete inactivity. There are practically no sales or inquiries, and selling agencies generally have deferred efforts to book tonnage until after the first of the year. Shipments have fallen off considerably during the week, as the result of requests from foundries that shipments be held up until January. A few inquiries that came out during the first half of the month have not yet resulted in the placing of orders. Prices remain stationary, but there has not been an inquiry of sufficient size for some time to thoroughly test the market. For first half delivery one local furnace is holding to $14.25 for No. 2 foundry, delivered, and another furnace is not shading $14.50. Another Central Western furnace, No. 2 stack of the Detroit Iron & Steel Company, has gone out of blast. Repairs have been completed to the furnace of the Upson Nut Company, Cleveland, but the blowing in of this stack has been indefinitely deferred. For prompt shipment we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.90
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—The Canada Iron Corporation, Midland, Ontario, has closed a contract for its furnace requirements during the entire year, amounting to 7000 tons per month, on a sliding scale basis. The foundry coke market is generally quiet. A few inquiries for first half are pending, and there is some demand for small lots of spot coke. Prices are stationary. We quote standard Connellsville furnace coke at $1.45 to $1.55 per net ton, at oven, for spot shipment, and $1.75 to $1.80 for the first half. Connellsville 72-hour foundry coke is held at $2 to $2.10 for spot shipment and $2.15 to $2.50 for the first half.

Finished Iron and Steel.—Mill agencies and jobbers report a light demand for all finished lines. Current orders and specifications are both small in number and for small lots, few being for as much as carloads. Consumers generally are allowing their stocks to run quite low. Prices on steel bars and structural material are firm, at 1.40c., Pittsburgh. The demand for plates continues dull, and the usual shading is being done by mills making only the narrow sizes. Very little sheet business has come out since the meeting held in Pittsburgh two weeks ago to attempt to hold up prices to the regular quotations, and prices appear to have so far been maintained, although no inquiry has come out of sufficient size to test the firmness of the market. The demand for structural material is light. Local fabricating plants have only a limited amount of work on hand. While the outlook is very promising, none of the prospective local work is expected to come out until after the first of the year. Among new work for next season that developed during the week is a 14-story office building to be erected by the Lender Printing Company in this city. Bids have been rejected for the Pingree Building in Detroit, requiring 800 tons of steel, and the plans will be changed somewhat. The demand for iron bars continues light, but both of the local mills are running this week. Prices on iron bars are weak, at 1.30c. to 1.35c., Cleveland.

Old Material.—The market is lifeless. Not only are the local mills buying nothing, but they are refusing to take shipments of scrap on contract. All of the local mills have fair sized stocks on hand, and they are expected to hold back on shipments until after the first of the year. The continued absence of a demand has had a decidedly weakening tendency on the market, and quotations are nominal, there being no sales on which to base new prices. In view of this condition we have not changed last week's quotations, but it is certain that should any actual business develop it would be done at prices below present quotations on practically all grades. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	19.50 to 20.00
Heavy melting steel	12.75 to 13.00
Old car wheels	12.50 to 13.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	11.75 to 12.00
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	12.75 to 13.25
No. 1 cast	12.50 to 13.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., December 19, 1910.

Pig Iron.—A considerably smaller tonnage is reported sold the past week than the week previous, with less specific information relative to the disposition of producers in the matter of price for round tonnages and forward deliveries. It is understood that so far none of the offers of a lower basis than $11, Birmingham, for No. 2 foundry, has been accepted even for lots of 1500 tons and upward, yet it has been rumored that spot shipment was had at $10.75, with $10.50 mentioned as the probable consideration in a lot of 500 tons. The sales that were reported are in the main lots of 150 tons to 350 tons each, for shipment during the next 60 to 90 days. A lot of 350 tons for strictly second quarter shipment is reported sold at $11.25. The most significant development within the week was the announcement that four furnaces now in blast on foundry grades would be blown out prior to January 15, with an intimation that a fifth stack would go out about February 1. In view of the curtailment to be effected and the heavy movement from furnace yards immediately after January 1, reasonably expected by reason of the resumption of foundry operations at that time, producers generally anticipate a stronger market for prompt or comparatively early shipments. As a matter of fact, three of the local interests are now practically out of the market by reason of their refusal to meet current prices. It is also a fact that no merchant iron is being offered at present and that the majority of warrant holdings represent a considerable higher price than could now be obtained. Such conditions will, of course, not be without effect on the market price, but the extent to which the demand will take definite form after January 1 is no doubt the most important consideration. The bona fide inquiries now pending are attractive in the aggregate, but with the buyers disposed to await further developments.

Old Material.—The aggregate movement is very small comparatively, and, as in the case in the pig iron market, prices are very much at variance. For certain grades dealers are disposed to advance their asking prices, but the buyers of all grades continue to provide for their requirements on the hand-to-mouth order. We revise dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$14.00 to $14.50
Old iron rails	12.00 to 12.50
Old steel axles	14.00 to 14.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	7.50 to 8.00
No. 2 country	7.00 to 7.50
No. 1 machinery	9.50 to 10.00
No. 1 steel	10.00 to 10.50
Tram car wheels	9.00 to 9.50
Standard car wheels	10.00 to 10.50
Light cast and stove plate	7.50 to 8.00

Cast Iron Pipe.—Report has recently been made of several significant bond issues for improvements to water systems and the aggregate tonnage known to be under consideration is large. The business represented by definite inquiries recently received is of small volume. There has been no change in quotations, producers not being disposed to make further concessions in order to move their stock accumulations. It is understood that all local plants will be closed down for a period of 10 days or more after this week for the annual inventories. The aggregate of unfilled orders

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at the close of the year will probably be less than was anticipated some moths ago. We quote water pipe as follows, per net ton, f.o.b. here: 4 to 6 in., $19 to $19.50; 8 to 12 in., $18 to $18.50; over 12 in., average, $17, with $1 per ton extra for gas pipe.

The Republic Iron & Steel Company is preparing to blow out one furnace at its Thomas plant for relining. The furnace of the Southern Iron & Steel Company, at Trussville, has been blown out. The plant of the Gadsden Pipe & Fittings Company, at Gadsden, Ala., recently destroyed by fire, will not be rebuilt.

Buffalo

BUFFALO, N. Y., December 20, 1910.

Pig Iron.—Exceedingly quiet conditions prevail. Many consumers are either proceeding with inventories or clearing their yards in preparation, and are not taking iron from the furnaces on contract as freely as they otherwise would. The aggregate of inquiry is less than for any week in the past two years, and orders have also been at a minimum rate. It is probable that on offers for good sized tonnages or specially desirable business some furnaces would shade the prices scheduled below, but in a general way they approximate the market as closely as possible for prompt and first quarter deliveries, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No. 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—New business has consisted principally of small orders for rush material, so that, while the demand on the jobbers has been quite good, the demand on the mills and shipment from the mills have been comparatively light. An encouraging feature of the situation is that some purchasers are asking that their contracts which expire the first of the year be extended to cover the first quarter of 1911 at the same prices. In bar and plate material prices are firm at 1.40c., Pittsburgh, with the exception of iron bars, which are being quoted a little under this rate. A small order for Wemlinger type of sheet piling has been placed for bridge abutment work on the West Shore Railroad in western New York and an inquiry is in the market for sheet piling of the same type for sewer construction work at Niagara Falls. The Canadian export trade continues in good volume in all lines. A large amount of railroad material has been ordered by Canadian car builders recently. The agency of the leading interest reports an aggregate of 20,000 tons having recently been placed covering railroad requirements for different parts of the Dominion and 2500 tons of plates have lately been taken for shipbuilding requirements. In structural material lines it is evident that a number of large building projects will take definite form early in the year, steps having been taken during the last two or three weeks to put into definite shape several such projects which had been held in abeyance for some time. The Lackawanna Bridge Company has taken Erie Canal contracts for 1600 tons of bridge work at Lockport and 1200 tons for near Syracuse. Bids are now being received for additional bridge work in connection with canal contracts.

Old Material.—Little business is being transacted and most consumers are holding back shipments on contracts. The demand for borings and turnings, which was somewhat active for a week or more, has eased off, buyers' requirements being pretty well taken care of for some time ahead. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$11.75 to $12.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	9.75 to 10.25
Locomotive grate bars	10.50 to 11.00
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast borings	6.50 to 6.75

St. Louis

ST. LOUIS, MO., December 19, 1910.

Pig Iron.—Some of the leading brokers did quite a good business in pig iron the past week, when the general situation and the near approach of the holiday season are considered. One sold in the aggregate 2000 tons of Southern foundry iron, for shipment this month and over the first quarter, and was also in receipt of inquiries totaling 1500 to 1800 tons, principally for Southern No. 2 foundry. Another agency sold upward of 1000 tons of Southern in small lots for forward shipment. A third stated that it had secured some good sized contracts. An inquiry is reported for 600 tons of analysis iron from an Illinois stove company for shipment over the first half, and another inquiry for 300 tons of Southern No. 2 foundry, same shipment. A sale of 300 tons of 8 per cent. silicon was made to a local stove company. While in some instances a higher price is asked, we quote Southern No. 2 foundry for shipment over the first quarter at $11; second quarter, $11.25, f.o.b. Birmingham.

Coke.—The only sale of importance was 1000 tons of foundry coke. The market is weak, but we continue the quotations of last week: $2 to $2.25 for best 72-hour Connellsville foundry per net ton, f.o.b. oven.

Old Material.—The market is weaker, owing to absence of new business or the prospect of any of consequence until after the turn of the year. Relaying rails continue in demand, but are easier. The only railroad list on the market the past week was that of the Mobile & Ohio, 1175 tons. The quotations reflect conditions, and are in some instances off 25c. to 50c. per ton. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	12.75 to 13.25
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.00 to 9.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.00 to 9.50
Railroad tank and sheet scrap	9.00 to 9.50
Railroad grate bars	8.50 to 9.00
Machine shop turnings	7.50 to 8.00

The German Iron Market

Bar Prices Weakening

BERLIN, December 8, 1910.

The market remains very quiet, with perhaps a slight weakening of the general tendency. Opinions regarding the situation, however, are not wholly agreed, some observers being disposed to regard the course of the trade as quite satisfactory, while most of the market reviews admit a waiting tendency in most lines of goods. Some say that orders are coming in very slowly, and that in certain classes of goods the amount of work on hand will not keep the mills busy longer than a few weeks. The section of the market that attracts most attention continues to be the bar trade. It is generally admitted now that price cutting has become very general in this specialty, so that the price convention can hardly be said to exist. According to agreement it is to last until the end of March, and it already seems very doubtful that it will be renewed. Some of the members think it would be better for the convention to terminate at once, rather than have the existing uncertainty continue. The present demoralization of prices is giving foreign markets a good opportunity to buy German bars at low rates. It is asserted in the reviews that German mills are selling for export at as low as 95 marks per ton, on board ship at North Sea port. The home price is nominally 112 to 114 marks, according to quantity ordered. Within the past few days offers of bars at 105 in the central districts of the country have been made.

The pig iron market remains in a satisfactory position. There is no let-up in production, and iron appears to be going into consumption as fast as produced. The foreign demand is active. Exports in November reached 66,600 tons, against 48,800 tons for November, 1909. Home consumers are calling for iron on contract at a rate satisfactory to furnacemen. It is said to be difficult to get suplementary orders filled on short notice. The consumption of old material continues heavy, but the supply coming upon the market is ample. In the Silesian district dealers in old iron raised their prices in November about 3 marks per ton. The situation in the ore market has hardly changed;

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prices are firmly maintained, both for home and foreign qualities.

Conditions in Finished Lines—Larger Allotments Asked

In half rolled steel material consumers are calling for goods on order at their regular pace. Nearly all have provided for their requirements to the end of the March quarter. The English market continues to make an active demand, which has not been influenced by the political excitement there. Belgian competition is felt there less sharply now, and American competition is hardly felt at all. In beams and other structural forms business is rather quieter in view of the advanced season of the year. In steel rails home business remains very far below normal, but the union has greater foreign orders than ever before. There are excellent prospects for good orders for lighter and grooved rails. Heavy rails for export cost 105 to 110 marks, on board ship; light rails for secondary railroads in the home market, 135 to 140 marks, and grooved rails, 140 to 145 marks.

Business in plates has grown slacker. In lighter plates some of the mills are so short of work that they can fill orders within a week or two. The demand for ship plates has gradually reached a normal level. The combination controlling this product, however, is meeting with some trouble in securing its prolongation, as several smaller works are demanding bigger allotments. A meeting will be held December 21 to try to arrange for its renewal. The Steel Works Union is also to hold a meeting December 20 to consider a proposal to increase the allotments in plates and piping. The Thyssen Company is demanding an increase of 20 per cent. in its allotments in piping, and the Rheinische Stahlwerke is asking for an increase of 10 per cent. in plates and bars. It is hardly believed that the union will grant these increases. The allotments in bars already amount to 3,475,000 tons. The market, as shown above, is demoralized, and it can hardly be expected that the organization will permit an increase of 347,500 tons to further glut it. The shipments of bars for the first 10 months of the year amounted to 2,842,000 tons, against 2,363,000 for the like months of 1909. In tubes they amounted to 100,200 tons, against 76,400 tons, and in plates to 808,400 tons, against 728,400.

The hardware trade has continued to improve at a moderate pace. The outlook for builders' hardware is regarded as promising; considerable orders for spring delivery are already coming in. At Solingen business in cutlery and other steel goods is very active, the Christmas trade having been quite heavy. Manufacturers of swords, sabers and bayonets are working on big foreign orders. There is a heavy demand for parts of automobiles and bicycles. The manufacturers of screws have just advanced their prices by reducing the rebate 3 to 4 per cent., an advance that was felt to be much needed. Business in wire and wire nails has grown rather quieter. Export business is meeting with sharp competition from foreign producers.

Foreign Trade

The latest reports from the Belgian market show that the firmer tendency recently reported continues, and it is counted upon to last, at least, through the first quarter of 1911. The American situation is attracting close attention. The decision of the United States Steel Corporation to restrict production rather than reduce prices has been commented upon favorably in the German trade. The event makes the impression that conditions on your side will, at least, become no worse than they are, and it is even believed that the decision of the corporation will soon cause orders to come out which had been held back with the hope of getting more favorable terms.

The following are Germany's exports of the leading kinds of iron and steel in November, as compared with those of a year ago, in metric tons:

	1910.	1909.
Pig iron	66,625	48,819
Half-rolled material	42,275	44,000
Beams	21,726	23,380
Steel rails	47,086	40,330
Iron ties	6,786	15,335

The Krupp Company has just declared a dividend of 10 per cent., against 8 per cent. last year, on its capital of 180,000,000 marks.

New York

NEW YORK, December 21, 1910.

Pig Iron.—Business closed in the past week includes 1500 tons for a Newark, N. J., foundry and 1500 tons for a malleable foundry in New York State. The inquiry from a nearby New York State point for 2500 tons is still pending. A number of 100-ton lots have been asked for, and there are other indications that foundrymen are not interested in supplying their wants very far into 1911. Furnaces seem to be making more effort to sell, and the market is therefore distinctly in the buyer's favor. We continue our quotations for tidewater deliveries as follows: Northern No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $14.75; Southern No. 1 foundry, $15.50 to $15.75; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—Inquiry, particularly for structural material, is better than for some time. A number of the railroads are in the market for their requirements in bar iron and track supplies for the year 1911. The Delaware, Lackawanna & Western is inquiring for 5000 tons. The Chesapeake & Ohio has already closed for 3500 tons. Plates in this territory are in very poor demand. A disappointment has been the holding up of awards on the material for the battleship which was to be built at the New York Navy Yard since the estimated cost will exceed the appropriation. The Worth Brothers Company was low bidder for the plates. Rumor has it that the Quebec Bridge award has gone to an English company. Bids on the revised specifications for the post office at the Pennsylvania Terminal went in December 20; as it now stands, about 6000 tons will be needed. Only the three low bidders on the original contract were asked to rebid, Richard E. Heningham, George A. Fuller Company and John Gill & Sons. Bids were received December 19 on the 3000 tons for the Sloane Building, but the award is not yet announced. Award on the bids for the Harlem prison, 3000 tons, has been held up by an injunction, the enjoiner holding that the specifications were prejudiced; P. J. Carlin was low bidder. Bids have been submitted on 2000 tons for the Masonic Temple addition, New York, and have been asked for another at Washington. D. C., 1000 to 2000 tons. December 22 bids go in on 2000 tons for an appraiser's store in Boston, and January 14 on the new building for the Bureau of Printing and Engraving at Washington, 7500 tons. No results are reported on the bids asked by the Thompson-Starrett Company for the Greeley Square Hotel. It is confirmed that the Public Service Electric Co. is in the market for 1000 tons for a power house at Perth Amboy, N. J. A lumber wharf is reported as being planned at New Orleans which will require about 1500 tons of structural steel. Cramp & Co. have the general contract for the extension to the Packard Motor Company building in Philadelphia, for which 1000 tons will be needed. H. J. Spieker & Co. were awarded 500 tons of reinforcing bars and the Toledo Iron Works 500 tons of structural material for the two high schools to be erected in Cleveland, Ohio. The Eastern Steel Company will furnish 100 tons for an extension to a cement plant in New York State. An inquiry is in the market for a Scherzer rolling lift bridge in New Jersey, which will take 300 to 400 tons. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Steel Rails.—A sale of 2000 tons has been made by the Pennsylvania Steel Company to a trolley road in Connecticut. The Illinois Steel Company sold 3800 tons last week, including 1000 tons for the Toledo, Peoria & Western and 2000 tons to a frog and switch company. The Tennessee Company will roll 5100 tons of 70-lb. rails for the Mexico Northwestern Railway. The Carnegie Steel Company has taken a contract for 6700 tons of 85-lb. rails for the Pittsburgh & Shawmut Railroad Company and has sold 1000 tons for frogs and crossings.

Ferroalloys.—Ferrosilicon is in good demand and it is being offered in this market at around $55.50, Pittsburgh. Ferromanganese is fairly active, but prices continue weak; sales have been made in this market at $38.50 seaboard, for delivery over the first half, and there are reports of transactions at lower prices.

Cast Iron Pipe.—The city of Baltimore opens bids today on 2760 tons, including specials, the pipe ranging from 3 to 36 in. The Board of Trustees of Angola, N. Y., will open bids January 11 on about 850 tons of water pipe, 50 hydrants, with valves, boxes, &c., and a steel standpipe, in accordance with plans and specifications of Witmer & Brown, water works engineers, Chapin Block, Buffalo. General conditions are quiet, as usual at this season. Carload lots of 6-in. are quoted at $22 per net ton, tidewater.

Old Material.—The most interesting feature of this branch of trade is the development of an export demand. Several thousand tons of steel melting scrap are wanted for shipment to Europe, the price offered being somewhat above that prevailing for domestic business, which indicates the better condition of trade across the Atlantic. It is expected that the beginning of an export trade thus made will lead to fairly large proportions, unless an improvement should occur in the domestic market, causing a rise in home prices. Domestic business is exceedingly quiet. Not only are orders light, but dealers generally are being requested

THE IRON AND METAL MARKETS

to withhold shipments on contracts until after January 1. Such sales as are now being made are only when very attractive prices are quoted to buyers. A sale of a quantity of wrought scrap was made to a mill in the central part of the State at $11.50, delivered. While the demand from the foundries is small at present, cast scrap is about as firmly held as anything on the list, except wrought pipe, on which new specifications of such a rigid character have been made by buyers that dealers are much stiffer in their views as to prices since they face the danger of larger rejections than heretofore. Dealers' quotations, per gross ton, New York and vicinity, are as follows:

Rerolling rails	$10.50 to $11.00
Old girder and T rails for melting	10.00 to 10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	12.00 to 12.50
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	10.00 to 10.50
Light iron	5.00 to 5.50
Cast borings	5.50 to 6.00
Wrought turnings	5.50 to 6.00
Wrought pipe	9.50 to 10.00
Old car wheels	11.50 to 12.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, December 21, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Dec.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
15	13.00	12.75	38.17½	4.50	4.35	5.85	5.75
16	13.00	12.75	40.00	4.50	4.35	...	...
17	13.00	12.75	....	4.50	4.35	...	...
19	13.00	12.75	....	4.50	4.35	...	...
20	13.00	12.75	38.45	4.50	4.35	5.75	5.65
21	13.00	12.75	37.90	4.50	4.35	5.75	5.65

Pig tin continues high, but is in small demand. Copper is listless and weak. Spelter has slumped. Lead is very quiet.

Copper.—The demand for copper is very limited. Consumers are buying but sparingly and are shopping about considerably with the idea that they can obtain concessions. It is hard to tell precisely what sellers are doing, but it is known that prices are weak, and considerable shading has been done. Copper producers are delivering metal which was ordered last month for December and January delivery, but they are booking little in the way of new orders. Most of the open quotations made in this market name lake copper at 13c. and electrolytic at 12.75c. The London market closed to-day with spot copper selling at £56 18s. 9d. and futures at £57 3s. 9d. The sales amounted to 500 tons of spot and 250 tons of futures. The market closed steady.

Pig Tin.—Consumers of pig tin here are entirely at the mercy of the London syndicate, which is in control of the market. Business here is very dull, but notwithstanding that the price of tin for spot delivery continues high. The quotations here follow the London fluctuations closely, and as stocks are rather scarce it appears that American consumers will be obliged to pay according to the London operators' dictation for the next few weeks at least, no relief being looked for until there are better shipments from the East. Yesterday there were offerings of pig tin at 38.35c., but no buying was reported at that price. As a matter of fact, consumers are taking the metal in very small quantities. In New York to-day pig tin was sold for 37.90c. The London market closed with spot tin selling at £172 5s. and futures at £172 12s. 6d. The sales amounted to 120 tons of spot and 770 tons of futures. The market closed firm.

Tin Plates.—The market is very quiet. Stocks are plentiful, but the price continues firm at $3.84 for 100-lb. coke plates.

Lead.—There is very little buying at this time, but the present position of lead is attracting considerable attention because of an announcement made by a representative of the leading interest to the effect that the production has been materially reduced within the last six months. It is hard to decide whether the recent advance in the price of lead was caused by a growing demand or came about because of an arbitrary decision to raise prices made by the leading interest. Just now lead is held at 4.50c. in New York and the price in St. Louis is 4.35c. The leading interest is in control of the situation in this market, but in St. Louis outside sellers are making the price.

Spelter.—The spelter market is very uncertain. There is little demand, and it is apparent that there are some large holders who are anxious to realize. What caused the break in the market is not known, but it is generally conceded that the tacit agreement which seems to have existed between the leading producer and the larger sellers has been broken. The metal can now be bought in this market at around 5.75c.

Antimony.—Cutting continues and Cookson's is quoted at a very low price. Sales have been reported at 7.50c., but the usual price for Cookson's is 7.62½c. Hallett's can be bought at around 7.75c. Chinese brands are selling at 7.25c. and Hungarian grades can be had as low as 7c.

Old Metals.—The market is of a holiday character and not enough business is being done to establish exact quotations. Dealers' selling prices are nominally unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, December 20.—The demand has slackened for the metals, but a fair amount of copper has been sold, deliveries running into March. The railroads are steady buyers. Spelter is weak and the recent sharp decline has encouraged buyers to wait. The fluctuations in tin do not make much change in the Chicago price. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 39c.; small lots, 41c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.60c. to 5.65c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 12c.; red brass, 11c.; yellow brass, 9c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 24½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, December 19.—Lead is quiet and held at 4.37½c. to 4.40c.; spelter is easier and quoted at 5.45c. to 5.50c., both at East St. Louis. Zinc ore is weaker and quoted at $39 to $41, Joplin base. Tin is held at 38.90c. per pound; antimony (Cookson's), 8.10c.; lake copper, 13.30c.; electrolytic, 13.20c., all at St. Louis. The demand for finished metals the past week was moderate in volume. The leading manufacturer reports sales to date for the year of 4,100,000 lb. of coffin hardware metal, east of Pittsburgh.

Iron and Industrial Stocks

NEW YORK, December 21, 1910.

The stock market has been exceedingly dull, transactions having been much lighter than during the previous period. Fluctations have been within narrow limits. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	8¼ - 8⅝	Railway Spr., com.	31⅛ - 32
Allis-Chalm., pref.	27 - 30	Railway Spr., pref.	92 - 92⅜
Beth. Steel, com.	29 - 29¼	Republic, com.	30⅜ - 31
Beth. Steel, pref.	59 - 59¼	Republic, pref.	93½ - 94
Can. com.	9⅜ - 9⅝	Sloss, com.	49⅝ - 50
Can. pref.	75⅜ - 77¼	Pipe, com.	15⅝ - 16¼
Car & Fdry, com.	49½ - 51⅛	Pipe, pref.	52 - 53⅛
Steel Foundries	42⅛	U. S. Steel, com.	71⅞ - 73⅞
Colorado Fuel	31¼ - 32	U. S. Steel, pref.	116⅛ - 116⅞
General Electric	153⅜ - 157	Westinghouse Elec.	66½ - 68½
Gr. N. ore cert.	55½ - 58	Am. Ship, com.	75
Int. Harv., com.	111 - 112	Chi. Pneu. Tool	40½ - 42
Int. Harv., pref.	121¾ - 122½	Cambria Steel	42 - 43
Int. Pump, com.	40⅛ - 40⅞	Lake Sup. Corp.	26¾ - 28⅝
Int. Pump, pref.	84½ - 85	Pa. Steel, com.	60
Locomotive, com.	36½ - 37½	Pa. Steel, pref.	104 - 104¼
Locomotive, pref.	106	Warwick	10 - 10⅝
Nat. En. & St., com.	16	Crucible St., com.	12¼ - 12⅞
Pitts. Steel, pref.	100½	Crucible St., pref.	75¾ - 77
Pressed St., com.	29⅞ - 31	Harb.-W. Ref., com.	32¾ - 32¼
Pressed St., pref.	93½ - 94	Harb.-W. Ref., pref.	94½

Crucible Steel Company of America.—The treasurer's report covering the quarter ending November 30, 1910, is as follows:

Gross profits:		
September	$259,259.57	
October	390,520.08	
November	372,979.47	
		$1,022,759.12
Deduct appropriations:		
Depreciation and repairs	$337,970.03	
Contingencies	20,543.68	
		358,513.71
Net profit applicable to dividends		$664,245.41

The net profit shown above, compared with that of the previous quarter, of $643,664.83, is an increase in favor of the present quarter of $20,580.58.

At a special meeting of the Niles-Bement-Pond Company it was voted to extend the date of redemption of the preferred stock until the first Monday of January, 1921. The preferred stock was previously subject to call in 1911 at 105.

Dividends.—Dividends on iron and industrial stocks have been declared as follows:

Otis Elevator Company, quarterly, on preferred, 1½ per cent., payable January 16.

American Locomotive Company, quarterly, on preferred, 1¾, January 21.

Shelby Iron Company, 2½, January 10.

Galvin Machine Company, semiannual, preferred, 3½, January 3.

Riehle Brothers Testing Machine Company, annual, 6, and extra, 1.

American Radiator Company, quarterly, common, 2, December 31.

American Smelting & Refining Company, quarterly, preferred, 1¾, January 3, and quarterly, common, 1, January 16.

American Shipbuilding Company, quarterly, preferred, 1¾, January 15.

Canadian Westinghouse Company, quarterly, 1½; extra, 1, payable January 10.

La Belle Iron Works, quarterly, 2½, December 31.

McCrum-Howell Company, quarterly, common, ¾, January 1, and common stock dividend, 50 per cent., January 30.

National Enameling & Stamping Company, quarterly, preferred, 1¾, December 31.

Niles-Bement-Pond Company, quarterly, common, 1½, December 20.

Railway Steel Spring Company, quarterly, preferred, 1¾, December 20.

Republic Iron & Steel Company, quarterly, preferred, 1¾, January 1.

Standard Coupler Company, common, 2, December 24, and semiannual, preferred, 4, December 24.

Standard Screw Company, common and preferred, 3 January 1.

Western Electric Company, two months, 1 1-3, and extra, 2, December 31.

Westinghouse Air Brake, quarterly, 2½; special, 1, and extra, 1½, January 10.

Notes on Prices

Rope.—Some manufacturers and jobbers find that current business is about equal to that of December a year ago, while others are not experiencing so large a demand. Buyers who in times of activity order by the carload find half or a quarter of a car sufficient for their requirements. Jute rope prices are higher owing to the very firm market on jute fiber. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure manilla of the highest grade, 8¾c. to 9¼c. per pound; second grade manilla, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 6¼c. to 6¾c. per pound; No. 2, 5½c. to 6c. per pound.

Linseed Oil.—The demand is light, as usual at this season, although it had been expected that manufacturing consumers would continue buying, as they had no stocks of oil on hand, because of the hand-to-mouth policy pursued by them for some time. Prices for jobbing lots remain unchanged, while April to September deliveries are quoted at much lower figures. Considerable foreign flaxseed and linseed oil has recently arrived in this country. The following quotations represent New York prices in five-barrel lots [illegible]:

	Cents.
State, [illegible]	93
City, [illegible]	93

Linseed, [illegible] less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon.

Spirits Turpentine.—Business at this point is light and orders are for comparatively small lots. At Savannah, receipts have fallen off, and exporters are taking about all turpentine received. This, more than demand, is sustaining the New York market. New York quotations in five-barrel lots are as follows:

	Cents.
In [illegible]	78½
In [illegible] barrels	79

Less than 5-bbl. lots, 1 cent advance per gallon.

Bolts, Nuts and Rivets.—At a recent meeting of the manufacturers of bolts, nuts and rivets, no changes were made in the discounts of carriage and machine bolts, lag screws, and nuts and rivets. So far as the volume of business is concerned, the output is moderate and to satisfy immediate wants the mills working almost entirely on old contracts rather than new business.

The Keefe Sectional Steel Tank.—The American Oil Storage Company, 74 Broadway, New York, has purchased the invention and patents of A. J. Keefe relating to flange sectional plates used in the construction of steel tanks for storing solids and liquids, and intends to begin their manufacture at once. These plates are of uniform size and are bolted securely, instead of being riveted. It is claimed that a tank so constructed has not only five times the strength needed to insure absolute safety and long life, but that it can be installed anywhere by experienced labor in one-half the time of a riveted tank at a total cost of about 2 per cent of the price of the tank. It also can be taken apart and again installed elsewhere without damage to the material. To meet the immediate needs of the crude oil industry, the company will at present manufacture these tanks in large capacities only, from 6000 to 50,000 bbl. each. H. B. Logan, president of Dossert & Co., New York, solderless cable connectors, well known in electrical circles, is president of the American Oil Storage company.

Steel Corporation Bonus.—The plan of annual bonus distribution among United States Steel Corporation employees is announced. The total this year is $2,700,000, as against somewhat more than $2,000,000 a year ago. Sixty per cent. of the bonus will be in common stock, at $70 a share, and 40 per cent. in cash. Employees have the opportunity also of subscribing for preferred stock at 114 and for common at 70, about 25,000 shares of each being available. Last year these subscriptions were on the basis of 124 and 90, respectively, for preferred and common.

Canadian Harvester Manufacturers Secure an American Plant.—The Massey-Harris Company, Toronto, Canada, having factories at Toronto, Brantford and Woodstock in Ontario, and being the largest manufacturer of harvesting machinery and agricultural implements on this continent next to the International Harvester Company, has purchased shares amounting to a controlling interest in the Johnston Harvester Company, Batavia, N. Y., from three large estates, in which this controlling interest has heretofore been vested. It is announced that there will be no change in the management of this company or in its policy in conducting its American trade.

The Tata steel plant in India, known as the Kalimati Steel & Iron Works, will be able, it is now stated, to furnish steel rails and structural shapes by the beginning of 1912. Pig iron can be produced by the fall of 1911. The company has a guarantee of 20,000 tons of rails a year from the Indian State Railways.

The Buckeye Iron & Brass Works, Dayton Ohio, has just made a shipment of three cars of oil mill machinery to Marseilles, France. It is to be used for the manufacture of peanut oil, enlarging the plant of the buyer, to whom the same manufacturer furnished considerable machinery about a year ago.

The Swedish Crucible Steel Company, successor to the Olson Adjustable Plow Point Company, Milwaukee, Wis., has opened a temporary office at Room 48, Rowland Building, Detroit, Mich., which it will occupy until its new factory in Detroit is completed.

The net car surplus, as shown by the statement of the American Railway Association, increased by 10,849 cars between November 23 and December 7, the total on the latter date being 53,915. One year previous the total was 57,470 cars.

A Large Spokane Hydroelectric Plant

The Washington Water Power Company, Spokane, Wash., which is erecting a large hydroelectric power plant, consisting of four units on the Spokane River, at Little Falls, about 28 miles northwest of Spokane, now has three of the units in operation, while the fourth is being installed. The power station consists of a reinforced concrete building in which are installed four 9000-hp. double runner, Francis inflow type water wheels, each unit being direct connected to a 5550-k.v.a., 4000-volt generator, revolving at 150 rev. per min. An exciter is mounted on the overhung shaft of each generator, each exciter having exciting capacity for two generators. In normal operation each generator operates in series with a 5550-k.v.a., 3-phase transformer, stepping up from 4000 to 63,000 volts. Any transformer may be operated on any generator, or the four may be operated in multiple on the low tension or the high tension side.

The speed of the water wheels is controlled by a governor, operated by oil under 150 lb. pressure. The water wheel gates are of the swing gate type, and are operated by a single acting oil engine, the oil pressure being furnished by a triplex pump driven from the water wheel shaft, which also furnishes the pressure for operating the governor. The governor has electric control from the switchboard, as well as a hand operating device from the wheel room floor. Aluminum cell lightning arresters are used for the 63,000-volt transmission lines, which at the present time are three in number. Two of these are direct to Spokane, and the other is a line feeding what is known as the Big Bend country to the south and west of Spokane, furnishing power for operating flour mills, interurban railways, and lighting and sundry small powers in the various towns in the district.

The dam is of solid concrete, and, together with the natural falls, gives an operating head of 73 ft. The plant is connected with the company's system in Spokane by a two circuit aluminum transmission line supported on steel towers placed an average of 750 ft. apart. The aluminum cables are held by suspension type insulators, with towers of such hight that the distance from the earth to the lowest wire is 40 ft. at the tower. The top of the towers carry two steel cables, which are grounded at each tower for lightning protection. The transmission line operates at 63,000 volts, the system being Y connected with grounded neutral.

The Holbeck Riverside Gas Power Company

The above-named company was recently organized with a capital of $1,000,000, and takes over the plant and equipment of the Riverside Engine Company, Oil City, Pa. In addition to continuing the manufacture of gas pumping engines, gas driven air compressors and gas engines for electric lighting and general power purposes, a line of Holbeck gas producers will be made.

The president of the new company is A. A. Holbeck, formerly of Cleveland, Ohio, and patentee of the Holbeck gas producer, which uses any grade of bituminous coal. The producer consists of two large vertical steel drums, one having a charging platform and central opening at the top into which the coal is fed, and the other constituting a scrubber, from which the gas is taken. One of these units was installed and has been in operation for some time at the plant of the Riverside Engine Company, and some interesting tests have been made. These gas plants will be built of various capacities, and are designed to be used in connection with gas engines or to produce fuel gas in sections where natural gas is not available or where any shortage exists, thus making gas engine plants independent and insuring uninterrupted operation.

Besides President Holbeck, the following constitute the officers and incorporators: J. B. Smithman, vice-president and treasurer; A. F. Smithman, secretary; H. S. Smithman and Joseph M Jenckes. The plant of the Riverside Engine Company is of modern and substantial construction, and consists of power plant, machine and erecting shops. The new company will rearrange the present equipment and will add other machinery for the new department later.

New Publication

Qualitative Chemical Analysis. By J. I. D. Hinds, Ph.D., LL.D., professor of chemistry, University of Nashville and Peabody College for Teachers, Nashville, Tenn. Published by the Chemical Publishing Company, Easton, Pa. Pages, vii. + 266. Price, $2.

This book is intended to be both educational and practical. It contains an up-to-date treatment on the subject of qualitative analysis from the standpoint of ions, solubilities and mass action. While it preserves all the excellencies of the old method, it introduces the student to the new view of chemical activities and to the recent explanations of analytic reactions and phenomena. It includes an adequate, though brief, discussion of those parts of physical chemistry which are necessary to an understanding of the processes of qualitative analysis.

Properties and reactions are given with unusual fullness, and the student is expected to become practically so familiar with them that he will be able not only to discover what ions are present in the unknown, but also to ascertain definitely what free elements or compounds compose the body under examination. The process of analysis is thus not one of simple routine, but constantly appeals to the student's knowledge of facts and principles, and the correctness of his conclusions depend upon close observation and good judgment.

The classification of the kations is practically that which is found in the textbooks. The grouping of the anions is essentially that given in Boettger's "Qualitative Analysis," but the systematic method for their separation and identification is a new arrangement which it is hoped will be found helpful to the beginner.

There is a complete list of the reagents and of the solutions with the method of preparing them to a given concentration. In addition to the ordinary table of solubilities, there is a table which gives the solubility in water of most of the substances which are met with as precipitates in the course of analysis. There are also tables of ionic conductivities, of the percentage of ionization of the more important acids, bases and salts at various concentrations, and of the international atomic weights. The book closes with a carefully prepared index.

Welfare Work at the Underwood Plant.—At the Underwood Typewriter Company's factory, Hartford, Conn., considerably over 2000 men and girls are employed. Among so many, injuries and illnesses are always likely, so the company has provided two hospital rooms, each having two beds. The rooms are light and attractive, well heated in winter, and there is a connection on one side with the ventilating system so that a change of air is readily provided. Small injuries and complaints can be taken care of by the nurse who is in almost constant attendance, but if a doctor is needed he can be quickly summoned by telephone. Two lunch rooms, one for the men and one for the girls, seat 722 and 232, respectively. The individual seats have backs and swivel on ball bearings. The company furnishes the tables, tableware and kitchen equipment, and a caterer attends to buying, cooking and selling the food. He is restricted to very reasonable prices, the various dishes ranging from 2 1-3 to 10 cents, and a fairly complete meal can be secured for 15 cents.

The Machinery Markets

The machinery trade is looking up in many quarters. There is a better volume of business in the New York market, but orders are scattered. A great improvement is shown in Chicago. More business is coming out there than at any time in the last three months, and some good sales have been closed. While a single tool business is at present being done in Cleveland, some excellent inquiries are out for machinery, which will be purchased after the first of the year. The Lake Shore Railroad is preparing a list, which will be issued in that market shortly. Some good future business is in sight in Cincinnati. However, the automobile manufacturers there and in other centers are practically out of the market. A material increase in business is looked for in Detroit where a number of good-sized contracts are pending. Milwaukee manufacturers and dealers are not quite so busy, except those who make hydraulic power equipment, for which there is an excellent demand. In the Northwest there is a good demand for a diversified line of equipment, and some important developments are pending in the Farther Central West. Inquiries are coming out in better volume in St. Louis and in the Southwest. Hydroelectric development on the Pacific Coast has created a good demand for equipment in that line, and there are some large inquiries out in San Francisco, which it is expected will be closed the first of the year.

New York

NEW YORK, December 21, 1910.

While stock taking is interfering somewhat with business, a better volume of inquiries is coming forward in the New York machinery market and some good orders have been recorded. Business is decidedly better than it was early in the month, and judging from the character of the inquiries out some good trade will develop after the first of the year. Business now being transacted is mostly of a single tool nature and chiefly for replacements. The railroads are buying a tool here and there, but on the whole they are adhering to a strict policy of economy. Men who are familiar with the railroad situation say that not for many years have the railroads in general allowed their shop equipment to become so run down, and many of them will have to become purchasers in the near future if they desire to keep their repair plants in even fair working condition. The shipbuilders along the Great Lakes and on both coasts have been good customers for machinery during the last few weeks and there are a number of good sized orders yet to be closed. The export trade is contributing largely toward the support of the market. Orders are being placed for German and French accounts, largely for machine tools and for special metal working machinery.

The Morrin Climax Boiler Company, 240 Loraine street, Brooklyn, N. Y., has purchased a plant formerly occupied by the West Pulverizing Machine Company, at Mallory and Pollock avenues. Jersey City, N. J. The plant includes an equipped foundry and machine shop and the Morrin Company proposes to occupy it within a week. In addition to making its line of high power boilers, the company will take over the manufacture of the West pulverizing machinery and will do a general machine shop and foundry business.

The American Tobacco Company has been placing a number of orders in this market lately for equipment to be installed in the new Lorillard plant at Marion, N. J. The company has purchased equipment for developing about 2000 hp., as well as a line of machine tools and special tobacco machinery.

The M. E. Blasier Machine Company has been organized at Utica, N. Y., to take over the business of M. E. Blasier, manufacturer of garment pressing and steaming machinery. The company has been incorporated with the following directors: Milton E. Blasier, George W. Sanborn, Frederick A. Klein, Thomas A. Hobbes and Wadsworth Goodier.

The Buffalo Boiler Works, Buffalo, N. Y., has purchased the foundry building at the foot of French street, Erie, Pa., and will establish a branch manufacturing plant there. The company will make a specialty of boilers, tanks and smokestacks and will do a general repair business in that line.

The Hessler Foundry & Mfg. Company has been incorporated at Oswego, N. Y., to engage in a general foundry business. The company will make a specialty of turning out gray iron castings.

Endicott, Johnson & Co., shoe manufacturers, Endicott, N. Y., have prepared plans for an extensive addition to their plant, the building and equipment of which will be rushed to completion as rapidly as possible.

The New York Central Railroad Company has completed plans for a roundhouse to be built at the Salina yards, Syracuse, N. Y. Geo. W. Kittridge, chief engineer, New York.

The Elmira Water, Light & Railroad Company, Elmira, N. Y., is having plans prepared for a new reservoir of 4,000,000-gal. capacity, with power house installation of two 8000-gal. pumps, with a 30-in. cast iron pipe line from the filtered water reservoir and a 30-in. cast iron pipe line across Hoffman Creek.

The Nichols & Wright Motor Company, Buffalo, N. Y., has been incorporated, with a capital stock of $300,000, to manufacture motors, engines and other motor appliances for motor boats, automobiles and aeroplanes. The incorporators are Chas. G. Hornung, W. R. D. McQuarrie and B. Knox. The new company will take over and continue the business of the Wright Motor Company, now located at South Division and Ellicott streets, and later will build and equip a new and larger plant.

The Frontier Electric Railway Company, which is to construct an electric railroad between Buffalo and Niagara Falls, a distance of 25 miles, has filed plans and profiles with the clerk of Erie County showing a power house and a number of steel bridges and viaducts to be constructed.

The Wagstaffe Company, Ltd., Hamilton, Ont., which has established a branch fruit preserving plant at Buffalo, now located in temporary quarters, has plans in preparation for the building of an extensive canning plant in the latter city next spring.

The plant of the Fredonia Heating Company, Fredonia, N. Y., was completely wrecked December 15 by the simultaneous explosion of two of its boilers, and the Buffalo, Lake Erie & Western Traction Company's power house adjoining was extensively damaged. The aggregate damage to the two plants, both new and recently equipped, will amount to about $40,000. The plants will be immediately rebuilt.

The New York State School for the Blind, Batavia, N. Y., will build a refrigerating plant from plans and specifications of Franklin B. Ware, State Architect, Capitol Building, Albany. Sealed proposals will be received by Dr. F. Park Lewis, president Board of Managers, 454 Franklin street, Buffalo, N. Y., until January 4.

The Cohoes Rolling Mill Company, Cohoes, N. Y., has acquired additional factory space which it will equip as a pipe threading shop. Additional storeroom space will also be provided in the new building.

Catalogues Wanted

The George G. Veness Mfg. Company, Malden, Mass., desires catalogues from manufacturers or dealers supplying the following: Can making machinery, sheet metal working dies, bending machines, solder, agate ware, enameled ware, enameling, aluminum coated sheets, sheet aluminum, sheet metal machinery, power and hand punches and shears, power presses and dies, tinplate, tinners' supplies and machinery.

Chicago

CHICAGO, ILL., December 19, 1910.

December had a poor beginning, but is turning out a fair month in the machinery trade, as a good deal more business is coming forward than in the preceding three months. Most of the pending business is in the form of inquiries which will not be closed until after the first of the year. In many cases buyers explain that they are getting prices and data to be submitted to their directors in January, and whether purchases will actually be closed then will depend to a great extent on the business outlook at the time. Some good sales, however, have actually been closed this month, and a little improvement in the financial world in January, which would encourage buyers, would bring a very satisfactory amount of business to the point of actual purchases.

The automobile trade does not offer any encouragement in that line, as the automobile manufacturers have generally

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cut their shop orders to one-half the product that they had under way a year ago, although a few of the strongest companies expect to make 75 per cent. of last year's product. Their distributing trade is congested with second-hand cars, and it is problematical how much new business there will be, probably not a great deal in the cities, but the farmers may continue as liberal buyers as they were last year.

The new building code in Chicago, recently adopted by the City Council, requires the use of machine mixed concrete in all buildings erected with this material. While the use of concrete mixers has become quite general among contractors, the fact that it is now required by law in this city will undoubtedly promote the use of these machines throughout the country.

The Board of Public Works, Chicago, will in the near future install two electrically driven pumps at the Twenty-second street water station at a cost of $60,000.

The City Council of Stanford, Ill., is preparing to establish a water works system at a cost of $7000.

The Wabash Railroad is having plans prepared for rebuilding its machine shop at Decatur, Ill., which was recently destroyed by fire.

The Big Four Railroad has awarded to the Murphy Construction Company, East St. Louis, Ill., a contract for the construction of a power plant at Mattoon, Ill., to be erected at a cost of $20,000. The plant will be housed in a building, 65 x 100 ft. The contracting company is in the market for brick work, mill work, structural steel and castings.

The flour mill at Stewardson, Ill., owned and operated by John Patterson, was destroyed by fire December 8, causing a loss of $9000.

The Allen Mill & Elevator Company's feed mill at Decatur, Ill., was burned December 9, causing a loss of $20,000, of which $13,000 is covered by insurance.

Philadelphia

PHILADELPHIA, PA., December 20, 1910.

The few sales reported are largely single tool propositions. Very little in the way of new business comes from the railroads; in fact, inquiries for the general run of machine tools is gradually falling off, but this is not unusual at this season. Machine tool builders report little change in the situation, although order books are probably not in as good shape as they were a month or so ago, as deliveries have been heavier than incoming orders. Builders of heavy engines state that they have recently been able to close some of the pending business, and, while plants are still being operated considerably under normal capacity, they have more work ahead than was the case a few months ago. There has been very little export demand; the little inquiry has been confided to special equipment. With the easing of the general demand for tools and equipment, a decrease in requirements for castings, both iron and steel, is reported, and foundries, as a rule, are not very actively engaged.

J. J. Harpel, Macungie, Pa., states that the recent damage to his foundry by fire will aggregate $5000, the pattern house, engine house, warehouse and foundry all being partly destroyed. The plant is to be immediately rebuilt and equipped.

The Fairbanks Company has been appointed selling agent in Philadelphia territory for the Toledo Bridge & Crane Company, Toledo, Ohio, manufacturer of hand power and electric cranes for all purposes.

Frank Salomon, the new general manager of the Otto Gas Engine Works, has under consideration plans which include a reorganization of the manufacturing and business departments. Betterments in manufacture will be given particular attention.

The contract for the new garage to be erected for the Packard Motor Car Company, at Broad and Wood streets, has been awarded to Cramp & Co., contractors. The building will be 71 x 168 ft., seven stories

The Pennsylvania Equipment Company, West End Trust Building, is in the market for 25 to 50 second-hand full power hopper self-cleaning wooden coal cars, 60,000 to 80,000 lb. capacity.

Proposals will be received until January 17, 1911, by the County Commissioners of Schuylkill County, Pa., for a general contract, including increased water supply, sewage disposal plant, power plant, elevators, heating, ventilating, plumbing and electrical work complete, for the construction of a building for the insane at Schuylkill Haven, Pa., in accordance with specifications, copies of which may be obtained at the office of Charles T. Straughn, County Controller, Pottsville, Pa. At the same time proposals will be opened for the general construction of the building.

The Auto Car Company, Ardmore, Pa., is having plans prepared by Stearns & Castor, engineers, for a two-story brick, steel and concrete addition, 56 x 220 ft. This building will be used for general manufacturing purposes, particularly in connection with commercial cars.

The Borough Council of Bristol, Pa., has authorized the Borough Solicitor to advertise for bids for the erection of a municipal water works and the construction of a sewage system.

Cincinnati

CINCINNATI, OHIO, December 20, 1910.

Machine tool traveling salesmen are coming in to spend the holidays and they generally report business as being very light. However, the majority of them agree that there are a large number of orders in sight, which could be booked if a general buying movement could be started with the trade. The railroads continue unsatisfactory customers, and no relief is anticipated from this source until after the rate question is settled. The automobile manufacturers have practically been out of the market for the past few weeks.

A few local foundries are busy, but a larger number of them are having a hard time to keep operating even on short time. Machinery dealers and the supply people are both doing a rather scant business.

The Cincinnati Shaper Company gave a dinner and theater party to its foremen on the evening of December 19. Superintendent March and Secretary Manley of the National Metal Trades Association made informal talks, which were responded to by different foremen.

The J. T. Towsley Mfg. Company, Cincinnati, manufacturer of woodworking machinery, states that its business during 1910 has been excellent, and when the annual statement is made up the company expects it will show up better than for any previous year of its existence.

The Wellsburg Bridge Company is a new incorporation at Wheeling, W. Va., with $100,000 capital stock. The incorporators are A. M. Schenk, J. J. Holloway, C. H. Copp, B. W. Peterson and G. O. Nagle, all of Wheeling. The company was formed to build a bridge across the Ohio River at Wellsburg.

The Foos Mfg. Company, Springfield, Ohio, announces that after January 1 its name will be changed to the Bauer Brothers Company. Chas. L. Bauer will be president, Louis E. Bauer vice-president and W. A. Bauer treasurer.

The John Dietz Mfg. Company, Cincinnati, has recently reorganized and increased its capital stock from $10,000 to $30,000. It has leased the two-story building at 808-810 Elm street, which will be fitted up for manufacturing washing machines. A line of woodworking machinery and other equipment will be needed. The company's present location is 20 Fifteenth street, and its officers are John Dietz, president; J. F. Chapman, vice-president, and N. S. Calhoun, secretary and treasurer.

The Lunkenheimer Company, Cincinnati, gave a beefsteak dinner to its salesmen and officers on the evening of December 16, at which the majority of its outside salesmen were present.

The E. A. Foy Company is a new incorporation at Cincinnati, with $75,000 capital stock, to take over the business of E. A. Foy & Co., manufacturers of lightning rods. It is the intention of the company to move into more commodious quarters next spring, but the location has not yet been selected. The new company's officers are E. A. Foy, president and treasurer, and C. I. Burdge, vice-president and secretary.

The chartering of the Webster Mfg. Company at Tiffin, Ohio, with $1,200,000 capital stock, practically confirms the report that this company will unite with the Tiffin Malleable Iron & Chain Company, as was recently reported. The Webster Company's headquarters are in Chicago, and it is rumored that its large plant at that point may be moved to Tiffin some time next year. Full details are not yet available.

The Roberts Motor Company, Sandusky, Ohio, has recently received a large order from Japan for its portable air compressors.

The Cincinnati Gasket & Packing Company, 1536-38 Plum street, Cincinnati, has its new plant in operation, and expects to make some additions to it early next year.

The D. T. Williams Valve Company, Cincinnati, expects to be established in its new quarters on Spring Grove avenue, Camp Washington, by January 1.

The Dayton Keyless Mail Box Company has been incorporated at Dayton, Ohio, with $5000 capital stock, to manufacture a patented metal mail box. The incorporators are W. H. Cross, Daniel Glaser, Frank West, Monroe Sharritt and Robert Bratton, all of Dayton.

The Hotel Gibson Company, Cincinnati, has been incorporated, with a nominal capital stock of $10,000, and it has been definitely announced that work on a 10-story fireproof hotel will be commenced some time in 1911. The new structure will be erected on the same site now occupied by the hotel in question, and will require a large tonnage of structural steel to build.

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Cleveland

CLEVELAND, OHIO, December 19, 1910.

Business with the local machine tool dealers continues light. Orders are mostly of a current nature for single tools. Some inquiries that came out early in the month for fair lots of tools, however, have resulted in the placing of orders during the past few days for a portion of the requirements. While very few new inquiries are coming out, dealers are receiving calls from quite a number of manufacturers who are looking round for machinery that they may decide to buy soon after the first of the year. The expected large list from the Lake Shore Railroad for its new shops at Elkhart, Ind., has not yet appeared. This list is nearly completed, but as yet it is uncertain when it will be given to the dealers. There is a moderate demand for second-hand machinery.

Some local manufacturers, however, say that the outlook is better than a few weeks ago and that they expect a good volume of business during the early part of 1911. This is true of turret machinery, for which inquiries have improved. Some local manufacturing plants are running at nearly full capacity, while others are not making much more than one-half of their usual output.

John W. Seaver, engineer, Cleveland, has received a contract from the Didier-March Company, New York, for reversing valves and operating mechanism for the new coke oven plant of the Bethlehem Steel Company. The valves will be reversed automatically by means of air cylinders, the air being applied to the cylinders by magnetic triple valves. The triple valves will be operated by an electrical timing device. Mr. Seaver has also received a contract from the Mount Hope Coke Company, Brownsville, Pa., for a coke quenching machine. Other contracts in connection with the Bethlehem coke oven plant are being placed.

The Ohio Electric Car Company, Toledo, Ohio, has increased its capital stock from $75,000 to $300,000, and in order to increase its output the company is now looking for a site for a new plant, which will probably be built as soon as a suitable location can be found.

The Terminal Warehouse Company, Citizens' Building, Cleveland, is having plans prepared for an eight-story cold storage warehouse, to be built at Canal road and West Third street. It is announced that about $1,000,000 will be spent in the erection of this plant and that work will be started early in the spring. Later a railroad and a terminal warehouse will be built near the cold storage warehouse.

The Allen Mfg. Company, Toledo, Ohio, has placed a contract for the erection of a new factory building. It will be 50 x 100 ft., three stories. The plant will be located at 3007 Detroit avenue.

On account of increasing business the E. A. Pfleuger Company, Akron, Ohio, manufacturer of fishing tackle and hardware specialties, has increased its capital stock from $100,000 to $150,000. No plant extensions are planned for the present.

The Perfecto Mfg. Company, Columbus, Ohio, has been incorporated, with a capital stock of $25,000, to manufacture metal goods. The incorporators are M. J. Killets, C. H. Estey, H. T. Bailey, J. E. Killets and M. C. Welch.

The Board of Managers of the Ohio Penitentiary, Columbus, will receive sealed proposals January 13 for a plenum system of heating and ventilation for that institution.

Swift & Co., who have just completed a large fertilizing plant at Parma, near Cleveland, have let a contract for the erection of a duplicate plant. It will be about 90 x 200 ft. and two stories.

The Holly Mfg. Company, Buffalo, N. Y., was low bidder for two vertical triple expansion pumping engines, each of 25,000,000-gal. daily capacity, for the city of Cleveland, bids for which were received December 12. The company submitted three proposals, ranging from $108,769 to $120,769 for each engine.

Indianapolis

INDIANAPOLIS, IND., December 20, 1910.

The Storck-Browning Company, Indianapolis, has been incorporated, with $100,000 capital stock, to manufacture sewing machines. The directors are J. H. F. Browning, R. L. Storck and W. E. Cary.

The creditors of the Parry Auto Mfg. Company, Indianapolis, which recently went in the hands of a receiver, are discussing plans for overcoming the financial difficulties of the company with a view to its reorganization.

The Diamond Pottery Company has been incorporated at Frankford, Ind., with $12,000 capital stock, to manufacture pottery. The directors are J. C. B. Beatty, G. K. Beatty and W. S. Fisher.

The South Bend Fixture Company, South Bend, Ind., has been organized to manufacture office and storeroom supplies. The directors are H. J. Holland, W. N. Drowley and C. E. Williams.

The Supreme Court of Indiana has made an important ruling to manufacturers. It has decided in a recent case that in a prosecution for using unguarded machinery the indictment must charge and the State must prove that the machinery is capable of being properly guarded without interfering with its usefulness.

The Dean Forging Company, Muncie, Ind., has increased its capital stock by issuing $100,000 of preferred. J. J. Dean is president of the company.

The Citizens' Trust Company has been appointed trustee to settle the affairs of L. C. Giboney, lessee of the Lebanon Foundry & Radiator Company, Lebanon, Ind. It is stated that creditors will realize 75 cents on the dollar.

The new petroleum plant of the Standard Oil Company at Whiting, Ind., which manufactured by-products, was burned December 12, with $75,000 loss.

The Triple Sign Company, Connersville, Ind., has increased its capital stock from $6000 to $30,000. A. C. Rieman is president.

The Rochester Bridge Company, Rochester, Ind., has increased its capital stock from $30,000 to $50,000. W. H. Denniston is president.

The machinery department of the Vonnegut Hardware Company, Indianapolis, Ind., will be moved to the building formerly occupied by the Francke Hardware Company, 43-45 South Meriden street, and will be operated under the name of the Vonnegut Machinery Company after January 1, 1911. The sales organization will include Anton Vonnegut, Charles Rassman and C. B. Williamson.

Fairbanks, Morse & Co. have purchased the factory of the Commercial Electric Company, Indianapolis, Ind. The company is using the factory for manufacturing standard types of electrical equipment.

The Perfection Biscuit Company, Fort Wayne, Ind., has purchased an additional tract of ground, 60 x 150 ft., and is preparing plans for the erection of a building.

The Hill Machine Company, Anderson, Ind., has taken over the plant of the Wilke Mfg. Company, into which it is now moving. The company states that it is not in the market for new equipment, but has quite a lot of second-hand woodworking machinery for sale.

Work is progressing rapidly on the new machine shops of the Southern Railway at Princeton, Ind., and it is expected that the machinery will be installed during January.

New England

BOSTON, MASS., December 19, 1910.

While business in the machinery trade is not brisk, it is not of a flat dullness. Brightening experiences are more numerous, both among the manufacturers and the dealers. In a number of cases the week has brought a much greater volume of orders. Several dealers report a marked increase in sales. One large machine shop is urging the prompt delivery of equipment ordered some months ago, and then held up because of the receipt of many cancellations. A few very good orders have been placed, including close to $10,000 worth of business by the Stanley Company, for the new shops at Salem, Mass., to manufacture gasoline engines. At Greenfield, Mass., the tap and die manufacturers are comfortably busy, and some improvement is noted by the machinery builders of the town. Heavy machinery is not in much demand. One large builder states that while November shipments were the largest for the months of 1910, December's business has been unsatisfactory. It is easy to find all kinds of business experiences, from very good to very bad, which seems to indicate an unsettled rather than a basically dull market.

The National Supply and Machinery Dealers' Association has acted upon the recommendation of the National Machine Tool Builders' Association, and has recommended to its members the adoption of the non-cancellation clause on all quotation sheets and correspondence relative to orders. The New England members in the various cities have been formally notified, and will proceed to act upon the suggestion. While the dealers as a whole are possibly less optimistic than the manufacturers as to securing the rigid adoption of the non-cancellation principle, they believe that the present move is in the right direction, and will bear some immediate fruit and much more in time to come.

The business of the E. F. Reece Company, Greenfield, Mass., manufacturer of taps and dies, has been merged in the F. E. Wells & Son Company of that place, manufacturer of machinery and pipe cutting tools. The Reece corporation will go out of existence, but Mr. Reece will continue as the manufacturing head of the tap and die departments, while S. A. Yeaw of the Reece Company, will probably be made treasurer of the F. E. Wells & Son Com-

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pany. The corporation will erect a factory building in the spring, to give greater manufacturing space for the manufacture of taps and dies. The structure will be adjacent to the present Reece factory, which is some distance from the works of the F. E. Wells & Son Company.

A dispatch states that L. M. Linnell, West Gardiner, Maine, for years interested in mining operations in the West, has acquired the mineral rights of 1000 acres of land in Skowhegan and Canaan, Maine, and will begin mining in the near future for hematite ore.

The improvements planned by the New York, New Haven & Hartford Railroad for 1911, including the Boston & Maine system, will total the expenditure of many millions of dollars. The latest announcement is of $3,000,000 for New Haven, Conn., and vicinity, for a passenger station to cost $1,000,000, a great roundhouse, a pier for passenger and freight steamers, a considerable amount of new trackage, and a big electric generating plant, to be located on Mill River in New Haven, which will supply the power when the main line is completed between Stamford and New Haven. The Boston & Maine should spend $12,000,000 at least, including the electrification of the Hoosac Tunnel, at $10,000,000 in one appropriation, of which $2,500,000 is for repair shops. The report is current that negotiations are on for the purchase by the New Haven interests of the Bangor & Aroostook Railroad in Maine and the Quebec Central in Quebec, which would be important links in the Boston & Maine system, giving it practically a monopoly in the extreme Northeast.

New England is receiving a fresh supply of skilled labor from the Middle West. As a rule these men were attracted from this section by the high wages offered by the automobile builders, and they are returning in the belief that in the long run they will fare better in the East. Toolmakers, who have been almost impossible to get, are applying for work in increasing numbers, and most of them have little difficulty in securing positions. Employers are not releasing skilled labor, and even though their works may not be running full are taking on high class men, in the belief that their services will be exceedingly valuable in the not distant future.

A Connecticut chuck manufacturing company reports November business as being the largest for that month it has ever experienced, and that undoubtedly for the year 1910 it will have done the largest business in its history. The demand, both domestic and foreign, for the last few weeks has been most satisfactory. The company further says that the outlook for business for 1911 is certainly encouraging.

Landers, Frary & Clark, New Britain, Conn., manufacturers of cutlery and hardware, have voted to increase the capital stock from $1,500,000 to $2,000,000. They are not yet ready to state their plans as to the disposition of the new capital.

The National Spring Bed Company, New Britain, Conn., has plans for the erection of a new factory building, as an enlargement of its works. The structure will be 40 x 100 ft., five stories, brick, with top story of steel and a concrete roof. A new boiler house will be 30 x 40 ft.

The Potter & Johnston Machine Company and the Foles & Jenks Mfg. Company, Pawtucket, R. I., and the Woonsocket Machine Company, Woonsocket, R. I., have entered into a selling arrangement and have established agencies in Providence, R. I., and in the South, for the handling of their machinery. The idea is that the textile machinery department of the Potter & Johnston Company and the other two companies produce complete mill equipments, and therefore the consolidation of interests in the sales end must prove of much mutual advantage.

The Potter & Johnston Company, Pawtucket, R. I., is completing a one-story addition to its machine shops, covering some 50,000 sq. ft. of land.

Toronto

TORONTO, December 17, 1910.

General conditions remain as they were. The substantial basis of business is broad and strong, and sentiment throughout trading and financial circles keeps on the side of optimism. Expectations of a steadily continuing demand appear to be general on the part of makers of and dealers in machinery equipment. They look forward to large applications of British capital to the mining fields of the country and to considerable appropriations of that capital to the purchase of plant and outfit. The fact cannot be too often repeated that the buying power that has been the sustenance of the machinery trade is not simply that derived from the soil in the last harvest, but is very largely a contribution of new capital obtained by the sale of securities abroad. If Canadian trade articles of factory equipment, power plant, construction outfit, mining machinery, &c., had no other support than the financial returns of the last crop it would be much less brisk than it has been.

The Montreal Tramways & Power Company has been formed and registered in London, England, with a capital stock of £4,110,000. Its objects are to construct and purchase tramways and street railways in Canada, to equip and maintain these, to manufacture rolling stock and to supply electricity to consumers.

Ely Bros., London, England, manufacturers of small arms, have under consideration a proposal to establish Canadian branch works at Fort William, Ont.

The Superior Rolling Mills Company has most of its plant assembled at Fort William, where it is expected that operations will soon be commenced.

The directors of the Dominion Power & Transmission Company, Hamilton, Ont., have placed an order with the Canadian Westinghouse Company of that city for a new generator, to be installed at the former company's power works at De Cern Falls. The capacity of the generator is to be 8500 hp. and its cost to be $200,000. The power company is also arranging to build another substation in Hamilton. This will cost $100,000.

The City Council of Halifax, N. S., has voted to give exemption from taxation for 20 years to the Nova Scotia Car Works, Ltd., which is to take over the works of the Silliker Car Company. Also the new company is to receive free from the city 5,000,000 gal. of water every year.

Tenders for two fire engines will be received up to December 27 by L. F. Monaghan, City Clerk, Halifax, N. S.

The pulp and paper mills to be established by Price Bros. & Co., on the Rivière au Sable, and for the building of which $5,000,000 has recently been raised by the sale of the company's bonds in London, are to be ready for operation by June, 1912. The new industries are expected to bring into existence at that point a town of 4000 or 5000 inhabitants. A water power development that can be depended on to maintain 14,000 hp. will be begun as soon as possible.

The ratepayers of Victoria, B. C., have ratified the by-law to spend $50,000 on new fire protection equipment account.

The Board of Trade of Calgary, Alberta, is in communication with American inquirers who are considering the establishment in that city of works for the manufacture of gas engines, and of works for the manufacture of stoves and heating apparatus.

The Dowsley Spring & Axle Company, Chatham, Ont., is making extensions of its plant.

The Ottawa Vacuum Cleaner Company, Ottawa, Ont., with a capital stock of $150,000, has been formed to manufacture electric portable vacuum cleaners and permanent installation cleaners.

Application has been made to the Provincial Secretary of Ontario on behalf of the Timmins-McMartin-Dunlop Syndicate for a charter for a milling, concentrating and refining company of $500,000 capital stock. The name of the company is to be the Porcupine Gold Mining Company. It is proposed to erect at once a mill having 30 stamps at the outset, and so built as to enable its capacity to be easily increased upon demand. Besides working on the ore of the mining interests associated in the company the plant will be used on custom business.

Henderson Bros., of Bruton, England, have decided to establish a factory in Ottawa for the manufacture of hair cloth machines and patent horizontal saws.

The Beaver Board Company of Buffalo, N. Y., has purchased land in Ottawa upon which to erect a factory for the making of a fireproof boarding to take the place of lath and plaster.

St. Louis

ST. LOUIS, December 19, 1910.

Business from the standpoint of actual orders placed in the machine tool line has been quiet, but a number of fairly good deals are pending, and it is hoped to see December make a fairly good showing in the end. Numerous small manufacturing plants are starting up, and a number of the established plants are taking advantage of the lull to put in more equipment, against the resumption of business looked for in some degree after the turn of the year.

It is reported that the Fulton Iron Works will build a new plant. This company, whose specialty is sugar mill machinery, has been greatly rushed with work for several years, and its present quarters are regarded as entirely inadequate.

The American Brake Company is pushing work on its large additions, and some of the new equipment is beginning to arrive. This plant will be built a model of its kind. Among other tools purchased are five steam hammers, including two of 4000 lb. each.

The Frank Adam Electric Company, maker of switchboards, junction boxes, &c., is very busy, and has been for a year or more.

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The Commonwealth Steel Company, now employing a large force of men in its steel foundry at Granite City, continues extremely busy on its patented passenger car platform specialties.

The Heine Safety Boiler Company keeps its large new plant on the Terminal Belt Line busy, and is now making deliveries from it as far East as Pittsburgh. Deliveries east of that point are handled by the Pennsylvania plant of the company. St. Louis is the headquarters.

The Stupp Bros. Bridge & Iron Company, St. Louis, has ordered a Pauling & Harnischfeger traveling crane for outdoor yard service.

The McQuay-Norris Company, St. Louis, has leased the building at 1311 Chestnut street. The company will engage in the manufacture of leakproof piston head packing rings for all types of automobiles, marine and steam engines and pumps.

The Foss Valve & Brass Mfg. Company, St. Louis, has been incorporated. The capital stock is $50,000. The incorporators are Clarence E. Anglin, Wm. J. Gates, G. Howard Willett, and others.

The American Tin Company, St. Louis, has been incorporated with a capital stock of $10,000. The incorporators are Nelson W. McLeod, W. E. Grayson and M. A. Dees.

The Reinforced Rail Joint Company, St. Louis, has been incorporated, with a capital stock of $8000. The incorporators are Harry F. Roach, John Gallop and Mary G. Roach. The company will engage in the manufacture of rail joints, machinery, &c.

The Willsville Light, Power & Water Company, Willsville, Mo., has been incorporated, with a capital stock of $15,000. The incorporators are C. H. Early, J. T. Mitchell, E. R. Barrett and others.

The new plant of the Hubbard Mfg. Company, Texarkana, Ark., manufacturer of hoops, was destroyed by fire December 3. The company announces that the factory will be rebuilt at once.

The Faultless Mattress Factory, Birmingham, Ala., will locate a branch plant at Russellville, Ark. The city donated a 2-acre site.

The J. A. Scott Mfg. Company, Helena, Ark., has been incorporated, with a capital stock of $50,000. The incorporators are J. A. Scott, W. A. Archer and R. L. Sheetz. The company will manufacture lumber.

Plans are being made to rebuild the Roberts Cotton Oil Company's mill at Jonesboro, Ark., recently destroyed by fire.

It is reported from Irondale, Mo., that plans for a hydroelectric plant, to furnish power for traction purposes, are being drawn by James P. Ward.

Pittsburgh

PITTSBURGH, PA., December 20, 1910.

With the close of the year so near at hand trade in this district is very light, so far as any orders for the immediate future are concerned. For the coming spring there is a great deal of work in prospect and considerable estimating will be done soon after the holidays. Little, however, can be said about the various projects known to be under way, even when the facts are reasonably certain. A policy of secrecy is being generally maintained by the larger interests involved, and when anything leaks out it is flatly denied.

In the campaign for new industries about to be inaugurated here an effort will be made to secure the location in Pittsburgh or vicinity of a number of automobile factories, particularly those manufacturing commercial vehicles of the heavier types. It is believed that nearness to the sources of the best supply of material, abundance of skilled labor and the rapidly growing local demand for such machines will be factors of considerable importance in the success of such establishments.

A feature of the fall and early winter trade has been the demand for grinding machinery, the call for which continues much better than in other related lines. All of the smaller sizes [illegible] stocked by hardware dealers, general stores, &c., throughout the country, while the belt or motor driven tools for machine shops and factories sell to excellent advantage, both directly and through machinery dealers.

With the opening of spring trade the Pittsburg Emery Wheel Company will have manufacturing facilities practically doubling the present capacity of its plant. The necessary additions to buildings and equipment are now being provided for.

Additional machinery to improve the efficiency and increase the capacity of the high pressure pumping system of the McKeesport, Pa., municipal water works is needed there, according to recommendations made by the Board of Fire Underwriters, and steps will be taken in the near future by the local authorities to provide the necessary equipment.

Improvements in its power and lighting system are to be undertaken by the Kanawha Water & Light Company, Kanawha Falls, W. Va.

J. B. Shepherd, Pittsburgh, heads the newly organized Woodlawn & Southern Street Railway Company, which has been chartered to build an interurban line through Beaver County.

The American Axe & Tool Works, McKeesport, Pa., is increasing the capacity of its shops by an addition now under construction.

The Brookville Water Company, Brookville, Pa., will purchase pumping units and electrical machinery, compressor, &c., to be driven from power furnished by gas engines, for its water supply system. Contracts covering the outside work have already been let to the Pitt Construction Company, Pittsburgh.

The Williams Gauge Company, Pittsburgh, which maintains a selling organization in many parts of the country, has had a favorable year in the manufacture and marketing of various steam specialties, including traps, governors and feed water regulators. With the power plant improvements and the new construction known to be impending for the coming season the outlook for business is bright.

To provide for the growth of its business and increased facilities the Charleroi Foundry & Machine Company, Charleroi, Pa., has increased its capital stock.

The Tennis Company, Pittsburgh, with offices in the Magee Building, is reported to be in charge of plans for the new York & Glen Rock Railway Company, which will build an electric traction line from York to Loganville, Pa. No definite time for awarding contracts for construction work, line material or equipment appears, however, to have as yet been determined upon.

Manufacturers here will figure within the next few weeks on machinery and auxiliary apparatus, including generating sets, condensing system, pumps, boiler plant, &c., for a new power station to be erected by the Capital Traction Company, Washington, D. C. The complete plans have not yet been worked out, or at least approved.

New foundry buildings to be erected in this State, in which equipment houses here are taking an active interest at present, include a plant to be built for the General Foundry Company, at Bradford, Pa.; a foundry building for the Philadelphia & Reading Railway at the east side of the old pattern shop in Reading, Pa., and an addition to the foundry of the Ridgeway Machine Company at Ridgeway, Pa. The plans of the first of these are now being finished, the contract for the second has been awarded, and work on the third is under way. All are good sized structures.

Detroit

DETROIT, MICH., December 20, 1910.

Owing to the enormous quantity of concrete work, road building, track ballasting, &c., in prospect for the coming spring, there threatens to be a scarcity of crushed stone, and the owners of plants supplying that material are very generally making preparations for increased capacity. The opening months of 1911 should by all present signs be among the best ever known for the sale of quarrying, conveying, crushing and screening machinery in Michigan and northern Ohio and Indiana, where some of the best limestone deposits in the country lie. The same is true, although to a less extent, of cement making plants. It involves, however, a line of equipment so extensive as to affect favorably many separate branches of the machinery trade.

The Newaygo Portland Cement Company, Grand Rapids, Mich., will provide for increased manufacturing facilities, including the installation of one or more additional electric power units.

Reports that a new plant consolidating the business of the Grand Rapids Book Case Company, Grand Rapids, Mich., and the Barber Chair Company, Hastings, Mich., would be erected are apparently premature. A merger of the two companies has been effected, but each of the factories will be separately maintained and possibly enlarged.

The Crabill Hose Clamp Company, said to be composed of Chicago interests, has been incorporated at Battle Creek, Mich., but definite information in relation to its plans has not been given out.

It is reported from Saginaw, Mich., that the Saginaw Wire Fence Company has been organized there, with $10,000 capital stock, and will operate a manufacturing plant.

Plans for a municipal electric plant to furnish power and lighting service will soon be carried into effect at Muskegon, Mich.

A steam power and pumping plant, air compressor and drilling machinery are being installed on the property of the Detroit New Ontario Gold Mining Company, Matheson, Ont., the ownership of which is vested in local interests.

A bond issue of $20,000 has been placed at Horner,

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Mich., to provide for the construction of a pumping plant, water and sewage systems.

The plant of the Owosso Motor Company, Owosso, Mich., will not be closed down as a result of receivership proceedings, but will continue to turn out light delivery trucks on contracts already taken. It is reported that the company will be reorganized on a stronger financial basis and some additional manufacturing facilities are likely to be provided before spring to meet the demand for the company's product.

Nearly 4000 men are now employed in the works of the Buick Motor Car Company, at Flint, Mich., and the output of cars decided upon for 1911 is reported to have been already oversold. An increase will, therefore, probably be provided for.

Extensive improvements and repairs will be made in the plant of the Burt Portland Cement Company at Eaton Rapids, Mich., which has been closed down for the purpose. The past year is reported to have been the best in the company's history.

The Calumet Chemical Works has been organized with $100,000 capital stock, to establish a manufacturing plant at Escanaba, Mich.

The Midland Machine Company, Detroit, has had an excellent trade this year in screw machine parts, special tools, jigs, &c., and the prospect in these lines for the coming season is good.

The system of power distribution to be established by the Manistee County Electric Company, whose headquarters at present are in the Houseman Building, Grand Rapids, Mich., will include a large hydroelectric plant and an auxiliary engine or steam turbine operated plant, the latter to be erected in Manistee, Mich. Plans and specifications are now being worked out by the company's consulting engineer, Daniel J. Albertson, Kalamazoo, Mich.

The Detroit Edison Company, Detroit, is proceeding with plans, mentioned some time ago, for an addition to its West Jefferson street power house.

Smith, Hinchman & Grylls, Detroit, have let the contract for the foundations of the Buhl Malleable Company's new steel foundry. Provision for the equipment is now being made, a list of considerable size having been given out to be figured on.

The Havers Motor Car Company has been organized to establish an automobile plant at Port Huron, Mich.

The business of the Beach Mfg. Company, Charlotte, Mich., has been incorporated with $100,000 capital stock. In addition to its large plant at Charlotte the company also operates branch plants at Grand Forks, N. D., and Portland, Ore., which are separately incorporated companies.

The Bates Tractor Company, Lansing, Mich., has been organized with $200,000 capital stock by M. F. Bates of the Bates & Edmonds Motor Company of that city. The company will manufacture gasoline tractors, and expects to build a plant in Lansing, and is now considering a number of locations that are available.

The Northern Engineering Works, Detroit, reports a large increase in sales of the Newten cupola, among which are one 6-ton to the Middleby Auto Company; one 12-ton, Modern Foundry Company; one 6-ton, Dake Engine Company; one 1-ton, Washington University; one 5-ton, Michigan Crucible Steel Castings Company; one 12-ton, Southern Iron & Steel Company.

Milwaukee

MILWAUKEE, WIS., December 19, 1910.

One contract of large size, for hydraulic power machinery, was received here last week from the Pacific Coast, and some buying was done on account of new tannery buildings in Milwaukee, but general trade has not been brisk. The month of December will, however, average fairly well as compared with previous seasons. From present indications considerable buying will develop all through the State by the latter part of January. From other industrial centers of Wisconsin, as far as Superior in the extreme Northwest, the reports received are most encouraging. Despite the dull condition of trade in general local shops have been well filled with work. Most of those devoted to the manufacture of machinery or other mechanical or electrical appliances make a feature of certain patented specialties which can be disposed of with a minimum of sales effort, and for these the aggregate demand is sufficient right along to insure the steady operation of their plants.

A notable example of this here in Milwaukee is the business of the Cutler-Hammer Mfg. Company, which has developed a line of electric controlling devices that are in constant demand. From the character of its trade one would have no evidence of the dullness prevailing in most lines of equipment during the fall months, as a very satisfactory volume of orders has been received.

Fred Frotenrath, manager of the American Machinery & Construction Company, Milwaukee, millwright, is arranging for the construction of a two-story factory building at 593 Island avenue.

The water works system at Rhinelander, Wis., will probably be taken over by the city and enlarged. The present equipment of the pumping station includes motor driven centrifugal pumps, two-stage, built in the shops of the Allis-Chalmers Company, Milwaukee.

Joseph Obenberger & Son, Milwaukee, have postponed until the late winter or early spring the construction of the addition to their forge shop.

The contract for heating apparatus to be installed in the first of the new buildings of the Minnesota Steel Company has been let to the American Heating Company, Superior, Wis.

Bonds covering the installation of the proposed water works system have been voted at Prescott, Wis.

The installation of an electric lighting plant is under consideration at Maiden Rock, Wis.

The municipal water works and electric power plant at Menasha, Wis., which is equipped with generators driven by Diesel oil engines, will probably be enlarged by the addition of a unit similar to those already installed. No definite purchase has as yet been authorized, the matter being still in the hands of the City Council.

A repair shop is to be provided for in the new building being erected at Marshfield, Wis., by the Marshfield Hardware & Auto Company.

A steam and electric power plant, with motors for driving the machinery, will be included in plans for a large new paper mill, to be built by the Lakeside Paper Company, recently organized by E. J. Lachmann of Neenah, Wis., and others. Its location is to be Menasha, Wis.

In connection with its timber cutting plant at Boyd, Wis., the Boyd Lumber, Land & Improvement Company will install planing mill machinery at some time during the present winter.

Wisconsin builders of hydroelectric machinery will bid on equipment for a large plant, to be erected in the vicinity of Marseilles, Ill., by interests identified with the Northern Illinois Light & Traction Company. The construction will be in charge of L. E. Myers Company, Chicago, Ill., who arranged for the building of the Northern Hydro-Electric Company's large generating station at High Falls, Wis., which is the most important hydraulic power development in this State.

The plant which the Endeavor Electric Light & Power Company, Endeavor, Wis., is planning to build will be located at Valders, Wis. The company's headquarters are at Endeavor, Wis.

It is reported from Appleton, Wis., that a manufacturing plant will be erected there by the Imperial Knitting Mill Company, recently organized.

The La Crosse Commercial Association, La Crosse, Wis., is endeavoring to secure the location in that city of the Reliance Engine & Iron Company, now building gas and gasoline engines in Racine, Wis. The company is doing an excellent business there, but has an unsatisfactory site, without side track facilities, and is stated to have been considering a change.

The Continental Realty Company, which operates a large electric power plant in Milwaukee, will construct three substations equipped with transformers.

A substation equipped with power transformers and other electrical apparatus will be built in Superior, Wis., by the Great Northern Power Company, Duluth, Minn., and a transmission line run directly from the 40,000-hp. generating station of the company at Thomson, Minn.

The Nordberg Mfg. Company, Milwaukee, has opened a district office at Butte, Mont., where quarters in the Lewisohn Building were recently secured. Victor Nordberg will be in charge as the manager of sales for that section.

The Board of Public Works, Wausau, Wis., has been authorized to have plans prepared and detailed specifications drawn for a new electric power plant, to be operated by the municipality.

The Murphy Boiler Company, 153 Barclay street, Milwaukee, has been incorporated for $10,000 by J. C. Murphy, A. J. Weidner and Samuel A. Connell.

John F. Conant, 510 Terrace place, Milwaukee, is the buyer of the Two Rivers Woodenware Company's plant at Two Rivers, Wis.

A new riveting system has been installed by the J. I. Case Threshing Machine Company, Racine, Wis., the equipment being furnished by the Hanna Engineering Works, Chicago, Ill.

The Water-Clarke Company, Superior, Wis., is about to proceed with the erection of an addition to its woodworking plant.

The Milwaukee Electric Railway & Light Company, Milwaukee, is installing in its Commerce street power house two steam turbine sets of 7500 kw. and two of 14,000 kw., furnished by the General Electric Company, Schenectady,

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N. Y. Corresponding additions will be made in the boiler house and the auxiliary apparatus, both at this time and later on.

The Badger State Machine Company, Janesville, Wis., whose products include punches, shears, bending rolls and woodworking machinery, has on hand at present a large volume of business, with very satisfactory prospects for the new year.

A modern plant, equipped with woodworking and power machinery, will be erected in Milwaukee by the Layton Park Woodwork Company, whose factory was destroyed by fire.

The Reliance Wrench Mfg. Company, 1508 State street, Racine, Wis., has been incorporated with $25,000 capital stock. The company will contract for the manufacture of its wrench for the present, but expects to erect a plant some time in January.

The Universal Mfg. Company, Racine, Wis., has filed articles of incorporation with $25,000 capital stock. The company will manufacture steering gears for motor cars and trucks, automobile parts and machine specialties.

San Francisco

SAN FRANCISCO, December 14, 1910.

Considering the lateness of the season, the general machinery market appears to be in fair condition. No large volume of orders is being booked, and none was expected at this time, but several large inquiries have recently come out for equipment to be purchased after the first of the year. Plans for a large increase of equipment are being made by many industrial and development companies, and the outlook is favorable for a period of considerable activity during the spring. Dealers feel encouraged by the fact that current business continues on about the same scale as for some time past, the year-end curtailment in some lines being compensated by an improvement in others.

Machine tool business is confined almost entirely to orders from small machine and automobile repair shops in outside towns, all large purchasers being inclined to hold off until January. The automobile repair trade has been a factor of some importance in the season's business. Some large installations are to be made, however, during the next six months, and if the railroads come into the market again the movement should be about up to normal. Many substantial orders have already been booked for delivery next year of contractors' and railroad equipment, dredging machinery and the like, and manufacturers in these lines are preparing to increase their output.

One of the principal installations in prospect is for the new shops at South San Francisco for Norman B. Livermore and others. Mr. Livermore is Western representative of the American Locomotive Company, Atlantic Equipment Company, Ransome Concrete Machinery Company and others, with offices in the Metropolis Bank Building. After the first of the year a new company will be incorporated, of which he will be president, absorbing the Mutual Engineering Company of San Francisco. A site of 12 acres has been secured at South San Francisco, and contracts have been let for the erection of a machine shop 100 x 400 ft. and a car shop 100 ft. square. The shop will be equipped for general locomotive and railroad repairs, and the manufacture of freight cars, logging equipment and suction dredge machinery. In addition to the equipment from the old shops, new tools required will include several large boring mills, tire-turning lathes, planers and complete outfits for a boiler shop, forge shop and woodworking shop. The shop is expected to be in operation within 90 days, and sufficient work is already under contract to keep it occupied for several months. The Norman B. Livermore Company will have the selling agency for this plant, as well as for the lines already represented.

Arrangements have been made by which the Yuba Construction Company, Marysville, Cal., will act as agent for the Bucyrus Company, covering the Pacific Coast, including Alaska and British Columbia. The Yuba Construction Company has a large business in the manufacture of hulls and small machinery for gold dredges, both for California and Alaska.

Several good orders have recently been placed by mining interests, both in California and Nevada. The mines along the mother lode in California are developing rich ore at a low level, and are planning more new equipment than for several years past. Arrangements are being made for pumping out many old mines, and the installation of new hoisting and pneumatic machinery. Most of the business from this source will be withheld until spring, as delivery is impossible during the winter, but large inquiries have increased rapidly in the last month. A number of orders for stamp mills, &c., are expected from Alaska mining concerns.

A lot of Chicago pneumatic drills has just been shipped to Alexander & Baldwin of Honolulu.

There is an active movement of second-hand machinery, the demand being principally for steam and gas engines and contractors' equipment.

Emil Koenig is preparing to establish a new foundry at Upland, Cal.

A new building is being erected for the machine shop of Angell & Redit at Anaheim, Cal.

F. S. Granger, promoter of an electric railroad between Fresno and Hanford, Cal., announces that a power house will be installed at a cost of $100,000, near Fowler, Cal.

The Northern Electric Company is planning to install repair shops on its new terminal site at Sacramento, Cal.

The California Ornamental Iron Works has been incorporated at Los Angeles, with a capital stock of $25,000, by G. A. Anderson, E. H. McGinnis and O. S. Lieb.

The Swayne Lumber Company, Stanwood, Cal., will install a lot of new machinery during the winter.

J. V. Kunze, Atlantic manager for the Pelton Water Wheel Company, is visiting the San Francisco offices.

The American La France Fire Engine Company of California has been incorporated in San Francisco, with a capital stock of $20,000, by R. S. Chapman, G. M. Alitzer, W. T. Barnett, A. D. Plaw and E. T. Zook.

The Destructor Company, 111 Broadway, New York, has taken a contract for two garbage incinerators for San Francisco, at $253,216. Each plant is designed for disposing of 120 tons of mixed refuse in 24 hours.

The G. W. Price Pump & Engine Company, San Francisco, has started the manufacture of a new line of traction engines, called Price's centipede tractor.

New sawmill machinery will be ordered to replace that recently destroyed by fire in the mill of the Goldfield Consolidated Mining Company, near Manhattan, Nev.

A pumping plant is to be purchased for a municipal water system at Tehachapi, Cal.

The Church Water Company, Riverside, Cal., has ordered from the Smith-Booth-Usher Company, Los Angeles, a pumping plant with a capacity of 450 gal. per min. on a lift of 350 ft.

Local shipbuilding plants, as well as those on Puget Sound, have considerable work on hand, principally repairs. This business has been increased by the heavy coastwise lumber traffic, and by the unusually large number of marine accidents which have occurred this fall. Little important new construction is coming up.

Dealers in machine tools hope that provision will be made during the short session of Congress for the needed improvements at the Mare Island Navy Yard, which requires a number of large tools. They believe that some definite action will result within a year or two from the recommendation by Secretary Meyer of the construction of a government drydock on deep water in San Francisco Bay, which would require the installation of a subsidiary marine repair shop.

The Los Angeles Gas & Electric Light Corporation, Los Angeles, Cal., is having plans prepared for extensive improvements. It is understood that the improvements include a steel gas holder to contain 6,000,000 cu. ft. of gas.

A company with a capital stock of $100,000, and of which J. M. Brennan is president, is establishing a shoe factory at Upland, Cal., which will commence operations with an initial capacity of 250 pairs of shoes daily. Machinery used for operating power will probably consist of one 12, one 25 and one 30 hp. gas engine, the rate for electric current being so high as to be prohibitive.

Hunt, Eager & Burns, Los Angeles, Cal., have prepared plans for a children's hospital to be erected at a cost of $75,000 and equipped with an electric light plant.

The Northwest

ST. PAUL, MINN., December 19, 1910.

The contract for pumping machinery to be installed in the water works at Minneapolis, including two motor driven centrifugal pumps of 20,000,000 gal. each, has been placed with the Henry R. Worthington Company, New York City. Some auxiliary apparatus will be purchased later as required.

The Cramer Bros. Company, Polson, Mont., will enlarge its power plant and install resawing machinery in the mill.

It is proposed at Egan, S. D., to install a pumping plant for serving the community, and a definite decision in the matter will be reached before spring.

A steel tower and tank will probably be purchased soon after January 1 at Easton, Minn.

The municipal authorities at Huron, S. D., have engaged L. P. Wolf, St. Paul, to plan and supervise the improvement of the local pumping system.

A bond issue of $20,000 for the installation of water works will be voted on at North Mankato, Minn.

A bond issue for the improvement of the pumping plant

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and water distribution system has been voted at Lake Preston, S. D.

For service next spring the city of Madelia will have a new steel tower and tank added to its water system.

The Butte Electric Supply Company, Butte, Mont., has been reincorporated under the laws of the State of Utah and its capital stock increased from $50,000 to $250,000.

The South

NASHVILLE, TENN., December 19, 1910.

The demand for machinery is scattering, with no particular trend to buying, which consists mainly of small orders from every branch of industry in the South. Contracts for important public works are being generally held in abeyance until after the holidays, for the reason that it is difficult to get decisive action on the part of official boards. A great deal of purchasing has been held back from divers causes, and so much of it is coming to be really necessary that relief must be afforded soon after the new year begins.

Work is now well under way on the new shops of the Louisville & Nashville Railroad at Boyles, Ala., which will include 10 new buildings of steel and concrete construction.

The Houma Lighting & Ice Mfg. Company, which has in its power plant a General Electric generator of 150 kw. driven by a Hall engine, together with modern refrigerating machinery, will enter shortly upon extensive additions and improvements. The company is located at Houma, La.

Considerable new equipment will be required in connection with construction work to be undertaken next February or March by the Cullman Coal & Coke Company on an industrial road from Cullman to Juliana, Ala.

Having obtained the approval of the State Railroad Commission, the Wofford Shoals Light & Power Company, Cornelia, Ga., will issue bonds and increase its capital stock to provide for the completion of its power generating and distribution system. Lighting service and industrial power are to be furnished a number of communities in the vicinity from alternating current generators driven by water turbines.

The Columbian Iron Works, Chattanooga, Tenn., has developed an excellent trade among municipalities and companies operating water systems in a patented meter box of its manufacture, for which there is a steadily increasing demand.

Alternating current motors for machinery drive are to be installed by the Greenville Mantel & Novelty Company, Greenville, S. C.

The installation of a large mechanical filtration plant is under consideration by the municipal officials at Henderson, Ky., in accordance with recommendations recently made by an expert.

J. H. Yates, Herndon, Va., is reported to be planning the erection of an electric power plant in that vicinity.

The Oliver Electric & Machine Company, Birmingham, Ala., in addition to installing complete power plants, makes a specialty of designing electrical machinery to fit particular requirements, and undertakes the rebuilding or repairing of apparatus. Samuel W. Oliver is president of the company.

J. H. Bridges, Henderson, N. C., has been engaged by the city of Warrenton, N. C., to make recommendations for a municipal pumping plant.

The Alabama Railway & Electric Company, whose plans for power plant equipment were recently mentioned, will probably proceed with the work early in the coming year. It is reported to be under the direction of R. W. Snyder, Allen Building, Birmingham, Ala.

The Carolina Crushed Stone Company, organized by H. G. Thomas, Columbia, S. C.; F. C. Ford, Charleston, S. C., and G. T. Franklin, Banby, Va., has bought the quarry and crushed stone plant of the T. A. Heise Stone Company, and will install machinery, enlarging its capacity to 500 tons daily.

Electric motors will be used for operating the machinery in the new plant of the Central of Georgia Guano Company, at Milledgeville, Ga. The equipment required has already been largely provided for, but some of the details are still to be settled upon.

From Richmond, Ky., it is reported that Louis Herrington and others of that place are organizing a company to build a hydroelectric plant in the vicinity of Danville, Ky., to furnish power and lighting service.

The Fayette Lighting Company, recently organized at Lexington, Ky., is having plans prepared under the direction of A. H. Peck, general manager, for a large electric power plant to serve that community.

A project supported by the Board of Trade of Stone Mountain, Ga., is under way to build an electric railway to Atlanta, Ga.

A bond issue of $250,000 has been voted by the stockholders of the Sayre Mining Company, Sayre, Ala., for the purpose of making extensive improvements, including the installation of a new electric light plant.

The Birmingham Aeroplane Company has been incorporated at Birmingham, Ala., with Jesse W. Alexander of Owenton, Ala., as president. The company expects to build a plant for the manufacture of an aeroplane on which it holds patents.

The Thornhill Wagon Company, Lynchburg, Va., whose plant was recently burned, has increased its capital stock to $300,000 and will build a plant of double the capacity of that destroyed. The machinery equipment has not yet been purchased.

The Decatur Fertilizer Company, Decatur, Ala., has been organized, with $10,000 capital stock, to manufacture fertilizer in a building already erected. Tracy W. Pratt is president of the company.

Texas

AUSTIN, TEXAS, December 17, 1910.

Good rains have fallen during the past week in many parts of the State, breaking the long drouth, and causing a general improvement in business conditions. The shortage of water supply which was beginning to be seriously felt in a number of towns in North Texas and the Panhandle country is relieved, at least temporarily. The plans for developing an increased supply and wider distribution of water, which were necessitated by the drouth, will be carried out in a number of towns, to provide for any future emergency that may arise.

Charles S. Downing of Kansas City, Mo., will construct a large system of irrigation, including the installation of pumping plants, upon a tract of land which he owns near Fort Stockton, Texas. He has already arranged for watering about 7500 acres. The proposed irrigation system will cost in the neighborhood of $500,000, it is said.

The Northern Produce Company, Cuero, Texas, will install an ice plant at that place.

J. A. Clay, general manager of the Durango Electric Company and the San Juan Water & Power Company, has been investigating the situation at Farmington, N. M., with the view of extending the electric power transmission lines of his interests to that locality for the operation of irrigating pumping plants and other power purposes. It is reported that he will also take over the Farmington electric light plant.

The demand for pumping machinery in the Del Rio, Texas, irrigated district is constantly increasing.

The Temple Lumber Company is installing a large machine shop at Pineland, Texas.

The sawmill and planer at Alexander Switch, Texas, which were recently purchased by R. K. Coke and W. H. Savage from the Alexander-Hardee Lumber Company, will be remodeled and enlarged. Considerable new machinery will be installed.

The Hardy Oil Company, which is laying an oil pipe line from the Markham oil field, near Markham, Texas, will install a pumping plant.

The Seco Pressed Brick Company has been organized at D'Hanis, Texas, with a capital stock of $40,000. The incorporators are F. Rothe, August C. Rothe, Joe Ney and others.

The Huasteca Petroleum Company, a subsidiary of the Mexican Petroleum Company, Los Angeles, Cal., will erect three oil storage tanks, one at Tampico, Mexico, with a capacity of about 1,000,000 bbl., another at Juan Casiano, Mexico, and the third at San Geronimo, Mexico, the combined capacity of the latter two to be about 600,000 bbl. This company recently finished the laying of a pipe line from the Juan Casiano field to Tampico, 110 miles, and is delivering oil through it at the rate of about 25,000 bbl. per day. On the route of this line were erected four pumping stations, each station costing about $100,000. The same company has a concession from the Mexican Government for the construction of a line from its oil fields in the gulf coast region to the City of Mexico, a distance of several hundred miles. It is now obtaining the right of way, preparatory to beginning construction work.

Tennison Brothers, Houston, Texas, have under construction a building containing 10,000 sq. ft. of floor space, which will be used as a factory building for the manufacture of eaves troughs, conductor pipe, metal shingles, cresting, well casing, stove pipe, irrigating pipe, &c. They have been operating a similar factory at Texarkana, Ark., for a number of years, but, owing to the low freight rates and better shipping facilities, it was decided to locate a factory at Houston to supply the Southwest, Louisiana and East Texas trade.

Machinery of the most modern type, including the new pneumatic system of operating trimmers, with motor-driven compressor, &c., will be furnished by the Giddings & Lewis

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Mfg. Company, Fond du Lac, Wis., for the new mill of the Waterman Company, which is to be erected at Blocker, Texas. A large band mill, steel carriage and resawing machinery will also be features of the equipment.

New bids on equipment for the proposed water works improvements will be taken at Dennison, Texas, where the tenders recently made were rejected.

Shaw Brothers' Ice & Fuel Company, Fort Worth, Texas, has been incorporated, with a capital stock of $40,000. The incorporators are Albert Shaw, Gus Shaw, William Shaw and George Shaw.

Plans are now under way for the construction of a water works system at Princetown, Collin county, Texas. The company has already been organized, with J. W. Godwin as president, J. H. Stinson vice-president, C. A. Wilson secretary and treasurer.

A fire December 6 destroyed 24 self-loading pockets and the entire hoisting machinery of the Trinity & Brazos Valley Railroad yards at Teague, Texas, causing a loss of $30,000.

The Powell pumping station of the Fort Worth water works, Fort Worth, Texas, was destroyed by fire December 8, causing a loss of $50,000 on the building and machinery.

The Swift Cotton Oil Mill Company's plant at Grandview, Texas, was destroyed by fire December 7, causing a loss of $50,000, fully covered by insurance.

Work has been started on the buildings to be occupied by the Port Lavaca broom factory, Port Arthur, Texas. The buildings include operating room, warehouse and bleaching room.

The Southwest

KANSAS CITY, MO., December 19, 1910.

Current trade continues fair, being about normal for the pre-holiday season, and a nice line of inquiries has developed upon which considerable business is expected to be closed in January.

Dickinson & Watkins, Little Rock, Ark., have been engaged by the city of Portland, Ark., to prepare plans for an electric power and pumping station, work out the complete specifications and supervise the construction.

A new timber cutting plant is to be built at Altheimer, Ark., by the Varner Land & Lumber Company of Pine Bluff, Ark.

A lighting plant and other electrical equipment will be installed in the near future by the Bartlesville Oil Refining Company of Bartlesville and Oklahoma City, Okla.

Construction work will begin in about two months on the line of the Oklahoma City & Ft. Smith Traction Company. Plans are in charge of Joseph Kreis, Oklahoma City, Okla., who is general manager of the company. A power plant will be built in or near the coal fields lying along the route surveyed for the road.

In consequence of the demands made upon its hydroelectric station on Fossil Creek, the Arizona Power Company, Prescott, Ariz., will soon arrange for the construction of another plant. The purchase of equipment is likely to be made very quickly after a definite decision in the matter has been reached.

Contracts for the preliminary work on the new water works system at Ada, Okla., will be let about the middle of January, and the purchase of machinery is to follow.

A new manufacturing plant will be placed in operation this winter at Tulsa, Okla., by the Tulsa Lightning Arrester & Electric Company, recently organized, of which W. J. Stewart has been elected secretary.

The Allin Machine Works, Helena, Ark., has been established to manufacture a hoe patented by W. J. Allin, which has five detachable blades. The company is in the market for drop forgings or steel castings and pressed steel blades or the special tools for making them, also handles and ferrules.

The Commercial Club of Tulsa, Okla., has closed a deal with J. S. King and associates of Des Moines, Iowa, for the installation of a steel and copper cable factory in that city.

The City Council of Manchester, Okla., has under consideration the establishment of a water works system.

Estimates are being prepared by Lamont, Okla., for the construction of a water works system at a cost of $17,000.

An appropriation of $85,000 has been made by Douglas, Ariz., for establishing a water works system.

The Oklahoma Traction Company is building a line to connect Tulsa and Salpulpa, a distance of 15 miles, and is the first interurban in Oklahoma. It is planning a chain of interurbans, one of which will connect with Bartlesville, 50 miles, and another will run to Coweta, 55 miles.

An agreement has about been reached between the Muskogee Industrial Development Club, Muskogee, Okla., and the Sun Ray Stove Mfg. Company of Delaware, Ohio, for the removal of the factory to Muskogee. The Muskogee Development Company will furnish a site and take $10,000 worth of stock in the proposed factory.

The Muskogee Packing Company, Muskogee, Okla, has been incorporated with a capital stock of $150,000. George E. Schneider, N. F. Hancock and F. H. Grubbs of Muskogee, G. D. Sleeper of Rex and T. C. Harrold of Wagoner are the incorporators.

Among companies recently chartered in Oklahoma is the Baker Grate Improvement Company, Oklahoma City, with a capital stock of $25,000. The incorporators are A. P. Crockett, W. F. Baker and George M. Ayers.

Plans are being formed for rebuilding the Kremlin Flour & Alfalfa mills, Kremlin, Okla., recently destroyed by fire.

The Atchison, Topeka & Santa Fe Railroad has let the contract for the construction of the new boiler house at Topeka, Kan. The building will be used to house the boilers furnishing steam to operate the pumps in the 12 new 10-in. wells. The company has also let a contract for the new gas welding plant and when completed will install gas making machinery.

Farther Central West

OMAHA, NEB., December 19, 1910.

One of the features of the coming construction season will be the erection of additional sash and door, flooring and interior woodwork factories at points in this territory where rates on timber from Southwestern or Northwestern and Pacific Coast mills will permit. This means a corresponding demand for the machinery used in such plants, with motors, controllers, electric lighting equipment, &c. The manufacture of cement, lime, plaster and clay products will also be largely increased, as building operations were delayed last season by periodical shortages of construction material, and concrete machinery, crushed rock, cut stone, &c., will also be extensively in demand, necessitating further plant enlargements on these accounts. Taken all in all, the construction work that begins in March or April will be responsible for a considerable aggregate of buying in behalf of the industries of this section.

E. G. Staats & Co., Inc., Mt. Pleasant, Iowa, are enlarging their factory and will install new woodworking machinery.

The power and pumping station and distribution system of the Public Water Company, Ottumwa, Iowa, have been purchased by the municipality and extensive improvements will be entered upon.

For the coming spring the erection of a new manufacturing plant is being planned by the Ottumwa Supply & Construction Company, Ottumwa, Iowa, which, since the fire that destroyed its plant, has been located in temporary quarters.

The plant of the National Lumber, Box & Package Company, Omaha, Neb., will be rebuilt for larger capacity, and woodworking machinery, electrically operated, installed.

An engineer will be engaged shortly by the authorities at Columbus Junction, Iowa, to plan the construction of a power and pumping plant.

Additional power transformers and other equipment for both the main generating plant and a substation at Stanton, Iowa, will be required by the Red Oak Electric Company, Red Oak, Iowa, upon completion of a transmission line to that place.

The Ft. Dodge Light & Power Company, Ft. Dodge, Iowa, which has a plant of about 750 kw. capacity, will probably add to its equipment in the near future, in consequence of a five-year lighting franchise obtained locally.

W. D. Crist, vice-president of C. E. Coon & Co., Brandeis Building, Omaha, will purchase a steel tower and tank, pumping units, cast iron pipe, valves, hydrants, &c., for a water works system which that company is under contract to install at Dorchester, Neb.

The Central Machine Works, Omaha, has been incorporated for $25,000. G. E. Selander and C. G. Bolin are the proprietors.

Pending the location of the main shops of the road, the Denver, Laramie & Northwestern Railroad Company, Denver, Colo., will install repair equipment in a shop at Utah Junction, Colo., where a roundhouse is also being erected.

Estimates covering the construction of water works at Olathe, Colo., have been prepared by an engineering firm of Denver, engaged for the purpose, and the matter will be actively taken up in the near future.

The Hassell Iron Works Company, Colorado Springs, Colo., is rebuilding its plant, recently destroyed by fire.

The Telluride Power Company, Telluride, Colo., has ordered a 1500-hp. Pelton impulse wheel, to operate under 1200-ft. head, with a General Electric generator.

The Fort Dodge Portland Cement Corporation, Fort Dodge, Iowa, has awarded the contract for the construction of its new plant at Gilmore City, Iowa. It is expected to

THE MACHINERY MARKETS

be completed by next summer, and will cost approximately $2,000,000. The rock crushing and power plants will be the first to be completed.

Beatrice, Neb., has under consideration the establishment of a water works system.

The Baker Machinery Company, Des Moines, Iowa, is now occupying its new building and will carry a full line of power transmission goods, mill and foundry supplies, steam and water specialties and mining and clay working machinery. The company has a very commodious factory building equipped for the manufacture of freight and passenger elevators. It will also do special machine and structural work, the new factory equipment enabling any class of mechanical work to be done.

The Waterloo Gas Engine Company, Waterloo, Iowa, is making extensive additions to its plant. The company has in course of construction a building 50 x 300 ft., and expects to build an addition to its general manufacturing plant in the spring which will be 120 x 450 ft. in size.

E. Derby, an Ohio manufacturer, will establish at Marshalltown, Iowa, early in the spring, a factory that is to manufacture a stamping and perforating device to prevent the raising of checks. The heads of the several departments in the present factory are to remove their families to Marshalltown in the near future.

The A. R. Flick box factory, Dubuque, Iowa, was destroyed by fire December 10, causing a loss of $35,000.

The Hastings Foundry & Iron Works, Hastings, Neb., has started the construction of five new buildings that will add 20,000 sq. ft. of floor space to the plant.

North Pacific Coast

SEATTLE, WASH., December 16, 1910.

The chief interest of the larger machinery houses, and particularly representatives of Eastern concerns, is centered in the several hydroelectric power developments that have recently advanced to the stage where machinery needs to be purchased. One contract which has just been placed through the Seattle office of the Allis-Chalmers Company, Milwaukee, calls for two hydraulic turbines that are said to be of the largest capacity of any yet built. Each is designed to produce over 20,000 hp. They will be installed by the Pacific Coast Power Company, whose headquarters are in Seattle, at an electric generating station on the White River, not far from Tacoma. The alternating current generators driven from these turbines will be supplied by the General Electric Company, Schenectady, N. Y., and orders for a large quantity of auxiliary equipment have been, or will be, placed among a number of other concerns. Some of this will not be required until later.

The city of Tacoma will soon call for bids covering the hydraulic turbines, governors, generators, exciter units, power transformers, &c., to be used in the large Nisqually plant, now under construction. Besides the main equipment, there will be a great deal of minor apparatus to be purchased in connection with this project.

The Central Power Company, Pe Ell, Wash., is completing a power dam on the Chehalis River, and will construct an electric plant supplying current to the industries in that vicinity.

A new hydroelectric power development, with pumping station, at Loomis, Wash., is reported to form part of the plans of the Whitestone Irrigation & Power Company, recently chartered under the law of this State.

Construction work is now in progress on the line of the Dalles Street Railway, The Dalles, Ore., equipment for which will be purchased early in the coming year, as needed.

The Olympic Power Company, Seattle, has just completed plans for a 25,000 hp. power plant near Port Angeles, on the Elwah River, which is intended to eventually produce 75,000 hp. Transmission lines are to be extended over a wide territory, in order to furnish lighting service to various communities and operating power for local industries.

The Portland Railway, Light & Power Company, Portland, Ore., is preparing to make further extensive improvements in its system, including the purchase of three large generating units and other machinery for its new Estacado hydraulic power station, and the erection and equipment of new substations. This company will be buying liberally at frequent intervals during the next few months.

A vote is to be taken shortly at Leavenworth, Wash., on a bond issue of $45,000 for water works construction. The estimates include thoroughly modern equipment for the proposed plant.

Plans are understood to be in preparation by A. Baker, superintendent of the Last Chance mine at Northpoint, Wash., to build a large ore concentrating plant on a site recently purchased for the purpose.

At the 300-stamp crushing and amalgamating mill of the Alaska Treadwell Gold Mining Company, Juneau, Alaska, arrangements are being made to install a large number of motors for driving the machinery by electric power. The shafting in use, which is direct driven from water wheels, is not to be displaced, but the one system will supplement the other as operating economy dictates.

The Oregon Railroad & Navigation Company, Portland, Ore., is building a four-stall roundhouse and machine shop at La Grande, Ore., for the repair of locomotives. In addition to the machinery heretofore used in the roundhouse at that point additional tools have been purchased, including a driving lathe, planer and drill presses.

The city of Ellinsburg, Wash., has issued bonds in the sum of $300,000 for the purpose of establishing a water works system.

The Klamath Falls Light & Power Company, Klamath Falls, Ore., has ordered a 1050-hp. horizontal double Pelton-Francis turbine, to be operated under 46-ft. head, with Westinghouse generators.

Government Purchases

WASHINGTON, D. C., December 19, 1910.

The Paymaster General, Navy Department, Washington, will open bids under schedule 3155 December 20 for two direct connected ventilating sets and one set electrical spare parts.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids December 27 for one power pump, schedule 3099.

The Constructing Quartermaster, Port Howard, Md., will open bids January 10 for constructing pump house and installing pumping machinery at Fort Smallwood, Md.

The United States Engineer Office, Pittsburgh, Pa., will open bids January 11 for furnishing and installing a water power air compressor plant at lock 1, Monongahela River, Pittsburgh, Pa.

The inspector of the Tenth lighthouse district, Buffalo, N. Y., opened bids December 8 for furnishing one vertical marine duplex pump for the tender Crocus as follows: M. T. Davidson Company, New York, $270; Charles A. Strellinger, Detroit, Mich., $200.

Bids were opened December 13 by the Bureau of Supplies and Accounts, Navy Department, Washington, as follows:

Class 1.—One double service planing machine for Mare Island, Cal.—Bidder 5, American Woodworking Machinery Company, Rochester, N. Y., $1475 and $1700; 56, Elec Machinery Company, San Francisco, Cal., $1940; 61, J. A. Fay & Egan Company, Cincinnati, Ohio, $1855.50 and $2065; 75, Henshaw Bulkley & Co., San Francisco, Cal., $1730 and $2180; 79, Harron, Rickard & McCone, San Francisco, Cal., $1855.50 and $2065; 118, Manning, Maxwell & Moore, New York, $1543; $1206, $1440, $1595 and $1865; 199, B. D. Whitney & Son, Seattle, Wash., $1645; 200, S. A. Woods Machine Company, Boston, Mass., $2049.50.

British Boilermakers' Lockout Ended.—The lockout of boilermakers, affecting altogether 50,000 shipyard employees of members of the Shipbuilding Employers' Federation in Great Britain, was ended December 14, the men voting almost unanimously to accept the terms of the employers. The lockout began September 2, following a strike of riveters at one yard. The employers' federation contended that this strike was in violation of an agreement for the prevention of strikes and lockouts which the federation had made with 19 shipyard unions. It was decided that the lockout continue until the boilermakers' union was prepared to guarantee the keeping of the agreement. The lockout has cost millions of dollars in wages and has affected nearly all branches of the steel trade.

Shimer & Co., Inc., Philadelphia, Pa., with an authorized capital stock of $5000, have been granted a Pennsylvania charter and will engage in the iron, steel and non-ferrous metal business. Offices have been opened in the Bullitt Building, Philadelphia, and the Frick Building, Pittsburgh, Pa. J. N. M. Shimer, of L. & R. Wister & Co., Philadelphia, is president of the new corporation; H. M. Shimer, vice president; C. E. L. Hatch, treasurer, and William E. Arnold, assistant treasurer and secretary. The new company has been appointed selling agent for the Dunbar Furnace Company, Dunbar, Pa., this business having formerly been conducted by L. & R. Wister & Co.

Lake Superior Iron Mines

Pensions for Old Range Workers—New Properties Being Opened

MARQUETTE, MICH., December 17, 1910.—The operations of the Steel Corporation's pension plan will affect immediately a considerable number of men on the Lake Superior iron ranges. It is estimated that in the Marquette district about 200 men have been in the service of some Steel Corporation subsidiary continuously for 20 years or more, and the age of many of these is upwards of 60. Capt. John McEncroe, Ishpeming, is filling a position of much responsibility, after having been in the employ of the Lake Superior Iron Company for 53 years. The second oldest employee is Peter Raymond, an engineer at the Lake Superior Hard Ore Mine, Ishpeming, who has been on the payrolls continuously for forty-seven years. A number of employees on other ranges are also entitled to pensions.

A fine new "dry" house has been completed at the Steel Corporation's Aragon mine at Norway, Mich. It is 40 x 100 ft., steel framed and brick lined, and contains 360 steel lockers. The entire work of construction, even to the wiring, the plumbing and the installation of the equipment, was performed exclusively by the company's own skilled mechanics.

After an idleness extending back to 1902, the Steel Corporation's Hilltop property in the Crystal Falls district of the Menominee range is to be restored to the active list. It will be provided with a new equipment of machinery, and shaft-sinking will then go forward. The matter of reopening the Cundy mine at Quinnesec is also under consideration.

The Steel Corporation's Section 16 mine at Ishpeming, Marquette range, has been closed temporarily, pending the erection of a steel shafthouse. The men affected have been transferred to other properties.

At Negaunee, on the Marquette range, excellent progress has been made with the unique work of removing the many hundreds of bodies from the old cemetery to the new burial ground, in order that iron mining may be carried on. A considerable portion of the old cemetery is underlaid with ore that will be mined on a royalty basis by the Cleveland-Cliffs Iron Company. On one side of the tract is the Negaunee mine and on the other the still greater Maas mine. The mines are connected by a long drift and through this much of the cemetery ore will be taken out. It is not alone because there are iron deposits that Negaunee's old burial ground is being abandoned, but also because the tract was becoming overcrowded with bodies. In addition to agreeing to pay a royalty on all the ore mined, the Cleveland-Cliffs Company has provided a much larger and better cemetery, and it is paying all the expenses of removal. The whole will amount to $100,000.

The Florence Iron Company has taken an option on the Charles Peterson homestead, 3 miles west of Florence, Menominee range, and is preparing to explore the property. A churn drill and a diamond drill will be operated.

The Volunteer Ore Company, which is opening a mine at Palmer Lake, in the Cascade district, Marquette range, has awarded a contract for the construction of a "dry" house, with accommodations for 200 men. Ore has been hoisted from the shaft for several weeks and by next spring there will be on hand a large stock pile. G. A. Tomlinson, Duluth, is president, and Thos. F. Cole is a director.

Minnesota Developments

A new mine to be developed on the Mesaba is the property of the Ruddy Mining Company in the Biwabik district. Shaft sinking is in progress. The property adjoins the Canton tract of the Steel Corporation and is said to contain a large body of ore. Adjacent is the old Holland mine, where ore running 60 per cent. and better has now been found. Pumping and other machinery are being put into position, preparatory to testing operations on a more extended scale.

The mining headquarters of the Republic Iron & Steel Company have been moved back to Duluth from Pittsburgh, Pa., to which city they were transferred some 18 months ago.

A costly work about to be undertaken by the Duluth & Iron Range Railroad is the rebuilding of the No. 1 ore dock at Two Harbors of steel and concrete at a cost of $1,500,000. The No. 6 dock, a smaller structure, was similarly rehabilitated last winter at a cost of $1,250,000. The remodeled No. 1 pier will be 1390 ft. long and 73 ft. above the water line, and will have a storage capacity of 65,000 tons. Construction work will be started the first of the year. It is expected the dock will be ready for service the latter part of the shipping season.

At Proctor, Minn., the Duluth, Missabe & Northern Railroad has completed a combination machine and blacksmith shop, 90 x 450 ft., and has in construction a car shop 200 x 450 ft. Among the equipment will be traveling cranes powerful enough to pick up and carry a locomotive. Electricity will be furnished by the Great Northern Power Company.

John R. Harrington of Virginia, Minn., one of the owners of the Jack Pot property, near Chisholm, Mesaba range, says that the shaft being put down has already reached a depth of 300 ft., and within two months it is expected to attain the point, 450 ft. down, at which ore was encountered by the diamond drill. A fine grade of ore has been found, and the owners anticipate that it will turn out to be one of the best producing bodies in that section.

The Interstate Company, which is the Minnesota mining division of the Jones & Laughlin Steel Company of Pittsburgh, is about to award a contract for stripping the Longyear mine, 1 mile east of Hibbing, Mesaba range. The removal of 4,000,000 cu. yd. of earth is planned. The work of stripping at Mesaba properties, contrary to expectations some years ago, has increased rather than decreased. Mines that were opened up as underground propositions, and which never were expected to be operated otherwise, have been denuded of their surface drift, and others are to be similarly treated. The stripping at the Susquehanna mine at Hibbing requires the removal of earth ranging in depth from 80 to 150 ft.

The Vanadium Mines Company is an Indiana corporation with a capital stock of $300,000 and owns a tract of land at Engle, New Mexico, on which a deposit of vanadium ore has been opened. An oxide plant is under erection at Cuttex, New Mexico, nearby, which has connections with the Santa Fe Railroad. An abandoned plant at Rankin, Pa., has been secured that is to be equipped with furnaces, &c., for the reduction of alloys. The officers of the company are: A. B. Bennet, president; W. A. Bonitz, vice-president, and C. R. Miller, secretary and treasurer. Offices have been established at 1473 Frick Building Annex, Pittsburgh.

The American Electric Fuse Company, Muskegon, Mich., announces that Fred B. Bonde, its Chicago district sales manager, is now located in room 900, Vogue Building, 290 Fifth avenue, where he carries a complete sample line of Blue Ribbon telephone protectors, Allen-Bradley motor starters, American enameled magnet wire and Americoil ignition apparatus. This is new territory for Mr. Bonde, who has recently been transferred from the St. Paul district.

Customs Decisions

Large Cast Iron Kettles

The status of large cast iron kettles imported under the tariff act of 1909 has been settled by the Board of General Appraisers. The kettles in question are used for chemical purposes. The inner part is enameled with vitreous glass. The custom house officials at New York took the view that the kettles should be classified as "manufactures of metal not specially provided for," with a duty of 45 per cent., under the Payne law. William A. Foster & Co., New York, importers, appealed to the board, their contention being that the correct duty is at the rate of 40 per cent., under paragraph 158, which provides for "other similar hollow ware of iron, enameled or glazed with vitreous glasses."

From a report filed with the board by the appraiser of the port at New York, it would seem that "kettles" are not provided for specifically under the act of 1909. Various other utensils are, however. The local appraiser stated that, as the kettles are not table, kitchen or hospital utensils, he regarded them as dutiable at the higher rate under paragraph 199. The board, however, holds that paragraph 158 applies to other articles than table, kitchen or hospital utensils, and cannot be limited in the manner indicated by the appraiser's report. The claim is accordingly sustained.

Watchmen's Time Detectors

The classification of watchmen's time detectors is the subject of a recent decision by the Board of United States General Appraisers, when a protest filed by the Timekeeper Company and others was construed under the terms of the tariff act of 1909. Under the Dingley tariff act of 1897 the board ruled that similar articles were subject to duty under paragraph 191, the movements at the specific rates according to the number of jewels, plus 25 per cent. ad valorem, and the cases at 40 per cent. In the present tariff act the language of paragraph 192, which corresponds with paragraph 191 of the old act, has included among watch movements such movements as are termed time detectors.

General Appraiser Fischer, who writes the decision for the board over-ruling the protest, says that the articles in question are thus watch movements inclosed in cases. The collector assessed duty on the movements and the cases separately under paragraph 192, tariff act of 1909, the movements as containing not more than 11 jewels at $1.35 each, and the cases at 40 per cent. on their value.

Molders' Patterns

The Board of United States General Appraisers has made a ruling in which it is held that the tariff act of 1909 does not contemplate the free entry into this country of molders' patterns. The identical issue arose under the preceding tariff act of 1897, and after a long and determined fight was decided in favor of the importers. In other words, the Government's right to levy duty was denied. Change in the language of the law enacted last year, however, led the Government to believe that a decision in harmony with its views might be arrived at by the board, and in this it was not mistaken. The protestants in the test case just decided are the International Harvester Company and F. P. Flowers & Co. According to the official papers in the case, the patterns are made either of brass or of wood, and were assessed respectively as manufactures of metal at 45 per cent., or as manufactures of wood at 35 per cent., under the terms of the Aldrich-Payne law. The protestants insisted before the board that the patterns are properly entitled to free entry under paragraph 629. Judge Waite, who writes the decision for the board, points out that the language of the statute has been changed in the free entry provision of the new law and hence the Government's assessment must stand.

Premium Payment for Errand Boys

BY H. M. WOOD,* CINCINNATI, OHIO.

It is poor economy to have a twenty-dollar-a-week man do work which a five-dollar boy can do just as well. That is the reason the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, has messenger boys who run practically all of the errands about the plant. The great saving in a bell-boy system lies in confining the high-priced men to work which really requires their skill. When a machinist wishes to send to the tool room or some other part of the shop, he calls a boy by push button, and sends the boy on the errand instead of leaving his own machine idle. As a secondary saving, there is less time lost in gossiping over next year's pennant prospects, because there seems to be less inclination for a man and boy to have a long confidential chat than for two men.

Fifty push buttons are located throughout the plant, and wired to a hotel annunciator on the wall opposite the window of the tool room. At the annunciator is a bench which serves as headquarters for the boys while awaiting calls. The tool room is chosen for the location of the annunciator, because of its convenient situation, and because most of the calls are to and from the tool room.

Twelve boys comprised the force of messengers at first. They were busy most of the time; at least it was often impossible to get a boy to respond to a call. There was some doubt as to whether there really was need of more boys, or whether the inefficient service was due to proverbial messenger boy slowness. It was therefore decided to try a variation of the premium plan of wages which is giving such general satisfaction for paying the productive workmen throughout the plant. As a basis for determining the premium, it was first ascertained that each boy made an average of about 50 calls a day. This number was therefore taken as a standard, and each boy was allowed ½ cent extra as a premium for each call made per day above the 50. If he should make 50 calls or less, he would get his regular day's pay as before, but no premium.

The number of errands which each boy runs is recorded by the tool room foreman. Each boy is given his individual number; and in the tool room there are 100 punched brass checks about the size of a quarter of a dollar for each number. These checks are strung on wires within convenient reach. When the annunciator indicates a call, the boy next in turn reports at the window of the tool room before answering the ring. The tool room foreman then removes one of that boy's checks from the wire and places it in a rack. If the 100 checks are all used during the day, the fact is noted, and a fresh start made. Each evening it is a simple matter to count the checks to keep tally on just the number of calls which each boy has made during the day. Thus the amount of premium payment is determined.

From the company's standpoint, a very marked improvement in the services was noticed at once. Furthermore, as a few of the boys graduated from their training school as messengers into regular machine shop work, it was found unnecessary to fill their places. To-day eight boys are doing the work which formerly required 12, and the present force is much more efficient. Although each boy makes more money than before, the total bell boy pay-roll is reduced.

From the boy's present viewpoint he sees value of the system in increased wages; he never makes less than formerly and, if he is energetic, he will make half as much again. There will probably be also a future value to the boy in teaching him early that his worth industrially is in direct proportion to the amount of work he accomplishes.

* Lodge & Shipley Machine Tool Company.

Personal

Joseph Monforth, manufacturer of textile machinery, at M. Gladbach, Germany, who has been visiting machinery manufacturers in this country and making purchases of mechanical equipment during the last three months, has returned home, sailing December 13.

J. A. Bennett, formerly mechanical engineer at the Lodge & Shipley Machine Tool Company's plant in Cincinnati, Ohio, has accepted the position of master mechanic of the Studebaker Brothers Mfg. Company, South Bend, Ind.

N. V. Hansell has been in Norway, Sweden and Germany for some weeks in the interest of the American Gröndal Kjellin Company, Ltd., 45 Wall street, New York. Making the tour of European concentrating and briqueting plants with him was Charles E. Herrmann, representing the Gates and other interests operating the Moose Mountain iron mine in Ontario.

F. S. Witherbee of Witherbee, Sherman & Co., New York, has returned from a stay of several months in Europe.

E. W. Oglebay of Oglebay, Norton & Co., Cleveland, will start early in the new year on an extended foreign trip.

John F. Budke, president of the Canonsburg Steel & Iron Works, Canonsburg, Pa., has returned from an extended visit to Hot Springs, Ark.

J. G. Bower has been appointed assistant manager of sales, Western district, for the Pressed Steel Car Company and Western Steel Car & Foundry Company, with office at Old Colony Building, Chicago, Ill., effective January 1.

Robert Wuest, commissioner of the National Metal Trades Association, has returned from a short trip to Bermuda.

E. H. Hargraves, president of the Cincinnati Tool Company, Norwood, Ohio, sailed from San Francisco last week for an extended business trip, to take in the Hawaiian Islands and Australia.

Geo. F. Kissel, with the Cambria Steel Company, Cincinnati, Ohio, has been promoted to the position of special salesman for that company, and will enter upon his new work January 1.

Joseph G. Butler, Jr., was the guest of honor at an informal banquet given at the Union Club in Cleveland, Wednesday evening, December 21. The banquet was arranged by a number of Mr. Butler's intimate associates in the iron and steel trade and was given in celebration of his seventieth birthday. There were about 50 guests present, mostly from Cleveland, Youngstown and Pittsburgh.

R. S. McNight has withdrawn from the Payne & Joubert Foundry & Machine Company, Birmingham, Ala., as general manager, to engage in another line.

A. H. Carpenter, manager of sales for the Southern Iron & Steel Company, with headquarters at Birmingham, Ala., has severed his connection with that company, and on January 1 will engage in other business.

William A. Knapp, treasurer of Sotter Brothers, Inc., boiler manufacturers, Pottstown, Pa., will sever his connection with that corporation January 1, after a continuous service of almost 32 years. Besides being treasurer, the estimating and drafting branch of the work has been very ably and successfully handled by Mr. Knapp for many years. He means to enjoy a much needed rest and his plans for the future are undecided.

W. G. McCune, auditor, has been elected treasurer of the Otis Elevator Company, to succeed the late Lynde Belknap.

George E. Hannah, assistant to the president of the Rogers Locomotive Works before its absorption by the American Locomotive Company, has been appointed assistant treasurer of the Nathan Mfg. Company, 85 Liberty street, New York.

S. L. Parker, formerly assistant general manager of the Chester Steel Castings Company, Chester, Pa., has been appointed New England sales agent, succeeding Frank D. Moffatt & Co., with offices in the Oliver Building, Boston, Mass.

J. W. Carrel, general sales manager of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, will sail for Europe from New York January 5, on a four months' business trip.

Obituary

WALLACE T. FOOTE, JR., of Port Henry, N. Y., died in St. Luke's Hospital, New York City, December 17, after an illness of several months, aged 46 years. He was a son of the late Wallace T. Foote, and was born at Port Henry. He was graduated from Union College in 1885 and from the Columbia Law School in 1888. After practicing law for a few years he turned his attention to other fields of activity. He was a director and officer of Witherbee, Sherman & Co. and president of the MacIntyre Iron Company. In *The Iron Age* of October 14, 1909, an article was printed, in which Mr. Foote's enterprise in opening up Adirondack iron ore deposits was set forth in detail. He was a member of Congress from 1895 to 1899. His wife, who was a sister of Frank S. Witherbee, died in 1896.

PHILIP MEDART of the Medart Patent Pulley Company, St. Louis, Mo., committed suicide December 16 by shooting himself. His health had been failing for several years. He was 72 years old.

STEWART WATT, Barnesville, Ohio, vice-president and superintendent of the Watt Mine Car Wheel Company, died December 10 from pneumonia, aged 65 years. He was born in Noble County, Ohio, and first operated a foundry in 1863. With his brother, who died several years ago, Mr. Watt was the joint inventor of the first self-oiling mine car wheel, and for the last 35 years had been actively engaged in the manufacture of mine car wheels.

MATTHEW KENNEDY, treasurer of the Kennedy Valve Mfg. Company, Elmira, N. Y., died November 26.

The Morgan Engineering Company's Huge Sign

According to sign writers and electricians, the new sign of the Morgan Engineering Company, Alliance, Ohio, is the largest in the country. The sign spells "Morgan," the letters being hung perpendicularly down the side of a tall smokestack. It is legible a mile and a half at night. The sign was constructed by the Dittenhafer Sign Company, Canton, Ohio, and it is fashioned out of the rust-resisting Toncan metal, made by the Stark Rolling Mill Company, also of Canton. Each of the six letters is 8 ft. high; the outline of each is 1 ft. wide, making each letter between 6 and 8 ft. wide over all, while each is from 8 to 10 in. deep. The letters, as rung on the side of the stack, cover a distance of 88 ft. from the top of the M to the bottom of the N. There are 310 electric bulbs in the sign, each of 8 candle power. It is estimated that it will cost the company between $800 and $1000 a year to operate. Toncan metal was used in construction, because it was necessary to find a metal that would withstand adverse atmospheric conditions, resisting rust and corrosion.

The Wabash Foundry & Machine Company, Wabash, Ind., incorporated with $50,000 capital stock, has taken over the plant of the George Barcus Company. The company will do a general foundry jobbing business as heretofore.

National Labor Legislation

Unlikely That Any Measure Will Be Enacted

WASHINGTON, D. C., December 17, 1910.—The programme of the labor leaders for legislation at the present session has been upset by President Taft's recommendations as set forth in his annual message, and the present outlook is decidedly unfavorable for the passage of any labor measure, with the possible exception of the re-enactment of the provision of the last annual naval appropriation bill requiring such warships as may be authorized thereby to be constructed on an eight-hour basis.

The strong pressure brought to bear upon the President to urge upon Congress the passage of the Gardner bill is reflected in the extended attention given to it. Throughout the campaign of the manufacturers against the Gardner bill the contention has repeatedly been made by shipbuilders that that measure was aimed directly at them and the manufacturers of armor and heavy guns, and the bill has been denounced on that ground as unjust and vicious in principle. The champions of the bill have declared that it covered many other things, and that, except for the "necessary exemptions" contained therein, it was eminently just and fair to all parties having contract relations with the Government. An enactment based upon the President's recommendation, however, would limit the application of the eight-hour principle to shipbuilders and manufacturers of armor and heavy guns, who would thus be singled out for a gross discrimination. There can be no doubt that such a provision covering ships, armor and guns will mean an enormous increase in the cost thereof, to be met by the taxpayer. It is probable that before Congress acts finally on the new naval appropriation bill an attempt will be made to draft a more definite provision regarding the application of the eight-hour law to warships, &c., than was contained in the last naval budget, in order that manufacturers may at least understand more clearly the conditions under which they will be required to operate their plants on the Government work in the event that they decide to compete.

The President's recommendation for the enactment of a so-called anti-injunction law limited to a requirement that no injunction shall be issued in equity without notice to the adverse parties is another disappointment to the labor leaders, who favor a drastic measure which shall provide that no action taken in pursuance of a labor dispute shall be construed as a conspiracy, forbidding judges issuing injunctions from committing violators of their orders for contempt, &c.

This can hardly be pleasant reading for Mr. Gompers and his colleagues. The opponents of all anti-injunction legislation, however, take issue with the President on the ground that, as stated by him in his message, the Federal courts now have the power to give notice of all injunctions issued by them, and ought not to be forced to give notice where the delay involved may be detrimental to the interest of the parties seeking restraining orders. There are may excellent lawyers in Congress who doubt the constitutionality of any provision limiting the issuing of restraining orders, contending that it is essential to the proper adjudication of all such causes that parties committing or threatening a wrong should be promptly enjoined—frequently without notice—in order that the *status quo* may be maintained until the court can hear the case on its merits.

With these considerations in view, and because of the exceptionally heavy calendar of unfinished business and the unusual importance of the annual budget measures, it seems improbable that anti-injunction legislation of any kind will be enacted, or that serious consideration will be given to the Gardner eight-hour bill.

W. L. C.

Niagara Falls' Industrial Advance During 1910

The city of Niagara Falls, N. Y., has made phenomenal advancement in industrial growth during the year now drawing to a close. Many new and extensive manufacturing plants have been added to the Cataract City's already large number of established industries, and a considerable proportion of the existing industrial plants have added largely to their manufacturing facilities in buildings and equipment, making 1910 the greatest year industrially in the history of the city. This statement is the substance of a report made at a recent meeting of the Niagara Falls Board of Trade by Congressional Representative James S. Simmons, who has been compiling data to submit to the Rivers and Harbors Committee during the present session of Congress relative to Niagara Falls' growing industrial importance, to aid in securing favorable action by the Federal Government for the establishment of a harbor for lake and canal shipping at Niagara Falls, above the upper rapids. Mr. Simmons stated that since the first of the year the Hydraulic Power Company has added 20,000 electric horsepower to its output by the installation of two additional generating units; the Niagara Falls Power Company has added 15,000 hp. to its output by improved methods and without diverting one more cubic foot of water than last year; the Canadian Niagara Power Company has added 12,500 hp. in the past 11 months, most of which will be sent to the New York State side of the river; the Hydraulic Power Company has built a transmission conduit to carry 40,000 hp. to the new industrial settlement at the north end of the city, where many of the new manufacturing enterprises are being located. In connection with the improvements being made by the Hydraulic Power Company, Mr. Simmons pointed out the fact that all of the power developed by that company is used in Niagara Falls except only that delivered to the Niagara Gorge Electric Railway, which is partly within the city for its operation.

Included among the more important of the new plants, the construction of which was commenced during the year, is that of the United States Light & Heating Company which will have 17 buildings, now practically completed, with 155,310 sq. ft. of floor space, costing about $400,000, to employ 1000 men at the outset and 2000 later on; the National Carbon Company's plant, steel frame construction, with 148,000 sq. ft.; the Defiance Paper Company's plant on Second street, and that of the Electrode Company on Buffalo avenue. The Spirella Corset Company will commence the erection of an extensive plant on a 5-acre site at the north end of the city early next spring. Among the older companies which have made good-sized additions to their plants during the year are the following: Aluminum Company of America, International Acheson Graphite Company, Castner Electrolytic Alkali Company, Development & Funding Company, Hooker Electro-Chemical Company, Niagara Alkali Company, Shredded Wheat Company and Union Carbide Company. All of the established factories reported increases in their operative forces of from 25 to 350 men.

The secretary of the Industrial Commission also reported that negotiations are being conducted with a number of other large manufacturing concerns using electric power in large quantities, with good prospects for the establishment of plants by them at Niagara Falls.

The Ball & Wood Company, Elizabethport, N. J., has taken a contract for furnishing and erecting for the French Worsted Company, Woonsocket, R. I., a 750-kw. mixed flow Rateau-Smoot turbine and Smoot alternating current three-phase 60-cycle generator, with directly connected exciter, under a general contract with the Rateau Steam Regenerator Company.

Planning the Next Tariff Revision

Revision by Schedules Gathers Strength

WASHINGTON, D. C., December 20, 1910.—The programme of the Congressional leaders for the consideration of the tariff question at the present short session, which has practically been agreed upon during the past week, confirms the statement made in this correspondence a fortnight ago that there will be no attempt at revising the Payne-Aldrich law before adjournment. Nevertheless, the tariff will be a live issue, and important action looking to future revision is likely to be taken by both Houses.

Unexpected developments have followed the presentation to Congress of President Taft's plan for the revision of the tariff by schedules. His project has received the qualified indorsement in the Senate of two such distinguished protectionists as Senator Aldrich of Rhode Island, chairman of the Finance Committee, and Senator Lodge of Massachusetts, both of whom have publicly announced their intention to aid in the movement set on foot by the Republican insurgents, under the leadership of Senator Cummins of Iowa, to pave the way for the correction of crudities and inequalities that may have developed or that may hereafter be discovered in the existing law. Senator Aldrich does not go so far as the President in advocating the revision of the tariff law "by schedules" in the strict sense of that term. He favors revision "by subjects," which he regards as the more scientific method and the only one which is thoroughly practicable. For example, in taking up the metal schedule, Senator Aldrich would have Congress consider not only all those items of the free list relating thereto, but those paragraphs of other schedules which are based more or less upon metal schedule rates. It will be seen, therefore, that the assurances given by the protectionist leaders of the Senate must be accurately understood to be fully appreciated, and it is also significant that they relate to action by Congress after both Senator Aldrich and Senator Lodge have retired from the Senate.

Measures to Be Considered

Two concrete propositions, however, are receiving consideration by the Republican leaders in the Senate—namely, the amendment of the Senate rules so that any schedule of the tariff may be taken up for action without the danger that it may be amended by the addition of unrelated matter modifying other schedules, and the enactment of a measure creating a permanent Tariff Commission having a larger membership and broader powers than are now possessed by the existing Tariff Board.

At present any tariff proposition that may be brought forward is subject to amendment by the addition of any provision relating to the Federal revenues. Should the proposed changes in the rules be made there will be no parliamentary obstacle in the way of carrying out President Taft's plan for the overhauling of the tariff, schedule by schedule, or in accordance with the modified plan suggested by Senator Aldrich, but it must be obvious that the actual consideration and passage of such separate measures must depend upon the will of the majority, as heretofore. Too much weight, therefore, should not be given to the proposed change in the Senate rules.

The second project looking to ultimate revision, to which Senator Aldrich has already given his indorsement, is the President's plan to enlarge and strengthen the Tariff Commission by making it a permanent board of five or more members with an appropriation sufficient to enable it to extend its researches without limitation either in this country or abroad. Senator Aldrich has publicly assured Senator Beveridge, the author of the pending Tariff Commission bill, that the Finance Committee will report upon the measure before adjournment, and as evidence of his good faith has already called it up for consideration in committee.

Quite as significant as the action of the Finance Committee is the decision of the leaders of the House Ways and Means Committee to give prompt consideration to the President's plan for enlarging and strengthening the Tariff Board. While Chairman Payne and two or three of his Republican colleagues are strongly opposed to the revision of the existing law in the near future, either by schedules or in any other manner, and are disposed to regard the Tariff Board as having as much authority as should be delegated to it, they appear to be ready to yield to the President in the matter, and the committee, therefore, has granted hearings to several members of the House and to a few representatives of business associations advocating a permanent and influential Tariff Commission.

The Democratic Position

The Democratic leaders in the House of Representatives have decided to hold a caucus January 19 to determine on a plan to enact tariff legislation promptly in the first session of the next Congress. Invitations have been sent out to the 76 new Democratic members-elect to be present and take part.

The first step in the plan is to choose the majority members of the Ways and Means Committee, who may meet at once and frame such a general bill as may be deemed expedient, or propose revision by separate schedules. It is believed to be settled that Representative Oscar Underwood of Alabama will be chairman of the new Ways and Means Committee. He has been a member of the minority side of the committee for five Congresses and occupies a position of influence recognized by Democrats and Republicans alike. Mr. Underwood is at this time in favor of a permanent Tariff Commission.

Champ Clark, who will undoubtedly be the new Speaker, has issued a statement in which he says: "It will require months of unremitting and intelligent labor to collect the facts on which to base a tariff bill or bills, as the case may be, such bill or bills as will be wise and just, and such as we are willing to go to the country on." He further says: "Individually, I prefer the scheme of separate bills for separate schedules, taking the schedules with the most obnoxious features first—perhaps in certain cases having separate bills for particular items; but whichever method is decided upon, the Ways and Means Committee will need the same quantity and character of information, for at last a general bill would be made up of the separate bills on all the schedules." It is the evident purpose of the Democrats to force the Senate to act on the tariff by co-operating with the President in the prompt passage by the House of bills revising certain schedules.

W. L. C.

New Railroad Equipment Orders.—The St. Louis Southwestern is reported in the market for 1500 box cars and 500 flat cars; the Chesapeake & Ohio for 200 flat cars; the Wichita Falls & Northwestern for 100 box cars; the Great Northern for 500 all steel ore cars; the Atlantic & West Point for 100 all steel flat cars, and the Chicago, New York & Boston Refrigerator Line for 300 refrigerator cars. At Pittsburgh the Wabash-Pittsburgh Terminal Railroad Company has received authority from the court to buy 2000 steel hopper cars. The Nashville, Chattanooga & St. Louis has ordered 100 box cars from the American Car & Foundry Company, and the Jamison Coal & Coke Company, 400 50-ton hopper cars from the Standard Steel Car Company. The Louisville & Nashville will build 600 hopper and 600 gondola cars at its shops, and the Seaboard Air Line 200 steel underframe cars at its shops. The Boston Elevated has ordered 50 steel

underframe surface cars from the Laconia Car Company, and the Pittsburgh Railway, 50 cars from the Pressed Steel Car Company. Locomotive orders are light, but the leading locomotive interests will be fairly occupied for some time, the one on the recently announced New York Central order for 275, while the other will have a large order from the Harriman lines.

A Permanent Tariff Commission Desired

John Candler Cobb, president of the National Tariff Commission Association, in an address delivered at St. Louis, December 16, before the Western Association of Shoe Wholesalers and the St. Louis Manufacturers and Jobbers, made very clear the present status of the campaign for a permanent tariff commission. Mr. Cobb's association has been extremely active during the past two years in educating the public, and especially Congress, as to the vital necessity of a permanent commission to handle the important question of the tariff. The association is made up of more than 100 of the principal commercial bodies of the United States. Mr. Cobb in his address described the progress of the campaign, and stated that in his opinion there is no more vital question before the American public than that of a permanent tariff commission which undoubtedly will serve to take the tariff out of politics. He said in part:

"The present condition of our tariff laws comes from the fact that they have been rather a haphazard growth than a consistent creation. They are based on the constitutional provision permitting the levying of duties on imports for the purpose of providing national revenue. The idea of using this power for the purpose of protection was an afterthought of which there is no suggestion in the Constitution, but the Supreme Court has declared it to be constitutional, and it is undoubtedly legal for Congress to fix import duties for the purpose of protection in its discretion. The far-reaching possibilities of the exercise of this power have not been and are not to-day fully appreciated. It is a power which can be applied to enrich or ruin individuals, industries or communities so directly and so quickly that its application must of necessity be subject to every sort of interest and pressure that human ingenuity and avarice can devise. The safeguarding of the exercise of this power by Congress is fundamentally the object of our work.

"As matters stand to-day, I think it may be assumed that the country has declared in favor of a fair and reasonable protective tariff with no excessive duties and no special privileges, and with this, most of us are in hearty accord. I think I may also say that most of us are of the opinion that the Payne bill does not fully measure up to this standard and the country in general is of the same opinion.

"We claim that far better results, and we believe the best results can be obtained through a permanent, independent tariff commission in connection with provision for revision by schedule. This latter, I believe to be of great importance for two reasons. First, if one schedule is under consideration a large majority of the men sitting in judgment have no interest either personal or for their constituents, whereas in a general revision, practically every judge has an interest at stake. And second, a general revision upsets and disturbs the entire business of the country, and creates a general unrest, largely sentimental, but none the less real, whereas the discussion of one schedule affecting a comparatively small number would have no appreciable effect upon general business.

"The commission should be independent, not nonpartisan, but entirely independent of any question of partisanship, as much so as the Supreme Court. The members of the commission should also be independent of responsibility or obligation to any appointing power, which can only be accomplished in my opinion by making the tenure for life or for so long a term that the question of reappointment is to a majority of the members at all times a matter of remote interest.

"In taking up the powers of the commission I will say in general that it seems to me unwise to give it any authority beyond the duty to investigate and report. The right to fix or change rates of duty would be unwise even if constitutional. This power should remain in Congress, and it should be no part of the duty of the commission to consider or settle questions of national policy. It is for the country to decide whether the policy shall be high protection, low protection or tariff for revenue, and it is for Congress to carry out the mandate of the country. The commission should be simply an agency to provide information to assist Congress in acting intelligently and consistently. The work of the commission would be equally necessary in consistently carrying out either policy."

New York Central Rails for 1911

In connection with the statement that the rail requirements of the New York Central lines will be 150,000 tons for 1911, President W. C. Brown says that the total of orders given in 1910 was 165,000 tons and in 1909, 101,000 tons. The amount of rail wear on New York Central tracks in the past year, particularly side wear from wheel flanges, has led to a more exacting specification for 1911. President Brown says:

> Neither the regular Bessemer rail nor the Bessemer ferrotitanium rail has been found entirely satisfactory for our high speed tracks. Dr. P. H. Dudley, our consulting engineer, has prepared specifications which I have approved for the high class open hearth rail. Neither the Steel Corporation nor the Lackawanna Steel Company was prepared to quote a definite price on the kind of rail we wanted. Each of them is going to make an experimental rolling of 10,000 tons subject to the test that we require, after which they will be in a position to name the price at which they can furnish us such rails as we want. Our purchase of steel rails for all lines will approximate $4,500,000.

In addition to open hearth rails, it is understood that the New York Central will buy a certain tonnage of ferrotitanium Bessemer rails for next year. Heretofore the New York Central has furnished the ferrotitanium used in making these rails on its specifications and has required that the heat be held three minutes in the ladle after adding the ferrotitanium, before teeming the ingots. For this extra time the railroad agreed that 25 cents a ton might be added to the price of ordinary Bessemer rails.

The New York Central Lines have laid special stress on the avoidance of rail breakage. They have permitted 0.10 in phosphorus, but have been content with lower carbons than some other roads, specifying a range of 0.37 to 0.47 per cent. carbon for 70-lb. rails, 0.40 to 0.50 for 75-lb., 0.43 to 0.53 for 80-lb., 0.44 to 0.54 for 90-lb. and 0.45 to 0.55 for 100-lb.

The Jeffrey Mfg. Company, Columbus, Ohio, has opened a new branch office in the Fourth National Bank Building, Atlanta, Ga., with D. C. Rose, formerly with the Dodge Mfg. Company, as manager. A stock of Jeffrey chains and catalogues will be on hand. This is the 10th Jeffrey branch office in the United States, although there are over 100 Jeffrey agencies situated in the principal cities of this country, as well as in the leading commercial centers all over the world. The Jeffrey products consist of elevating and conveying machinery for handling and distributing material for every possible purpose, including the designing, supervision, manufacturing, assembling and erecting of such apparatus.

Cement Meetings in New York

The Association of American Portland Cement Manufacturers held its annual meeting at the Hotel Astor, New York, December 12 to 14. One of the most interesting features of the meeting was a paper by W. S. Mallory, president of the association, and also president of the Edison Portland Cement Company, who described the experience at the works of that company in the closing of its plant on Sunday. It had been an accepted practice in the industry that kilns could not be shut down over Sunday without causing considerable losses. Thomas A. Edison insisted that it could be done, and Mr. Mallory's paper explained the successful results in the adoption of the six-day week. Following is an extract from Mr. Mallory's paper:

> I have corresponded with many of the largest plants in other lines, who use kilns and furnaces of various types, and find that outside of blast furnaces, which produce pig iron, none of them, such as open hearth furnaces, puddling furnaces, cupolas, heating furnaces, brass furnaces, air furnaces, copper furnaces, operate on Sundays, although in some cases light heat is kept on the furnaces over Sunday.
>
> Kilns for the manufacture of brick and similar material are kept under heat on Sunday, but are seldom loaded and unloaded on that day. Therefore, if all these allied lines of manufacture can successfully operate their kilns and furnaces only six days per week, why is it necessary, in view of the results obtained at the Edison plant, to operate cement kilns for seven days each week? If an arrangement could be made by which every cement plant in the United States would discontinue Sunday operations, the problem of over capacity for 1911 would be solved, and more than 30,000 employees would have their rest on Sunday, and be in a position to do much more efficient work the other six days.

In the discussion which followed the statement was made that the system had been tried successfully by the Vulcanite Portland Cement Company. The association took no action on the recommendation for a general shutdown on Sunday, but the paper was taken under special consideration for discussion at a later date.

The new officers of the association are as follows: President, Edward M. Hagar, Universal Portland Cement Company; vice-president, W. S. Mallory, Edison Portland Cement Company; treasurer, John B. Lober, Vulcanite Portland Cement Company. Executive Committee: Ernest R. Ackerman, Lawrence Cement Company; Geo. S. Bartlett, Western Portland Cement Company; A. H. Craney, Jr., St. Louis Portland Cement Company; Bethune Duffield, Wabash Portland Cement Company; T. Henry Dumary, Helderberg Cement Company; R. W. Kelley, Virginia Portland Cement Company; R. W. Lesley, of American Portland Cement Company; Conrad Miller, Dexter Portland Cement Company; John R. Morron, Atlas Portland Cement Company; S. B. Newberry, Sandusky Portland Cement Company; Geo. E. Nicholson, United Kansas Portland Cement Company, and C. H. Zehnder, Alma Cement Company.

The National Association of Cement Users held its annual convention in the Concert Hall of Madison Square Garden, New York, December 12 to 14. Numerous delegates were present from foreign concrete associations and from various Government departments and municipalities. The following officers were elected for the coming year: President, Richard L. Humphrey, Philadelphia; first vice-president, E. D. Boyer, Catasauqua, Pa.; second vice-president, Prof. A. N. Talbot, Urbana, Ill.; third vice-president, E. S. Larned, Boston; fourth vice-president, Prof. Ira H. Woolson, New York.

The first annual cement show in New York was opened in Madison Square Garden on the night of December 14 and closed December 20. There have been few shows in that noted exhibition hall which have equaled it for generally attractive appearance and educational value. Many of the booths contained novel effects for interesting and instructing the visitors. The show was particularly instructive to those who contemplate putting up buildings either for residential or business purposes. It included numerous exhibits of machinery and equipment for contractors, in which most of the representative manufacturers of the country participated.

The Crane Company's New Malleable Foundry

The Crane Company, Chicago, announces the completion of its new malleable foundry, which is located at South Canal and Fifteenth streets. The building, which has five stories, has a frontage on Canal street of 177 ft. and on Fifteenth street of 225 ft. It is built of reinforced concrete and steel, being fireproof throughout. Following the practice which it has pursued for many years, the company has placed the foundry on the top floor. This floor also contains the galvanizing department. The fourth floor is used for the cleaning, sorting and annealing of castings. The core making and some of the machine work is done on the third, while the second floor is given over to the general machines and cutting of fittings. On the first floor are found the stockroom, and the shipping and receiving departments. The basement is used for the storage of sand, coal, iron and other materials.

The general system of foundry work used in the new plant is that of continuous pouring. In this system the work to which the molder confines his operations is that of making the molds and placing them on a conveyor which carries them to the men who do the pouring. After pouring, the molds are carried to other workmen, who dump them out and start the sand and castings to their respective conveyors and departments. Each department is provided with the most modern foundry equipment, all of which is operated by electricity, no steam power being used.

Welfare of the employees has been one of the considerations in the erection and equipment of the new plant, and pains have been taken throughout the building to make it free from dust, smoke and other unwholesome features. Dressing rooms as well as a special dining room are provided for the girls employed in the core making department, and shower baths for the men. The plant is described at length in the *Valve World* of November, and is the first to be erected by the company since its decision some time ago to house the manufacturing end of its business in fireproof structures. Nearly all the equipment of the building was designed and built by the company.

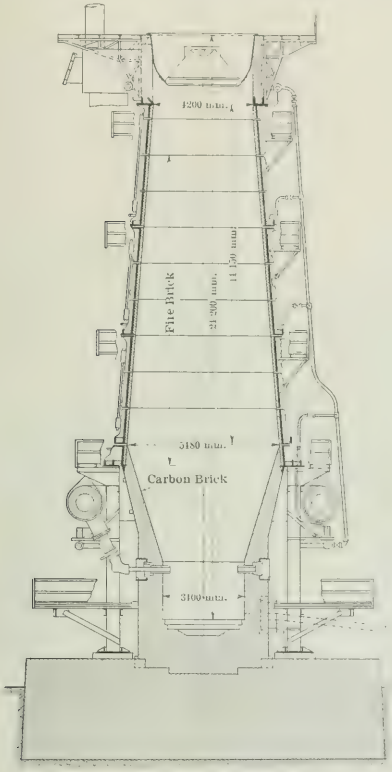
Progress of the Heroult Furnace in Germany

The Duesseldorf correspondent of *The Iron Age* writes: "The Lindenberg Company of Remscheid, which holds the German patents for the Héroult electrical furnace, says in its annual report, just issued, that the use of this furnace is making steady progress in Germany, and that the prospects for the next year are favorable. It refers to 23 furnaces of this type already in operation and 17 in course of construction, of which three will be of 20 tons capacity. The 23 furnaces in operation produce 225,000 tons of steel a year. The company says it has worked out new metallurgical processes of far-reaching importance, and has applied for patents on them in all important countries."

The Corrugated Bar Company, Buffalo, N. Y., has changed its principal place of business and office from New York City to its works at Blasdell (South Buffalo), adjacent to the plant of the Lackawanna Steel Company. The Corrugated Bar Company is the Buffalo branch of Garrison & Co., St. Louis, manufacturers of reinforcing bars for concrete work. D. E. Garrison, St. Louis, is president of both companies.

The Burgers Thin Wall Blast Furnace

What has been done in the United States in the direction of thin walled blast furnaces with water cooled shells was indicated in an article in *The Iron Age* of June 16, 1910, page 1458. The illustration given in that connection was of the No. 8 furnace at the South Chicago works of the Illinois Steel Company. Similar furnaces have been provided by United States Steel Corporation in the Pittsburgh, Cleveland and Birmingham districts. The resemblance of the design of these furnaces to that developed 12 years ago by Burgers at the Gelsenkirchen Works in Germany is referred to by the London *Iron and Coal Trades Review* in an article on the Burgers type from which we take the following:



Sectional Elevation of German Blast Furnace Constructed on the Burgers System.

In the forced working of blast furnaces the brick lined shaft presents the weak part, and in the wear the section of the furnace shaft undergoes alterations which cause increased coke consumption and heavy repairs. The Burgers design was directed toward preserving the shaft for a longer period by decreasing the lining, and, on the other hand, by making the furnace shaft wall in iron and as strong as possible. In the furnace so designed a supporting ring rests on columns. For the sake of safety there are, round the ring, two iron hoops. The inner wall of the ring, as may be seen from the illustration, is cooled by water which collects at the lower part of the ring and can be drawn off wherever suitable. The surface and interior of the furnace is lined with thin firebricks, 2 to 2¾ in. in thickness. On the supporting ring rest shaft rings about 5 ft. deep, which consist of separate segments. The latter are held together by strong bolts, and are furthermore secured by hoops. At the bottom flange of each third segment is arranged a channel; the various channels are connected by pipes to draw off the water at a few places only. At each third shaft ring is a water pipe which supplies the cooling water at a low pressure. The horizontal joints of the shaft have groove joints to avoid a shifting of the shaft ring. The interior lining of the segments consists of firebricks. The bottom is arranged as usual with plates and provided in the interior, as well as the hearth, with carbon bricks.

The first furnace of this type was blown in in June, 1899, at the Vulcan Works at Duisburg, and has been in blast for eight and one-half years. This furnace was 61 ft. 6 in. high, with a bosh diameter of 19 ft. In consequence of bad trade it was blown out and was then increased in hight up to 65 ft. 6 in. In the reconstruction the iron shaft was used again. The new design differs from the original in so far that each set of three rings has one water channel, whereby the water cooling is simplified.

There are five furnaces on the American system at different works, partly already in blast and partly under construction. Contrary to Burgers, who made the shaft principally of cast iron plates, the Americans have arranged the casings of wrought iron or cast steel, an alteration the value of which is doubtful, according to experience in Germany, as after an intensive wear and deterioration of the firebrick lining, excessive cooling takes place. A further consequence will be that the whole furnace stack, in consequence of the change in temperature, will move, warp and get slack in the joints.

There are to-day five furnaces in blast in Germany built on the Burgers system. Last year the Société Générale des Hauts Fourneaux, Forges et Aciéries de Makievka, of Makievka, in Russia, built a furnace on the same system. This company expressed satisfaction with the construction and regular working of the furnace. The coke consumption was lower than that of the best periods of previous furnaces with brick shafts. With regard to the capacity, they report that on account of cholera, labor difficulties had taken place, but in spite of these they had had on various occasions daily outputs of 280 tons of hematite pig iron. Under ordinary circumstances they expected to reach easily 300 tons per day. This company intends to rebuild a second furnace and to provide it with a cast iron casing, as shown in Fig. 1.

With regard to German, it can be reported that at the Gewerkschaft Deutscher Kaiser in Bruckhausen a furnace 85 ft. high and 23 ft. bosh diameter, which had given on a monthly average about 500 tons per day, has been continuously working over a period of years. In Dortmund a cast iron cased furnace produces about 350 tons per day, while at Gelsenkirchen several furnaces of 69 ft. hight and 21-ft. bosh diameter have given a daily output of 200 to 300 tons per day. Here the working of the furnaces has not caused any difficulties and is very regular.

Texas, the largest State in the Union in point of area, made greater progress in its increase in population during the last 10 years than any of the States which exceed it in the number of inhabitants, and now takes rank as fifth State in population, passing Missouri, which in 1900 held that place. Census statistics just issued show that the inhabitants of Texas now number 3,896,542, and that only New York, Pennsylvania, Illinois and Ohio surpass that State in population, while Missouri drops back to seventh place, having been passed by Massachusetts during the last 10 years. The population of Texas increased 847,832, or 27.8 per cent. in the past decade.

The Whiton Hardware Company, Seattle, Wash., has purchased the entire stock of tools, shop supplies, valves, fittings and general foundry and mill supplies of the Vulcan Iron Works of that city.

The Gyroscope and Its Useful Possibilities—IV

The Author's Development of the Active Type

BY ELMER A. SPERRY, NEW YORK.

In Fig. 32 is a pendulum with a small gyroscope mounted upon it. This pendulum has freedom of oscillation upon its two gudgeons. As stated, all ships roll like a pendulum, and therefore, this may be considered to be a ship with a small gyroscope upon it. The spinner weighs about a pound, and it spins at a very low velocity compared with what a well organized gyroscope would do.

If the rings supporting the gyroscope are locked so that it cannot precess and the pendulum is set swinging it will be found to take as long to come to rest as when the gyroscope is not spinning. When the rings are released so that the gyroscope can precess automatically, the pendulum will come to rest in much shorter time, but it will be noticed that the dampening effect is greatest while the swing is large, and that finally when the oscillations are short the gyroscope appears to have no more effect. This is the passive use of the gyroscope.

The Active Gyroscope

In Fig. 33 a cord is seen passing through the two gudgeons of the pendulum just above the tripods and at a point midway between these gudgeons the cord passes around one of the little horizontal pulleys immediately below the gyroscope arranged in an elongated opening in the wooden top of the pendulum. These pulleys operate the little pinions in the lower

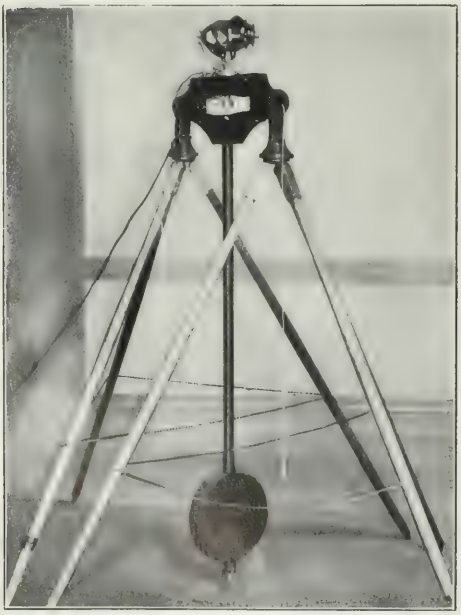


Fig. 32.—A Pendulum with a Gyroscope for Dampening Its Oscillations.

middle portion of the fork of the gyroscope, one being geared directly to the base ring shown horizontally in Fig. 33, and the other operating the precessional ring through an intermediate miter segment. This arrangement affords means whereby either of these rings may be tilted at will by the simple act of drawing the cord through the center of the gudgeons and around either one or the other of the pulleys, to accelerate precession. No movement, manipulation or stress whatsoever applied through the cord, could of itself effect the oscillation of the pendulum for the reason just stated that the cord passes through the center or axis of this oscillation and in line therewith.

Since the gyroscope responds only to the large or wide angle oscillations, but either does not respond at all or moves very slightly with the smaller oscillations, it cannot, when used passively, control or extinguish these smaller oscillations. It being desired, especially in connection with improvements in conditions for gunnery on battleships and war vessels generally that the gunner should operate if possible from a level gun platform, it becomes desirable to act on these smaller

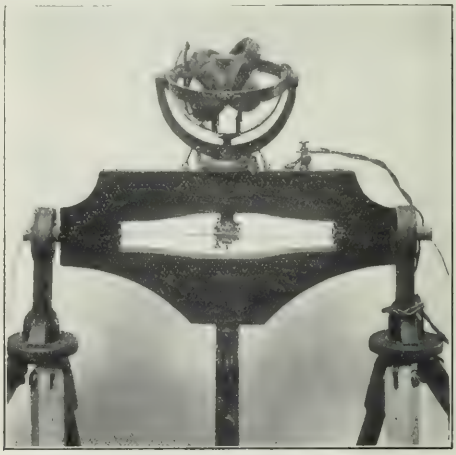


Fig. 33.—Detail of the Gyroscope and Pendulum Trunnions.

oscillations or roll of the ship so as to completely extinguish them and hold the ship on a practically even beam. This is especially true now, as all the larger vessels are designed for broadside service and volley fire. The gunner does not know at what instant his gun is to be fired, and therefore is compelled to keep an incessant aim upon the target. If the body is rolling much or little this is a difficult task. The recoil of the volley fire also throws the boat over and sets up rolling, and it is the duty of the gyroscope to extinguish and prevent all rolling disturbances from whatever source. The lesser angle rolling must be taken care of by the active type of gyroscope. By this means the full angle operation of the gyroscope is secured independently of the amount of motion or, in fact, any motion whatever on the part of the ship and is therefore in readiness to deliver to the boat stresses which are equal and opposite to those received by the boat from any source and prevent them from causing the boat to roll.

This was undertaken by Sir John I. Thornycroft in his work for preventing rolling, but his devices involved changing the center of gravity of the vessel and thus introduced an additional disturbing and unstabling element which required additional treatment. As will be remembered, his device involved a great moving weight running as high as 5 per cent. of the

total displacement of the boat and a very large amount of hydraulic machinery for handling these weights and a considerable amount of motive power for operating them. With the active type of gyroscope, a weight of only a small part of 1 per cent. of the displacement of the ship is required to perform a very substantial service, down to the point of practically fully extinguishing the rolling. By the use of this device, there is entire absence of any shift of the center of gravity of the vessel, and its stability remains unchanged. The sizes, weights, speeds and location of a gyroscope for this purpose are among the points which have been canvassed in tests carried on at the Washington Navy Yard during the past winter.

Tests of a Ship-Steadying Gyroscope

Figs. 34 and 35 show front and rear views respectively of a working model of a 26,000 ton battleship of the super-dreadnought class, with 5-ft. metacentric hight and 18-sec. period of roll, capable of rolling through a total arc of 60 deg., and means of autographically recording all motions, both of the ship's model and the gyroscope upon it. The gyroscope was operated both passively and actively; means were also provided for emplacing the discharges of the active gyroscope variously with regard to the ship's oscillation, so that the effect of different combinations might be studied. Many other auxiliaries were provided, one of which permitted the actual velocities of the gyro wheel to be taken while in operation. This was accomplished by the stroboscopic apparatus of Capt. D. W. Taylor, similar to that used by him in his classic investigations of propellers under service conditions; in fact, both the ingenuity and reliability of performance of the model ship and the auxiliaries is directly due to Mr. Taylor and his assistants at the Washington Navy Yard. By means of this very complete equipment, studies and records have been made and charts of performance prepared and valuable data accumulated, much of which is new, as many of the observations, it is believed, were never before undertaken.

The investigations with the active type of gyroscope are in a new line of research, the results obtained are important in point of much more perfect control of the ship's roll than hitherto possible.

Captain Taylor has prepared a very full report upon this work, forming a part of which is a 40-page appendix in which he treats the question in a most masterly manner under some 16 heads. In this most unique and valuable work, he has given an original mathematical treatise on practically all the phases and bearings of this question, including an original investigation of the underlying phenomena of the gyroscope itself. It is of the greatest value to this important art that its problems should have come under the observation and been studied and reviewed by so able a mathematician and at the same time one so experienced in all branches of experimental research, and well fitted by long training to judge of the practical bearings of the results extending, as does this experience, to the very largest undertakings and structures in the marine. To give some idea of the enormous work involved, the author takes the liberty of reproducing, Fig. 36, a sample page of this treatise.

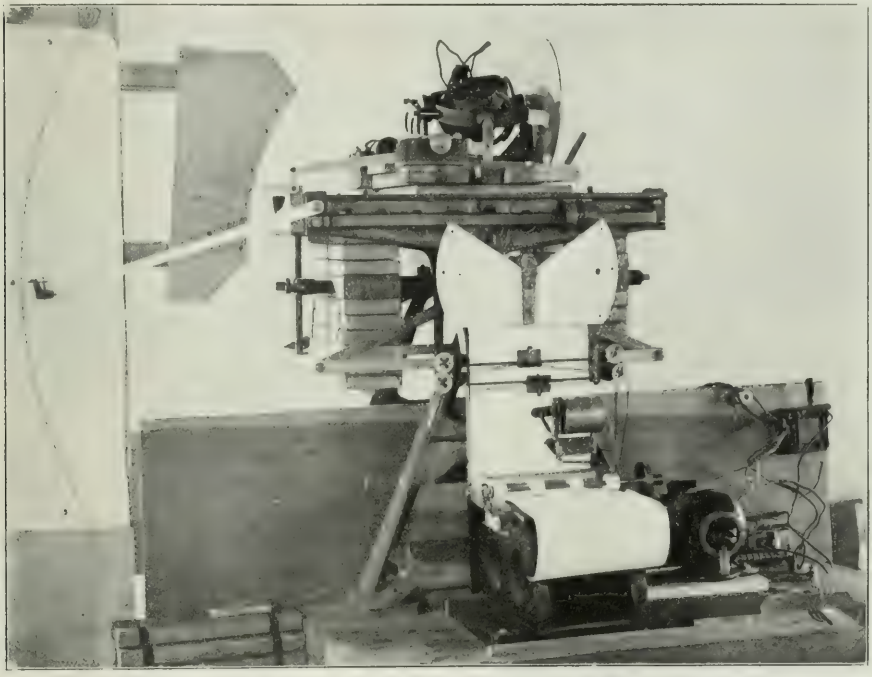


Fig. 34. Apparatus Used in Government Tests of the Sperry Gyroscope as a Ship Stabilizer.

The practical effect in operation of the active type of gyroscope is to secure a large reduction of weight over and above that possible with the passive type. One of the reasons for this becomes apparent from the action of the pendulum before described. With the smaller angles of roll, the gyroscope would have to be large enough so that its small angles of response would develop the required energy for extinguishing or still further reducing the roll (complete extinguishment being impossible); whereas with the active type the full 180-degree oscillation of the gyroscope is always available, where required for the extinguishment of large or even the smallest angles of roll as necessary. Thus an extremely small machine taking advantage of the larger angles (between 20 and 30 times as large) is sufficient to accomplish this purpose.

Fig. 37 shows three curves, of which the one at the top gives the number of oscillations of the ship's model

before it was brought to rest by the natural friction, after having been originally tilted to 25 degrees to one side of the center. The shorter central curve illustrates the number of oscillations of the model with the gyroscope acting passively or on Dr. Schlick's plan,

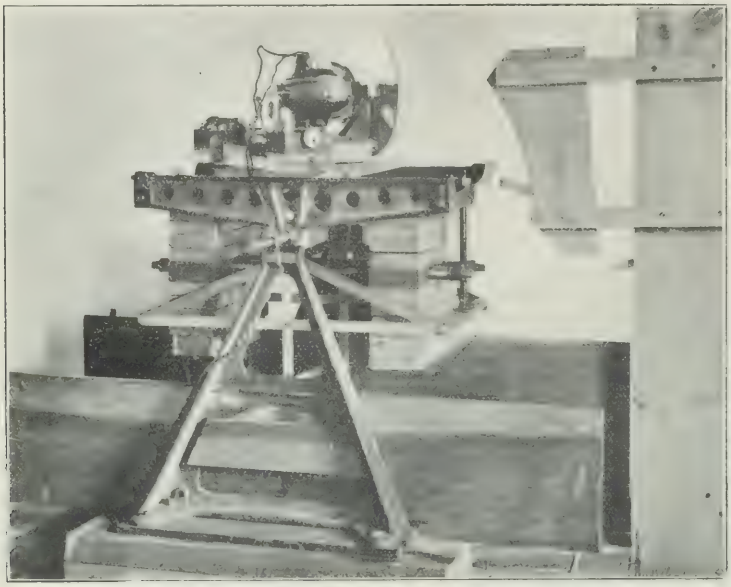


Fig. 35.—Rear View of the Testing Apparatus for the Sperry Ship Gyroscope.

the several rolls of smaller magnitude at the end being omitted where the passive type of gyroscope failed to respond, and the still shorter curve at the bottom shows the number of oscillations of the ship in being

$$\frac{M'_Z}{m r^2} = (\alpha^2+\beta^2)\sin\psi\cos\psi\cos\theta - 2\alpha\beta\sin^2\psi\sin\phi + \gamma\sin^2\psi\cos\phi + \delta\sin\psi\cos\psi\sin\theta - \alpha^2\sin\psi\cos\psi\cos\phi + \gamma\cos^2\psi\cos\theta.$$

$$= \beta^2\sin\psi\cos\psi\cos\theta - 2\alpha\beta\sin^2\psi\sin\theta + \gamma\cos\theta + \delta\sin\psi\cos\psi\sin\theta$$

Now as before put $m = \frac{w}{2\pi g}\,d\psi$

Then

$$M'_X = \frac{wr^2}{2\pi g}\left[\beta^2\sin\phi\sin\psi\cos\psi\,d\psi + 2\alpha\beta\cos\phi\sin\psi\,d\psi + \gamma\sin\theta\,d\psi - \delta\cos\phi\int^{\sin\psi\cos\psi\,d\psi}\right]$$

$$M'_Y = \frac{wr^2}{2\pi g}\left[-2\alpha\beta\sin\psi\cos\psi\,d\psi + \delta\cos^2\psi\,d\psi\right]$$

$$M'_Z = \frac{wr^2}{2\pi g}\left[\beta^2\cos\phi\sin\psi\cos\psi\,d\psi - 2\alpha\beta\sin\phi\sin^2\psi\,d\psi + \gamma\cos\theta\int^{\sin\psi\cos\psi\,d\psi} d\psi + \delta\sin\theta\right]$$

Evidently the moments for a complete ring of radius r and weight w will be obtained by integrating the above expressions with respect to ψ from 0 to 2π.

Now

$$\int_0^{2\pi}\sin\psi\cos\psi\,d\psi = 0 \qquad \int_0^{2\pi}\sin^2\psi\,d\psi = \pi = \int_0^{2\pi}\cos^2\psi\,d\psi$$

Let M_X M_Y M_Z denote the moments for the complete ring. Then evidently

$$M_X = \frac{wr^2}{2\pi g}\left[2\pi\alpha\beta\cos\phi + 2\pi\gamma\sin\phi\right] = \frac{w}{g}r^2\left\{\alpha\beta\cos\phi + \gamma\sin\phi\right\}$$

Fig. 36.—A Page from Capt. D. W. Taylor's Report on the Gyroscope Tests.

brought to rest (absolute freedom from motion being possible) by the same gyroscope when operated actively. These are among the interesting results reached in the investigations referred to above.

Possible Influence on Ship Design

When the motive power of vessels changed from an upsetting force to one almost exclusively of forward thrust, the design of ships underwent quite radical changes in connetion with lines affecting the stability, decreasing this factor and favoring decreased resistance, aiding the attainment of higher speeds. Now that stability may be imparted to a structure of naturally small righting movement, and, as is well known, even to structures of unstable equilibrium, it is possible that even more radical changes in design may result. Ships may now be designed that are practically free from those ballistic qualities which favor rolling, but structures to which unequal sea pressures easily impart motion need no longer be avoided, as a comparatively small gyroscope which can easily be present in duplicate may very readily hold them practically from rolling motions in such a way that ordinary seas will have little or no effect upon them, while an exceptional wave will have only a temporary effect. It has been suggested in connection with such vessels that they need not pitch if of sufficient length; be this latter fact as it may, it is apparent that a point has now been reached and a situation created with reference to the resisting and prevention of rolling and motion of ships at sea that, to say the least, is interesting in many quarters; for example, to those who are concerned in pro-

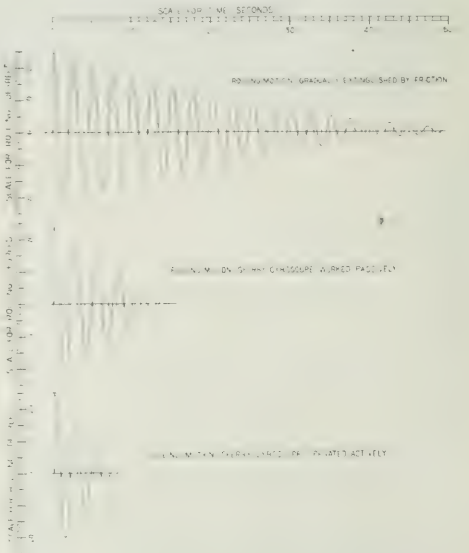


Fig. 37.—Curves Comparing the Dampening Effect Without the Gyroscope and with It Working Both Passively and Actively.

viding safety and comfort to passengers at sea, and in preventing deterioration of certain classes of freight, such as live stock, which is known to suffer heavy depreciation in stormy weather. This is entirely outside naval uses, especially as related to gunnery, trimming ships to secure level gun platform, suppression of recoil from broadside firing, and other uses.

The New Field Open to the Gyroscope

In following out the possibilities of the active type of gyroscope, the author has constructed an apparatus adapted to deliver gyroscopic control in a single direction by carrying the gyroscope through a succession of motions for reversing the plane between each impulse. Two views of this apparatus are illustrated in Fig. 38.

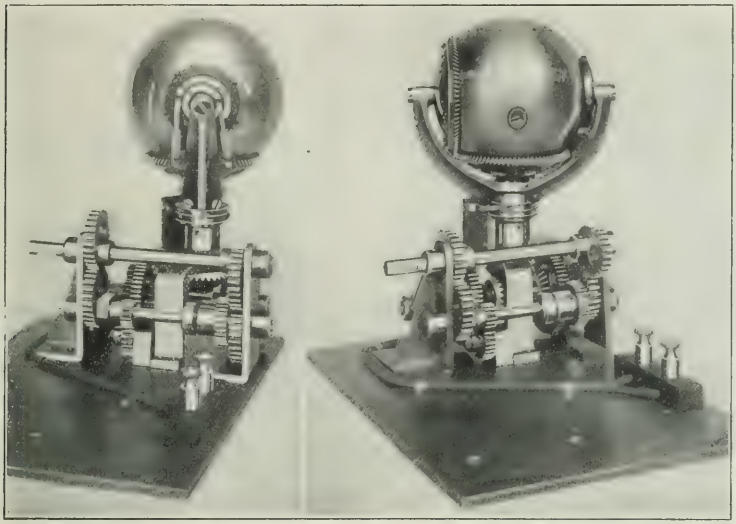


Fig. 38. Two Views of a Special Model of the Sperry Active Gyroscope.

It is evident that the early workers were hampered by too close adherence to the earlier treatment of statical stability, and the direct effect of wave slope together with some other elementary factors, rather than the more practical considerations of the effect of movements of the ship, stresses involved, &c. In 1904, Dr. Schlick presented a paper before the Institution of Naval Architects. Accompanying this paper in the form of an appendix is a mathematical treatise of the theory of the gyroscope and its application to steadying ships. There seems, however, to be little in this treatise which is useful in the practical application of the gyroscope, especially the active type of gyroscope to ships. Captain Taylor in his report on this subject stated of this treatise that it is a very elaborate mathematical theory, but that it largely ignores practical considerations.

The problem is a comparatively simple one—namely, of holding the ship against rolling by neutralizing with the gyroscope each disturbing influence as it reaches the ship, while taking advantage of all the aid possible through the design of the hull and disposition of the masses. With this end in view it is not yet known the best relation between these two features. With the last adjusted to best fit the new conditions, it is believed that the gyro steadying plant of the active type will be well within practical limits of space, weight and cost. Especially is this true when compared with the practical results of its operation. A great many ships, as they now stand, could with comfort and profit utilize the gyro steadying gear of this class, which is at present available, and some important installations are now being contemplated. In this connection it is interesting to note that the weight of an active gyroscope for each degree of roll quenching power on a modern battleship would be about one-tenth that of a zone of equal width of the submerged armor thus possible of displacement, and the cost much less; this is outside of the very important consideration of having the entire ship under control either automatically to extinguish roll or at the will of the commander, with its many evident advantages.

The Gyroscopic Compass

Referring to the use of the gyroscope as a compass, it is interesting to note that the possibility was first brought out by Foucault, 1852, who, after many attempts, succeeded finally in making up an apparatus so delicate and beautifully constructed as to demonstrate the working of the instrument in the short period of duration of spins of a small disk. The observations were taken through a telescope. The directive feature was only a fraction off that of the magnetic needle, but magnetism or the location or variations in the positions of the magnetic meridian have nothing whatever to do with its directive feature, for it points to exact geographical north, not to magnetic north. About this time, Foucault took this apparatus to England and there aroused great enthusiasm in scientific circles by exhibiting it to the Royal Society in operation.

Hopkins in America, associated with the *Scientific American*, in 1878, made a small electrically driven

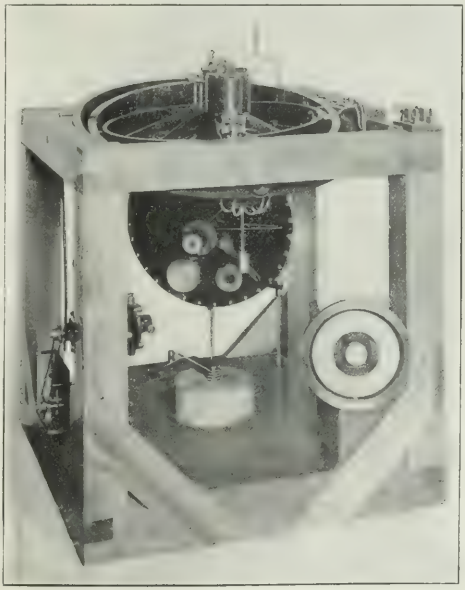


Fig. 39.—A Sperry Gyroscopic Compass in an Artificial Ship Mounting.

gyroscope by means of which better and more persistent results were obtained.

More recently, attempts have been made by a German firm to use mercury floats for sustaining the rotating wheel, constituting a gyrostat which, in this instance, runs at the enormous speed of between 22,000 and 23,000 rev. per min., which has been considered by many to be impractical. Those familiar with the use of mercury in its mechanical and also electrical applications usually find it very unsatisfactory. At best it is a volatile liquid, subject to many changes with differences in temperature, and what is worse, is also subject to the phenomenon known as "sickening," which affects the surface and the mercury for some distance under the surface, altering its mechanical behavior and also its viscosity. The best engineering practice has for some years avoided the use of mercury in every possible way, and especially where electrical conditions were involved, and substituting in its stead simple mechanical means which are free from these serious objections.

Working in this line the author has found simple details by means of which the whole gyroscopic proposition is reduced to a strictly mechanical basis easily within the comprehension of all, containing no unknown quantities and correspondingly easily dealt with. In the cases where the gyroscope is used and employed as a battle compass, the apparatus is placed below decks, and small instruments about the size of an ordinary compass are distributed in different positions on the ship, giving the exact indications of the gyroscopic compass itself.

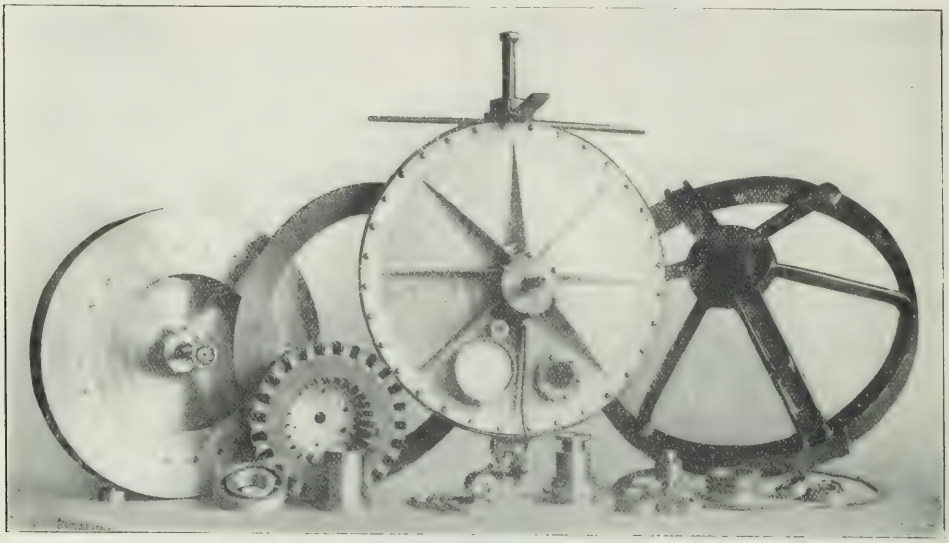


Fig. 40. The Unassembled Parts of the Sperry Gyroscopic Compass.

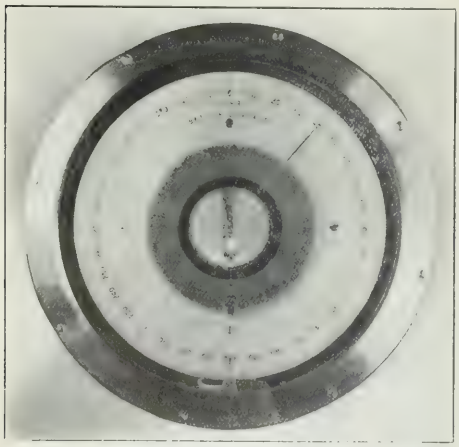


Fig. 41. An Indicating Compass Controlled from Any Desired Point by the Master Gyroscopic Compass.

The author's work has extended to the point where action of such instruments can be controlled from the gyroscopic compass and distributed as desired, the indications being accurate to a very small fraction of a single degree. Many observations have been made indicating that they are accurate to 1-3600 of the circle. Fig. 39 shows the battle compass as mounted in an artificial ship, which gives all changes of heading as well as automatic continuous roll and pitch to which the compass is continually subjected. Both roll and pitch may be varied at will as to angle and period. Fig 40 shows the unassembled parts of the compass.

Fig. 41 shows one of the receiving instruments for the binnacle or other position. It is found that this receiving instrument requires no cardian mounting and is equally accurate in any position, vertical or horizontal. Indications are held with the accuracy described following the master instrument instantly, and are very much more "dead beat" than an air compass for marine purposes, though it is not submerged nor is any liquid used in connection with it. Among the nu-

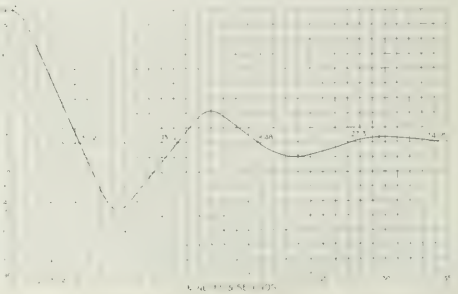


Fig. 42. Diagram of the Settling Taken from the Sperry Gyroscopic Compass.

merous points never before achieved is the automatic correction of the northerly or southerly component of vessels' speed at sea, this correction being made between the gyroscopic compass and its transmitting member, in such a manner that the indications received by the navigator and elsewhere about the ship are thus absolute and maintain true geographical north.

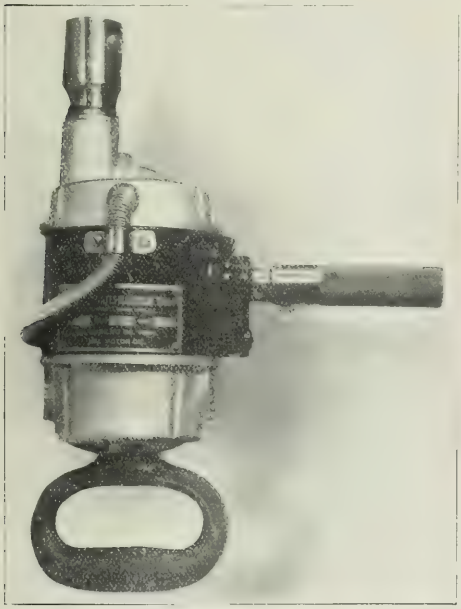
Fig. 42 indicates an actual settling taken from the author's gyroscopic compass, while in the operation of being started in the East and West position and brought up to about 4000 rev. per min. only. This shows the instrument to reach true north in 34 min.; at normal speed the directive force is about 6600 times that of the compass needle.

It is felt that the navigator has now at hand a most desirable aid, and one that greatly simplifies his work, for this type of compass is not affected in the slightest degree by the steel of the ship or cargo, nor any magnetic disturbances in either; neither should shifting cargo, turning turrets, gunfire, nor the striking of the ship by a shot disturb its accuracy or reliability, nor is it affected in the slightest by those disturbances technically known as deviation or variation.

THE END.

A New United States Electric Hand Drill

The United States Electrical Tool Company, 1938 West Eighth street, Cincinnati, Ohio, has placed on the market a new type of electric hand drill. This tool is claimed to be the lightest ever built and its complete weight is only 9 lb. The motor is of the self-starting induction type and is wound for 110 or 220 volt, 60-



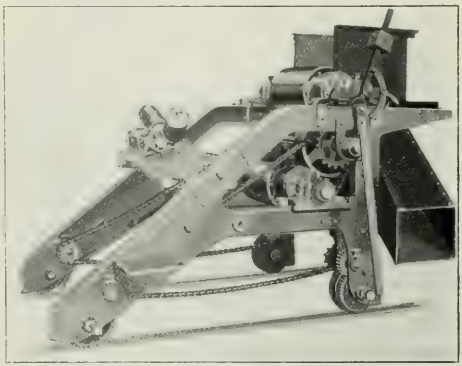
A New Electric Drill Made by the United States Electrical Tool Company, Cincinnati, Ohio

cycle, single phase alternating current. The power for operating the tool is obtained from an ordinary lamp socket in the usual way. To reduce the weight of the drill to the lightest possible figure the casing of the motor is constructed of aluminum throughout.

The Central Iron & Steel Company, Harrisburg, Pa., has taken the contract for the plates for four of the torpedo boats to be built for the United States Navy.

The S–A Automatic Reversing Tripper

The Stephens-Adamson Mfg. Company, Aurora, Ill., has recently developed a new type of reversing conveyor tripper upon which an application for a patent is pending. The tripper is used to enable a belt conveyor



The New Conveyor Tripping Device Made by the Stephens-Adamson Mfg. Company, Aurora, Ill.

to discharge its load at any point along the line that is necessary when it is desired to discharge material into any one of several bins from a single conveyor or distribute the material along a large pile. The advantage of an automatic reverse on a tripper is that the tripper may be left unattended to work back and forth between the trips. In this way the material is piled evenly with no chance of clogging until the whole pile is level with the conveyor structure. The special feature of this tripper is its simplicity of design and the consequent reliability of operation. It is said to be a decided improvement over the old methods requiring cable pulls or complicated and expensive systems of gearing. As the drive is through friction gears, it is not positive and is therefore able to make allowance for obstructions on the track or accidents in which it is claimed a positive drive would be at disadvantage.

In the older type of automatic tripper made by this company, an iron friction wheel working on a shaft between the two tripper pulleys operated it. This friction engaged a paper friction on either pulley shaft depending upon the desired direction of travel, and the friction wheel shaft was mounted in an eccentric bushing operated by a hand lever to make the friction engage its mate on the desired pulley shaft. Motion was transmitted from this shaft to the tripper through all four wheels by gears and chains and sprockets.

In the new machine the hand lever controlling the movement of the friction wheel shaft is replaced by a longer wheel lever, which is hung vertically from the friction shaft so as to engage with the floor trips. In running against either trip, the lever which is shown hanging down at the right of the engraving operates the friction shaft through the eccentric bushing and reverses the direction of travel. The adjustable weight in the upper right corner assists the motion of the lever and also helps to keep the frictions in contact. If desired to keep the tripper stationary at any one point this weight may be locked in a neutral position.

F. H. Evans has moved into his new factory at 31 to 35 Hewes street, Brooklyn, N. Y., after doing a manufacturing business at 596 Kent avenue for 39 years. With largely increased facilities, with additional new and improved machinery, he will continue the manufacture of his specialty, the Evans patent expansion bolts; also his full line of tar and pitch heaters, roofers' and pavers' kettles, steel pails, &c.

The Paragon Electric Furnace*

A Combination of an Arc and a Resistance Furnace—Smaller Electrodes Possible

BY J. HARDEN.†

The electric steel furnace appears to be steadily gaining ground in this country, and among others a 1½-ton Kjellin induction furnace has recently been erected in Sheffield, for crucible steel work, and has successfully competed its guarantee run. This furnace is especially adapted for producing the highest grade of tool steel. It is, however, well known that a furnace of this type is not adaptable for any extensive refining of steel, owing to the refining surface of the bath being small.

It has long been recognized by steel makers generally that, although the induction furnace is an excellent tool in the hands of the crucible steel maker, a furnace which would permit more extensive refining, and also the construction of large units, at the same time keeping the advantages embodied in the induction furnace system, is much to be desired. It is because of the comparatively low power factor of larger furnaces of the plain induction type that this class of furnace has not been constructed in large units to any great extent.

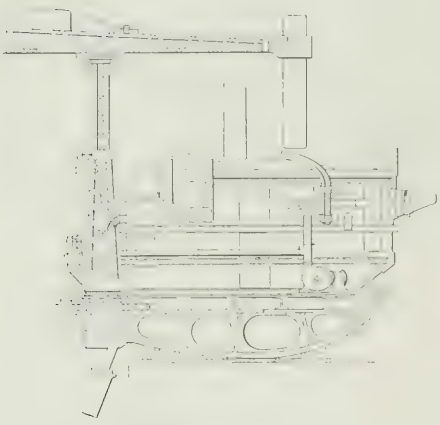


Fig. 1.—The Paragon Electric Furnace.

In order to overcome this, the Röchling-Rodenhauser furnace, which is partly a resistance furnace and partly an induction furnace, was designed. A considerable number of these furnaces have been erected and are in operation abroad, giving very good results. Many steel makers, however, are of the opinion that it would be an advantage if a furnace could allow superheating the slag for refining purposes, but at the same time enable the metallurgist to so regulate the heat of the charge that gases could be expelled without difficulty. At the same time, the perfect circulation of the bath should be maintained so as to secure a perfectly uniform material.

A new furnace on these lines, which the inventors call the "Paragon" furnace, has been designed and protected by patents, which appears to possess points in its favor. As is shown in Figs. 1, 2 and 3, this furnace is a combination of an arc and a resistance furnace, which makes it very much like an open hearth furnace, and it may indeed be worked exactly in the same manner. The slag blanket is kept at the desired temperature by means of arcs playing over the surface of the slag, while the remainder of the heating power is transmitted to the bath by means of terminal plates, such as are used in the Röchling-Rodenhauser furnace.

The result of this combination is that the slag may be heated to any desired temperature while dephosphorization and desulphurization take place, but the heating effect of the arcs need not be increased to such an extent as to keep the whole charge superheated, which, of course, would tend to overheat the steel immediately beneath the arcs, but a carefully regulated amount of current can be sent at the same time through the resistance plates, thus also heating the charge from underneath.

When the dephosphorization and desulphurization are finished, it may be desirable to alter the gradient of heat in the furnace, so that the lower portion of the bath is hotter than its surface, in order to expel the gases more readily. This result is obtained by diminishing the power transmitted through the arcs and increasing the power transmitted to the side plates. In fact, it is even possible to extinguish the arcs for a time and keep the bath liquid by means of the side plates, which for this purpose are provided with a cooling device of enforced air. The metallurgist has, therefore, the power of controlling the gradient of heat in the bath at will.

This combination has another advantage, viz., that the electrodes do not require to be of such large section for a given capacity of furnace as would be the case if the total amount of power were transmitted by means of the arcs only, owing to the fact that normally about 50 per cent. of the total power is transmitted through the arcs, while the other 50 per cent. is transmitted through the side plates. The advantages claimed, therefore, are threefold:

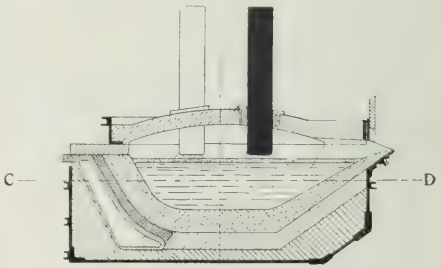


Fig. 2.—Section of Furnace on C-D in Fig. 3.

1. The size of electrodes for a given furnace capacity is only about half that of an arc furnace, and consequently with a given electrode section available the melting capacity of the furnace can be nearly doubled.

2. Owing to the destructive effect of large arcs immediately under the roof of the furnace, the roof very quickly deteriorates, but in the case of this new furnace the roof is not subjected to such severe strain, owing to the reduced size of the electrodes and to the

* From the London *Iron and Coal Trades Review*.

† Of the Gröndal Kjellin Company, London, England. The Paragon furnace will be introduced in the United States by the American Gröndal Kjellin Company, New York.

smaller amount of power transmitted through the arcs; therefore, the maintenance of the furnace costs less, and the roof lasts longer.

3. The control of the load factor of the furnace is better, because the current flowing through the resistance plates is a perfectly steady one, whereby the heavy current fluctuations otherwise caused by large arcs is very extensively compensated.

The result of this is that no special machinery is required either for compensating for the lower power factor of a true induction furnace or designed with a large fly wheel effect, as in the case of a simple arc furnace, on account of its fluctuating load factor. Standard machinery and standard transformers only appear to be necessary, which, of course, decreases the first outlay for the plant, and under the circumstances may prove to be almost a deciding influence.

The power consumption per ton of steel should also prove more economical by means of this combination, as the high temperature of the steel is only required during desulphurization, it being well known that dephosphorization does not require such a hot slag as desulphurization, and it follows as a logical sequence that the higher the temperature of the steel for any length of time, the greater also the heat losses during the process; in view of this, the total melting and refining process should be more economical with this combination. It therefore appears that this type of furnace includes several of the advantages of the induction furnace, viz., a good circulation of the charge, inasmuch

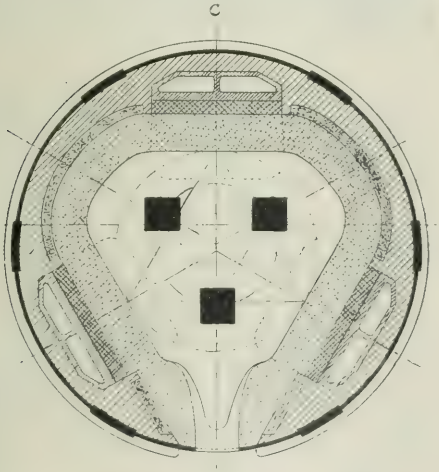


Fig. 3. Horizontal Section on C-D, Fig. 2, and Part Plan.

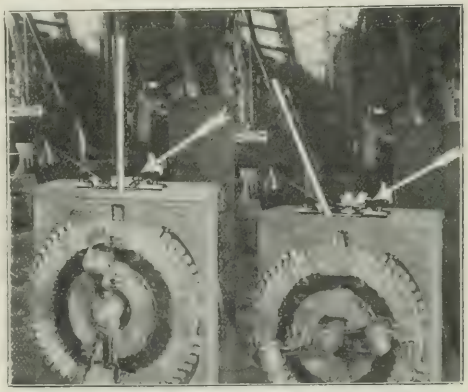
as it is heated from below as well as from above, and a high load factor.

No electrical apparatus, in the ordinary sense of the word, seems to be an element of the design of this furnace, because the power supply transformers may be situated in an adjoining building protected from dust and injury, and entirely beyond the reach of the workmen. The low-voltage current only requires to be transmitted to the furnace by means of insulated busbars and cables, which is easily arranged.

The regulation appears to be simple, as if the furnace is operated direct from a generator, the field rheostat controlling the current to the generator is all that is required; or, if transformers are used in connection with an existing power supply, so-called regulating transformers with interchangeable terminal steps are employed. In fact, comparatively little regulation in this respect should be found necessary, because the current in the arcs ought to be easily regulated by altering the length of the arcs, while the current in the resistance plates is more or less automatically regulated by the condition of the charge.

The Kittredge Safety Controller Lock

One of the subjects which received much attention at the recent meeting of the Association of Iron & Steel Mill Electrical Engineers, held at Pittsburgh, Pa., was the importance of increasing the safety factor on the electrical apparatus used in steel mills. Among the appliances exhibited was the Kittredge safety lock for



Two Views of the Kittredge Safety Controller Lock Made by the Delta-Star Electric Company, Chicago, Ill.

controllers manufactured by the Delta-Star Electric Company, 541 Jackson Boulevard, Chicago, Ill. The view at the left shows the controller handle locked in position, and that at the right illustrates the lock released and the handle free to be moved.

This lock consists of a hinged U-shaped metal piece fastened to the controller frame, and mounted so as to engage or disengage the controller handle. The handle is surrounded by two projections on the safety lock when the latter is in the engaging position, and the controller cannot be operated until the lock is released by a special key. By using this lock it is possible for an attendant to lock the controller handle securely against operation by unauthorized persons, thus preventing the possibility of starting the apparatus and injuring it or workmen.

The Steel Car Forge Company, whose general office is in the Frick Building, Pittsburgh, Pa., with works at Ellwood City, Pa., Butler, Pa., and Hammond, Ind., is calling attention to its facilities for making all the forgings necessary to bring freight and passenger cars up to the new safety appliance standards of the Interstate Commerce Commission. These items cover such appliances as grab irons, hand holds, brake steps, ladders, uncoupling levers, drawbar yokes, &c. The company claims that its products can be sold to the railroads cheaper than they can be made in the railroad companies' own shops and promises prompt shipment, as a large stock of such material is carried.

First Roechling-Rodenhauser Furnace in the United States.—An electric furnace of the Roechling-Rodenhauser induction type will be installed by the Crucible Steel Casting Company, Lansdowne, Pa. It will be of 2 tons capacity, and single phase, 25-cycle current will be used, furnished by a generator driven by a 425-hp. oil engine. Cold material will be charged for a time; later a cupola may be used for melting the scrap. The furnace will be built by the American Electric Furnace Company, a connected interest of Naylor & Co., 45 Wall street, New York.

The Sarco Multiple Unit CO_2 Recorder

A New Type of Instrument Embodying Several Distinctive Features

After a series of tests covering 14 months, the Sarco Fuel Saving & Engineering Company, 90 West street, New York City, has placed on the market a new type of multiple unit carbon dioxide recorder. In the design of this new instrument it was endeavored to produce a machine compact enough to be made in a single unit or in multiples thereof up to 10 without excessive weight or bulkiness. All adjustments, such as leveling liquids, &c., have been avoided, and the motive power is made as nearly constant as possible by the use of standard electric motors. It is not possible to obtain more than 15 to 18 records per hour in recorders of the surface absorption type, and the gas is therefore passed through caustic solutions, which enable from 35 to 40 readings to be made per hour. As far as possible glass has been dispensed with, the only points where it is retained being at the seals, where the sample of gas is measured and also where the final operation of recording the CO_2 content of the gas is performed. Elsewhere metal has been used. Figs. 1 and 2 show front and rear views of a six-record unit, while Fig. 3 give details of the construction of the recorder.

The special features of this new recorder are separate units, elimination of all adjustments except the initial one of setting the pen at zero, making simultaneous records, the elimination of time lag, the mixing of the caustic solution in the recorder itself, the elimination of temperature errors, the automatic handling of the liquids used, a pen which inks itself at the end of each stroke and complete absorption of the gas. The motive power for operating the recorder consists of a direct connected motor driven suction fan to draw a continuous stream of gases through the various pipe lines to the machine and a motor driven rotary pump to handle the paraffine oil in the successive operations constituting a cycle for measuring a sample of the gas,

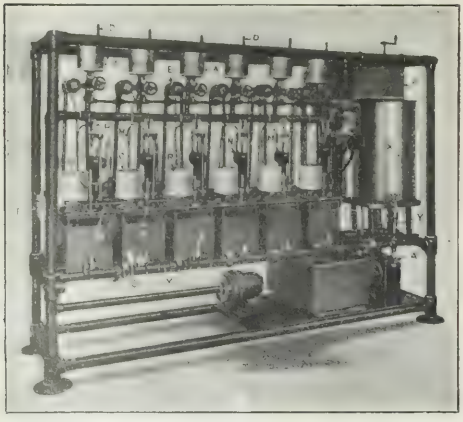


Fig. 1.—Front View of a Multiple Unit CO_2 Recorder Made by the Sarco Fuel Saving & Engineering Company, New York.

absorbing its CO_2 content, recording this value and expelling the sample.

A clock mechanism which is substantial enough to drive the several drums on which are mounted the individual charts for each furnace is used, and a sufficient supply of oil is led to each unit from a central supply tank and performs the successive operations previously mentioned. The recorder is composed of several distinct units, all of which depend upon the same central source of power for their operation. These units are entirely separate, and there is consequently no possibility of the gases from the several furnaces becoming mixed.

The furnace gas is led to the recorder through individual pipe lines, each of which is connected to a seal, A. At the other end of these individual pipe lines is a ¾-in. sampling tube perforated with holes extending into the last pass of the boiler, and a filter is placed just outside the flue or boiler setting to remove the soot

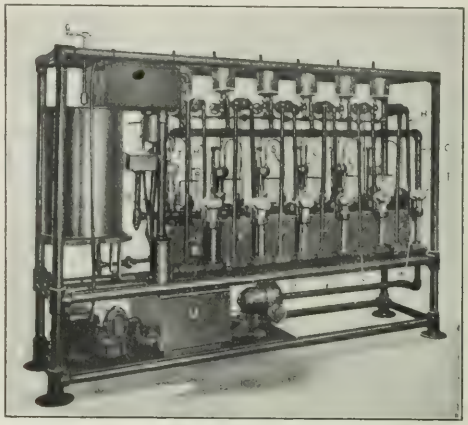


Fig. 2.—Rear View of a Six-Record Machine.

from the gas. On the other side of the filter, the pipe is reduced to ⅜ in. in diameter for conducting the gas to a recorder, this small dimension being used to reduce the time lag. No clogging will occur from using this contracted diameter, as the filtering of the gas to free it from soot and the draining of moisture are done at the boilers. The motor driven suction fan B, located at the bottom of the machine produces the suction necessary to draw a steady stream of gas through the seals and into the internal gas line C, which is connected thereto. The seals are employed to produce an equal degree of suction for each unit, and their efficiency can be easily determined, as they are made of heavy glass tubing, and the gas passes through paraffine oil therein, the inlet D being perforated so as to secure bubbles of the gas instead of a steady flow. The gas is again filtered at the internal filters E, which are cast iron cylinders containing a brush through which the gas is forced before passing to each unit.

An overhead tank of paraffine oil, F, located at the top of the machine supplies the motive power for drawing the gas through each unit. This oil is led to the various units by the line G, and by reason of its head draws samples of the gas through the tees located between the seals and the internal gas line. The gas passes through the inlet lines H, to the measuring or inlet burette I. As the paraffine oil, which is being constantly fed to the units gradually fills the pipe lines J, it rises in each measuring burette to the inlet connection, K, and prevents further gas from being trapped while, as it continues to rise, it forces the gas through the capillary copper tubes L, into the bottom of the absorption vessels O, where it is deprived of its carbon dioxide by bubbling through the caustic potash solution contained therein. The remainder of the gas is forced up through the capillary tube M, into the recording burette N, which is supplied with paraffine oil from the main supply tank and contains a frictionless metal float. The pressure of the gas forces the paraffine out of the burette, and the floats are carried down with the liquid. These floats are suspended from frictionless wheels P, by strong threads, which also carry the pen Q, for re-

cording the CO_2 content of each sample on the charts R. The paraffine oil is continually rising in the riser, S, and the central siphon T, while the record is being made, and the hight of the siphon is such that as soon as the record is completed it starts to flow and passes all of the oil into the discharge tank U, from whence it is pumped to the supply tank by the pump V. This latter tank has a filter for cleansing the paraffine oil and also has an overflow communicating with the discharge tank.

When the siphon starts to flow, the paraffine oil in the system recedes from the measuring burette due to a reduction in pressure, and the gas which has forced the float downward is then passed back into the absorption vessel at the top through the tube L, leaving by the exit tube B, and finally reaches the atmosphere through the riser tubes S. When the siphon has stopped flowing, one cycle is completed, the time being dependent upon the number of records to be made per hour. About three minutes is consumed if 20 records per hour are to be made. The gas is again drawn through the inlets to each unit, and another cycle commences. After each record the pen is automatically inked by return to the inkwell F'. The recording charts R, are mounted on drums, C', which are driven from the clock E', by worm gears on the clock shaft D'. To remove the chart drums it is simply necessary to separate them from their face plates, as the latter receive their motion from spur gears, located on their shanks, which are driven by the worms on the clock shaft.

Sticks of caustic potash are placed in the internal caustic tank X, water added, and the whole thoroughly stirred by an ordinary stirrer. The solution is then fed to each absorption vessel through the line Y, and the plug cocks Z, shut. If desired the remaining solution can be run off through the outlet valves A', and the

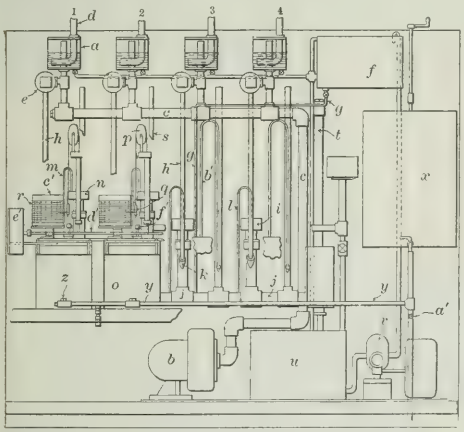


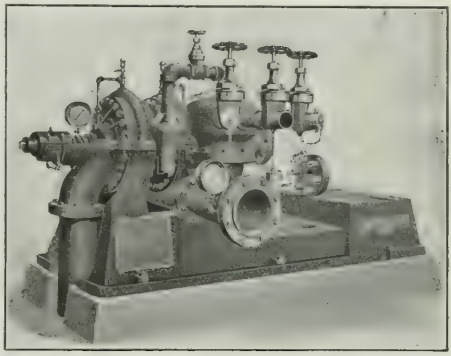
Fig. 3.—Details of the Construction of the CO_2 Recorder.

system washed with water to prevent the solution from crystallizing on the inside of the tank, and the pipe line. When the solution in each vessel has absorbed all the carbon dioxide possible, the plug cocks are opened and the solution run off. The caustic potash solution if made with a specific gravity of approximately 1.25 will last for 10 days, running 24 hours per day, and the paraffine oil is never changed. The ink-well requires filling only once a week, and the only adjustment necessary is setting the pen to zero by a turnbuckle when running on air. Everything else is automatic except the winding of the clock and renewing the charts and the caustic potash solution.

Old Grindstones.—A correspondent desires to ascertain whether there is any use for grindstones which have been worn to so small a diameter that they are no longer available for the original purpose. If any of our readers can suggest some use for such wornout grindstones we will be pleased to receive the information.

The American Centrifugal Fire Pump

Recently the American Well Works, Aurora, Ill., has developed a new type of centrifugal fire pump. It is of the volute centrifugal type, of improved and simplified design, and embodies in its construction the leading features of the latest types of high pressure centrifugal pumps made by this company. Like the pump an efficiency test of which was reported in *The Iron*



The New Centrifugal Pump for Fire Service Made by the American Well Works, Aurora, Ill.

Age August 4, 1910, this new type has pipe bends of long radius between the stages and the runners and the interior of the casing are machined true and adjusted with the least possible amount of clearance to prevent back flow.

It is possible in this design to secure from a two-stage pump the pressure usually required in fire service. In this way the additional mechanism and power required by a multi-stage pump to produce this pressure can be dispensed with, and the pump is also more compact. This is an important consideration where the pump is to be installed in an engine room or a basement having limited space. The pump is of the single suction type, with horizontal split volute, and is so designed that the covers may be raised to inspect or repair the runner or working parts without disturbing the pipe connections in any way.

Bronze is used exclusively for the construction of the impellers and the impeller shaft has bronze sleeves, through packing boxes, lantern rings and water seals. The bearings are placed outside of the stuffing box, are babbitted with hard babbitt metal and have removable liners. Ring oilers are used on the main bearings to carry up the lubricant from the oil reservoirs. This arrangement gives constant lubrication without requiring much attention.

The discharge pressure for which the pump is designed is 100 lb. with a suction head of 20 ft. Four sizes are regularly built, having the following pipe connections and capacities:

	No. 4.	No. 5.	No. 6.	No. 7.
Diameter suction and discharge pipes, in..	6	8	8	10
Capacity, gallons per minute.....	500	750	1,000	1,500
Capacity, 1½ in. lines of hose.....	2	3	4	6

The discharge casting with which the pump is provided has the necessary number of hose and discharge valves. It is also equipped with pressure and vacuum gauges and a flexible shaft coupling, and the builder guarantees it to fulfill all conditions of the Underwriters' Association.

Kane & Roach Sheet Straighteners and Automatic Shears

A New Machine with Several Novel Features

Kane & Roach, Niagara and Shonnard streets, Syracuse, N. Y., are manufacturing a new sheet straightener and automatic shears which was invented by W. E. Kane. This machine is intended for straightening sheets or narrow strips of sheet metal from coils and cutting them off automatically to any desired length on the automatic dumping table, which, as its name indicates, discharges them on a truck or into any receptacle. It is made especially compact, but is also heavy, strong and durable, and all parts are readily accessible for dismantling the machine. Fig. 1 is a general view of the machine, while Figs. 2 and 3 show the working and the driving sides of the staightener, respectively.

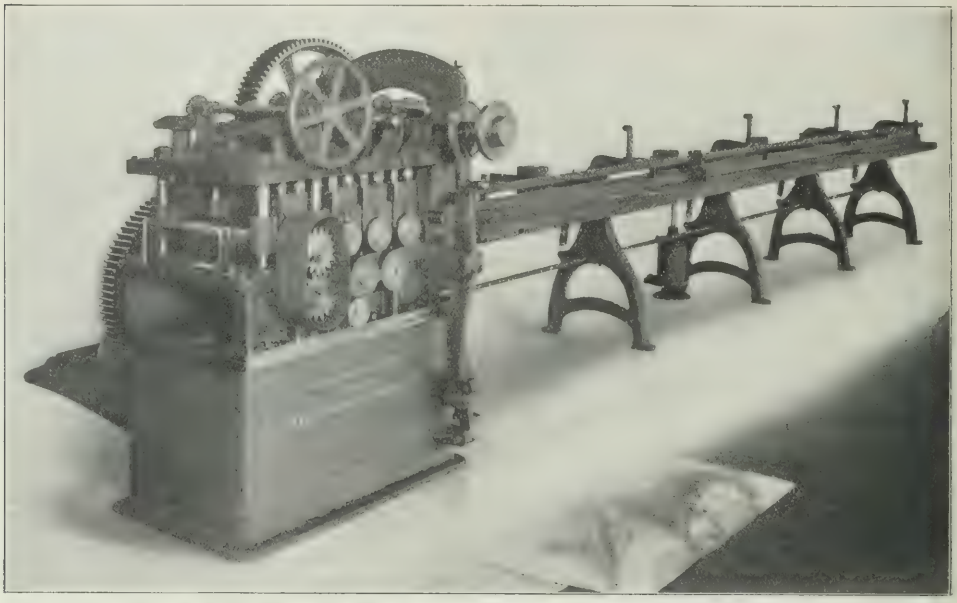


Fig. 1. The No. 2 Sheet Straightener and Automatic Shears Built by Kane & Roach, Syracuse, N. Y.

The coil of material to be straightened and cut is placed on a reel at the front of the machine, one end being first straightened enough so that it will reach into the machine and be gripped in the first pair of feeding or pinching rolls. This draws the material through the machine, forcing it between the straightening rolls, which are driven by gears. These rolls can be adjusted for any different style of material so as to produce commercially straight work. At each end of the table adjustable gauges are provided which can be set to the width of material passing through the machine. These guide the material to the straightening rolls and along the table, thus preventing it from running off sideways.

A stop gauge in the middle of the table can be set at any desired distance and as the material passes through the straightening rolls it strikes the gauge. This trips the machine and stops the feeding rolls instantly, and at the same time the shears are set in motion, while, as the piece is cut, the cam controlling the dumping lever operates to throw the piece out of the way. As the shears recede from the stock and the table resumes its vertical position, another cam instantly starts the rolls feeding the stock through again, which is repeated as long as material is fed. To prevent noise and jar the table has a dash-pot which stops it at either limit of its travel.

The straightening rolls are arranged with scales and pointer for easily duplicating the proper setting for handling various kinds of work. This is a decided advantage, as once the proper settings have been determinded for the different thicknesses, they can be noted down and on future work the rolls adjusted to the same scale reading. The straightening rolls are adjusted by the crank while the hand wheel regulates the adjustment of the pinching or drawing rolls which in addition to drawing the material through also helps to roll out kinks, irregularities or dents which are not very large.

The machine is driven with two belts, one operating the shears and the other the rolls. Both are driven from the one pulley on the line shaft and one runs under the other. The construction of this machine is very strong. All the journals are of very hard bronze and all the gears are machine cut and very strong.

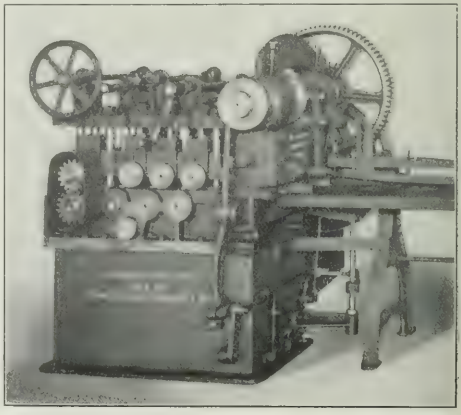


Fig. 2.—The Working Side of the Machine.

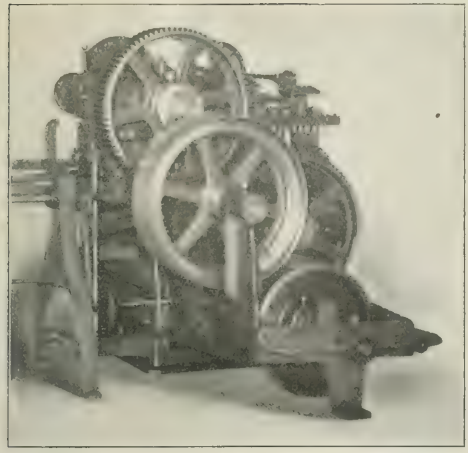


Fig. 3.—The Rear or Driving Side of the Shears.

The machine illustrated will handle strips 14 or 15 in. wide and 5-16 in. thick down to stock 3 or 4 in. wide and ⅛ in. thick, and in some cases stock slightly thinner can be accommodated. This machine can be furnished in different sizes for either lighter or much heavier and wider work, and if desired can also be arranged for straightening shapes other than sheets and flat stock. Any desired length of table can be furnished.

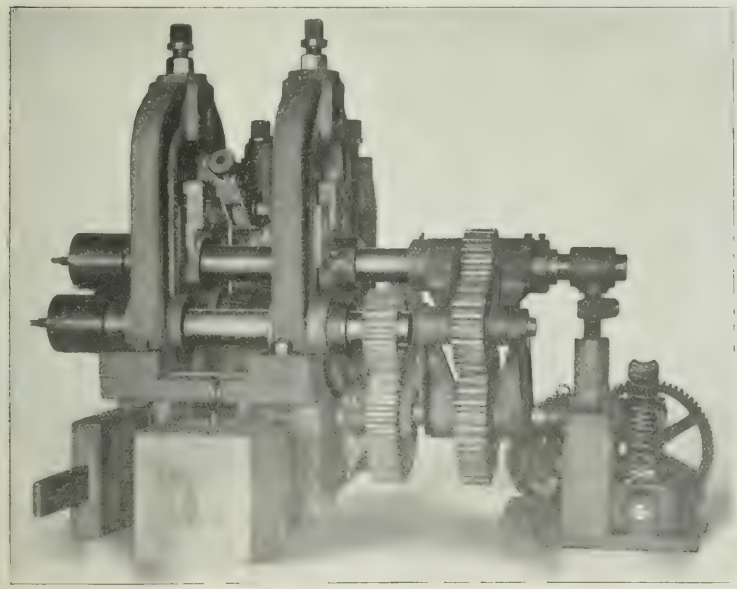
State Arbitration in Pennsylvania.—The Legislature of Pennsylvania, which will begin its biennial session January 3, will be asked to extend the powers of the State Bureau of Industrial Statistics so that it will exercise the functions of a bureau of labor and arbitration. When the bureau was created it was intended to develop the division, which is officially attached to the Department of Internal Affairs, so that it would act in labor matters, but the purpose was never carried out. John L. Rockey, chief of the bureau for the last four years, has called attention to the opportunities for such exercise of State power in reports, and a bill will be drafted to enable the chief of the bureau to extend his offices in labor disputes. It is pointed out by men interested in the project that numerous labor difficulties in Pennsylvania could have been prevented in the last decade by the interposition in a friendly way of State officials

Danville Bending Machine with Motor Drive

The Danville Foundry & Machine Company, Danville, Pa., has applied the electric motor drive to some of its bending machines. The special line of work handled by one of them is the production of fifth wheels for wagons, but it can also be used to bend small angles and tees.

The essential part of the machine is the three rolls through which the material to be bent is passed. The stock is fed between the rolls on edge and during its passage through the machine grooves in the rolls keep it from slipping to either side, and when it emerges from the rolls, the bar, angle or tee has been bent in the form of a circle. Power is transmitted from the Westinghouse 7½-hp. type CCL motor driving the machine to the rolls through back gears and a countershaft on the motor, a worm and worm wheel and a train of spur gears. A screw in the center of either head enables the top roll to be raised or lowered to vary the space between the rolls to accommodate material of varying thicknesses. Once the adjustment has been made the screws are locked with nuts to keep the adjusting sleeve rigid. The spur gear on the wheel of the shaft of the adjustable roll is moved by an intermediate gear. This gear is connected at the bottom of the main drive with toggle joints, thus keeping the gear in proper mesh regardless of the position of the top roll.

All three rolls are positively driven, and the top one can be raised instantly by ratchets between the two uprights to remove a complete ring without touching the screws in the housings. These ratchets operate on cams that raise the roll, an arrangement which saves much time and obviates trouble in adjusting the top roll to bend another ring of the same diameter. After the completed ring has been removed, the top roll can be instantly replaced when it is ready for bending another ring. As the material enters the machines, it passes through a device on the rear which makes the first bend, so that it can be received in the other rolls.



A Motor Driven Bending Machine for Angles, Bars and Tees Built by the Danville Foundry & Machine Company, Danville, Pa.

One of these machines has been installed in the plant of the Keystone Forging Company, Northumberland, Pa. This machine has turned out about 400 rings, varying in diameter from 28 to 30 in., and made from bars [illegible] in. in section in eight hours. It is stated that this output can be considerably increased if the machine is operated continuously. The maximum section of bars handled is [illegible].

The Machine Tool Field in Belgium*

The Opportunities for American Machines to Meet the Shop Requirements of the Extensive Manufacturing Plants

BY CAPTAIN GODFREY L. CARDEN.

This contribution from Captain Carden of the United States Revenue Cutter Service emphasizes his belief that Belgium is a very inviting market for the tool builders of the United States. This opinion is based upon a study of the conditions existing in that country which he made while a special agent for the Department of Commerce and Labor. In this present article the discussion of the building and use of machinery and machine tools in Belgium begun in "The Belgium Machine Tool Market," which appeared in *The Iron Age,* November 17, 1910, is continued.

The Charleroi Electrical Works are unexcelled among the Belgium electrical plants. The shops are located at Charleroi on the Paris-Liège line of railway. Fig. 1 is a view of the assembling room. The machine tool installation comprises approximately 510 tools of various types and makes. Many of the best Bullard boring mills are in high favor, and I understand that aside from the merits of its tool this is largely due to personal representation on the part of the Bridgeport firm. There are a number of heavy Niles machines in service which are highly spoken of, and Mr. Krebs declared that taking into consideration



Fig. 1. The Assembling Department of the Charleroi Electrical Works, Charleroi, Belgium.

American machine tools are in evidence, but the majority of the machines are of Belgium or German origin. I personally inspected these works in company with H. E. Duquesne, secretary of the firm, and Henri Krebs, the engineer-in-chief.

The machine tool installation represents a total valuation of $386,000 and, as an evidence of the administrative capacity, I was informed that the company had shown net earnings of $193,000 in a single year. The total capitalization of the firm is $965,000.

The percentage of old tools in service is comparatively small, and new tools are being added constantly.

* Similar articles by Captain Carden on Austria-Hungary appeared in *The Iron Age* March 31 and May 12, 1910, and on Russia June 16, 1910.

weight of metal these Niles tools was fully as cheap as some of the best of the European machines of similar type. He had satisfied himself on this point after careful calculations, since it would appear that Niles machines at first glance were more expensive. An 8-ft. boring mill installed in the plant is shown in Fig. 2. The value of American machine tools is fully recognized in the Charleroi plant, and this is a fact which should be borne in mind by those of our manufacturers who have machines of especial merit to offer.

Belgium is essentially a manufacturing country, and it is safe to say that by far the greater proportion of its output is for export. The competition in Europe to-day is largely one of merit; in other words, the busi-

ness success of individual firms is essentially based on quality. The locomotive trade emphasizes this and accounts for the painstaking efforts put forth to turn out not only highly developed machines but engines of high finish. To the American mind much of the work on locomotives, stationary engines and other equipment is decidedly unnecessary, but the European trade demands it, and because of the exacting requirements abroad there necessarily exists a demand for high grade tools. Under such circumstances the field readily lends itself to American machines, and if not taken advantage of the fault lies with the selling connections at home. In Belgium, especially, the writer has frequently heard it remarked by responsible heads of firms that they would gladly welcome an opportunity to pay the prices demanded for machine tools in the United States plus the cost of transportation and installation. It cannot be denied that Belgium manufacturers more or less feel that they are at a disadvantage in comparison with American buyers, aside from all questions of transportation, tariff, insurance charges, &c. As a further instance there is the statement of Director de Jonge of the Minerva Works, of Antwerp, who is on record as saying that his establishment does not hesitate to buy direct from America and that by so doing there is often effected a saving of from 20 to 25 per cent., and this includes the payment of a commission to the factor in America and the transportation of the machines from the United States to Antwerp. So far as Belgium manufacturers are concerned the impression becomes forcible that they ask for nothing better than to be placed on the same basis as the American buyers. They cannot understand why there should be any discrimination against Belgium any more than between States in America, and always with the understanding that they expect to pay in addition the charges incident to duty and transportation.

Small Arms Plants

Belgium has long been recognized as one of the greatest manufacturing countries of the world for small arms, and Belgium shot guns and rifles have generally been offered on the market at especially low

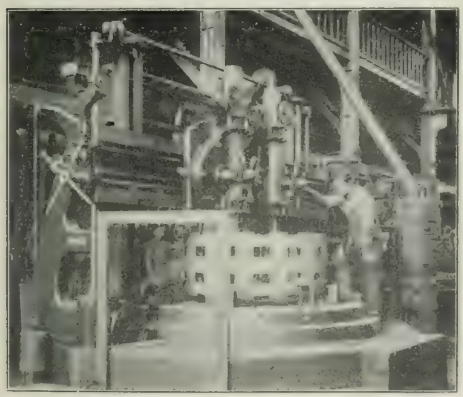


Fig. 2.—An 8-Ft. Boring and Turning Mill at the Charleroi Electrical Works.

figures. Liège is the principal city in Belgium for the manufacture of sporting arms, and until comparatively recently practically all of the work has been performed in the houses of the workmen. Even now as one walks along the streets of Liège one meets at almost every step boys hurrying along with bundles of gun barrels on their shoulders, or perhaps girls carrying bundles of gun locks or breech mechanism. In many of the homes the workmen have managed to instal a few small machines, and by working a few hours every night are enabled to earn additional compensation. This work is performed by men who are ordinarily employed otherwise during the day. The works of some of the best gun firms in Belgium are little more than assembling shops, the real detail work being undertaken in the homes. This arrangement undoubtedly cuts down the overhead expenses and permits selling at extraordinarily low figures. Recently, however, there has been established in Liège, in the very center of this hand-working community, a great plant which is undertaking

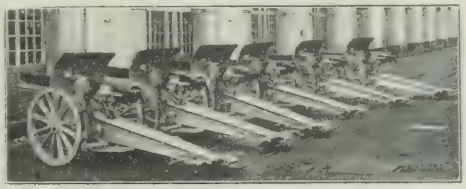


Fig. 3.—The Type of Field Guns Manufactured at the Cockerill Works, Liège-Seraing, Belgium.

to manufacture both sporting and military rifles wholly within the works, and under the assumption that through the medium of the most modern types of machine tools even the hand work of the Liège people can be undercut in point of economy and an enhanced output capacity secured. The writer refers here to the Pieper works. Just now the Pieper plant is engaged in the manufacture of sporting guns, rifles and automatic pistols, but in the course of time Pieper will be enabled to handle large military rifle orders and ammunition contracts.

The machine tool installation at Pieper's is an exceptionally fine one. Director Goebel, the head of this fine establishment, has visited the United States and is familiar with many of the best American machine tools. Pratt & Whitney secured a large order with this house, and this statement in itself is evidence of the high grade equipment sought after. Such foreign tools as are in service represent the best on the market, and I have no hesitancy in saying that there are no cheap tools on the Pieper floors. Jaspar of Liège has been drawn upon to supply 200 milling machines with automatic attachment and overhanging arm. Jaspar is making one size only of plain miller built on Richards' designs; the price asked for this machine is $530.75 with an agent's discount of 20 per cent. The small miller sold by Jaspar to Pieper with automatic attachment and over-hanging arm brings $145. Director Geobel expressed the opinion that shapers, profilers and small milling machines, so far as the European market is concerned, are covered by sufficiently good European made tools, but with reference to many other machines he was decidedly in favor of American make and declared that the prices charged for some American tools were not too high, since the machines warranted the same by reason of the high grade work produced. In this latter category he took especial pains to mention Warner & Swasey hexagonal turret lathes. The total number of machines installed at Pieper's approximates 1100 and represents a payment in cash of $289,500.

The Pieper Works are employing many women operatives and these women are assigned to lathe, turret lathes, small and Lincoln millers, gun barrel lathes, drills, &c., their wages varying from 58 to 67.5 cents per day. Foremen are paid 45 centimes (8¾ cents) per hour. The wages paid to good tool men vary from $1.35 to $1.45 per day, a day's work comprising 10 hours. At the time of the writer's visit the Pieper establishment was employing 900 people.

Just outside of Liège in the suburb of Herstal is located a large military arms manufacturing plant, known as the Fabrique Nationale d'Armes de Guerre Société Anonyme. This establishment is to Belgium what the Springfield Arsenal is to the United States, with this difference that the Belgium plant is a private



Fig. 4.—Machine Tool Installation in the Gun Department of the Cockerill Works.

concern. The Belgium Government looks to the Fabrique Nationale for the manufacture of the necessary small arms for the army, and the entire re-arming of the Belgian military forces has been effected through the outputs of this plant. The Belgian forces absorbed 300,000 Mauser rifles from the Fabrique Nationale, together with the necessary complement of small arm ammunition. The Fabrique Nationale as at present operated dates from 1889; this concern has an output capacity of 350 military rifles per day, 200 carbines, 150 sporting guns, 800 pistols, 400,000 cartridges, 150 bicycles, 50 motorcycles and 5 automobile carriages. The plant is divided into four departments for the manufacture, respectively, of small arms; ammunition, bicycles and motorcycles, and automobiles. There are very many American machine tools in the Fabrique Nationale, but German tools are mostly in evidence. The machines for ammunition manufacture are almost exclusively of German make. American tools are found to a considerable extent in the small arms department, and in the automobile shops American machines are easily in the lead. Machine tools are being constantly bought and at the time of my visit I observed equipment under installation from the Pratt & Whitney shops. The Fabrique Nationale is practically independent of outside firms and manufactures nearly all essential parts on its own account. Here as in the Pieper works many women are employed, and the average rate of wages is therefore low. Ten hours constitute a working day.

The Cockerill works at Seraing, another suburb of Liège, devotes an important part of its plant to the manufacture of military equipment. I referred to the Cockerill works in previous writings. This establishment is manufacturing all field guns required by the Belgian military forces and is drawn upon to furnish much of the material absorbed in the seacoast fortifications of Belgium. Fig. 3 shows some of these guns. Ordinarily the Cockerill works employ about 10,000 men. This is one of the oldest plants in Belgium and dates its history from 1817. The gun shops, the interior of which is illustrated in Fig. 4, are probably the most modern of the Cockerill plant and five years ago new tools were installed to the total valuation of $115,800. The finish and accuracy of the Cockerill guns have won for them the admiration of the Belgian government. Until comparatively recent Belgium has been accustomed for years to buy only Krupp material. It was at the Cockerill works that John Ericsson of the Monitor fame, saw service from 1825 to 1827. There Ericsson studied and designed the construction of his steamer designed to be fitted with boilers of high pressure, having interior furnaces operated under air pressure. The designs also called for engines operating with surface condensers.

The workmen at Cockerill's are generally called upon to perform 59 hours of service per week. Pay days are fortnightly and on Saturday, and on pay days the shops close at 4 P. M. Some idea of the daily rate of pay may be gained from the following table:

	Francs.	Cents.
Lathe men	5	96.5
Milling machine hands	4.50	87.5
Planer men	4.50	87.5
Drilling machine hands	3.75	72.5
Turret lathe men	4	77.2
Boring and turning mill operators	5	96.5
Foremen in charge of machine tool groups	7	$1.35

Belgium is too often regarded as a cheap market. Wages are cheap when compared with wages paid in the United States, but it must be borne in mind that some of the best machine work in Europe is turned out from Belgian shops. If Belgian manufacturers are able to offer low quotations on output it is because they understand shop necessities and are enabled to economize in other ways than on wages. The Belgians thoroughly understand machine tools, and as an evidence one will generally find only the best grades of American machines installed on Belgian floors. To American manufacturers this statement of fact based on personal observation should be sufficient to indicate the possibilities of the Belgian market. American machine tools, it is almost needless to say, can generally be depended upon to win in that field where the requirements are based on merit, provided always that the representation behind the tools is of an intelligent American sort.

The Coke Industry and the Foundry

Cupola Practice as Modified by Character of Fuel

Bulletin 3 of the Bureau of Mines is a monograph of 32 pages by Dr. Richard Moldenke, secretary of the American Foundrymen's Association, entitled "The Coke Industry of the United States as Related to the Foundry." Dr. Moldenke carried on investigations at the fuel testing plant of the United States Geological Survey in 1904 to 1907, being particularly interested in tests of various cokes in the cupola. The equipment and other details of the tests were covered in a previous publication of the Geological Survey. The present pamphlet is devoted to a review of the lines on which the coke industry has developed, but more particularly to features of practice in the use of foundry coke, the conditions and phenomena of a cupola heat and the modifications in cupola charging practice required for the use of various cokes. In the section devoted to "Coke in Foundry Melting," Dr. Moldenke discusses charging methods and the uncertainties of cupola melting and urges the adjustment of practice to fuel. He refers to the advantages of retort oven coke, including uniform analysis and the desirable size and shape of the lumps. The absence of thin fingers accounts in part for the success of retort oven coke when first used in foundries. Charges of coke that have lumps of uniform shape and size give results similar to those obtained by using anthracite. A milder or stronger blast should be used according as the coke is light or heavy, and the relative weights of the metal and coke charges on the bed should be changed. Where heavy charges are used, coke with a large percentage of volatile matter should be avoided.

Referring to the tests made at St. Louis, attention is called to the results of heats in which heavy coke was used. These included burned iron at the beginning of the heat and unmelted iron in the cupola drop. It is suggested that no change in coke be made without trial heats to show how to use it. Coke producers are urged to make thorough melting tests with their coke, so that when selling it they can advise foundrymen how to get the best results. Foundrymen are advised to insist on penalties for excess of moisture, to guard particularly against the occluded water resulting from quenching at retort ovens.

Troubles from Burned Iron

Concerning burned iron in the cupola and its effect on castings, the author says that whatever cause may be put forward for pin holes, excessive shrinkage, draws and cracks in castings, practically all of these troubles can be traced back to burned iron.

Pin holes are due, not to the inability of the air to get out of the molds fast enough, but to the yielding up of dissolved gases in the iron at the moment of set. The first thing that happens in the mold, if the iron poured is not much overheated, is the setting of a thin skin of metal against the sand, and hence these gases in going upward and outward to escape strike the thin shell that has set and stay there. When the casting is put on the planer and the skin is removed the pin holes make their appearance and the casting is condemned.

The evils of high sulphur are nothing, the author says, compared with burned iron and a little oxygen can do a great deal of damage. Only a small amount of aluminum or titanium needs to be added to the ladle to produce the desired deoxidation.

Small and Frequent Charges of Fuel

Dr. Moldenke takes up the question of depth of fuel bed, and recurs again to the advocacy of small charges, reducing to a minimum the fluctuation in position of the effective part of the coke bed. He recommends, in addition to uniform charges, making them so small that the layers of coke are only thick enough to cover the layers of metal, unless the definite knowledge regarding the range of the melting zone of the cupola permits heavier charges.

The question of the adjustment of the bed comes in for extended consideration. Making up the charges in the yards is advocated, as well as the use of special charging buckets with swinging bottom doors to drop the charges exactly as laid. In conclusion the author gives this summation of his discussion:

In this description of a cupola heat the foundryman may find suggested a method by which he can make use of practically any kind of coke. If the coke is heavy almost like anthracite—he can use fairly heavy charges, as the fluctuations of the melting zone will be slight. If the available coke is light, he absolutely must take small charges, the smaller the better, for large charges would result in too strong combustion and perhaps in red hot coke near the charging doors. The limit for lightness is set only by coke so light that combustion takes place too rapidly and the iron cannot take up the heat fast enough. This limit is quickly found in practice. The methods of making all varieties of coke, and particularly those made in retort ovens, are now fairly well settled, and hence foundry coke is made a specialty at only those plants that can obtain the right kinds of coal for the purpose—that is, these coke makers have coals of various kinds available, which when ground and mixed give the desired result.

As retort oven coke, it is hoped, will be the foundry fuel of the future, the coke makers by careful study of details will probably bring about a very uniform product, with so slight variations in composition and physical structure that a method of operation in the cupola, such as that outlined above, will give uuiform satisfaction to the user. In the meantime, however, we have to do with existing conditions. We have coke with low and with high sulphur, coke with low and with high ash, and occasionally coke so soft as to be very near the danger limit. By the very nature of the process of making it coke cannot be uniform in structure, and only careful selection from the ovens as they are discharged gives the foundryman what he is paying for. In brisk times this selection is likely to be made less conscientiously, coke forks being discarded or their prongs made closer. Many coke tests have shown conclusively that much can be done to improve a coke by adapting the process of making it to the requirements. This matter will be treated more fully in another bulletin of the Bureau of Mines.

Mine Rescue Station at Pennsylvania State College.—At the Pennsylvania State College School of Mines, on the evening of December 5, was opened with appropriate exercises what is believed to be the first mine rescue station to be established in the United States by a school of mines. Its purpose is to give instruction in the use of mine rescue apparatus. It is equipped with two Draeger oxygen rescue helmets, with all necessary apparatus, one Draeger pulmoter for causing artificial respiration, safety electric lights and safety lamps. It has a large "smoke room" built gas tight, in which noxious and unbreathable gases may be liberated, and in which the men may be trained in the use of the helmets in such atmospheres. In this room is a large wooden structure representing a full-sized portion of a mine entry with an overcast, and students are trained to enter this with the helmets and, working in the noxious atmosphere, to build brick stoppings, to climb through the overcast carrying loads, and to do other work such as would have to be done by a rescue party. The room is provided with glass doors and windows which permit the interior to be seen from the outside.

The new No. 6 mill of the Reading Iron Company, at Seventh and Laurel streets, Reading, Pa., has been started on single turn. When in complete operation this mill, which has heretofore made wrought iron pipe up to 13 in. in diameter, will be able to make up to 24 in., for which the latest design of pipe mill machinery is being installed. The company's No. 5 mill has been shut down for general repairs.

The Joan D'Arc Mfg. & Supply Company, St. Louis, Mo., manufacturer of the Lynch packless valve, the Marquette relief globe and refrigerating and ice making machinery without the ammonia process, will

move its Louisville, Ky., plant early in the spring to a new location, which has not yet been decided upon. The company has offers from several cities, and expects to reach a decision in the near future.

Welfare Work in the Shops of J. H. Williams & Co.

A little more than a year ago the Welfare Department of the National Civic Federation sent out a number of circular letters to prominent manufacturers throughout the United States asking for information as to their experience with welfare work in industrial establishments. J. H. Williams & Co., Brooklyn, N. Y., manufacturers of drop forgings, have been prominent in this line of work for some time, and the following letter written by the late J. H. Williams, Sr., gives the important features of the work as it existed a year ago, with the exception of some slight revision of figures to bring the data up-to-date:

Our employees, numbering about 500, residing largely in the immediate vicinity of the factory and our restricted city location, precludes the successful establishment of some institutions, such as dining rooms, social clubs, entertainments, evening instructions to apprentices, &c. Our situation in the midst of a city also prevents any attempt at athletic and recreation grounds, gardens and housing of workmen. But we are sensible of the responsibility of employers to employees, and have, therefore, observed some of the conditions of health, safety and comfort. Our aim has been with our employees:

To establish good will, good fellowship and friendly spirit.

To lighten their labors and show interest in their welfare.

To promote interest and cheerfulness by fair treatment.

To never interfere with the freedom of individual conduct.

To avoid paternalism or giving with condescension.

And, above all, to express our appreciation through good wages.

We do not discourage labor unions among our employees, and are not opposed to labor organizations in general. Our working time since March, 1901, is nine hours a day. Piece work is adopted where practicable, but under a regulated or unchangeable system, so that piece work rates are never cut while the condition of production remains unchanged. We avoid arbitrary rules, and adopt as few rules generally as possible. Endeavoring to keep somewhat in touch with our employees and not overlooking the ethical side of our relations, we have enjoyed for the 26 years since our business started satisfactory co-operation, which has encouraged us to establish the simple conditions that follow.

As to the results in the way of influence upon the men, while we make no pretensions as to welfare work, we believe from our observations that the influence of a single institution of this kind is barely noticeable, but collectively and where other general conditions throughout the factory correspond, and where no spirit of paternalism exists, the results, though indirect, are excellent, and the appreciation, although not often openly acknowledged, is apparent. In our own experience we have been more than compensated for any expenditure and trouble from the demonstration that the establishment of one good condition stimulates an interest in and leads to others.

Fire Protection.—Complete equipment of all modern appliances, with organized department.

Accident Prevention.—Complete so far as the best authorities can suggest, and exceeding the requirements of the laws of the State of New York.

Baths.—Established in 1893, and the first, so far as we are aware, in a manufactory in this country. Notwithstanding that they are conveniently located in the same rooms with the lockers, that the temperature of the room is comfortable at all seasons, and that they are always clean and in good order, with an abundance of hot, as well as cold, water, they are not used quite as much as could be desired. Some of the men use them regularly, some on Saturdays only and some not at all; others who have facilities at home prefer bathing there. They are patronized mostly in the warm season; even then not so generally as would be expected. This can be accounted for from a desire on the part of the employees to leave the premises as quickly as possible at the termination of the day's work, and also from the fact that, not having acquired the habit in early life, as is being taught in Germany, they are generally slow in adopting a custom of daily or frequent bathing. The original baths, however, are not a failure, for we have since erected more, and on a larger scale, in the newer and extensive addition to our factory. These have been erected in the toilet rooms or lavatories, and made more attractive than those originally erected, thus hoping to still further encourage their use.

Cooling System.—Air is drawn from a point above the roof by powerful fans and distributed through each forge building until it descends over each man's head through an adjustable pipe under his control, thus assuring an abundant supply of pure, cool air, which enables the men to work with comfort during the warm months.

Drinking Water.—Refrigerated with a 5-ton De La Vergne apparatus, drinking water is furnished and piped to different departments throughout factory at a temperature of about 40 degrees.

Sanitary Conditions.—Machine shop floors are scrubbed every week, cuspidors supplied, general cleanliness observed, good light and artificial heat exist and ventilation has received special attention in the additions and alterations as completed.

Grinding and Polishing.—This room is equipped with the usual system for exhausting dust.

Library.—Books from the City Traveling Library, as well as from our own permanent one, are at the disposal of the employees and their families.

Mutual Aid Association.—A successful organization was established some years ago, and it proves to be of advantage and interest beyond its primary object, for under its auspices and for its benefit a ball or theater party occurs every winter and a picnic or other outdoor entertainment every summer. Besides, other functions originate and are carried out through this organization.

Hospital Fund.—We encourage during the holiday season a collection among our employees for the benefit of one of the city hospitals. This annual fund in 1909 was $227.50, employees and the company contributing equally.

Insurance.—Coupled with other insurance we include the tools of our die sinking, &c., employees, the values based upon lists furnished by the workman.

Savings Fund.—Employees have the privilege of making a weekly deposit, or instructing withdrawals from their weekly pay in sums of 20 cents to $5 in multiples of 10 cents. The amount so received is invested for best returns. Depositors are entitled to loans within the amount of their deposits, but rights to profits otherwise accruing thereon are nullified thereby. Earnings average from 5 to 6 per cent. per annum. The fund, distributed about the time when the works are closed for a week of annual repairs, is largely used for vacation purposes; distribution in 1908 was $15,876, and the net profit on investment, $214.88.

Komposite Anti-Friction Metal.—The Komposite Metal Company, Land Title Building, Philadelphia, Pa., has established a plant in that city for the manufacture of high grade metals and making a specialty of a journal bearing metal. It has extremely high wearing qualities and melts at a temperature ranging from 575 to 700 degrees F., according to the grade of the metal, or about 70 degrees above the high tin metals. It has a higher bearing strength and its lubricating qualities are also claimed to be much higher than babbitt. Komposite metal, as described by the company, is not a mechanical mixture of so many parts, but "is a composite metal, scientifically prepared and chemically united, the chemical union of the various metals being thorough and complete," thus preventing them from separating when cooling. This metal carries the maker's guarantee. It is furnished in various degrees of hardness, graded from No. 1 to No. 4, for heavy machinery and severe work down to light work, and covering all requirements of machinery and shafting. In remelting Komposite anti-friction metal the molten metal should be stirred with a stick until the froth leaves the surface, when the addition of a small piece of rosin before pouring will insure the absence of blowholes from the cast bearing. Mandrels and journals should always be heated somewhat before pouring the metal into the box or bearing.

The Western Steel & Iron Works, De Pere, Wis., has disposed of its posthole auger business, including patents and machinery for auger manufacture, to the Hall Mfg. Company, Monticello, Iowa, engaged in a similar line. The Western Steel & Iron Works will hereafter devote its entire attention to the manufacture of cow stanchions and barn equipment.

New Tools and Appliances

This is essentially a news department for which information is invited.

A New Portable Oxy-Acetylene Outfit.—Alton, Laine & Co., 420 Jackson avenue, Long Island City, N. Y., have recently placed on the market a portable oxy-acetylene welding outfit known as the Astra, which will handle all classes of welding. The equipment furnished includes one oxygen storage tank, an acetylene storage tank, two reducing regulators with gauges, safety devices for both gases, a welding torch, hose, goggles and wrenches. One of the repairs recently made with one of these outfits was the successful welding of a 4-ton water jacketed dynamo bearing which had cracked.

Muffle Furnace for High Speed Steel.—The Bellevue Furnace Company, Detroit, Mich., is manufacturing a muffle furnace for high speed steel employing oil as fuel. The brick lining is grooved and curved and serves as the flue which carries the flame from the inlet to the outlet of the furnace in a continuous spiral. The muffle is supported by the spiral remaining between the grooves. To make the furnace adaptable for certain forms of steel which are apt to warp from the extreme heat when treated in a horizontal furnace, the position of this furnace can be easily changed from the horizontal to the vertical, thus giving practically the equivalent of two separate furnaces.

Semiportable Riveter.—The Electrical Machinery Sales Company, 39 Loan & Trust Building, Milwaukee, Wis., has placed on the market a semiportable riveter for handling the large line of work that manufacturers have been doing heretofore by hand and a hammer. It is claimed that with this riveter one boy can do the work faster, more evenly and satisfactorily than two men. This riveter can be operated horizontally, vertically or upside down, and one special feature is that the rivets may be placed in the holes by the operator on the outside of the work and a head formed on the inside. Another special feature is that the rivets can be driven through the material and headed with one pressure of the lever.

Automatic Lubricator for Pneumatic Tools.—The Lagonda Mfg. Company, Springfield, Ohio, has recently developed a new type of lubricator for use with the boiler tube cleaner, which was illustrated in *The Iron Age* March 17, 1910. It is also adapted for use with all sorts of pneumatic tools. The lubricating device consists of an oil reservoir and is attached between the cleaner and the air hose. The reservoir is filled with oil before the cleaner is inserted in the boiler tube and the flow regulated by a screw as circumstances may require. The oil flows from the reservoir into the air passage and is thoroughly mixed with the air before entering the cleaner. To guard against the supply of oil being exhausted before the tube has been finished the lubricator has a sight feed oil cup, from which the oil is conveyed to the tube through a separate flexible metal hose placed inside the rubber air hose. This lubricator can be placed on the wall or any other rigid object, and is thus neither in the workman's way nor subject to derangement by the vibrating tool.

New Boring Machine.—The Rochester Boring Machine Company, Rochester, N. Y., has brought out a No. 4 floor boring machine. As compared with the previous size, which was illustrated in *The Iron Age* June 30, 1910, the new machine has a 4½-in. spindle as against the 3⅜-in. spindle of the other size; 12 spindle speeds instead of 10; 16 feeds for boring and drilling which is double the original number, and 8 milling feeds in place of 4. The machine handles 8-ft. pieces, between the outer support and the saddle. The vertical traverse of the saddle is 60 in., and the horizontal traverse of the column is 84 in. A 7½-hp. motor is required. These are the specifications of the standard machine, which may be varied to suit requirements. The machine is arranged to do slotting, a valuable adjunct for such work as keyways. In general mechanical details the tool is similar to the original machine, including the continuous traverse for any length of bar. Steel gears are used throughout, all of them inclosed and running in oil.

A Planer with Inclosed Driving Gear.—With the view of improving the efficiency of its line of planers the Cleveland Planer Works, Cleveland, Ohio, will hereafter make its open side Cleveland planers with the driving gear inclosed in a casing. With this change all of the driving mechanism of these planers except the bull gear and the bull gear bearings will be entirely inclosed. A pad is cast on the side of the bed, and to this is bolted an oil-tight casing which serves both as an oil pocket and a gear covering. This permits the running of the gear in oil and prevents danger of insufficient lubrication when the machine is operated by a careless workman. It also keeps the dust and chips from working into the gear, thus giving a quieter running machine and a longer-lived gear.

Electrically Driven Planer.—The Knecht Planer Company, Cincinnati, Ohio, has added to its line an electrically driven planer in which gearing reverses the table and the driving pulley and belt run continuously in one direction. The drive is by a belt from an electric motor on the housing to the main driving pulley, and it is so arranged that the power used on the forward and the return strokes are independent of each other, thus giving different cutting speeds and a constant return. The reversing pulley, like the main driving pulley for the cutting stroke, runs continuously in one direction, and is held during the cutting stroke by a pawl and ratchet which is released at the end of the stroke just before the reversing belt, which is shifted in the usual way, is moved to the pulley. As soon as the pulley is released it begins to move and is in motion at the time the belt is shifted, thus relieving the motor of any heavy loads. The feed mechanism is positive and independent of the driving mechanism, being actuated by a clutch which is tripped at each end of the stroke. The boxes through which the movements of the feed are transmitted are mounted on each end of the cross rail, so that the feed can be controlled from either side. The range covered is from 1-64 to ¾ in., increasing by 64ths, and a conveniently located lever provides for any desired variation within these limits. A handle on top of the feed box enables the feed to be engaged or disengaged without disturbing its direction or amount, and another at the center permits a fast traverse to be transmitted to the slide that is connected for feeding, a feature that saves considerable time, particularly when setting or testing work.

A High Speed 30-In. Light Radial Drill.—The Midland Machine Company, Detroit, Mich., has recently placed on the market a new radial drill for rapid drilling and tapping, which is said to be adapted to a wide range of work and to be also accurate, convenient and efficient in its production. The tool is said to combine all the advantages of the sensitive drill press with the high productive capacity of the radial drill. It is compact, accurately built and is easily manipulated by levers within close reach of the operator. The arrangement for reversing the spindle and furnishing additional speeds consists of a continuous belt running around four pulleys, two on the vertical shaft and two on the horizontal one, with clutches between each pair of pulleys that are operated by separate levers. Moving either lever reverses the direction of rotation of the spindle, and if both are moved simultaneously three additional speeds are rendered available.

Driving Wheel Lathe Dog.—S. W. Putnam, general superintendent of the Putnam Machine Company, Fitchburg, Mass., has invented a new type of lathe dog in which the sliding serrated jaws are drawn back so as to move this surface toward the lathe face plate and hold it in this position by a latch. After the wheel is mounted the dogs are released by tripping the latch and grip the tire with their serrated surfaces. The dogs on the opposing face plate are set in the same way and the tire set in motion. The motion of the tire will then tend to make the dogs grip it in proportion to the resistance of the cut and keep it from slipping.

Trade Publications

Calendar.—Hickman, Williams & Co., The Rookery, Chicago, Ill. Size 9⅛ x 15 in. One of the novel features of this calendar is having the dates begin with December 15 and cover an entire year instead of commencing at January 1, thus bridging the gap which generally occurs at the end of a year. Each day has its own separate leaf, and the month and day of the week are printed in clear type and the date is given in figures measuring 6¾ in. high and proportionately broad.

Shafting, Hangers and Pulleys.—The A. & F. Brown Company, 172 Fulton street, New York City. Catalogue and price-list. Size 4½ x 7¼ in.; pages 112. Gives general description and specifications for a number of different styles of shafting, hangers, pulleys, &c. Tables of dimensions are included for some of the specialties covered and an extensive index completes the catalogue.

Counting Machines.—The C. J. Root Company, Bristol, Conn. Catalogue. Relates to the Bristol, Elm City and Ro-co counters, all of which are illustrated. *The Iron Age*, July 7, 1910, contained an illustrated description of the Ro-co wire measuring device.

Air Compressors.—Allis Chalmers Company, Milwaukee, Wis. Bulletin No. 4025. Briefly describes the Allis-Chalmers motor-driven air compressors and calls attention to a few of the many applications to which this type of apparatus is adapted.

Gasoline Engines.—Charles A. Stickney Company, St. Paul, Minn. Brochure. Illustrates the various types of Stickney engines, which are made in seven sizes, ranging from 1½ to 16 hp., and the different uses to which they may be put, together with the St. Paul engine, which is designed for installation in buildings protected by fire insurance. This engine is manufactured in six sizes, ranging from 3 to 16 hp. A number of views in the plant of the company showing these engines at different stages of manufacture are included.

Wood and Metal Working Machinery.—W. F. & John Barnes Company, Rockford, Ill. Two catalogues. No. 67 describes a line of woodworking machinery, while No. 70 shows the Barnes upright drill and other machine tools. Among the machines illustrated in the latter catalogue is the No. 3 horizontal radial drill, an illustrated description of which appeared in *The Iron Age* December 23, 1909.

Gasoline Engine.—J. Thompson & Sons Mfg. Company, Beloit, Wis. Folder. Concerned with the Thompson air cooled gasoline engine, which is mounted on skids that also support the gasoline tank and the spark coil and battery. This gives the advantage of portability.

Automatic Metal Polishing Machines.—The Robinson Machine Company, Russell street and Milwaukee avenue, Detroit, Mich. Catalogue. Illustrated. Calls attention to the use of automatic polishing machinery for the finishing of brass tubing or flat surface work as well as special machines for manufacturers of safes and gas tanks for automobiles. Data on the efficiency and economy of these machines are included.

Hot Metal Working Machinery.—The Ajax Mfg. Company, Cleveland, Ohio. Catalogue. Size 6½ x 9⅝ in.; pages 96. Illustrates and describes the various lines of machines made by this company, together with the product manufactured by them. Among the machines covered is a high speed stop motion bulldozer which was illustrated in *The Iron Age* September 10, 1908. A number of tables are included which make the catalogue valuable as a reference book.

Steel Valves and Fittings.—Crane Company, Chicago, Ill. Special steel catalogue No. 70. Treats of a line of cast steel valves and fittings which are especially adapted for high pressure, saturated and superheated steam lines and extreme hydraulic service. All the fittings are illustrated and a number of dimension tables are included.

Engines and Boilers.—Clark Engine & Boiler Company, Kalamazoo, Mich. Catalogue J. Size 5⅛ x 8 in.; pages 58. This catalogue supersedes all former issues and describes and illustrates a line of horizontal, vertical, stationary and portable engines and boilers, tanks, stacks and all kinds of sheet iron work and castings. Repair parts for the various engines are illustrated and priced and a telegraph code completes the catalogue.

Hoisting Machinery.—J. G. Speidel, Reading, Pa. Catalogue A. Relates to a line of hoisting machinery which includes chain hoists, trolley tramways, traveling cranes and cellar hoists. All of the machines are illustrated and described at some length.

Railroad Car Movers.—G. G. Rowell & Son, 891 Union street, Appleton, Wis. Catalogue. Deals with the Rowell and the Samson railroad car movers, which are said to be so constructed that when the cam which moves the car is brought in contact with the wheel it forces the latter to revolve instead of lifting it from the track.

Testing Sets and Precision Lathes.—Frederick Pearce Company, 18 Rose street, New York City. Catalogue No. 500A and pamphlet. Illustrations and descriptive matter in the former explain the use of two distinct types of portable testing sets in which the resistances are controlled by plugs and switches, respectively. The precision lathe described in the pamphlet was designed to fill the gap formerly existing between the small watchmakers' tool and the small bench lathe.

Electric Vehicles.—The Lamsden Company, 54 Lackawanna avenue, Newark, N. J. Bulletin. Pertains to a line of electric storage battery wagons and trucks and small industrial trucks. An illustrated description of the last appeared in *The Iron Age* April 7, 1910.

Fire Protection Apparatus.—American-La France Fire Engine Company, Elmira, N. Y. Pamphlet entitled "The Story of the Chemical Fire Engine." Traces the development of chemical fire extinguishers from the small hand machines employing sulphuric acid and bicarbonate of soda, which were introduced nearly 50 years ago, to the present standard two and four wheeled chemical engines. The various types of engines are illustrated with brief specifications and there is a table showing the number of engines in service in the larger American cities, the length of service and the percentage of fires extinguished by them.

Blowers.—Schutte & Koerting Company, Twelfth and Thompson streets, Philadelphia, Pa. Catalogue 4, section A. Describes and illustrates the Koerting jet blowers for forcing air and gas by the use of a steam jet.

Solid and Inserted Tooth Circular and Band Saws.—The Buckeye Saw Mfg. Company, 285 North Water street, Columbus, Ohio. Pamphlet. Illustrates a very complete line of all kinds of saws and sawmakers' tools, hand cut files and hack saws. Tables of prices and dimensions are given of the various appliances illustrated and considerable space is given to instructions on the use and maintenance of saws.

Sprocket and Traction Wheels.—Lehigh Car, Wheel & Axle Works, Catasauqua, Pa. Pamphlet. Pertains to the Fuller face hardened sprocket and traction wheels. The advantages of the face hardening are discussed and there is a complete pricelist of the various types of wheels. Space is also given to the sprocket clutches made by this concern.

Cutter Grinders.—The R. K. LeBlond Machine Tool Company, Cincinnati, Ohio. Catalogue. Size 6 x 9 in.; pages 70. This is the company's latest catalogue describing and illustrating the operation of the LeBlond cutter and tool grinder, which was illustrated in *The Iron Age* June 4, 1908. In addition to the illustrations, descriptions and brief specifications of the machines, space is given to remarks on grinding, the use of emery wheels and the operation and care of the grinder. The illustrations of the various kinds of grinding done by this machine give only a limited idea of its range and capacity.

Babbitt Metal.—Magnolia Metal Company, 115 Bank street, New York City. Pamphlet. Gives briefly the advantages of the Magnolia metal, with the results of tests made on Magnolia and genuine Babbitt metal.

Self-Lifting Elevators.—The Self-Lifting Elevator Company, Lima, Ohio. Folder. Describes a type of elevator for mills, stores and residences in which the person using it lifts himself without any appreciable effort.

Power Pumps.—The Deming Company, Salem, Ohio. Catalogue H. Size 6¾ x 9¼ in.; pages 189. Describes and illustrates the Deming line of triplex power pumps, complete well working heads and cylinders for operation by any power and under all conditions of operation. In addition to the illustrations and descriptions of the pumps themselves, the general construction of the triplex pump, which embodies the principle of the three-throw crank shaft, is illustrated and described, as well as the various types of drives for these pumps. In the latter part of the catalogue there are a number of illustrations of representative installations of the Deming power pump and a number of tables of useful information complete the catalogue.

Wireless Clusters and Lighting Specialties.—Benjamin Electric Mfg. Company, Chicago, Ill. Catalogue B-19. Size 6 x 9 in.; pages 79. Divided into four sections dealing with wireless clusters and cluster fixtures, special fixtures, lighting specialties and fixture accessories. In each section there are illustrations of the devices, with the code word and price.

Recording Gauges and Thermometers.—Industrial Instrument Company, Foxboro, Mass. Two bulletins. No. 38 describes recording gauges for automatically and continuously registering in ink on a paper chart the pressure of steam, gas, water or air. An important feature is the large effective working scale of the chart, thus securing close readings of pressure fluctuations. In bulletin No. 39, dial type thermometers for temperatures ranging from 50 to 500 degrees F. are described. The readings do not depend on the relative expansion of metals or on mercury, but upon the pressure exerted on the vapor of an inclosed liquid, which is dependent on the temperature. The thermometers are made either with a threaded stem or with a flexible tube, the latter allowing the body whose temperature is required to be placed some distance away.

Arch Plates, Door Jambs and Grates.—Pupkin & Rose Construction Company, 103 Park avenue, New York City. Pamphlet. The maker claims a fuel saving of 5 to 15 per cent. with its improved arch plates and door jambs over those generally installed under boilers. The important feature of the plates is

that they deliver air to the top of the grate. They are of cast iron with the upper one perforated with 3/8 to 3/8 in. holes over the door openings, besides holes in the face of the plate fronting the fire. The door jambs are of heavy cast iron construction, corrugated on the outside and perforated so that air can circulate between the casting and the brick slabs. With this jamb, burnt out fire bricks may be easily removed, as it is not necessary to shut down the boiler or employ a mason. The fire is only banked, the burnt tiles slipped out and new ones inserted. In the improved grate, bars supporting ribs are placed longitudinally under the web containing V-shaped openings and set in from the outer edges of the web.

Transformers.—Duncan Electric Mfg. Company, Lafayette, Ind. Bulletin No. 11. Describes and illustrates the construction and the various parts of Duncan transformers. Several pages are devoted to transformer testing. Diagrams of connections and dimensions of Duncan transformers ranging in size from 0.5 to 50 kw. are given.

Band Saw.—P. Pyrtill, 512 West Forty-first street, New York City. Loose leaf catalogue. Gives general description and specifications for a special patternmakers' band saw, in which all adjustments are absolutely controlled and both wheels and the entire blade have been encased to safeguard the operator.

Water Works Appliances. — The Coldwell-Wilcox Company, Newburgh, N. Y. Loose leaf catalogue. Devoted to a general line of water works appliances, a portion of which is illustrated. In addition to the lines covered by the catalogue the company manufactures many types of special sluice gates and water works appliances, which can be furnished if desired.

Steam and Oil Separators.—Austin Separator Company, 55 Woodbridge street, Detroit, Mich. Catalogue No. 16. Calls attention to the standard receiver and accumulator types of steam and oil separators for the elimination of water from live steam, extracting oil and impurities from exhaust steam and separating oil, grit and moisture from compressed air, gas, &c., and vacuum separators for jet and surface condensers.

Pneumatic Forge Hammers. —Nazel Engineering & Machine Works, 4041 North Fifth street, Philadelphia, Pa. Illustrates and describes the Bêché patent pneumatic forge hammer, which this firm has the sole right to manufacture in the United States and Canada. Brief specifications of the hammer are given as well as a diagram showing the momentary resting of the ram after a blow has been struck, which is a special feature.

Combustion Recorder.—Precision Instrument Company, 49 Larned street, W., Detroit, Mich. Catalogue D. Treats of the Precision Simmance-Abady patent combustion recorder that records the percentage of carbon dioxide in the combustion of coal, which is the ultimate guide to the perfection of stoking, damper control and the condition of the boiler settings. The various styles of recorder are illustrated, together with specimen charts produced by it.

Gasoline Engines and Windmills. — The Challenge Company, Batavia, Ill. Catalogue No. 54. Size 6 x 9 in.; pages 224. Gives general description and specifications for a full line of gasoline engines and windmills in both steel and wood, steel and wood tanks, feed grinders, wood saws, pumps, cylinders, &c., steel substructures and water works supplies. All of the various lines are illustrated, and tables and an illustrated list of repair parts are included.

Water Columns.—The Reliance Gauge Column Company, Cleveland, Ohio. Circular. Devoted to the Reliance safety water columns, which are made in both the low and the combined high and low water alarm types.

Wood Pulleys.—Dodge Mfg. Company, Mishawaka, Ind. Booklet, entitled "Five and One-Half Miles per Minute." Describes a test recently conducted with a Dodge iron spider wood rim pulley. This pulley was 46½ in. in diameter, with a 16-in. face and a 4-in. bore. It was exact duplicate of one supplied a customer for a rim travel of 9000 ft. per min., and during the test the speed was slightly in excess of 2400 rev. per min., which gave a rim travel of 29,200 ft.

Gas Producers and Engines.—J. Thompson & Sons Mfg. Company, Beloit, Wis. Two bulletins. No. 26 relates to the Thompson suction gas producers of the water seal type, which are designed for continuous operation. In addition to the specifications for this producer, space is also given to a general description of gas producers and their uses. In bulletin No. 28 illustrations and descriptive matter explain the operation of the Thompson automatic tandem gas engine.

Special Woodworking Machinery.—Trevor Mfg. Company, Lockport, N. Y. Two catalogues. The first, A, deals with a line of machinery for making shingles, barrel heads, flat barrel staves and for cutting veneers and thin stock generally for baskets, boxes and crates for shipping fruit and vegetables. B pertains to a line of machinery for turning long wooden handles of various kinds and preparing the stock from the log, as well as special lathes for turning yacht spars, flag poles, oars, canoe paddles, &c. In both catalogues the full line of machinery is illustrated and brief specifications are given.

Motor Cars Supplies.—The Motor Car Supply Company, 1451 Michigan avenue, Chicago, Ill. Catalogue No. 18. Size 6¾ x 8¾ in.; pages 312. Pertains to a very complete line of supplies of all kinds for motor cars. Practically all the accessories are illustrated and priced. A complete index renders the finding of any particular article comparatively simple.

Corliss Engines.—The Griffith & Wedge Company, Zanesville, Ohio. Folder. Illustrates the heavy duty Ohio Corliss engine and contains a table of the sizes and indicated horsepower.

Portable Mold Dryer.—Hanna Engineering Works, 2059 Elston avenue, Chicago, Ill. Pamphlet. Describes and illustrates the Hanna portable mold dryer, which it is claimed will dry any mold regardless of size or shape perfectly. The application of these at successive stages to a large gas engine bed is described at length and the text is supplemented by a number of illustrations.

Water Softener.—The Dearborn Drug & Chemical Works, McCormick Building, Chicago, Ill. Booklet, entitled "Treatment of Boiler Feed Waters." Covers the whole problem of treating boiler feed waters and shows a number of boiler tubes that have been corroded both externally and internally.

Wire Rope.—A. Leschen & Sons Rope Company, 920 North First street, St. Louis, Mo. Pamphlet. Its purpose is to provide as far as practicable a means for quickly selecting the quality and construction of wire rope best suited for various kinds of service. With this end in view the construction of the various types of wire rope is described, and this is followed by illustrations of them.

Dynamometer.—Joseph Tracy, 116 West Thirty-ninth street, New York City. Booklet. Concerned with a fan dynamometer, that has been especially designed for the absorption and measurement of the power developed by internal combustion motors. *The Iron Age*, November 24, 1910, contained an illustrated description of this dynamometer.

Air Compressors.—The Sullivan Machinery Company, 150 Michigan avenue, Chicago, Ill. Two bulletins. No. 58 H contains an illustrated description of the small steam driven Sullican air compressors, classes WA-3 and WA-4. No. 58 I gives descriptions of accessories, such as air reheaters, receivers and unloading devices used in connection with the Sullivan air compressors, and to these have been added a number of tables and a collection of miscellaneous data on the subject of compressed air and its applications.

Engines and Boilers.—Nagle Engine & Boiler Works, Erie, Pa. Catalogue No. 70. Size 6½ x 9 in.; pages 92. Lists the various sizes and styles of engines and boilers for all classes of service built by the company.

Special Track Work, Castings and Vises.—Barbour-Stockwell Company, 205 Broadway, Cambridgeport, Mass. Two loose leaf catalogues and a pamphlet. The first is devoted to special track work for street railroads and shows switches, frogs, crossings, switch targets, tie plates and track drains. The second calls attention to a line of miscellaneous and sewer castings, and the pamphlet illustrates and describes the Chandler and Washburn patent quick action vises.

Grain Elevator Supplies and Equipments. — Union Iron Works, 620 William street, Decatur, Ill. Catalogue No. 26. Size 6 x 9 in.; pages 270. Lists an extensive line of grain elevator equipment and supplies, which includes corn shelling and cleaning machinery and elevating, conveying and power transmitting machinery. All of the various appliances are illustrated and brief specifications and dimension tables are included.

Woodworking Machinery.—The Oliver Machinery Company, Grand Rapids, Mich. Several catalogues. These list various woodworking machines, such as universal saw benches, variety saw tables, swing cut-off saws, lathes, a motor driven speed lathe, a circular safety planer cylinder, a belt driven speed lathe and a number of different band saws and wood trimmers.

Motor Driven Elevators.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Section No. 3103 of perpetual catalogue No. 3002-A. Devoted to the subject of motor driven elevators and contains a number of illustrations of typical installations.

Gas and Gasoline Engines.—Seager Engine Works, Lansing, Mich. Three bulletins. No. 27-A is concerned with the Olds power pump, No. 35 relates to a self-contained 1½-hp. gas engine, and No. 37 illustrates another 1½-hp. engine connected to operate a standard contractors' diaphragm pumping outfit.

Pneumatic Tools.—The Empire Engine & Motor Company, Orangeburg, N. Y. Catalogue No. 2. Size 6 x 9 in.; pages 63. Relates to the Empire line of air tools, which includes pneumatic motor chain hoists, drills, reamers, center grinders, crane motors, portable winches, hoisting engines, &c. All of these are illustrated and brief specifications are given on the facing pages.

Hammers and Forges.—C. C. Bradley & Son, Syracuse, N. Y. Several circulars. Deal with a line of hammers and forges of various styles. The forges burn either hard coal or coke and are intended to bring iron and steel to the proper forging heat. The hammers include a rubber cushioned helve hammer, an upright strap hammer and a compact hammer, the special advantage of which is the small amount of floor space required.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square ..... ℔ ¢ 1.75¢
½ to 4 in. x ⅝ to 1 in. ..... ℔
1½ to 4 in. x ¼ to 5-1 ..... ℔ 1.85¢
Rods ⅜ and 11-16 round and square ..... ℔ 1.85¢

Angles:	Cts ℔
3 in x 3 in and larger	2.00¢
3 in x 3-16 in and over	2.25¢
1½ to 2 in x ¼ in	2.10¢
1½ to 2¼ in x 3-16 in and thicker	2.00¢
1 to 4 in. x 3-16 in	2.10¢
1 to 4 x ¼ in.	2.30¢
2 x ⅛ in	2.30¢
3 x ⅛ in	2.40¢
5 x ⅛ in	3.45¢
½ x 3-32 in	4.25¢

Tees:	
1 in	2.65¢
1¼ in	2.45¢
1½ to 2½ x ¼ in	2.15¢
1½ to 2½ x 3-16 in	2.35¢
3 in. and larger	2.05¢
Beams	2.00¢
Channels, 3 in. and larger	2.00¢
Bands—1½ to 6 x 3-16 to No 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	3.95¢
Norway Bars	3.50¢

Merchant Steel from Store—

per ℔

Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	4¢

Sheets from Store—

Black	One Pass, C R Soft Steel	R. G. Cleaned
	℔	℔
No. 16	2.55¢	2.80¢
Nos. 18 to 20	2.70¢	2.90¢
Nos. 22 and 24	2.75¢	3.00¢
No. 26	2.80¢	3.10¢
No. 28	2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ℔ ¢ 12 @14½
Patent Planished, W. Dewees Wood ..... ℔ A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	℔ 2.95¢
Nos. 22 to 24	℔ 3.30¢
No. 26	℔ 3.50¢
No. 28	℔ 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—Galvanized.

Nos. 22 and 24	¢ ℔ 5.75¢
No. 26	℔ 6.25¢
No. 28	℔ 7.75¢

Corrugated Roofing—

2½ in. corrugated.

	Painted	Galvd
No. 24 ..... ℔ 100 sq. ft.	$3.85	4.80
No. 26 ..... ℔ 100 sq. ft.	.95	4.00
No. 28 ..... ℔ 100 sq. ft.	.60	3.75

Tin Plates

American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 ..... $6.35
IX, 14 x 20 ..... 7.60
A. Charcoal:
IC, 14 x 20 ..... $7.10
IX, 14 x 20 ..... 8.50

American Coke Plates—Bessemer—

IC, 14 x 20 ..... .07 ℔ $4.10
IX, 14 x 20 ..... 5.10

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating $8.40
IX, 20 x 28 with an 8 lb. coating 10.50

Seamless Brass Tubes—

List November 15 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ℔

High Brass Rods—

List August 1, 1908. 14¾¢ ℔

Roll and Sheet Brass—

List August 1, 1908. 14¾¢ ℔

Brass Wire—

List August 1, 1908 14¾¢ ℔

Copper Wire—

Base Price. Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots) ℔ 18 ¢
Sheet Copper Cold Rolled, 1¢ ℔ net advance over Hot Rolled
Sheet Copper Polished 20 in. wide and under, 1¢ ℔ square foot
Sheet Copper Polished over 20 in. wide, 2¢ ℔ square foot
Planished Copper, 1¢ ℔ square foot more than Polished

METALS—

Tin—

Straits Pig ..... ℔ ¢ 40¼@40¾¢

Copper—

Lake Ingot ..... ℔ 14¾@15 ¢
Electrolytic ..... ℔ 14½@14¾¢
Casting ..... ℔ 14¼@14½¢

Spelter—

Western ..... ℔ 6¼@6½¢

Zinc.

No. 9, base, casks .. ℔ 8¼¢ | Open ..... ℔ 8¾¢

Lead.

American Pig ..... ℔ 5 @5¼¢
Bar ..... ℔ 6¾@6½¢

Solder.

½ x ½, guaranteed ..... ℔ 23½@24 ¢
No. 1 ..... ℔ 21½@22 ¢
Refined ..... ℔ 19 @19½¢

Prices o Solder indicated by private brand vary according to composi ion.

Antimony—

Cookson ..... ℔ @10¢
Hallett ..... @10¢
Other Brands ..... @9½¢

Bismuth—

Per ℔ $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents—
Copper, Heavy cut and crucible	℔ 11.00@11.25
Copper, Heavy and Wire	℔ 10.75@11.00
Copper, Light and Bottoms	℔ 9.75@10.00
Brass, Heavy	℔ 7.25@ 7.50
Brass, Light	℔ 5.75@ 6.00
Heavy Mechine Composition	℔ 9.75@10.00
Clean Brass Turnings	℔ 7.25@ 7.50
Composition Turnings	℔ 8.25@ 8.50
Lead, Heavy	℔ .....@ 3.75
Lead, Tea	℔ .....@ 3.50
Zinc Scrap	℔ .....@ 4.00



THE IRON AGE

Established 1855 | New York, December 29, 1910 | Vol. 86: No. 26

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-18 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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Unprecedented Ore Stocks

Their Bearing on Prices for 1911

The Coke Market Stronger—Activity in Cast Iron Pipe

Actual iron market developments of the closing week of the year relate to the basic departments of the industry rather than to finished material. In the coke trade a number of contracts are reported, including one for 18,000 tons and one for 12,000 tons a month for the first half of next year, and one for 15,000 tons a month for the entire year. There is a better feeling among coke producers, and the very low prices recently quoted have been withdrawn. Contract Connellsville coke is now more generally on a $1.75 basis. The incorporation of a company to sell the output of a number of Connellsville producers is not as significant as some reports have indicated. Only about 7000 ovens are likely to be included.

The Lake Superior ore situation has assumed importance in view of a recent meeting of producers and producer-consumers in connection with the proposal to maintain the 1910 price throughout 1911. The argument has been brought forward that consumers who buy all their ore in the market would be helped by such a policy in working off their stocks of high-priced ore, many of them having enough to last them for nearly a year. In 1908, it will be recalled, the high ore prices of 1907 were held for a while in line with the general price maintenance policy, but in May, under actual buying, declined 50c. a ton. How far the expanding demand of one year ago misled ore buyers is indicated by total stocks of Lake Superior ores on docks and in furnace yards December 1, this year, of 32,600,000 tons. Estimates of a total movement of 25,000,000 tons in 1911 are now current, against estimates for 1910, made one year ago, of 50,000,000 tons.

The pig iron market has grown even quieter in the past week. In the Chicago district local foundry iron interests have made fresh concessions to move accumulated iron. Southern irons must be sold below $11, Birmingham, to compete now in the Northwest.

The only noteworthy sales of the week are 6000 to 7000 tons of low phosphorus iron for New Jersey delivery, at the equivalent of $22 delivered in eastern Pennsylvania, and 5000 tons of high manganese iron by an Alabama company.

Better co-operation among pig iron producers is aimed at by meetings held last week at Philadelphia and Cleveland. Central Western furnacemen agree that more furnaces should blow out, but there is no concerted effort in that direction. The proposal for a selling agency for basic iron has had some support in the Pittsburgh, Valley and Cleveland districts, but one interest has thus far held out against it.

In finished lines buyers are awaiting the outcome of the present uncertainty regarding prices, and that attitude may continue for some time. A dinner con-

ference of steel manufacturers, on the invitation of Chairman Gary, will be held in New York, January 11. Concerning the expectations of buyers that lower prices will come before the new year is far advanced, it should be said that strong influences are operating and will continue to operate against the precipitation of an open market. As an alternative the possibility of co-operation on a lower level has been discussed.

Canadian buying of structural material promises to be considerable in the new year. In Vancouver alone plans are maturing, calling for 35,000 tons. The New York Central has taken bids on 3000 tons of steel for bridges over the New York State Barge Canal. At Portland, Ore., bids are in for 8500 tons for the new bridge. For the Masonic Temple addition in New York 4000 tons will be required.

There is fair buying of railroad track supplies, including spike contracts for the Louisville & Nashville and St. Paul. The former is in the market for 50,000 pairs of splice bars. The Carnegie Steel Company has sold 5000 of its heavy I-beam steel ties for export.

The cast iron pipe trade is more active, in part from the usual December contracting for gas pipe, of which the leading producer has booked 15,000 tons in December. The Pacific Coast awards to be made in February amount to 24,000 tons of water pipe for Portland and various California points and 12,000 tons of gas pipe for Portland.

The copper outlook, on the heels of three years of adversity, is anything but encouraging to producers. Prices are weaker and demand halting. The grip that has been on the pig tin market so long shows no signs of relaxing. Statistically the lead situation is stronger.

The Lake Superior Ore Market in 1911

Lake Superior iron ore interests evidently are in the same fog of uncertainty regarding the coming year that envelops the rest of the iron trade. Some estimates have been made as to the amount of ore ahead of the furnaces which use Lake ores—that is, the total of ore in furnace yards and on Lake Erie docks. These indicate the largest stocks on record. That statement, moreover, must be interpreted in the light of the steady diminution in the production of pig iron now in evidence, from the rate of 22,400,000 tons a year on December 1, whereas one year ago it was advancing beyond the rate of 31,000,000 tons a year, shown by the statistics of December 1, 1909. While it may be agreed that the low rate of production in this holiday week is likely to be improved upon as the new year advances, no probable improvement can keep the present stock of Lake ore from being a serious incubus on the ore market of 1911. The leading interest is credited with having on hand about 19,000,000 tons. Its shipments in 1910 were about 23,000,000 tons. It has now in furnace yards and on docks what may be reckoned a year's supply even under any probable increase in its pig iron production next year beyond the rate now prevailing, which is less than 50 per cent. of capacity. But the Steel Corporation has for years provided a large factor of safety against strikes on the lakes, or on docks or at the mines, and would ordinarily have ore stocks at the opening of navigation sufficient to carry it into late summer.

The amount of ore now carried by independent steel companies and merchant furnaces, together with the dock stocks of merchant ore firms, is not known. But gauged by the Steel Corporation's stocks it may be estimated at 13,000,000 to 14,000,000 tons. This would mean that 32,000,000 tons to 33,000,000 tons of Lake ore is ahead of the industry. Estimates made by Cleveland ore firms, of the amount of ore to be shipped next year, in view of the enormous total now piled up, and of the off year that is ahead for pig iron and steel, range from 60 to 70 per cent. of the production of 1910. That would mean from 25,000,000 to 30,000,000 tons, with the probabilities rather in favor of the lower than the higher amount.

The price of Lake Superior ores for 1911 will be influenced to a considerable degree by developments in the steel trade in the first quarter of the new year. The policy of the ore producers in making no readjustment in prices on 1910 deliveries has been commended by a number of furnace companies, in spite of the fact that pig iron prices have declined $3 to $4 a ton in the past year. The same argument has been used that was brought forward in defense of holding finished material prices in 1908. It has been urged that to reduce ore prices would be taking a needed prop from under the pig iron market, and would bring even more than a corresponding reduction in the price of pig iron. Now that it is seen how far into the future the present surplus of high priced ore will last, the intimation has come down the line that a reduction in ore prices in 1911 is by no means a foregone conclusion. That view must meet the same test as the claim made a year ago, that because ore prices for 1910 were higher than those for 1909, pig iron for 1910 delivery should bring a higher price. It is difficult to see why the price of Lake Superior ores should be long out of line with prices of pig iron and finished iron and steel, or why, in view of the readjustment of the latter to a lower level, the basic material should be left untouched.

The perplexities of the Lake ore situation are not alone due to the fact that a year's supply must be brought down the lakes in the seven months of navigation, and that decisions must often be made regarding prices and tonnage more than a year in advance of the use of the ore. There are the diverse interests of those who are purely producers, those who are only consumers, and in the third place the great producing-consuming companies. The situation for the coming year may be said to be simplified in one particular—that the demand from merchant furnaces for ores for steelmaking pig iron will be smaller than in many years. Stocks of both steel making ores and pig iron in the hands of merchant furnaces are very large. Moreover, the chance that the steel companies will be buyers of pig iron in 1911 is very remote, unless there should be again a temporary resort to such a method of sustaining the market. The interest of the merchant ore companies in giving the Northern producers of foundry iron such a price for ore as will enable them to hold their market against Southern iron is obvious. However, if closer cooperation among pig iron producers should result from the present situation, Southern competition might even become a manageable factor, though the history of the 1908 movement is to the contrary. Evidently, so far as consumers'

interests are concerned, the non-Bessemer rather than the Bessemer ore situation is the present problem. It remains to be seen to what extent such consumers will indorse the proposition that their interests will be best conserved by holding ore prices in 1911 to the level of 1910, which has been equaled only twice in the past 15 years.

Progress with the Six Day Week

Labor conditions in the iron and steel industries in 1911 promise to be favorable to the effort to establish to a much greater extent than formerly the six-day week. The pressure upon mills to get out product, which was so marked in 1906, the greater part of 1907 and for a portion of 1909 and 1910, furnished a reason for doing much of the work of repair on Sunday, as well as loading and unloading, and in some cases Sunday work was performed on new construction. In the months of only partial employment of capacity that are ahead, there will be no need of employers urging Sunday labor, and the workmen should be well satisfied to get six days' work, instead of asking for seven day jobs, with their extra day's pay, as most of them do where both the long week and the short week are worked.

Without waiting for the committee of the American Iron and Steel Institute to report, some steel manufacturers apart from Steel Corporation subsidiaries have made a beginning in the reduction of seven day labor. At one plant all the mechanical men—engineers, firemen and others—who have been working continuously, have been put on a six-day week. The few men who are paid by the month are naturally pleased with the change. Some of those who are paid by the day have not been as well satisfied, but as time goes on and the benefits of the new regime appear, complaints are fewer.

Blast furnace workers, as is well known, have generally preferred the seven-day week, with seven days' pay, to the six-day week with six days' pay. Blast furnace operations being so largely mechanical and the manual labor required being not severe, the objection of the men to the six-day proposal is one of the important features of the problem. A plan for doing away with the 24-hour day in connection with the change from day to night shifts and vice versa, at the end of the week, has been in operation at some blast furnaces and may be adopted at others. The time for the change is transferred from Sunday morning or Sunday evening to Wednesday noon, and the off-going and on-coming shifts work 18 hours respectively before and after Wednesday noon.

It has been found that the reduction of repair work on Sunday to a minimum has worked definite economies. Under the old arrangements, where large numbers of engineers, firemen, machinists and electricians were regularly on duty on Sunday, the amount of work done per man was much less than at present, where only a few are assigned to do absolutely necessary work. Sunday was apt to be a day on which efficiency was forgotten.

Illustrating what can be done in minimizing Sunday labor, even though custom has required the doing of a good deal of it, the effort for reform in the cement industry is interesting. As indicated in our report last week of the recent New York meeting of the Association of American Portland Cement Manufacturers, two cement companies have found it possible to close their plants on Sunday, in the face of the accepted practice in that industry to work seven days a week. The belief that considerable losses would result from shutting down cement kilns on Sunday is opposed by the experience at works employing open hearth furnaces and puddling, heating and reverberatory furnaces, where the most that is done is to keep a light heat on the furnaces through that day. Moreover, the human side of the argument of those who are leading the movement for a six-day week in the cement industry is reinforced by the existence of excess capacity which next year will be more of a problem than it has been in 1910. The like condition in the pig iron industry may add to the incentive to solve the more difficult problem there.

Workmen's Compensation and the Common Law

Much misapprehension exists as to the effect of workmen's compensation acts upon existing laws having to do with employers' liability. Briefly stated, the new principle will replace the statutes of employers' liability, but cannot affect the operation of the common law, which is a fundamental principle of the Federal Constitution and the constitutions of several States. The injured employee can accept his compensation as fixed by the act or he can sue under the common law. To restrict the liability of the employer to the provisions of workmen's compensation would require a constitutional amendment, a remedy which has its advocates.

Under the common law the fellow servant principle, which takes financial responsibility from the owner where injuries result through the negligence of a fellow workman, exists in an accentuated form, as compared with the existing practice under employers' liability. Generally speaking every one employed in a works is the fellow servant of every one else. Negligence must be personal on the part of the owner, or, under what is known as the vice-principal doctrine, on the part of some one specially delegated by him to perform his duties. He is negligent when he fails to exercise reasonable care in providing reasonably safe places and machinery and methods in connection with the work; in warning employees of dangers and instructing them in their duties; and in providing sufficient and competent servants. Naturally, in the modern industrial plant much of this personal responsibility must be vested in others. The employer gains in one way by the reversion to the common law, because the statutes of employers' liability have a much narrower definition of a fellow servant, which includes no such officials as superintendents and foremen.

However, various conditions of modern industrial life leave the common law alternative one of possible menace. The basic idea of compensation is that the employee shall be recompensed for any injury, no matter how received or through whose negligence, except when self-inflicted. The family shall be protected by a fixed amount of compensation, based upon his earnings. Whether accidents result in temporary or in permanent disability, or in death, they shall not be permitted to work unusual hardship nor to impose burdens upon the public. In the argument for the aboli-

tion of the common law alternative, it is held that justice would best be served if claims for every accident, even though the employer be himself to blame, should be adjusted on the one fixed principle. If the employer is to pay for injuries to his people, no matter how great the degree of their own negligence, then he should himself be relieved of the possible onus of costly litigation, where the contention is made under the common law that he is personally to blame. Unless this is done, the lawyer who does business on the contingent fee basis will retain an ample opportunity to pursue his trade. Another factor to be considered in this connection is the vastly increasing number of immigrant operatives whose knowledge of the English tongue is so limited as to render warnings and instruction uncertain quantities.

Correspondence

American Society of Mechanical Engineers

To the Editor: In your admirable report of the recent convention of the American Society of Mechanical Engineers, I note quite a serious error in your notice of the report of the Committee on Constitution and By-laws, which I presented on behalf of the committee at the business session. The matter which I presented had nothing to do with "an amendment of the constitution," nor had it anything to do with any paper or matter "necessary in order to properly confer the title in the Engineering Societies Building shared by the American Society of Mechanical Engineers." The title to that property is perfect, and stands in the name of three founder societies. The matter which was presented by me on behalf of the committee related solely to an amendment of the charter as to the time of holding the annual meeting, so as to make it in conformity with the constitution under which the society has acted for 15 years or more. The whole matter was for the purpose of correcting a small clerical error in the charter, but as this had to be done legally it had to be done with considerable form.

JESSE M. SMITH.

NEW YORK CITY, December 22, 1910.

Plea for Amending the Bankruptcy Law

To the Editor: The present Federal bankruptcy law should be amended, so that an individual or firm that becomes financially embarrassed in business may, by petition of a creditor, or by voluntary act, become the direct subject of the court. This would eliminate all the demoralizing and costly go-between red tape procedure of lawyers, keepers and receivers, who absorb the bulk of the assets which should go to the creditors.

In almost every instance the individual or firm summoned to the court can pay 10 per cent. at once upon all liabilities, which is all that is usually received by the creditors after months of delay under the present system. Then, at the discretion of the court, an extension of time may be granted for further payments and for possible reorganization of the business. Such a course would obviate failure in the vast majority of cases and save millions yearly which are now lost, or needlessly wasted, through outside operation of the law. If every individual or firm in business could feel that it was thus protected by the United States court from vicious attacks and business injury of the present system of keepers and receivers, and investors and stockholders could feel the same protection for their interests, there would come fresh confidence and great improvement in business conditions. There would be more business all over the country, better credit, and all needless failures checked. This course of the law would establish honesty in all business methods and give stability to trade.

The only way to obtain this amendment to the present law is for business men to become aroused everywhere to the necessity of thus protecting their business from outside mercenary attacks, and to agitate until Congress shall listen and grant their request.

LOUIS STARR.

BOSTON, MASS., December 23, 1910.

Labor Efficiency and the Cost of Living

To the Editor: In your issue of December 15 Messrs. Root and Brombacher make some very good points on the relation of labor efficiency to the cost of living. On this Christmas evening the thought occurred to me, while reading their letters, that if both employers and workmen fully understood these questions they would be apt to get together without delay. It is misunderstandings that keep men apart, and they may not be all on one side.

I think I need a little more light from these two gentlemen. It is agreed that labor efficiency, long hours and machinery will produce more; but suppose this leads to less men needed, more out of work, more labor competition and lower wages. Is not the cost of living of the men thereby increased? Does not higher efficiency mean that the work will be done by the most efficient and the others thrown out of work?

Of course the most efficient men, like the most efficient coals, are used first, but the poorer coals hold their energy while the poorer men possess only active energy, and if not employed they consume the products of the energy of others. Does not competition lower the price of labor as well as the price of products, and is it not natural for labor to combine as well as capital to secure larger profits? Granting the gentlemen's economic theories, what have they to offer to take the place of John Mitchell's "safety line" for preventing labor from cutting its own throat by competition? What living standard is there below which workmen cannot be forced?

J. C. PARKER.

PHILADELPHIA, PA., December 25, 1910.

New Railroad Equipment Orders.—Inquiries rather than orders for cars have been the rule in the past week. The principal roads in the market are the following: Chesapeake & Ohio for 200 flat cars; the Chicago & Alton for 25 caboose cars; the Swift Refrigerator Transportation Company for 50 produce cars; the Chicago, New York & Boston Refrigerator Line for 300 refrigerator cars; the Pittsburgh, Shawmut & Northern (soon to come into the market) for 2000 freight cars. The Great Northern has ordered 500 50-ton ore cars from the American Car & Foundry Company and the Baltimore & Ohio, 20 coaches from the same company and 30 from the Pullman Company. Locomotive orders include 60 for the Boston & Maine from the American Locomotive Company and 40 from the Baldwin Locomotive Works; 31 for the Soo Line, from the American Locomotive Company; 8 for the New York, Ontario & Western, from the American Locomotive Company; 15 for the Cincinnati, New Orleans & Texas Pacific, 3 for the Wichita Falls Route and 2 for the Lake Superior & Transfer Company, all from the Baldwin Locomotive Works. The above are reported by the *Railway Age-Gazette*.

The Crawfordsville Wire & Nail Company, Crawfordsville, Ind., has taken over the business of the Crawfordsville Tank Company of that city, manufacturer of galvanized steel tanks and troughs, and is now conducting the business at its present location, but is erecting buildings adjoining the wire plant and hopes to be able to begin operations in the new plant by February 1.

The Republic Iron & Steel Company, Pittsburgh, has placed an order with the Morgan Construction Company, Worcester, Mass., for a 10-in. and 12-in merchant mill.

Follansbee Brothers Company Changes

On account of the resignation of V. H. Arnold, due to ill health, Albert Matthews has been transferred from central New York to New York City and has been made district sales manager at that place for the Follansbee Brothers Company, Pittsburgh, Pa., manufacturer of black and galvanized sheets and tin plates. His territory will embrace New York, New Jersey, eastern Pennsylvania, Delaware and eastern Maryland. Mr. Matthews has been succeeded in central New York by James V. Dalton, whose headquarters will be at Syracuse. A. R. Johnson, for several years district manager at Cleveland, Ohio, has been transferred to the New England States. William U. Follansbee, Jr., for several years local representative, covering Pittsburgh and immediate vicinity, has been made district sales manager at Cleveland, Ohio, succeeding Mr. Johnson. He is assisted by Scott Follansbee. The vacancy caused by the transfer of William U. Follansbee, Jr., to Cleveland, has been filled by H. V. Jones, for several years located at Columbus, Ohio. Mr. Jones is succeeded at Columbus by Edwin J. Fisher, assisted by L. E. Pence. Mr. Fisher has been in the Chicago office of the company for several years. A complete list of the branch offices, together with district managers, is as follows:

D. E. Allen, Norfolk, Va.
Austin Clawson, 427 Commercial Nat'l Bank Building, Chicago.
Edwin G. Fisher, 205 New First Nat'l Bank Bldg., Columbus, O.
Wm. U. Follansbee, Jr., 1111 Superior Viaduct, Cleveland, Ohio.
E. C. Folkening, 110 South Alabama street, Indianapolis, Ind.
Ed. Harper, Seneca and Hamburg streets, Buffalo, N. Y.
A. G. Hinderer, Fourteenth and Broadway, Louisville, Ky.
A. R. Johnson, 1780 Hudson Terminal Building, New York City.
Albert Mathews, 1780 Hudson Terminal Bldg., New York City.
G. W. Nuckols, 148 Second avenue, North, Nashville, Tenn.
E. H. Rider, 608 Warren avenue, West, Detroit, Mich.
Ed. Schrader, 705-709 South Fourth street, Memphis, Tenn.
W. B. Slifer, 21-23 South Ford street, Rochester, N. Y.
H. H. Wherry, 685 Thirty-ninth street, Milwaukee, Wis.
Stockhoff Supply Company, St. Louis, Mo.
Geo. S. Lacy, Marvin Building, San Francisco, Cal.
T. H. Prest Supply Company, Kansas City, Mo.

New Lackawanna Station at Buffalo.—The Delaware, Lackawanna & Western Railroad Company has completed plans for a new passenger station and terminals at the foot of Main street, Buffalo, N. Y., to cost approximately $1,500,000. It will have a plaza frontage of 100 ft on Main street and 200 ft. on Ohio street, the location being on the easterly side of Main street, between Ohio street and the Buffalo River. The architecture will be in the Italian Renaissance, similar in design to the company's stations at Scranton and Hoboken. The waiting room, restaurant and other terminal accessories will be on the second floor on a level with the tracks, which are to enter the station on an elevated structure. The dock frontage between the new station and the Buffalo River will be 1500 ft. in length and will provide landings and dockage for the steamers of a number of lake passenger lines. The plans have been approved by the Public Service Commission and are now before the city authorities for approval.

The New York Revolving Portable Elevator Company, 352 Garfield avenue, Jersey City, N. J., manufacturer of a portable tiering machine for stacking bales, boxes, &c., and known as the Revolvator, whose plant suffered complete destruction by fire October 3, now has in course of construction a factory which will in every way be superior to the old one. With new machinery, run by individual motors, the capacity will be three times that of the old plant. At the rate the company is booking orders for future delivery, it would seem as if the new works would be running up to full capacity from the start. Having plenty of ground, the business may be enlarged to take care of a still increasing demand. The new location is within a few hundred feet of the old property, near the Greenville station of the Central Railroad of New Jersey.

The Structural Materials Laboratory at Pittsburgh

One of the important functions of the Government Bureau of Standards, as defined in the act establishing it, is that pertaining to "the development of physical constants and the properties of materials." Realizing the necessity of basing its work on the fundamental standards of length, weight and other units, the bureau first established those departments, others following in logical order. The scientific equipment of the Washington laboratory is now being augmented by purchases for the Pittsburgh laboratory, where extensive research tests on iron and steel are being provided for, as well as work on cements and concretes, lime, brick and other clay products. This additional equipment will put the Pittsburgh laboratory on a footing commensurate with the important interests it will represent. The work there will have direct reference to practical questions on structural engineering, the improvement of current methods and products and the uses of materials. In doing this the equipment and personnel of the Washington bureau will supplement the resources of the Pittsburgh plant.

A large amount of reliable work has been done in other laboratories, and the results obtained are now at the command of engineers, on such subjects as the strength of steel as modified by chemical composition and by heat and mechanical treatment; the strength of columns of steel, of plain and reinforced concrete, of brick and brick piers, on each of these kinds of materials taken separately and in combination.

The United States Engineering & Mfg. Company.—Under this name a company has been organized at Pittsburgh with a Delaware charter and a capitalization of $1,000,000, of which $500,000 is 7 per cent. cumulative preferred and $500,000 common stock. The purpose is to make electric rock drills, wheels for automobiles, new vault lighting arrangements for sidewalks, and other specialties. J. J. Jones, consulting engineer, states that the company will erect a machine shop, 120 x 300 ft.; a foundry building of the same size; a power house, 40 x 80 ft., and a general office building and pattern shop. The machine shop is to be equipped with two 30-ton electric cranes, and similar equipment is to be installed in the foundry. The power house is to have two 250-hp. gas engines and electric generators. Joshua J. Jones is president and McKintry Griffiths is vice-president and treasurer. President Jones states that the company will proceed at once with the erection of its plant, and expects to have it in operation within a year.

The Best Mfg. Company's Removal.—On and after January 1 the Best Mfg. Company, Pittsburgh, piping equipment of every description will be located at its new plant at Oakmont, near Pittsburgh. The post-office and telegraph address will continue to be Pittsburgh, while all freight and express matter should be addressed to Verona, Pa. The new plant more than doubles the manufacturing capacity, and its concentration of departments, modern equipment and splendid facilities for handling material will enable the company to render the best possible service to its customers. Its iron foundry is equipped throughout with modern installation, including a complete line of power molding machines, ranging from small squeezers to the largest jarring machines adapted for all classes of work. This department has a capacity of 90 tons per day, and can handle castings up to 50 tons. The company will carry a large stock of valves, fittings and flanges, both full size and reducing, and also pipe.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Dec.28, 1910.	Dec.21, 1910.	Nov.30, 1910.	Dec.29, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.25
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	14.75	14.75	14.75	18.75
Basic, Valley furnace	13.25	13.25	13.50	17.00
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	13.90	13.90	13.90	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	28.00	28.50	31.00
Open hearth billets, Philadelphia	*24.50*	25.50	25.50	30.60
Wire rods, Pittsburgh	28.00	28.00	28.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	15.50	15.50	16.00	20.00
Iron rails, Philadelphia	17.00	17.00	18.00	20.50
Car wheels, Chicago	13.50	13.50	13.50	18.50
Car wheels, Philadelphia	13.00	13.00	13.75	17.50
Heavy steel scrap, Pittsburgh	13.50	13.50	14.25	18.00
Heavy steel scrap, Chicago	12.00	12.00	12.25	16.00
Heavy steel scrap, Philadelphia	12.50	12.50	13.00	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.32½*	1.35	1.35	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.60
Common iron bars, Pittsburgh	*1.35*	1.40	1.40	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.30	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.85
Cut nails, Pittsburgh	1.60	1.60	1.60	1.85
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	13.00	13.00	13.00	14.00
Electrolytic copper, New York	12.75	12.75	12.87½	13.62½
Spelter, New York	*5.60*	5.75	5.95	6.30
Spelter, St. Louis	*5.50*	5.65	5.80	6.15
Lead, New York	4.50	4.50	4.50	4.70
Lead, St. Louis	4.35	4.35	4.40	4.65
Tin, New York	**38.45**	37.90	37.35	33.95
Antimony, Hallett, New York	7.75	7.75	7.75	8.25
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.; New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; tees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c. base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 235c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

THE IRON AND METAL MARKETS

Plugged and Reamed.

1 to 1½, 2 to 3 in...	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.....	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in	49	43
1¾ to 2¼ in	61	43
2½ in	63	48
2¾ to 5 in	69	55
6 to 13 in	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, December 28, 1910.—(*By Telegraph.*)

Pig Iron.—The pig iron market is exceedingly quiet, due to some extent to the holiday season and inventory period. The effort of the makers of basic iron to get together and organize a new company to handle their output is still under way. A meeting will be held in Cleveland this week, but it is stated that a large basic interest has refused to join, and it will probably fall through. No sales are reported, but some renewal of buying is expected after the first of the year. It is reported that No. 2 foundry is being offered by one furnace for first quarter at $13, at Valley furnace. We quote standard Bessemer iron, $15; basic, $13.25; No. 2 foundry, $13.75; malleable Bessemer, $13.75, and gray forge, $13, all at Valley furnace, with a freight rate of 90c. a ton for delivery in Pittsburgh district.

Steel.—There is very little new inquiry for billets, sheet or tin bars. Sales are reported of 1500 tons of open hearth slabs at $23, Pittsburgh, and two sales of 500 tons each, of small billets at $24, Pittsburgh, full freight to destination added. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24 and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

Inventory period is now at hand and consumers are taking in as little material as possible. It is known that stocks of finished iron and steel are low and this leads to the belief that after the turn of the year there may be a better buying movement. The recent meetings of manufacturers of sheets, tin plates, steel bars, plates, structural steel and other finished materials, at which it was decided to maintain regular prices, have given a stronger tone to the market; it is known that some low quotations on certain products have been withdrawn as a result of these meetings. The pig iron market is practically lifeless and the output is being steadily curtailed. Prices on steel billets and sheet and tin bars are reasonably firm. There is a better feeling in the coke trade, and some low prices on furnace coke, made a week or 10 days ago, but which were not taken up, have been withdrawn. The scrap trade is neglected and prices on two or three grades are lower.

Ferromanganese.—A sale is reported of 200 tons of foreign 80 per cent., 50 tons a month for first four months of 1911, at about $38, Baltimore. Inquiries are light. We quote 80 per cent. foreign, for delivery through the first half, at $38.25 to $38.50, Baltimore, the rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—News is lacking as to recent sales, and the market is bare of new inquiries. We quote 50 per cent. for delivery over first half at $54 to $55, and for prompt delivery at $55 to $55.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25. f.o.b. cars Jisco and Ashland furnaces.

Skelp.—A local pipe mill is reported to have bought 1000 tons of narrow grooved steel skelp on the basis of 1.25c., delivered in Pittsburgh district. New inquiry is light, buyers being pretty well covered for some time ahead. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—Specifications against contracts have not been coming in at a satisfactory rate for some time, and new demand is light. We continue to quote Bessemer and open hearth rods at $28, f.o.b. cars, Pittsburgh, but it is stated that Bessemer rods have recently sold for prompt delivery below $28.

Muck Bar.—No sales of local bar have been reported in this market for several weeks. We continue to quote best grades of local muck bar, made from all pig iron, at nominally $29, Pittsburgh.

Steel Rails.—No new developments have transpired in regard to the pending contracts of the Pennsylvania and New York Central railroads for 150,000 tons each. The Carnegie Steel Company has sold 5000 heavy I-beam steel ties for export, and the Louisville & Nashville Railroad is in the market for its splice bar requirements for next year, which will aggregate 50,000 pairs. An important anthracite coal interest is in the market for 3000 to 4000 tons of light rails for next year for its coal mines and yard trackage purposes. Specifications against contracts and new demand for light rails are fairly good, the local interest having taken about 1800 tons in the past week. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—The Carnegie Steel Company has received a definite contract for 10,500 tons of hull material, which includes plates, shapes and steel bars, for the new battleship to be built for the Government by the Newport News Shipbuilding & Dry Dock Company. Contracts have not yet been placed for the armor plate and deck plates, but will likely be given out this week. Inquiries for new cars in the past week have been fairly good. The Pittsburgh, Shawmut & Northern is in the market for 1500 steel gondolas; the Buffalo, Rochester & Pittsburgh for 1500 steel hoppers; the Baltimore & Ohio for 30 steel baggage cars; the Boston Elevated for 50 subway steel car bodies; the Hudson & Manhattan for 50 steel street cars; the Central Railroad of New Jersey for 250 flat cars; the Tidewater Oil Company for 12 tank cars; the Great Northern for 75 tank and 400 ore cars; the Canadian Collieries Company for 50 steel hopper cars, and the Chicago & Northwestern for 200 general service cars. The Wheeling & Lake Erie Railroad has asked the courts for permission to build 15 engines, and if this is granted the Wabash-Pittsburgh Terminal Railroad will then go ahead and build 2000 steel cars, for which permission has been given. The Carnegie Steel Company is receiving right along heavy orders for steel plates from the National Tube Company, to go into gas and oil lines for the Standard Oil Company and other interests, and serve to keep the Homestead mills better filled than otherwise would be the case. The general demand for plates is fair and the leading mills are operating to about 50 per cent. of capacity. As a result of the recent meeting of plate manufacturers held in this city, prices of ¼-in. and heavier plates, both in the narrow and wider sizes, are now reported to be firm on the basis of 1.40c., Pittsburgh.

Structural Material.—Reports that the Quebec Bridge contract has been placed are untrue. It is still held up. Little local work is coming out. The American Bridge Company has taken 1000 tons of bridge work for a Western railroad and 600 tons for an office building in a Southern city. We quote beams and channels up to 15 in. on the basis of 1.40c., Pittsburgh, and the market is said to be firmer at this price than for some time.

Sheets.—There is no improvement to note in the demand, while specifications against contracts are coming in at a very unsatisfactory rate. The tone of the market is firmer, however, and it is stated that regular prices, which are on

the basis of 2.20c. for No. 28 black and 3.20c. for No. 28 galvanized, are being better maintained than for some time. The full schedule of prices on black and galvanized and also on roofing sheets, as affirmed at the sheet meeting held here two weeks ago, is printed on a previous page.

Tin Plates.—This is the off season in the tin plate trade, very little new business being placed, as most of the large customers, such as the meat packers, condensed milk concerns and can makers, have covered their requirements for the first half of next year. The mills are running mostly on these contracts, on which direct shipments will commence in a month or six weeks. It is stated that the regular price of $3.60 per base box of 100 lb. cokes, f.o.b. Pittsburgh, is now being maintained as a result of the meeting held here two weeks ago.

Bars.—The new demand for both iron and steel bars is quiet, but specifications from railroads, implement manufacturers and wagon builders are coming in at a fairly satisfactory rate. The demand and specifications against contracts for hard steel bars for concrete purposes are good. As a result of the meeting of the steel bar makers held here recently, steel bars are now reported firm on the basis of 1.40c., Pittsburgh, while common iron bars are held at 1.35c. to 1.40c., Pittsburgh.

Hoops and Bands.—Only small orders covering actual needs are being placed, while specifications against contracts are coming in at only a fairly satisfactory rate. The tone of the market seems to be firmer since the recent meeting of the makers of hoops and bands at which it was decided to hold present prices. We quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Cotton Ties.—A few small lots are being shipped out this month against contracts, on which 78c. per bundle is charged. The cotton tie trade for this year is about ended.

Spikes.—In the last week or two the demand for railroad spikes has been better, and some fair sized contracts have been placed. A local mill has received contracts for 1000 kegs for the Chicago, Milwaukee & St. Paul and 600 kegs for the Norfolk & Western Railroad. More are pending, and will likely be closed early in the new year. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Spelter.—The market has declined still further and prime grades of Western are quoted at 5.30c., East St. Louis, equal to 5.42½c., Pittsburgh. The smelters seem to have lost control of the market, and it is predicted that spelter will touch 5c., East St. Louis, before the decline has stopped.

Merchant Steel.—The demand is only for small lots to cover actual needs, while shipments by the mills this month against contracts will show a heavy falling off as compared with last month. An improvement is expected after the first of the year. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—A meeting of shafting makers was held in this city last week, at which it was decided to make a strong effort to maintain discounts, which have been more or less elastic for some time. Specifications against contracts are only fair, while the new demand is mostly for small lots to cover actual needs. Regular discounts on cold rolled steel shafting are 57 per cent. off in carload and larger lots and 52 per cent. off in small lots delivered in base territory.

Rivets.—A meeting of rivet makers was held in New York last week, at which prices were reaffirmed. Trade is reported quiet, only such quantities being taken as are absolutely needed. Prices quoted are 1.90c. on structural rivets and 2c. on boiler rivets, base, f.o.b. Pittsburgh, usual terms.

Wire Products.—The new demand for wire nails and wire is light, being only for small lots to meet current needs and to maintain a fair assortment of sizes. Specifications against contracts are coming in at a fairly satisfactory rate, and it is believed that by the middle of January conditions in this trade will have considerably improved, in view of the spring trade opening up. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—This is the dull season in the pipe trade, and with the ground frozen no contracts are expected for gas or oil lines for several months. The only orders coming in now are for small lots of merchant pipe and oil country goods, mainly for shipment to California. It is believed that about February 1 the demand for merchant pipe and for large sized pipe for oil and gas lines will commence to open up. Discounts on both iron and steel pipe, as printed on a previous page, are more or less shaded.

Boiler Tubes.—The steel boiler tubes for 75 locomotives to be built by the Lake Shore & Michigan Southern Railroad have been placed with a local mill. The tubes for 100 locomotives to be built by the Boston & Maine Railroad have also been placed. The demand for locomotive tubes is considerably better. Merchant tubes continue quiet, and not much improvement is expected for a month or two or until spring trade opens up. Prices on tubes continue more or less demoralized, and discounts printed on a previous page are being freely shaded.

Iron and Steel Scrap.—The market is quiet and very little material is moving. Consumers realize that prices of scrap are lower, but do not want to take in any material until after the first of the year, while dealers also feel that any change in the market will be in the direction of better prices and for this reason are not pressing sales. In fact, several prominent dealers state they would not sell large tonnages of scrap for forward delivery unless they would get material advances over present prices. Such scrap as is loaded on cars and has to be moved can be had at low figures, but the tonnage available is small. Prices on low phosphorus scrap and rerolling rails are slightly lower. We note sales of about 500 tons of low phosphorus melting scrap at prices equal to about $17.25, f.o.b. cars, Pittsburgh, and about 600 tons of heavy steel scrap at prices ranging from $13.60 up to $13.85, f.o.b. cars, Pittsburgh. Dealers quote about as follows, per gross ton, f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.50 to $13.75
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	9.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	14.75 to 15.00
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.25 to 17.50
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.00 to 24.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	7.90 to 8.00
Machine shop turnings	8.60 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	14.50 to 14.75
Heavy steel axle turnings	10.25 to 10.50

Coke.—A better feeling is apparent in the coke trade, due to some large contracts for furnace coke recently placed and also because the first of the year is about at hand, from which date there will not be so much spot shipment coke offered. The Reading Iron Company, Reading, Pa., has recently closed for its entire requirements of blast furnace coke, about 18,000 tons per month, for first half of 1911, on the basis of about $1.75 per net ton at oven. The Bethlehem Steel Company, South Bethlehem, Pa., has also bought upward of 15,000 tons of furnace coke per month for all of next year at about the same price. The Girard Iron Company will start its furnace at Girard, Ohio, early in January, and has closed for its requirements of coke for first half of the year, about 12,000 tons a month. There is some inquiry in the market for foundry coke and the tone of prices is firmer. The Bessemer Coke Company and several other leading makers of coke state they will not sell furnace coke less than $2 and foundry at $2.50 per net ton at oven. A movement is under way by some of the Uniontown, Pa., coke concerns to form a central selling agency to handle the output of coke of a number of the smaller coke operators, and a charter has been applied for for the Fidelity Coal & Coke Company, with a capital of $300,000, and which it is said will handle the output of 7000 ovens or more. Several of the leading cokemakers are not identified with this project, stating they prefer to handle their coke themselves. A meeting is to be held this week by those interested in the new project to work out the details. The output in the Upper and Lower Connellsville regions last week was 292,612 net tons, about the same as the previous week. We quote standard makes of furnace coke for spot shipment at $1.40 to $1.50 per net ton at oven, while for delivery over first half of 1911 from $1.75 to $2 is quoted. Best makes of 72-hour foundry coke for spot shipment are held at $1.90 to $2 per net ton at oven, and for first half of the year at $2.25 to $2.50. A good deal of tonnage has been entered on 72-hour foundry coke for first half of the year delivery at these prices.

THE IRON AND METAL MARKETS

Chicago

FISHER BUILDING, December 28, 1910. (*By Telegraph.*)

Trade is very quiet in nearly all lines. The wire mills make the best showing, as a good crop year such as we have had is always followed by a good spring trade in agricultural implement and hardware lines. The railroads continue to buy bar iron freely for repair work, but the demand for other finished materials is light. The mills are kept going wherever possible to keep men employed, although it would be to the interest of the steel manufacturers to shut down entirely for a time. The Gary mill will roll 5000 tons of the rails ordered some time ago by the Erie Railroad, but no other rail orders are reported except small miscellaneous lots. The hopes of the steel industry for the immediate future are now centered in the enormous amount of structural business that is pending. If the deadlock that holds back this business were once broken there would undoubtedly be a rush to obtain advantages in deliveries. Western Canadian cities are coming forward in this field. Winnipeg will make extensive improvements the coming year and business in prospect at Vancouver, B. C., for bridges and buildings will require 35,000 tons of steel. The Pacific Coast cities will take a large tonnage of material the coming year. The only line in which there is any active buying movement at present is cast iron pipe. The leading interest in this line has booked 15,000 tons of gas pipe during December and a larger tonnage for gas companies is pending. Portland, Ore., is in the market for 6000 tons of water pipe, and contractors have inquired for material for 1500 tons of steel pipe for a water power plant near Seattle. Western cities are making up specifications for their requirements in water pipe. Their purchases were curtailed considerably the past six months by the condition of the bond market, which is now becoming more favorable. The scrap market is weak and depressed. There is a fair amount of business in copper and other metals.

Pig Iron.—The only new buying is in small lots. The foundries are generally following the plan of purchasing for short delivery periods, and as most of them have covered their requirements for the first quarter no new business of any moment is expected until there is a favorable turn in the business situation. One of the local furnace interests recently made concessions in order to realize on a large accumulation of iron, but it is understood that the end desired has been accomplished and the market for spot Northern is a little firmer. Shipments from furnace have been heavy during December. Low prices for Northern iron and scrap have checked to a considerable extent the demand for Southern iron in this territory. The Southern furnaces that are not content to pursue a waiting policy have found it necessary to make concessions on prompt iron, and unless there is improvement in the demand in January the Chicago market for Southern iron is likely to go below $11, Birmingham. There is not much pressure now to sell below this figure, and only a slight improvement in the demand would be necessary to steady the situation. Curtailment of production in the South would have the same effect, as the furnace interests there which have already restricted their output are sold up for the first quarter. A reduction in Northern ore prices would prove a serious matter for Southern iron in this territory. The increase in Northern production has already practically excluded Southern iron from Michigan and Wisconsin territory and the Northwest. The following quotations are for December shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern car foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	18.40 to 18.90
Jackson Co. and Kentucky silvery, 8%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 10%	20.40 to 20.90

(*By Mail.*)

Billets.—The market is very quiet, with forging billets quoted nominally at $28 base, Chicago, subject to concessions on any desirable tonnage.

Rails and Track Supplies.—No rail orders of any moment are reported closed. Most of the large Western roads have rails on hand which they would not spend the money to lay in track last fall, and for this reason are not interested in early deliveries on 1911 contracts. The track supply trade is equally quiet. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.20c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—The estimating departments of the fabricating interests are working nights on new business. Almost every day they are asked to figure on some large new job, and the business pending reaches the largest tonnage ever known. The general talk of lower prices is believed to be the chief factor in delaying the actual closing of contracts. If this were settled, or the closing of contracts gets a fair start at any time, a rush is expected in booking work for steel buildings. The Bon Marche Building, at Seattle, Wash., 1450 tons, is reported let to the Vulcan Iron Works of that city. Stone & Webster, Boston, are taking bids on 1500 tons of steel for a hydroelectric pipe line near Seattle, Wash. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The Great Northern Railway, following its recent order for 500 steel ore cars, is reported to have placed its pending order for 400 special hopper cars with steel underframes. A Chicago coal company has ordered 400 steel hopper cars. Scattering inquiries which are pending have brightened the prospects for car material. Plates are a little firmer than two weeks ago. Some of the outside mills have withdrawn concessions on sheared plates and, while 1.35c., Pittsburgh, can still be done on narrow sizes, the market has a stronger tone. The enormous pending tonnage of structural business will give the plate mills good specifications in the near future. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—New business last week was better than the mill interests had reason to expect. The withdrawal of concessions in prices had a pronounced effect in checking new business, which was falling off, anyway. Not much new buying is expected until the middle of January, but jobbers are carrying light stocks. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—A large tonnage of concrete bars will be required the coming year for terminal work at Kansas City, and the mills have already figured on good inquiries from this source. The railroads continue to specify freely for bar iron. New business in soft steel bars is quiet. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.40c. to 1.45c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—A good crop year is always followed by good spring trade in the agricultural field. While the record-breaking corn crop last year has caused a decline in the market for this cereal, it still commands a good price, and other grain values are satisfactory. This is bringing the wire mills good orders for spring trade, making a better showing for wire products than for any other branch of the steel industry. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Last week was the best in two or three months in specifications for agricultural steel. Farmers pay little attention to the stock market or the percentage of activity in iron and steel works, and a full demand is expected this spring for agricultural implements. Jobbers in merchant steel are carrying light stocks over their inventory season, and while they are buying from hand to mouth it is expected their orders will reach a fair total in January.

Cast Iron Pipe.—Western cities are somewhat slow in advertising their specifications for water pipe, and no large inquiries are reported in the market. The bond market is becoming more favorable, and if this improvement continues it will be easier to sell municipal bonds. A fair tonnage of gas pipe has been bought for the coming year. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—The year is ending quietly in the scrap trade, with prices generally weaker. There is not much material in transit, as dealers have cleared up most of the scrap they bought on railroad lists during the fall. The straggling lots that come in are hard to place. The dealers who make a specialty of buying melting steel are very reluctant to pay $12, delivered, for it, although they realize more than that price from the mills. Business has fallen off so rapidly in finished materials the past month that stocks are accumulating at mills and foundries, and buyers are

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holding off until they see better indications in finished lines or lower prices for scrap. There are no trades except in odd lots in transit, which can only be placed with consumers by shading prices. The general level of the market has remained unchanged the past week with this allowance. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$15.50 to $16.00
Old steel rails, rerolling	14.00 to 14.50
Old steel rails, less than 3 ft.	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.00 to 12.50
Frogs, switches and guards, cut apart	12.00 to 12.50
Shoveling steel	11.50 to 12.00

The following quotations are per net ton:

Iron angles and splice bars	$13.50 to $14.00
Iron car axles	18.50 to 19.00
Steel car axles	18.25 to 18.75
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.00 to 10.50
Steel axle turnings	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	12.25 to 12.75
Stove plate and light cast scrap	10.50 to 11.00
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	8.75 to 9.25

Philadelphia

PHILADELPHIA, PA., December 27, 1910.

Occasional sales are reported, but generally speaking, the markets continue dull and featureless. Some round lots of low phosphorus pig iron have been sold, but there is little movement in foundry grades. Fresh inquiries are light. Some mills report a shade better volume of business in plates and shapes, mostly of a miscellaneous character, with prices firmly maintained. The old material market is at a standstill. Furnace coke has been more active, sales in round lots for first half being reported; foundry coke, however, shows no particular movement. Current reports that there had been a meeting of the producers of basic pig iron held in this city December 16 are erroneous. The meeting referred to was held under the direction of the chairmen of the foundry and steel making pig iron subcommittees of the American Iron and Steel Institute, was attended by a number of general producers of pig iron in eastern Pennsylvania and Virginia, and conditions referring to the pig iron situation were discussed.

Iron Ore.—Consumers show no interest in the market. Importations at this port during the week ending December 24 aggregated 17,356 tons, valued at $67,232. This brings the total importations for 51 weeks of the year to 1,133,245 tons. Total shipments of ore from Wabana, Newfoundland, will aggregate 221,000 tons during the year, which represents about 77,000 tons less than total sales, shipment on that amount having been postponed. Two cargoes now afloat will conclude the season's shipments of Wabana ore to this port.

Pig Iron.—Buying has been irregular. In foundry grades the movement has been light, sales being closely confined to small prompt lots, for which prices of standard eastern Pennsylvania brands are maintained at $15.50 to $15.75, delivered, for No. 2 X foundry, although reports of lower prices for off grade irons are frequently heard, particularly in the Lebanon Valley district. In some instances producers continue to hold No. 2 plain grades at $15.25, minimum, but on desirable business others are still willing to allow the full 50 cents differential between No. 2 X and No. 2 plain grades. Some further movement in low grade irons to the pipe foundries in this district is reported at about $14.25, delivered, for Northern iron. Virginia foundry grades have not been active, small lot sales being reported at unchanged prices. The most important recent inquiry was that of the Pennsylvania Railroad for 450 to 900 tons of high silicon and 450 to 900 tons of low silicon foundry iron for first quarter delivery. Other inquiries are mostly for small lots. The demand for forge iron is practically at a standstill, with prices nominally quoted at $14.25 to $14.50, delivered in this vicinity. There is no fresh interest being taken in basic iron. A sale of a block of 6000 to 7000 tons of standard low phosphorus iron, for delivery understood to be over the greater part of next year, as well as several small lot sales at the market, is reported. Very little movement in any grade of iron is expected until after the turn of the year, as both buyers and producers are occupied with inventory matters. The following range of prices represents the market for standard brands, delivered in buyers' yards, eastern Pennsylvania and nearby points:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.50 to 16.00
Virginia, No. 2 plain	15.50 to 16.00
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	22.00 to 22.50

Ferromanganese.—The demand is very light, with prices nominally quoted at $38.25, Baltimore, for prompt, and $38.50 for first half shipment.

Billets.—What little business comes out is in small lots for prompt delivery. Prices are unchanged, but the market has in no way been seriously tested, ordinary open hearth rolling billets being quoted at $24.50, delivered in this vicinity, with ordinary forging billets at $28, Eastern makers' mills.

Plates.—Several mills report an increase in the volume of business, and express themselves as more encouraged as to prospects after the turn of the year. The bulk of the orders received are for prompt shipment. Prices are reported as being maintained firmly at the recent 1.55c. minimum for ordinary plates, delivered in this vicinity.

Structural Material.—A trifle better run of orders for miscellaneous plain shapes is reported, but there has been practically no large business placed. Reports that a producer in this district would furnish the material for the Quebec Bridge are denied by parties interested. Prices of plain shapes are being maintained at 1.55c. minimum, delivered in this district.

Sheets.—Orders are less numerous. Mills in this district are practically all closed for the usual year end overhauling and inventories, and in several instances will have to await an accumulation of orders before resuming operations. A small lot business, which can be largely supplied from stock, is reported. Prices are unchanged, the following range representing Eastern makers' quotations: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—New business has been rather light and confined to miscellaneous prompt requirements of consumers. For ordinary prompt business refined iron bars are quoted at 1.35c. to 1.45c., delivered in this vicinity, although for desirable quantities and specifications as low as 1.32½c., delivered, has been done. Steel bars are quiet, leading producers maintaining the recent quotation of 1.55c., delivered in this territory.

Coke.—The movement in foundry grades is light and irregular. At least one good sized lot of furnace coke, understood to aggregate 50,000 tons, covering requirements of one of the Eastern furnace interests for the first half, is reported sold within the range of ruling prices. Quotations while unchanged appear a trifle firmer, the following range per net ton representing the market for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	$3.90 to $4.00
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.50 to 3.60
Foundry coke	3.85 to 4.05

Old Material.—Transactions have been comparatively small and in many instances hardly sufficient to establish quotations. No movement is reported in heavy melting steel scrap, and the demand for rolling mill grades drags. Quotations are, to a large extent, nominal. The following range, however, about represents sellers' ideas of the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$12.50 to $13.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 18.50
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.00 to 17.50*
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.75 to 16.25
Wrought iron pipe	12.25 to 12.75
No. 1 forge fire	11.00 to 11.50
No. 2 light iron	7.00 to 7.50
Wrought turnings	8.00 to 8.50
Cast borings	8.00 to 8.50
Machinery cast	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Grate bars	11.00 to 11.50
Stove plate	10.00 to 10.50

* Nominal.

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Cleveland

CLEVELAND, OHIO, December 27, 1910.

Iron Ore.—The total quantity of Lake Superior ore in all furnace yards on December 1 is estimated at 23,174,000 tons. With the stocks on Lake Erie docks on the same date previously reported, this makes a total of 32,600,000 tons in round figures. With this large quantity of unconsumed ore on hand the indications are that there will be considerable falling off in the ore movement from mines during the coming season. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The condition of the pig iron market was discussed at some length at a meeting of blast furnace interests held in this city December 21, but practically nothing was accomplished. The question of trying to maintain a minimum price that would allow producers a reasonable profit was brought up, but was declared illegal and impracticable. The sentiment of the meeting was in favor of further curtailing production by blowing out stacks and by banking during the holiday season. No attempt was made, however, to take united action on the matter of reducing the output, so that each producer will continue to act independently. The sentiment in favor of banking furnaces during the holidays seems to have resulted in such action in few, if any, cases. The representation at the meeting from the Cleveland, Valley and Pittsburgh districts interested was quite small. The market continues extremely quiet. We note the sale of 1500 tons of malleable iron to a northern Ohio consumer for the first half delivery, and two lots of foundry iron for the same delivery, 500 tons of Northern to a Cleveland stove manufacturer and 1000 tons to a northern Ohio concern, half Northern and half Southern. There is an inquiry from an Erie, Pa., engine builder for 500 tons of foundry iron for the first half. The few other inquiries that have come out during the week are for small lots. One unsatisfactory feature of the present situation is the fact that many foundry iron consumers have overbought quite heavily, and furnace companies will start the new year with considerable last half iron on their books, some of which will not be consumed much before the end of the first quarter. This iron was sold early in the year when business was better than at present, so that the actual requirements of the buyers were less than anticipated. Prices remain steady at recent quotations. No. 2 foundry for local delivery is firm at $14.25, delivered, for the first half. The Valley price of $13.75 is being met for outside shipment. Southern iron is offered at $11, Birmingham, for the first half. For prompt shipment we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.90
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—The market is generally quiet, although there is some inquiry for foundry coke for the first half. Some other consumers who have not placed contracts are expected to depend for the present on spot shipment purchases to meet their requirements. Prices remain about stationary. We quote standard Connellsville furnace coke at $1.45 to $1.50 per net ton at oven, for spot shipment, and $1.70 to $1.80 for the first half. Best grades of Connellsville 72-hour foundry coke are held at $2 for spot shipment and $2.10 to $2.50 for the first half.

Finished Iron and Steel.—Some of the mill agencies are getting a good volume of orders, but they are all for very small lots. Orders are almost wholly for immediate requirements, and no inquiries for round tonnages are pending. There are reports that a Western bar iron mill, taking advantage of lower prices on billets, has recently sold some steel bars in the Ohio territory on the basis of 1.35c., Pittsburgh, but this shading has not affected the general market, which is firm at 1.40c., Pittsburgh. While the demand for plates is still light, one mill agency reports an improvement in orders and specifications from Ohio boiler makers. The demand for structural material is light, most of the larger work pending in this territory being held up until after the first of the year. The demand for sheets shows a little more activity than during the past few weeks, both in specifications and current orders; prices are being fairly well maintained, but buyers are not contracting for future delivery at current prices. The demand for iron bars continues light, and one of the local mills is shut down this week; prices are stationary, 1.30c., at mill, being the minimum quotation. The demand for forging billets has picked up somewhat and orders are being taken at rather better prices than have prevailed during the past two or three weeks. Rivet prices are again weaker. Current orders and contracts for the first half are being taken at $2 a ton below the regular quotations.

Old Material.—The market is almost lifeless. Local mills have good sized stocks on hand and are holding back on shipments until after the first of the year. As a result of the absence of a demand, prices show further weakness. Several quotations have been reduced from 25c. to 50c. a ton and others are largely nominal. Dealers do not look for much change in the condition of the market until well along in January. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$15.75 to $14.25
Old iron rails	15.50 to 16.00
Steel car axles	19.50 to 20.00
Heavy melting steel	12.75 to 13.00
Old car wheels	12.00 to 12.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	11.75 to 12.00
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	12.50 to 13.00
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

The Republic Iron & Steel Company will open a sales office at 1007 White Building, Buffalo, N. Y., January 15. This office will be a branch of the company's sales office in Cleveland. The Buffalo office will be in charge of M. E. Gregg, at present the traveling representative of the company in the Buffalo territory, who will continue to act also as the traveling representative.

Cincinnati

CINCINNATI, OHIO, December 28, 1910.—(*By Telegraph.*)

Pig Iron.—Two Indiana inquiries for approximately 500 tons each of foundry iron for first quarter delivery are being figured on, but aside from these very little interest is taken in the market at the present time. Both producers and consumers are playing a waiting game, and no change is expected until after the holiday season. A few foundries are buying carload lots to fill immediate requirements. With some agencies this small spot shipment business was good during the first two weeks of December, but the latter part of the month makes a poor showing. For shipment from January to July, inclusive, one company reports a sale of 600 tons of Northern iron based on $14, at furnace, for No. 2 foundry. There was also a sale of 400 tons of Southern No. 2 foundry at $11, Birmingham, February to June shipment. While some furnaces are holding out for a premium of 50c. per ton covering shipments extending through the first half, it is generally conceded that $11, Birmingham, and $14, Ironton, can easily be done for the remainder of this year and for the coming quarter. A typographical error was made last week in the quotations on Southern coke No. 2 foundry. Instead of $14.25 to $15.75, the quotations should have read $14.25 to $14.75. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—Last week several medium sized lots of furnace coke for prompt shipment were sold by Wise County operators to Southern furnaces. No time contract business is reported. Foundry coke continues inactive. Prices for both furnace and foundry coke remain the same, except that a premium of 5c. to 20c. is understood to have been obtained on the shipments above mentioned from the Wise County field. For spot shipment $1.45 to $1.55, and on contracts $1.65 to $1.85 per net ton at oven are named for furnace coke in all three fields. Foundry coke is quoted at $2 for prompt delivery, and around $2.25 per net ton at oven on contracts.

Finished Iron and Steel.—As was anticipated, the week opens up very dull, but a large structural steel busi-

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ness in 1911 is expected by leading interests in this territory. The warehouse price of structural material runs from 1.75c. to 1.85c. Sheets are rather poor sellers just now.

Old Material.—Leading scrap dealers are not making any effort to buy more stocks, preferring to wait until their yards are partially cleaned out. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 6.50
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., December 26, 1910.

Pig Iron.—The sale of 5000 tons of high manganese iron for shipment over the first half of next year was the only transaction of consequence reported in this market in the past week. It is understood that the tonnage just mentioned was sold at $13, Birmingham, but with certain stipulations as to the silicon content. A lot of 200 tons of standard Clifton iron for first quarter delivery was sold at $12.50, Birmingham, and 100 tons of that brand for shipment during the next four months brought the same price. For regular foundry iron $11, Birmingham, is believed to have been maintained, although carloads and lots of 100 to 200 tons for comparatively early shipment have been the usual thing recently. A comparison of the aggregate stocks with the tonnage required for unfilled orders as of January 1 is being awaited with much interest by the producers, and it is quite likely quotations will be revised as a result. All indications are very favorable for a much stronger demand for prompt shipments after foundry plants are again in operation, while the recent reduction in pig iron output must, of course, have a tendency to strengthen prices. Three furnaces producing foundry iron and two producing basic iron have been blown out in this immediate district within the past fortnight; also that still another furnace producing foundry iron is to be blown out during the next two weeks, and that no preparations are being made for an addition to the output of foundry iron within the next few months. Within the week a very attractive tonnage of charcoal iron for shipment in the first half was submitted to producers, and it is understood that with the placing of that tonnage quotations will be firmer, owing to the condition of producers' order books.

Cast Iron Pipe.—It has been definitely announced that approximately 24,000 tons of water pipe and 12,000 tons of gas pipe will be awarded producing interests early in February next. The water pipe is required at Portland, Oregon, and California points, while the gas pipe is for Portland only. So far as can be ascertained no figures have yet been submitted on any of this business, but the competition will doubtless be very keen owing to the stocks now on hand and the condition of order books. We continue to quote water pipe nominally as follows per net ton, f.o.b. cars here: 4 to 6 in., $19 to $19.50; 8 to 12 in., $18 to $18.50; over 12 in., averge $17, with $1 per ton extra for gas pipe.

Old Material.—Nothing of particular interest has developed in this market and dealers are adhering to asking prices as last revised. The movement is very light and additions to stocks are seldom required. A very attractive tonnage is understood to be in sight for dealers, owing to the recent cleaning at foundry plants, but it is quite probable that offers will be very low. We quote dealers' asking prices as follows per gross ton, f.o.b. cars here, which are nominal in the main:

Old iron axles	$14.00 to $14.50
Old iron rails	12.00 to 12.50
Old steel axles	14.00 to 14.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	7.50 to 8.00
No. 2 country	7.00 to 7.50
No. 1 machinery	9.50 to 10.00
No. 1 steel	10.00 to 10.50
Tram car wheels	9.00 to 9.50
Standard car wheels	10.00 to 10.50
Light cast and stove plate	7.50 to 8.00

No. 2 furnace of the Birmingham Coal & Iron Company's Vanderbilt, Ala., plant has been blown out. Two furnaces running on basic iron at the Ensley group of the Tennessee Coal, Iron & Railroad Company were blown out last week.

The Hammond-Byrd Company of Birmingham, Ala., has been appointed Western representative of the American Casting Company, also of Birmingham, to handle its National lock joint cast iron culvert pipe.

Buffalo

BUFFALO, N. Y., December 27, 1910.

Pig Iron.—The market remains very quiet, with light inquiry and diminished order lists. What sales are made continue to run in small lots to take care of buyers' immediate needs. Consumers and producers alike are apparently resting on their oars until the new year, and pending the conclusion of inventory taking, which is a factor in restricting interest in the market at present, limiting the consumption of iron to a minimum. Price schedules, which were advanced slightly in November to meet increased cost, have not been changed materially since that time, the majority of furnaces standing rather firmly by them; attractive offers for fairly prompt shipment might, however, receive consideration in some instances. The report that 1000 tons of malleable had been sold from this district recently at $16, Philadelphia, for first half delivery, equivalent to $13.50 at furnace, is erroneous and has been emphatically denied by all Buffalo district furnaces, as also the report that 2000 tons of malleable had been purchased by a Buffalo consumer at $14, delivered. A purchase was made of resale iron, but the report in question was misleading, as no malleable can be purchased here at as low a price as this would represent. We quote as follows for prompt and first quarter delivery, f.o.b. Buffalo:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.50 to 14.75
No. 3 foundry	14.25 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.50 to 15.25
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—The period of quiet incident to the closing up of the year's business and inventory taking is distinctly in evidence, the demand being light for all finished materials. The lull is more pronounced because of the fact that buyers are holding off on placements for stock hoping to gain advantage from price reductions should any occur and restricting all orders to immediate requirements. A feature of current small orders is that they are generally marked "rush," indicating depleted stocks with both jobbers and manufacturers. The Canadian export trade is still good, although less active than for the preceding few weeks. In structural material there is considerable inquiry, and the outlook for early spring construction is very promising. Bids went in Wednesday for the 180 tons required for the R. T. French & Co. warehouse at Rochester. The Eastman Kodak Company, Rochester, is asking figures on three new buildings, requiring a large tonnage, and plans are out and figures will be taken early next week for the new buildings for the Buffalo Orphan Asylum, involving about 600 tons.

Old Material.—Buying is exceedingly limited. Mills continue to hold up shipments on contracts and are taking less material than for some time. The embargo placed on shipments of borings and turnings by one of the large users in the Pittsburgh district has brought that branch of the market to a decided standstill locally. Prices are unchanged, but largely nominal. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$11.75 to $12.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	9.75 to 10.25
Locomotive grate bars	10.50 to 11.00
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast borings	6.50 to 6.75

The New York State Steel Company will not finish the relining of its furnace and have it ready for blowing in before January 15. The company expects to use the entire product of the furnace for its own consumption, for a time at least, after its resumption, and will have none to market.

St. Louis

ST. LOUIS, December 26, 1910.

While the pig, coke and metal markets are seasonably quiet, as customary at the stock taking and accounting period of the year, revived inquiry is confidently expected when it has passed. An encouraging feature is noted in an increase of indications for business in railroad equipment and supplies in the near future. A large increase in the volume of manufactures is shown by statistical records in St. Louis the past year, a total in value of $300,000,000 having been reached. The coming year promises to be the banner twelvemonth for the promotion and building of in-

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terurban railroads in southern central Illinois. Several electric railroads are also planned for central Missouri.

Pig Iron.—With one or two exceptions, the pig iron brokers did but little business during the past week, and with most of them even inquiries were very limited in number and in volume. The consensus of opinion seemed to be that it was more quiet than is usually the case toward the year's end. And, furthermore, some of the leading sellers state they cannot reasonably look for much improvement until the second week in January, at which time the inventory season will be over. It is also admitted that in view of the spread between Northern and Southern iron being less than one-half the usual difference, Southern iron continues to suffer a handicap in competing territory. Among the inquiries noted is one for 500 tons of malleable iron, for shipment over the first half. A contract for 600 tons of Southern No. 2 foundry, for shipment over the first half, was divided between two offices, while another office sold between 300 and 400 tons of Southern foundry, mostly for prompt shipment. With most sellers the price for Southern No. 2 foundry is $11, Birmingham, for shipment over the first half, but a leading interest asks $11.25 for the second quarter.

Coke.—It was a dull market in coke the past week, inquiries and sales being light. A leading office reports a sale of 12 cars of Connellsville foundry, shipment of four cars per month for three months, while another office placed a contract for 200 tons of Connellsville foundry for shipment over the first half. The tone of the market continues easy and the price for standard 72-hour Connellsville foundry is quoted at $2 to $2.25 per net ton, according to quantity and delivery, f.o.b. oven.

Finished Iron and Steel.—The leading interest reports a sale to the Kansas City Southern Railway of 1000 tons of standard rails. We note an inquiry by the Cotton Belt Railroad for 2000 cars, and learn that another local railroad company is in the market for 200 to 400 cars. Leading local steel foundries report that inquiries for railroad equipment are becoming more numerous on the part of Southwestern railroads and considerable business is confidently looked for early in the coming year.

Old Material.—Leading dealers in scrap iron and steel state that the market is lower to sell, the demand being so limited that an inducement in prices is necessary to effect sales. At the same time they regard scrap iron and steel a purchase to hold, believing that a better demand will spring up in the near future. Stocks in local yards are smaller than at the corresponding time last year. Relaying rails continue in good request. There were no offerings by the railroads during the past week. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	15.50 to 16.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.00 to 10.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	8.50 to 9.00
Railroad tank and sheet scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.00 to 7.50

The new lead smelter at Webb City, Mo., to be operated by George Moore, has been buying lead ore heavily for the past few weeks.

The annual dinner of the Manufacturers' Publicity Association will be held this evening in the Fort Pitt Hotel, Pittsburgh. Addresses are to be made by Herbert S. Houston, chairman of the Executive Committee, and by Richard H. Waldo, secretary of the Eastern Division of the Associated Advertising Clubs of America. A vaudeville entertainment will also be given. Colvert Gordon is president of the association; J. C. McQuiston, Westinghouse department of publicity, vice-president; W. A. Keirn, Mesta Machine Company, treasurer, and C. W. Brooke, Machesney Building, secretary.

New York

NEW YORK, December 28, 1910.

Pig Iron.—Foundries appear to have little need of iron for the immediate future and are no more convinced than they have been for some time that they will pay more by waiting. Shipments on contracts go on without interruption, as a rule. Inquiries are of the 100 ton and 200 ton order and only one for a considerable lot—and that for 1500 tons—is spoken of in the local market. We quote for tidewater delivery as follows: Northern No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $14.75; Southern No. 1 foundry, $15.50 to $15.75; No. 2, $15.25 to $15.50.

Steel Rails.—A trolley line in Maine is inquiring for 3300 tons of standard sections. The Tennessee Coal, Iron & Railroad Company has sold 1000 tons each to the Louisiana Railway & Navigation Company and the Kansas City Southern. Sales of the Illinois Steel Company have amounted to about 2000 tons in the past week.

Finished Iron and Steel.—The quiet of holiday and inventory season is everywhere evident. Prices appear if anything to be a trifle firmer than two weeks ago. An encouraging report is that consulting engineers are rather busy with plans for new work, particularly from the railroads, which presages quite a little better business for the steel mills in the near future. Immediate prospects, however, especially in the plate and bar trades in this territory, show no improvement over recent and present conditions. In structural material very few new contracts have been closed and little additional inquiry has come into the market. The Boston Bridge Works was awarded 360 tons of bridge material for the Boston & Maine and the Phoenix Bridge Company 85 tons from the same road. There is still about 2000 tons pending for the Boston & Maine. The Vulcan Iron Works has the Bon Marche store, Seattle, 1400 tons. The New York Central received bids December 23 on 800 to 1000 tons for a suburban station, and December 27 on 3000 tons for bridges over the New York State Barge Canal. No awards are yet reported on these nor on the 1000 tons for the Delaware, Lackawanna & Western or the Sloane Building. It is said that very low prices were offered on the erection of the latter. Since the opening of the bids on the Quebec Bridge, three out of the four bidders have been rumored to have the award, but the truth is that no decision has been reached. The Pennsylvania lines West are inquiring for 300 tons, and the New York, New Haven & Hartford for 150 tons of bridge material. The American Bridge Company has submitted a bid on the Portland, Ore., bridge, 8500 tons. It has developed that the Masonic Temple addition on Twenty-third street will require nearly 4000 tons. On the bids opened December 22 for the construction of caissons for the dry docks building at the Pearl Island naval station, the Puget Sound and the New York navy yards, the Snare & Triest Company, New York, was low bidder on the last named, and the Moran Company, Seattle, on the other two. About 550 tons of steel will be required for the New York structure, about the same for the Puget Sound and somewhat less for the other. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Cast Iron Pipe.—The market is bare of news this week. The nominal quotation of carload lots of 6-in. continues at $22 per net ton, tidewater.

Old Material.—No inquiries of moment and few sales are reported. Dealers expect a continuance of quiet conditions until some time in January, and would not be surprised if prices went somewhat lower. Quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$10.50 to $11.00
Old girder and T rails for melting	10.00 to 10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	12.00 to 12.50
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	10.00 to 10.50
Light iron	5.00 to 5.50
Cast borings	5.50 to 6.00
Wrought turnings	5.50 to 6.00
Wrought pipe	9.50 to 10.00
Old car wheels	11.50 to 12.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	12.00 to 12.50

Ferroalloys.—Buyers are somewhat indifferent about ferrosilicon. There is an inquiry in this market for a 50-ton lot and quotations are being made at around $56, Pittsburgh. Some low prices have been quoted on foreign ferrosilicon for spot or early delivery, but it is declared that sellers are not particularly anxious to quote on futures at

THE IRON AND METAL MARKETS

present. A stronger market is looked for. There are a few inquiries for small lots of ferromanganese and it is being offered at $38.50 to $39, Baltimore.

Metal Market

NEW YORK, December 28, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
		Electro-		New	St.	New	St.
Dec.	Lake.	lytic.	Tin.	York.	Louis.	York.	Louis.
22	13.00	12.75	38.20	4.50	4.35	5.75	5.60
23	13.00	12.75	38.25	4.50	4.35	5.70	5.55
24	13.00	12.75	....	4.50	4.35	5.70	5.55
27	13.00	12.75	38.20	4.50	4.35	5.65	5.50
28	13.00	12.75	38.45	4.50	4.35	5.65	5.50

Pig tin has steadily advanced day by day. Copper is neglected and weaker. Spelter has declined further. Lead is firm and said to be scarce.

Copper.—A deadlock exists between buyers and sellers, and prices are decidedly nominal. The leading interests continue to hold lake copper at 13c. and electrolytic at 12.75c. There are reports of offerings of lake at 12.87½c. and electrolytic at 12.62½c., New York, but as considerable shopping about would have to be done to be able to buy at such prices it is considered that the daily figures quoted above are the market quotations. The business week has been a short one. There are reports of a few small sales of electrolytic at 12.75c., delivered in the Naugatuck Valley, 30 days cash, but these transactions were not of enough consequence to have any effect on the market. In London to-day the copper market closed with spot copper selling at £56 and futures at £56 15s. The sales amounted to 700 tons of spot and 700 tons of futures. The market closed weak.

Pig Tin.—The London market closed at noon Friday last and did not reopen until this morning, and as stocks are scarce and well concentrated here both buyers and sellers seem to have preferred to await the opening of the London Exchange. Late in the afternoon of December 21 a sudden buying movement developed and a big business was done, amounting to between 350 and 400 tons. Most of these transactions were for spot and December delivery, and a few orders were placed for stocks to be delivered early in January. The market advanced in a few hours from 37.70c. to 37.85c. The following day it opened at 38.20c., whereupon buyers who had been making inquiries withdrew, and since that time quotations have steadily advanced with practically no transactions. Considering the fact that this market will be closed two days during the ensuing week very little trading is expected until the new year begins. The pig tin market in New York went up 25 points to-day, on the strength of advanced prices in London. This afternoon pig tin was sold in New York for 38.45c. The London market closed with spot tin selling at £175 7s. 6d. and futures at £175 10s. The sales amounted to 200 tons of spot and 300 tons of futures. The market closed strong.

Tin Plates.—Business is dull. The price continues at $3.84 for 100-lb. coke plates.

Lead.—A great deal of discussion has been going on over recent statements regarding the depletion of lead stocks. It is now generally believed that lead is scarce. In this connection a statement from authoritative sources as to the position of a leading lead producing company is interesting. It is learned that the St. Joseph Lead Company in 1909 produced 53,000 tons of lead, and in 1910 62,000 tons. One year ago over 8000 tons of lead was in the hands of the company, while at the present time its holdings amount to not more than 2500 tons. Other lead producers believe that the leading interest is as comparatively short of stocks. There has been little buying. The market is being held very firmly at 4.50c., New York, and 4.35c., St. Louis, and promises to maintain its strength. Some outside sellers are asking from three to five points more than that price.

Spelter.—Spelter is being manipulated with little effect on the consumer, as buyers are practically out of the market. The price has been reduced 10 points within the week, with the idea of drawing consumers out, but with no apparent success. It is hard to tell from day to day just what the price will be, but from the uniformity of quotations it is judged that holders of the metal understand each other very well. Considering that within about five weeks Government reports showing the stocks of spelter on hand will be out, it is reasonable to suppose that some sellers are trying to get rid of their stocks previous to the publication of the official figures. The future of the market is decidedly uncertain. The metal can be bought here at 5.65c. and in St. Louis at 5.50c., and perhaps lower, as the market there is somewhat disorganized. Sheet zinc has been reduced to $7.50 per 100 lb. basis, less 8 per cent. discount, f.o.b. Peru, Ill.

Antimony.—The price of Cookson's has stiffened, and it is now being offered at 7.62½c. to 7.75c. Some people appear to be overstocked with certain brands of antimony. Hallett's can be had at around 7.75c. and Chinese brands are selling at 7.25c. Hungarian grades are offered at from 7c. up.

Old Metals.—The market is weak, with but little buying. Dealers' selling prices are nominally as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.00 to 11.25
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, December 27.—The railroads are steady buyers of copper and other metals for repair work, and there is a fair demand for copper in other lines. Tin is a shade lower. Spelter continues to decline. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 38.75c.; small lots, 41c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.50c. to 5.55c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 12c.; red brass, 11c.; yellow brass, 9c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 24½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, December 26.—Lead is quiet at 4.37½c.; spelter is lower and quoted at 5.25c. to 5.30c., both at East St. Louis. Zinc ore is lower and held at $38 per ton, Joplin base. Tin is quoted at 38.60c. per pound; antimony (Cookson's), 7.85c.; lake copper, 13.22½c.; electrolytic, 13.05c., all at St. Louis. The demand for finished metals for the past week was slow.

Iron and Industrial Stocks

NEW YORK, December 28, 1910.

The stock market has been unable to withstand the pressure of dull business and prices have given way to some extent. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week, there being quite a number of stocks in which there were no transactions, was as follows:

Allis-Chalm., pref.	29 - 30	Pressed St., pref.	92
Can, com.	8⅞ - 9⅛	Railway Spr., com.	31¼
Can, pref.	76¼ - 77⅞	Railway Spr., pref.	92
Car & Fdry, com.	48½ - 50	Republic, com.	30 - 30½
Steel Foundries	42 - 42½	Pipe, pref.	50¼ - 52½
Colorado Fuel	31	U. S. Steel, com.	71⅛ - 73¼
General Electric	151 - 155¼	U. S. Steel, pref.	116½ - 116¾
Gr. N. ore cert.	56¾ - 56¾	Westinghouse Elec.	65½ - 67
Int. Harv., com.	110½ - 111	Va. I. C. & C.	56½
Int. Harv., pref.	121½ - 122	Am. Ship, com.	76
Int. Pump, com.	40 - 41	Chi. Pneu. Tool	40½ - 41
Int. Pump, pref.	84½	Cambria Steel	42¼ - 42⅝
Locomotive, com.	36¾ - 36½	Lake Sup. Corp.	28¼ - 28⅞
Locomotive, pref.	105½	Warwick	10¼
Pressed St., com.	30 - 31¼	Crucible St., pref.	75⅛ - 77¼

Dividends.—The Youngstown Sheet & Tube Company has declared a quarterly dividend of 2 per cent.

The Monongahela River Consolidated Coal & Coke Company, Pittsburgh, has declared a quarterly dividend of 2 per cent., or $1 a share, on the preferred stock, payable January 25. The last dividend of this company was declared about this time last year, and was at the rate of 1¼ per cent.

The Nova Scotia Steel & Coal Company has declared the regular quarterly dividend of 2 per cent. on the preferred stock, and 1¼ per cent. on the common, payable January 14.

The Vulcan Detinning Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable January 20.

Stockholders of the Union Switch & Signal Company have voted to increase the common stock from $2,000,000 to $4,000,000. The directors subsequently met and declared a stock dividend of 60 per cent. and the usual 3 per cent. quarterly cash dividends on common and preferred shares, all payable January 10. The directors also decided to offer to stockholders pro rata 10,000 shares of new common stock at $75 a share, par value $50, payable in installments, which will give the company $750,000 additional work capital. Ten thousand shares of the new common stock will remain in the treasury for future use. Stockholders of record December 31 will have the right to subscribe for the new

stock, so that the old shares will sell ex-dividend and ex-rights on that date.

The Walworth Mfg. Company has declared a regular quarterly dividend of 3 per cent., payable December 31.

The American Rolling Mill Company, Middletown, Ohio, has declared a dividend of 1½ per cent. on the preferred stock and 3 per cent. on the common, payable January 15.

Notes on Prices

Rope.—This is, of course, the dull season in cordage, and not much is expected in the way of business, but hopes are entertained that spring trade will show improvement. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure Manila of the highest grade, 8¾c. to 9¼c. per pound; second grade Manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure Sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 6¼c. to 6¾c. per pound; No. 2, 5½c. to 6c. per pound.

Linseed Oil.—Crushers have reduced the price of raw linseed oil in five-barrel lots to 90c. per gallon. The demand continues moderate, but since the reduction in price the market is firmer, owing to an advance in both foreign oil and seed on the other side. What has caused this advance is not ascertained, but the idea that there might be a further decline in the price of domestic oil has, at least for the present, been abandoned. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
State, raw	90
City, raw	90

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon.

Spirits Turpentine.—The market at Savannah is very firm, as large interests are absorbing most of the receipts which at this time are comparatively light, so that the outlook is for higher prices during the nonproductive season. At this point the demand is small, New York quotations in five-barrel lots are as follows:

	Cents.
In oil barrels	79½
In machine barrels	80

Less than 5-bbl. lots, ½ cent advance per gallon.

Stephens-Adamson Improvements.—The Stephens-Adamson Mfg. Company, Aurora, Ill., has just completed a new steel fabricating shop. For the manufacture of conveying and screening machinery this shop is one of the largest and best equipped in the country. The building is of steel construction designed by the J. C. Buckbee Company, Chicago. The arrangement of machinery provides for the most economical procedure of the work through the shop, and no expense has been spared to enable a high grade product to be turned out in the least time and in the most efficient manner. This company has also increased the size of its offices and power plant. These additions have been greatly needed to take care of a largely increasing business.

The Orton & Steinbrenner Company, with main office at 1806 Borland Building, Chicago, is erecting a plant at Huntington, Ind., for the purpose of manufacturing locomotive cranes and clamshell buckets. The main building will be 80 x 160 ft., one story, with steel frame throughout, brick side walls and wood floor and roof. It will have two small extensions. The main bay will carry a three-motor electric traveling crane, while one of the side bays will have a hand power traveling crane. There will also be several hand power jib cranes. The building will be equipped principally for a machine shop, but will also have a limited capacity in fabricating structural steel. The company is engaged in the business of contracting engineer for material handling machinery.

The Hubbard Steel Foundry Company, Chicago, has increased its capital stock from $300,000 to $400,000. The company has under construction at its foundry at East Chicago, Ind., an addition, 120 x 190 ft., to provide additional molding floor space. A 30-ton acid open hearth furnace was completed in August, 1910, with corresponding steel foundry equipment.

New Publications

Shop Kinks. By Robert Grimshaw. Bound in cloth. Size 6 x 7½ in. Pages 393; illustrations 224. Price $2.50. Published by the Norman W. Henley Publishing Company, 132 Nassau street, New York City.

This is the fifth edition of a book which is said to be entirely different from any other on machine shop practice and one that shows special ways of doing work, as it is done in a number of leading shops in America. The work is the outcome of a notebook started by the author about 30 years ago and contains items written by the author and others for technical journals and also material gathered from visits to shops or based on data contributed by leading machine tool builders and users. As far as possible the effort has been made to group items of the same nature together, and the finding of them is rendered easy by an extensive alphabetical index.

The Mechanical World Electrical Pocket Book for 1911. Size 4 by 6 in.; pages 208. Bound in cloth. Price sixpence net. Published by Emmott & Co., Ltd., 65 King street, Manchester, England.

In presenting this new issue of the yearly revised electrical pocket book, in general the book has been thoroughly revised and many new illustrations introduced. Among the particular changes noted are that the descriptive matter has been condensed, thus affording space for a large number of new tables on subjects such as current densities, permissible temperature rise, percentage losses in electrical machinery, units of illumination, incandescent lamp current consumption, life of glow lamps and allowances for depreciation. The notes on accumulators have been rewritten and extended as well as the sections dealing with circuit breakers, boosters and the use of electricity in coal mines. Another change worthy of special mention is the introduction of a new section on liquid starters. In all the sections, both the new ones and those which have been included in previous issues, considerable useful data and tabular information have been given.

The report of the Cincinnati Branch, National Metal Trades Association for the quarter ending December 15 shows that manufacturing plants that are members of the association are working at 91 per cent. of capacity, as compared with June, 1907. This is exactly the same percentage shown in the report for the quarter ending September 15, and, judging from reports from other parts of the country, is considered a remarkably good showing for the Cincinnati manufacturers.

The Standard Steel Company has about completed its new plant in Bedford, Ohio, a suburb of Cleveland, and will place it in operation by January 1. The plant is equipped with one stand of cold rolls for polishing and planishing, room being provided for the installation of additional rolls later. The company will make blue polished and planished sheets for ovens, heaters, steel ranges, stove pipe and for other purposes where high-grade blue or polished sheets are required.

The Standard Chain Company, Pittsburgh, Pa., has been awarded a contract by the United States Government for 96,400 ft. of its Ajax steel loading chain, to be used in anchoring torpedo mines. The order was awarded after severe competition, under specifications calling for the best chain possible.

The new plant of the Canton Sheet Steel Company, Canton, Ohio, is now in operation, five of the eight mills having been started during the past few days. The rest will be started a little later.

The Machinery Markets

Encouraging reports as to future business in the machinery trade come from all parts of the country, and in some sections a decided improvement is already noted. The railroads are good customers for machinery in several centers. Trade in the New York market has picked up and the month is closing strong. In New England an improvement is noted in spots. Inventory taking is interfering with trade in that market, as well as in Philadelphia. A better volume of inquiries is noted in the Cleveland market and several are for good sized lots of tools. This is encouraging, as the business done there of late has been of a single order character. Railroad buying is occupying the attention of the Cincinnati trade, and there are indications that the Lake Shore will soon buy for its Elkhart shops. A small list is now out from the Chesapeake & Ohio Railroad. The railroads are also more active in Chicago. The carrying companies have been making purchases there recently without issuing lists, but business from other sources is not well distributed, some houses reporting a good trade, while others are rather dissatisfied. A greater degree of activity exists in Detroit than was looked for at the close of the year and a large amount of new business is in sight. Dock improvements along Lake Superior, which will call for heavy expenditures for freight handling machinery, contribute to the better feeling in the Northwest. The Southern Pacific Railroad Company is expected to buy in the South for improvements in Louisiana, and an unusual amount of railroad construction planned for Texas will bring out some good trade there.

New York

NEW YORK, December 28, 1910.

Business shows a material improvement in the New York market, both in the way of orders and inquiries. If two-thirds of the inquiries now before the trade materialize within the next 30 days a very excellent business will be done in January. The Simms Magneto Company is expected to come into the market for about $30,000 worth of equipment within the next few days, and there are two small lists out which may be closed. The New York Central Lines have been purchasing a tool here and there, but other railroads in the East continue their policy of economy. One New York machinery house received 14 inquiries in one mail, calling for from one to three machine tools, and every inquiry came from a manufacturer in a different field, which indicates the diversified demand. A number of Eastern steel mills have taken advantage of the slack market in that trade and are giving orders for equipment to be installed in place of machinery now idle because of shutdowns. The call for mining equipment continues especially good, and the smelters have been large purchasers during the last four weeks. The American Smelting & Refining Company has been doing a great deal of general buying for all of its plants. Business continues excellent in the second-hand machinery trade and some classes of machine tools are bringing especially good prices.

The Coldwell Lawn Mower Company, Newburgh, N. Y., has purchased the plant of the Newburgh Steam Mills at Newburgh. The plant consists of a main building, 350 ft. long, six stories, containing 200,000 sq. ft. of floor space. A large section of the Coldwell Company's plant was recently burned and the company has been purchasing in this market to replace machinery destroyed. It is moving its equipment into the recently acquired building as fast as possible, and will devote that structure to the manufacture of its horse and motor equipment, as well as its repair department. The company is well provided in its hand mower department, as just before the plant was burned a new building directly across the street was completed. The new plant is admirably situated on the Hudson River and it has over 1000 ft. of docking facilities and switching connections with the West Shore Lines.

The Turner Construction Company, 11 Broadway, New York, has been awarded the general contract for the construction of a large factory at Bayonne, N. J., for the standard Oil Company, 26 Broadway, New York. The plant will be used for the manufacture of oil cans, and it will be 153 x 300 ft. and two stories. The building will cost about $100,000, and it will be equipped with a full line of metal working equipment used in the manufacture of cans.

A tract of land embracing 300 building lots in Harrison avenue, Kearny, N. J., has been purchased by Mendel-Samuels & Sons, scrap metal dealers of Newark, N. J. The land will be used for yards and buildings for storing scrap metal. Equipment for handling scrap metal will be installed and the plant will cost about $150,000. The land is adjacent to the Erie Railroad and switching tracks from the main line will enter the yard. The plant will be one of the largest of its kind in the country.

D. B. Dunham & Son, builders of automobile bodies, Rahway, N. J., who are erecting a five-story brick building, 100 ft. square, at Central avenue and Fourth street, Newark, N. J., are installing a steam heating plant, a large automobile elevator, a line of woodworking machines, blacksmith tools, drill presses and machine tool equipment. The power will be electric and will be furnished by the Public Service Corporation of New Jersey.

The Gould Coupler Company, Depew, N. Y., is arranging to purchase machinery equipment to be installed in a new plant in course of construction in the suburbs of Buffalo, N. Y. The company has inquiries out in this market indicating that it will spend about $10,000.

The Elizabeth City Iron Works Supply Company, Elizabeth City, N. C., has inquiries in the New York machinery market for a fair sized list of machinery, largely in the line of machine tools. The requirements include six good sized lathes, several drills, a boring machine and other mechanical equipment.

The Inspiration Copper Company, 25 Broad street, New York, whose property is located near Globe, Gila County, Ariz., is installing a machine shop which will be equipped with a lathe, drill press, shaper, bolt and pipe cutter, steam hammer, &c.

The application of the Dunkirk Power & Heating Company, Dunkirk, N. Y., to consolidate with the Dunkirk Distributing Company and to increase the capital stock to $50,000 has been granted by the Public Service Commission of the State of New York. The company will furnish heat and electrical power.

The International Bridge Company will build and equip a one-story brick power house at Niagara street and the Erie Canal, Buffalo, near the bridge entrance.

The International Auto-League Tire & Rubber Company, Buffalo, N. Y., manufacturer of and dealer in automobile accessories and supplies, will build and equip a three-story brick addition to its factory and warehouse at South Division and Pine streets.

The Berney Bond Glass Company of Bradford, Pa., operating factories at Bradford, Smethport and Hazelton, Pa., is arranging for the establishment of a branch plant at Westfield, N. Y., on the shore of Lake Erie. Negotiations are under way for securing the plant of the United States Canning Company there.

The main building, a four-story frame structure, of the Gowanda Agricultural Company, Gowanda, N. Y., manufacturer of plows, was destroyed by fire December 20. The plant will be rebuilt and equipped at once.

The firm of Barber Brothers, Syracuse, N. Y., has been incorporated under that name, with a capital stock of $50,000, to manufacture and deal in machinery, tools and hardware specialties. The incorporators are C. E., T. J. and C. C. Barber of Syracuse.

Scott Bros., Rome, N. Y., were the lowest bidders, at $393,135.50, for Erie Barge Canal contract A, providing for the construction of locks and controlling works in Seneca River on the Cayuga and Seneca Canal, section 1, for which bids were opened December 21 by State Superintendent of Public Works Frank C. Stevens, Albany, and on bids opened the same date the Wells-Boughton Company, Troy, N. Y., was lowest bidder, at $42,940.50, on Erie Barge Canal contract No. 91, for the construction and equipment of a power house at Crescent Dam.

Henry Tosh & Son, Port Byron, N. Y., were lowest bidders, at $14,777.50, for the construction of a bridge over the Erie Canal at South Washington street, Rome.

The Zunner Machine Company, Rochester, N. Y., has been incorporated, with a capital stock of $25,000, to manu-

THE MACHINERY MARKETS

facture special machinery, boilers and special lines of hardware. The incorporators are J. H. G. Zunner, W. D. Clapp and H. Satterlee. Factory premises are arranged for. J. H. G. Zunner is manager, with offices in the Central Building.

The Thompson-Johnson Machine Company, Jamestown, N. Y., has been incorporated with a capital stock of $10,000, to engage in the manufacture of machinery, tools, &c. A. Thompson of Erie, Pa.; J. A. Anderson of Cleveland, Ohio, and Nelson A. Johnson of Jamestown, N. Y., are the incorporators.

The A. M. Taylor Machine Company, Penn Yan, N. Y., has been incorporated to make special machinery used in the manufacture of grape baskets, &c. The incorporators are A. M. Taylor of Kenks Park, N. Y., and E. F. Lewis and A. H. Jameson of Rochester, N. Y. The company is capitalized at $25,000.

Catalogues Wanted

The Yates Machinery & Supply Company, 86 Warren street, New York, Eastern agent of the Reading Chain Block Company, desires catalogues of manufacturers of mill equipment with a view to establishing agencies. The company has had a decidedly successful year under the management of G. S. Pierson, who was formerly with the Fairbanks Company.

Anton Traut, Museum strasse, Innsbruck, Austria, desires to establish an agency for American woodworking machinery and other mechanical equipment and wants manufacturers' catalogues.

Pittsburgh

PITTSBURGH, PA., December 27, 1910.

So far as the sale of machinery is concerned, operations at present are practically suspended. Very little business was transacted last week, and until the new year has fairly opened not much more is likely to be done.

From the ore and coke furnaces, steel mills, fabricating plants, &c., not much more is to be expected, beyond the announcements of the past six weeks, until after the railroad rate question has been settled and the railroad companies come into the market. The necessities of the latter are, however, piling up.

It is reported from Martinsburg, W. Va., that the new plant of the Tuscarora Foundry & Machine Works, which was visited by fire and had to be practically rebuilt, will be in full operation again by the first of the year.

A site for its new pumping plant has been secured by the city of Romney, W. Va., and the work will be proceeded with as soon as possible.

Additional power equipment will need to be provided by the Titusville Electric Traction Company if the extensions to its system are made as proposed at present. The company's electric generating station is at Fieldmore Springs, near Titusville, Pa., where the headquarters are located. All purchasing is in charge of the president and general manager, W. J. Smith.

It is reported from Montes, W. Va., that a new engine unit will need to be installed by Brown & Hill of that place, one of those previously in service having been wrecked by an accident.

A substation for its power system, 67 x 68 ft., will be erected at Forbes and Craft streets, Pittsburgh, by the Pittsburgh Railways Company.

The Pemberton Coal & Coke Company, Affinity, W. Va., has purchased new electric power plant equipment, including an engine-driven generator of 150 kw., and a large motor-generator set. The order was placed with the Westinghouse Electric & Mfg. Company, Pittsburgh. Auxiliary apparatus will be bought as needed.

Builders of power machinery and manufacturers of auxiliary apparatus expect to figure early in the coming year on one of the largest contracts to be let by a traction company for some time, comprising the equipment of the new electric generating plant to be built by the Northern Ohio Traction & Light Company, Akron, Ohio, the cost of which has been estimated at nearly $1,500,000. The location will be in the vicinity of Cuyahoga Falls. A modern shop for repair and maintenance work will also be built, probably in Akron. The power system will be operated by a separate company.

It is reported from Somerset, Pa., that a municipal pumping plant will be built there, funds for the purpose having been voted.

The Blackwood Coal & Coke Company will install mining and timber cutting machinery, including a large band mill, power equipment, &c., in the vicinity of Blackwood, Va., where its extensive property will be developed.

The Sisterville Boiler Works, Sisterville, W. Va., whose incorporation was recently reported, will enlarge and improve the plant of its principal stockholder, E. A. Ryan, whose business has been taken over by the new company.

Matthew Lans & Sons, Pittsburgh, Pa., manufacturers of bolts, nuts, washers, &c., are completing a large warehouse building at a cost of $40,000. This will give the company better facilities for making quick shipments, as it will allow for the carrying of a large amount of stock.

Chicago

CHICAGO, ILL., December 27, 1910.

Reports from dealers of their operations in December are somewhat conflicting. Some have done a good business for the month, others have a promising list of inquiries, while a few complain that they see little improvement. On the whole, the month is considerably better than those which preceded it. Business in the machine tool line has been swinging up and down for the past three years. After each dull spell it rises a little higher in volume. It was dull enough last fall to justify a long upward swing the coming year. The number of inquiries has been increasing steadily the past two or three weeks, and may grow into a satisfactory buying movement.

The attitude of the banks has been an important factor in the trade the past six months. They have been advising caution regarding extensions or improvements. They were very grudging in making new loans and requiring liquidation of old ones, and this policy caused many buyers to postpone replacements or new purchase of machine tools. Money is getting easier now and the bankers are looking for business. This has a far reaching sentimental effect in the business world, and indications of it are to be noted in the machinery district. There are more buyers looking around, getting ready to place the business which has been held up the past six months.

Three railroads have been making considerable purchases of new tools recently, without inviting competition by sending out general lists. The Kansas City Southern has been purchasing tools for new shops. The Wabash has been making purchases for shops which are being rebuilt at Decatur, Ill., and the Southern for shops under reconstruction at Princeton, Ind.

The Reflector & Hardware Specialty Company, Chicago, is having plans prepared for a two-story factory building 87 x 109 ft.

The Concrete-Steel Products Company, Chicago, has been reincorporated under the laws of Illinois with $50,000 capital stock, succeeding a company of the same name which held a charter from a Western State.

The Gardner Grain Weigher Company, Ottawa, Ill., has been incorporated with a capital stock of $25,000. The incorporators are W. C. Vittum, C. B. Chapman and Duncan McDougall. The company will engage in the manufacture of grain weighing, loading and conveyor devices.

Construction work on the new preserving department of the Corn Products Refining Company at Granite City, Ill., has been started. The building will be 72 x 208 ft. and four stories, representing an investment of $400,000.

Philadelphia

PHILADELPHIA, PA., December 27, 1910.

Owing largely to the holidays, the market has been practically at a standstill. Inventory matters, which also have a bearing on trade conditions at this season, have contributed to the dullness. Buying has been confined to odd tools, either urgently required or where for reasons it has been desirable to place the business before the year end. Manufacturers have, in the large majority of instances, suspended operations for various periods, ranging from a day to a week, and are giving their attention to matters pertaining to the closing of the year's business. Very little in the way of fresh inquiries has been reported from prospective buyers of any class of equipment, and the trade anticipates the usual holiday dullness during the coming week.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for a 20-ton 40-ft. span overhead electric traveling crane.

Fire damaged the spring shop of the Baldwin Locomotive Works at its Eddystone, Pa., plant December 23. The machinery is reported as being but slightly damaged. While particulars are not available, it is understood that the work of rebuilding the damaged portion of the building will be started at once.

While definite confirmation is lacking, it is stated that the Schuylkill Haven Foundry Company, Schuylkill Haven, Pa., has been organized, with a capital stock of $30,000, and will engage in the manufacture of soil pipe, and that contracts for the erection of the buildings, consisting of a main

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structure, 80 x 100 ft., and several smaller buildings, have been let. These buildings are to be equipped with modern machinery. The following officers of the company are named: Frank Brown, president; D. D. Coldren, secretary, and E. H. Baker, treasurer. The officers together with George Mickel, J. F. Fleming, M. A. Blackton, George Opie, George Berger, G. M. Parson and George Saul constitute the Board of Directors.

The Baldwin Locomotive Works has received orders for 40 locomotives from the Boston & Maine Railroad, on which deliveries are to be made in March and April. Indications for the maintenance of the present rate of activity at the company's several plants are more favorable. Several other large contracts for locomotives are under negotiation, but orders have not yet been definitely placed.

Smedley Brothers, lumber and mill work, Church and Tacony streets, are taking estimates on a two-story addition, 40 x 60 ft., to their planing mill. Additional woodworking machinery, not yet decided upon, will be installed in the new addition.

The Herr Automatic Press Company, Franklin and Clearfield streets, has let a contract for a manufacturing building, to be erected on a site recently acquired at Ambler, Pa., to the American Bridge Company. The building will be 50 x 150 ft., one story, of brick and steel, on completion of which the company will remove to the new location.

Cincinnati

CINCINNATI, OHIO, December 27, 1910.

A number of manufacturing plants have shut down for the entire week, and are taking advantage of the holiday season for making repairs, taking stock, &c. Business is naturally slow in coming in, but there are a number of scattered orders for machine tools reported, a few of which are from New York exporters. There is a rumor, that has not been confirmed, however, that the Lake Shore Railroad will be ready to purchase all the necessary equipment for its Elkhart, Ind., shops some time during January. Some business is also expected from Chesapeake & Ohio Railroad, but the list from this road is said to be a small one. Machine tool builders generally expect a heavy railroad business to commence early in the spring.

On December 21 part of Cincinnati's manufacturing district suffered a fire loss roughly estimated at $2,500,000. Several leather and shoe factories were burned, including the plants of the Griess-Pfleger Tanning Company, the United States Leather Company, the Krippendorff-O'Neal Company and the Cahill Shoe Company. Practically all these companies have secured new quarters and will start work again as soon as new machinery can be obtained. The Victor Safe & Lock Company's Sycamore street plant was also badly damaged, but as the company's new factory in Norwood is about complete it will not experience much inconvenience in carrying on its manufacturing.

The Foundrymen's Association of Cincinnati, recently reported as having been organized for the purpose of promoting a more friendly feeling among the local foundry interests, has elected the following officers to serve one year: President, George Houston of the Houston, Stanwood & Gamble Company; vice-president, William Goodman of the Laidlaw-Dunn-Gordon Company, and secretary and treasurer, W. B. Dean of the Dean Mfg. Company, Newport, Ky.

The General Foundry Company has been incorporated at Warren, Ohio, to do a general foundry business. The capital stock is $100,000, and the incorporators are Calvin Campbell, Geo. F. Fellius and Wm. H. Hulme, all of Warren.

The Hisey-Wolf Machine Tool Company, Cincinnati, is moving into its new plant on Colerain avenue.

The H. C. Wood Company, Cincinnati, will commence work on its proposed new ice factory in Norwood soon after January 1. None of the machinery or equipment has yet been purchased.

The stockholders of the Rahn-Carpenter Company, Cincinnati, machine tool manufacturer, will hold a meeting December 31 for the purpose of considering changing the name of the corporation.

It is now practically certain that work will be commenced on the proposed union depot for Cincinnati some time in 1911. Preliminary plans have been made up, which show that the structure and real estate on which it will be erected will cost nearly $30,000,000.

The Tool Steel Gear & Pinion Company, Cincinnati, has decided on doubling the capacity of its plant at Carthage, Ohio, and is now working on three additions to house some new machinery that has been purchased. The company makes a specialty of hardened and toughened gears used largely by electric railways, and included in recent large contracts is one for re-equipping the Chicago Railways Company's system.

The Auto Tire Interlining Company, Cincinnati, has been incorporated with $25,000 capital stock for the purpose of manufacturing inner tubes for automobile tires. Wm. Stacey is president, and G. S. McDuff secretary and treasurer of the new company.

The Baltimore & Ohio Southwestern Railroad Company has purchased a large tract of land in the western section of Cincinnati, on which, it is stated, the company will erect some large equipment repair shops and a roundhouse some time during next year.

The Roche-Bruner Company, Johnston Building, Cincinnati, has been awarded contract for building two large warehouses for which considerable structural material will be required. One of these will be for the Big Four Railroad and the other for the Schwarzschild & Sulzberger Company.

The Imperial Car Company, Harry Strauss, president, Cincinnati, has completed plans for a large garage and repair shop to be erected on Madison road.

Recent West Virginia charters include one for the Twin City Mining Company of Minneapolis, Minn., with $350,000 capital stock. The company proposes to mine and manufacture iron, and the incorporators are George Salzer, Benjamin C. Garbett, F. W. Merritt, Frederick E. Dunn and George I. Gorman, all of Minneapolis.

There is a rumor that cannot be confirmed this week that the Baltimore & Ohio Railroad Company has acquired a site at Newark, Ohio, on which it expects to erect some large repair shops.

The Chesapeake & Ohio Railroad Company has decided to make some additions to its shops in Covington, Ky., and work will probably be commenced during the spring.

The Carrollton Novelty Company, Carrollton, Ohio, has succeeded the Ferguson Mfg. Company, in the manufacture of toys and juvenile vehicles. The new company has increased capital to extend the business.

Cleveland

CLEVELAND, OHIO, December 26, 1910.

The outlook for a fair volume of business in the local machinery market for early next year is more promising than it has been for some time. Inquiries have improved considerably, several for quite good sized lots of machine tools having developed during the week, so that a good volume of business is pending. Prospective buyers, however, are holding off until after the first of the year and until they can form a more definite idea regarding future business conditions. If general business improves in January a large share of the pending machinery business is expected to be placed early in the year. The inquiries are largely for small lots of tools and from industrial concerns outside of metal working lines that are planning the installation of machine shops for repair work or additions to their present shops. Local engineering firms report a good volume of work in prospect in the way of new plants and additions, but practically all of this work is being held up until the new year.

Local machine tool dealers report the volume of business during the week as about normal for the holiday season, sales being nearly all small single tools. One inquiry for about 30 small tools resulted in the placing of a portion of the order. The demand for boilers in this territory is quite active.

The Ajax Mfg. Company, Cleveland, reports a good volume of business in prospect in the line of forging machinery and that the outlook has improved materially during the past few weeks. This company recently received an order from the Louisville & Nashville Railroad for a 5-in. upsetting machine.

The Erie City Iron Works reports the following recent sales of boilers in this vicinity through Hall H. Hill, local sales agent: Two 150-hp. boilers to the American Agricultural Chemical Company, Linndale, Ohio; two 150-hp. boilers to the Glidden Varnish Company, Cleveland; five 150-hp. boilers to the Cleveland Steel Company; three 100-hp. boilers and one 125-hp. engine to the George Pottery Company, East Palestine, Ohio; one 600-hp. water tube boiler for the Cleveland plant of the Westinghouse Electric & Mfg. Company; two 256-hp. vertical water tube boilers to the Mosaic Tile Company, Zanesville, Ohio. Hall H. Hill has also sold a 500-hp. C. & G. Cooper Company Corliss engine to the American Agricultural Chemical Company and a 300-hp. condensed milk plant to the Western Reserve Condensed Milk Company, Coldwater, Mich.

The Croxton Motor Company has been organized in Massillon, Ohio, with $250,000 capital stock, to take over the plant of the Croxton-Keeton Motor Company in that city, which recently went into the hands of a receiver. The officers are: H. A. Croxton, president and general manager; J.

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P. Stoltz of New York, vice-president, and H. D. Michaels of New York, secretary and treasurer. The officers, with W. E. N. Hemperly and Clarence P. L. McLain, constitute the Board of Directors.

It is reported that the Baltimore & Ohio Railroad has decided to locate its new Western repair shops at Newark, Ohio, and that an expenditure of about $2,000,000 will be made in the plant and machinery equipment.

It is announced from Canton, Ohio, that William Pennock, E. G. Van Horn, F. J. Bordner and F. D. Shively have purchased the stock of several associates in the Shuil Steel Castings & Mfg. Company, Canton, Ohio, thus gaining a controlling interest in the concern. No change in the officers is contemplated. Mr. Pennock is president; Mr. Van Horn, general manager, and Mr. Bordner, a director.

The West Steel Casting Company, Cleveland, will erect a new foundry building at its plant at East Seventieth street and the Lake Shore Railroad.

Emery A. McCuskey, Canton, Ohio, has been appointed receiver in voluntary bankruptcy proceedings brought against the Orrville Pump & Furnace Company, Orrville, Ohio. The assets are placed at $15,000 and the liabilities at $25,000.

The plant of the Brightman Mfg. Company, Shelby, Ohio, maker of shafting, nuts and other products, was badly damaged by fire December 19. The company's capital stock is $300,000, L. H. Brightman of Cleveland being the president.

The Black Diamond Coal & Coke Company, Columbus, Ohio, will rebuild its tipple and power house at Lathrop, Ohio, which were recently destroyed by fire.

It is announced from Sandusky, Ohio, that the plant of the Hollinger Cutlery Company will be moved to that city from Fremont, Ohio, next spring. Sandusky will provide a plant for the company.

Thomas & Armstrong, London, Ohio, are planning the erection of a plant for the manufacture of a radiator shield, on which M. V. Armstrong, a member of the firm, recently secured patents.

A new plant will be built by the Mt. Vernon Window Glass Company, Mt. Vernon, Ohio.

A new sewage disposal plant will be built in Canton, Ohio. Plans have been prepared by Consulting Engineer L. E. Chapin.

New England

BOSTON, MASS., December 27, 1910.

New business representing a good many thousands of dollars is pending. The figures totaled from the reports of dealers are surprising, when compared with the bookings of actual orders. Apart from a hesitancy in making contracts, due to a desire to watch developments in the market, a coincidence of sound business reasons for deferring orders is working temporarily against the trade. However, results will follow in the near future. The week now ending shows the holiday tendency to sacrifice business for Christmas. Salesmen consider their calls on customers all but wasted. The bright spots in a slack market have not diminished in number, and the general opinion is that the early months of 1911 will show an improvement, though observers do not agree as to the degree of better business.

The New England States are suffering severely from drought. Some relief was experienced from a hard rain which fell late last week, but the effect will be only temporary, unless early January thaws follow. In some places industries are actually crippled because they can get little water. It is not a case of waterpower, but of actual shortage of water for general industrial purposes. Some of the large centers have but a few weeks' supply in their storage reservoirs, and users have been warned to be as economical as possible. A continued period of extreme cold would necessitate the shutting down of a large number of works. The last six months has not been seasonable in rainfall, but if the early weeks of the year are normal the deficiency should be made up.

The Manufacturers' Association of Connecticut, Inc., has been organized with a powerful membership, with the purpose of furthering the interests of the manufacturers of the State. Col. George Pope, treasurer of the Pope Mfg. Company, Hartford, is the president, and Col. Charles M. Jarvis, president of the American Hardware Corporation, New Britain, is the vice-president and treasurer. The incorporators represent in an important way the metal and machinery interests of the State. Besides Colonel Pope and Colonel Jarvis are George L. Brown, Brown Cotton Gin Company, New London; J. F. Alvord, Excelsior Needle Company, Torrington; F. B. Farnsworth, McLagon Foundry Company, New Haven; Gen. George E. Keeney, Somersville Mfg. Company, Somersville; A. H. Bullard, Bullard Machine Tool Company, Bridgeport; George A. Vaughn, Putnam Mfg. Company, Putnam; Clarence E. Whitney, Whitney Mfg. Company, Hartford; E. Kent Hubbard, Jr., Russell Mfg. Company, Middletown. Philip E. Curtiss, Hartford, has been made secretary of the association. Offices will be opened in Hartford in the near future. The association will take an active part in all matters in which the industries of the State are interested.

The tannery of the Bay State Belting Company, Boston, Mass., at Salem, Mass., was damaged by fire December 16, with a loss of $50,000, fully covered by insurance. Four buildings were destroyed, but the principal loss was on raw material, hides and rough leather. The main factory building is uninjured and is running as usual, as is the belt factory at South Boston. There is no interference with deliveries. The burned buildings will be replaced next summer.

A good many industrial works are closing for a few days to take inventory, following the usual custom, the only exception to which is where business is well above normal. Always in this section buying is seriously impeded during the closing months of the year, the natural intention being to defer expenditures until the new fiscal year has begun.

The E. A. McMillan Company, North Adams, Mass., manufacturer of specialties, is planning to erect an addition to its works. The Willimantic Industrial Company, Willimantic, Conn., is raising the capital for the erection of a new factory building, which will be occupied by the Rossiter Velvet Company. The Revere Rubber Company will erect a large plant at Providence, R. I., adjacent to the Joseph Bannigan Rubber Company's property, and will manufacture rubber goods. The corporation is controlled by the United States Rubber Company.

The New London & East Lyme Electric Company, a Connecticut corporation, will petition the next Legislature for the right to build an electric trolley line from Niantic to the Connecticut River, to connect with a new drawbridge now under process of construction by the State of Connecticut. The Aroostook Valley Railroad Company, an electric system, will petition the Maine Legislature for a charter to make large extensions of its systems.

Announcement is made that Marshall I. Smith, Bristol, Conn., manufacturer of machinery, dies, tools and light hardware, will remove his business to Hartford, Conn., where he has taken space in the Industrial Realty Company's Building on Market street. Mr. Smith's property was recently sold to the Wallace Barnes Company, and he had planned to erect a new shop at Bristol.

The statement is made at Athol, Mass., that the National Perforating Machine Company, Kansas City, Mo., will establish works in that town and plans to erect a factory building.

United Drug Company, Boston, Mass., has been investigating sites for a branch factory in the West. Kansas City and other Western cities have been considered. The company contemplates an investment of $350,000 in buildings and land, not including machinery.

Detroit

DETROIT, MICH., December 27, 1910.

The closing days of the fall and early winter season exhibit a greater degree of activity than was looked for some weeks ago, comparing favorably with last year in this respect. A large amount of new business is either pending or in sight and every indication points to an active year ahead. One of the best evidences of impending developments is the increasing requirements of plants auxiliary to the automobile industry, which are buying more freely and putting on larger working forces. From various cities of Michigan and contiguous territory there also come reports of new companies entering this field, some of which have season contracts already assured that will enable them to start on a good earning basis. The manufacture of motor trucks and other commercial vehicles is assuming much greater importance than was apparent a year ago. This is a factor to be reckoned with more and more by the machinery trade.

The Aluminum Castings Company, Detroit, is now having an active season on automobile and other work, additions being made to the force employed in both the pattern shop and foundry.

The Lake Superior Brass Foundry Company has been incorporated at Laurium, Mich.

It is reported from Fremont, Ohio, that a large plant for the manufacture of gasoline engines will be built there in the spring by the Morton Tractor Company.

A new plant will need to be erected at once to replace that of the Holly Electric Light & Power Company, Holly, Mich., which recently burned. It had a capacity of 200 kw. in engine and hydraulic turbine driven units. The fire also destroyed the property of the Holly produce & Milling Company.

The Detroit Insulated Wire Company, Detroit, is concluding the most successful year in its history.

The Fisher Closed Body Company, Detroit, has been or-

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ganized with $125,000 capital stock, by Fred H. Fisher and Louis Mendelsohn. Building contracts have been awarded for a new three-story manufacturing plant, 145 x 180 ft., to be erected on Stanton avenue. It is designed in accordance with the company's own plans. The present factory is at St. Antoine and Piquette streets, where more men are being put on.

The Vinton Company, Detroit, was recently given the contract for a two-story shop building, 50 x 70 ft., to be erected by A. Beer.

A new manufacturing plant is to be erected at Pinconning, Mich., toward the latter part of winter, by the National Chicory Company of Bay City, Mich. It will be operated in addition to the factory now in service.

A new electric traction line is to be built from Niles, Mich., to Buchanan, Mich., by the Southern Michigan Railway Company of South Bend, Ind., which will not, however, be in the market before spring for any equipment on that account.

An extension is to be made to the plant of the National Wood Dish Company, Thompsonville, Mich., and additional machinery provided, including power equipment.

The Russell Motor Axle Company, Detroit, has increased its capital stock from $100,000 to $150,000.

The Universal Motor Company, Detroit, has had plans drawn for a new boiler house, 40 x 60 ft., the construction contracts of which are being let.

Alfred Robinson and Michael Sullivan, Detroit, have organized the Thelma Motor Works, which is incorporated for $10,000. They have built a factory for the production of marine engines.

The Candler Radiator Company, Detroit, has in hand some excellent contracts from automobile companies, and is adding to its force of assemblers, testers, &c.

It is stated here that plans are in progress for a factory to be built at Dayton, Ohio, by the Meade Auto Engine Works, under the direction of C. D. Meade, with an office now in the Reibold Building there.

The Standard Hardware Mfg. Company, Adrian, Mich., has purchased the plant, machinery, tools, patterns and material of the Wing & Parsons Mfg. Company, at Adrian, and will continue the business in the manufacture of hardware specialties. It is not decided whether to remain at Adrian or move to another location.

The Seager Engine Works, Lansing, Mich., has let a contract for an addition to its plant, but the work of construction will be delayed until next summer.

The city of Muskegon, Mich., has employed F. F. Van Tuyl, consulting engineer, Detroit, to prepare plans and specifications for a municipal electric light plant at a cost not to exceed $75,000.

Milwaukee

MILWAUKEE, WIS., December 26, 1910.

The experience of machinery manufacturers in this State, as the year 1910 draws to a close, has been radically divergent, according to the line of production involved.

In the output of machine tools, grinders, pneumatic apparatus, &c., as well as all shop equipment of a related character, a notable advance has been made. Nearly all manufacturers in these several lines have either built new plants or greatly increased the capacity of those previously operated. At West Allis, the principal industrial suburb of Milwaukee, a large new community of metal working establishments has been entirely built up within six months, and other important concerns are about to locate there. Racine, Beloit, Janesville, Oshkosh, Green Bay, Marinette, Eau Claire, Madison, Superior and other cities have also been the scene of important developments along this line. The growth of the electrical industry, to which extended reference has heretofore been made, also continues in cumulative measure.

For the heavier types of machinery, involving large outlays in single orders, there has not, however, been a satisfactory demand during the past year. Rock and ore crushers, ore reduction plants, cement making machinery, steam engines, steam turbines, gas engines, blowing engines, air compressors, traveling cranes, saw mill, pulp mill, paper mill and other forest products machinery have sold very well at times; but long dull periods have intervened. As these are among the mainstays of the metal working industries of the State, the effect has been generally felt. In Milwaukee the largest plants are now working on reduced force, with no prospect of any immediate betterment. The auto parts industry also took a slump about midsummer, from which it is recovering but slowly, with the exception of gasoline motors, ignition apparatus, &c., the demand for which has been largely sustained by other lines of buying.

For woodworking machines the inquiry has been almost constantly rising, with corresponding gains in production. The leading manufacturers of such apparatus have all arranged for much larger plants for the coming season. Gasoline engine driven locomotives have also come to the front, the machines being designed principally for industrial service, as in mining, logging, contractors' work, quarrying, &c. In the building of these an important line of manufacture for this State has become firmly established, practically within the year. Gasoline engines, both portable and stationary, for every variety of service, also exhibit a large gain in production, with the certainty of further rapid expansion. Pumping machinery, from the smallest to the largest, sold fairly well all through the year. For the coming spring the demand will probably be so large as to cause backward deliveries, and early purchasing is desirable.

The Columbia Electric Light & Power Company, Pardeeville, Wis., will install an electric power plant at Rio, Wis., for which it requires a return tubular boiler of 150 hp., Corliss or four-valve engine of 125 hp., a three-phase, 60-cycle alternating current generator of 100 kw., feed water heater, pump, switchboard, &c.

The Hoyer Metallic Packing Company was recently organized in Milwaukee with $30,000 capital stock, by A. E. Martin, 391 Thirteenth avenue, and others.

The city of Waupaca, Wis., will purchase an independent power plant to be installed in the basement of the new high school, including one or more high speed engines direct connected to dynamos, also motors and other mechanical and electrical appliances.

The Wehr Steel Company, which has established a crucible steel foundry in the new industrial district of West Allis, at Forty-fifth avenue, will be in complete operation soon after the first of the year. Oil burning furnaces and other equipment of the most modern design have been installed.

A large power dam will be completed next spring at a point about six miles from Couderay, on the Chippewa River, by the Arpin Lumber Company, Grand Rapids, Wis. Whether the construction of a hydroelectric plant will follow at this time does not appear to have been as yet determined.

Two large new factory buildings are to be erected in the near future by the B. J. Johnson Soap Company, Milwaukee.

A horizontal return tubular boiler of 125 hp. is to be purchased by the village of Waterloo, Wis., for the local water supply plant.

The new forge shop of the Allis-Chalmers Company, at West Allis, which contains some of the most powerful equipment of any similar plant in the country, will be put in operation within the coming fortnight.

The Milwaukee Chair Company, Malwaukee, is erecting a three-story addition to its factory.

Among the orders recently completed by the Phoenix Mfg. Company, Eau Claire, Wis., is one for a heavy logging engine to be shipped to Alaska.

The Badger Malleable Iron Works, South Milwaukee, Wis., has had a very good year, with favorable prospects for the immediate future.

The Gogebic & Iron Counties Railway & Light Company, Ashland, Wis., is preparing to begin construction in the spring of a dam and power plant at Mellen, Wis. D. W. Mead, Madison, Wis., who designed the plant of the Northern Hydro-Electric Power Company, is preparing the plans.

The plant of the Penney Boat Mfg. Company, Milwaukee, which has a moderate output of small craft, recently burned and will probably be rebuilt.

A new factory is expected to be built at Plymouth, Wis., to take the place of the Western Parlor Frame Company's plant, which was destroyed by fire.

The Milwaukee Motor Car Company, Milwaukee, has increased its capital stock from $50,000 to $250,000.

New power equipment, including boilers and engines, is to be purchased by the Berlin Brewing Company, Berlin, Wis., which will remodel its plant. New refrigerating apparatus has already been contracted for.

The Northwestern Engineering & Construction Company, Milwaukee, will start work early in the spring, and possibly during the late winter, on a new electric line for the Molino-Sterling Traction Company, which will comprise one of the most extensive systems in the State of Illinois. Heavy purchases of equipment will need to be made by the traction company before next fall.

The Edgar Veneer & Mfg. Company, which was recently incorporated at Edgar, Wis., by O. G. Fehlhaber, Geo. Rifleman and R. E. Puchner, for $50,000, will soon begin work on a modern plant.

The Beloit Lighting & Heating Company, recently organized at Beloit, Wis., has leased a building there and will install machinery, which has not yet been purchased, for the manufacture of lighting outfits, including lathes, drills and tools for fabricating light sheet metal. Chas. H. Jones is manager.

To provide for the growth in its business and enlarged

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manufacturing facilities, the H. S. Powell Mfg. Company, Beaver Dam, Wis., has increased its capital stock from $100,000 to $200,000.

It is reported from Madison, Wis., that the Gisholt Machine Company will not proceed with the construction of its new buildings until spring. Bids on the extension of its main machine shop are, however, now being taken.

It is reported that C. R. Thomson, Richland Center, Wis., will be in the market about 60 days hence for an electric power plant, to be operated by water turbines, at Viola, Wis.

The planing mill and woodworking plant of the Gooding & Mylrea Lumber Company, recently destroyed by fire at Wittenberg, Wis., will probably be rebuilt, but no definite decision in the matter appears to have been as yet reached.

Plans have been completed for the new plant of the Wisconsin Furniture Company at Neillsville, Wis., which will be two stories, 80 x 200 and 80 x 140 ft. Woodworking machinery will be required, together with electric motors and probably an engine driven power set. A sprinkler system is also to be installed.

The Universal Mfg. Company, Racine, Wis., has been incorporated with $25,000 capital stock. Manufacturing space will be leased from another company and no new equipment will be purchased at the present time.

Toronto

TORONTO, December 23, 1910.

Though there has been some slackening of activity, the business in sight is reported to be of a volume to make the outlook for the remainder of the winter very encouraging. There is not the same pressure for speedy execution of orders, as cold weather, to mention no other cause, is unfavorable to the putting up of some works in which plant is to be installed, and is adverse to the operation of some of the outdoor industries in which machinery is used. A busy spring is looked forward to, and much of the work the machinery manufacturers have now in hand and that machinery jobbers are looking after is for the beginning of work two or three months hence. A considerable quantity of worn out machinery will be replaced in factories within the next fortnight or so, the time usually chosen for easing down to make repairs.

The *Record*, Windsor, Ont., says that the Hupp Motor Car Company of Detroit is looking over the Canadian field to find a suitable location for branch works, and that Windsor and Toronto are favorably regarded. The company has a large Canadian trade.

Dr. Max Wiedman, a sugar beet expert from Germany, is in negotiation with parties in Calgary, Alberta, respecting a project to build a large beet sugar factory in the Canadian Pacific Railway irrigation block in that province. He has formed a company and made arrangements for capital, which is to be provided by persons in England and Germany.

The 8500-hp. generator the Dominion Power & Transmission Company, Hamilton, Ont., has decided to add to its works at De Cew Falls is to be built by the Canadian Westinghouse Company, Hamilton. It is to cost about $200,000, and it is not expected to be ready for use until next autumn.

The Powell River Paper Company is establishing large works at Powell River, B. C., 75 miles north of Vancouver. A cargo of machinery, sent by way of Cape Horn from New York, arrived about a week ago. The new paper mill the company is building is to have a capacity of 100 tons of news print per day. There will be a ground pulp mill and a chemical pulp mill. The water power developed by the company is to be 68,000 hp. A capital outlay of $2,800,000 is being made upon the company's various works.

The Canada Foundry Company, Toronto, which has the contract for building the Dominion Steel Corporation's No. S blast furnace, is now starting upon that work, the foundation being prepared. The company has also the contract to build the corporation's two 500-ton open hearth mixers. It is at work upon the buildings, producers, gas main and stacks for that section of the plant. The mixers, which have been completed at the company's Toronto works, are about to be shipped. The company's engineers were at Sydney last week conferring with the management respecting the construction of still another blast furnace.

The P. J. Mitchell Company, London, England, which is engaged upon the construction of an 8000-hp. electro turbine engine for the Dominion Steel Corporation, recently obtained a contract to build a second one for the corporation one of 7000 hp., to operate the new blast furnaces. A steamer is due in February to deliver the completed parts of this second turbine plant.

In 1911 the Dominion Steel Corporation will spend between $1,500,000 and $2,000,000 in new construction.

The Canadian Refining & Smelting Company, Orillia, Ont., has its building up, and is putting in the plant for treating high-grade Cobalt ore.

The Canadian Pacific Railway Company has decided to spend in the first half of 1911 the sum of $7,000,000 on new rolling stock and locomotives. Two thousand box, coal and refrigerator cars, 200 passenger cars, and a large number of baggage and express cars will be built in the company's own shops. The Dominion Car & Foundry Company has received orders for 2000 steel frame box cars of 80,000 lb. capacity. Orders for 500 stock cars and 800 flat cars have been placed with outside makers. Of the 75 locomotives ordered, they have been divided equally among the Angus shops, the Montreal Locomotive Works at Longue Point and the Canadian Locomotive Works at Kingston, Ont.

Extensive improvements are being made in the shops of the Canada Car Company, Amherst, N. S. The company has orders on hand to keep its works busy till next June.

The Amherst Boot & Shoe Company, Amherst, N. S., whose plant turns out 1000 pairs a day, is doubling its manufacturing capacity.

The Maritime Edge Tool Company, St. Stephen, N. B., has made large additions to its factory.

G. T. Davis & Sons, Quebec, have launched two icebreakers from their works.

The Dorchester Electric Company has obtained the consent of the municipal authorities of Quebec to extend its system into that city and sell electricity there, one of the conditions being that the company build and keep in steady operation within the city machine shops to cost not less than $200,000.

The Fres Falls Company is pushing the construction of its pulp and paper mills at Cap de Madeleine, near Three Rivers, Que.

The E. & T. Fairbanks Company, which recently came from St. Johnsbury, Vt., to Sherbrooke, Que., has decided to double its manufacturing capacity.

The D. F. Jones Company, Gananaque, Ont., has added a night gang and is keeping its rolling mills in constant operation.

The addition the Canadian General Electric Company is making to its works at Petersborough, Ont., will be 125 x 274 ft. It is to be of brick and steel, and is to cost $100,000.

The Standard Ideal Company, Port Hope, Ont., manufacturer of enameled sanitary ware, &c., is spending $100,000 on new construction.

An addition 40 x 60 ft. is being made to the works of the Wheel Company at Merritton, Ont.

The Canadian Bridge Company, Walkerville, Ont., is making a $100,000 addition to its works.

The shareholders of the Silliker Car Company, Halifax, N. S., have ratified the resolutions accepting the offer of F. B. McCurdy & Co. and associates for the purchase of the property in behalf of the Nova Scotia Car Works, Ltd. The transfer will be made January 1.

A firm of English capitalists, said to be connected with Vickers' Sons & Maxim, has been negotiating for control of the Dominion Bridge Company, Montreal.

The Hamilton & Port Dover Electric Railway Company, which has obtained provincial charter to construct an electric line between Hamilton and Port Dover, Ont., at an estimated cost of $1,000,000, will build its power house at Caledonia, Ont. George Lynch Staunton, K. C., Hamilton, is to be president of the company.

Indianapolis

INDIANAPOLIS, IND., December 27, 1910.

The McCray Refrigerator Company, Kendallville, Ind., has received an extension from the State of its corporate charter until 1940. J. T. Stahl is president of the company.

The Fellwock Automobile & Mfg. Company, Evansville, Ind., has increased its capital stock from $20,000 to $50,000. W. E. Fellwock is president of the company.

The Richmond City Waterworks, Richmond, Ind., has increased its capital stock from $375,000 to $550,000.

The Motsinger Mfg. Company, Pendleton, Ind., manufacturer of devices for automobiles, will move its plant to Anderson, Ind., in January.

The Baltimore & Ohio Southwestern Railroad is equipping a new machine shop at Seymour, Ind. A new engine and large boiler for heating and operating the roundhouse will also be purchased and the yards will be lighted by electricity.

The city of Marion, Ind., did not receive any bids for the $50,000 of 4 per cent. bonds offered to raise funds for a municipal light plant, owing to a technical question as to their legality.

The city water works department of Ft. Wayne, Ind., will establish a new pumping station in the eastern part of the city, the pumps to be operated by electricity.

THE MACHINERY MARKETS

The Arnold-Sandberg Machine Company, Terre Haute, Ind., has been incorporated, with $50,000 capital stock, to manufacture traction engines. The directors are D. B. Arnold, H. M. Sandberg and C. O. Sandberg.

Henry M. Williams, Vincennes, Ind., foundry and machine shop, is erecting a larger building to accommodate his business. An engine, lathe and a milling machine will be purchased as additional equipment.

The American Drill Company, Marion, Ind., grain drills, is making an addition to its paint shop, 33 x 75 ft., and an addition to its steel storage house, 46 x 58 ft.

The Southern Indiana Power Company has been incorporated at Indianapolis, with $800,000 capital stock, by T. N. Stilwell, F. E. Matson, W. J. Henley, E. E. Gates and Gustav H. Mueller, all of Indianapolis. The company will build power stations in the coal fields of the State to supply light, heat and power to the communities there. The first will be near Bedford, Ind.

The Shelbyville Filler & Color Company, Shelbyville, Ind., has purchased ground in that city, with 285 ft. frontage on the Pennsylvania Railroad, and will build a new factory on it.

The South

ATLANTA, GA., December 26, 1910.

An announcement of much interest to the trade is that recently made at New Orleans, La., to the effect that new shops and a thoroughly modern roundhouse will be added to the facilities of the Southern Pacific Railway Company's repair plant and storage yards at La Fayette, La., on the line of the Louisiana Western Railway. The buildings used at present will also be improved. Some betterments are stated to be already under way.

The tendency on the part of Northern manufacturers to establish district sales offices in Atlanta, for covering the territory east of New Orleans, Birmingham and Nashville, has been very pronounced during the past year. Among the late additions to the colony of representatives here is one for the account of the Berlin Machine Works, Beloit, Wis.

The J. B. McCrary Company, Atlanta, is completing plans for a pumping plant and water distribution system at Douglasville, Ga.

A new plant will be built in Atlanta, Ga., by the Spalding Foundry Company to replace the one recently visited by fire.

The Cincinnati, New Orleans & Texas Pacific Railway is planning important improvements in its shops at Somerset, Ky., definite announcement of which is expected to be made in the near future.

The Chattanooga Southern Railroad has bought a large tract of ground at Alton Park, Tenn., where it is reported that terminal facilities will be constructed and car and locomotive shops erected.

A new Corliss engine unit is to be installed by the city of Adel, Ga., in its electric plant. Purchase has not yet been made.

The Louisville & Nashville Railroad Company will provide equipment for a repair shop at Russellville, Ky.

The Cedartown Iron Company, which is headed by G. B. McCormack, Birmingham, Ala., will install mining equipment in the vicinity of Frog Mountain, Ga., on land acquired for that purpose.

H. R. Robertson, Candler Building, Atlanta, Ga., will install an electric plant at Dahlonega, Ga., for the Cedar Mountain Land Company, of which he is secretary.

T. J. Carling and H. Horne, Macon, Ga., have organized the Alabama Electric Company, which will build a hydroelectric plant at Wetumpka, Ala., to furnish industrial power and lighting service.

The authorities at Wetumpka, Ala., have engaged the Solomon-Norcross Company, Atlanta, Ga., to plan improvements in the local power and pumping plant and prepare estimates covering the construction of a sewage system.

The Bristol Metal Mfg. Company, Bristol, Tenn., is proceeding with plans for a large new manufacturing plant, which will be rushed to completion.

New power plant equipment is to be purchased by the Hazelhurst Brick & Mfg. Company, Hazelhurst, Miss.

Work has commenced on the new manufacturing plant of the Acme Box Company, Chattanooga, which is not expected, however, to be complete before next May. The main structure will be two stories, 140 x 225 ft., and equipped with power and woodworking machinery of the most modern design. C. E. Bearden, Chattanooga, made the plans, which include a sprinkler system.

The Anglo-American Mill Company, Owensboro, Ky., manufacturing a midget flour mill under English patents, is considering a change of location with a view to equipping larger shops.

The sawmill of the Porter-Wadley Lumber Company, at Cotton Valley, Webster Parish, La., was destroyed by fire December 15, including the planer and a quantity of lumber. The loss was $60,000.

The plant of the Central Sugar Company, Lockport, La., was damaged by a fire which started in the boiler room December 15, to the extent of several thousand dollars.

St. Louis

ST. LOUIS, December 26, 1910.

The Regal Buggy Company, St. Louis, has leased the new building erected at a cost of $100,000 at Eleventh and Howard streets. The building is four stories and has 80,000 sq. ft. of floor space.

The Lowell Bleacheries, Lowell, Mass., has purchased the entire block bounded by Polk, Van Buren, Courtols and Schirmer streets. The intention of the company is to erect a plant for the manufacture of cotton, to cover the entire block in the near future. The plant, it is believed, will cost more than $500,000.

The Valve Brass Mfg. Company, St. Louis, has been incorporated with a capital stock of $50,000. The incorporators are Clarence E. Anglen, William G. Gates and G. Howard Willett.

At an explosion of powder at the plant of the Pacific Glass Sand Company's magazine, Pacific, Mo., the mill and some of the heavy machinery were damaged.

The Missouri Pacific Railway Company has awarded the contract for the building of the new machine shops and a mechanical coaling station at Nevada, Mo. The contract calls for the expenditure of $75,000.

Lee A. Sears has taken over the Lamar foundry at Lamar, Mo., formerly owned and operated by M. A. Button, who retires on account of ill health.

The Falls City Lead & Zinc Company, Joplin, Mo., has increased its capital stock from $100,000 to $125,000.

The new building for the Rogers Ice & Cold Storage Company, Rogers, Ark., has been started. The basement is to be 53 x 73 ft., over which a building 53 x 93 ft. will be erected.

A franchise to put in an electric light and ice plant is to be granted to the Berryville Roller Mill & Elevator Company, Berryville, Ark.

The construction of an electric power and pumping plant for municipal use is under consideration at Marionville, Mo.

The Hannibal Wagon Company, Hannibal, Mo., which was recently organized to operate a local plant, will enlarge and improve it.

Texas

AUSTIN, TEXAS, December 23, 1910.

An unusual amount of railroad construction in Texas, the Southwest and Mexico is in prospect for the coming year. The National Railways of Mexico, commonly known as the Government merger system, is gradually extending its lines and making important improvements to its physical property. In addition to the branch lines which it now has under construction, others are planned, and their construction will probably be started during 1911. The Kansas City, Mexico & Orient, the Southern Pacific and the Mexico Northwestern will continue to push construction work upon their respective lines during the coming year, it is authoritatively announced. In Texas the charters of 42 new railroad companies were filed in the Secretary of State's office during 1910. Most of these proposed lines are still on paper, while a few of them are actually in process of construction. It is expected that considerable new construction will be done by some of the older systems in this State during the year if the trend of legislation by the Texas body of law makers which meets next month is favorable toward the investment of outside capital in railroad enterprises.

The Georgetown Water & Light Company, Georgetown, Texas, will pass into the hands of the city on December 30. Of the $45,000 which the city derived from a recent bond issue $31,500 will be spent in improving the plant.

Lon Hines of San Antonio has organized the Mexican-American Importing & Mfg. Company, for the purpose of establishing a hat manufacturing plant at Harlingen, Texas, or some other point in that section of the lower Rio Grande Valley.

J. H. Whatley and Dr. Sam G. Duff of Greenville, Texas, will construct a sewer system and disposal plant at Honey Grove, Texas. The City Council of the latter place recently granted them a franchise for the proposed improvement.

W. H. Morrison & Co. will erect a 40-ton ice plant at San Benito, Texas. The special purpose of the proposed plant is to furnish ice for cars of vegetables, large shipments of these products being made from San Benito to the markets of the country.

THE MACHINERY MARKETS

F. L. Loveoshire of Dallas, Texas, has been employed by the City Council of Corpus Christi, Texas, to prepare the plans for the proposed sewer system and disposal plant. The initial expenditure for the improvement will be $75,000.

A number of large irrigation systems are being constructed in the valley of the Pecos River and in the vicinity of Pecos, Texas, and the completion of these enterprises will witness the installation of a large amount of irrigation pumping machinery. Among the larger companies and the proposed cost of the respective projects are the following: Orient Irrigation Company, $750,000; Arno Co-operative Irrigation Company, $350,000; Porterville Canal Company, $215,000; Toyah Valley Irrigation Company, $300,000; Imperial Irrigation Company, $300,000; Fort Stockton Lands Company, $150,000; Red Rock Canal Company, $84,000; Big Valley Irrigation Company, $68,000; Farmers' Independent Canal Company, $50,000; Pecos & Toyah Lake Irrigation Company, $1,000,000.

The Harlingen Brick Works will double the capacity of its plant at Harlingen, Texas.

Clay Bros. of San Angelo, Texas, will install an electric light plant and ice factory at Fort Stockton, Texas.

The Rockport & Aransas Pass Interurban Railway Company, which was recently organized with headquarters at Rockport, Texas, will construct an interurban railroad between Rockport and Aransas Pass. Either electric or gasoline motor power will be used. Among the incorporators are Charles F. Hoff, R. W. Newberry, S. A. Clevenger and Charles G. Johnson of Rockport.

The contract for the construction of the Port Bolivar Iron Ore Railway from Longview, Texas, to the Cass County iron ore fields, 30 miles, has been let to C. P. Sharp. It is a Santa Fe project.

W. C. Wilkins of El Paso, who recently purchased a tract of land near La Union, N. M., will install an irrigation pumping plant.

J. T. Steele will install an irrigation pumping plant upon his land near La Union, N. M.

The American Sugar Refining Company contemplates erecting a large beet sugar factory at Arksia, N. M.

W. D. McBee of Clovis, N. M., and associates are preparing to install an electric power plant and construct a system of transmission lines to the farmers in the vicinity of Melrose, N. M., to provide power for operating irrigating pumping plants.

Jose Lago of Chihuahua, Mexico, is having plans prepared for a large meat packing plant, which he will erect in that city.

The furniture factory of Gaskell Romney at Colonia Dublan, State of Chihuahua, Mexico, which was recently destroyed by fire, will be rebuilt.

H. O. Flipper of El Paso, representing the Sierra Mining Company, has been granted a concession by the Government of the State of Chihuahua, Mexico, for the installation of a hydroelectric plant near Ocampo, that State. The proposed plant will furnish power for the machinery at the mines of the Sierra Mining Company.

The Richardson Construction Company, in which John Hays Hammond of New York is largely interested, is having surveys made for a gigantic system of irrigation which it will construct in the valley of the Yaqui River, State of Sonora, Mexico, for the purpose of watering 500,000 acres of land owned by the Yaqui River Land & Irrigation Company. In connection with the irrigation project a large hydroelectric plant will be installed.

The Gulf, Colorado & Santa Fe Railway Company will erect a brick machine shop at Somerville, Texas, as an addition to a 10-stall engine house. The new shop will be 54 x 92 ft.

A coal chute with machinery at Teague, Texas, owned by the Trinity & Brazos Valley Railway Company, was destroyed by fire December 6.

Hearne, Texas, has voted favorably on bond issues for a water works system and a municipal electric light plant.

The Southwest

KANSAS CITY, MO., December 26, 1910.

The situation for the new year is full of promise. New railroad building, both by steam and electric lines, will unquestionably cause heavy purchases before spring; while the betterments decided upon by some of the principal roads have already exerted a favorable influence on the situation. In this respect the Southwest seems to be in advance of any other section. During January there will be an unusually large number of municipal bond issues disposed of, thereby making funds available for the purchase of machinery to be installed in electric power stations, pumping plants, &c., and in most cases manufacturers must guarantee rush deliveries to secure contracts.

Bids are about to be taken at Stafford, Kan., on boilers, pumping machinery, &c., for the new water works.

New machinery is to be purchased for the manufacturing plant of the Muskogee Furniture Company, Muskogee, Okla., plans for the enlargement of which are now being completed.

A roundhouse, forge and machine shop, together with a small power plant, will be erected at Lawton, Okla., by the St. Louis & San Francisco Railroad.

The Gila River Power Company, Silver City, N. M., hos been granted the right, by the territorial authorities, to install a hydroelectric plant of 15,000 hp. on the Gila River in Grant County.

A bond issue has been authorized at Lamont, Okla., for the purchase of water works machinery and the funds are expected to be available by January 20.

The erection of a new steel tower and tank as a part of the system at the Quindaro pumping station is under consideration by the authorities at Kansas City, Mo.

It is reported from Las Vegas, N. M., that a new plant will take the place of the foundry and shop of J. C. Adlon, which suffered from fire, or extensive remodeling entered upon.

The Empire District Electric Company, Joplin, Mo., which represents a merger of large power properties, including the Consolidated Light, Power & Ice Company, the Galena Light & Power Company, the Spring River Power Company and the Joplin Power & Water Company, has added to its holdings the Webb City & Carterville Gas Company and the Carthage Gas Company, for the account of which and the properties heretofore operated, extensive improvements will be made during the coming year.

A gas engine power and compressor plant is being installed by the Melrose Mining Company and a 350-ton concentrating plant completed at Duenweg, near Webb City, Mo. This company will for the future be one of the heaviest buyers of equipment and supplies in the district.

Sealed proposals will be received by the city clerk of Onaga, Kan., until the close of business on January 10, for installing a water works plant and erecting a stand pipe with all necessary equipment.

Additional machinery for the electric light plant will be purchased by the city of Kiowa, Okla. Bids are to be taken until January 1.

Plans for the construction of an incinerator plant are now being considered at Kansas City, Mo.

A broom factory is to be added to the plant of the Turner Paper & Woodenware Company, Texarkana, Ark., with corresponding increase in the power equipment.

Frank Frantz, Orville G. Frantz and E. Frantz, Oklahoma City, Okla., are organizing a company to quarry granite and establish a cutting and finishing plant. A large quantity of machinery will be needed.

L. C. Brown, cashier of the State Bank, Nickerson, Kan., is organizing a company to manufacture the Baldwin standing grain thresher, invented by C. C. Baldwin. This machine is designed to thresh the grain as it travels over the field, without cutting the straw.

As the result of a recent sale of bonds, the city of Tulsa, Okla., will expend $100,000 in improving the municipal water works system.

North Pacific Coast

TACOMA, WASH., December 23, 1910.

The termination of the present calendar year is marked on the North Pacific slope by industrial progress of the most satisfactory description. Without experiencing any boom, and notwithstanding labor troubles that threatened at one time to seriously check prosperity, as they did farther south, manufacturing developed steadily all through the year, so that the beginning of 1911 will find it not only greater in volume but also much more diversified than ever before in the history of this section. The growth also to be noted in British Columbia has resulted in an enlarged demand from across the border, and the Alaskan trade contributes much more than in any previous season to the support of machinery builders, sales agencies and supply houses here.

The immediate business of the month will be moderate, as usual, just before and during the holidays, but promises a fair total, and it looks now as though January would start in strong.

New power plant equipment, including a Corliss engine of 1000 hp., is about to be installed in the plant of the Wheeler-Osgood Company, Tacoma, Wash., to provide for the needed increase in capacity.

The Great Northern Railway Company is planning additions to its shops in Everett, Wash., which involve, with equipment, the expenditure of about $100,000. Work on both freight and passenger cars and in connection with maintenance of way is to be provided for.

THE MACHINERY MARKETS

A new plant will be completed shortly at Byron, Wash., by the Byron Machine Company, which controls the manufacture of several patented articles.

Additional machinery has been installed by the West Oregon Lumber Company, Linnton, Ore., which will shortly start operations in a new plant.

The Tacoma Pattern Works, Tacoma, Wash., now has its new shop in service and is able to take care of a larger volume of business.

The Archer Blower & Pipe Company, Seattle, Wash., has the contract for the blower system of the immense new mills of J. Hanbury & Co. at Vancouver, B. C., the machinery of which will be motor driven.

The installation of two multi-stage centrifugal pumps of 6,000,000 gal. capacity each, for high pressure fire service on the water front, is recommended at Tacoma, Wash.

A large timber cutting plant, with dry kilns, sash and door factory and auxiliary woodworking establishments, will be constructed in the near future by the Lovegren Lumber Company, recently organized, whose headquarters are in Portland, Ore.

A 10-stamp mill will be erected by the Montana Consolidated Mining Company of Tacoma, Wash., at its American-Kootenai mine, near Libby, Mont.

The Gilbert Hunt Company, Walla Walla, Wash., recently succeeded the Gilbert Hunt Mfg. Company, of that place, which has been engaged in the production of agricultural machinery, structural steel, &c., and will enlarge the capacity of the plant.

Bids are now being taken on the construction of the large new mill of the Inland Empire Paper Company, Spokane, Wash., and the matter of equipment will be taken up in detail as delivery is required. Electric power is to be used.

Ore reduction works will probably be built in the near future at Robinette, Ore., by the Smuggler-Union Company, whose headquarters are at Telluride, Colo.

The Stockwell-Haley Company, Los Angeles, Cal., manufacturing mattresses and other household goods, has had plans prepared for a new factory. The building will be 62 x 200 ft., four stories. The first floor and foundation walls will be of reinforced concrete and the upper stories of brick. The building will have automatic sprinklers and other fire protection.

The Northwest

MINNEAPOLIS, MINN., December 26, 1910.

Confidence in the coming year prevails all through the Northwestern States, judging by reports from the principal trade centers and talks with visiting machinery users, traveling men, &c., as well as bank clearings and commercial activities in many different lines. Current orders for equipment, material and other supplies sold in connection with industrial enterprises are, of course, light; but the business in prospect promises well for midwinter sales. A great deal of attention will henceforth be devoted to the matter of spring deliveries, and many contracts that may not be definitely closed until February and March, or even later, are to be practically arranged for in the very near future. Types of equipment now come in for careful consideration and operating records receive close scrutiny, particularly by contractors requiring heavy apparatus.

At the head of Lake Superior harbor and dock improvements will lead to large expenditures for the early part of 1911. The latest announcement of a long string of projects previously mentioned in this report is to the effect that one of the large wooden docks at Two Harbors, Minn., No. 1, is to be rebuilt of steel and equipped with the heaviest type of handling machinery. Other similar work is being planned and will be announced shortly.

The Minneapolis, St. Paul & Sault Ste. Marie Railway recently released a large tract lying along its tracks in the northeastern part of Minneapolis, which will be utilized for a new industrial district. A number of woodworking plants, the first of which is to be that of the J. F. Wilcox Mfg. Company, will be established in this location, and other shops and factories are expected to follow. The site already has excellent track facilities, and more spurs will be put in as buildings are erected.

The David Tozer Company, Stillwater, Minn., is arranging to replace with a thoroughly modern plant, which will probably be electrically operated, the planing mill which was destroyed by fire.

The Imperial Iron Works, Duluth, Minn., will have, in consequence of the plant extensions now being made, considerably increased facilities for production during the coming year.

By March 15 the new shops of the Duluth, Missabe & Northern Railway Company will be completed and ready for service, giving much more extensive facilities for repair work than heretofore, and making that company a considerably heavier buyer of equipment and supplies. Increasing traffic and the use of steel frame cars are having an important influence upon the requirements of all of the ore-carrying roads.

The Minnesota Canal Power Company, Duluth, Minn., which is planning the construction of a hydroelectric plant of 80,000 hp., at Ironton, Minn., will furnish commercial power for numerous industries at the head of the lakes. It is proposed to tap the St. Louis River above Cloquet and conduct the water through a canal to the power plant, where a head of about 600 ft. can be secured.

The Fisher Creek Mining & Smelting Company, of which W. A. Knight, Minneapolis, is secretary, will probably add before long to the capacity of its ore reduction plant, situated about 35 miles south of Libby, Mont., making its capacity 100 tons daily. Definite plans have not, however, been fully worked out.

A new woodworking plant, 25 x 125 ft., equipped with machinery from the Berlin Machine Works, Beloit, Wis., will be put in operation shortly by the O'Neil Lumber Company, Kalispell, Mont.

An engineer engaged by the city of Lewiston, Mont., to investigate the local water works, recommends rebuilding the entire system, which will necessitate the purchase of much new equipment. The cost of the improvement is estimated at $85,000. It will probably be undertaken next spring.

Machinery will be bought this winter by the Eclipse Mining & Milling Company, Hailey, Idaho, for ore reduction works to be constructed in the spring.

Brunn-Kinney & Co., Jarbige, Idaho, are installing a battery of steam boilers, heater, pumps, air compressor and other equipment purchased from the Chalmers-Williams Company, Chicago.

The Centerville Mine & Milling Company, Centerville, Idaho, will build a large hydroelectric plant on the Payette River and then rebuild, on a much larger scale, the works which were destroyed by fire, operating them throughout with electric current. The process used is for the recovery of monazite.

The Buechner & Orth Company, St. Paul, Minn., is preparing plans for a one-story reinforced concrete building for a hardening plant, smithshop and boiler room; a two-story building 90 x 150 ft., for assembling room and small machinery, and a one-story building 50 x 50 ft., for storeroom. Equipment for the new buildings will be purchased.

At Payette, Idaho, the Salmon Falls Light & Power Company, incorporated with $100,000 capital stock, has a hydroelectric plant under construction to supply commercial power and light in the surrounding district. Turbine wheels operating under 123 ft. head will be installed. The plant is expected to be in operation by June 1, 1911.

Farther Central West

OMAHA, NEB., December 26, 1910.

Stocks of machinery, together with shop, mill and factory supplies, have been depleted lately to such an extent that considerable ordering will need to be done early next year by dealers in the leading cities of this section, in order to fill routine requirements. Apart from the standard lines of material ordinarily carried, however, trade is likely to open up slowly.

From the mines, ore mills and smelters of South Dakota, Colorado, Wyoming and Utah a good many inquiries are coming into Denver and Salt Lake City, on which considerable business is bound to develop later.

The project for a municipal gas plant at Newton, Iowa, was recently approved. Bids on its construction and equipment will be taken until January 16. Information can be obtained by addressing the city clerk.

Construction work has been started on the 5000 barrel cement making plant of the Fort Dodge Portland Cement Corporation, for which 10 steel-frame rotary kilns, each 8 ft. in diameter by 125 ft. long, will be required, together with the necessary crushing machinery, tube mills, ball mills, coolers, packers, &c., will be provided. The crushing plant, equipped with gyratory breakers, will also be made sufficiently large to furnish about 1500 tons of rock daily for commercial use. A large power plant, electric motors, controllers and auxiliary apparatus are included in the plans. F. D. Brandenburg, the president, has his office in the First National Bank Building, Ft. Dodge, Iowa.

A motor generator set of 1000 kw. capacity will be added to the power plant equipment of the Tri-City Railway Company, Davenport, Iowa. The unit has been purchased.

It is proposed at Goose Lake, Iowa, to install a municipal pumping plant, and a bond issue for the purpose will be voted on.

The authorities at Fairfield, Iowa, have decided upon reconstructing the water works plant, including the ad-

dition of a modern mechanical filtration system. A total of about $60,000 will be expended. New steam pumps are to purchased.

The growth in the business of the Chandler Pump Company, Cedar Rapids, Iowa, has necessitated new office quarters, and ground for a suitable structure was recently purchased.

An election will be called shortly at Battle Creek, Neb., to vote on bonds for a pumping plant.

Funds for the construction of a water works system will be available next month at Wymore, Neb.

Early in the coming year the Hassell Iron Works Company, Colorado Springs, Colo., will have a foundry added to its plant, construction being already under way.

An ordinance was recently passed by the City Council, Denver, Colo., to permit the Denver Union Water Company to build a pumping plant for the South Denver supply system.

An expenditure of $25,000 for water works has been decided upon at Kaysville, Utah.

An order has been placed with the F. C. Richmond Machinery Company, Salt Lake City, Utah, for a steam driven air compressor to be used by the Southern Utah Railroad Company for supplying pneumatic shop tools.

An impulse wheel of the Pelton Water Wheel Company's build has been purchased by the Ohana Mining Company, whose headquarters are in Salt Lake City.

The Nebraska Portland Cement Company, Superior, Neb., is erecting a large cement mill, having 240 acres of proved material. A machine shop is now under construction. The next building to be erected will be 52 x 373 ft., for the grinding mills, kilns and coolers. Side tracks have been laid and the excavation work for foundations is completed.

The town of Gunnison, Colo., is preparing plans for enlarging its electric light plant, contingent upon the approval of a bond issue of $100,000 to be voted on at the spring election. It is proposed to install additional water power to develop 1000 hp.

The Swenson Valve Company, Decorah, Iowa, is installing machinery to double its output. Molding machines will be added to the company's equipment.

The Lehigh Clay Products Company, Lehigh, Iowa, is making improvements at its plant. A dryer building, 48 x 100 ft., four stories; a machinery building, 33 x 44 ft., four stories, and a clay storage room, 32 x 70 ft., are under construction.

The Amsterdam Button Company, Muscatine, Iowa, has been incorporated with a capital stock of $50,000. The company will occupy the old McKee & Bliven factory and will open soon after January 1. The incorporators are J. Howard Hanson, Nicholom Barry, Jr., and E. Watson Gardiner.

The Lahan Stove & Mfg. Company, an Eastern corporation, will establish a plant at Omaha, Neb., involving an investment of $75,000. The company will manufacture both steel and cast iron stoves. As soon as the company decides on the site the contracts for the erection of the factory will be given out.

Government Purchases

WASHINGTON, D. C., December 27, 1910.

The Paymaster-General, Navy Department, Washington, will open bids January 3, under schedule 3190, class 1, for two Bement vertical drilling machines, and under schedule 3202, class 56, for four portable ventilating sets.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids January 17 for two sets of refrigerating machinery, schedule 3227, one motor headstock for 14-in. speed lathe and one 24-in. planer and jointer, schedule 3188.

The Bureau of Supplies and Accounts opened bids December 20 as follows:

Schedule 3092, class 1.—One steam drop hammer. Bidder 100, Hershaw, Bulkley & Co., San Francisco, Cal., $4855; 130, Morgan Engineering Company, Alliance, Ohio, $4865; 137, Manning, Maxwell & Moore, New York, $4975; 150, Niles-Bement-Pond Company, New York, $5800; 167, Joseph T. Ryerson & Son, Chicago, Ill., $2960; 257, Eccles & Smith Company, San Francisco, Cal., $1990.

Schedule 3127, class 61.—One 18-in. lathe.—Bidder 75, Fairbanks Company, Washington, D. C., $1192.85; 80, Garvin Machine Company, New York, $1260; 99, Hendey Machine Company, Torrington, Conn., $1458; 115, J. P. Kemp, Baltimore, Md. $1024.20, $1387.80, $1408; 70, Exeter Machine Works, Pittston, Pa., $1468.45, $1432.80, $1453.70 and $1513.45; 137, Manning, Maxwell & Moore, New York, $1458; 150, Niles-Bement-Pond Company, New York, $1217.

Schedule 3158, class 101.—Two direct connected ventilating sets and one set spare parts.—Bidder 60, Diehl Mfg. Company, Elizabethport, N. J., $630 and $680; 91, General Electric Company, Schenectady, N. Y., $684; 194, B. F. Sturtevant Company, Hyde Park, Mass., $488.

While contracts have not been fully consummated, the New York Shipbuilding Company, Camden, N. J., has received the tender of an order to build a training cruiser for the Chinese Government, particulars regarding which are not yet available.

Savings Bank Life Insurance in Massachusetts

The second financial year of the insurance departments of the Whitman Savings Bank and the People's Savings Bank of Brockton closed October 31, 1910, and at that time the second full year of business for savings bank life insurance ended. Since then the State Actuary has calculated the legal reserve upon the policies in force, determined the surplus available for dividends, and recommended the following scale of dividends to the trustees of the Whitman and Brockton banks, which was adopted by them December 12:

On monthly premium policies which have been in force one year a dividend of 8 1-3 per cent. was declared, and this dividend amounted to one month's premium.

On monthly premium policies which have been in force two years a dividend amounting to one and one-half month's premium was declared. This dividend is 12½ per cent. of one year's premium. This dividend will also be paid on all policies which reached their second anniversary during the present financial year.

Monthly premium policies when they shall have been in force three years will receive dividend amounting to one and two-thirds month's premium. This dividend is about 14 per cent. of one year's premium.

The effect of these dividends is to make the cost of a workman's policy considerably less than that of a similar policy in ordinary industrial insurance.

Complimentary Dinner to Joseph G. Butler, Jr.—Half a hundred well-known men identified with the iron trade in the Central West gathered around the banquet board at the Union club in Cleveland, December 21, to pay honor to one of the veterans of that industry, Joseph G. Butler, Jr., of Youngstown, Ohio, and to celebrate the seventieth anniversary of his birth. Several of the speakers gave reminiscences, and numerous tributes were paid to the guest of honor. Attorney James H. Hoyt of Cleveland acted as toastmaster. The principal speakers and their subjects were: Charles M. Schwab, "The American Ship;" James A. Campbell of Youngstown, "The Guest of the Evening;" William P. Palmer, "We Have Been Friends Together in Sunshine and in Shade." Mr. Butler spoke of "Memories Cast in the Sand Molds of Time." Other speakers were: Samuel Mather of Cleveland, Leonard Peckitt of Catasauqua, Pa., Harry Coulby of Cleveland, W. A. Rogers of Buffalo and John Stambaugh, Rev. J. P. Barry, and Robert Bentley of Youngstown. Judge E. H. Gary, chairman of the United States Steel Corporation, and Willis King, vice president of the Jones & Laughlin Steel Company, sent letters of congratulation.

International Harvester Company Bonus.—The plan for distributing cash bonuses aggregating $550,000 among employees of the International Harvester Company was announced last week. Under the profit sharing plan employees will also be allowed to subscribe for preferred stock at $115 and for common stock at $100 a share to an amount not exceeding their annual salaries or wages, and may pay the stock in monthly instalments not exceeding 25 per cent. of each month's salary or wages. In addition to the regular dividends there is an annual bonus of $4 on each share of preferred stock, and $3 on each share of common stock for five years. The employee must be in good standing in the company's service and retain his stock during that period.

The New York State Public Service Commission has prepared plans for the elimination of grade crossings in the city of Jamestown, N. Y., by the elevation of the tracks of the Erie Railroad. The plans call for a large amount of structural steel. The estimated cost of the work is $500,000, to be borne one-half by the railroad and one-half by the city and State.

How the Eight-Hour Law Is Working

The Government's Experience with Its Vessel Contracts

WASHINGTON, D. C., December 27.—The recent failure of the Secretary of the Navy to obtain competitive bids for the construction of the 27,000-ton battleship, the machinery for a sister ship and for two naval colliers, supplemented by the refusal of all the private shipyards of the country to compete for the construction of two revenue cutters, presumably for the reason that the laws authorizing the building of these vessels stipulate that they shall be built under the provisions of the eight-hour act of 1892, has aroused great interest among shipbuilders and manufacturers who heretofore have done work for the government. The Newport News Shipbuilding & Dry Dock Company has been awarded the contract for the battleship referred to upon the only bid received by the Navy Department, but the single bids on the two colliers submitted by other concerns being defective and no bids whatever being secured for the revenue cutters, it will be impossible to proceed with their construction, and the pressing question now is whether Congress, in view of the results that have followed last winter's legislation, will re-enact the eight-hour provision with reference to the forthcoming naval programme; also as to what action will be taken with reference to the vessels heretofore authorized for which no bids have been obtained.

It is believed here that shipbuilders were deterred from bidding on the warships and cutters referred to for two reasons: First, because any material reduction in the length of the work day in their respective plants would force the cost of construction above the limit of the appropriation acts and, second, because the language of the laws authorizing the vessels is so vague as to make it practically impossible for the shipbuilder to determine in advance the conditions under which he would be obliged to carry out his contract. The refusal of the Department officials to construe the law in advance added to the uncertainties, especially as it was fully realized by all parties concerned that the enforcement of the first statute of this kind as to the construction of vessels might be very drastic because of the exceedingly close surveillance under which the work would be carried on. The provision regarding the eight-hour day contained in the last naval appropriation act is as follows:

> And the contract for the construction of said vessels shall contain a provision requiring said vessels to be built in accordance with the provisions of an act entitled "An act relating to the limitation of the hours of daily service of laborers and mechanics employed upon the public works of the United States and of the District of Columbia," approved August 1, 1892, and shall be awarded by the Secretary of the Navy to the lowest best responsible bidder, having in view the best results and most expeditious delivery.

The corresponding provision of the act authorizing the construction of the two revenue cutters, for which the Government has been unable to secure a single bid, reads as follows:

> The Secretary of the Treasury is directed to have the vessels provided for herein constructed in accordance with the provisions of the act entitled "An act relating to the limitation of the hours of daily service of laborers and mechanics employed upon the public works of the United States and of the District of Columbia, approved August 1, 1892."

In advertising for bids for the two revenue cutters the Secretary of the Treasury in a circular entitled "Special Information Furnished to Bidders," said:

> The act of Congress authorizing these vessels provides that they shall be constructed in accordance with the provisions of the act entitled "An act relating to the limitation of the hours of daily service of laborers and mechanics employed upon the public works of the United States and of the District of Columbia," approved August 1, 1892.

The first section of the act referred to under the provisions of which the vessels are to be constructed is as follows:

> "Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the service and employment of all laborers and mechanics who are now or may hereafter be employed by the Government of the United States, by the District of Columbia, or by any contractor or subcontractor upon any of the public works of the United States or of the said District of Columbia, is hereby limited and restricted to eight hours in any one calendar day, and it shall be unlawful for any officer of the United States Government or of the District of Columbia or any such contractor or subcontractor whose duty it shall be to employ, direct, or control the services of such laborers or mechanics, to require or permit any such laborer or mechanic to work more than eight hours in any calendar day expect in case of extraordinary emergency."

As heretofore stated in this correspondence, the act of 1892 has repeatedly been construed in the courts as applying only to public works constructed upon property either owned by the Government, like public building sites, or over which it has full jurisdiction, as in the case of river and harbor improvements, &c. The extension of the law to the construction of battleships or the manufacture of armor plate or heavy guns, or anything else coming within the legal category of "chattels" was never contemplated by its framers.

It is an open secret here that the Department officials are thoroughly disgusted with the action of Congress, but it is clear that their mouths are closed by the action of President Taft in incorporating in his last annual message a recommendation for legislation in place of the pending eight-hour bill. The President said:

> I recommend that instead of enacting the proposed bill, the meaning of which is not clear and definite and might be given a constr ction embarrassing to the public interest, the present act be enlarged by providing that public works shall be construed to include not only buildings and work upon public ground, but also ships, armor and large guns, when manufactured in private yards or factories.

In view of the recent experience of the Navy and Treasury Departments under last year's appropriation laws and with President Taft's specific recommendation in mind, producers of the country will await with much interest the action of Congress on the budget bills to be reported soon after the holiday recess.

W. L. C.

The Flat-Top Fuel Company, Bluefield, W. Va., has published a map 21 x 30 inches of the coal bearing territory in West Virginia and Virginia within a radius of 30 miles of Bluefield, W. Va. The shipments from mines within this radius are put at 15,000,000 tons of coal a year and 3,000,000 tons of coke. The properties of the Flat-top Fuel Company are put down as representing 24,500,000 tons of unmined coal.

The Foerderer Foundry Company, Indianapolis, Ind., recently incorporated, succeeds a firm of the same style, engaged principally in making builders' cast iron hardware. No immediate improvements are contemplated, but in the course of several months the company may be in the market for additional equipment.

The Pittsburgh Company, which is exploiting the advantages of Ellwood City, Pa., for the location of factories, has issued a 30-page pamphlet for the purpose of giving detailed information regarding the location, transportation facilities, resources and general conditions of the city. The pamphlet is a fine specimen of typography and is profusely illustrated.

The Société Anonyme des Etablissements of Ph. Bonvillain & E. Ronceray, 9 and 11 rue des Envierges, Paris, has been awarded a gold medal at the Brussels Exposition. This is the highest award made for the molding machine department of the exposition.

New Tools and Appliances

This is essentially a news department for which information is invited.

Large Double Action Drawing Press.—For the heavy blanking and drawing work connected with the automobile trade, the D. H. Stoll Company, Buffalo, N. Y., has recently completed a specially designed large double action toggle motion drawing press. The work that it is primarily intended to do is the drawing of radiator fronts, which is done in one operation from the blank. The press weighs 86,000 lb., and has a overall hight of 14 ft. It is driven through gearing having a ratio of 35 to 1, while the action of the press is controlled by a lever that extends to the front of the press and operates a multiple disk friction clutch which is 24 in. in diameter. This clutch is designed for severe service, is capable of transmitting 100 hp. at 250 rev. per min., and is fitted with friction blocks. The flywheel mounted on the driving shaft has a weight of 2300 lb., and the 8¼-in. crank shaft has two cranks of 7-in. throw. The crank pin bearings are 10 in. long and the shaft bearings are 17 in. in length, all being bushed with bronze. The press has an outside or hold-down slide, and the toggle motion gives an exceptionally long pause to the slide when the latter is at the bottom of the stroke.

Ellipsograph.—J. T. Kelley, West Rush, N. Y., is manufacturing an ellipsograph which enables ellipses having a wide range of major and minor axes to be drawn. If desired the compass member can be detached from the ellipsograph and used as an ordinary compass or dividers, as an extra leg is supplied with the tool for that purpose.

Caliper and Depth Gauge.—Schuchardt & Schütte, West Street Building, New York City, are placing on the market a vernier caliper and depth gauge. When setting the jaw for outside measurements, the inside jaws on the depth gauge are simultaneously set to the same measurement without any allowance. One edge of the tool is graduated in sixteenths and the other in fiftieths of an inch, and with the verniers readings can be secured to 1-128 in. on the upper scale and to 0.001 in. on the lower scale. The caliper can be furnished either with or without a micrometer adjusting screw and with either polished or nickel plated finish.

Lathe for Turning Trolley Wheels.—The Garvin Machine Company, Spring and Varick streets, New York City, has equipped its standard No. 3 screw machine for the rapid production of trolley wheels. Two tools are mounted on the cross slide and each of these finishes one-half the groove in the wheel. The saddle carrying these tool slides is not rigidly fixed to the bed, but has limited longitudinal motion by a rack and pinion operated by a lever below the pilot wheel. The work is gripped in the maker's pneumatically operated chuck, and a rotating steady mounted in the turret bears against the outboard face and relieves the chuck of considerable strain. In producing these wheels the first operation is to finish the groove, after which the hole is drilled, bored and reamed by successive tools in the turret. In operation a hard bronze wheel 4 in. in diameter and 1½ in. wide, with a ¾-in. groove and a ⅞-in. hole, can be finished in 2 minutes.

Poppet Valve Grinder.—J. H. Higbee, Muncie, Ind., has recently patented a new type of poppet valve grinder for gas engine and automobile engine cylinders. A compound ratchet movement, which gives an exact duplication of the hand action, is the principal feature of the machine. The rate of production is from four to eight valves every 10 or 12 minutes per man.

Horizontal Boring, Drilling and Milling Machines.—Franklin Machinery Company, Franklin, Pa., is manufacturing a horizontal boring, drilling and milling machine in which the control is centralized, and all the levers for the changes of speeds and feeds and for starting and reversing are conveniently located near the usual operating position. The all-gear type of drive is employed and steel gears and clutches and a friction adjustable from the outside of the drive box gives 12 speed changes and half that number of feed changes. All of the drive and feed gears run in an oil bath. The automatic feed is applied to the boring bar, both directions of table motion. the boring bar saddle and the outboard bearing, and a convenient hand wheel is provided for gradually advancing the various feed operated parts.

Combination Pliers.—The Medhus-Pihl Company, Hastings, Mich., is making a combination tool in which the jaws have a square recess fitting into a projection on the handles. In this way four positions in which the jaw can be placed with relation to the handle are obtained, and a number of other special jaws which are interchangeable enables the tool to be used for a number of different purposes.

Twenty-four-Inch Crank Shaper for Heavy Duty.—C. F. Dodge, Lowell, Mass., has placed on the market a new crank shaper with V-shaped ram guides which insures accurate alignment, and the method of bolting the ram overcomes any tendency to spread the frame or buckle the ram when taking heavy side cuts or roughing. A back geared crank with quick return actuates the ram, and the stroke can be changed while the machine is in motion, the length being indicated on a stationary index. The position of the ram can also be altered while the machine is at rest or in motion. The head swivels to any angle, and the feed screw has a micrometer dial reading to thousandths of an inch. The box type table can be swiveled through 360 degrees, or, if desired, can be readily removed and the work secured to the table.

Double Spindle Milling Machine.—Beaman & Smith, Providence, R. I., have recently built a double vertical spindle milling machine in which each spindle has an adjustable support for the lower end of the milling cutter. The spindles can be adjusted for center distances between 24 and 40 in., and the vertical adjustment is from 3 to 9 in. above the table, which is 36 x 48 in. Nine speed changes are available through two pull levers.

Refillable Fuse Shell.—The A. F. Daum Company, Pittsburgh, Pa., is manufacturing a refillable cartridge fuse shell in which blown out fuses can be removed and a new one easily and expeditiously put in place. When a fuse blows out, it is simply necessary to remove the shell from the board, unscrew the metal ends from the tube, extract the damaged fuse, replace it with a new wire or strip, screw on the ends and put it back on the board. These shells can be furnished with knife, clip or screw contacts.

A New Type of Roller Bearing.—The New York Oilless Bearing Company, 127 White street, New York City, has recently placed on the market a new type of roller bearing. The mechanism is an adaptation of the principle of the barn door hanger to a rotating instead of a sliding member, and the bearings are made to cover a wide range of special requirements, such as high speed, absence of oil, high temperatures, &c.

The steel work of the new building of the Union Drawn Steel Company, Beaver Falls, Pa., has been completed, and the brick work is being pushed as rapidly as possible. The main building will be 150 x 300 ft., two stories. Special machinery for the manufacture of cold drawn shafting and rods is being manufactured for the equipment of the plant.

The Chicago Malleable Castings Company, 120th street and Center avenue, Chicago, has completed the past year a new power house and new annealing ovens. The company now has under consideration the erection of another foundry building, 80 x 270 ft., which will necessitate the purchase of additional equipment.

C. A. Bookwalter, Indianapolis, Ind., is interested, with other citizens, in the Greater Indianapolis Industrial Association, which has acquired 1000 acres of suburban property, to be given as free factory sites to new industries. The association is not organized for profit.

Personal

Effective January 1, W. R. Lathrop will take charge of the Birmingham, Ala., sales office of the Niles-Bement-Pond Company and Pratt & Whitney Company, in place of N. C. Walpole, resigned.

Charles M. Hall, of the Aluminum Company of America, Niagara Falls, who invented the process now generally used in this country for the production of aluminum, has been awarded the Perkins medal for 1910. The presentation will be made in New York at a meeting soon to be held of the joint bodies interested.

The engineering firm of Dodge, Day & Zimmermann, Philadelphia, has added to its organization Walter Loring Webb and James M. Kennedy, both well known in the engineering world. Mr. Webb is the author of several engineering text books, including "The American Civil Engineers' Pocket Book," "Economics of Railroad Construction" and "Problems in the Use and Adjustment of Engineering Instruments."

Frank B. Baird, president of the Buffalo Union Furnace Company, Buffalo, N. Y., will sail for the Mediterranean January 7 on a pleasure trip, to be gone about two months.

Charles T. Fairbairn has been appointed manager of the Southern district of the Republic Iron & Steel Company, with headquarters at Birmingham, Ala., succeeding W. A. Green, resigned. Mr. Fairbairn has been in charge of the ore department of the company with office at Pittsburgh.

C. T. Needham, senior partner of John Needham & Sons, Manchester, England, was elected a member of Parliament December 3 for one of the divisions of that city. Mr. Needham is well known in this country and Canada, having made frequent visits in extending the business of his firm on this side of the Atlantic.

Charles W. Beaver of the hoisting department of the Yale & Towne Mfg. Company, 9 Murray street, New York, sailed December 28 for England, where he will remain four months in charge of the European business of the company. Mr. Beaver has been directing the export hoisting business for the company from its New York office.

J. M. Sherrard, sales manager of the Taylor Iron & Steel Company, High Bridge, N. J., will make his headquarters in the New York office of the company, 100 Broadway, after January 1.

Obituary

Thomas G. Williams, Bedford, Ohio, died December 21, aged 62 years. He was born in Little Western, Pa. Later his family moved to Hanging Rock and shortly afterward to Ironton, Ohio. His ancestors for generations were mill people in Wales. Mr. Williams was widely known in the sheet steel and tin plate trade throughout the country. At different times he was connected with the American Galvanizing Works at Cincinnati, Ohio; Morehead-McCleane Company, Pittsburgh, Pa.; United States Iron & Tin Plate Company, Demmler, Pa.; Cambridge Iron & Steel Company, Cambridge, Ohio, and Parkersburg Iron & Steel Company, Parkersburg, W. Va. Recently he had helped to organize and construct the new plant of the Standard Steel Company at Bedford, Ohio, and was secretary and general superintendent of the company.

Edgar N. Dickson, president and treasurer of the Dickson Malleable Iron Company, Milwaukee, Wis., died suddenly December 20, aged 44 years. He was formerly purchasing agent of the Allis-Chalmers Company, but a year ago organized the Dickson Malleable Iron Company, of which he was the principal owner. He leaves a wife and two children.

Edward J. Gardner, president of the E. J. Gardner Axle & Machine Company, Carlisle, Pa., died from pneumonia December 25, aged 60 years. He was the son of Frank Gardner, a pioneer in steam engine and car manufacturing in Pennsylvania. He leaves a widow and four children.

Customs Decisions

Washers

By a decision of the Board of United States General Appraisers, S. Hoffnung & Co., New York, have been successful in securing lower duty on washers made of wrought iron or steel. The goods, which are patented, were invoiced as "fast-nut" washers, duty being assessed at the rate of 45 per cent. under the revision in the tariff act of 1909 for "manufactures of metal." The goods were claimed to be properly dutiable at ¼ of 1 cent per pound under paragraph 162, which provides specifically for washers. The board reverses the custom house authorities and finds in favor of the importers.

Lacemaking Machinery Parts

Parts of lacemaking machines will not receive the benefit of the free entry accorded machines, if imported separately. This conclusion was reached by the board in disposing of a protest filed by Peter Balzarini. The merchandise is described as bobbin machines or apparatus used for winding the threads upon the bobbins. General Appraiser Fischer states in his decision that parts of the machines are not to be accorded the same privilege of exemption as the statute extends to machines. The board accordingly reaches the conclusion that the parts will have to stand a duty of 45 per cent. under the provision for manufactures of metal in the act of 1909.

Fishhooks

O. G. Hempstead & Son have succeeded in securing a reduction in the duty assessed on fishhooks made from iron or steel wire. The differences between the Government and the importers turned on the question of the value of the wire from which the fishhooks are made. It was the contention of the importers that the wire was not valued at more than 4 cents a pound, and, therefore, should be allowed to enter at the lower rates provided for fishhooks made from wire worth less than 4 cents per pound. The decision written for the board says that it is established by the proof offered that the wire used in the manufacture of the hooks cost less than 4 cents a pound. The Government offered no proof that at the date of shipment a change had occurred in the value of the wire used in the manufacture of the hooks. Under these circumstances, the protests are sustained.

The Lone Star Iron Works, Dallas, Texas, was incorporated November 21, to continue the jobbing business of the old Herdwick Foundry & Machine Company. It will add equipment to manufacture a line of gasoline engines. J. H. Lieber is president; W. S. Myers, first vice-president; B. Kinsell, second vice-president; Otis Williams, secretary; T. F. Lewis, treasurer.

The property of the Western Tin Plate Mills, at Greencastle, Ind., recently sold at receiver's sale, has been formally transferred to Austin Lynch, of Canton, Ohio, representing the majority bondholders. The purchase price is given at $51,000.

The Pidgeon-Thomas Iron Company, Memphis, Tenn., which lost by fire a four-story building recently, is clearing the site and will build at once.

A Large Alberger Pumping Contract

One of the largest contracts for pumping machinery ever placed has just been awarded to the Alberger Pump Company, 140 Cedar street, New York, by the United States Bureau of Yards and Docks, the total sum involved being slightly over $323,000. The contract covers pumping equipment for the three new dry docks to be constructed at New York, Puget Sound and Pearl Harbor navy yards, and includes, all told, 11 54-in. vertical volute pumps, each direct connected to a 550 hp. induction motor, and 7 15-in. vertical volute drainage pumps, each direct connected to an 85 hp. induction motor; also all necessary suction and discharge piping, electrically operated gate valves for such pipes and all electrical controlling apparatus for the motors. Three of the 54-in. units will be located at New York, while four of these units are required for each of the other docks.

Each unit is required to operate against a static head, varying from zero when the dock is full to a maximum of 42 to 44 ft. when the dock is completely empty, while operating at a constant speed of 219 rev. per min. without exceeding the rated horsepower of the motor at any point. In addition to this, each pump is required to maintain an average capacity of 66,000 gals. per min. when emptying the dock from approximately mean high water to 1 ft. above the elevation of the keel blocks, the static head varying from zero to 32 or 34 ft. Under these conditions the contractor has guaranteed an average efficiency of 45 per cent. for New York and Pearl Harbor and 46 per cent. for Puget Sound, these efficiencies being the ratio of the actual useful work in pumping the docks to the electrical input to the motors, and consequently including all losses in the motors, pumps and piping. To meet these average efficiencies it is necessary for the pumps themselves to reach a maximum efficiency of nearly 80 per cent.

In addition to obtaining a high efficiency, the other characteristics of the pump have to be very carefully determined to meet the special conditions involved in this class of work. It is claimed that few concerns in this country are equipped with the necessary engineering data and experience to undertake work of this character.

Texas Freight Rates on Cast Pipe and Steel Rails

The Texas Railroad Commission has issued an order reducing the freight rates on cast iron pipe and steel rails and fastenings, effective January 10. It reduces the rate on cast iron pipe between Texas common points from 16½ cents to 13¼ cents per 100 lb., and the rate from Galveston to Texas common points from 19½ cents to 16¼ cents. The reduction on steel rails and fastenings is 60 cents, or a lowering of the rate per ton from $2.70 to $2.10.

In voting for these reductions Commissioner W. D. Williams cites the fact that the railroads had made a voluntary reduction of rates on interstate shipments from Birmingham to Texas common points, when their managers were clamoring for higher rates on almost all classes of commodities. He said that this voluntary reduction by the railroads of the interstate rates was more than 20 per cent. of the rate, and this concurrently with a 10 per cent. advance in rates on less favored articles. He points out that the rate to Dallas, Fort Worth and San Antonio is $3.90 per ton, all of which the Texas roads receive for an an average haul of 325 miles. The interstate rate from Birmingham to the same cities is so divided by voluntary agreement that the Texas roads get 16¼ cents from Orange, Texas, the average distance in the latter case being, it is said, 381 miles. The reduction in rates means that the Eastern producers will be able to meet competition for Texas business from Birmingham, Ala., on more equal terms.

The Richardson-Phenix Company

The Richardson-Phenix Company, Milwaukee, Wis., a consolidation of the Sight Feed Oil Pump Company of Milwaukee and the Phenix Lubricator Company of Chicago, has completed the equipment of its new factory in Milwaukee, which it claims is the largest plant in the country devoted exclusively to the manufacture of lubricating devices. The new company will manufacture the well-known Richardson and Phenix mechanical lubricators, individual oiling systems, power plant oil filters, and general appliances for lubrication, for cylinder lubrication and also for machinery.

Wilbur E. Richardson, president of the company, has devoted a number of years to the development of this business, which has grown so rapidly that it has been found necessary to broaden the organization in order to handle the largely increased business. He is in personal charge of the works and will continue to devote his time to designing and developing new apparatus for efficient lubrication. J. Wm. Peterson, president of the Peterson Engineering Company, lubrication engineer, New York City, has been appointed general manager of sales, with headquarters in the Hudson Terminal Building, New York City. He has for several years been engaged in the design and installation of power plant oiling systems. The Western sales office is located in the First National Bank Building, Chicago, and will be under the management of J. S. Ward, who for several years was identified with the Phenix Lubricator Company. The Eastern and Western sales offices have been augmented by sales representatives in various cities throughout the country. A new series of interesting engineering bulletins, bearing on the subject of lubrication, is being prepared, and engineers desirous of receiving the series can have their names placed on the mailing list by communicating with either office mentioned above.

Lignite for Power Plant Boilers

Bulletin 2 of the Bureau of Mines is a pamphlet of 42 pages by D. T. Randall and Henry Kreisinger, dealing with "North Dakota Lignite as a Fuel for Power Plant Boilers." The tests described were made at the Power plant of the United States Reclamation Service at Williston, N. Dak. The boiler furnaces were designed to burn a brown lignite mined on adjacent Government land. The furnaces were of the semigas produce type, having an external resemblance to a Dutch oven. The grate was 21 in. below the lower edge of the firing door, and the space between the bridge wall and the end of the prolonged firebrick arch was contracted This construction permitted of a thick fuel bed and at the same time enabled the fireman to see its condition at the top. The conclusions of the authors are thus stated:

The combination of boiler and furnace setting described gives good results with the North Dakota lignite. Steam can be made with a fuel efficiency of 55 to 58 per cent. of the heat in the coal, and no difficulty is experienced in obtaining the full capacity of the boiler.

These results compare very favorably with the results obtained in the average plant using a good grade of bituminous coal when the heat available to the boiler is considered.

Little, if any, advantage is gained by crushing the coal by hand instead of in a power crusher.

To reduce the moisture in the coal by weathering seems to improve the economy, but these tests are not sufficient in number to determine definitely the condition of the fuel and the time required for weathering to insure the best results.

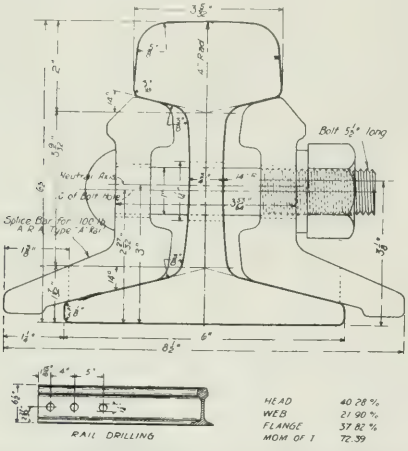
The steam blower for the ash pit is inefficient, and there is no gain in supplying superheated steam to it. A considerable saving in steam and equally good results could probably be obtained by substituting for the steam blower a fan such as is commonly used for forced draft.

Heavy Section High Carbon Rails

Results from Their Use by the Central Railroad of New Jersey

The rapid wear of rails under its heavy trains led the Central Railroad of New Jersey to undertake an experiment representing a radical departure. To secure additional hardness carbon running from 0.90 to 1.10 per cent. was specified and to reduce the liability to breakage with such a high carbon rail, the section was made very large to reduce strains, a weight of 135 lb. to the yard being adopted. The following article from the *Railway Review* is based on data furnished by the engineers of the railroad:

The rails previously in service weighed 90 lb. per yard, and in designing the new section, the Pennsylvania Steel Company was instructed to increase the amount of material in the rail by 50 per cent., with suitable proportions in the increased dimensions of the section. This section is shown in the accompanying illustration. It is 6½ in. high and 6 in. wide on base, with a web ¾ in. thick. The distribution of metal in the section is: Head, 40.28 per cent.; web, 21.9 per cent.; base, 37.82 per cent.; moment of inertia, 72.39.



Design of 135-Lb. Rail Section, Central Railroad of New Jersey.

The head is 2 in. deep and 3 5-32 in. wide at the bottom corners. The base is 1 7-32 in. high; the fishing angles 14 degrees, and the regular splice bars of the 100-lb. A. R. A. "Type A" rail are used, with 1-in. bolts. Other data of the section appear in the drawing, and the rail drilling spaces are also shown.

Analyses of samples of the metal shows that on the average the carbon runs from 0.95 to 1 per cent., although in some drills it has been found as high as 1.12 per cent. The rails were made by the open hearth process, so that phosphorus is very low, being less than 0.02 per cent.

Service Results

These rails have been laid at several places in the main line between Easton and White Haven, Pa., where the track is very crooked, and with but little tangent. There is not only a very heavy freight tonnage, but fast trains as well, so that the elevation of the curves runs high, in many instances being as much as 8 in. Owing to the large size and stiffness of these rails it was arranged to have them curved for alignment at the mill. This work of curving was done systematically, all of the rails being curved to the proper ordinates to fit the curves where they were laid, including the easement ends. This required that the curved rails be numbered and loaded accordingly, so as to come off the cars exactly in order while unloading for distribution along the track.

For this experiment 1000 tons of the rails were rolled and put into the track about the middle of last August. Thus far the experiment has proved satisfactory so far as the wearing qualities of the rails are concerned, but it is yet too early to form conclusions as to the ultimate economy of rails of this size of section and of the peculiar chemical composition. Thus far there have been no breakages of these rails across, but there have been some fractures of the rail head longitudinally, and it is significant that these fractures, in every case, have occurred where the carbon content has run above the maximum limit. There is also another interesting fact regarding these fractures: they have all occurred on the outside of the inner rail of the curve, practically on line with the side of the rail web. In some instances pieces of the head, 2 ft. in length, have been broken down in this manner, and a study of the cause has shown that the fractures have occurred by reason of the excessive pressure on that side of the head underneath the false flange of worn locomotive tires. Since the wheels seek the outer side of the curve the driving wheels on the inside of curve are pulled over to the extent which brings the false flange about on line with the outside face of the rail web. The shoulder on these false flanges first cuts a slight groove in the top of the rail, and the fracture starts in this groove. Owing to the high curve elevation the excessive weight sustained by the lower side of the curve, combined with the small bearing surface on the corner of the false flange, brings heavy strains at this particular part of the top surface of the rail head.

High Carbon 100-Lb. Rails

This company has also undertaken high-carbon experiments with 100-lb. rails of A. R. A. "Type A" section. The trials of these high-carbon rails comprise 14,382 tons rolled at four different mills. The following tabulation gives the proportions of carbon and phosporus in each lot rolled, also the number and date of removal of rails taken from track-on account of defects.

			Defective rails.	
Tons.	Average carbon	Average phosphorus	Date rolled.	Date removed.
*1513	0.75	0.012	December, 1909	March, 1910
*1753	0.76	0.015	January, 1910	March, 1910
*5985	0.739	0.026	March, 1910	May, 1910
†1774	0.65	0.060	August, 1909	December, 1909
*1560	0.688	0.012	August, 1909	December, 1909
			August, 1909	March, 1910
			August, 1909	October, 1910
‡1797	0.548	0.097		None
14,382 total tons.				Total, 7 rails.

* Open hearth. † Bessemer steel. ‡ Bessemer ferrotitanium.

All things considered, the service has been quite satisfactory, considering that only seven breakages have occurred in the whole lot. In fact, the breakages have been fewer than in previous experience with rails of lower carbon. With open hearth rails the carbon runs from 75 to 83 points, and with the Bessemer rails 65 points. Very careful records have been kept of these rails, from the time they were rolled until broken rails were found in the track.

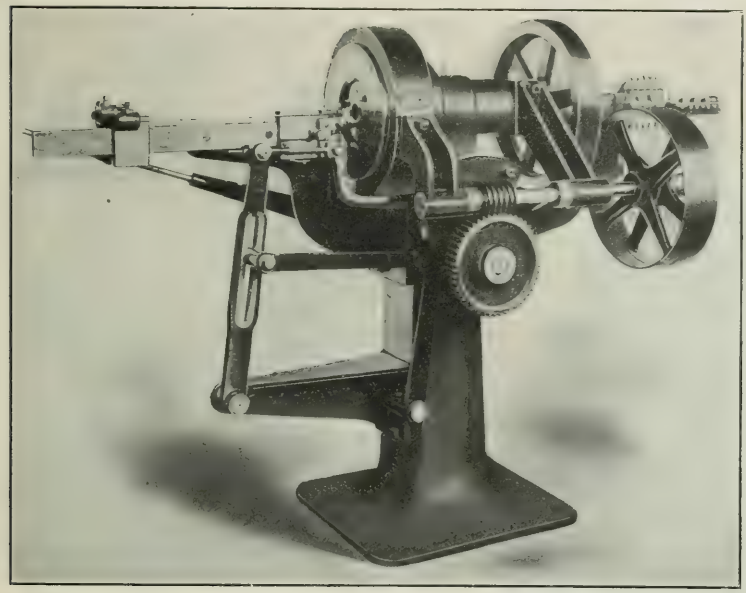
Fishbein & Gross, Cleveland, Ohio, have purchased the property and fixtures of the S. M. Shimer Company's scrap yard, located at Newburgh, Ohio, which will hereafter be operated by them. They will also continue to use their yard at Windsor avenue and the Cleveland & Pittsburgh Railroad in Cleveland.

The Spear & Miller Company, manufacturer of brake shoes, has removed its office from the Great Northern Building to the Railway Exchange, Chicago.

The Manville Wire Swager

Equipped with Full Automatic Feeding and Cutting-Off Mechanism for Handling Wire from the Coil

A new type of swaging machine has been recently brought out by the Manville Brothers Company, 27 Benedict street, Waterbury, Conn. It is equipped with full automatic feeding and cutting-off mechanism for handling work on the order of bicycle spokes and similar articles, and is capable of handling a great variety of work at a minimum labor cost, as the wire is taken directly from the coil, straightened, swaged, cut to length and dropped out as a finished product without being touched by the operator. As in the other types of swagers now on the market the work is done by a series of rolls mounted in a cage which rotates at high speed.



A New Machine for Automatically Swaging Wire Made by the Manville Brothers Company Waterbury, Conn.

In this machine the main swaging spindle is driven by a belt running over the pulley at the rear of the spindle, while the other mechanism is driven by a pulley mounted on a worm shaft which transmits power through the worm to the worm wheel on the main cam shaft passing through the pedestal. The four different mechanisms controlling the feed, the cut-off, the binder and the dies are operated by four cams carried on this main cam shaft.

In operation the wire is fed in through the double roll straightener at the right of the machine and passes through the hollow spindle in the center of the swager. From here it passes through the feed grip and the cut-off quill at the extreme left, where the wires are cut to the proper length and dropped.

The feed mechanism consists of two levers, two links, a roll and the large feed cam on the cam shaft. The cam on the cam shaft engages with a roll on the shorter of the two levers which is connected with the long slotted lever by a link, as is clearly shown in the engraving. The other link which is adjustable connects the slotted lever to the feed grip lever which is mounted on a slide and travels back and forth on the dovetailed slide way. Adjusting this link in the slotted lever regulates the length of the swaged portion of the wire, while that of the unswaged portion depends upon the throw of a cam piece set in the main feed cam. The sizes and shapes of these cam pieces are different for the various kinds of work.

The cutting-off mechanism is operated from the main cam shaft by the cut-off cam engaging with a roll on a forked connection which terminates in a threaded rod. This rod passes through a swivel on the end of a swinging lever, carrying a miter segment and meshes with a corresponding one on the horizontal lever. The latter carries the cut-off knife and in common with the knife, and the other short levers is mounted on a casting clamped to the feed slide way. This casting can be adjusted with its mechanism for varying the length of the pieces of wire cut off.

While the feed grip is returning for another stroke, the wire is held in place by the binder. This consists of a lever with a roll engaging the binder cam within the machine pedestal and a set screw adjustment at its outer end, operating upon a vertical rod. This set screw forces the vertical rod against the wire at the top of the bracket which supports the straightener.

Like the other mechanisms, that controlling the die is operated by a cam on the main shaft which engages a roll to which a lever is attached. This lever, which is at the rear of the machine, has a vertical member that carries a second roll operating between the two flanges of a grooved collar mounted adjustably on the hollow spindle which extends through the center of the main swaging spindle. Two wedges are hinged on the forward end of this hollow spindle and are free to reciprocate between the swaging dies and the pieces taking the thrust of the swaging rolls. The motion of this hollow spindle with its wedges regulates the swaging of the wire, and when they are thrust forward, the dies close upon the wire and swage it, while when they are drawn back, the full diameter of the wire is retained.

German Spelter Interests Cut Loose From London.—The German Zinc Association has just made a move intended to liberate the German market from London influence. Hitherto it has been the practice in Germany to make contracts for spelter for future delivery, not at a fixed price, but at the London price prevailing at the time of delivery. The association has decided that contracts must be made at a fixed price. This decision holds only for the first quarter of 1911, but among the spelter interests it is assumed that it will be prolonged if the new system operates satisfactorily, and then will later on be made permanent. The association declared business open for the first quarter of the year at unchanged prices, and for April at an advance of about 6 cents per metrical cwt., or 110 lb.

A New Plain Milling Machine

The Brown & Sharpe No. 13 B Constant Speed Manufacturing Type, a Powerful, Rigid Machine, with New Mechanical Features

The No. 13 B plain milling machine of the Brown & Sharpe Mfg. Company, Providence, R. I., is of the constant speed type, and is especially adapted to modern manufacturing methods and the production of duplicate parts. It has a longitudinal feed of 34 in., a transverse feed of 6 in. and a vertical adjustment of 12 in. The machine lends itself readily to motor drive with any constant speed motor, full efficiency being available at all times. The drive is either from the main line or a countershaft, a friction clutch mounted in the driving pulley furnishing means for starting and stopping the machine. New mechanical features include the control of both longitudinal and transverse feeds by a single hand wheel, and the method of attaching the change gears by clutched hubs and split washers. The machine is of heavy construction. The upright which supports the spindle head is of box form, while the bed and saddle are proportioned to give full support to the table when under the heaviest cuts. The saddle is long, wide and heavy, with large bearing surfaces on the bed. The location of the levers and the hand wheel tend to convenience and facility in operation. Fig 1 is a general view of the machine showing the arrangement of the operating mechanism, and Fig. 2 shows the rear of the tool. Figs. 3, 4, 5 and 6 are sections through the change gear case, the spindle worm case, the table and through the bed, respectively, the last showing the method of using the hand wheel for operating both the longitudinal and the transverse feeds. Fig. 7 gives details of the table reversing mechanism, and Fig. 8 is an end view with the gear case open.

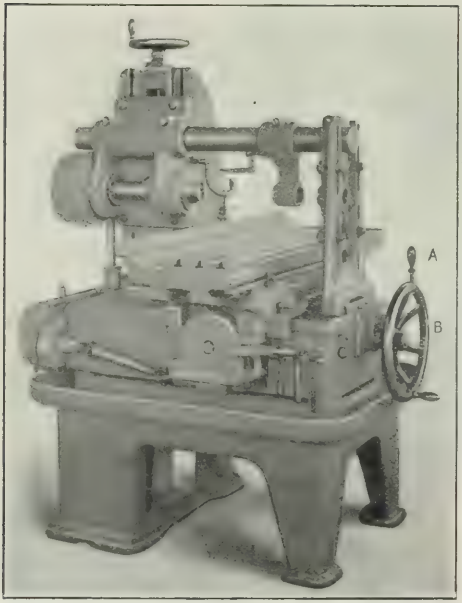


Fig. 1.—General View of the No. 13 B Constant Speed Miller Built by the Brown & Sharpe Mfg. Company, Providence, R. I.

The friction clutch which starts and stops the machine is operated by the lever A, Fig. 1. The transmission of the drive to the spindle is shown in Figs. 3 and 4. Referring to the former, power is carried from the main shaft *a*, running at the constant speed of 300 rev. per min., through bevel gears to the shaft

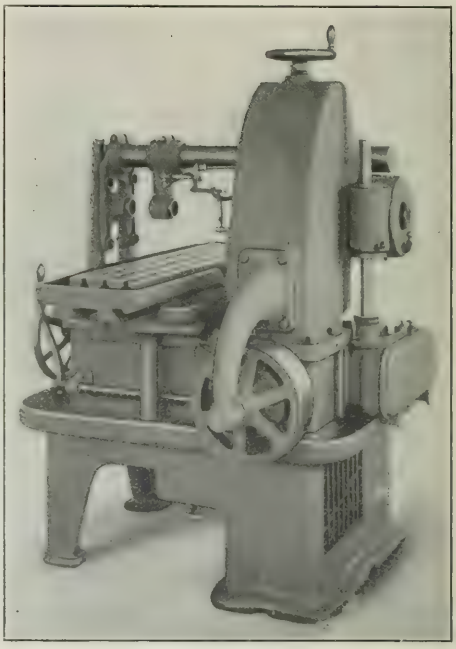


Fig. 2.—Rear View of the Machine.

b, and then through the change gears *c* and *d* to the worm shaft *e*, Fig. 4. In this way eight changes of speed ranging in approximately geometrical progression from 20 to 124 rev. per min. are obtained. Mounted on this shaft is a hardened steel worm meshing with the large worm wheel *f*, to which the spindle is keyed. The worm and the worm wheel run in oil and provide a smooth, powerful drive. Full provision is made for the wear of the worm. Adjustment for end thrust is made by loosening the screw *g* and tightening the nut *h*, this action forcing the bushing *i* against the worm,

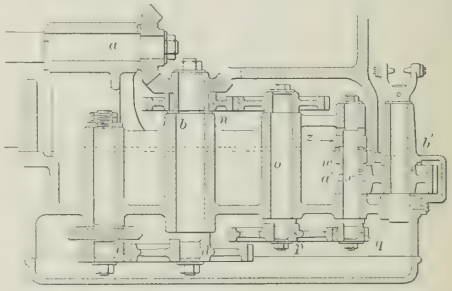


Fig. 3.—Sectional Elevation Through Change Gear Case.

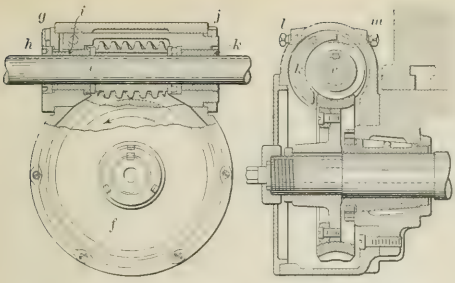


Fig. 4.—Sectional View, Giving Details of Spindle Worm.

The spindle speeds and table feeds, of which there are eight of each, are obtained through change gears kept in a wooden box in the base of the machine. The gear case is seen open in Fig. 8. The tables of speeds and feeds, together with directions for making changes, are cast into the cover of the case, constituting an entirely new feature deserving special mention. The change gears are held in place by clutched hubs and split washers, and can be removed readily without disturbing the nuts. The heavy spindle of the machine is of crucible steel with accurately ground large bearings. It has a standard No. 11 taper hole, and is threaded to receive a chuck or large cutter, and has a recess across for driving an arbor or collet with clutch collar. A 13-16-in. drawing-in bolt is also furnished for such purposes as holding in arbors. The heavy phosphor bronze spindle boxes are provided with means of compensation for wear.

the thrust being taken on ball bearings. To compensate for back lash between the worm and wheel the nut *j* is first loosened, releasing the bushing *k*. As the shaft *e* is mounted eccentrically in its bearings, the screws *l* and *m* are adjusted until the proper center distance is established between the worm and wheel, thus removing the back lash.

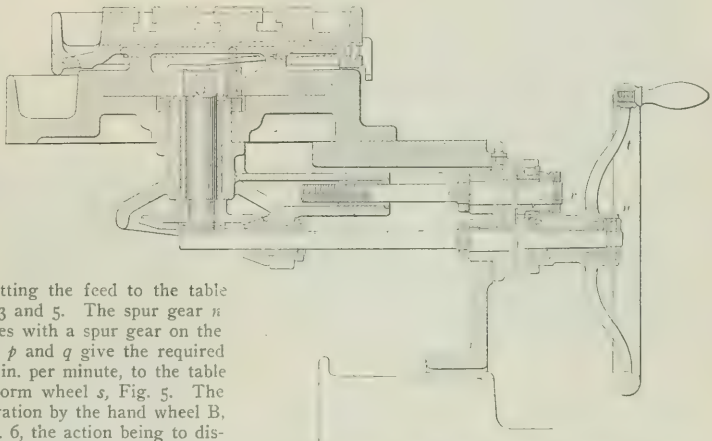


Fig. 6.—Section Through Bed, Showing Operation of Feeds.

The manner of transmitting the feed to the table is shown in detail in Figs. 3 and 5. The spur gear *n* on the shaft *b*, Fig. 3, meshes with a spur gear on the shaft *o*. The change gears *p* and *q* give the required feed, ranging from ¾ to 9 in. per minute, to the table through the worm *r* and worm wheel *s*, Fig. 5. The quick return is put into operation by the hand wheel B, Fig. 1, shown also at *t*, Fig. 6, the action being to disengage the worm and wheel. Thus the hand wheel controls both the longitudinal and the transverse feeds, which is an entirely new feature for the type. Under usual conditions the hand wheel operates the longitudinal feed, in the position shown in Fig. 6. To secure

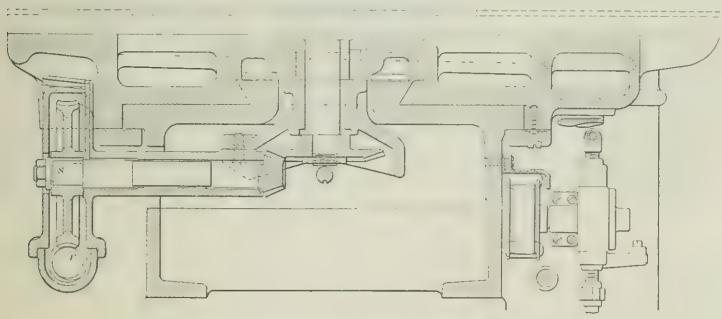


Fig. 5. Sectional Elevation Through Table.

The table is heavy and sufficiently deep to support rigidly all work to its full capacity. The overall dimensions, including the oil pans and channels, are 50 x 15 in., while the working surface is 40 x 12½ in. Three ⅝-in. T slots are furnished for clamping the work in place. The hand wheel on the front of the bed provides for quickly returning the table.

the transverse adjustment the hand wheel is pushed in, disengaging the clutch at *u* and engaging the gear *v*, located on the screw which controls the transverse adjustment. The longitudinal feed is positive and automatic in either direction, and can be released automatically at any point.

The table reverse is shown in Figs. 3 and 7. The driving gear *w* slides on the change gear shaft *x*, its position being determined by the action of the knob seen at C in Fig. 1 and at *y*, Fig. 7. To reverse the feed the gear *w* is moved into mesh with *z*. The gear *a'*, which is on the same shaft with *z*, in turn drives the gear *b'* on the hook joint shaft. The table is driven direct when the gear *w* is in mesh with *c'*, the gears *z* and *a'* running idle.

A vertical adjustment is operated by the hand wheel on the top of the upright, graduated to thousandths of an inch. The spindle head slides in ways and is

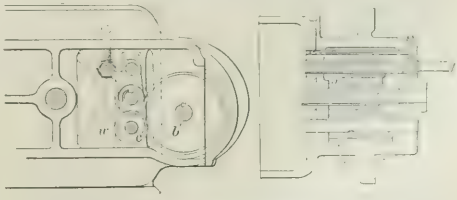


Fig. 7. Details of Table Reversing Mechanism.

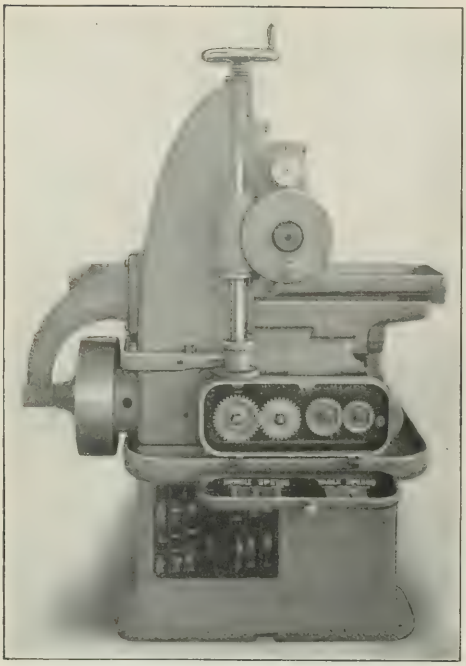


Fig. 8.—End View with Gear Case Open.

clamped to the upright by bolts. The overhanging arm is a solid steel bar ground round, and may be pushed back from over the table when not in use. A specially designed arm support is also furnished. The arbor support can be used at any intermediate point near the cutter, and has a bronze bushing for the outer bearing of the arbor and an adjustable center. In addition to the graduations on the hand wheel of the vertical adjustment, a dial graduated to thousandths of an inch indicates transverse adjustments. The heavy base rests on two legs and a pedestal, and has an oil rim to catch waste oil and a tank and pump to furnish an ample supply of lubricant. The pedestal provides space for convenient storage of the change gears. The bed has unusually wide ways for the saddle.

The principal specifications and dimensions of the machine are given in the following table:

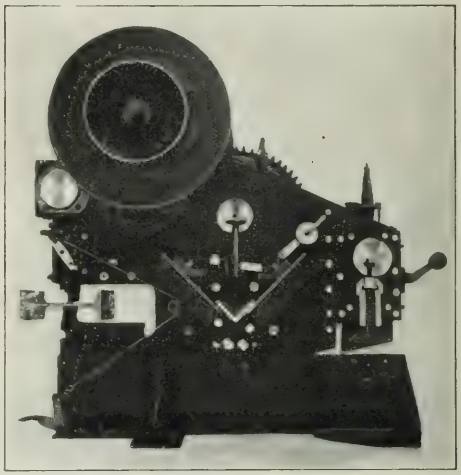
Longitudinal feed, inches	34
Transverse feed, inches	6
Vertical adjustment, inches	12
Diameter of spindle, inches	3¼
Taper hole through spindle	No. 11
Diameter of hole through spindle, inches	1 5/16
Diameter countershaft pulley, inches	14
Speed of countershaft, revolutions per minute	300
Width of belt, inches	4
Number of speed changes	8
Minimum speed, revolutions per minute	20
Maximum speed, revolutions per minute	124
Distance from spindle center to under side of overhanging arm, inches	5½
End of spindle to arbor bushing with arm support in position, inches	22½
Distance face of column to arm support, inches	26
End of spindle to center in arbor support without arm support, inches	27½
Overall dimensions of table, inches	50 x 15
Working surface of table, inches	40 x 12½
Number of T slots	3
Width of T slots, inch	⅝
Number of feed changes	8
Minimum feed, inch per minute	¾
Maximum feed, inches per minute	9
Width of vise jaws, inches	6⅛
Depth of vise jaws, inches	1 9/16
Opening of vise, inches	3⅜
Floor space required, inches	84 x 67
Net weight, pounds	3,800
Shipping weight, pounds	4,400

The equipment furnished includes countershaft, friction pulleys, sets of change gears, a flanged vise with hardened tool steel jaws, and all the accessories usually supplied with a machine of this character.

The Pels Combined Punch and Shear

Among the new tools exhibited at the Brussels Exposition by Henry Pels & Co., 90 West street, New York City, was a triple combined universal punch, splitting shear and angle and bar cutter. This tool is able to handle all the punching and shearing operations met with in shipyards and boiler, bridge or structural shops. Its construction follows the same general lines as the one-stroke beam shear and the structural shape shear of this company, which were illustrated in *The Iron Age* April 23, 1908, and January 21, 1909, respectively, the frame being made of one very heavy open hearth rolled steel plate.

The manufacturer is able to build this shear to conform to any specifications which may be furnished. The punch end can be supplied with any desired depth of throat, and is built either with or without the universal jaw. Coping, slotting and notching operations can be cared for by the application of a special attachment and a shearing attachment for the punch end can



The Triple Combined Universal Punch, Splitting Shear and Angle and Bar Cutter Made by Henry Pels & Co., New York City.

also be furnished if desired. The machine will cut angles and tees both square and at a bevel of 45 degrees, as well as cutting round, square and flat bars, and by using interchangeable knives, beams and channels can also be sheared. Plates having unlimited length and width can be handled and extra long knives can be used. The shear channels are milled out of the frame, and, as they have no fillets, the passing of plates in and out of the machine is accomplished very easily.

As separate gags are used for the three parts of the tool, it can be worked to the limit of its capacity by three men simultaneously. For securing exact adjustment of the work, the punching slide has the usual stop motion and can be operated either by the hand lever or the foot treadle.

Seven sizes in all of the machine are built, the one illustrated being the middle size, having a throat depth of 20 in. The maximum dimensions of rounds and squares handled are 2⅜ and 2¼ in., respectively, while angles and tees up to 5 x 5 x ½ in. can be cut either square or with a bevel. By using interchangeable knives beams as large as 7 in. and weighing 16 lb. per foot can be cut and channels 6 in. deep and 3 in. broad can be handled. The machine will also shear plates of any length or width where the thickness does not exceed ⅞ in. and will punch 1¼-in. holes in material 1 3/16 in. thick.

Asbestos

Its Occurrence in Nature and the Methods of Manufacture

BY J. F. SPRINGER, NEW YORK.

Asbestos is one of the most peculiar substances known to the geologist. It occurs in extraordinarily thin veins running through the strata of ordinary serpentine rock. Some veins are not more than ½ or ¼ in. thick and some are less. Whatever this vein thickness is, that is the length of the asbestos fibers. A peculiarity of this fiber is its smoothness. For a long time it was very difficult to spin asbestos into a thread because of this smoothness, but now this has been overcome and asbestos thread is now produced so thin that a mile of it weighs only about a pound.

While asbestos in some form has been known for 2000 years, it has become important industrially only during recent years. Now it is used for many things, particularly for covering steam pipes, for which it has admirable qualities. It is a very good non-conductor of heat, and it is largely because of this that it is so much sought. In addition, it is fireproof, as shown in Fig. 2. Asbestos does not have to be of the very highest quality to withstand 2000 or 3000 degrees F. It derives its ability to resist heat from the fact that its chief constituents have already been burnt or oxidized, as it is made up of oxides of silicon, magnesium, aluminum, iron and hydrogen. It also possesses great resistance to acids. All of these make its use in connection with steam installations of high utility. In Fig. 1 a typical application of manufactured asbestos to steam purposes is shown, the coverings being made by the H. W. Johns-Manville Company, New York City.

The United States contains some asbestos, but has never become an important factor in its production. Canada produces nearly the whole, while Russia and Cape Colony add a little. Italy contains some high-grade asbestos, (amianthus), but is scarcely a factor, apparently because of the difficulty of mining the material. In Canada, the mines are commercial propositions. In appearance and form, its asbestos (chrysotile), is quite different from the Italian, but chemically and industrially they are very similar. The Canadian asbestos is found at or near the surface, 150 or 200 ft. being about the maximum depth of the mines, which are usually worked as open pits like stone quarries. Cableways or derricks are employed to bring the raw material to the surface. That which promises fibers ⅝ in. and longer is usually dressed by hand. Girls and men break up the fragments with hammers and small sledges, and a certain amount of the fibrous portion is recovered by sieves. The material from which the hand process fails to extract the fiber and the shorter lengths find their way to the mill, where they are mechanically treated.

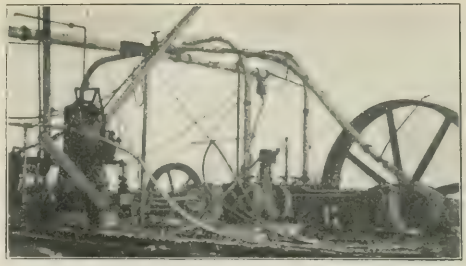


Fig. 2.—Asbestos Pipe Covering Intact After Destruction of Plant by Fire.

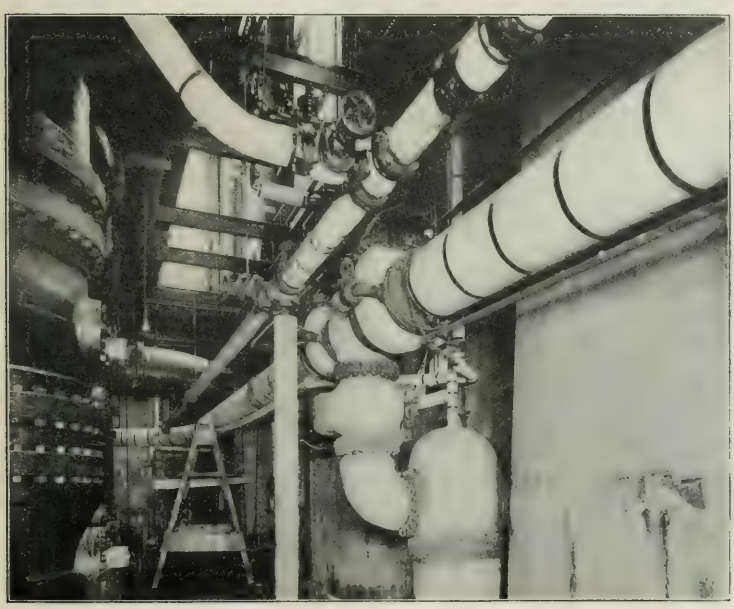


Fig. 1.—View in Basement of the Lardner's Point Station, Philadelphia, Pa., Showing Use of Asbestos Pipe Covering.

Mechanical methods are only a few years old and are in vogue at nearly all the works now. Rock crushers, jaw breakers, crushing rolls, fans, conveyors and screens make up nearly all the chief items of the equipment. These would have but moderate success were it not for the machines known as fiberizers. One variety is the beater, which consists of a horizontal cylinder of boiler plate with a shaft extending along its axis and provided with a group of arms about every 6 in. These arms are fitted with knives or blades, so that when the shaft is rapidly operated the ore is cut up. The arrangement is such that the material fed in at the ends is discharged at the center, or vice versa. Another fiberizer is the cyclone. At the bottom of an iron case are arranged two chilled iron devices similar to propellers. These are independently operated in opposite directions from the outside. The effect of their rotation at 2000 or 2500 rev. per min. is to soon break up the asbestos material, which is fed in in pieces the size of walnuts, into quite small fragments. This is one of the most efficient machines, despite the fact that some of the fiber is ruined.

Electro-magnets are employed by a couple of concerns for the purpose of removing chance bits of iron.

The Brass Manufacturers' Annual Meeting

The National Association of Brass Manufacturers held its annual meeting at the Hotel Astor, New York City, December 13 and 14. In attendance and matters accomplished it was one of the most successful meetings held in years. New members were elected. A committee was appointed to take up with the pottery and enameled iron manufacturers the question of standardizing openings and threads. Another committee was appointed to take up with the authorities in Washington the question of establishing uniform measures and threads. The following officers were elected for the ensuing year: Theodore Ahrens, Louisville, Ky., president; trustees, A. S. Hills, Haydenville, Mass.; W. H. Wasweyler, Milwaukee, Wis.; C. C. Hale, New Haven, Conn.; D. H. Roberts, Detroit, Mich.; F. Somerville, Toronto, Canada; J. W. Sharpe, Jr.; Philadelphia, Pa. The next meeting will be held in Chicago in March. William M. Webster, 1112-1114 Schiller Building, 109 Randolph street, Chicago, has been reappointed commissioner.

The Crane Company, Chicago, has distributed to its employees a bonus of 10 per cent. on their wages or earnings for the year ending November 30. All employees in the shops and branch houses and clerks in the general office are included in this annual Christmas distribution. The fiscal year of the company, which formerly ended November 30, has been changed to end December 31, conforming with the requirements of the national corporation tax law, but the amount received by each employee is calculated on the former fiscal year.

Voightmann & Co., a new Chicago corporation with $150,000 capital stock, succeeds a firm of the same style in the manufacture of metal fire windows and doors. No changes in the plant or business are contemplated.

The Newark Automatic Gear Cutter

A Powerful Machine of the Horizontal Cutting Type for Heavy Spur Gears

The Newark Gear Cutting Machine Company, Newark, N. J., is building an automatic spur gear cutting machine for heavy spur gears 84 in. in diameter, 24 in. face width and 6 in. circular pitch. An important feature in a machine as large as this, which is the most powerful and the largest of the horizontal type made by this company, is the convenience with which the operator can set the machine for producing the various pieces of work to be turned out. As will be noticed from Fig. 1, which shows the operating side of the machine, all the operating levers are placed on that side so that they are under the control of the operator.

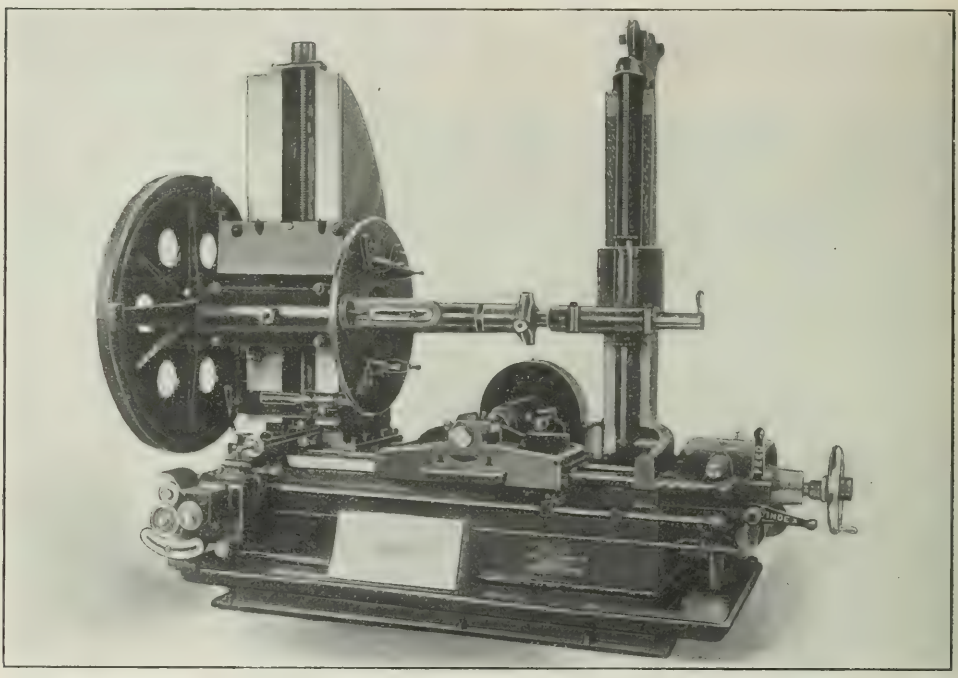


Fig. 1.—Operating Side of an Automatic Spur Gear Cutting Machine Built by the Newark Gear Cutting Machine Company, Newark, N. J.

Fig. 2 shows the driving side of the machine, the special feature of which is the single driving pulley, which runs at the constant speed of 300 rev. per min.

The large diameter work spindle is of accurately ground machinery steel, and has a taper hole to receive the work arbors which are held in place by a draw-in bolt. The work head, which is of massive proportions, is fastened to the head with gibs, thus maintaining the proper alignment regardless of which clamping bolt is first tightened. A screw and micrometer dial graduated to read in thousandths of an inch is provided for the head, which can be quickly raised or lowered by power.

A taper hole in the cutter spindle, which is a crucible steel forging, receives the cutter arbors that are drawn into and forced out of the spindle positively by a draw-in bolt without hammering. Both the spindle and the arbor are sufficiently heavy to enable either a gang of finishing cutters or a gang of finishing and roughing cutters to be mounted side by side on the arbor. A powerful spur gear train drives the spindle, and the various speed changes are secured through

change gears placed as near the last member of the driving gear train as possible. In this way the driving shafts are permitted to rotate at constant speeds, and when the cutter is running at slow speed on heavy pitches undue strains in the shafts are avoided.

Change gears are also employed for securing the changes in the cutter carriage feed, but the cutter speed and the carriage feed rates are independent of each other, so that one may be changed without its affecting the other. The engagement of the power feed to the cutter carriage is controlled by the feed lever, which is marked to distinguish it from the index lever. The quick return of the carriage is constant, and is not affected by the feed or speed of the cutter, while the former can be set so that the carriage will feed and return without having the blank index, a feature which is useful in setting the machine for the production of work. The draw-cut principle is utilized in the carriage feed, and the thrust collars are placed so that the feed screw is not subjected to compression strains, either while feeding or returning the carriage. The special advantage of this type of feed is said to be the securing of a smooth uniform feed that is free from vibration. The carriage hand wheel is self-disengaging, and does not revolve when the power feed is engaged. The carriage is especially long, with the cutter spindle bearing set at its center, a construction that prevents chattering or vibration. It is said that even when operating under severe duty the action of the carriage is very smooth and quiet, due to the use of very long bearings with narrow guides.

The indexing or dividing mechanism consists of a large master wheel, which is a worm wheel generated in place on each machine and positive actuating mechanism. This worm wheel is made in sections—that is, the wheel proper and a ring. This construction is used as it is possible in this way to insure accuracy that could not be obtained otherwise. The positive indexing mechanism which includes a very simple clutch requiring no adjustment transmits motion to the master wheel. A complete set of indexing gears is furnished for cutting every number of teeth up to 100 and all, except prime numbers, from 100 to 450, while the machine is so arranged that where any unusual number is required to be cut, it can be done by employing an extra change gear, although this is seldom necessary as a wide range of higher numbers can also be cut. A lever is used to trip the index mechanism when setting the machine or to set the machine to rotate the blank continuously.

A safety device which prevents the carriage from feeding until the division has been correctly completed is furnished in connection with the positive indexing mechanism, and is especially valuable when the large size of the gears cut is taken into consideration. Another safety device prevents the machine from dividing when an obstruction on the gear blank such as a lug or flange would collide with the rim support and otherwise injure the gear or the machine. This latter device is entirely automatic and operates without any setting or adjustment regardless of the size of the gear or the number of teeth being cut. Another valuable feature of it is the interlocking by which the operator is prevented from engaging the feed mechanism while the machine is dividing.

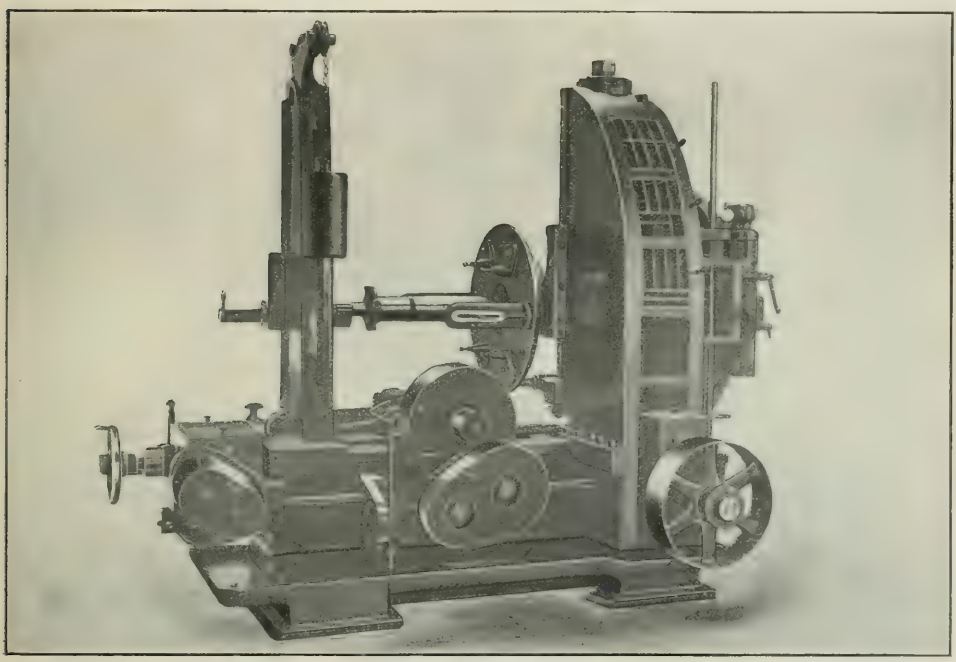


Fig. 2.—Driving Side of the Cutter.

The Fitz Simons Steel & Iron Company, Chicago, has been incorporated with $20,000 capital stock, and has opened offices and a warehouse at 218-224 North Jefferson street. The company will carry a stock of cold-rolled strip steel, shafting and other special lines of steel. R. F. Fitz Simons, the president, has been active in this branch of the steel trade in Chicago for 10 years. Charles E. Erickson, the secretary and treasurer of the company, has been identified for several years with a manufacturing interest at Aurora, Ill.

Farmers in a community near Atchison, Kan., are organizing a company to build an electric power plant which will supply them with power for light and other purposes. Many prosperous farmers in Kansas and other Western States have small power plants for their farm houses and barns.

The Pratt & Whitney 6-Ft. Vertical Surface Grinder

A Large Machine Possessing the Accuracy and Rigidity Necessary in a High Grade Precision Tool

As a consequence of the unusual results obtained and the almost unlimited application of the small surface grinder built by the Pratt & Whitney Company, Hartford, Conn., and described in *The Iron Age,* December 30, 1909, a demand has been created for a machine having greater capacity. To meet this a large vertical surface grinder has been developed, the design and construction of which are very similar to the smaller one, the same distinctive features which tend toward rigidity and accuracy being retained. Although this new grinder weighs 24,000 lb. every precaution necessary to secure a precision tool of extreme accuracy has been exercised in its manufacture. Fig. 1 is a view of machine, while Figs. 2 and 3 give an idea of the very diverse character of the work handled by it, the former showing a number of sewing machine frames and the latter some circular saw blades which were finished by it.

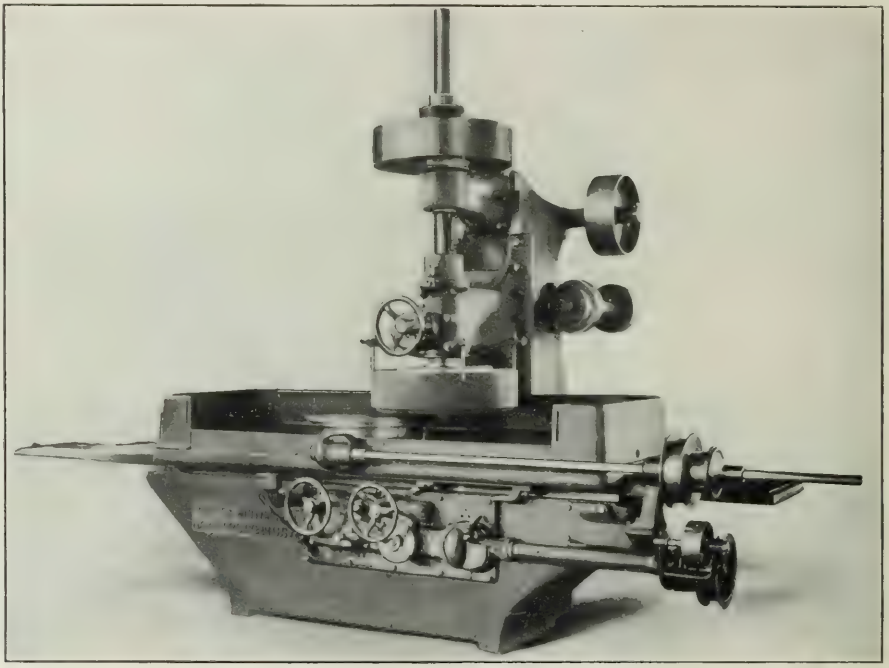


Fig. 1.—Vertical Surface Grinder with Rotary Plain Chuck Built by the Pratt & Whitney Company, Hartford, Conn.

The bed is very massive and so proportioned and internally braced as to insure continued accuracy. The three point type of support is used, this eliminating errors due to improper leveling. The bearing surfaces are wide and of the V and flat types, and oil reservoirs providing for their automatic lubrication are located in the bed.

To meet the peculiar conditions of grinding work and retain the required degree of accuracy, it was found that a table of unusual construction was necessary. It has been made amply heavy and powerfully ribbed in a manner to resist torsional strains. Both the bed and the table are made perfectly true by masters. The latter being the longer, the traveling action tends to keep these members perfectly true. The table has guards which cover and protect the bearing surfaces of the bed at all times. A spacious pan is cast integral with the table for collecting and conveying the water to the tank. The working surface, which is 6 ft. x 20 in., is provided with suitable T-slots. The table has a maximum travel of 6 ft., four feed variations being provided which may be easily obtained while machine is in operation. The reversing mechanism which forms a part of the gear box is of a most efficient and substantial type. The reversing arm through which the length of stroke is governed is actuated by the adjustable table dogs, and the reversing action is accomplished within a thousandth of an inch. The table is under perfect control at all times, provision having been made for instantly engaging or disengaging the feed as desired.

The spindle is made of special steel and runs at a constant speed of 550 rev. per min. The lower or head box is made in halves and lined with babbitt in a novel way, which prevents it from working loose. The two parts are bolted and doweled together, thus making the box equal to a solid member in point of rigidity. The thrust is taken against ball bearings, and the adjustment is controlled automatically. The bronze upper spindle bearing is entirely independent of the 30-in. driving pulley which is mounted in ball bearings that absorb the entire pull of the 7-in. driving belt and keep it from being transmitted to the spindle. Large self-feeding oilers are employed to secure proper lubrication of the spindle boxes.

Probably the most important factor in the remarkable productive capacity of this type of machine is the cupped shape wheel used, which covers the full width of the work, thus assuring a perfectly flat surface together with the greatest possible production. By swiveling the column the wheel may be tilted horizontally, a feature that has been found very convenient for grinding work concave. On circular work tilting the rotary table secures the same end. The grinding wheel used on this machine is 30 in. in diameter, 4 in.

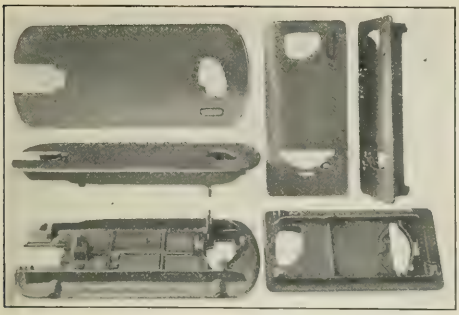


Fig. 2.—Sewing Machine Beds Finished on the Grinder

wide and 6½ in. high, and as an extra precaution against breaking has a steel band that can be adjusted as the wheel wears.

The vertical adjustment is very sensitive, the head being perfectly counterbalanced and accurately controlled through the feed mechanism, which may be operated either automatically or by hand. Eight feeds, ranging from 0.0005 to 0.004 in., are obtained automatically through a ratchet wheel, each tooth of which represents a feeding movement of 0.0005 in. The automatic feed can be disengaged automatically, and the vertical movement may be accurately adjusted by a number of graduations.

Each machine has a pump of new design that is capable of supplying an abundance of water. The exceptionally large water tank is conveniently located in a manner which permits the direct return of the water without passing through pipes. In fact, the whole design is of such a nature as to prevent the collection of dirt or grit in inaccessible places. The water is carried through the hollow spindle, and by the action of centrifugal force is driven between the grinding wheel and the work, thus keeping both cool and free

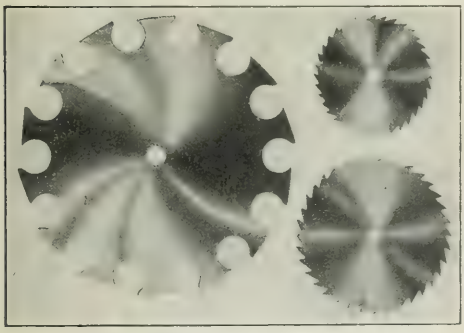


Fig. 3.—Saw Blades Polished in the New Machine.

from dust. For conveying water to the outside of the grinding wheel and for cleaning purposes, an outside stream is also provided. The table has a high water guard around the wheel which prevents the escape of the water and a guard which assists in controlling the water is also provided for the wheel.

In addition to the rotary plain chuck with which the machine shown in Fig. 1 is equipped, the grinder can be furnished with either a rectangular or a rotary magnetic chuck. The rotary chucks are 30 in. diameter and have 4 speeds, namely, 25, 40, 60 and 100 rev. per min. The rotary chuck is controlled absolutely independently of the table by an entirely new device in which all clutches have been eliminated.

The following table gives the principal dimensions and specifications of the machine:

Spindle speed, revolutions per minute	550
Diameter spindle driving pulley, inches	30
Width of spindle driving belt, inches	4
Diameter of grinding wheel, inches	30
Width of grinding wheel, inches	4
Hight of grinding wheel, inches	6½
Distance from top of table to new grinding wheel, in.	17
Number of feeds	8
Minimum feed, inch per revolution of spindle	0.0005
Maximum feed, inch per revolution of spindle	0.004
Diameter rotary chuck, inches	30
Number of chuck speeds	4
Minimum chuck speed, revolutions per minute	25
Maximum chuck speed, revolutions per minute	100
Working surface of table, inches	72 x 20
Table travel, feet	6
Number of table feeds	4
Size of motor required, horsepower	40
Speed of motor, revolutions per minute	900
Width of motor belt, inches	10
Net weight of tool, pounds	24,000

In common with the other large grinding machines now on the market this tool is arranged for a constant speed electric motor drive.

The Titan Steel Casting Company to Make Manganese Steel on a Large Scale

Following the announcement that Robert E. Jennings has acquired an interest in the Titan Steel Casting Company, and has been elected president, comes the news that this company will make manganese steel castings on a large scale. As Mr. Jennings is largely responsible for the success of the Taylor Iron & Steel Company, the trade in general may look to considerable advancement in the manufacture and adaptation of the special steel.

Nearly 20 years ago Mr. Jennings, together with Wm. J. Taylor and Prof. Henry M. Howe, reorganized the old Taylor Iron Works, at High Bridge, N. J., into the Taylor Iron & Steel Company, and effected a connection with Sir Robert Hadfield of Sheffield, England, for the exclusive use of his special system for the manufacture of manganese steel castings in the United States. This system had then already won a great reputation throughout England and the Continent of Europe. The association of these gentlemen was mainly due to the advice and influence of the distinguished metallurgist, Maunsel White, then of the Bethlehem Steel Company, South Bethlehem, Pa.

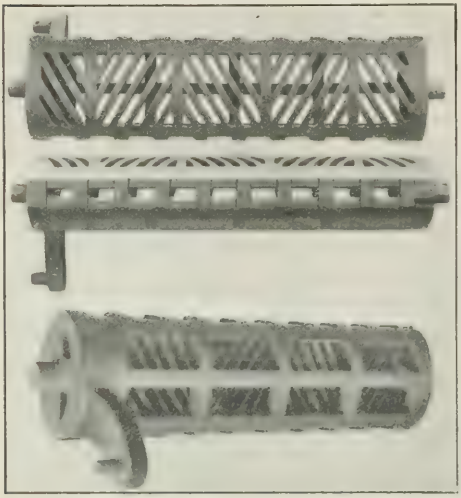
The introduction of manganese steel has been a campaign of education, and the progress and advancement made with this steel, when measured with the advances made in other kinds of steel during the same period, have been somewhat disappointing. This may be due to too much secrecy in the art of its manufacture, or a too conservative policy, or both. With more concerns taking up the manufacture of this steel, greater progress will be made, and it is the intention of the Titan Steel Casting Company to specialize more than ever the product and adapt it to uses where it has not been thoroughly tried.

The Titan Company is largely owned by the Athas of Newark, a family of steel makers, whose name has always stood for excellence in every branch of the business, and with the well equipped plant under the leadership of a man so well-known in the steel industry as Mr. Jennings, the further advancement of the manganese steel casting business is assured. Maunsel White has been engaged as the consulting metallurgist of the company.

The Haskell & Barker Car Company, Michigan City, Ind., has elected W. J. McBride as president, to succeed the late John H. Barker. Mr. McBride was formerly vice president and manager. Charles Porter is treasurer of the company, and Samuel J. Taylor auditor. Herman Pries remains as superintendent. Louis K. Boisot, trust officer of the First Trust & Savings Bank, Chicago, is secretary. This bank was made trustee for the estate left by Mr. Barker, for the benefit of his daughter.

The Thomas Elliptic Grate Bars

The Thomas Grate Bar Company, Birmingham, Ala., is manufacturing a new type of grate bar under the patents granted to Edward L. Thomas, its president. The special advantages claimed for this bar are great strength and adaptability for every kind of fuel because of its circular construction, keeping the lower part cool by open spaces in the sides, automatic



Top, Side and Bottom Views of an Elliptic Locomotive Grate Bar Made by the Thomas Grate Bar Company, Birmingham, Ala.

shedding of the ashes due to the oval character of the top surface, the elimination of clinker as the molten clinker making material rolls off the top in the form of a cinder and long life due to the protection afforded the oval bottom surface from the heat by the draft spaces in the sides.

As these bars are adaptable for every draft space known, on account of their peculiar design and operation they are claimed to burn any known fuel successfully. The Thomas grate bar is said to be scientific in its construction, being made up of two oppositely curved surfaces joined together at each side with spacing and connecting lugs, having an area of about one-third of the side surface, thus giving an air space of two-thirds the side area. The top portion of the bar supports the fuel, while the bottom portion supports the grate bar itself. In use the heat from the upper portion of the bar will attempt to heat the grate unit by passing through the spacing and connecting lugs, but the circulation of air through the excess air spaces around the lugs causes the heat to radiate, thus keeping the bottom cool.

Another special feature, which is claimed to be peculiar to this grate bar, is the automatic self-cleaning of the ashes as they are made on account of the curved surface of the bar. In this way the live coal and fresh fuel are left on the bars at all times, and no flat places for the ashes to lie on or clog the draft spaces are furnished. These draft spaces on the other hand are always open and permit a free passage of air through the grate and the fuel bed, which gives an increased boiler efficiency. The slag clinker formed when coal is used as fuel separates into small particles and is expelled in the shape of cinders, as there is no surface for it to run on and harden.

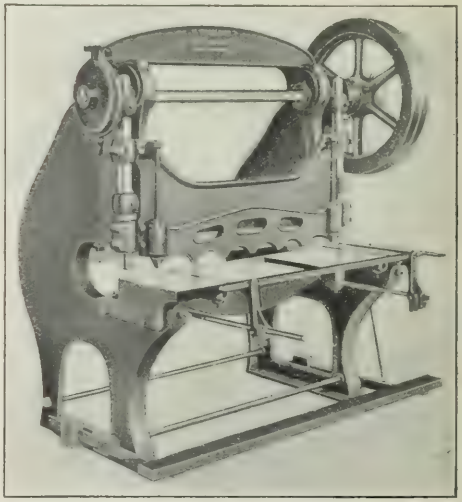
The stationary bars are 6 in. wide, 5¼ in. deep and can be supplied in any length, while the perforated bars are 1 in. thick and the holes are ⅝ in. in diameter. Both locomotive and rocker grate bars are made, the former being the type illustrated. Any width and length of rocker grate can be made to fit any furnace or fire box.

The Excelsior Gap Squaring Shear

A new type of quick action power gap squaring shear, known as the maker's No. 48 type, has been placed on the market by the Excelsior Tool and Machine Company, East St. Louis, Ill. In this shear an effort has been made to embody in a moderate priced machine all the essential features embodied in tools costing considerably more.

The upper cutting head is mounted upon two 2¼-in turned steel guides, which are secured in four bearings that form a part of the housings. The cutting head also has four bearings which are provided with adjustable caps to take up any wear. It is operated by two eccentrics and is balanced by counter-weights on the rear of the machine. The shaft is 4 in. in diameter at the clutch end and 2¾ in. at the opposite end, both of which are accurately fitted into the housings. The clutch controlling the motion of the machine is of the three-jaw type. It responds instantly to the action of the foot treadle, and the stopping of the cutting head at the upper end of its travel is regulated by the friction on the left. Cast steel is used for the clutch slide, and the fly wheel has hardened tool steel jaws which engage with the corresponding sliding member of the clutch. A safety locking device is furnished for the clutch, which prevents the machine from being operated by the treadle or otherwise until this device is released.

Ample means of lubrication are provided for all the working parts. Both ends of the table are graduated, and in addition it has a squaring gauge, extension back



The No. 48 Power Gap Squaring Shear Made by the Excelsior Tool & Machine Company, East St. Louis, Ill.

and front gauges and a sliding gauge mounted on the upper head to cut metal into strips of various widths continuously. These different gauges enable the operator to cut sheets of various widths and lengths without having to adjust any of the gauges when changing from one sheet to another.

Four sizes of shear are built, and the following tables gives dimensions common to all of them:

Speed of flywheel, revolutions per minute	60
Diameter of flywheel, inches	34
Face width of flywheel, inches	5
Weight of flywheel, pounds	600
Hight of shear, inches	86
Depth of gap, inches	15

In the smallest size of shear, the blades are 49 in. long, and it will cut No. 14 gauge iron. The length of blade in the other sizes is 74, 98 and 122 in. respectively, while the capacity increases by two gauge numbers from No. 14 to No. 18. The weights of the four sizes are 3400, 4000, 6000 and 8000 lb., respectively.

Trade Publications

Calendar.—Draper Company, Hopedale, Mass., builder of looms, has issued an 11 x 14 in. calendar. A picture of the Northrop loom of this firm occupies the upper part of this calendar, while a 6½ x 9¾ in. calendar pad fills the remainder. One of the special features of the calendar is the giving of a monthly calendar on one sheet followed by leaves, two for each month, with spaces for memoranda. Contrasting colors are used where portions of two months occupy the same leaf, and a complete calendar for the year is given on the last sheet.

Valves.—Coffin Valve Company, Boston, Mass. Loose leaf bulletin. Illustrates the various types of Coffin sluice and gate valves and shows views both of the valves themselves and also of places where they have been installed.

Metal Cutting-off Machine. — The Hurlbut-Rogers Machine Company, South Sudbury, Mass. Two circulars. List types of cutting-off machines, one of which possesses the special feature of accelerating the main spindle when the tool is nearing the center of the work. These machines are made in four sizes for handling stock ranging from ¼ to 6 in. in diameter. The other is a cutting-off and centering machine of the cone driven type, which is built in five sizes for cutting rough shafting from ¼ to 6 in. in diameter.

Electrical Merchandise.—Pettingell-Andrews Company, Atlantic avenue and Pearl street, Boston, Mass. Catalogue No 14. Size 6½ x 10¼ in.; pages 715. Covers a general line of electrical merchandise which includes practically everything required in any form of electrical construction. The illustrations throughout the book are numerous and a large number of tables of specifications and dimensions are included. A numerical index of the various figure numbers that occupies five pages and an eight-page alphabetical index enable practically anything to be found at once.

Induction Motors.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Circular No. 1188. Describes a line of alternating current slip ring motors especially designed for hoisting service. Space is also given to the controlling devices and brakes best suited for use with this motor.

Metal Working Machinery.—Langelier Mfg. Company, 67 Clifford street, Providence, R. I. Several circulars. Refer to a line of metal working machinery which includes wire hammering, reducing and swaging machines and single and multiple spindle drills. Illustrations are given of the various machines and these are supplemented by brief specifications.

Charging Plugs and Lightning Arresters.—Albert & J. M. Anderson Mfg. Company, 289 A street, Boston, Mass. Two bulletins. No. 24 describes and illustrates the Anderson charging plugs and receptacles for charging storage batteries on electric vehicles, trucks and railroad trains. No. 25 shows the construction of the Ajax lightning arrester and its installation for protecting overhead electrical construction.

Pipe Joints.—The Best Mfg. Company, Pittsburgh, Pa. Circular No. 3. Illustrates the various types of pipe joints which this firm is prepared to furnish. The different styles include screwed joints, welded joints, the Van Stone joint, bronze unions and special types of joints for hydraulic work.

Milling Machines.—The Ingersoll Milling Machine Company, Rockford, Ill. Bulletin No. 21R. Concerned with a new heavy milling machine designed expressly for continuous heavy duty service on locomotive connecting and side rods and heavy steel work in general. This machine is built with tables ranging from 36 to 60 in. in width and from 8 to 16 ft. in length. The illustrations show a 48-in. machine arranged for constant speed motor drive and also with a vertical spindle.

Pipe Threading and Cutting-off Machines. — The Cox & Sons Company, 519 Lafayette Building, Philadelphia, Pa. Pamphlet. Points out the special advantages of the Cox pipe threading and cutting-off machines, which are built for belt, engine and motor drive. Among those shown is the motor driven pipe threader which was illustrated in *The Iron Age* February 10, 1910.

Metal Working Machinery.—The Dreses Machine Tool Company, 227 West McMicken avenue, Cincinnati, Ohio. Two loose leaf catalogues. One is devoted to the radial drills built by this company, while the other calls attention to an extensive line of screw and turret machinery. Among the machines covered by the two catalogues are a 36-in. radial drill, a 1½-in. turret screw machine and a motor driven universal monitor brass lathe, which were illustrated in *The Iron Age* December 30, 1909, and February 10 and April 28, 1910, respectively.

Gasoline Engines. — The Witte Iron Works Company, Kansas City, Mo. Two circulars. Give general description and specifications for the Witte stationary and the Witte Junior gas and gasoline engines.

Steam Engines and Boilers.—Chandler & Taylor Company, Indianapolis, Ind. Nine bulletins. Deal with the line of steam engines and boilers built by this company, which includes inclosed direct connected engines, high speed automatic cut-off engines, high and medium speed throttling engines, portable and semi-portable boilers, plain vertical boilers and stationary tubular boilers. Illustrations and brief specifications of the various engines and boilers are included in the different bulletins.

Brick Machinery.—Wallace Mfg. Company, Frankfort, Ind. Catalogue No. 21. Illustrations and descriptive matter explain the operation of a line of brick machines ranging in capacity from 10,000 to 2500 bricks per hour. Space is also given to brick cutters, pug mills, clay crushers and dry pans.

Sensitive Drilling Machines.—H. G. Barr, 21 Hermon street, Worcester, Mass. Several loose leaf circulars. Pertain to a line of single and multiple spindle sensitive drilling machines. Each circular is devoted to one particular type of machine. It has illustrations in the upper part, while dimension tables and brief specifications occupy the remainder. Among the machines shown is included the drilling and tapping machine an illustrated description of which appeared in *The Iron Age* March 24, 1910.

Sawmill Machinery.—The Salem Iron Works, 206 South Liberty street, Winston-Salem, N. C. Loose leaf catalogue. Consists of a number of folders illustrating the complete line of machinery. Among the machines shown are a number of sawmills of both the permanent and portable varieties, a top saw for double mills, a side edger, a single surfacer and a planer and matcher with beading and molding attachment.

Core Ovens. — The G. S. Blodgett Company, 190 Bank street, Burlington, Vt. Catalogue. Treats of a line of patent portable galvanized ovens for core baking, japanning, enameling, bronzing, hardening, rubber goods manufacturing, &c.

Dryers.—The F. G. Cummer & Son Company, Cleveland, Ohio. Catalogue. Treats of the Cummer dryers, which are claimed to be capable of drying material of all sorts. The general construction of the dryer is described at length and is followed by special information regarding the handling of certain kinds of material.

Electric Lights. — The Shelby Electric Company, Shelby, Ohio. Bulletin, No. 13, superseding bulletins 6C, 6D and 6F. Deals with the Mazda multiple lamps, which are made in sizes ranging from 25 to 500 watts.

Cutting Machinery.—Oswego Machine Works, Oswego, N. Y. Catalogue No. 8. Size 7¾ x 10¾ in.; pages 79. Illustrated. Treats of machines for cutting paper, books, box board, cloth, tin foil, leather, &c.

Shapers.—The John Steptoe Shaper Company, 2951 Colerain avenue, Cincinnati, Ohio. Loose leaf catalogue. Relates to the line of shapers made by this company, which ranges from a 14-in. improved crank type to the 26-in. triple geared shaper which was illustrated in *The Iron Age* November 3, 1910. A separate leaf is devoted to each tool and an illustration is given in the upper part, while a brief description and specifications occupy the remainder.

Disintegrators. — Mead & Co., Nineteenth street and Michigan Central Railroad, Detroit, Mich. Illustrations and descriptive matter explain the operation of a line of disintegrators for grinding corn and other material, such as sugar, saltpeter, coal, bones, drugs, fireclay, plaster, cement, foundry facings, &c.

Packing.—H. W. Johns-Manville Company, 100 William street, New York City. Mailing card. Deals with the J-M Permanite sheet packing, which is claimed to be practically indestructible, as it is made of long fiber asbestos and is impervious to the action of acids, ammonia, oil, air, alkali and sugar solutions.

Screw Cutting Die Heads.—The Geometric Tool Company, New Haven, Conn. Loose leaf catalogue. Deals with a line of adjustable self opening, screw cutting die heads which are made in a number of different types. After a brief general description of the construction of these die heads and a number of tables of useful information, the catalogue is divided into sections, each of which deals with a particular style of head.

Cotton Mill and Gining Machinery.—The Van Winkle Gin & Machine Company, Atlanta, Ga. Catalogue No. 11. Pertains to the line of machinery for cotton seed oil mills and cotton gins made by this company. The various appliances used for handling cotton from the wagon to the bale are illustrated and described, and there are a number of hints on their operation and use.

The Whitehall Building's Mechanical Plant

Interesting Details of the Equipment of New York's Latest Skyscraper

BY CHARLES H. HUGHES, NEW YORK.

The new 32-story Whitehall Building on West street, New York City, will on completion be one of the largest in New York. It will be devoted chiefly to offices, although on the three upper floors will be a restaurant and club, while on another there is a complete gymnasium.

The engineering features are particularly interesting. As it is located close to the Hudson River, water was reached on digging only a few feet below the street level. To excavate to a depth of 30 ft., over an area large enough for an 1800-hp. engine and boiler room equipment, would require sinking and sealing a large number of caissons necessitating an expenditure of at least $2,000,000. To reduce the size of the excavated area and also the cost, the engineers decided to excavate only for the boiler room, and to locate the engine room directly above it, the former being about 30 ft. below the street and the latter approximately 6 ft. below. Caissons were sunk around the space assigned to the boilers, and keyed together, thus making a water tight cofferdam separate from the building proper, the columns resting on their own foundations.

The next problem to solve was how to support the engine room floor. If the columns carried it, the vibrations of the engines would be transmitted to them, and the entire structure would tremble, which, while not necessarily being dangerous, would at least be annoying to the tenants. To prevent vibration, the engine room floor, which is reinforced concrete 3 ft. thick, is supported by columns surrounding those of the building, both resting on the same foundation. To keep the engines from getting into step, calculations were made on their horizontal thrusts, and by referring to Fig. 1 it will be noticed that they are peculiarly placed, the arrows indicating the direction of rotation.

In laying out engines it is important that their period of vibration does not coincide with that of the building. This can be done by selecting well balanced units and making a study of the horizontal thrusts. It is a well known fact that every steamer has a critical point of maximum vibration, that is when the vibrations of the engine and hull coincide; while above or below this point, even if the speed is increased, the vibration of the steamer will decrease. The same is true for buildings.

Boiler Room

Having the engines above the boilers is a novel arrangement and is rarely adopted except under special conditions. In the present instance, owing to the great cost that would be involved by having both on the same level, and local conditions preventing the boilers being placed above the engines, the lay-out chosen was the only alternative. In power houses for electric railroads and lighting companies the boilers and coal bunkers are often placed above the engines.

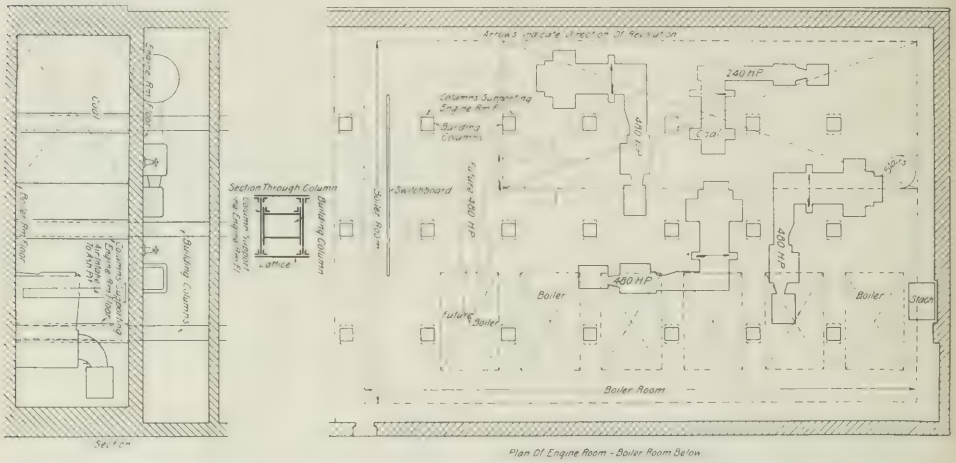


Fig. 1.—Sectional Elevation and Plan View of the Engine and Boiler Rooms in the Whitehall Building, New York City.

The boiler equipment consists of five horizontal water tube Erie City boilers, built by the Erie City Iron Works, Erie, Pa., each having a heating surface of 4022 sq. ft. It is interesting to note that they were shipped assembled from the works, and are the largest ever brought that way into New York City. Some idea of their size can be gained from Fig. 2, which shows the boilers being trucked to the building. The shipping weight was 25 tons apiece, and on account of the size the Erie Railroad was the only road that could



Fig. 2.—Carting the Boilers to the Building.

handle them, the others could not because of bridges and tunnels.

The boilers are equipped with Foster superheaters above the tubes and below the drums, which is preferable to placing the superheaters above the drums or on the side of the boilers. In the former case the overall hight is increased, while in the latter the setting is weakened. Another feature illustrated in Fig. 3 is the use of a hand hole plate with a four-footed crab of sufficient size to cover two tubes. This reduces the number of plates and joints by 50 per cent. No part subjected to pressure is made of cast iron, but of open hearth steel, having a tensile strength of 55,000 to 62,000 lb. per sq. in. The front and rear heads and top of

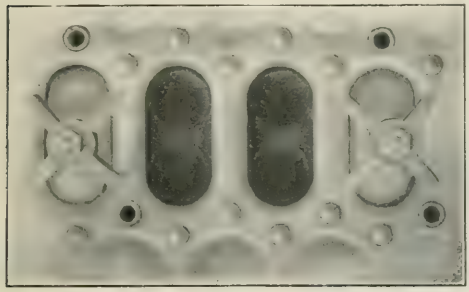


Fig. 3.—View Looking Into the Tubes.

the steam drums are covered with 2 in. of 85 per cent. magnesia with a ½-in. air space between the covering and the drums. Outside of the covering is a watertight casing of No. 16 galvanized iron. The working pressure is 150 lb. One of the boilers partly installed is shown in Fig. 4.

As the walls below the street are solid and as the openings in the engine room floor can be covered, a closed boiler room, which is not often found in an office building, is secured. Connected to a pipe leading to the roof is a fresh air duct with a powerful fan and two 16-in. outlets in front of every boiler. The boiler room can be made practically air tight; thus a strong draft is produced when the furnace doors are opened. From each ash pit is a galvanized iron air intake 24 x 18 in., extending almost to the engine room floor above. These intakes, provided with suitable dampers, draw the hot air from the ceiling.

On the same level as the boiler room floor is the coal bunker, which is about 30 ft. wide by 90 ft. long. Coal is shoveled from the bunker into cars running on tracks to the furnaces.

Engine Room

There are four units, consisting of Rice & Sargent engines, three of 480 hp. and one of 240, direct connected to three 300-kw., 220-volt and one 150-kw., 220-volt direct current Garwood Electric Company's generators. The engines are tandem compound, non-condensing, and run on superheated steam, from a header below the engine room floor, the throttle valves being operated by suitable stands. The exhaust header is also below the floor, giving a clear and light engine room free from all steam piping. An interesting feature of the units is their slow speed, which affords a marked contrast to the high speed engines and turbines so often installed. The full load speed of the larger engines is only 100 rev. per min., and of the other, 110 rev. per min., while the no load speed of the former does not exceed 102 and of the latter 112 rev. per min. Although the horsepower rating conditions given above, assume steam at a pressure of 150 lb. at the boilers, yet the engines are designed for a working pressure of 175 lb. They have a large reserve capacity, and can operate the generators at a 25 per cent. overload for two hours, after a run of eight hours under full load, or are capable of standing without serious straining or injury to any of the parts a momentary 75 per cent. overload.

The main steam piping with the fittings and valves, is laid out for a pressure of 250 lb. and a superheat of 150 deg. F. Van Stone joints are used on pipes 6 in. and over, and valves over 6 in. are fitted with a bypass. The exhaust steam lines exceeding 4 in. are adapted for a pressure of 100 lb.

The generators run in parallel, each taking its proper share of the load automatically. The question of efficiency was carefully looked into by the engineers, the specifications requiring that the efficiency at various loads should be determined upon the assumption that the friction of the engines as shown by the friction card remained constant throughout the entire range of loads specified. The efficiencies for the generators figured on the above basis and guaranteed by the builder were: full load, 93 per cent; ¾ load, 92¾ per cent., and ½ load, 92½ per cent.

The electrical equipment besides the generators comprises two 15-kw. and one 5-kw. balancer set and a storage battery with a maximum momentary discharge of 2000 amperes at 220 volts. This battery is used for regulating purposes, and when a sudden peak in the lighting load is to be carried. The feeders for electric motors are installed on the two-wire 220-volt system, while those for lighting service are on the three-wire 220-volt system. All the conductors and cables are in special armored conduits, thus minimizing the fire risk.

Miscellaneous Equipment

In a building the size of the Whitehall the mechanical and electrical equipment is large and complicated. For boiler feed purposes alone there are three 12 x 7½ x 10 in. pumps, besides three 12 x 7 x 10 in. for house service, one 10 x 10½ x 10 in. for blow off, a 4-in. centrifugal and other smaller ones.

The vacuum cleaning system is one of the largest ever installed in an office building. There are two vacuum pumps, each chain driven by a 25-hp., 220-volt direct current motor. The pumps are so designed that

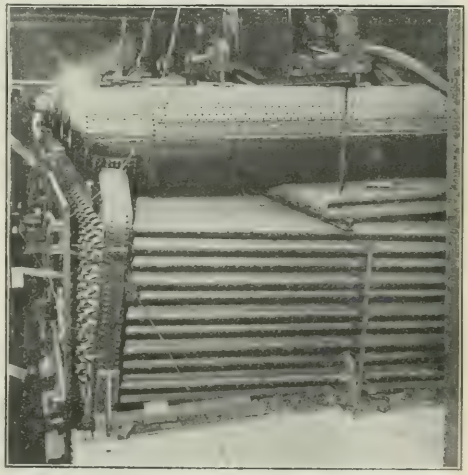


Fig. 4.—The Boilers Partly Installed, Showing Location of Superheaters.

they automatically increase their speed, when the vacuum decreases as more sweepers are put in use, until a fixed vacuum is obtained, when they will operate at a constant speed. As soon as sweepers are disconnected, thus increasing the vacuum, the pumps automatically slow down until the fixed vacuum point is again

reached, thus operating at a minimum cost. From the pumps a 4-in. header runs around the basement with seven risers reaching to the top floor. These are of standard wrought iron pipe, 3 in. in diameter to the eighth floor, 2½ in. from the ninth to the seventeenth, 2 in. from the eighteenth to the twenty-second, 1½ in. from the twenty-third to the twenty-sixth and 1 in. above the twenty-seventh, with an outlet, fitted with an improved sweeper cock on every floor. An idea of the size of this system can be obtained from the following list of appliances operated from it, 16 12-in. carpet renovators, 16 12-in. floor sweepers, 16 10-in. vacuum mops for polishing floors and 16 brushes for cleaning furniture and walls.

No less complete is the refrigerating plant, having a capacity of 20 tons of ice every 24 hours. The ammonia process is used with a horizontal, double acting, steam driven compressor, having Corliss valve gear with separate eccentrics for steam and exhaust valves. The compressor is supplied with steam at 150 lb. pressure and superheat of 100 deg. F.

There are 29 passenger elevators of the overhead one to one traction type, one plunger elevator for ashes and one for safes. Of the passenger cars 7 from the ground floor and 2 from the basement run to the thirtieth floor, 10 from the ground floor to the twentieth floor and 10 to the twelfth floor. All are equipped with signaling devices.

For heating, steam is used, with the overhead system and drop risers. Outside of the size, there are no novel features, as standard practice has been followed. The radiators and coils have a radiating surface of 60,800 sq. ft.

In the ventilating system are two supply and one exhaust fan, each having a capacity of 30,000 cu. ft. per min. at ½-oz. pressure. To supply dust-free air, an air washer is employed, that is guaranteed to remove 98 per cent. of the solid matter. The washer is of galvanized iron, with a spray chamber, sprays, eliminators and a centrifugal pump for circulating the water. The sprays are of brass, arranged to control the area of the air passage, delivering the water in a finely divided spray and thus washing the air. Eliminators catch the entrained water which falls into a settling tank at the bottom of the washer.

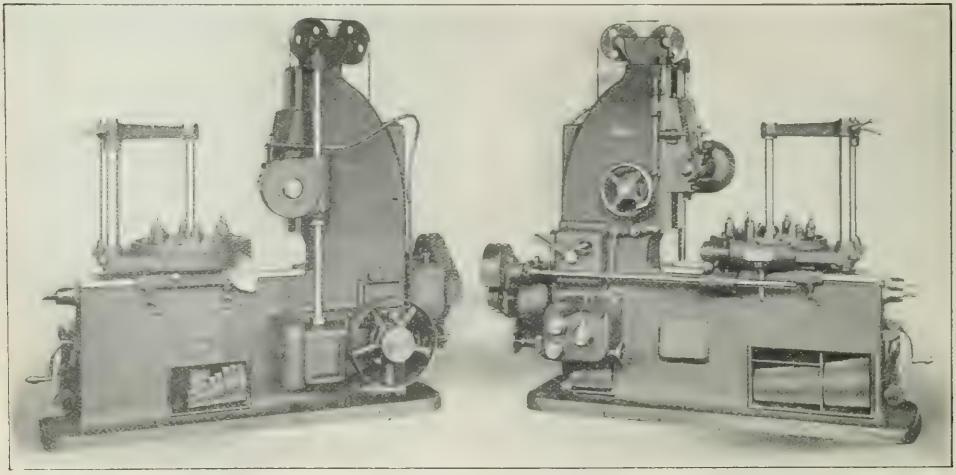
Clinton & Russell, 32 Nassau street, New York City, are the architects. The power plant was designed by James Dougan, C. E., and the electric work by A. E. Wells of their staff. George A. Fuller & Co., New York City, are the builders.

A New Gould & Eberhardt Gear Cutter

An Automatic Vertical Machine for Cutting Gears of All Types

Gould & Eberhardt, Newark, N. J., have designed a new vertical cutting type of automatic gear cutting machine. It is adapted for cutting bevel face and spur gears and more especially for roughing out automobile bevel gears preparatory to finishing them on any one of the standard bevel gear planers now on the market. The capacity for cutting bevel gears is 24 in. in diameter and 8 in. face width, while for spur gears the limits are 36 in. and 10 in. respectively, the diametral pitch for both in cast iron being 3 and 4-in steel. Fig. 1 gives views of the driving and operating sides of the cutter, and Fig. 2 shows the work table tilted. The special features of the cutter are the cutter slide moves in a vertical plane, a draw cut type of feed, an adjustable work table and a smaller number of hand levers for controlling the feeding, indexing and return movements than is customarily used.

In this machine the work lies flat in a horizontal position on the work table which is arranged on the anvil principle, and the cutter slide moves up and down instead of horizontally. There is a separate and distinct drive to the feed screw mechanism. The reciprocating parts are mounted on the vertical upright portion of the main frame, and the feed operates on the draw cut principle. The special advantages claimed for this vertical cutting feature are that the construction is very rigid and strong, while at the same time the disadvantage of tilting the cutter slide with its



Driving Side. Operating Side.

Fig. 1.—Two Views of a New Automatic Gear Cutter Built by Gould & Eberhardt, Newark, N. J.

numerous moving parts when cutting bevel gears is eliminated. This latter advantage is the more important, as the old way was undesirable since it lacked the rigidity which was necessary in taking heavy cuts particularly since the advent of high speed steel and as the reciprocating parts had to be mounted on an angularly adjustable slide which received its motion in a roundabout way from the primary mover.

The work table can be adjusted to any angle and is mounted so that all the strains received from the cutter by the table are transmitted to the main base of the machine, an arrangement which eliminates one sliding surface. While in this angular position, the table is supported, as is clearly shown in Fig. 2, by a centrally located segment having a worm wheel sector for adjusting the position of the table. The worm and the worm sector act as a lock, and in addition the latter has a strap in the segment which furnishes a lock for the table when the latter is properly adjusted. The operator is enabled to adjust the work table to any desired angle at the front end of the machine, one turn on the crank handle being equal to 1 degree, while the sector vernier graduated in degrees shows the amount of angularity given to the table. The table indexing mechanism is novel in design, positive in action and simple in construction, being practically the same as that found in the latest type of spur gear cutting machines. The large diameter worm wheel, which is the last member of the indexing train, is close to and rigidly secured to the work table upon which the gear blank that is being cut is fastened. A triangular shaped work mandrel outer support, which supports the gear blank at its outer end in any angular position, is also mounted upon this table.

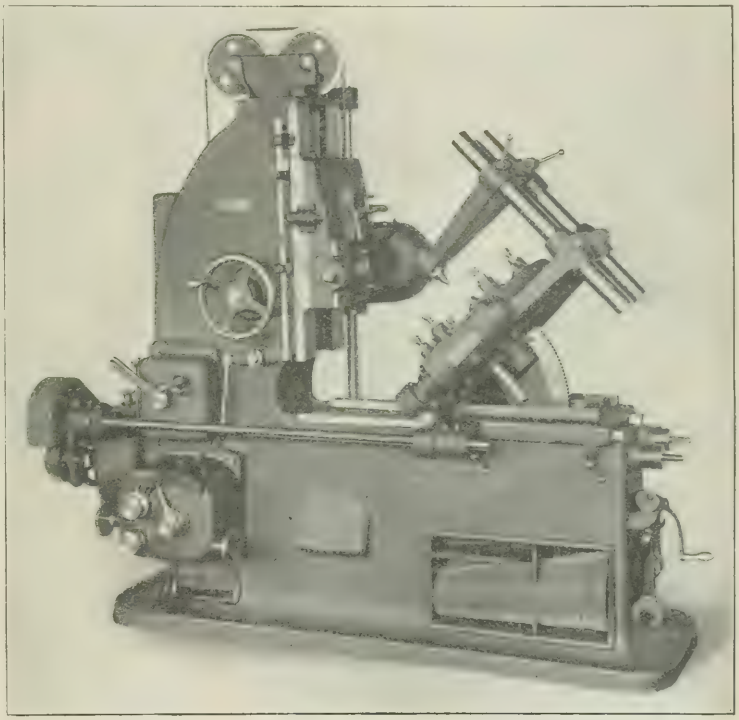


Fig. 2. View Showing the Work Table Tilted.

Sixteen different rates of feed, ranging in approximately geometrical progression from 1 to 15½ in., are furnished for cutter slide through the medium of a variable feed direct reading gear box and two hand wheels. In this way the various feeds can be engaged rapidly. The cutter slide has a rapid return and is counterbalanced. The number of levers used to control the feeding, indexing and return movements are less than in any other similar construction, and they are also interlocked so that a movement cannot take place before the preceding one has been entirely completed.

The cutter driving parts are of the simple and rigid form found in the spur gear cutting machines of the maker, and the cutter is driven by a steel worm and a specially constructed bronze worm wheel, which insures a powerful and smooth running drive. The chrome nickel steel cutter arbor is solid and can accommodate various sizes of bushings for different diameters of cutter holes. Change gears furnish a number of cutter feeds varying in geometrical progression from 23 to 145 rev. per min.

The complete weight of the machine is 3500 lb. As ordinarily furnished it is arranged to be run by a belt from the countershaft, and one driving pulley is sufficient for operating the entire mechanism, but if desired it can be furnished with the electric motor drive. For the complete protection of the operator all the gears are entirely inclosed with guards.

Winnipeg's Industrial Expansion.—The Winnipeg Bureau of Information recently completed a careful canvass of the 236 industrial establishments centered at Winnipeg, and as a result found that the total value of the output of these industries amounted to $36,500,000, which is about double the amount shown by the Government statistics five years ago. In view of the fact that the Dominion census showed an output for the city of but $8,606,248 in 1900, Winnipeg is making remarkable strides and may be expected to rank third in Canadian cities when the Government census is completed in 1911. During 1910 there were 65 industrial companies incorporated under Manitoba charters with Winnipeg as their head office, with a total authorized capital exceeding $18,000,000, and in addition to these new companies, 13 local going concerns were granted charters and increased working capital to the extent of over $3,000,000.

C. C. & E. P. Townsend, New Brighton, Pa., manufacturers of wire nails and rivets, have completed the erection of an addition to their plant 120 x 180 ft., of brick and concrete construction. New wire nail machines will be installed, and the capacity for the manufacture of wire nails will be considerably increased. The plant has for some time been running double turn.

The New Gang Radial Drill

A 2½-Ft. Tool Embodying a Number of New Features, the Chief of Which Is the Simplicity of All Its Movements

A new line of radial drills, known as the style A tool, has been built by the W. E. Gang Company, Cincinnati, Ohio. Three sizes of tool are built having arms 2½, 3 and 3½ ft. long, the first being the one illustrated. Fig. 1 is a general view of the new tool, while Fig. 2 gives details of the driving gears, depth gauge and automatic trip, and Fig. 3 is a section through the back gears. In the construction of this tool the maker has endeavored to embody all of the modern improvements in the present day standard radial drill and also features which are said not to be found in other makes. Two of the special features of the tool are the simplicity of all its movements and the driving of the spindle at the lowest point of its largest diameter close to the work.

All of the gears are incased in housings which are built into the frame, and are supported by bearings at each end, a construction which tends for rigidity and durability and keeping all the running parts in alignment. At the same time it also serves to exclude dust, retain the lubricant and protect the workman from injury. The journals are all bronzed bushed. In both the drive and feed wherever severe duty is encountered hardened steel gears are used. Lubrication is either by the splash system or direct oiling devices throughout. The speed box is of the selective type, which consists essentially of a cone of six gears, running in oil, and a lever carrying a tumbler gear, which transmits the power from the constant speed pulley shaft to the cone of gears. This tumbler gear acts without shock or jar. A tight and a loose pulley are provided on the machine, so that it can be driven direct from the line shaft, and by the use of band shifter rings the belt can be delivered to the pulleys at any angle. This pulley on the speed box is intended for an 8-in. belt and to run at 350 rev. per min. There are 12 changes of speed, ranging from 39 to 280 rev. per min., suitable for drills ranging from ½ to 2¾ in. in cast iron, and from ⅜ to 2 in. in steel. The correct position of the speed box lever for these sizes of drills for both cast iron and steel is shown by the plate attached to the speed box.

The column revolves upon a stationary stump, having a bearing at the top and bottom, giving practically a double column. The weight is taken on a roller thrust bearing, thus allowing the column to swing freely, and it is securely clamped by the slight movement of a lever that lifts the column away from the rollers so that they cannot become imbedded in their track. The arm has a radius of 4 ft., and is very rigid. It is raised and lowered by power under control of a lever at the top of the column.

From Fig. 1 it will be noted that the head is adjusted on the arm by rack and pinion, actuated by the hand wheel A, and is clamped by the lever B. The lever C enables the operator to advance or return the spindle, which has a reverse motion for tapping, and is counterbalanced by the arrangement shown at D, quickly.

The back gears are located on the head between the friction reversing clutch and the spindle, and consist essentially of a square tooth clutch actuated by a lever at the side of the head and a pair of gears. The lever is indexed by a spring plunger for either one of its

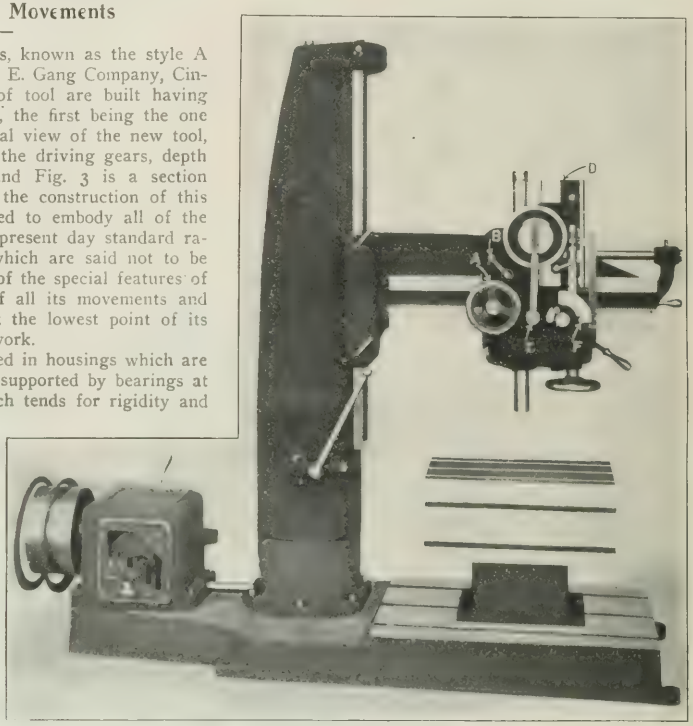


Fig. 1—New 2½-Ft. Radial Drill Built by the W. E. Gang Company, Cincinnati, Ohio.

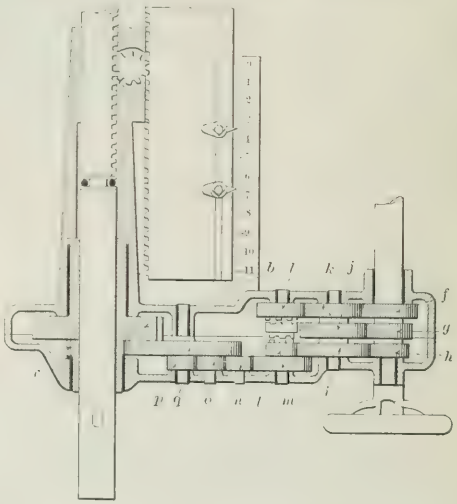


Fig. 2—Details of Driving Gears, Depth Gauge and Automatic Trip.

two positions. The feeds are six in number, ranging from 0.007 to 0.036 in. per revolution of the spindle, any one of which can be instantly obtained by shifting the lever F. The position of the levers is shown by an engraved plate, and a spring plunger drops into position when the lever is moved opposite the feed desired.

In Figs. 2 and 3, which show the arrangement of the driving and back gears, respectively, the different members are lettered from *a* to *r* to show the order in which they transmit power from the driving spindle to the work spindle. In Fig. 2 any one of these three gears—*f*, *g* and *h*—can be connected to the sleeve by a sliding clutch. In Fig. 3 the machine is driven directly when the gears *a*, *b* and *c* are in mesh, while when employing the back gear drive *b*, *c*, *d* and *e* are engaged. Both Figs. 2 and 3 show the depth gauge, which is a stationary steel gauge bolted to the head with graduations plainly in view at all times, all depths being read from zero. The automatic trip, illustrated in Fig. 2, will operate at as many different depths as there are holes to be drilled, while at the same time the spindle is free to be raised or lowered irrespective of the position of the tripping dogs. This device also automatically trips the feed when the spindle reaches the limit of its movement.

As illustrated, this machine is equipped with a plain box table measuring 16 x 24 in. or it can be supplied with a tilting table on the base, which is deep, heavy

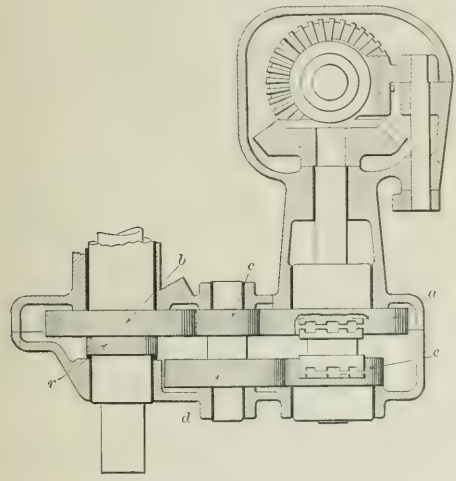


Fig. 3.—Section Through Back Gears.

and well ribbed, and measures 28 in. wide by 6 ft. 3 in. long. Six inches are added to the length of the base for the other sizes. The net weight of the 2½-ft. tool is 3600 lb.

The Penn Enamel Sink Company has applied for a Pennsylvania charter, with a capital stock of $100,000, and will take over the plant and other property of the Clymer Mfg. Company, Indiana, Pa., manufacturer of white enameled kitchen sinks, low-down closet tanks, &c. G. A. Conrath, former superintendent of the Clymer Company, heads the new corporation. Enameled bathtubs and some other specialties are to be added to the list of products next year, for which extensive additions to the foundry and equipment will be made in the spring. J. M. Kelly, a former plumbing supply man of Buffalo, N. Y., has charge of the Pittsburgh office at 616 Empire Building. The new company will aim to establish a reputation for quality.

The Ward-Dickey Steel Company, Indiana Harbor, Ind., is sending out samples of a new freight car seal which does not require the use of a tool in attaching it, but cannot be opened without destroying it. This seal is made of a strip of tin plate. One end is formed into a pocket, and when the seal is attached in use the other end is inserted in this pocket, locking automatically.

Turning a Wrist Pin in an Acme Screw Machine

A recent adaptation of the 2¼ x 11 in. screw machine, built by the Acme Machine Tool Company, Cincinnati, Ohio, is equipping it with a special set of tools to enable it to turn wrist pins for logging engines used on the Pacific Coast. The turning tools used in the turret are of the box type illustrated in *The Iron Age* October 27, 1910. Fig. 1 shows the machine with the finished wrist pin partly cut off in the chuck and Fig. 2 shows the pin after two more operations.

The time for finishing the pin, which is of 0.25 per cent. carbon steel, 2¼ in. in diameter and 11 in. long,

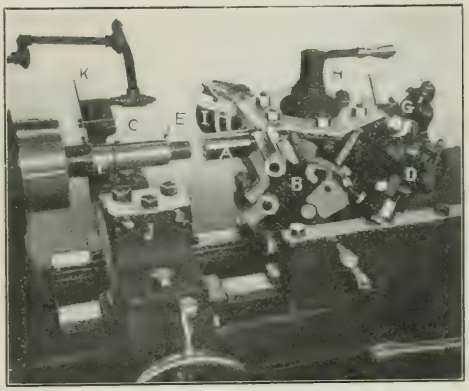


Fig. 1.—Machining a Wrist Pin in a Screw Machine Made by the Acme Machine Tool Company, Cincinnati, Ohio.

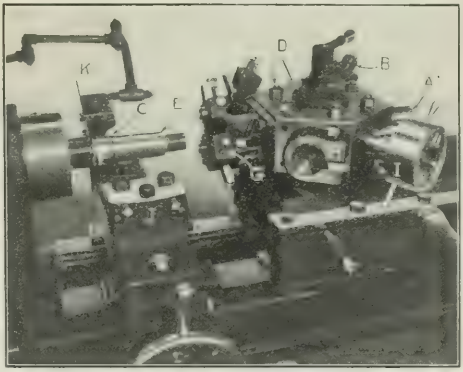


Fig. 2.—Rounding the End of the Pin.

is 20 minutes for the entire cycle of operations. The stock is fed in through the head stock the same as for ordinary screw work, and when it presses against the stock stop A the chuck is closed and the turret is indexed simultaneously to bring the box tool B in line. This is fed along the bar until it has cut up to the shoulder C. In this, as in all the other positions of the turret, the limit of the turret travel is determined by the revolving stops on the end of the slide. As the turret is withdrawn it is indexed and again fed along the work, the tool D cutting as far as the shoulder E. The next operation is skimming over the bevel F by the tool G, and the following one is rounding up the end with the tool H, which brings the pin to the condition shown in Fig. 2. Threads are cut by the die I after the end has been rounded. Feeding the forming tool J on the cross slide up to a stop serves to shape the whole body of the wrist pin to the exact finished dimensions, and then the piece is parted by the cut-off tool K on the other end of the tool carriage.

The New Rockwell Tilting Furnace

A Furnace Pouring Directly Into Molds Without Intermediary of Crucible or Ladle

Heretofore tilting or rotary furnaces have been mounted on trunnions, and in pouring the spout described an arc, its depositing point continually changing. On this account the ordinary furnace is not adapted to pour metal directly into molds, it being necessary to shift the mold to catch the flow and hence melting furnaces, especially in brass rolling mills and foundries making light or intricate work, where the metal is likely to chill. It has also become especially important since the introduction of molding machines to pour and handle molds more expeditiously to avail of the possible output of the machines.

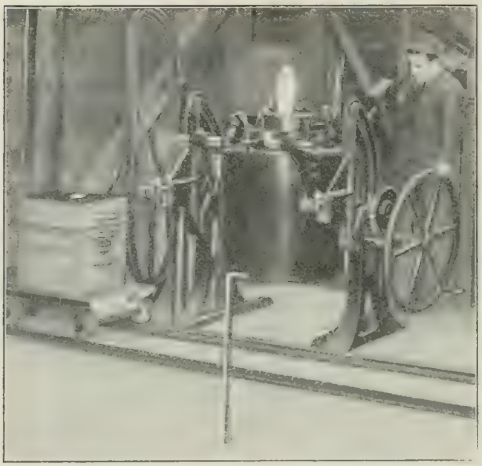


Fig. 1.—Closing the Lid After Charging the Furnace.

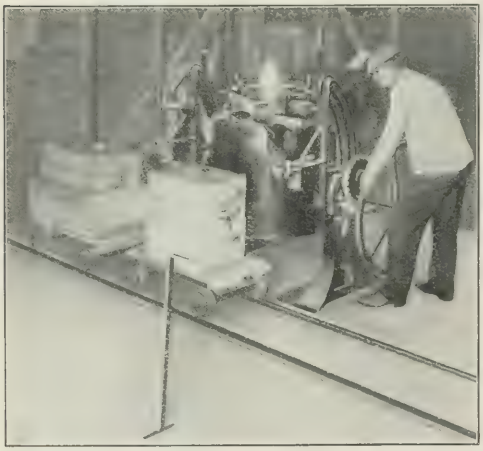


Fig. 2.—The First Turning Operation Using the Handwheel.

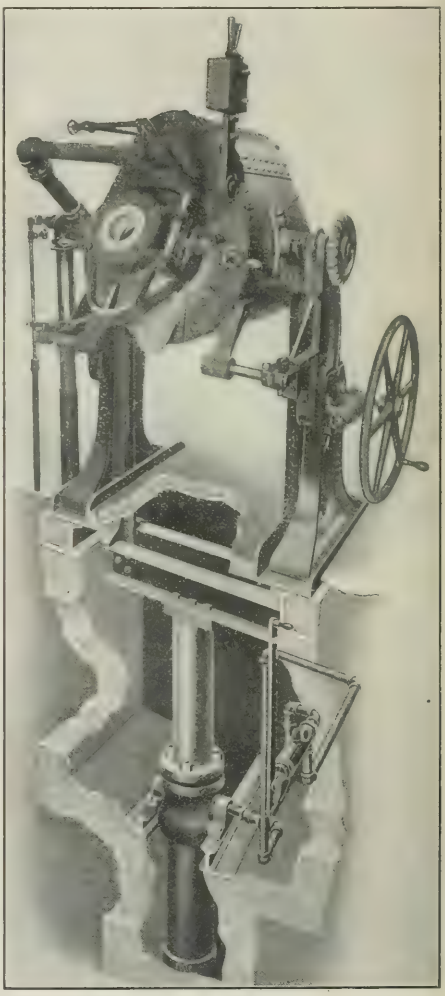


Fig. 3.—The Furnace and Its Hydraulic Lifting Cylinder.

The New Centric Spout Tilting Furnace Built by the Rockwell Furnace Company, New York.

impossible to pour evenly into a small opening. Therefore, the custom is to pour the metal from the furnace into either a ladle or crucible and from that into the molds or chills.

This second handling is objectionable, since the metal loses considerable heat during the transfer, and must be initially brought to a correspondingly higher temperature than if poured direct. This transfer has prevented many users of pit type or lift-out crucible furnaces from adopting tilting crucible or open flame

These two conditions occasioned the design of the new furnace and operating device made by the Rockwell Furnace Company, 26 Cortlandt street, New York, the invention of W. S. Quigley, vice-president of the company. It may be used with or without crucibles, and is fired by oil or gas. The furnace is mounted so as to tilt or revolve about the tip of the pouring spout as a center, so that the metal always flows from a fixed point. The entire contents of a furnace can be poured into an opening less than 2½ in. in diameter at any de-

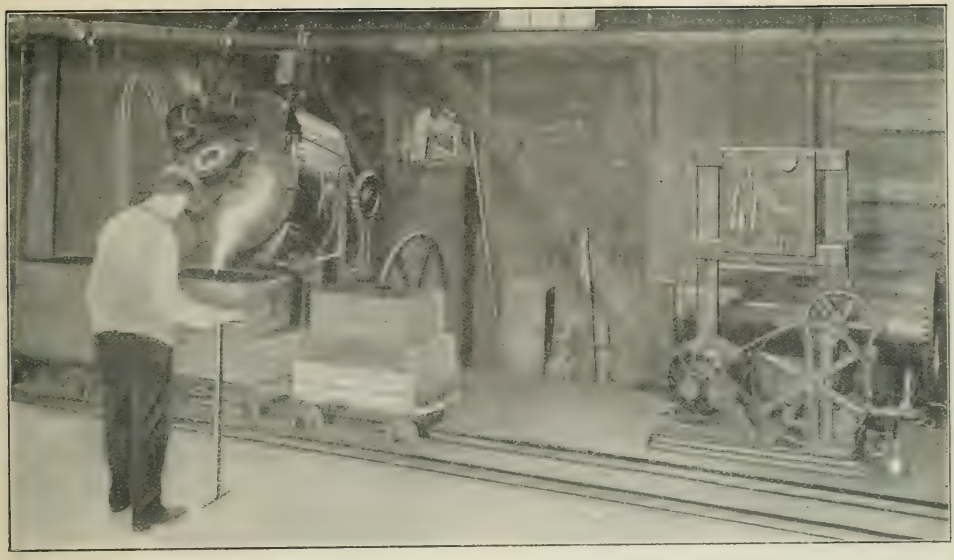


Fig. 4.—The Furnace and the Auxiliary Equipment Furnishing the Hydraulic Pressure.

sired speed, and the operator can raise, lower or lock the furnace in any position instantly.

At first glance the furnace, Fig. 1, resembles the standard tilting crucible furnace. (The open flame furnace is not shown, but is handled in the same manner.) It is mounted on trunnions, and may be revolved by a hand wheel like the ordinary furnace for charging, mixing, skimming, and, if need be, for pouring into a ladle or crucible, but there is an additional guide over each trunnion, and stops as may be seen in Fig. 2, which, in the position shown, prevent the furnace being tilted by hand farther than the special bearings, into which they are locked, as in Fig. 3, when ready to pour with the pouring device.

The lifting device, Fig. 3, is a simple hydraulic ram, controlled in speed and direction by the hand lever in the foreground, which operates a balanced valve regulating the flow of water into or out of the cylinder. Water under pressure is supplied by a small hydraulic pump, Fig. 4, driven by a 2-hp. electric motor, which will operate three to five furnaces. The pump may be belt driven from a line shaft, if preferred. The fuel, oil or gas is conveyed to the furnace through telescopic pipes, Fig. 3, which permit the furnace to be operated in any position.

The switch and pressure controlling device on the panel above the motor and pump automatically maintains the pressure between 80 to 200 lb. in the tanks shown in the background. The water exhausted from the cylinder flows back to an open tank on which the reservoir rests, and is used repeatedly.. If necessary to prevent freezing 3 lb. of calcium chloride can be added for each gallon of water, when the solution will remain fluid down to 10 degrees F., or oil may be substituted for the water.

Fig. 5 shows the furnace ready to pour, Fig. 6 the operation of pouring an engine driver bearing, and Fig. 7 the pouring continued until the furnace is nearly empty.

Suggested Ways of Using the Furnace

Pouring directly into the flask the furnace cannot be used to its greatest efficiency unless the molds or chills are passed along rapidly, as by cars on a track

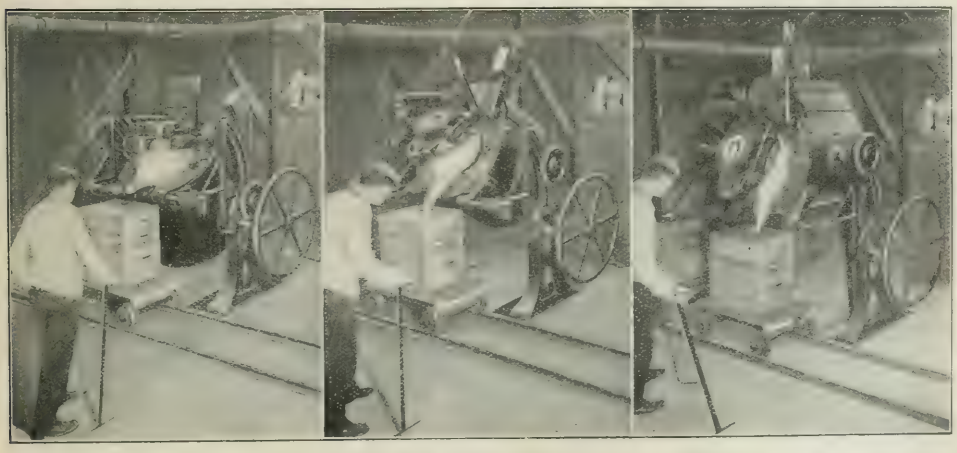


Fig. 5.—Ready to Pour. Fig. 6.—Pouring. Fig. 7.—Pouring Ended.

Three Positions in the Complete Pouring of the Furnace.

or a conveyor. The man at the molding machine can start the molds to the furnace, and after pausing for the pouring they can be continued to the shaking-out point. If the castings can be shaken out within a few minutes after pouring an automatic trip, working by gravity can be provided to dump the flasks on a grating, the sand passing through and the castings being delivered into a dump bucket, preparatory to going to the rumblers, while the flasks are returned to the molding machine. The sand passing through the grating may fall into the hopper of a sand mixing machine, or into a dumping bucket hung on a trolley or into a conveyor to be carried to the point where the sand is tempered before being used again.

Except for the men required to temper the sand, if done by hand, only three men are necessary for the entire operation—one making the molds, one pouring them and one shaking them out. The molding floor is eliminated, and the castings, sand and flasks are automatically handled. Should the castings have to remain in the flasks several hours before shaking out, they can be taken from the furnace to a storage floor, deposited there long enough to cool, and again picked up and taken to the shaking out point, all automatically, the rest being as described before.

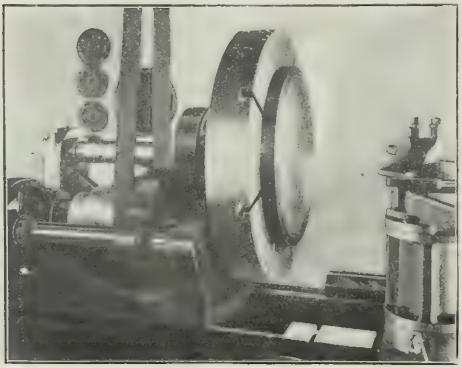
The application to brass mill casting shops of such a system in connection with this furnace promises increased economy. The molds can be placed on racks, which, instead of being stationary, may be on a carriage, and run past the furnace on a track. This will enable the casting of the metal with the mold either vertical, or slightly inclined, and using either pouring strainers or pouring directly into the molds. Rack carriages can be arranged in a pit to accommodate various lengths of molds, as well as for tube shell or core molds and bolt and wire bar molds. The easy manipulation of the molds for taking up the shrink can be provided for.

These are suggestions only as conditions are different in every foundry, but with a proper selection of equipment a successful system of pouring and conveying should be possible that would result in a liberal return on the investment.

An Accurate Piece of McCabe Lathe Work

An extremely accurate piece of work was done on a measuring and testing machine built for the Government by the South Norwalk Engineering Company, South Norwalk, Conn. The tool employed for doing this work was the double spindle lathe built by J. J. McCabe, 30 Church street, New York City and illustrated in *The Iron Age,* March 8, 1906. The piece of work was a nickel steel forging 32 in. in diameter and weighing about 900 lb.

The forging was first chucked and faced perfectly flat and smooth with a 4-in. centering hole extending partly through the piece. A 1¼-in. hole was threaded with 20 threads to the inch at the same setting as the large pilot hole and was used for a draw-in bolt. After the forging was faced and bored on one side it was reversed and put on a hardened and ground plug that was specially made for this particular piece of work. The long draw-in bolt, which extended the entire length of the spindle, was next screwed in and the work drawn up against the face plate by tightening a nut at the back of the spindle. After this the other side of the piece was finished.



Making Measuring Machine Parts on the Double Spindle Lathe Built by J. J. McCabe, New York.

Eight pieces in all were machined, the variation allowed from the uniform thickness being only 0.0008 in. either way. These eight pieces were used in two series of four each, and the total clearance allowed on each series after assembly was 0.003 in. When the size of the pieces handled is taken into consideration, the work has been finished about as perfectly as it is possible to do it on a lathe.

Another piece of work turned out on this lathe was six chrome nickel steel forgings similar to those described above. Each of these pieces weighed about 2200 lb., and the limit of accuracy was approximately the same.

The Garvin Hole Grinder

A New Machine Designed for the Maximum Production of High Grade Hole Grinding

In the present type of grinder the operator is generally confined very closely to the machine, and considerable time is required to center and clamp the work in the chuck. With a view to overcoming these objections the Garvin Machine Company, Spring and Varick streets, New York City, has designed its No. 2 hole grinding machine, with the idea of using the operator to bring about a very large production of high grade hole grinding. Special attention has also been given to the reduction of the time required for centering and clamping the work in position, and the grinder is equipped with the maker's standard automatic chuck. Fig. 1 is a general view of the machine, Fig. 2 shows the three-jaw adjustable chuck furnished with the machine equipped with a set of jaws for gripping bevel pinions on the pitch line, while Fig. 3 gives details of the drive on the rear of the machine, and Fig. 4 is a detail showing the manner in which the work head is fastened to the bed.

In addition to the special chuck for holding bevel pinions shown in Fig. 2, jaws for gripping spur gears on the pitch line can also be furnished. These jaws can be adjusted sideways for holding gears where the number of teeth is not a multiple of three. The rollers in the jaws have a slight rolling adjustment to care for any warping that may have been caused when the gears were hardened, and in the case of the jaws for holding bevel pinions the conical pin has a collar around it which in turn is stepped into the chuck jaw, thus allowing the bevel pinion to come to these three shoulders for squaring purposes. In using this chuck the maker's standard air cylinder mount is necessary. The master collet type chuck, which is especially adapted for holding delicate work where an all-round grip is desired, and a magnetic chuck with a centering plug passing through the center for the rapid centering of work which it is not expedient to hold in chuck or collet, can be furnished, as well as slotted face plates. This multiplicity of chucking equipment reduces the time consumed in centering the work to a minimum.

The machine is driven by one belt from the shaft above to the main shaft, which is mounted on the inside of the bed and extends the entire length, as shown in Fig. 3. The drum shaft which is also inside the bed is driven from the main shaft. For changing the speed of the grinder spindle a cone pulley is provided.

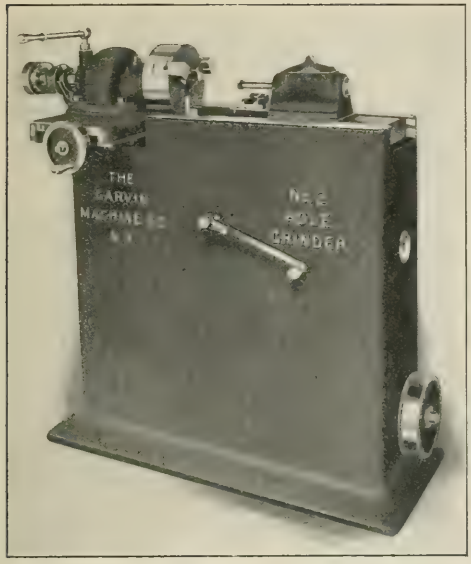


Fig. 1.—The New Hole Grinder Built by the Garvin Machine Company, New York City.

The tool steel spindle has an overhang of substantial diameter, and runs in two high speed ball bearings. It is driven from the drum shaft below by a mineral tanned leather belt at a speed of 20,000 rev. per min. The housing for the wheel spindle is mounted on an aluminum slide, and is at the longitudinal center of the machine. The slide runs on 22 3/8-in. steel balls, which in turn are confined to four tool steel V-strips let into the base and sides, one of which is adjustable for taking up wear.

The driving pulley carries a leather faced friction clutch on its end and in side, and as the grinder spindle is moved out of the way for gauging the hole being ground, it disengages the friction clutch and brakes the momentum of the work spindle, stopping it instantly. As the grinder spindle is advanced, the friction engages itself before the grinder spindle reaches the work, thus starting the work spindle at full speed immediately. The right-hand lever, Fig. 3, controls the stopping and starting, and through this feature a large saving of time is effected as it is not necessary to stop the countershaft and wait for the momentum of the spindle to dissipate itself.

The work head is of heavy construction and can be swiveled to an angle of 15 degrees for grinding taper holes. It is gibbed to the bed with the square locking system shown in Fig. 4, and this feature, together with the long bearing construction, assures perfect alignment at all times. The head adjusts across the machine and is operated by the hand wheel shown at the left in Fig. 1. This hand wheel has a micrometer graduation which enables a very fine feed to be secured. This spindle which is of hammered steel and ground has a large diameter. The bearing which is of ample length is of the cap type of construction, and is provided with means for taking up wear. All the running bearings have ample provision for lubrication, and are provided with dustproof caps for protection. An adjustable diamond truing attachment is mounted on the rear of the bed for truing up the wheel and removing the glazed surface produced by grinding. When not in use this attachment is swung back out of the way, as shown in Fig. 3, and is always at hand when needed.

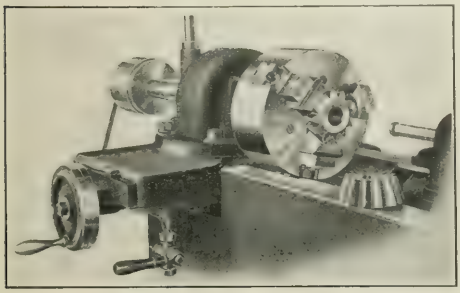


Fig. 2.—The Special Chuck Jaw Arrangement for Holding Bevel Pinions.

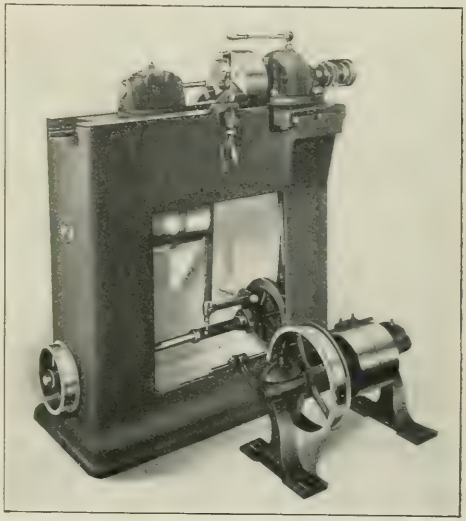


Fig. 3.—Rear View of the Machine, Showing Details of the Drive.

The following table gives the principal dimensions and specifications of the grinder:

Minimum diameter of hole, inch	⅞
Maximum diameter of hole, inches	4
Length of hole, inches	4
Cross feed of work head, inches	2⅜
Swing, inches	9
Maximum swivel of head, degrees	15
Diameter of threaded spindle nose, inches	2¼
Pitch of spindle nose threads	10
Diameter of hole in spindle, inches	1⅝
Speed of work spindle, revolutions per minute	250
Maximum speed of grinder spindle, revolutions per min.	20,000
Width of grinder spindle belt, inches	1
Speed of countershaft, revolutions per minute	333
Diameter of countershaft pulleys, inches	8
Width of countershaft pulleys, inches	3
Floor space required, inches	30 x 48
Net weight, pounds	1,200
Domestic shipping weight, pounds	1,325
Foreign shipping weight, pounds	1,650
Measurement of case, cubic feet	68

For a number of cases where it has been found very convenient to face the hole or grind the outside at the same chucking, the builder is prepared to furnish a two-spindle grinder head with one spindle offset.

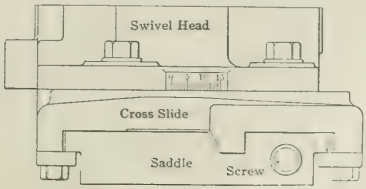


Fig. 4.—Detail Showing Fastening of the Work Head to the Bed.

Alloy Steels for Automobiles*

Their Selection and Treatment—Many Expensive Steels Used Where They Are Not Needed

BY HENRY SOUTHER.†

The reasonable use of materials is to be the theme of this paper. Many considerations are involved in looking back to the beginning of the automobile industry, and it seems necessary to do this in order that the evolution may be followed as far as materials are concerned. At the beginning every faculty of designer and builder was focused on the production of an operative machine. Materials were disregarded so long as they would help build the vehicle and were obviously steel, brass, aluminum or wood. All were too busy to regard the quality. Generally speaking, there were available from the standpoint of the automobile builder Bessemer steel, open hearth steel and cast or crucible steel. Variations within these classes were regarded as unimportant and heat treatment was an unknown term; certainly only theoretical at the best, and therefore useless to a practical man.

Now, these same men have among them those who state that the heat treating department of the works is the most important of all. This is not so with all yet; there are some who still balk at talk of critical points, recalescence, pyrometers and the like. The evolution is rapid, however, and this class will soon disappear.

After a year or two the cars operated very well; at least well enough to run long enough to break parts, crank shafts, axles and steering parts. Then a little attention was directed toward steel. There seemed to be no clear idea of a cure. If a steel part broke with an appearance of brittleness, good old wrought iron was tried as a sure cure. If bending occurred tool steel was tried in some cases and medium carbons (0.50 per cent.) in others, it being understood that high carbons were stronger but brittle. The natural or annealed state was the only one known to the automobile industry at this time.

Early Mistakes with Alloy Steels

About this time nickel steel was mentioned as a possibility. It had been used, or as some said "advertised as used" for bicycle construction. But generally it was regarded as something fancy and not worthy of the consideration of hard headed men. It was expensive, hard to work and no good anyway in the opinion of many. So when alloys came along in earnest and were offered systematically by steel agents they had a hard time making any progress. The high prices quoted were laughed at. There seemed to be no chance that alloys would ever be given a fair trial. After some little time and persistence by the steel agent, alloy steels were tried and proved good even at 15 cents per pound. Some designs required alloy steels to stop breakage, the result of small dimensions, sharp corners where fillets should be and similar mistakes. In this way the alloy or perhaps the high quality carbon steel had a chance to make good in a spectacular way. These instances helped the spread of high grade steels until now the pendulum has swung too far and alloys are used where they need not be and money is thereby wasted. There is indication of a notion that an alloy steel is a cure-all; and that if needed in one part it must be a fine thing in all parts.

Unfortunately the art of heat treatment has not spread as fast as alloy steels have, and many cases exist where very expensive steels have been put into cars in an annealed or forged condition, which is absolutely unreasonable. The alloy steel is no cure-all and must be used intelligently, if any compensation for increased cost is to be realized.

A case in point is found in an engine crank shaft. It is large for the duty. If it is made of an alloy treated up to 100,000 lb. per square inch or more, when 60,000 lb. would suffice, there has been no gain to the automobile and there has been a money waste. It is not generally understood that a high elastic limit adds nothing to the stiffness or rigidity of a part. It does add to resistance to fatigue, but with the case in point the shaft is over size and fatigue cannot take place in the absence of bending.

The same general condition applies to gears of all kinds. It is not the rule, by any means, that gears of smallest section are made of the strongest steels. This should be so and is so in one very marked case. On the other hand many very heavy gear sets, duty considered, contain steel of greatest strength and all out of proportion to necessity. This is unreasonable, as it is obvious that strength should be a function of design. A bridge or a building is calculated to a nicety; as yet automobiles rarely are. Knowledge of steel is not yet sufficiently widespread. The history of the automobile is short and there has not been time enough to disseminate knowledge of so many special steels and special treatments. Then, too, an air of mystery regarding special steels and secret treatments has been fostered in some circles in such a way as to befog the issue and retard the spread of truth.

The Time When Users Did Not Help Sellers

At the beginning of the automobile art the steel industry was old. Alloys and heat treatments were no mysteries to the steel metallurgist. Makers of armor plate, gun tubes, propeller shafts and other important specialties had been using many grades of steel and many treatments to meet peculiar needs. This knowledge had not and does not spread readily to makers of small arms, sewing machines, bicycles or typewriters, and they all need it to some extent.

Some reason for this is found in the old fashioned selling methods of many steel companies. Most salesmen are not furnished with accurate knowledge of the steels they sell, or if they are they are forbidden to use such knowledge on possible customers. They use a line of argument that contains no metallurgical information and is too often far from the truth. There are large numbers constantly engaged in this way, so it is no wonder that little real progress is made by aid of the salesman. Fancy names and fancy prices for common steel are their specialty.

It is a pleasure to feel that such methods are giving way to others and better. The steel works engineer, metallurgist or chemist is now placed in contact with the consumer. His wants are learned and supplied without secrecy or mystery. The opportunities of change and improvement are pointed out, and advance in the art will be rapid. As it is now there is but little knowledge among consumers as to the relative importance of analysis and heat treatment or of the importance of casting, rolling, hammering and cold working of steels. Consequently many consumers are in doubt as to what to believe—the truth as expounded by the conservative metallurgist or the near truths about the special alloys of the salesman.

* A paper read at the meeting of the Section of Mining and Metallurgy of the Franklin Institute, Philadelphia, October 20, 1910. Reprinted from the *Journal* of the Institute.

† President Souther Engineering Company, Hartford, Conn.

Experience with Machine Steel

Before taking up the finer steels it is well to study the history of what preceded them in the automobile art. At the outset carbon steels were mostly considered and known as machine steel. Such steel was available and cheap, or at least low in first cost. Such steel is not always cheap, as much of it tears in machining to such an extent that work is ruined, or will not permit the cutting of a thread at all because of its softness. Such machine steel is of about the following composition; it is not, strictly speaking, machine steel, but there is so much of it on the market so called that it must be recognized: Carbon, 0.08 to 0.13 per cent.; phosphorus, 0.08 to 0.10 per cent.; manganese, 0.40 to 0.60 per cent., and sulphur, 0.06 to 0.08 per cent.

Machine steel, so called, as found in steel warehouses is not all alike by any means. This lack of uniformity is discovered by the user, whose judgment usually is that the steel is no good anyway and does not behave twice alike in the machine shop.

The best machine steel then existing in stock contained carbon from 0.18 to 0.25 per cent., with other elements like the foregoing analysis. Such steel machines smoothly and cuts a keen thread. A slight increase in carbon, coupled with the other elements given, makes a very marked difference in machining quality. A third quality of machine steel found on the market at the time in question was between the other two in carbon contents and much higher in manganese, analyzing about as follows: Carbon, 0.12 to 0.18 per cent.; phosphorus and sulphur, about 0.08 per cent., and manganese, from 0.60 to 0.90 per cent. The manganese contents made for smooth cutting and the steel was a good one for carriage axles, which must be machined very rapidly, and other similar uses.

These machine steels were all characteristic of Bessemer output and were put into the early automobiles. They answered the purpose until the machines began to wear fairly well and poor (weak) design developed. High carbons were tried and wrought iron was tried, all in a blind unreasoning way. Some troubles were cured, but some could not be cured by any change of material known at the time. The details of design were such as to cause failure with any material. Failure was delayed but not prevented.

Screw Stock

One grade of steel, common then and now, known as screw stock, deserves notice, as it plays a more important part in automobile construction than it ought to. It is close to machine steel and is sometimes sold as such. The approximate analysis is as follows: carbon 0.08 to 0.12 per cent., phosphorus 0.12 to 0.18 per cent., manganese about 0.50 per cent., sulphur about 0.10 per cent. The dominant element, that makes for easy cutting, is phosphorus, which is twice normal for Bessemer steel. More steel of this quality than of any other composition, can be put through an automatic screw machine in a given time, and turn out a fine product. But the drawback is phosphorus, which causes brittleness in steel and makes it unsafe for automobile construction. Except in screws of no importance or parts carrying no load, it should not be used. Important screws are now made of alloy steels heat-treated. Connecting-rod and engine-base screws for example. The above screw stock after casehardening, as it often is, shows a coarse brittle grain even with the best of treatment. No hardened parts of this quality should be used.

The Present Standard Machine Steel

At the present time little steel high in phosphorus finds its way into automobile construction. Basic open hearth steel is mostly used, and this is uniformly below 0.04 per cent. in both phosphorus and sulphur. This quality of steel in the vicinity of 0.10 per cent. carbon machines with the greatest difficulty; consequently a standard machine steel has been developed containing enough carbon and manganese to offset the softness. The analysis is as follows: carbon 0.20 to 0.30 per cent., phosphorus and sulphur not over 0.04 per cent., manganese 0.40 to 0.70 per cent.

This quality of machine steel handles well in every stage of manufacture and responds to heat treatment in a way that makes the product suitable for many parts of a car. This steel is a fine steel for the general run of drop forgings. It is suited for the important members of low priced light cars, and for carbonized and hardened level and transmission gears in such cars as are of low power and generous gear design.

With the general use of basic open-hearth steel this type of machine steel is bound to be generally adopted. Its usefulness is very widespread and its cost as low as any open-hearth steel. The extra expense that is warranted is the care necessary to free from seams or other physical defects. This is done by the steel maker or the one who prepares the billets or bars for shipment. Freedom from seams insures a sound product at the finish of an expensive series of operations and is worth paying for.

Simple heat treatment will give an elastic limit per sq. in. of 60,000 lb. This is the result of quenching at about 1500 degrees F. in oil, then partly annealing at 800 degrees or 900 degrees F. Such strength is accompanied by good refinement of grain and corresponding toughness and capacity to resist shock and repeated alternate stress. The machine steels previously mentioned would not be safe under the foregoing treatment or any other; as refinement of grain does not take place to a satisfactory extent in the presence of so large a percentage of impurities.

Without a fine grain development in steel fatigue takes place very rapidly. In using this term "fatigue" the same phenomenon is in mind that is often referred to as crystallization. Cold crystallization does not take place. It is a different physical change and will be discussed later.

Soft, Tough Steel Not the Disideratum

About the years 1893-1894 bicycle parts often failed (to quote) "while riding along the smoothest road." The fractures did not exhibit coarse crystals as a rule, particularly in cold-drawn spoke wire or tubing. But in every case there did exist an opportunity for concentration of strains, bending or vibration, at a limited section. These failures led to studies of fatigue conditions.

It was commonly thought by well trained mechanics that the softest toughest steels would resist longest under these conditions simply because of the tough quality. This was found to be not so. Tough and soft steel is weak steel having an elastic limit per sq. in. from 30,000 to 40,000 lb. A good grade of forty (0.40 per cent.) carbon steel may have an elastic limit of 50,000 or 60,000 lb. Such steels in an annealed condition were compared under such circumstances as to produce a fatigue break. The dead or actual load used in comparison was the same. This load was chosen to produce a fiber stress nearly as great as the elastic limit of the weaker steel, say 25,000 lb. per sq. in. (about 84 per cent.). This stress was only 50 per cent. of the elastic limit of the stronger steel. The weaker steel, soft and tough, broke quickly after 20,000 to 50,000 alternations of stress. The stronger steel, looked upon as being brittle and hard, endured, say, 400,000 alternations of stress, an increase not in direct proportion to strength and quite contrary to the characteristic of toughness as measured by elongation. It is evident that the toughness was not the controlling element under fatigue conditions and that strength as indicated by elastic limit was an important factor with some other element not obvious, playing an important roll. Such an element was sought in the crystalline structure. Such structure is fairly indicated by trans-

verse fracture for the purpose in hand. The fracture of the low-carbon tough steel is coarse grained with crystals presenting large cleavage planes. That of the higher carbon, brittle steel, showed a close grained structure with no crystals having cleavage planes of conspicuous size. That is, the steel that endured longer was strong and fine grained. These were the controlling elements.

The Required Heat Treatment

It is for this object that all heat treating processes are practiced—to produce greater strength and to refine the grain. The most reasonable steel to use in automobiles is that which will respond best to treatment or that will respond sufficiently for a given purpose, dimensions and duty considered. There is no reason in selecting a steel that will not respond somewhere in proportion to the cost of the operation; that is, the improvement must be material. Neither is it reasonable to select a steel at great cost that will respond to such an extent as to be way beyond the necessities of the case.

The treatment necessary to give a steel depends somewhat upon the physical condition of the steel as received by the consumer or user. For example, it is quite possible and often happens that bars of steel reach the manufacturer of automobile parts in a very coarsely crystallized state, this being due to the last forging or hammering operation prior to shipment by the steel mill. If this steel is to be used by the parts maker without further drop forging or other heating operations, the steel must receive a thorough annealing. In the absence of such annealing operation, which will reduce the coarse condition of it to a properly refined condition, a single heat treatment will not produce the expected results.

If, on the other hand, the bar or billet is to be forged, then this coarse crystalline condition matters but little and the annealing must necessarily follow the forging operation and for the same reason; to guard against a possible condition of coarse crystallization which will not be refined by a single heat treatment.

Our steel makers would do well to learn whether or not the consumer of the steel is to again forge. If not, annealing should be the final operation at the steel works in all cases. Otherwise, steel of good quality may not perform as well as it should.

It is not always possible for the steel manufacturer to know whether or not steel is to be forged again; in view of that fact, it is the habitual practice of some of the steel mills to anneal as a final operation. No harm is done if the steel is again forged, and if not forged the steel is found by the user to be uniform in machining qualities and well behaved under heat treatment. Uniformity of machining quality is of far more importance in the eyes of the mechanic than is fully appreciated by many steel companies. Many thoroughly good qualities and shipments of steels are complained of and perhaps condemned because of the presence of so-called hard spots and bad cutting qualities. The machine shop cannot be expected to know that it is not the composition of the steel that is at fault, and the steel maker should guard against such complaints by the relatively inexpensive operation of annealing.

These remarks apply very strongly to tool steels that are to be shaped into expensive tools, to spring steels and to the higher carbon steels in general. They apply in a lesser degree to the lower carbon steels, but nevertheless are of great importance.

Many machine steels are condemned because tools are rapidly dulled in machining them, and the complaint is, as a rule, that they are too hard to cut. As a matter of fact they are too soft to cut smoothly. They tear and cling to the point or edge of a tools, and the cutting operation becomes more or less of a rubbing operation which creates heat and dulls the tool by softening it. Proper annealing, suited to the carbon, will correct this fault, but the machine shop manager cannot be expected to know this and probably has no facilities for annealing or other heat treatments in many cases.

Take an engine crank for example. Other considerations than strength influence the design. It must have ample diameter to furnish adequate bearing surfaces. It must be rigid and stiff. No alloy can increase this latter quality. A steel with 60,000 lbs. elastic limit per sq. inch is quite strong enough to outlast the engine. One of 200,000 lb. elastic limit would make no better crank shaft under the assumed conditions and would cost more at first cost, in forge, in machine-shop, and in heat treatment. This is a fair example of unreasonable use of alloy steel.

Endurance Under Alternate Stress

To return to qualities producing endurance under alternate stress. A drop forging as it comes from the dies is likely to be in a non-homogeneous condition as the result of the process and at the best, because finished at a relatively high temperature, is likely to possess a very coarse open grain. If intended for a vital part this grain must be refined. It may be perfectly done by proper heat treatment, and it is done habitually by careful operators. The result is a homogeneous piece of metal. No other character of steel is fit to enter the construction of an automobile where it is potentially possible of much harm or much good. Carbon steels should be so treated; alloy steels must be, if fair value for money spent is to be received.

Alloy steels of expensive variety have been put into cars without heat treatment, just to say they were used. An alloy steel not suitably treated, that is, in an annealed or forged state, is little if any better than good open-hearth machine steel in an annealed condition. Its endurance under fatigue test is low. Its elastic limit is low, and its structure as indicated by transverse fracture is bad. Such use of alloy steel is unreasonable, and the only additional value obtained for the excess paid as compared with carbon steel is an advertising value.

On the other hand, alloy steels suitably chosen and heat-treated have extricated many an engineer from real trouble. A driving shaft, having 60,000 lb. elastic limit, for example, may have proven weak with good carbon steel. Because of the design of connecting parts a change in dimensions is often practically impossible. A solution is easy with a good 0.30 carbon, 3.5 per cent. nickel steel treated to 90,000 lb. per sq. in. elastic limit, or if necessary a chrome-nickel of high carbon treated to 150,000 lb. elastic limit. Such applications of alloys are worth all they cost and are reasonable in every way.

It is the alloy steel that responds best of all steels to heat treatment. Results are obtainable that are nothing short of wonderful. Only recently a tensile strength of 300,000 lb. per sq. in. has been reached. Coupled with such strength, say 200,000 lb. per sq. in., very great ductility is obtainable as indicated by elongation and reduction of area at section of rupture. Too great stress cannot be laid on this last item. It is the best measure, in a tensile test, of the degree of refinement of grain attained by heat treatment. Reduction of area will be slight if the crystals or grains are large. If the grains are large as already stated, endurance under fatigue will be little, and endurance is beyond argument the most valuable asset of an automobile subjected as it is to shock and vibration at all times, while in motion, and to an extent beyond any other mechanism.

Conditions of High Endurance

Attention has been called to the relative endurance of 0.10 and 0.40 per cent. carbon steels under fatigue test. Under the same dead load a specimen of 0.30 per cent. carbon, 3.5 per cent. nickel heat-treated will endure several million alterations of a 25,000 lb. per sq.

in. fiber stress, and a specimen of 7.5 per cent. nickel has endured one hundred million without rupture with the fiber stress at about 50,000 lb. per sq. in. The tensile tests give no indication of any such difference in endurance, unless it be in the reduction of area coupled with a high elastic limit. These figures are always large with good endurance. The reduction of area is a measure of fine grain, so it would seem that this quality may be the most influential in determining endurance.

There is good chance for theorizing and reasoning along this line. With the theory of cold crystallization set aside, a reasonable cause for breakage must be found. Steel may be considered as made up of crystals which interlace and adhere. If a test specimen were made up of crystals whose faces equaled the diameter of the specimen, there would be the exaggerated condition of all adhesion and no interlacing—one cleavage plane extending across the specimen. It is easy to conceive that the separation of surfaces once started would jump at once across the specimen and rupture would occur. There would be only adhesion to overcome. It is equally plain, were the same specimen made up of an infinite number of crystals, that a separation started at the periphery would meet with an interruption before being of finite size; after which a fresh start might recur at anotfier point to meet with similar interruption. In this way an infinite number of starts would be necessary to bring about rupture. In other words there would be no chance for a continuous fracture along any one line or surface, and rupture would be delayed indefinitely.

A fibered piece of steel endures better than one not fibered, although both may be of very fine grain. It is easy to conceive that if "fiber" is all the name implies, an incipient fracture formed in one fiber could not continue across the space between fibers and would thus stop. Wrought iron breaks under fatigue as in an axle or shaft. The fracture always shows crystals. It it not possible that a fatigue break can take place only where crystals exist, and that because crystals are at a given section, fracture takes place there?

It is easy to understand how a progressive fracture may proceed along the faces of a series of crystals as in the splitting of granite by means of wedges driven into a row of holes. It is not easy to conceive the splitting of good fibrous hickory or elm, except with and along the fiber. Splitting across the fiber is impossible; there could be no continuous fracture and therefore no rupture.

A fatigue break has been described as "progressive intermolecular rupture." It would seem more probable to be "intercrystalline," inasmuch as the molecules, of a given composition, are doubtless all of a size, regardless of heat treatment or physical treatment. On this theory heat treatment would cause no difference in behavior under fatigue; which would be contrary to fact.

Another phase of fatigue is that such breaks rarely if ever occur unless strains concentrate at or near one plane or section. If strains be distributed as in a beam of uniform strength, fatigue does not occur. A generous fillet or a taper retards fatigue almost indefnitely. A sharp corner causes it to occur very quickly.

Design and material both play an important part, and the two must be considered simultaneously if good engineering is to be attained. If a design be adequate with poor material, it is folly to buy better. If design be suited for the best, then only such may be used, otherwise bending and breaking will occur at once. These statements seem too simple for reiteration, but it is a sad fact that both simple truths are violated in automobile construction.

Case Hardening

There is one form of heat treatment as old as the hills, that is little understood by many that have practiced it longest—namely, "case hardening." It is easy to turn out coarse or fine grained product. The fine grained is desirable (as in good tool steel), the coarse grain is not, as in burned tool steel. Too few realize that a low grade steel after carbonizing is no longer low grade. It has had money spent on it to improve it; and if the low carbon was pure steel, the high carbon exterior, the result of carbonizing is pure high carbon steel, therefore good tool steel, and must be treated accordingly.

No tool dresser would heat tool steel in boxes for 10 hours at a temperature of 1700 degrees F., then quench in water at that temperature and expect a tool to do good work. Yet this is exactly what is done in many otherwise well regulated plants, and the steel is blamed if the parts so treated are brittle. So treated the crystals are large; the steel is brittle.

If used for ball or roller bearings, the polished surface is friable and crystals spawl out, thus starting pits and fractures. Suitable refining treatment improves this condition and makes a success out of a possible failure.

In case hardened parts two qualities of metal are to be dealt with, and the best practice demands treatment that will refine both grades. The interior of two are the original carbon, and the exterior a carbonized layer of a higher carbon. The refining temperature of the lower carbon is higher, and one treatment must reach this. The other temperature, correct for the high carbon, will not undo the refinement of the lower carbon. Thus by two treatments both qualities are fully refined, and the composit structure is a good one. Alloy steels are subject to the same laws, and it is only necessary to be acquainted with the critical points of the various compositions to get the best results.

Transmission gears and main drive bevel gears are successfully made of carbonized steel, both carbon and alloy. The quality selected must be referred to design and duty. The duty of constant mesh gears running in oil is relatively easy if the dimensions be generous. The duty of clashing transmission gears is never easy, and may be awful with a dragging clutch or careless manipulation by the car driver, and with clashing taking place under loaded or partly loaded conditions.

With equally good design the bevel driving gears do not need the same or as good steel as the transmission gears. It is common and good practice to make the large bevel gear of good carbon steel and the driving pinion meshed with it of an alloy steel.

After Treatment Important

The character of the treatment and resulting condition of the steel are of vastly more importance than the composition of the steel used. The best of alloy steel may be so handled in treating as to produce a weak and inferior part. Similarly by the best of treatment good open hearth machine steel may be so well handled as to make a most excellent main drive pinion or other part.

It is true that the best must be produced for a few designs, but such are much in the minority at this time. There has been very little real close designing as yet. Empirical knowledge and data as to available materials are not yet exact. The art of heat treating is not uniform and widespread among producers of automobile parts. A liberal margin of safety against uncertainty and nonuniformity is still the rule.

There is one practice in vogue among purchasers of alloy steels that does not seem to be founded on good reason. It is that physical requirements are specified in face of the fact that the steel is to be forged and heat-treated before being used in a car. Its final condition may bear no relation to its purchased condition. It may be carbonized, for example. If steel be purchased on chemical analysis, the control is sufficient. With a known composition heat treatment may be in-

telligently directed without reference to original tension test characteristics.

If to be used as purchased the matter is different and physical characteristics must be known. Elastic limit, reduction of area, elongation and tensile strength, in the order named, are desirable. If these physical tests be demanded then complete chemical analysis must not be. The steel manufacturer cannot produce if tied hand and foot. It is proper to specify chemical analysis as to impurity—that is, phosphorus and sulphur—and also as to the dominant elements—nickel, chrome-nickel, and so on. Even in these elements manufacturing tolerances must be allowed. The practice of limiting all elements and coupled with physical requirements is wrong and often leads to the absurd situation of specifying an impossibility.

Even at the best, with the one writing the specifications knowing exactly what has been the practice in one steel works, it is not certain that in another works the result would be quite the same. Some works use melting processes, casting methods and forging methods that may easily modify physical characteristics as compared with practices in other works.

Few Grades of Steel Needed

With a given quality of automobile in view, the number of grades of steel necessary to construct it is few—namely, a good all around forging steel, a steel of slightly better quality to be used for gears, a spring steel and a steel suited for the pressed sheet steel portions of it. These steels, properly handled and heat treated, each part for its peculiar duty, will produce a car of very high grade so far as the steel portions are concerned. The car of extreme design, racing or otherwise, one that has been designed to strip off the last pound of weight, must be handled differently. Such a car is the exception and must be treated accordingly.

If an order be accepted at all under such unfair restrictions, it must be at an advanced price to cover probable difficulties. This simple fact is so well known to the steel producer that it is apparently absurd to state it, but it is not well known by steel consumers and needs repeating for their benefit.

Summary

To sum up: The attempt has been made to indicate that alloy steel is better than plain carbon steel—that is, stronger and more enduring; that the design of some cars is such as to necessitate the use of the strongest alloy steel, and that the design of others is such that an alloy steel is superfluous and money wasted.

That steel that is good for one purpose is bad for another, and really that the term "good steel" is meaningless unless it be understood for what. Pure steel, meaning freedom from impurities, means something always. It insures that such steel will give "good" results if the composition is suitable for a purpose and if the steel be treated to develop proper physical characteristics for the duty to be performed. Several steels (compositions) may be available that will perform a given function perfectly if properly selected and treated. No consumer need be tied to one maker, one composition or one method of treatment. Several of each are always at hand that will give satisfaction. Reasonable use of steels can only be reached along lines as broad as this.

A new Nelson stove, 22 x 75 ft., has just been completed at the plant of the Pennsylvania Steel Company, Steelton, Pa., by Arthur G. McKee, engineer, Cleveland, Ohio. Mr. McKee has also commenced the erection of a 22 x 100 ft. Nelson stove at the blast furnace of the Penn Iron & Coal Company, Canal Dover, Ohio. Fifteen stoves of the Nelson type have been built, and are now in operation at various blast furnace plants.

Illumination of Iron and Steel Mills.

The Questions of Safety and Economy—Three Prominent Types of Electric Lamps

BY G. H. STICKNEY.

To the manufacturers I represent it is more important that lamps should be used advantageously so as to give satisfaction rather than that any one type should be given preference. We have now an illuminating engineering laboratory, with a floor area of about 9000 sq. ft., devoted entirely to the experimental study and demonstration of electric lights to the various practical requirements of illumination.

The Factors of Safety and Economy

Your convention has given its principal attention to the attainment of safe conditions of operation. Of all the elements necessary to insure safety illumination is of prime importance. A pamphlet, which an insurance company has passed out at this convention, calls attention to the increased number of accidents during the winter season on account of the decreased illumination. This in itself is equivalent to stating that in general mills are not sufficiently well illuminated. It is not only necessary that workmen should see, but they must see quickly, which means stronger illumination.

Safety, however, is not the only consideration calling for adequate illumination. Economy of shop and mill operation makes it profitable to provide a more intense illumination than would be necessary on the score of safety alone. Better illumination will almost invariably result in increased production and improved workmanship, avoiding defective product as well as wasted labor and material. With the changing conditions, the standard of mill illumination is constantly rising, due to increased cost of labor and decreased cost of light.

There are many plants in which it is realized that the illumination is not adequate, but where the adoption of modern systems and modern arrangements is postponed on account of the element of first cost. Here is where the cost man can profitably make some calculations. If he will capitalize his first cost in terms of the probable life of the apparatus, he will generally find that the cost of operation for one year is relatively large and the first cost relatively small, so that the economy in improved service and reduced cost will render the change an exceedingly profitable one.

Intensity of Light

In selecting and arranging the lighting equipment for any particular condition of industrial lighting there are three fundamental considerations which must be applied: Utility, reliability, economy. Under utility we may consider intensity of illumination, distribution, diffusion, color of light. Under reliability we may consider lamp operation, mechanical construction, insulation. Under economy we may consider cost of power, cost of maintenance, investment and depreciation.

In any ordinary building the intensity of solar illumination through the middle of the day is much higher than is practicable in artificial illumination. In fact the daylight illumination is often 20 times as intense as the artificial illumination provided for the same operations. Fortunately, our eyes are adapted to work well through a wide range of intensity. On the other hand, with increased illumination it is possible to see better and quicker. In deciding on the intensity for any character of work, it is essential to select the minimum at which the workman can see quickly and without effort those things which his duties and

* From a paper read at the meeting of the Association of Iron and Steel Electrical Engineers, Pittsburgh, Pa., October 20, 1910. A paper by Mr. Stickney on "Electric Lighting for Industrial Plants" appeared in *The Iron Age* of February 24, 1910, p. 446. The author is connected with the General Electric Company, Schenectady, N. Y.

safety require. A department which has to be exact to thousandths of an inch in scaling work would require more intense illumination than where wider variation is permitted.

Perhaps the most satisfactory way of determining the intensity necessary for a process is to provide for variable intensity and then measure the necessary intensity as determined by observation. Especially where they are using individual drop lamps workmen are liable to demand several times as much illumination as is really needed.

In a large number of industrial plants visited by the speaker there appeared to be excessive loss of light from accumulated dust and dirt. In one particular instance where we made measurements the light was doubled after cleaning the lamps.

Where conditions permit it is desirable to keep the walls of a room light colored. This improves both daylight and artificial illumination.

Local and General Illumination

In lighting a room there are three principal methods—namely, local illumination, general illumination and a combination of the two. Where work is widely scattered in small groups, local illumination or a combination of local and general illumination is generally the more economical of power. When local illumination means small, portable lamps in the hands of the workmen, it is open to a number of obvious objections and should generally be avoided.

General illumination, in which a reasonably even intensity of illumination is provided throughout a room, gives the best working illumination, allows the use of large, efficient units with minimum wiring, and usually low maintenance cost for the installation. It is often expedient to provide general illumination supplemented by local illumination at a few points where the processes require it.

In any case, the characteristic light distribution of the light source should be taken into account and, perhaps, modified to meet the conditions. For example, since the ordinary flame arc lamp provides a powerful downward light, it should be used high above the floor, so as to give a reasonably even distribution. Mazda or tungsten lamps naturally distribute their maximum light near the horizontal, with considerable upward light. Therefore, they should be provided with reflectors designed to give a characteristic distribution corresponding to the hight and arrangement of lamps. In some cases it is usual to place a number of lamps under a single reflector. This is a good arrangement, but the speaker prefers an arrangement with a single reflector over one large lamp. This arrangement has lower maintenance cost and allows each lamp to distribute its light without interference from any other.

In the lighting of small or low rooms, especially at low intensity, small sources are necessary to provide even distribution. In large, high rooms, unless the intensity to be provided is exceedingly low, relatively large, powerful lamps are advantageous. Not only do they simplify the installation, but they actually make a better appearance and lighting effect. In our attempt to secure even distribution and diffusion we often lose sight of the possibility of carrying it too far. And while the fault is not common, there are many instances of flatness of illumination, which is tiring to the eyes and actually interferes with our ability to see.

The Principal Types of Lamps

Three principal types which lend themselves to mill lighting are the flaming carbon arc, the magnetite or luminous arc and the Mazda or tungsten incandescent lamp. The flaming arc is inherently a light of great volume. The units consume 500 or more watts and produce the greatest flux of light in proportion to power consumption of all the artificial illuminants. The most efficient electrode produces an orange-yellow light, which has the property of penetrating smoke and dust to good advantage. Direct and alternating current lamps are made. They take 10 to 13 amperes at 55 volts. The alternating current may be run on compensators, but the direct current lamps run two or more in series, corresponding to the line voltage. The electrodes, giving the highest efficiency and steadiest light, require renewal once in 10 to 20 hr. In the common form the electrodes are both above the arc and converge downward, the arc being controlled by a blow magnet. The economizer just above the arc acts as a reflector and concentrates the light downward. White light electrodes are also available, but are only about one-half as efficient as light producers as the yellow electrodes.

A recent development is the so-called Boston flame arc, in which two special electrodes are placed axially one above the other. This is operated ordinarily at 6.5 amperes, 110 volts direct current, or two or more in series on higher voltages. Owing to the arrangement of electrodes the natural maximum intensity of light is near the horizontal. The distribution is modified with reflectors to provide a characteristic distribution to suit requirements. This lamp has an electrode life of about 20 hr. Owing to its adaptability and efficiency it is being used for large interiors.

The magnetite lamp is less efficient as a light producer than the flame arc, although it surpasses nearly all other illuminants. It has the particular advantage of long electrode life and low cost of maintenance. At low cost of power it often figures out more economical than the flame arc. The light is white and has a wide distribution easily modified by reflectors. This lamp is not recommended for office or drafting room lighting, owing to the solid residue of the magnetite forming dust.

The Mazda or tungsten lamp, while of higher specific consumption than the flame arc lamp, has the advantages of adaptability and subdivision of units. It is more independent of variation in voltage than previous incandescent lamps. The larger sizes have the advantage of greater mechanical strength and lower maintenance cost per candle-power hour. The ordinary line is made for 110 volts (nominal) circuits, but a 220-volt line is also available. As the low voltage lamps have shorter and heavier filaments they are sometimes used two or more in series where subject to vibration. When there is excessive building vibration it is advisable to provide spring suspensions to protect the lamps. Mazda lamps should almost invariably be used with reflectors or diffusers, by which the light is redirected to provide a characteristic distribution most suitable for any particular case. In the Mazda mill diffuser the reflecting surface is corrugated to give suitable redirection and diffusion. The surface is of baked enamel, such as is used on bicycles and which has been found effective for diffusion and efficient reflection. These reflectors are particularly adapted for ordinary hights of 10 to 20 ft. As the Mazda lamp is proving suitable for use over cranes, detachable skirts are being provided so that the diffusers concentrate the light as required for the greater hight. For use along side walls a detachable apron is designed to give efficient concentration toward the middle of the room.

The population of the continental United States, not including Alaska, is 91,972,266, an increase of 15,977,691, or 21 per cent. over 75,994,575 in 1900, when the increase was 13,046,861, or 20.7 per cent., over 62,947,714, the total in 1890. The total population of the United States, with all possessions, is about 101,100,000. This number includes 7,635,426 in the Philippine Islands, as enumerated in the census there in 1903, and estimates for the population of the Island of Guam, the American possessions in Samoa, and persons on the Panama Canal Zone.

New Sullivan Air Compressors

Small Single Stage Machines for Heavy Duty

The Sullivan Machinery Company, 150 Michigan avenue, Chicago, Ill., has recently placed on the market two new single stage steam and power driven air compressors, known as the classes WA-4 and WG-4, respectively. Figs. 1 and 2 show the steam driven compressor, and gives details of its construction, respectively, while Fig. 3 is an exterior elevation, and Fig. 4 is a sectional elevation of the WG-4 type. These compressors have been designed especially for the severe service demanded of machinery of this class in foundries, shops, mills and buildings which is coupled with the fact that compressors of this type seldom receive the attention given to the larger and more costly machines. The capacity of these classes of compressors is small, and the pressure at which they operate ranges from 10 to 100 lb. per square in.

In the design of these machines the maker had two objects in view—namely, to produce an air compressor which would be as simple and durable as possible,

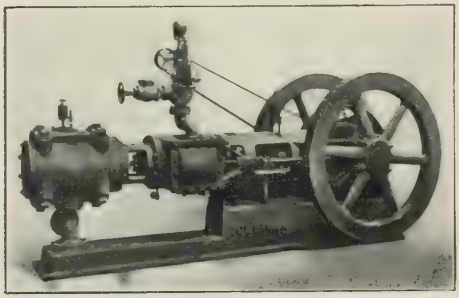


Fig. 1.—The WA-4 Air Compressor Built by the Sullivan Machinery Company, Chicago, Ill.

while at the same time the highest possible efficiency was secured. These compressors consist of a heavy substantial frame supporting the bearings and crank shaft at one end and the steam and air cylinders at the other. A heavy steel guard surrounds the crank at the center and prevents oil from being thrown on the floor.

One of the special features is the design of the air cylinders which are cored to form water jackets, while the heads are also jacketed over their entire area, a feature which keeps the heat generated by compression within safe limits. Radial automatic poppet valves are used for both the inlet and discharge, the former being placed close to the ends of the cylinder at the bottom and the latter in a similar position on the top. As these valves act in a true radial direction with respect to the axis of the cylinder, the losses in efficiency due to clearance are reduced to the lowest possible terms. Very short and direct ports or pockets lead to the valves, so that practically all the air is expelled from the cylinder after compression and none is trapped In case of breaking of the valves and their parts it is said to be impossible for the broken pieces to enter the bore of the cylinder. The valves are held in place

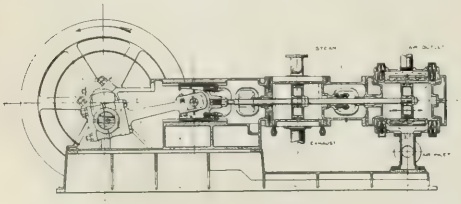


Fig. 2.—Details of the WA-4 Steam Driven Compressor.

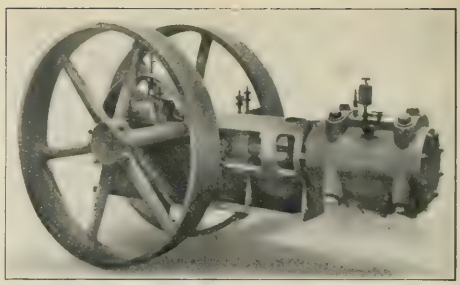


Fig. 3.—The Sullivan WG-4 Belt Driven Air Compressor.

in cages seated in the cylinder walls by taper fits, and when it becomes necessary to take out the valves it is simply necessary to remove the plug on the outside of the cylinder and withdraw the entire valve and cage for inspection or regrinding.

In the steam driven machines the slide valve which is of the ordinary steam type is controlled by the eccentric on the shaft and is connected to it by a simple arrangement of valve rods. The air cylinder is located on the outside of the steam cylinder and is connected to it by a heavy distance piece. A subbase running the entire length of the compressor supports the air cylinder, and insures the maintenance of the proper alignment of all parts. In the belt driven machines the air cylinder is attached directly to the rear end of the frame, and all the working parts, such as the crank shaft, cross head, connecting rods and main bearings are of ample dimensions to provide a high factor of safety. All parts subject to wear are arranged so that it may be taken up fully with very little trouble.

The steam driven compressors are governed by a split ball throttling regulator, having an extra cylinder which brings the throttle valve under the control of the air receiver pressure. Under ordinary operating conditions governor varies the speed of the compressor to supply the demand for air and the halves of the ball prevent the compressor from exceeding a safe speed by their centrifugal action. When desired the other class of compressor is fitted with an unloading device placed on the air inlet. This operates to shut off the incoming air when the receiver pressure exceeds a pre-

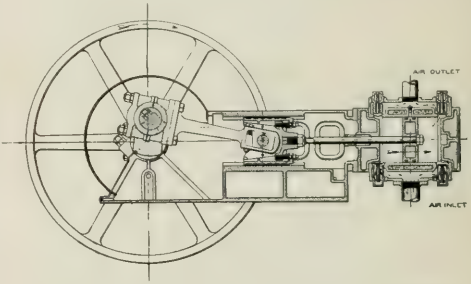


Fig. 4.—Sectional Elevation of the New WG-4 Compressor.

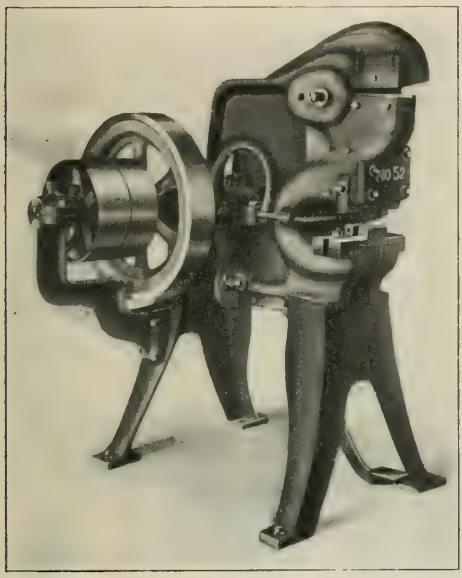
determined point and enables the compressor to run at regular speed and compress no air until the receiver pressure falls below the point set. In this way a considerable reduction in the amount of power used when the compressor is furnishing air intermittently is secured, while at the same time it runs at its regular speed, which is an important factor in power driven machines. The action of this unloading device is smooth and even, and the load is thrown off and on the compressor without sudden jar or strain.

In both classes of machines the main bearings have an adjustable cap, and are heavily lined with babbitt metal. In their manufacture a special fixture which

insures accurate alignment is employed to bore them out at right angles to the center line of piston rod. The cross head is of the box pattern type which is the same as that used in high grade cross compound machines. It is fitted with shoes which are easily and quickly adjusted. All of the important bearings and the air cylinder are fitted with sight feed oil cups. The mechanism is very simple, and the machines require only ordinary care.

The Beloit Combined Power Punch and Shear

The Slater, Marsden & Whittemore Company, Beloit, Wis., is manufacturing a line of combined power punchers and shears. The body is a single piece casting,



The No. 52 Beloit Combined Power Punch and Shear Manufactured by the Slater, Marsden & Whittemore Company, Beloit, Wis.

which makes the main frame exceptionally rigid and gives much more strength than would be the case if it were two separate castings bolted together. The eccentric and its shaft are cast in one solid piece, which eliminates all possibility of the former becoming loose. The eccentric shaft gear has an extra long bearing in the hub. The clutch for throwing the machine in and out of gear is of the improved positive four-jaw type, and is operated by a foot lever conveniently located for the operator.

The knives are of carefully tempered high grade tool steel and are very heavy. They have four cutting edges, as they are both adjustable and reversible, and can be quickly removed for sharpening. The steel mandrel is fitted for standard punch couplings and clutches.

The machines are very heavy and substantial, with ample back gears so that they require a minimum amount of power to drive them. In addition they are strong and compact as well as easy to operate. The flywheel shaft has an outboard bearing, which is fastened securely to the leg of the machine, as in the illustration.

Four sizes of tool are built, the one illustrated being the smallest, and the following table gives the principal dimensions and specifications:

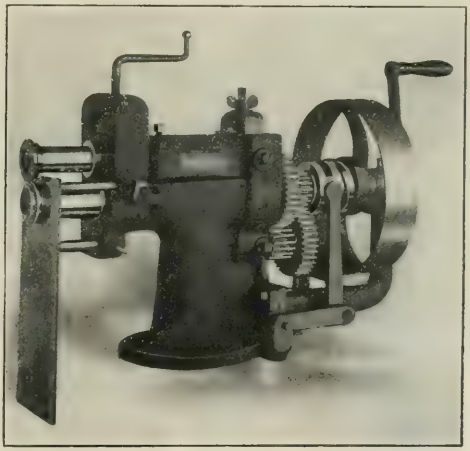
	No. 52	No. 53	No. 54	No. 55
Minimum section of flats handled, inches	½ x 4	½ x 6	⅝ x 6	¾ x 6
Maximum section of flats handled, inches	⅜ x 6	⅝ x 4	¾ x 4	⅞ x 4
Maximum diameter of rounds handled, inches	1	1¼	1½	1¾
Diameter of hole punched, inch	½	⅝	¾	1
Maximum thickness of metal punched, inch	½	⅝	¾	¾
Throat depth, inches	6	7	8	10
Ratio of back gearing	7 to 1	8 to 1	9 to 1	9 to 1
Diameter of pulleys, inches	12	16	18	20
Face width of pulleys, inches	4	5	5	5
Speed of flywheel, revolutions per minute	225	200	210	200
Weight, pounds	1,650	2,700	3,250	5,000
Size of punch and die	No. 4	No. 5	No. 5	No. 6

All the machines are furnished with knives for cutting both round and flat stock, one punch and die and an adjustable gauge. Angle shearing attachments and punching and shearing attachments for special work can be furnished when specially ordered at an additional cost.

The Niagara Power Bench Press

Where operations such as burring, turning, wiring and the like are to be performed in large quantities it has been found desirable to have machines better adapted for continuous power drive than the tinsmiths' machines regularly employed. For doing this kind of work economically, the Niagara Machine & Tool Works, Buffalo, N. Y., has designed a series of power bench presses.

The frames of these machines are substantially constructed and the bearings, which are long, have bronze bushings. The shafts are extra heavy and the driving shaft has an additional outboard bearing at the right of the driving pulley. A large variety of work



The No. 8 Power Bench Press Made by the Niagara Machine & Tool Works, Buffalo, N. Y.

can be handled by these machines and special working rolls and gauges are made to suit the requirements of each particular case. The upper shaft can be raised or lowered by a crank screw, or, if desired, a treadle attachment can be furnished for this purpose.

Three sizes of machine are built. The two smaller sizes are intended for lighter material, while the one illustrated, which is known as the No. 8 power bench machine has back gears. The presses are equipped with either tight or loose pulleys or with a jaw clutch to control the motion, which can be stopped at any time.

The new plant of the Ellwood City Forge Company, Ellwood City, Pa., has been put in operation. John Evans is president of the company and David Evans is secretary and general manager.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1½ in. round and square ..... ₹ lb 1.75¢
1 to 6 in. x ½ to 1 in. ..... ₹ lb 1.85¢
1½ to 4 in. x 1¼ to 5-1 ..... ₹ lb 1.85¢
Rods ⅜ and 11-16 round and square ..... ₹ lb 1.85¢

Angles—
3 in x 3 in. and larger ..... 2.05¢
3 in x 5-16 in. and ⅜ in. ..... 2.25¢
1½ to 2 in. x ¼ in. ..... 2.10¢
1 to 2½ in. x 3-16 in. and thicker ..... 2.10¢
1 to 1¾ in. x 3-16 in. ..... 2.20¢
1 to 1¾ in. x ¼ in. ..... 2.00¢
1 to 1¾ x ⅜ in. ..... 2.30¢
¾ x ⅛ in. ..... 2.30¢
¾ x ¼ in. ..... 2.40¢
½ x ⅛ in. ..... 3.15¢
⅜ x ⅛ in. ..... 4.25¢

Tees:
1 in. ..... 2.65¢
1¼ in. ..... 2.55¢
1½ to 2 in. x ¼ in. ..... 2.15¢
1½ to 2½ x ⅜ to 6 in. ..... 2.35¢
3 in. and larger ..... 2.05¢

Beams ..... 2.00¢
Channels, 3 in. and larger ..... 2.0¢
Bands—1 to 6 x 3-16 to No. 8 ..... 2.30¢
"Burden's Best" Iron, base price ..... 3.15¢
Burden's "H B & S" Iron, base price ..... 2.95¢
Norway Bars ..... 3.50¢

Merchant Steel from Store—

per lb

Bessemer Machinery ..... 1.90¢
Toe Calk, Tire and Sleigh Shoe ..... 2.50@3.00¢
Best Cast Steel, base price in small lots ..... 7¢

Sheets from Store—

	Black		
	One Pass, C R Soft Steel		R. G. Planished
	₹ lb		₹ lb
No. 16	2.55¢		2.85¢
Nos. 18 to 20	2.60¢		2.90¢
Nos. 22 and 24	2.75¢		3.05¢
No. 26	2.80¢		3.10¢
No. 28	2.95¢		3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₹ lb 12@14½¢
Patent Planished, W. Dewees Wood ..... ₹ lb A, 10¢; B, 9¢ per lb

Galvanized.

Nos. 12 and 14 ..... ₹ lb 2.95¢
Nos. 22 to 24 ..... ₹ lb 3.45¢
No. 26 ..... ₹ lb 3.70¢
No. 28 ..... ₹ lb 3.80¢
No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24 ..... ₹ lb ..5.75¢
No. 26 ..... ₹ lb ..6.25¢
No. 28 ..... ₹ lb ....7.50¢

Corrugated Roofing—

2½ in. corrugated.

	Painted	Galv'd
No. 24	2.85 per sq. ft.	4.20
No. 26	3.05 per sq. ft.	4.40
No. 28	3.60 per sq. ft.	5.15

Tin Plates

American Charcoal Plates (per box.)

"A A A," Charcoal:
IC, 14 x 20 ..... $6.35
IX, 14 x 20 ..... 7.40
A, Charcoal:
IC, 14 x 20 ..... $5.40
IX, 14 x 20 ..... 6.50

American Coke Plates—Bessemer—
IC, 14 x 20 ..... $4.40
IX, 14 x 20 ..... 5.40

American Terne Plates—
IC, 20 x 28 with an 8-lb coating $8.70
IX, 20 x 28 with an 8-lb coating 10.50

Seamless Brass Tubes—

List November 17, 1908 ..... Base price 26¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908 ..... Base price 18¢

Copper Tubes—

List November 13, 1908 ..... Base price 21¢

Brazed Brass Tubes—

List August 1, 1908 ..... 19½¢ ₹ lb

High Brass Rods—

List August 1, 1908 ..... 14¼¢ ₹ lb

Roll and Sheet Brass

List August 1, 1908 ..... 14¼¢ ₹ lb

Brass Wire—

List August 1, 1908 ..... 14¾¢ ₹ lb

Copper Wire—

Base Price ..... carload lots nilt 14¼¢

Copper Sheets—

Sheet Copper Hot Rolled, base (quantities over) ₹ lb 18¢
Sheet Copper Cold Rolled, 14 oz. and over (over 14 oz.) ..... 21¢
Sheet Copper Polished 2 in. wide and under, 1¢ ₹ square foot
Sheet Copper Polished over 2 in. wide, 2¢ ₹ square foot
Planished Copper, 1¢ ₹ square foot more than Polished

METALS—

Tin—

Straits Pig ..... ₹ lb 40¼@40¾¢

Copper—

Lake Ingot ..... ₹ lb 14¾@15 ¢
Electrolytic ..... ₹ lb 14½@14¾¢
Casting ..... ₹ lb 14¼@14½¢

Spelter—

Western ..... ₹ lb 6¼@6½¢

Zinc.

No. 9, base, casks ..... ₹ lb 8¼¢ Open ..... ₹ lb 8¾¢

Lead.

American Pig ..... ₹ lb 5 @5¼¢
Bar ..... ₹ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed ..... ₹ lb 23½@24 ¢
No. 1 ..... ₹ lb 21½@22 ¢
Refined ..... ₹ lb 19 @19¼¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₹ lb .5 10¢
Hallett's ..... .@0 10¢
Other Brands ..... @9¾¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting ..... 24¢
Rods & Wire ..... Base Price 31¢
Sheets ..... Base Price 33¢

Old Metals.

Dealers Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible ..... ₹ lb	11.00@11.25
Copper, Heavy and Wire ..... ₹ lb	10.75@11.00
Copper, Light and Bottoms ..... ₹ lb	9.75@10.00
Brass, Heavy ..... ₹ lb	7.25@ 7.50
Brass, Light ..... ₹ lb	5.75@ 6.00
Heavy Machine Composition ..... ₹ lb	9.75@10.00
Clean Brass Turnings ..... ₹ lb	7.25@ 7.50
Composition Turnings ..... ₹ lb	8.25@ 8.50
Lead, Heavy ..... ₹ lb	@ 4.75
Lead, Tea ..... ₹ lb	@ 4.50
Zinc Scrap ..... ₹ lb	@ 4.00

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